

**For discussion
on 23 December 2014**

Legislative Council Panel on Transport

**Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities – Reclamation and
Superstructures**

PURPOSE

We propose to increase the approved project estimate (APE) of **845TH** (i.e. “Hong Kong-Zhuhai-Macao Bridge (HZMB) Hong Kong Boundary Crossing Facilities (HKBCF) – Reclamation and Superstructures”) by \$5,461.1 million from \$30,433.9 million to \$35,895.0 million in money-of-the-day (MOD) prices. This paper seeks Members’ views on the above proposal. Details of the proposal are enclosed in the draft Public Works Subcommittee (PWSC) Paper at Annex.

BACKGROUND

2. The HZMB is a cross-boundary road infrastructure project providing direct land transport connection between the two shores of the Pearl River Delta, linking Hong Kong in the east and linking Macao and Zhuhai in the west. The entire HZMB project consists of two parts: (i) the HZMB Main Bridge; and (ii) the link roads and boundary crossing facilities of the three sides. The works of the HZMB Main Bridge are situated in Mainland waters and are being carried out by the HZMB Authority. The three governments are responsible for their own boundary crossing facilities and link roads. The HZMB related local projects, including the Hong Kong Link Road (HKLR), the HKBCF and the Tuen Mun – Chek Lap Kok Link (TM-CLKL), are huge infrastructure project that encounter many technical challenges during construction. We have been reviewing the implementation of the projects with a view to overcoming and handling the concerned difficulties in a timely manner to dovetail with the commissioning of the HZMB.

3. On 18 November 2011, the Finance Committee (FC) of the

Legislative Council approved the upgrading of **845TH** (the Project) to Category A at an estimated cost of \$30,433.9 million (in MOD prices) for the reclamation works and the construction of the superstructures for the HZMB HKBCF. The Project mainly involves reclamation to provide land for the development of the HKBCF, construction of cargo clearance facilities, construction of passenger clearance facilities, provision of accommodation for and facilities of Government departments, provision of transport and miscellaneous facilities, provision of road access for connection of the HKBCF to the HZMB HKLR, the TM-CLKL and the Hong Kong International Airport, and provision of other associated infrastructures and facilities.

PROGRESS OF THE PROJECT

4. The entire **845TH** Project is currently implemented mainly under ten works contracts. As of November 2014, we have awarded five works contracts. Of which, the contract on reclamation works commenced in November 2011 with about 69% of the works completed so far. Besides, part of the vehicular bridges, at-grade roads and underpasses at the Airport Island also commenced construction in May 2012. For the superstructure works¹, the traffic control and surveillance system contract, the passenger clearance building contract and the infrastructure works stage 1 (western portion) contract commenced in January, April and July 2014 respectively. Another two large-scale superstructure works contracts will be awarded shortly. Tenders of the remaining three ancillary works contracts will be invited later. We will endeavour to complete the essential works of the HKBCF project to dovetail with the commissioning of the HZMB.

REVISION OF PROJECT ESTIMATE

5. Following a review of the financial position and the tender results of the major works contracts, we consider it necessary to increase the APE of **845TH** by \$5,461.1 million from \$30,433.9 million to \$35,895.0 million (in MOD prices) to cover the additional costs arising mainly from the following:

¹ The superstructure works, in general, refer to the infrastructures and facilities within the approved project scope of the Project other than the reclamation works. They include, mainly, the passenger clearance building, cargo clearance facilities, passenger clearance facilities, accommodation for and facilities of Government departments, transport facilities and road network, and other associated infrastructures and facilities, etc.

- (a) higher-than-expected costs of superstructure works; and
- (b) increase in provision for price adjustment.

6. We are well aware of the importance of cost control. Therefore, we have optimised the design and adopted cost-saving measures as far as possible when devising the design of the superstructure works. In the planning of contract packages, due consideration has been given to increase the number of contractors capable of undertaking the works with a view to achieving more competitive tender prices. However, the tender prices of several recently returned tenders for the superstructure works contracts of the HKBCF were higher than expected, which are believed to be attributed mainly to the surge in construction prices after mid-2011 and the tenderers' higher risk assessment for the future market condition and the tight works programme of the Project.

7. Details of the proposed increase in APE are elaborated in the draft Public Works Subcommittee (PWSC) Paper at Annex.

ADVICE SOUGHT

8. Members are invited to comment on our proposal to increase the APE of the Project, and to support the submission of the proposal to the PWSC for consideration.

**Transport and Housing Bureau
December 2014**

For discussion
on XX YY 2015

PWSC(2014-15)XX

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

HEAD 706 – HIGHWAYS

Transport – Roads

**845TH – Hong Kong–Zhuhai–Macao Bridge Hong Kong Boundary
Crossing Facilities – Reclamation and Superstructures**

Members are invited to recommend to the Finance Committee to increase the approved project estimate for **845TH** by \$5,461.1 million from \$30,433.9 million to \$35,895.0 million in money-of-the-day prices.

PROBLEM

The approved project estimate (APE) of **845TH** is not sufficient to cover the cost of works under the project.

PROPOSAL

2. The Director of Highways, with the support of the Secretary for Transport and Housing, proposes to increase the APE for **845TH** by \$5,461.1 million from \$30,433.9 million to \$35,895.0 million in money-of-the-day (MOD) prices.

PROJECT SCOPE AND NATURE

3. In November 2011, the Finance Committee (FC) of the Legislative Council approved the upgrading of **845TH** (the Project) to Category A at an estimated cost of \$30,433.9 million in MOD prices. The approved scope of works under **845TH** comprises –

- (a) reclamation to provide land for the development of the Hong Kong Boundary Crossing Facilities (HKBCF);
- (b) construction of cargo clearance facilities including processing kiosks and examination facilities for goods vehicles, cargo examination platforms, etc.;
- (c) construction of passenger clearance facilities including processing kiosks and examination facilities for private cars and coaches, passenger clearance building, etc.;
- (d) provision of accommodation for and facilities of 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, car parks, passenger queuing areas, road networks, footbridges, fencing, sewage and drainage systems, water supply system, utilities, electronic system, and traffic control, surveillance and information system, etc.;
- (f) provision of road access for connection of the HKBCF to the Hong Kong-Zhuhai-Macao Bridge (HZMB) Hong Kong Link Road (HKLR), the Tuen Mun-Chek Lap Kok Link (TM-CLKL) and the Hong Kong International Airport (HKIA);
- (g) reprovisioning of affected airport facilities; and
- (h) provision of ancillary commercial areas, electrical and mechanical (E&M) works, other civil engineering works, landscape and amenity works, etc.

Plans of the works of the HKBCF are at **Enclosure 1**.

PROGRESS OF THE PROJECT

4. The entire **845TH** Project is currently implemented mainly under ten works contracts. The details of which are at **Enclosure 2**. As of November 2014, we have awarded five works contracts. Of which, the contract on reclamation works commenced in November 2011, with about 69% of the works completed. Besides, part of the vehicular bridges, at-grade roads and underpasses at the Airport Island also commenced construction in May 2012. For the superstructure works¹, the traffic control and surveillance system contract, the passenger clearance building contract and the infrastructure works stage 1 (western portion) contract commenced in January, April and July 2014 respectively. Another two large-scale superstructure works contracts will be awarded shortly. Tenders of the remaining three ancillary works contracts² will be invited later. We will endeavour to complete the essential works of the HKBCF to dovetail with the commissioning of the HZMB.

JUSTIFICATIONS

5. Following a detailed review of the financial position and the tender results of the major works contracts³, we consider it necessary to increase the APE of **845TH** by \$5,461.1 million from \$30,433.9 million to \$35,895.0 million (in MOD prices) to cover the additional costs arising mainly from the following –

- (a) higher-than-expected costs of superstructure works; and
- (b) increase in provision for price adjustment.

¹ The superstructure works, in general, refer to the infrastructures and facilities within the approved project scope of the Project except for the reclamation works. They include, mainly, the passenger clearance building, cargo clearance facilities, passenger clearance facilities, accommodation for and facilities of Government departments, transport facilities and road network, and other associated infrastructures and facilities, etc.

² The scope of the three ancillary works contracts mainly involves the construction of automatic vehicle clearance support system, X-ray vehicle inspection systems, and the remaining ancillary buildings and facilities (including a cargo examination building, private car annexures, detective dog base building, dangerous goods store, maintenance depots etc.). The total cost of these three contracts is estimated to be about 10% of all the works under the HKBCF project.

³ These cover six out of the nine superstructure works contracts, and together with the reclamation contract, the known tender prices amount to about 90% of the total cost of works of the Project.

The details of the increase in the APE of the Project are elaborated in paragraphs 6 to 21 below.

