

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

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 Bridge¹, 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.

¹ 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.

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 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

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 road², but the benefits go far beyond this. With the 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.

² 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
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%

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 LegCo³ 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 8th 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 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)

³ 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.

- (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

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 bank 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 the provision for currency fluctuation and contingency, we estimate the cost of **3QR** to be \$9,046.5 million in MOD prices, made up as follows –

/ RMB¥.....

	RMB¥ million	HK\$ million (at rate RMB 0.88:HKD 1)
(a) Detailed design and construction of –	5,046.3	5,734.3
(i) Bridge and tunnel in sea	4,304.1	
- bridge	2,430.7	
- tunnel in sea	1,873.4	
(ii) artificial islands	742.2	
(b) procurement and installation of associated equipment, plant, etc. for –	38.1	43.2
(i) bridge	18.4	
(ii) tunnel in sea	17.2	
(iii) artificial islands	2.5	
(c) traffic control and surveillance system, signage	70.3	79.8
(d) bank loan interests accrued during construction	989.1	1,123.9
(e) miscellaneous expenses including preliminary design and investigation, lands provision for works area, further studies and testing, site supervision, etc.	606.2	688.8
	Sub-total	<hr/> 6,750.0 7,670.0
(f) contingencies		767.0
	Sub-total	<hr/> 8,437.0
(g) Provision for Renminbi fluctuation		843.0
	Sub-total	<hr/> 9,280.0
Less funding in 4QR – Preliminary Design and Investigation		(233.5)
	Total	<hr/> 9,046.5 (in MOD prices) <hr/>

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

Year	\$ million (MOD)
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 style="width: 50%; margin: auto;"/> 9,046.5 <hr style="width: 50%; margin: auto;"/>

19. The cash flow in paragraph 18 above is worked out on the basis of the cash flow 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 and requested the Administration to provide information on the HZMB traffic forecast.

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

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 8th 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 9th 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

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.

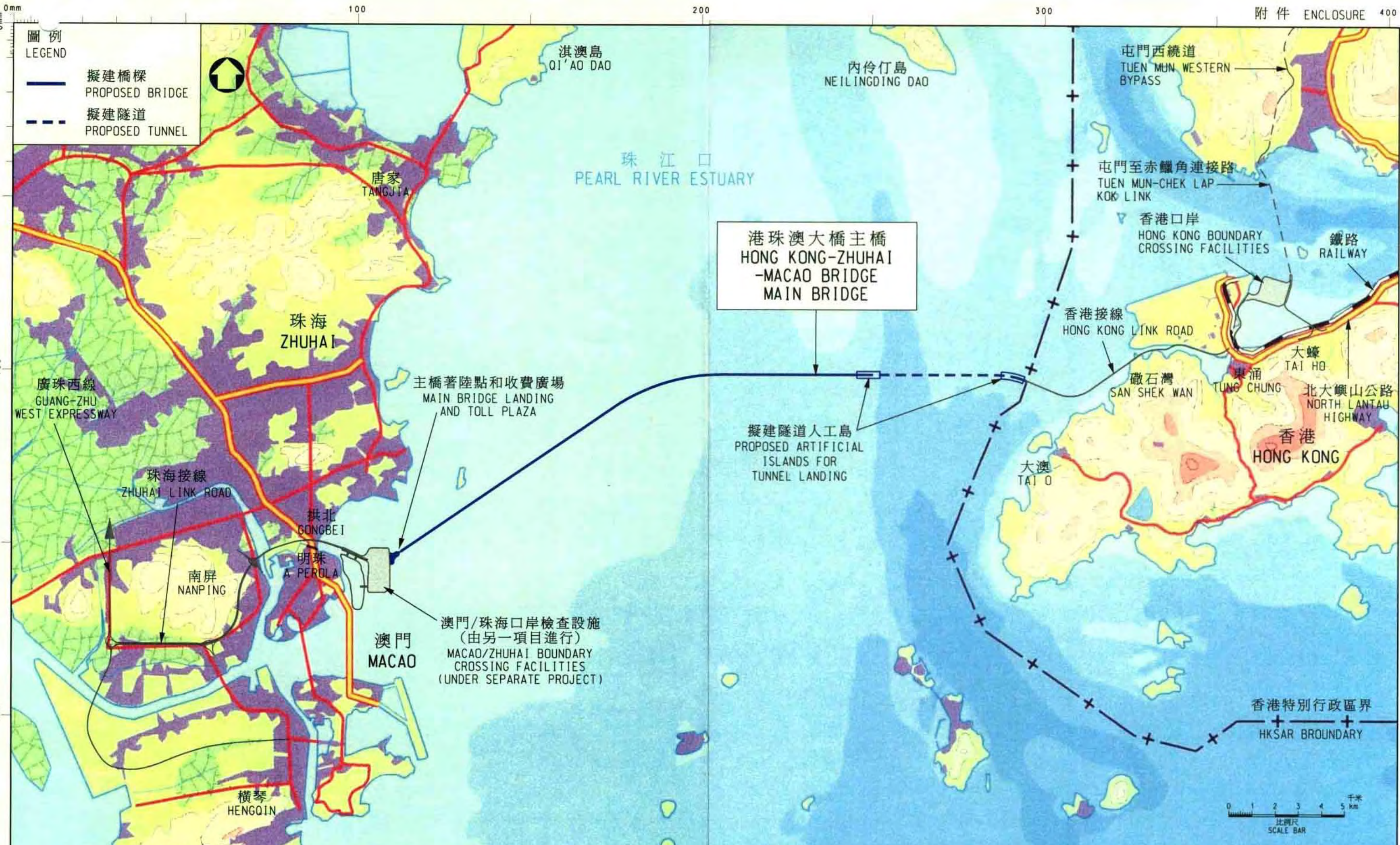
39. In June 2008, with the approval of the Finance Committee (FC), we upgraded **835TH** “Hong Kong-Zhuhai-Macao Bridge - preconstruction works” to Category A at an estimated cost of \$46.6 million in MOD prices to provide fund for HKSAR’s share of the cost for some preconstruction works for the HZMB, 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 FC, we upgraded part of **3QR** to Category A as **4QR** “Hong Kong-Zhuhai-Macao Bridge – funding support for preliminary design and site investigation (PD&SI) 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.



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

設計 designed W H YIP 03/04/09	繪圖 drawn K L LEUNG 03/04/09	圖則編號 drawing no. HZM8003QR-SK0002	比例 scale 不按比例 N.T.S.
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