

**For Discussion  
on 25 April 2008**

**Legislative Council Panel on Transport**

**Hong Kong – Zhuhai – Macao Bridge,  
Hong Kong Boundary Crossing Facilities  
and the Link Road in Hong Kong**

**PURPOSE**

This paper updates Members on the progress of the planning work for the Hong Kong – Zhuhai - Macao Bridge (HZMB), the Hong Kong Boundary Crossing Facilities (HKBCF) and the link road in Hong Kong, and seeks Members' support for funding applications to be made to the Public Works Subcommittee (PWSC) and the Finance Committee (FC) for the preconstruction works for the HZMB and the investigation and preliminary design (I&PD) study for the HKBCF.

**BACKGROUND**

2. In January 2003, the National Development and Reform Commission and the Government of Hong Kong Special Administration Region (HKSAR) jointly commissioned the Institute of Comprehensive Transportation (ICT) to conduct a study entitled "Transport Linkage between Hong Kong and Pearl River West". The study confirmed the strategic significance of and urgent need for the construction of a land transport link between the HKSAR and the Pearl River West.

3. The governments of Guangdong, the Hong Kong Special Administrative Region (HKSAR) and the 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, covering a wide range of topics including navigation clearance, hydrology, environment, traffic, economic benefits and financial viability. A total of eight AWCG meetings and numerous expert group meetings have been held to deliberate on the outcome of the various topical studies. 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 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 Boundary Crossing Facilities (BCF) of each government should be set up within their own respective territories (三地三檢).

## **LATEST DEVELOPMENT**

4. HPDI has substantially completed the feasibility study for the HZMB.

### **Strategic Value of HZMB**

5. 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, but the benefits go far beyond this. With the HZMB, the Western PRD will fall within a reachable 3-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-a-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.

### **The Proposed Alignment**

6. HPDI recommends that the HZMB should take a bridge-cum-tunnel alignment with an immersed tunnel underneath the main navigation channels near the boundary of the HKSAR, with landings at Gongbei of Zhuhai and A Perola of the Macao SAR at the

western bank and at San Shek Wan of Northwest Lantau at the eastern bank. A plan showing the alignment is attached at **Annex A**.

## **Financing Arrangement and Economic Benefits**

7. As regards the financial case, the feasibility study report points out that in view of the mega size of the whole HZMB project, it is not financially viable to attract private investment. The report recommends that the three governments should be responsible for their associated link roads and BCF within their own territory, and private investment should be invited to undertake the Main Bridge under a Build, Operate and Transfer (BOT) franchise for a period of 50 years. It also recommends that the three governments should contribute to part of the construction cost of the Main Bridge, which is proposed to start from the artificial island off Gongbei of Zhuhai and A Perola of the Macao SAR and extend to the eastern artificial island west of the HKSAR boundary. The split of the contribution should be determined in accordance with the principle of Equalization of Benefit to Cost Ratio<sup>1</sup>.

8. At the 8<sup>th</sup> AWCG Meeting held on 28 February 2008 in Guangzhou, a consensus was reached on the financing arrangement for the HZMB project as follows-

- (a) each of the three governments will be responsible for the construction, operation and maintenance of the BCF and link roads within its own territory;
- (b) the HZMB Main Bridge should start from the artificial islands off Gongbei and Macao to the eastern artificial island west of the HKSAR boundary. It will be a 29.6km dual 3-lane carriageway in the form of a bridge-cum-tunnel structure running across major navigation channels in the Pearl River Estuary with an immersed tunnel of about 6.7km and the construction cost (excluding financing cost) is estimated to be RMB ¥31 billion at early 2007 prices;
- (c) the three governments should, if necessary, contribute to the funding gap of the HZMB Main Bridge, and the split of the contribution should be determined in accordance with the principle of Equalization of Benefit to Cost Ratio, with Hong Kong contributing 50.2%, Mainland 35.1% and Macao 14.7%. The exact amount of contribution would depend on the outcome of the tendering

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<sup>1</sup> Equalization of Benefit to Cost Ratio is an approach to equalize the ratio of the estimated benefit obtained to the estimated cost incurred for a joint investment from different territories with different economic status. Under this principle, the amount of contribution by the three governments to the cost of the HZMB Main Bridge and Link Roads should be apportioned in such a way that the Benefit to Cost Ratio of the three places will be the same.

exercise and the financing arrangements proposed by the successful bidder; and

- (d) further discussion among the NDRC and the three governments as to the details of the tendering exercise and the content of the tender documents would be necessary.

9. Under this arrangement, the Economic Net Present Value (ENPV)<sup>2</sup> of the project is about RMB ¥40 billion for an operation period of 20 years. The estimated ENPV for Hong Kong is about RMB ¥23 billion as compared to RMB ¥13 billion for the Mainland and RMB ¥4 billion for Macao. The Economic Internal Rate of Return (EIRR)<sup>3</sup> of the project is 8.8% in respect of Hong Kong over a 20-year period, or 12% over a 40-year period.