HIGHER-THAN-EXPECTED COSTS OF THE SUPERSTRUCTURE WORKS

6. We are well aware of the importance of cost control. Therefore, we have optimised the design and adopted cost-saving measures as far as possible when devising the design of the superstructure works. In the planning of contract packages, due consideration has been given to increase the number of contractors capable of undertaking the works with a view to achieving more competitive tender prices. However, the tender prices of several recently returned tenders for the superstructure works contracts of the HKBCF were higher than expected, which are believed to be attributed mainly to the surge in construction prices after mid-2011 and the tenderers' higher risk assessment for the future market condition and the tight works programme of the Project.

SURGE IN CONSTRUCTION PRICES

7. When we applied for funding for **845TH** in 2011, our cost estimate was based on the market situation at that time and cost information of similar infrastructure projects available up to mid-2011. Since then, there has been a surge in the construction prices, in particular for the sectors of heavy civil engineering works (such as viaducts, drainage works, piling works) and building works, leading to the tender prices of the superstructure works obtained in end 2013 and 2014 being higher than our original cost estimate in mid-2011.

Heavy civil engineering works

Increase in plant, material and labour costs

8. Currently, there are a number of large-scale heavy civil engineering works projects involving viaducts, piling and reinforced concrete works under construction in Hong Kong and adjacent regions. These projects are being constructed within a similar time frame as the HKBCF superstructure works. As a result, the demand for similar construction plant, materials and labour needed for the HKBCF superstructure works is strong.

9. There has been quite a surge in the cost of plant and machinery needed for the HKBCF superstructure works starting from mid-2011. The rental cost of heavy construction plant such as piling plant, tower cranes, crawler cranes, excavators and rollers has increased by about 30% to 55% from mid-2011 to mid-2014. Tenderers might have envisaged that the supply of construction plant in the market would become even tighter and therefore might have included additional costs in their tender prices in order to ensure sufficient machinery and equipment.

10. Regarding construction materials, in general, there has also been considerable increase in the prices of materials commonly required in heavy civil engineering works and building works after mid-2011. Taking the example of aggregates, concrete blocks and colour glazed ceramic wall tiles which are needed for this Project, the average wholesale prices of these three materials have increased by 16%, 18% and 49% respectively from mid-2011 to mid-2014. In view of the recent volatility of the market, tenderers might have made upward adjustments to their tender prices when making the bids in end 2013 and 2014.

11. Regarding labour costs, the construction workers required for the HKBCF superstructure works mainly include concretors, bar benders and fixers, structural steel erectors, structural steel welders, riggers/metal formwork erectors, carpenters (formwork), construction plant mechanics and levellers. The relevant wage information of these trades according to the Census and Statistics Department is at **Enclosure 3**. The overall composite labour wages indices of the construction industry have increased by about 34% from mid-2011 to mid-2014 while the wages of those key trades involved in the HKBCF project such as concretor, carpenter (formwork), and bar bender and fixer have increased by 80%, 62% and 44% respectively (see **Enclosure 3**).

12. Furthermore, the work sites of the HKBCF are located in the northwest of Lantau. The additional daily traveling time of workers can be two hours longer than that of other sites which are more convenient. Workers may also need to travel to work by boat. As there have been other major infrastructure projects in the urban areas in recent years, there is plenty more job opportunities in the urban areas; and hence jobs in remote sites such as the HKBCF would become relatively less attractive. Recruitment exercises conducted by the contractors revealed that the labour force within the Tung Chung area would not be enough to meet the demand. As a result, contractors expect that they may have to provide higher subsidies when employing

workers so as to attract them to work at the HKBCF.

Specialist sub-contractors

13. The viaducts and piling works are construction activities that require specialist sub-contractors to carry out the sophisticated operation such as the installation of precast bridge segments and the pre-stressing operation⁴. There are limited specialist sub-contractors in the market as many viaducts and piling works are being carried out concurrently. As a result, the tender prices of the viaducts and piling works are higher than expected.

Building works

14. The HKBCF superstructure works contracts involve a lot of buildings and building services works. The construction prices of which have been increased significantly since mid-2011. The Building Works Tender Price Index and Building Services Works Tender Price Index compiled by the Architectural Services Department have increased by an average of about 26% from the first half of 2011 to the first half of 2014. Besides, as the majority of the building services works will only be carried out at a later stage of the Project, tenderers might have built in additional risk premium in their tenders to cater for the possible further market surge for the building services works.

TENDERERS' PERCEPTION ON HIGHER PROGRAMME RISKS DUE TO THE TIGHT WORKS PROGRAMME

15. We originally planned to commence the reclamation works by end 2010. As a result of the delay caused by the judicial review (JR) on the Environmental Impact Assessment (EIA) report of the HZMB⁵, we could only commence the reclamation works in end November 2011. The construction programme thus becomes very tight in order to dovetail with the commissioning of the HZMB. The tenderers might have envisaged that in

⁴ Pre-stressing operation is to apply stress by steel tendons to the concrete structural elements in order to enhance their loading capacity.

⁵ On 22 January 2010, a Tung Chung resident filed an application with the Court of First Instance (CFI) for leave for JR against the decisions of the Director of Environmental Protection (DEP) as regards the approval for the EIA Reports and the granting of Environmental Permits (EPs) relating to the HKBCF and HKLR projects. The CFI handed down its judgement on 18 April 2011 quashing the EPs and therefore their construction could not commence. DEP appealed against the court's judgment. The Court of Appeal handed down its judgment on 27 September 2011, unanimously allowing DEP's appeal and therefore the EIA reports and EPs of HKBCF and HKLR projects are maintained valid.

case of any unforeseen delay, or any need to implement delay recovery measures (e.g. by increasing labour resources and plant, or arranging overtime work), additional costs will be incurred. Unlike other works projects, the HKBCF project is a large scale infrastructure project. Coupled with its extremely tight construction programme, contractors have little room to flexibly deploy their labour and plant. In addition, with the increase in construction cost in the market, the tenderers might have reflected the cost of these higher programme risks in the tender prices.

16. Based on the reasons mentioned in paragraphs 6 to 15 above, the tender prices of the superstructure works are higher than our original cost estimate in mid-2011 and have contributed an increase of about \$4,971.3 million. Of which, the cost increase for the viaducts and vehicles underpasses; drainage works, sewerage works, waterworks and common utilities enclosures; building piling and building services are more significant.

INCREASE IN PROVISION FOR PRICE ADJUSTMENT

17. According to the current government practice, the monthly payments to contractors for most construction contracts are adjusted to cover market fluctuation in labour and material costs, which are known as Contract Price Fluctuation payment. The price adjustment is assessed based on the price adjustment factors derived from the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output together with the cash flow of the Project.

18. When the project estimate of **845TH** was prepared in 2011, a provision of \$6,070.6 million was allowed for price adjustment based on the Government's price adjustment factors available at that time and the original cash flow pattern. Due to the additional cost increase as explained in paragraphs 6 to 15 above as well as the differences in the original and the latest cash flow of the Project, we need to seek an increase in the provision for price adjustment. Based on the latest project estimate, cash flow and the latest price adjustment factors, the provision for price adjustment has to be increased by \$2,213.7 million from \$6,070.6 million to \$8,284.3 million. The details of the latest cash flow of the Project and the latest provision for price adjustment are at **Enclosure 4**.

SAVINGS IN OTHER ITEMS

19. The tender prices of the reclamation works of the HKBCF artificial island as well as the electronic works of the traffic control and

surveillance system are less than those in the APE. There is a net saving of \$1,160.6 million as detailed below –

- (a) the revised estimate for the reclamation and traffic control and surveillance system is reduced by \$955.2 million from \$6,144.9 million to \$5,189.7 million. The difference is due to the lower prices in the awarded tenders as compared to the sums allowed in the APE for these works items;
- (b) the revised estimate for the pedestrian area and other external works is reduced by \$73.0 million from \$546.2 million to \$473.2 million. The difference is mainly due to the design revision in the public transport interchanges; and
- (c) the revised estimate for the furniture and equipment is reduced by \$132.4 million from \$1,216.3 million to \$1,083.9 million. The difference is mainly due to the design revision in the furniture and equipment.

REVIEW OF CONTINGENCIES

20. As we have known the tender prices of most of the works contracts, there is therefore less market risks. We have reviewed in detail and considered that there is scope to reduce the contingencies under the original APE by \$563.3 million from \$2,214.8 million to \$1,651.5 million to partly cover the increase in cost.

21. The remaining project contingency has to be maintained to cater for unforeseen situations arising during the implementation of the Project. Although the reclamation works and part of the infrastructure works at the Airport Island commenced in November 2011 and May 2012 respectively, the major superstructure works contracts just commenced by phases in 2014. The coming two years, i.e. 2015 and 2016, will be the peak construction period for all the superstructure works contracts. For such mega and complex works project under an extremely tight programme and in view of the current market conditions, similar to all other mega projects, to be prudent, we must provide a reasonable amount of funding as contingency for addressing any unforeseen

circumstances. Also, in order to dovetail with the commissioning of the HZMB, we may need to implement delay recovery measures to cope with delays arising from the difficulties encountered during construction. These measures will incur additional cost. We will expose ourselves to unacceptable budget risk if we reduce the contingency level further.

SUMMARY OF FINANCIAL POSITION

22. In sum, a breakdown of the proposed increase of \$5,461.1 million is as follows –

Factors	Proposed increased amount/savings in MOD prices (\$ million)	Percentage of the increased amount/ savings (%)
Increase due to -		
(a) higher-than-expected costs of the superstructure works;	4,971.3	69.2
(b) increase in provision for price adjustment under the original APE	2,213.7	30.8
(c) Total increase (c)=(a)+(b)	7,185.0	100.0
Partly Offset by -		
(d) Savings in other items	(1,160.6)	67.3
(e) Drawdown from Contingencies	(563.3)	32.7
(f) Total savings (f) = (d)+(e)	(1,723.9)	100.0
(g) Proposed increase (g)=(c)-(f)	5,461.1	

A comparison of the cost breakdown of the original APE and the revised project estimate is at **Enclosure 5**.

FINANCIAL IMPLICATION

23. Subject to approval, we will revise the phased expenditure as follows –

Year	\$ million (in MOD prices)
Up to 31 March 2014	3,242.6
2014 – 15	3,394.5
2015 – 16	7,339.4
2016 – 17	11,295.4
2017 – 18 ⁶	5,467.7
2018 – 19 ⁶	2,839.6
2019 – 20 ⁶	2,315.8
	35,895.0

24. The proposed increase in the APE will not give rise to any additional recurrent expenditure.

PUBLIC CONSULTATION

25. We amended the road scheme at the southern portion of the HKBCF artificial island and gazetted the proposed amendment under the Roads (Works, Use and Compensation) Ordinance (Chapter 370) on 2 and 9 March 2012. During the 60-day statutory period for objection, no objection to the proposed road scheme amendment was received. The proposed road scheme amendment was authorised on 28 May 2012 and the notice of authorisation was gazetted on 8 and 15 June 2012.

⁶ The latest cash flow is one year longer than originally planned. It is mainly due to the update following the latest tender programme and sequence of works. For example, we have postponed the construction of those works which are not necessary to be completed at the time when the HZMB is commissioned (such as access roads and viaducts connecting to TM-CLKL Northern Connection, part of the landscape works on the artificial island, and part of the ancillary buildings and facilities, etc.) so as to reduce the amount of works during the construction peak and to relieve tenderers' perception on the risks due to the tight works programme. As a result, we have reserved about \$10.62 billion in 2017-18 to 2019-20 for the remaining works, finalisation of the contract accounts and appropriate contingencies for the works.

26. During the course of construction, to enhance communication with the public, we have set up a Project Information Centre adjacent to the site office near Tung Chung Ferry Pier to receive visitors who are interested in the Project. We also distribute newsletters about the information of the Project to stakeholders from time to time. Also, we have set up a project website and hotline to facilitate the public to offer comments and suggestions. The proposed increase in the APE does not involve any change in the project scope. We consider it not necessary to conduct further public consultation on the proposed cost increase.

27. We will consult the Legislative Council Panel on Transport on the proposed increase in APE for **845TH** on 23 December 2014.

ENVIRONMENTAL IMPLICATIONS

28. The proposed increase in the APE will not have any environmental implications.

ENERGY CONSERVATION MEASURES

29. The proposed increase in the APE will not lead to any energy conservation measures.

HERITAGE IMPLICATIONS

30. The proposed increase in the APE will not have any heritage implications.

LAND ACQUISITION

31. The proposed increase in the APE will not require any land acquisition or clearance.

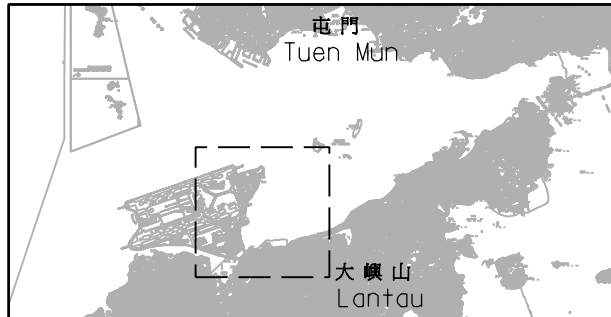
BACKGROUND INFORMATION

32. The FC approved the upgrading of **845TH** to Category A in November 2011 at an estimated cost of \$30,433.9 million in MOD prices.

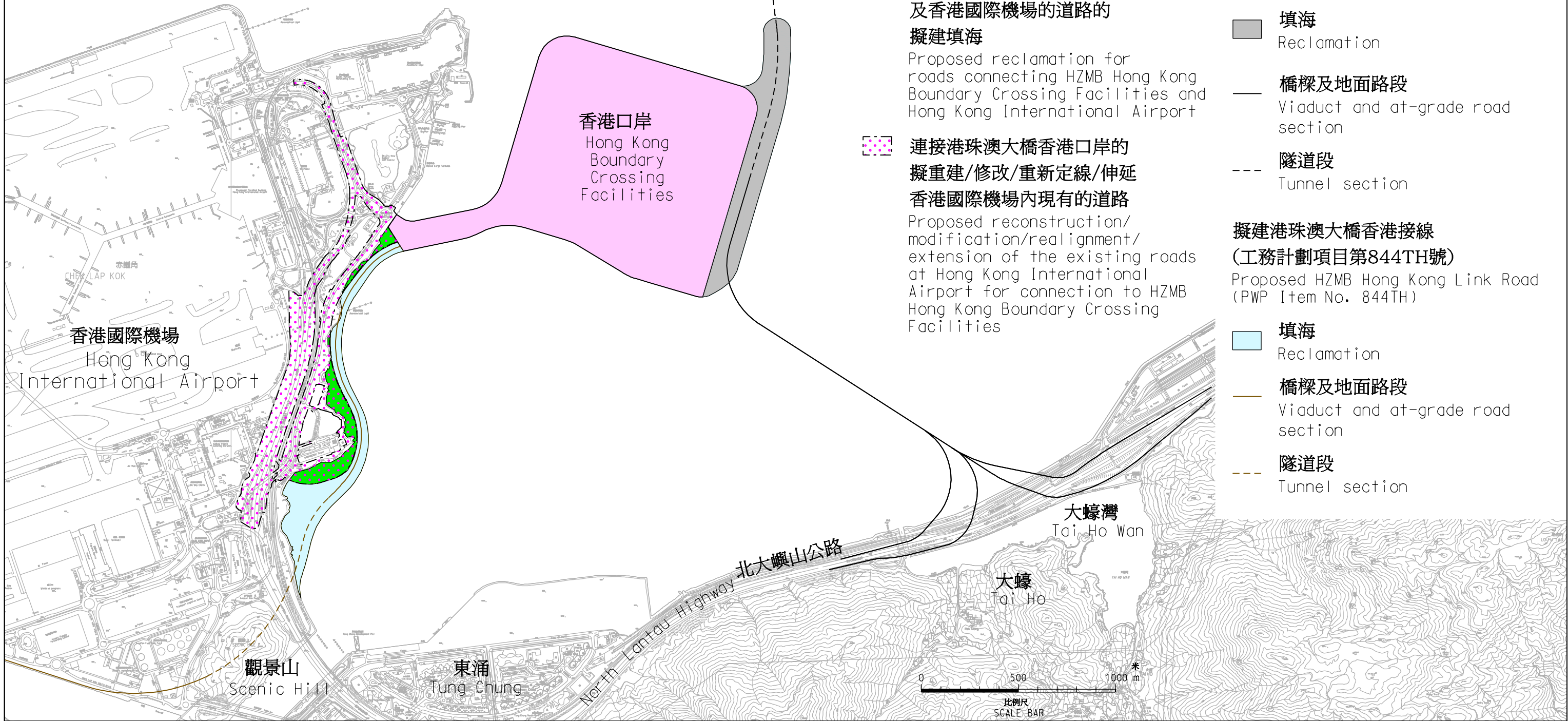
33. The proposed increase in APE will not involve any additional tree removal. We will carry out the landscape works of the HKBCF project based on the latest Hong Kong International Airport Approved Plant Species List.

34. The proposed increase in the APE will not involve the creation of any additional professional and technical posts or job opportunities.