10. We have engaged a traffic consultant to explore and review possible options for regulating cross-boundary vehicles after the commissioning of the HZMB, and to recommend the preferred arrangement for these vehicles.

### **Preconstruction Works for HZMB**

11. In order to fast track the project implementation programme, the AWCG has agreed to advance a physical modelling study normally undertaken at the preliminary design stage to assess in more details the impact of the HZMB on the hydrology, flooding and ports in the Pearl River Estuary and to fine-tune the design of the HZMB to minimize such impacts. We intend to submit a paper to the PWSC in May 2008 proposing to upgrade 835TH-“Hong Kong-Zhuhai-Macao Bridge – Preconstruction Works” to Category A at an estimated cost of \$46.6 million (in MOD prices) for employment of consultants to carry out the preconstruction works for the HZMB, including the physical modelling study as well as the tendering exercise. The draft PWSC paper is attached at **Annex B**.

### **Hong Kong Boundary Crossing Facilities**

12. In light of the recommendation of the HZMB Task Force in January 2007 for each government to set up its BCF in their own territories, Highways Department commissioned a site selection study in May 2007 to identify a suitable location for the

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<sup>2</sup> The Economic Net Present Value (ENPV) is the difference between the discounted present value of economic benefits and the discounted present value of costs.

<sup>3</sup> Economic Internal Rate of Return (EIRR) is the discounted rate used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. Generally speaking, the higher a project's EIRR, the more desirable it is to undertake the project.

HKBCF. The study, completed in early 2008, has examined various possible sites, including various 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. It finally recommended the preferred location of the HKBCF at the waters off the north-east of the Airport Island, which is shown at **Annex A**.

13. With the proximity of the preferred site to the Airport, air/land transit of passengers can be facilitated by extending the existing Automated People Mover to connect the Airport Terminal with the HKBCF. Furthermore, this location would also provide integration between the HKBCF and the proposed Tuen Mun - Chek Lap Kok Link. In the long run, the existing SkyPier on the Airport Island could be relocated to the HKBCF which will become a multi-modal transportation hub. However, the preferred site would require reclamation as well as re-provisioning of some affected Airport facilities such as the existing/planned Marine Cargo Terminal. We have closely involved the Airport Authority in our site selection and will discuss further with it the various interface issues. The Islands District Council and various green group were also consulted during the site selection study.

14. We need to commence the I&PD study for the HKBCF as soon as possible to determine its location, general layout, land requirement and impacts, so that it will be completed in time to meet the opening of the HZMB. Under the I&PD study, we will carry out an environmental impact assessment (EIA) study according to the EIA Ordinance for identification of the environmental impacts and the mitigation measures required, including those related to heritage preservation. Site investigation work is also included to provide geotechnical and geological information for subsequent design work. The project profile of the study has been made public for comments.

15. The HKBCF will be implemented as a Public Works Programme (PWP) item. We intend to propose to the PWSC in May 2008 the part upgrade of 834TH, entitled “Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – investigation and preliminary design” to Category A to fund the proposed I&PD study and site investigation work at an estimated cost of \$86.9 million (in MOD prices). The draft PWSC paper is attached in **Annex C**.

## **Hong Kong Link Road (HKLR)**

16. The Hong Kong Link Road (HKLR)<sup>4</sup> is a 12.6 km dual 3-lane road connecting the HZMB Main Bridge at the HKSAR boundary with the proposed HKBCF at the north-east of the Airport Island.

17. Various alignments options have been investigated in the I&PD study, and two rounds of public consultation with the environmental concern groups and the Islands District Council have been conducted so far. It is now envisaged that a sea viaduct along the airport channel and the southeast coastline of the Airport Island will be a better alignment given the preferred location for the HKBCF. The HKLR will be entirely within Hong Kong and will likewise be pursued as a PWP project in line with our established procedures in Hong Kong. Funds for the construction works will be sought from the FC in due course in accordance with PWP procedures.

### **ADVICE SOUGHT**

18. Members are invited to note the content of this paper and indicate support for the funding applications for the preconstruction works for the HZMB, and the I&PD study of the HKBCF.

Transport and Housing Bureau  
21 April 2008

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<sup>4</sup> The link road within Hong Kong was originally named the North Lantau Highway Connection (NLHC) connecting the HZMB from its landing point at San Shek Wan in Northwest Lantau to the existing North Lantau Highway. However, subsequent to the three governments' agreement on the scope of the HZMB Main Bridge, and the recommendation of the BCF Site Selection Study to locate the proposed HKBCF at the waters off the north-east of the Airport Island, the link road will be adjusted to start from the HKSAR boundary and land at the HKBCF, and is now renamed the HKLR.

圖例  
LEGEND

- 擬建橋樑  
PROPOSED BRIDGE
- - - 擬建隧道  
PROPOSED TUNNEL



港珠澳大橋  
HONG KONG - ZHUHAI - MACAO BRIDGE

For discussion  
on 21 May 2008

PWSC(2008-09)XX

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 706 – HIGHWAYS

#### Transport – Roads

#### 835TH – Hong Kong–Zhuhai–Macao Bridge – preconstruction works

Members are invited to recommend to Finance Committee the upgrading of **835TH** to Category A at an estimated cost of \$46.6 million in money-of-the-day prices for the preconstruction works for the Hong Kong-Zhuhai-Macao Bridge.

### PROBLEM

We need to carry out preconstruction works for Hong Kong-Zhuhai-Macao Bridge (HZMB), which includes a physical modelling study with recommendations on the further refinement of the design for HZMB, and works related to the Build-Operate-Transfer (BOT) tendering process for the Main Bridge of HZMB, jointly with the governments of Guangdong Province and the Macao Special Administrative Region (SAR).

### PROPOSAL

2. The Director of Highways (D of Hy), with the support of the Secretary for Transport and Housing, proposes to upgrade **835TH** to Category A at an estimated cost of \$46.6 million in money-of-the-day (MOD) prices to fund the Hong Kong Special Administrative Region (HKSAR)'s share for the preconstruction works for the HZMB.

### PROJECT SCOPE AND NATURE

3. The scope of **835TH** comprises –



- (a) a physical modelling study (inclusive of the associated design refinement for the HZMB) to supplement the topical study on hydrology in the assessment of the impacts of HZMB on the hydrology, flooding and ports in the Pearl River Estuary, and identification of ways to minimize any adverse impact; and
- (b) works relating to the tendering exercise for the HZMB Main Bridge.

4. We plan to commence the physical modelling and studies in mid 2008 for completion by July 2009.

#### **JUSTIFICATION**

5. The governments of Guangdong, the HKSAR and 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, covering a wide range of topics including navigation clearance, hydrology, environment, traffic, economic benefits and financial viability. A total of eight AWCG meetings and numerous expert group meetings have been held to deliberate on the outcome of the various topical studies. 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 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 Boundary Crossing Facilities (BCF) of each government should be set up within their own respective territories.

6. HPDI has substantially completed the feasibility study for the HZMB.

#### **The Proposed Alignment**

7. HPDI recommends that the HZMB should take a bridge-cum-tunnel alignment with an immersed tunnel underneath the main navigation channels near the boundary of the HKSAR, with landings at Gongbei of Zhuhai and A Perola of the Macao SAR at the western bank and at San Shek Wan of Northwest Lantau at the eastern bank. A plan showing the alignment is attached at the Enclosure.

### Financing Arrangement and Economic Benefits

8. As regards the financial arrangement, the feasibility study report points out that in view of the mega size of the whole HZMB project, it is not financially viable to attract private investment. The report recommends that the three governments should be responsible for their associated link roads and BCF within their own territory, and private investment should be invited to undertake the Main Bridge under a BOT franchise for a period of 50 years. It also recommends that the three governments should contribute to part of the construction cost of the Main Bridge, which is proposed to start from the artificial island off Gongbei of Zhuhai and A Perola of the Macao SAR and extend to the eastern artificial island west of the HKSAR boundary. The split of the contribution should be determined in accordance with the principle of Equalization of Benefit to Cost Ratio [效益費用比相等]<sup>1</sup>.

9. At the 8<sup>th</sup> AWCG Meeting held on 28 February 2008 in Guangzhou, a consensus was reached on the financing arrangement for the HZMB project as follows –

- (a) each of the three governments will be responsible for the construction, operation and maintenance of the BCF and link roads within its own territory;
- (b) the HZMB Main Bridge should start from the artificial islands off Gongbei and Macao to the eastern artificial island west of the HKSAR boundary. It will be a 29.6 kilometre (km) dual three-lane carriageway in the form of a bridge-cum-tunnel structure running across major navigation channels in the Pearl River Estuary with an immersed tunnel of about 6.7 km and the construction cost (excluding financing cost) is estimated to be RMB ¥31 billion;
- (c) the three governments should, if necessary, contribute to the funding gap of the HZMB Main Bridge, and the split of the contribution should be determined in accordance with the principle of Equalization of Benefit to Cost Ratio, with Hong Kong contributing

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<sup>1</sup> Equalization of Benefit to Cost Ratio is an approach to equalise the ratio of the estimated benefit obtained to the estimated cost incurred for a joint investment from different territories with different economic status. Under this principle, the amount of contribution by the three governments to the cost of the HZMB Main Bridge and Link Roads should be apportioned in such a way that the Benefit to Cost Ratio of the three places will be the same.

50.2%, Mainland 35.1% and Macao 14.7%. The exact amount of contribution would depend on the outcome of the tendering exercise and the financing arrangements proposed by the successful bidder; and

- (d) further discussion among the NDRC and the three governments as to the details of the tendering exercise and the content of the tender documents would be necessary.