Transport and Housing Bureau
XXXX 2014



位置圖 Location Plan 比例 Scale - 1:300000



圖例 :

Legend :

工務計劃項目第845TH號
Under PWP Item No. 845TH

- 擬建港珠澳大橋香港口岸
Proposed HZMB Hong Kong Boundary Crossing Facilities
- 連接港珠澳大橋香港口岸及香港國際機場的道路的擬建填海
Proposed reclamation for roads connecting HZMB Hong Kong Boundary Crossing Facilities and Hong Kong International Airport
- 連接港珠澳大橋香港口岸的擬重建/修改/重新定線/伸延香港國際機場內現有的道路
Proposed reconstruction/modification/realignment/extension of the existing roads at Hong Kong International Airport for connection to HZMB Hong Kong Boundary Crossing Facilities

其他工務計劃項目 :
Under other PWP Items:

- 擬建屯門至赤鱸角連接路 (工務計劃項目第825TH號)
Proposed Tuen Mun-Chek Lap Kok Link (PWP Item No. 825TH)
- 填海
Reclamation
- 橋樑及地面路段
Viaduct and at-grade road section
- 隧道段
Tunnel section
- 擬建港珠澳大橋香港接線 (工務計劃項目第844TH號)
Proposed HZMB Hong Kong Link Road (PWP Item No. 844TH)
- 填海
Reclamation
- 橋樑及地面路段
Viaduct and at-grade road section
- 隧道段
Tunnel section

工務計劃項目第845TH號 港珠澳大橋香港口岸 - 填海及口岸設施工程
PWP Item No. 845TH - Hong Kong-Zhuhai-Macao Bridge (HZMB)
Hong Kong Boundary Crossing Facilities - Reclamation and Superstructures

圖則編號 plan no. HZM6845TH-SK0001A	比例 scale 1:20000
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG PROJECT MANAGEMENT OFFICE	
	HIGHWAYS DEPARTMENT HONG KONG
路政署	香港

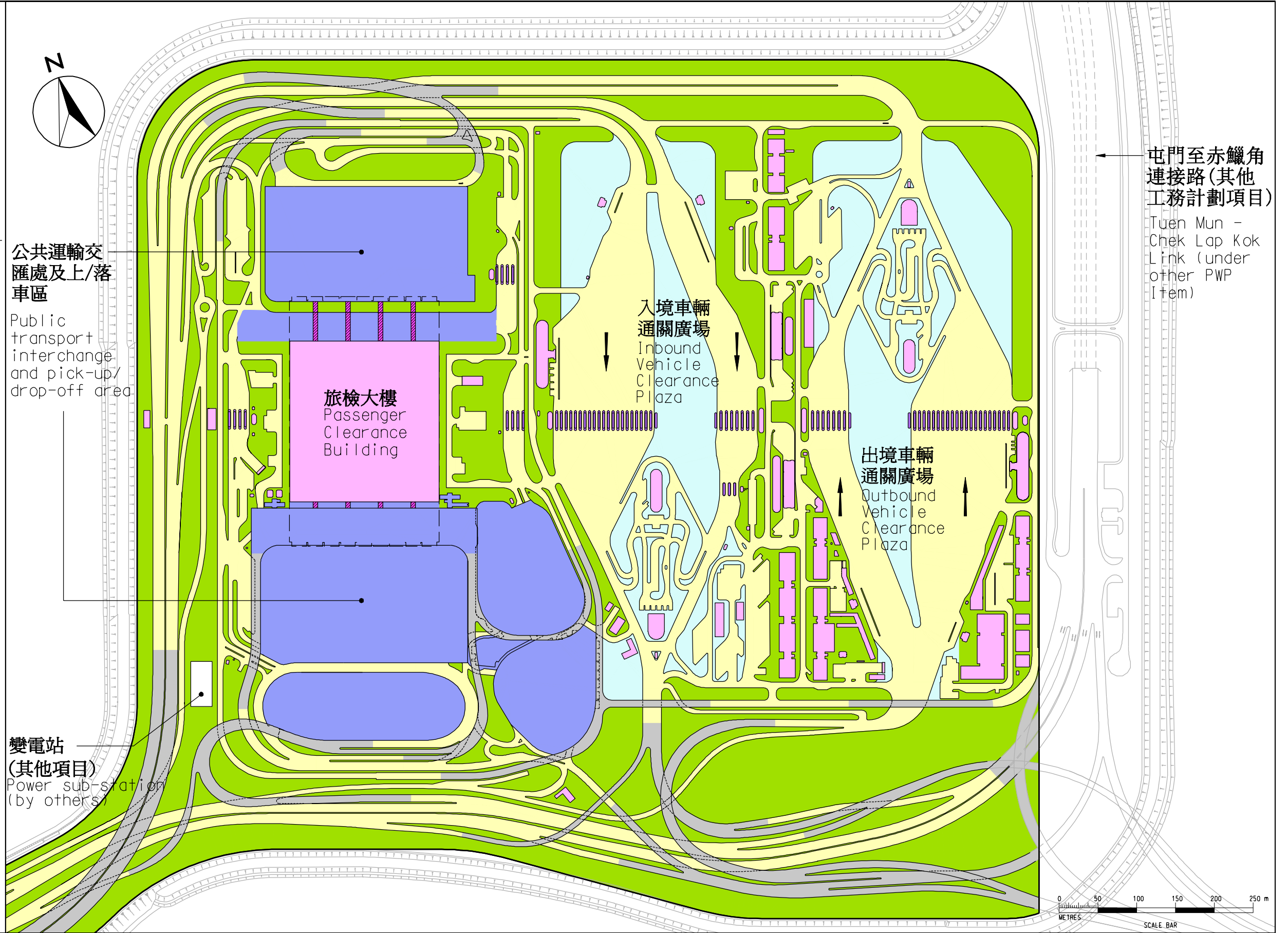
圖例

Legend

- 擬建行人路, 行車道和美化市容地帶
Proposed footpath, carriageway and amenity area
- 擬建公共運輸交匯處, 上落車區及泊車轉乘設施
Proposed public transport interchange and pick-up/drop-off area / Park-and-Ride
- 擬建行車道
Proposed carriageway
- 擬建行人天橋
Proposed footbridge
- 擬建高架道路
Proposed viaduct
- 擬建綠化地帶
Proposed green area
- 擬建建築物
Proposed building
- 行車方向
Traffic direction
- 擬建檢查亭
Proposed kiosk

註釋
NOTE

1. 在工程項目進行時, 布局及細節可能再作調整。
Layout and details are subject to further development when the project proceeds.



工務計劃項目第845TH號 港珠澳大橋香港口岸 - 填海及口岸設施工程
香港口岸的最新整體布局圖

PWP Item No. 845TH - Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities (HKBCF) - Reclamation and Superstructures
Latest Master Layout Plan of HKBCF

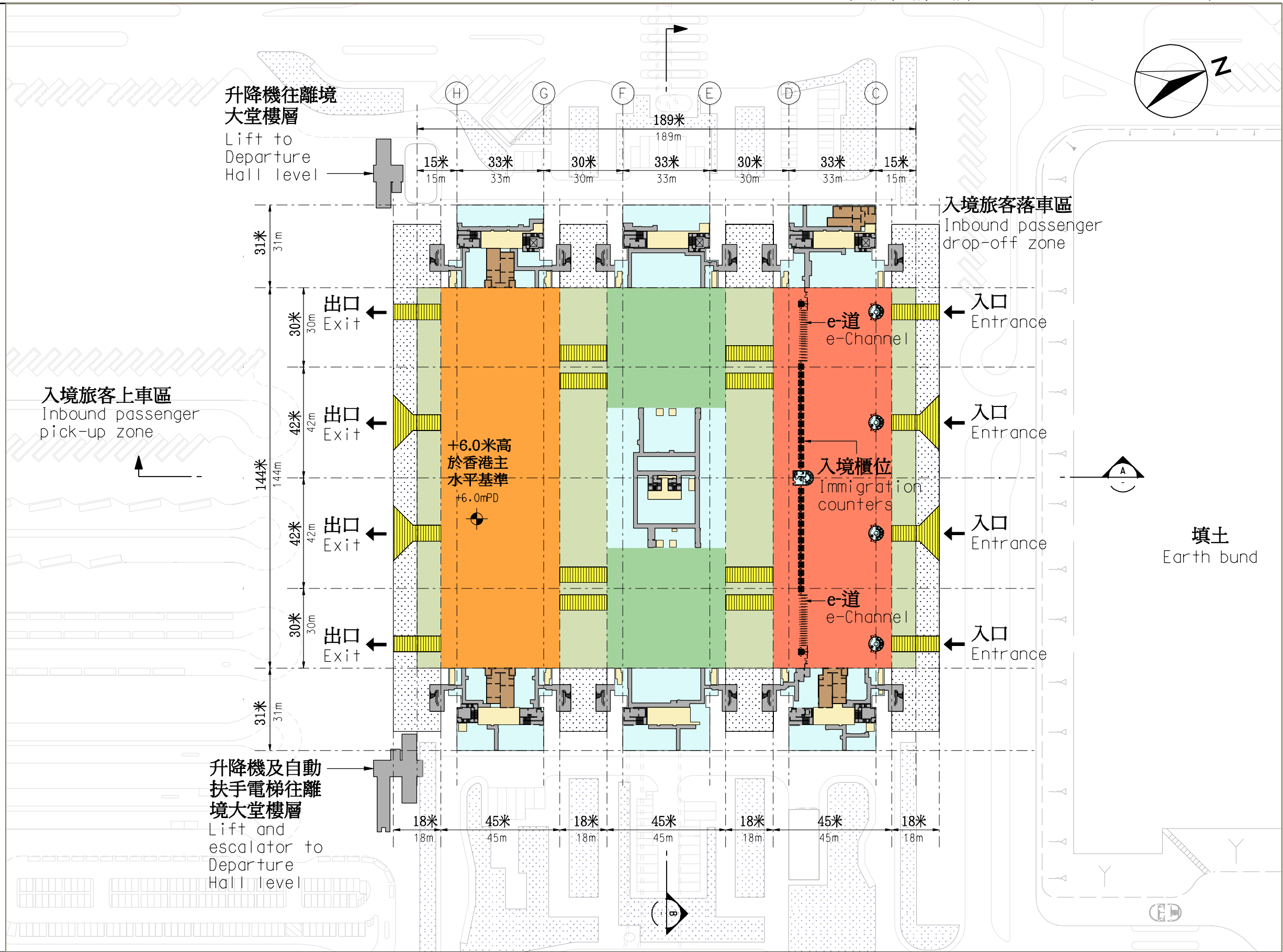
圖則編號 plan no. HZM6845TH-SK0301A	比例 scale 1:5000
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG PROJECT MANAGEMENT OFFICE	
	HIGHWAYS DEPARTMENT HONG KONG
路政署 香港	