10. Under this arrangement, the Economic Net Present Value (ENPV)<sup>2</sup> of the project is about RMB ¥40 billion for an operation period of 20 years. The estimated ENPV for Hong Kong is about RMB ¥23 billion as compared to RMB ¥13 billion for the Mainland and RMB ¥4 billion for Macao. The Economic Internal Rate of Return<sup>3</sup> of the project is 8.8% in respect of Hong Kong over a 20-year period, or 12% over a 40-year period.

11. We have engaged a traffic consultant to explore and review possible options for regulating cross-boundary vehicles after the commissioning of the HZMB, and to recommend the preferred arrangement for these vehicles.

12. In order to fast track the project implementation programme, the AWCG has agreed to advance a physical modelling study to assess in more details the impact of the HZMB on the hydrology, flooding and ports in the Pearl River Estuary and to fine-tune the design of the HZMB to minimise adverse impacts.

13. The cost of the physical modelling study including the associated design refinement for the HZMB, and tender for the HZMB Main Bridge will be shared by the three governments on an equal basis.

## FINANCIAL IMPLICATIONS

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<sup>2</sup> The Economic Net Present Value (ENPV) is the difference between the discounted present value of economic benefits and the discounted present value of costs.

<sup>3</sup> Economic Internal Rate of Return (EIRR) is the discounted rate used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. Generally speaking, the higher a project's EIRR, the more desirable it is to undertake the project.

14. We estimate the HKSAR's share of the cost of the preconstruction works to be \$46.6 million in MOD prices (see paragraph 15 below), made up as follows–

		<b>\$ million</b>	
(a)	Physical modelling study	36.0	
	(i) physical modelling study	26.9	
	(ii) the associated design refinement for the HZMB	9.1	
(b)	Works relating to the tender for the HZMB Main Bridge	4.0	
(c)	Contingencies	4.0	
	Sub-total	44.0	(in September 2007 prices)
(d)	Provision for price adjustment	2.6	
	Total:	46.6	(in MOD prices)

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

<b>Year</b>	<b>\$ million (Sep 2007)</b>	<b>Price Adjustment Factor</b>	<b>\$ million (MOD)</b>
2008 – 2009	9.0	1.02575	9.2
2009 – 2010	31.0	1.06293	33.0
2010 – 2011	4.0	1.10545	4.4
	44.0		46.6

16. 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 2011. The three governments will engage consultants to undertake the preconstruction works for

the HZMB on a lump-sum basis without provision for price adjustment as the duration of each consultancy will not exceed 12 months.

17. The proposed preconstruction works for the HZMB will have no recurrent financial implication.

## PUBLIC CONSULTATION

18. We briefed the 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 HPDI by the AWCG to conduct the feasibility study for the HZMB and the commissioning of the investigation and preliminary design study for the Hong Kong Link Road (HKLR). 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 the various alignment options for the HKLR, and consulted them on the proposed **796TH** “Hong Kong-Zhuhai-Macao Bridge - conceptual design and advance technical studies”.

19. 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 and the various alignments of the HKLR. The ACE members and representatives of the green groups gave useful suggestions on the scope of the environmental impact assessment (EIA) study and suggested that close liaison be maintained with the other two governments to facilitate assessment of the cumulative environmental impacts.

20. We consulted the Islands District Council on the alignment options of the Hong Kong Link Road on 2 June 2005 and 17 October 2005 respectively.

21. We consulted the Panel on 25 April 2008 regarding our plan to submit the funding application for the preconstruction works for the HZMB. Members showed their support for the funding application. **[To be confirmed]**

## ENVIRONMENTAL IMPLICATIONS

22. The proposed preconstruction works for the HZMB will not give rise to any adverse environmental impacts.

23. Regarding the BCF and the associated local link roads connecting the HZMB within the HKSAR boundary, we have commenced the EIA study for the HKLR and will commence the EIA study for the HZMB Hong Kong BCF in mid 2008 to assess and evaluate the environmental acceptability of these projects under the EIA Ordinance (Cap. 499). We will submit the EIA reports to the Director of Environmental Protection under the EIA Ordinance for approval and will follow the statutory procedures of making the EIA reports available for comments by the public and the AC E.

## HERITAGE IMPLICATIONS

24. The proposed preconstruction works for the HZMB 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 within the boundary of HKSAR.

## LAND ACQUISITION

25. The proposed preconstruction works for the HZMB do not require any land acquisition.

## BACKGROUND INFORMATION

26. 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 ICT to conduct a study entitled "Transport Linkage between Hong Kong and Pearl River West" at a cost of \$800,000. The ICT completed the study in July 2003.

27. In March 2004, we included an item under **Subhead 6100TX** at an estimated cost of \$11.0 million to fund HKSAR's share of the cost for the HPDI to conduct the feasibility study for the HZMB. In April 2005, we increased the 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 some additional topical studies for the

feasibility study. In September 2006, we further increased the APE of this item by \$2.3 million to \$14.2 million to conduct supplementary studies under “separate locations of boundary crossing facilities mode” for completing the feasibility study of the HZMB. Upon substantial completion of the supplementary studies, HPDI finalised the HZMB feasibility study report and submitted it to the AWCG for consideration in January 2008. The report is being revised to take into account further comments of the three governments and also the consensus reached in the 8<sup>th</sup> AWCG Meeting.

28. 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 EIA, 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, acceptance standards as well as the cost estimation for construction works in oceanic condition. The EIA studies for works on land and off-shore are in progress and expected to be complete by the third quarter of 2008. The other advance technical studies are also in good progress and interim reports have been submitted to provide useful information for future BOT tender preparation works.

29. We included **835TH** in Category B in March 2008.

30. The proposed preconstruction works for the HZMB will not directly involve any tree removal or planting proposals.

31. The proposed preconstruction works for the HZMB will be carried out in the Mainland and they will not create any new jobs in the HKSAR.

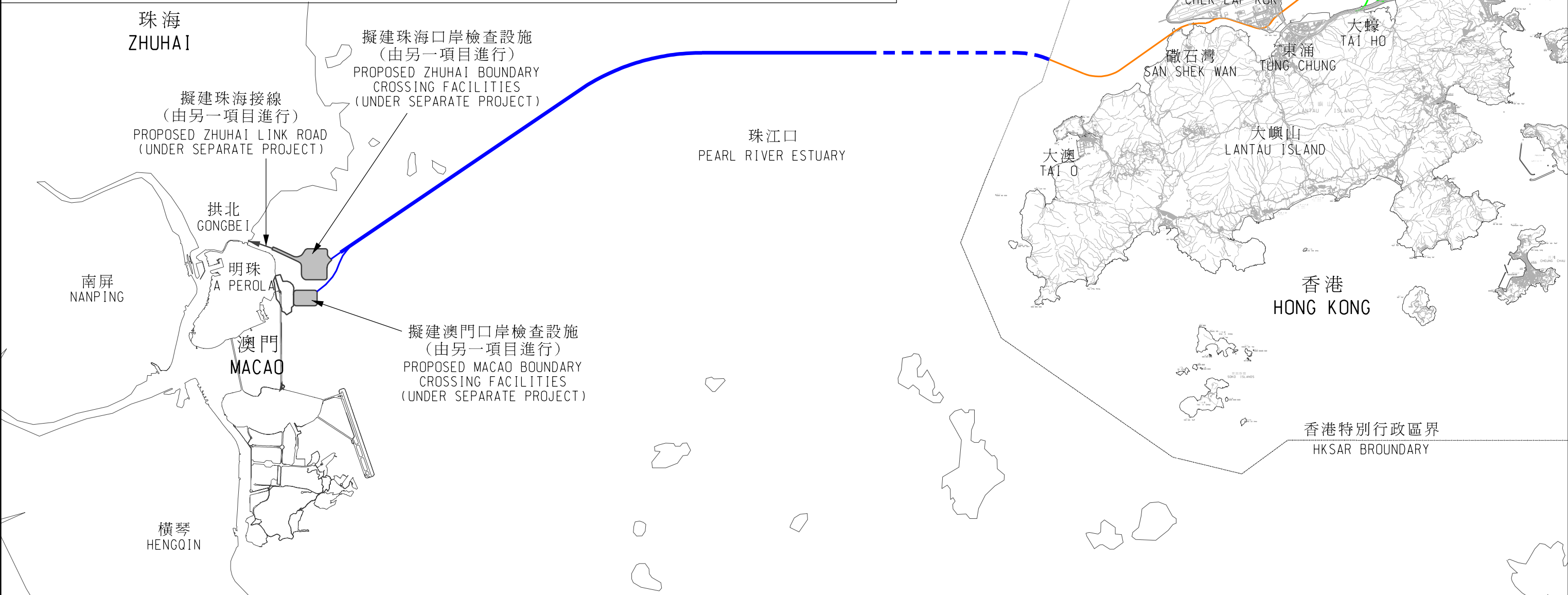
圖例  
LEGEND

- 港珠澳大橋主體**  
HONG KONG-ZHUHAI-MACAO BRIDGE  
MAIN BRIDGE
- 擬建橋樑  
PROPOSED BRIDGE
  - - - 擬建隧道  
PROPOSED TUNNEL

**相關香港工程項目**  
RELATED HONG KONG PROJECTS


- 擬建屯門至赤鱗角連接路及屯門西繞道 (示意路線)  
(工務計劃項目第825TH號)  
PROPOSED TUEN MUN-CHEK LAP KOK LINK AND TUEN MUN WESTERN BYPASS (INDICATIVE ALIGNMENT)  
(PWP ITEM No. 825TH)
- 擬建港珠澳大橋香港接線 (示意路線)  
PROPOSED HONG KONG-ZHUHAI-MACAO BRIDGE HONG KONG LINK ROAD (INDICATIVE ALIGNMENT)
- 擬建港珠澳大橋香港口岸 (示意位置)  
(工務計劃項目第834TH號)  
PROPOSED HONG KONG-ZHUHAI-MACAO BRIDGE HONG KONG BOUNDARY CROSSING FACILITIES (INDICATIVE LOCATION)  
(PWP ITEM No. 834TH)

註釋：所有示意路線及位置都可能修改。  
NOTES: ALL INDICATIVE ALIGNMENTS / LOCATION ARE SUBJECT TO CHANGE.