圖例 Legend

- 入境檢查區
Immigration clearance zone
- 海關檢查區
Customs clearance zone
- 清關後區
Post clearance zone
- 辦公室
Office
- 後勤地方/機房
Back of house/plant room
- 公廁
Public toilet
- 室內綠化區域
Indoor planting area
- 室外綠化區域
Outdoor planting area
- 衛生署健康檢查站
Department of Health Health Screening Station
- 緊急出入口
Means of escape/access
- 大約地面水平
Approximate level

註釋 NOTE

1. 所有地面水準均以香港主水平基準為計算根據，並以米為單位。
All levels refer to Hong Kong Principal Datum (PD) and are in metres (m).
2. 在工程項目進行時，
布局及細節可能再作調整。
Layout and details are subject to further development when the project proceeds.



工務計劃項目第845TH號 港珠澳大橋香港口岸 - 填海及口岸設施工程
旅檢大樓的平面圖 - 地面平面圖 (入境樓層)

PWP Item No. 845TH - Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities (HKBCF) - Reclamation and Superstructures
Passenger Clearance Building - Ground Floor Plan (Arrival Hall Level)

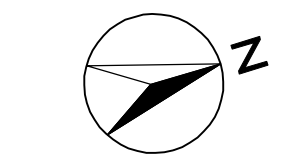
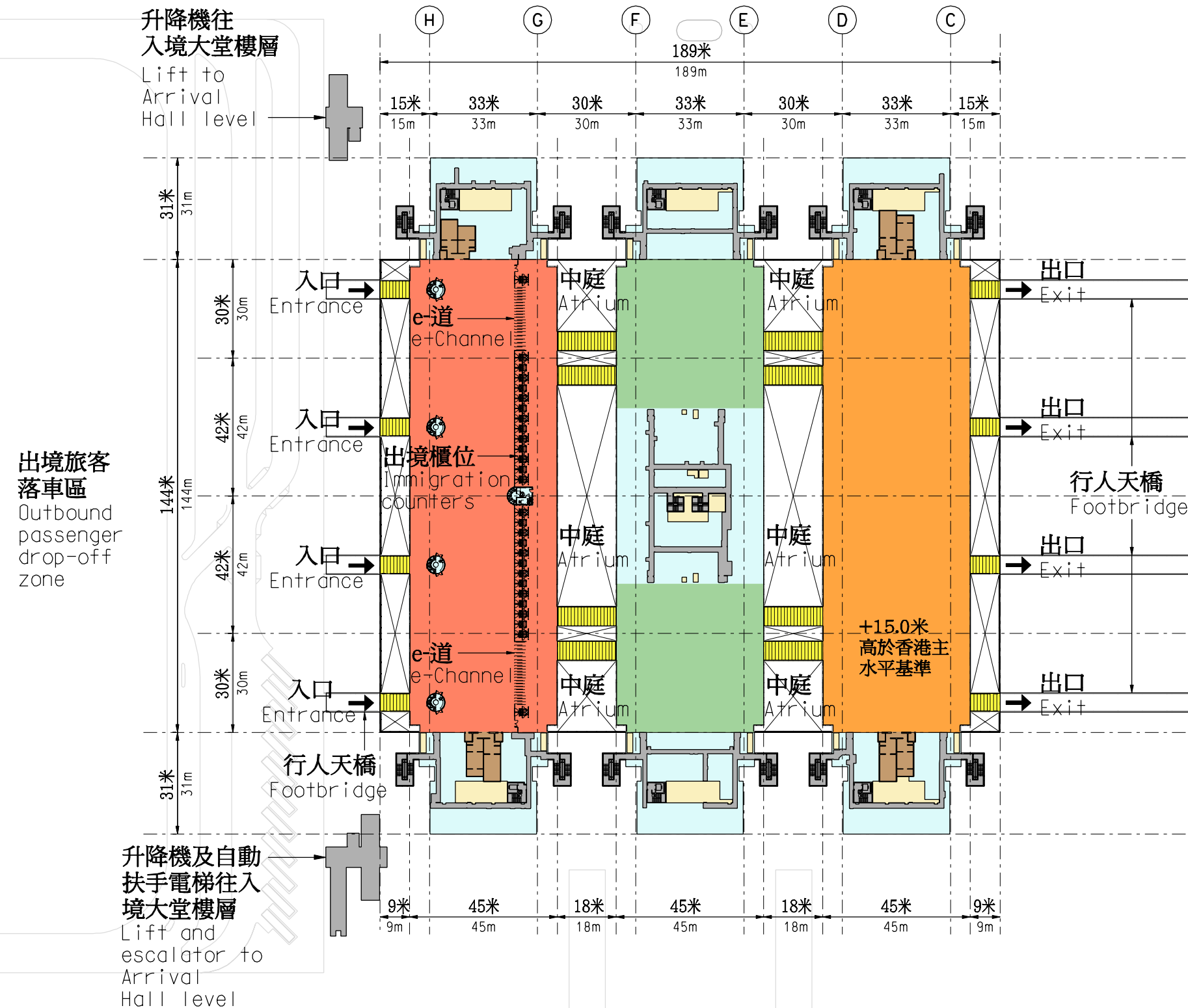
圖則編號 plan no. HZM6845TH-SK0401A	比例 scale 1:1500
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG PROJECT MANAGEMENT OFFICE	
	HIGHWAYS DEPARTMENT HONG KONG
	路政署 香港

圖例 Legend

- 出境檢查區
Immigration clearance zone
- 海關檢查區
Customs clearance zone
- 清關後區
Post clearance zone
- 辦公室
Office
- 後勤地方/機房
Back of house/plant room
- 公廁
Public toilet
- 室內綠化區域
Indoor planting area
- 室外綠化區域
Outdoor planting area
- 衛生署健康檢查站
Department of Health Health Screening Station
- 緊急出入口
Means of escape/access
- 大約地面水平
Approximate level

註釋 NOTE

1. 所有地面水準均以香港主水平基準為計算根據，並以米為單位。
All levels refer to Hong Kong Principal Datum (PD) and are in metres (m).
2. 在工程項目進行時，
布局及細節可能再作調整。
Layout and details are subject to further development when the project proceeds.