圖則名稱 drawing title

工務計劃項目第835TH號 - 港珠澳大橋 - 施工前工作  
PWP ITEM No. 835TH - HONG KONG-ZHUHAI-MACAO BRIDGE  
- PRECONSTRUCTION WORKS

設計 designed T W LI 03/04/08	繪圖 drawn Y L SHIU 17/04/08	圖則編號 drawing no. HZM6835TH-SK0002	比例 scale 不按比例 N.T.S.
覆核 checked W C LAU	批准 approved H C TAM	© 版權所有 COPYRIGHT RESERVED	
港珠澳大橋香港工程管理處 HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG PROJECT MANAGEMENT OFFICE		 <b>HIGHWAYS DEPARTMENT HONG KONG</b> 路政署 香港	



For discussion  
on 21 May 2008

PWSC(2008-09)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 – investigation and preliminary design”, to Category A at an estimated cost of \$86.9 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).

### PROPOSAL

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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.

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 \$86.9 million in money-of-the-day (MOD) prices to engage consultants to undertake the investigation and preliminary design (I&PD) for 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 (TMCLKL) and the Airport;
  - (g) reprovisioning of the affected Airport's facilities; and
  - (h) provision of other facilities for connection with the Airport such as extension of the existing Automated People Mover to connect the Airport Terminal with the HKBCF.

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A plan showing the tentative location of HZMB HKBCF is at Enclosure 1.

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

- (a) a review of the findings of previous studies of the HKBCF and examination of the design options of the HKBCF;
- (b) impact assessments on environment, traffic, marine, aviation and other related aspects;
- (c) preliminary design of the works described in paragraph 3 above; and
- (d) associated site investigation and works supervision.

5. We plan to commence the I&PD study in July 2008 for completion in May 2010.

## **JUSTIFICATION**

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, covering a wide range of topics including navigation clearance, hydrology, environment, traffic, economic benefits and financial viability. A total of eight AWCG meetings and numerous expert group meetings have been held to deliberate on the outcome of the various topical studies.

7. 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 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 own respective territories.

8. In the light of the recommendation of the Task Force, Highways Department commissioned a site selection study in May 2007 for the HKBCF. The study, completed in early 2008, has 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. It finally recommended the preferred location of the HKBCF at the waters off the north-east of the Airport Island. The preferred site would have the least environmental impacts. Also, with the proximity of the preferred site to the Airport, air/land transit of passengers can be facilitated by extending the existing Automated People Mover to connect the Airport Terminal with the HKBCF. Furthermore, this site location would also provide the chance for better integration with the proposed TMCLKL. However, the preferred site would require reclamation and reprovisioning of some affected Airport facilities such as the existing/planned Marine Cargo Terminal.

9. HPDI has substantially completed the feasibility study for the HZMB.

10. At its 8<sup>th</sup> meeting held on 28 February 2008, the AWCG was briefed by the HPDI on the main findings of the HZMB feasibility study and reached a consensus on the project financial arrangement. In particular, it was agreed that the three governments shall be responsible for the construction, operation and maintenance of their own BCFs in their respective territories.

11. In order to provide the HKBCF on time to meet the opening of the HZMB, we need to commence the I&PD study for the HKBCF as soon as possible to determine its location, general layout, land requirement and impacts. Under the I&PD study, we will carry out an environmental impact assessment (EIA) study according to the EIA Ordinance in order to identify the environmental impacts and the mitigation measures required, including those related to heritage preservation. We will also carry out site investigation work to provide geotechnical and geological information for preliminary and subsequent detailed design work. 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 I&PD study and supervise the site investigation works.

## **FINANCIAL IMPLICATIONS**

12. We estimate the cost of the I&PD study to be \$86.9 million in MOD prices (see paragraph 13 below), made up as follows—

		<b>\$ million</b>	
(a) Consultants' fees		45.0	
(i) review of the findings of previous studies, and examination of design options	5.0		
(ii) impact assessments (environmental, traffic, marine and aviation, etc.)	25.1		
(iii) preliminary design	13.3		
(iv) supervision of site investigation	1.6		
(b) Site investigation		29.1	
(c) Contingencies		7.4	
	Sub-total	81.5	(in September 2007 prices)
(d) Provision for price adjustment		5.4	
	Total	86.9	(in MOD prices)

———— A breakdown of the estimated consultants' fees is at Enclosure 2.