出境旅客上車區
Outbound passenger pick-up zone

工務計劃項目第845TH號 港珠澳大橋香港口岸 - 填海及口岸設施工程
旅檢大樓的平面圖 - 一樓平面圖 (出境樓層)
PWP Item No. 845TH - Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities (HKBCF) - Reclamation and Superstructures
Passenger Clearance Building - First Floor Plan (Departure Hall Level)

圖則編號 plan no. HZM6845TH-SK0501A	比例 scale 1:1500
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG PROJECT MANAGEMENT OFFICE	
	HIGHWAYS DEPARTMENT HONG KONG
	路政署 香港

平台
Podium platform

一樓(出境)
First floor
(Departure level)

閣樓
Mezzanine floor

地面(入境)
Ground floor
(Arrival level)

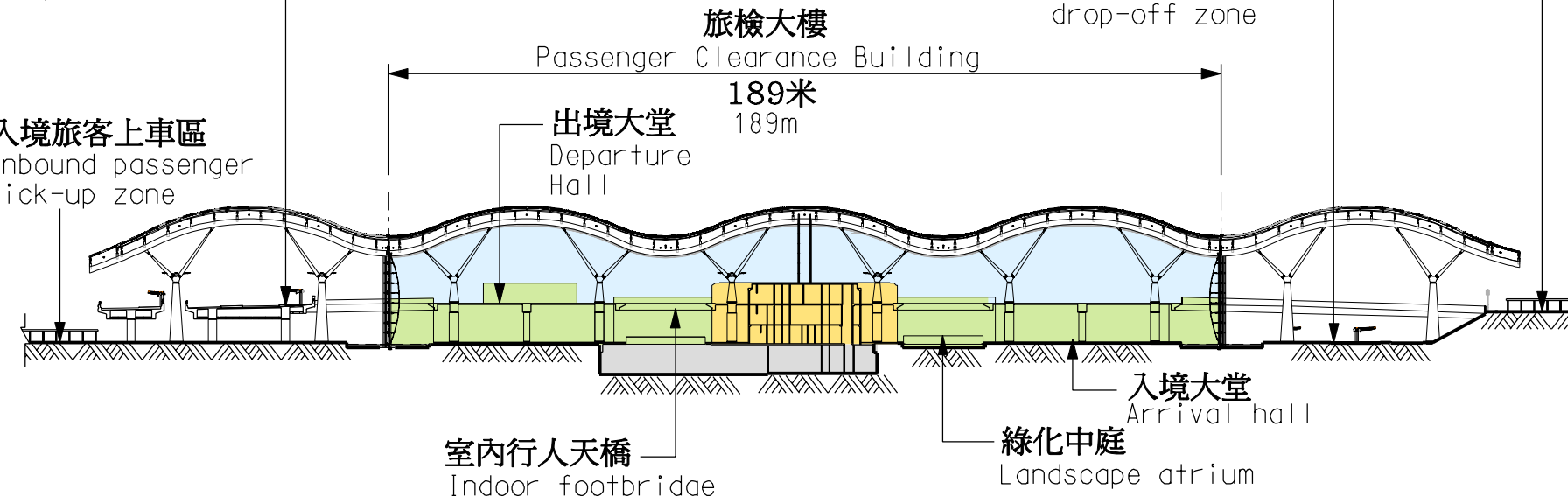
地庫
Basement floor

出境旅客落車區
Outbound passenger
drop-off zone

入境旅客上車區
Inbound passenger
pick-up zone

入境旅客落車區
Inbound passenger
drop-off zone

出境旅客
上車區
Outbound
passenger
pick-up zone



剖面 A - A
Section A - A

平台
Podium platform

一樓(出境)
First floor
(Departure level)

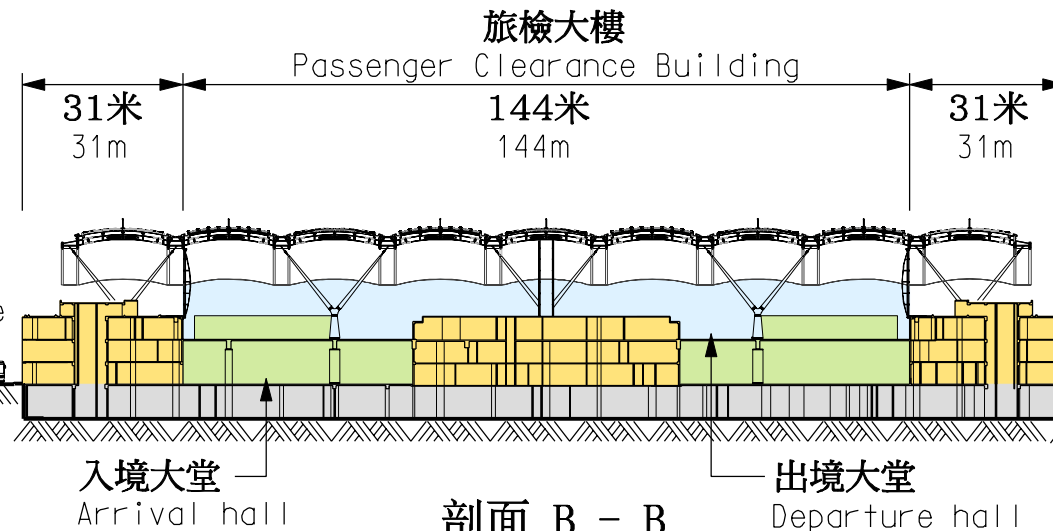
閣樓
Mezzanine floor

地面(入境)
Ground floor
(Arrival level)

地庫
Basement floor

4.5米 4.5m
4.5米 4.5m
5.5米至7米 5.5m to 7m

約+6.0米
高於香港
主水平基準
Approximate
+6.0mPD



擬建行人隧道及公用設施共
同溝通往車輛通關廣場
Proposed subways and common
utility enclosure to vehicle
clearance plaza

剖面 B - B
Section B - B

圖例
Legend

- 辦公室
Office
- 機房
Plant room
- 出入境大堂
Departure/Arrival hall

註釋
NOTES

1. 所有地面水準均以香港主水平基準為計算根據, 並以米為單位。
All levels refer to Hong Kong Principal Datum (PD) and are in metres (m).
2. 在工程項目進行時, 布局及細節可能再作調整。
Layout and details are subject to further development when the project proceeds.

工務計劃項目第845TH號 港珠澳大橋香港口岸 - 填海及口岸設施工程
旅檢大樓-剖面圖

PWP Item No. 845TH - Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities (HKBCF) - Reclamation and Superstructures
Passenger Clearance Building - Sections

圖則編號 plan no. HZM6845TH-SK0601A 比例 scale 1:1500

HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG PROJECT MANAGEMENT OFFICE

HIGHWAYS DEPARTMENT HONG KONG 路政署 香港



工務計劃項目第845TH號 港珠澳大橋香港口岸 - 填海及口岸設施工程
香港口岸旅檢大樓構思圖(東南面展望圖)

PWP Item No. 845TH - Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities (HKBCF) - Reclamation and Superstructures
Artist Impression of HKBCF Passenger Clearance Building (Perspective from Southeast Direction)








圖則編號 plan no. HZM6845TH-SK0702A 比例 scale N.T.S.