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

<b>Year</b>	<b>\$ million (Sep 2007)</b>	<b>Price Adjustment Factor</b>	<b>\$ million (MOD)</b>
2008 – 2009	19.9	1.02575	20.4
2009 – 2010	36.9	1.06293	39.2
2010 – 2011	24.7	1.10545	27.3
	<u>81.5</u>		<u>86.9</u>

14. 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 2011. We will engage consultants to undertake the I&PD study 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 to be awarded through competitive tendering.

15. The proposed I&PD study and its associated site investigation works will have no recurrent financial implication.

## **PUBLIC CONSULTATION**

16. In July 2007, we consulted environmental concern groups and fishermen representatives on their views of 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 as a matter of principle. The fishermen representatives also expressed their objection to any reclamation for fear that it would affect their fisheries production.

17. We consulted the Islands District Council 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 did not short-list the San Shek Wan option due to their adverse impact on Chinese White Dolphins and their significant adverse noise, air, visual and landscape impacts, including significant hill cutting, removal of woodland with landscape value and clearance of an archaeological site.

18. We consulted the Legislative Council Panel on Transport on 25 April 2008 regarding our plan to submit the funding application for the proposed I&PD study. Members showed their support for the funding application. **[To be confirmed.]**

## **ENVIRONMENTAL IMPLICATIONS**

19. The reclamation works, dredging operation, extension of Automated People Mover, and road bridges are designated projects under Schedule 2 of the EIA Ordinance (Cap. 499) and environment permits are required for the construction and operation of these works. We will carry out an EIA study to address the potential environmental impacts of the Project in detail. We will submit the EIA report to the Director of Environmental Protection under the EIA Ordinance 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.

20. The proposed I&PD study and site investigation works will only 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 construction projects.

#### **HERITAGE IMPLICATIONS**

21. The proposed I&PD study and its associated 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. We will investigate in the I&PD study whether the Project will affect any unknown heritage site.

#### **LAND ACQUISITION**

22. The proposed I&PD study and its associated site investigation works do not require any land acquisition.

#### **BACKGROUND INFORMATION**

23. In May 2007, we engaged a consultant to undertake the HZMB HKBCF Site Selection Study – Feasibility Study. We charged the total cost of \$3.85 million for the study under the block allocation **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.

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

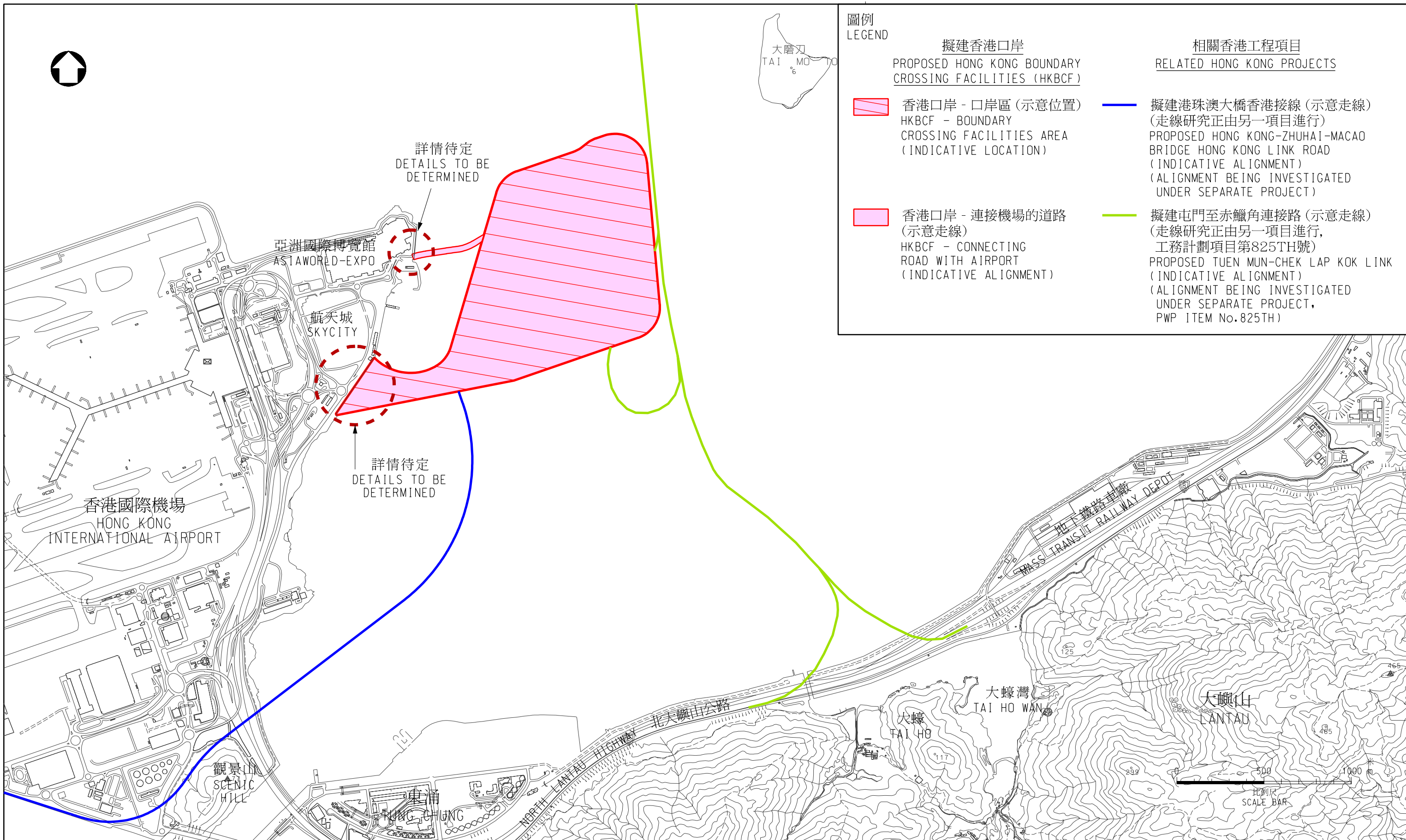
25. The proposed I&PD study and its associated site investigation works will not involve any tree removal or planting proposals. We will require the consultants to take into consideration the need for the tree preservation during the planning and design stages of the Project. We will also incorporate tree-planting proposals, where possible, in the construction phase.