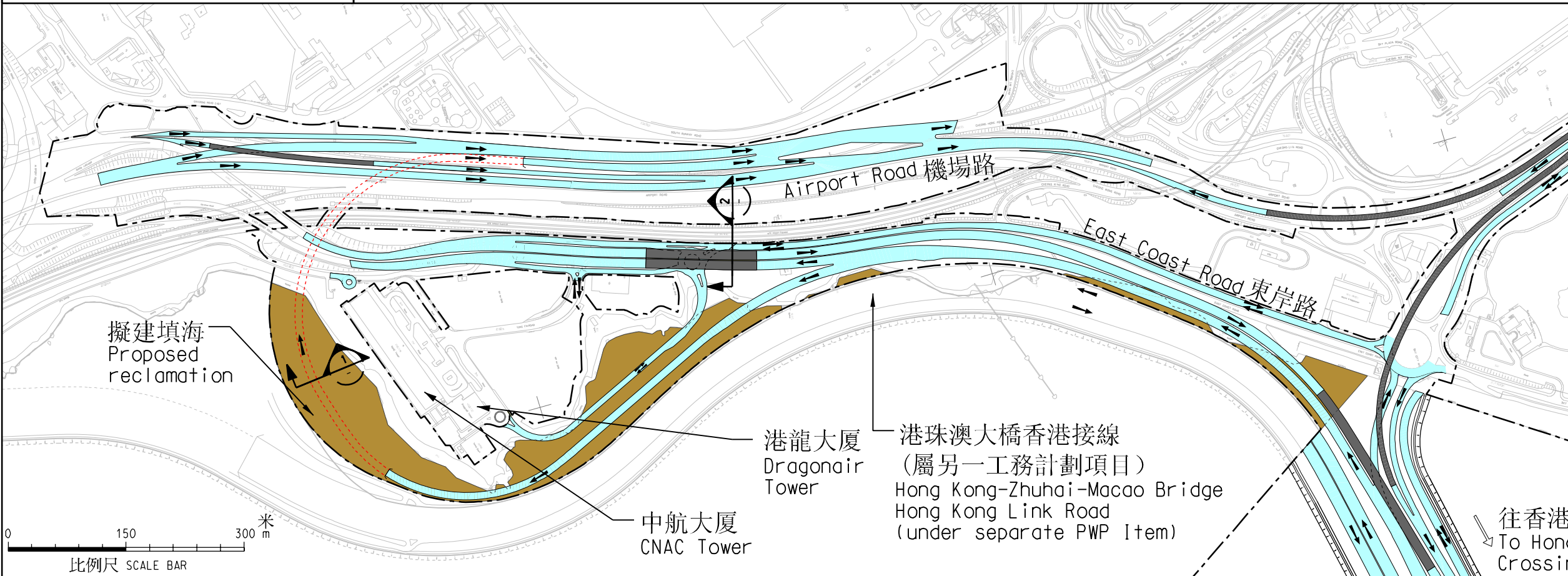
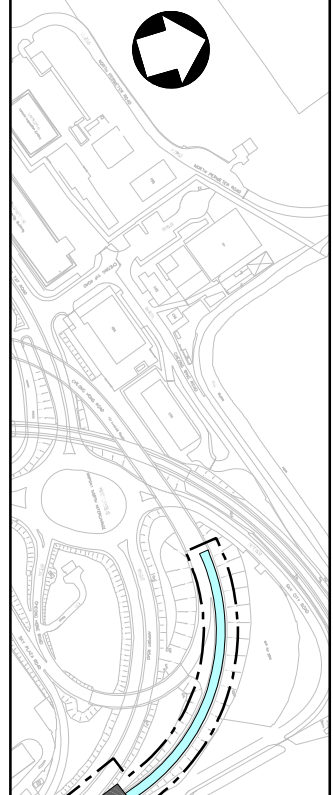
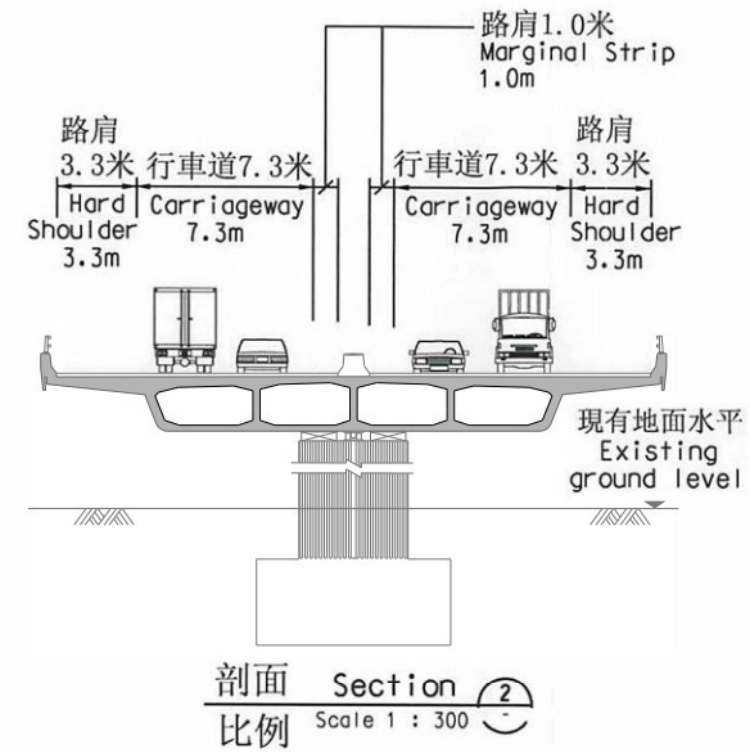
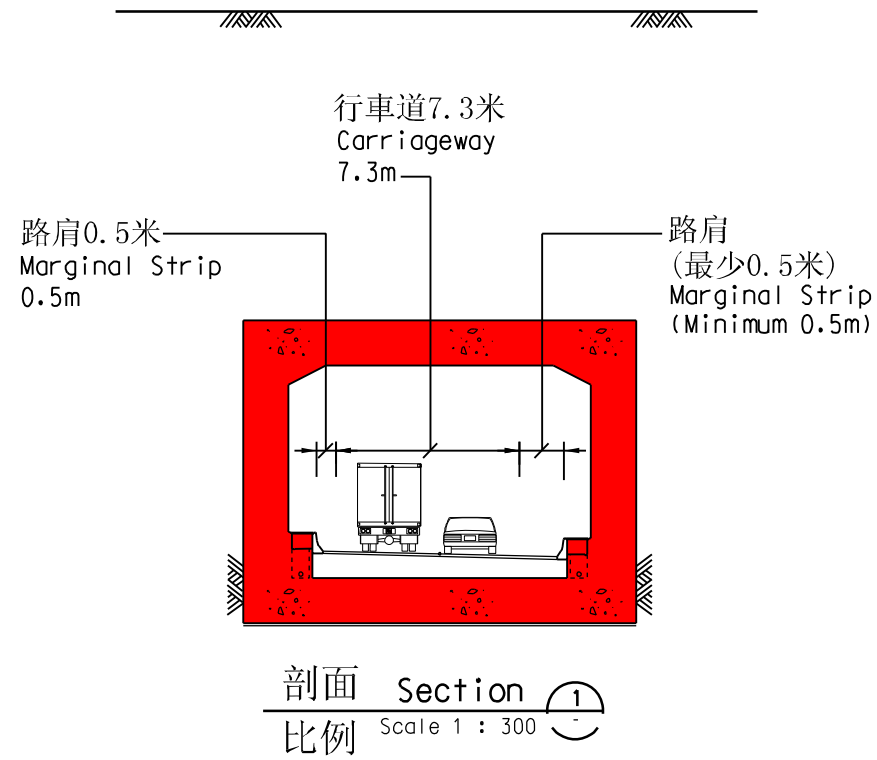
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG PROJECT MANAGEMENT OFFICE



HIGHWAYS
DEPARTMENT
HONG KONG

路政署
香港


- 圖例**
LEGEND
-  施工範圍
Limit of works area
 -  擬建高架道路
Proposed viaducts
 -  擬建地面道路
Proposed at-grade roads
 -  擬建行車隧道
Proposed tunnels/
underpasses
 -  行車方向
Traffic direction
 -  擬建海堤
Proposed seawall
 -  擬建填海
Proposed reclamation



註釋
NOTE

1. 在工程項目進行時，道路的路線可能再作調整。
The alignment of roads shown are subject to further development when the project proceeds.

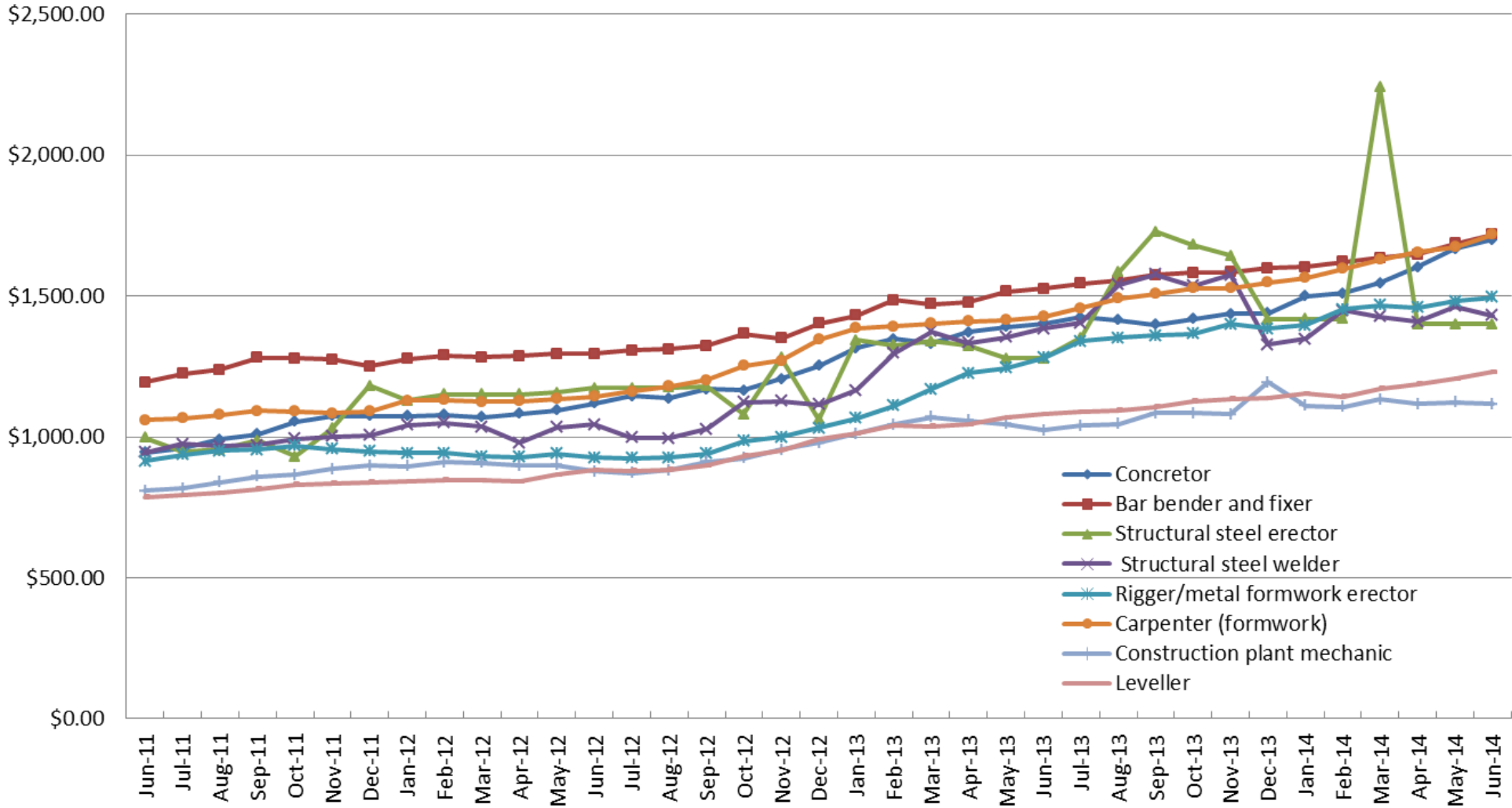
工務計劃項目第845TH號 港珠澳大橋香港口岸 - 填海及口岸設施工程
機場島上之道路工程
PWP Item No. 845TH - Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities - Reclamation and Superstructures
Roadworks on Airport Island