26. We estimate that the proposed I&PD study and its associated site investigation works will create about 75 jobs (22 for labourers and 53 for professional/technical staff) providing a total employment of about 1,300 man-months.

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Transport and Housing Bureau  
May 2008





圖例 LEGEND		擬建香港口岸 PROPOSED HONG KONG BOUNDARY CROSSING FACILITIES (HKBCF)	相關香港工程項目 RELATED HONG KONG PROJECTS
	香港口岸 - 口岸區 (示意位置) HKBCF - BOUNDARY CROSSING FACILITIES AREA (INDICATIVE LOCATION)		擬建港珠澳大橋香港接線 (示意走線) (走線研究正由另一項目進行) PROPOSED HONG KONG-ZHUHAI-MACAO BRIDGE HONG KONG LINK ROAD (INDICATIVE ALIGNMENT) (ALIGNMENT BEING INVESTIGATED UNDER SEPARATE PROJECT)
	香港口岸 - 連接機場的道路 (示意走線) HKBCF - CONNECTING ROAD WITH AIRPORT (INDICATIVE ALIGNMENT)		擬建屯門至赤鱗角連接路 (示意走線) (走線研究正由另一項目進行, 工務計劃項目第825TH號) PROPOSED TUEN MUN-CHEK LAP KOK LINK (INDICATIVE ALIGNMENT) (ALIGNMENT BEING INVESTIGATED UNDER SEPARATE PROJECT, PWP ITEM No.825TH)

圖則名稱 drawing title	設計 designed K Y HO 26/03/08	繪圖 drawn H S CHAN 10/04/08	圖則編號 drawing no. HZM6834TH-SK0004	比例 scale 1:20000
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	覆核 checked K MA	批准 approved H C TAM	© 版權所有 COPYRIGHT RESERVED	
	港珠澳大橋香港工程管理處 HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG PROJECT MANAGEMENT OFFICE		<b>HIGHWAYS DEPARTMENT HONG KONG</b> 路政署	

**Enclosure 2 to PWSC(2008-09)XX**

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

**Breakdown of estimates for consultants' fees and site investigation works**

			<b>Estimated man- months</b>	<b>Average MPS* salary point</b>	<b>Multiplier (Note 1)</b>	<b>Estimated fee (\$ million)</b>
<b>Consultants' staff costs</b>						
(a)	Review of the findings of previous studies, and examination of design options	Professional	28	38	2.0	3.2
		Technical	48	14	2.0	1.8
(b)	Impact assessments (environmental, traffic, marine and aviation, etc.)	Professional	153	38	2.0	17.4
		Technical	204	14	2.0	7.7
(c)	Preliminary design	Professional	83	38	2.0	9.5
		Technical	102	14	2.0	3.8
(d)	Supervision of site investigation	Professional	10	38	1.6	0.9
		Technical	23	14	1.6	0.7
Total consultants' staff costs						<hr/> 45.0
<b>Out-of-pocket expenses</b>						
<b>(Note 2)</b>						
(a)	Site investigation					<hr/> 29.1
Total						<hr/> 74.1

\* 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 2007, MPS pt. 38 = \$56,945 per month and MPS pt. 14 = \$18,840 per month).
2. Out-of-pocket expenses are the actual cost to be incurred. The consultants are not entitled to any additional payment for the overheads or profit in respect of these items.
3. 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.