圖則編號 plan no. H2M6845TH-SK0012	比例 scale 1:6000
HONG KONG - ZHUHAI - MACAO BRIDGE HONG KONG PROJECT MANAGEMENT OFFICE	
 HIGHWAYS DEPARTMENT HONG KONG	
路政署 香港	

List of works contracts under 845TH

Contract No.	Contract Title	Scope of Main Works	Contract Award Date	Status
HY/2010/02	HZMB HKBCF - Reclamation Works	Reclamation to provide land for the development of the HKBCF and TM-CLKL southern landfall	November 2011	In progress
HY/2011/03	HZMB HKLR - Section between Scenic Hill and HKBCF	Construction of vehicular bridges, at-grade roads and underpasses at the airport island entrusted to the HKLR project	May 2012	In progress
HY/2013/05	HZMB HKBCF and HKLR, and TM-CLKL Southern Connection - Traffic Control and Surveillance System	Construction of traffic control and surveillance system for the HKBCF, HKLR and TM-CLKL Southern Connection	January 2014	In progress
HY/2013/01	HZMB HKBCF - Passenger Clearance Building	Construction of passenger clearance building, drop-off deck and area, and associated infrastructure works for the HKBCF.	April 2014	In progress
HY/2013/02	HZMB HKBCF - Infrastructure Works Stage I (Western Portion)	Construction of infrastructure works including vehicular bridges and at-grade roads at the western portion of the HKBCF	July 2014	In progress
HY/2013/03	HZMB HKBCF - Vehicle Clearance Plazas and Ancillary Buildings and Facilities	Construction of vehicle clearance plazas, public transport interchanges, ancillary buildings and facilities and associated infrastructure works for the HKBCF	To be awarded shortly	-
HY/2013/04	HZMB HKBCF - Infrastructure Works Stage II (Southern Portion)	Construction of infrastructure works including vehicular bridges and at-grade roads at the southern portion of the HKBCF	To be awarded shortly	-
HY/2013/06	HZMB HKBCF - Automatic Vehicle Clearance Support System	Construction of Automatic Vehicle Clearance Support System for the HKBCF	Not yet awarded	Prepare to tender
HY/2014/04	HZMB HKBCF - Gantry Type X-ray Vehicle Inspection System	Construction of gantry type X-ray vehicle inspection system for the HKBCF	Not yet awarded	Prepare to tender
HY/2014/05	HZMB HKBCF - Remaining Ancillary Buildings and Facilities	Construction of remaining ancillary buildings and facilities at the HKBCF	Not yet awarded	Prepare to tender

Trend of Average Daily Wages of Various Trades of Workers



Average Daily Wages of Various Trades of Workers

Trade	6/2011 (\$/day)	6/2012 (\$/day) [Increase against previous year]	6/2013 (\$/day) [Increase against previous year]	6/2014 (\$/day) [Increase against previous year]
(a) Concretor	943.7	1,118.6 [18.5%]	1,401.0 [25.2%]	1,699.8 [21.3%]
(b) Bar bender and fixer	1,192.7	1,295.5 [8.6%]	1,526.5 [17.8%]	1,718.4 [12.6%]
(c) Structural steel erector	997.3	1,172.5 [17.6%]	1,278.3 [9.0%]	1,400.0 [9.5%]
(d) Structural steel welder	944.9	1,044.2 [10.5%]	1,383.0 [32.4%]	1,430.3 [3.4%]
(e) Rigger/metal formwork erector	914.4	925.9 [1.3%]	1,280.0 [38.2%]	1,495.2 [16.8%]
(f) Carpenter (formwork)	1,059.6	1,143.2 [7.9%]	1,425.5 [24.7%]	1,718.5 [20.6%]
(g) Construction plant mechanic	809.2	878.6 [8.6%]	1,023.6 [16.5%]	1,116.4 [9.1%]
(h) Leveller	786.9	881.4 [12.0%]	1,079.2 [22.4%]	1,230.5 [14.0%]

845TH – Hong Kong–Zhuhai–Macao Bridge
Hong Kong Boundary Crossing Facilities – Reclamation and Superstructures

Table 1 – Cash flow and provision for price adjustment in PWSC(2011-12)30

Year	Original project estimate (in September 2011 prices) (\$ million) X	Original price adjustment factors (October 2011)# Y	Approved project estimate (in MOD prices) (\$ million) Z	Provision for price adjustment (\$ million) A = Z - X
2011 - 2012	63.9	1.00000	63.9	0.0
2012 - 2013	1,737.3	1.05375	1,830.7	93.4
2013 - 2014	2,210.1	1.11171	2,457.0	246.9
2014 - 2015	4,311.6	1.17285	5,056.9	745.3
2015 - 2016	5,387.2	1.23736	6,665.9	1,278.7
2016 - 2017	5,168.4	1.30541	6,746.9	1,578.5
2017 - 2018	4,707.0	1.37721	6,482.5	1,775.5
2018 - 2019	777.8	1.45296	1,130.1	352.3
Total	24,363.3		30,433.9	6,070.6

Table 2 – Latest cash flow and provision for price adjustment due to latest project estimate (PE) and latest price adjustment factors

Year	Latest PE (in September 2011 prices) (\$ million) a	Latest PE (in September 2014 prices) (\$ million) ^^ b	Latest price adjustment factors (October 2014) ## c	Latest PE (in MOD prices) (\$ million) d	Latest provision for price adjustment (\$ million) e	Net increase in provision for price adjustment (\$ million) f
Up to March 2014	2,968.1^	3,242.6^	1.00000	3,242.6^	e = d - a	f = e - A
2014 - 2015	2,889.0	3,394.5	1.00000	3,394.5		
2015 - 2016	5,892.9	6,924.0	1.06000	7,339.4		
2016 - 2017	8,555.9	10,052.9	1.12360	11,295.4		
2017 - 2018	3,907.2	4,590.8	1.19102	5,467.7		
2018 - 2019	1,914.3	2,249.2	1.26248	2,839.6		
2019 - 2020	1,483.3	1,742.8	1.32876	2,315.8		
Total	27,610.7	32,196.8		35,895.0	8,284.3	2,213.7

Notes:

- # Price adjustment factors adopted in October 2011 were based on the projected movement of prices for public sector building and construction output at that time, which were assumed to increase by 5.5% per annum from 2012 onwards.

- ## Price adjustment factors adopted in October 2014 were based on the latest movement of prices for public sector building and construction output, which are assumed to increase by 6.0% per annum over the period from 2014 to 2018 and by 5.0% per annum from 2019 to 2020.

- ^ \$2,968.1 million was the actual expenditure (excluding price adjustment) up to March 2014; whereas \$3,242.6 million was the actual expenditure (including price adjustment).

- ^^ The September 2014 prices is converted by multiplying the latest project estimate (in September 2011 prices) by 1.17497. The figure of 1.17497 represents the changes in price movement for public sector building and construction output between September 2011 and September 2014.

845TH – Hong Kong–Zhuhai–Macao Bridge
Hong Kong Boundary Crossing Facilities – Reclamation and Superstructures

Comparison between Approved Project Estimate and the Latest Project Estimate

	(A) Approved Project Estimate (\$ million)	(B) Latest Project Estimate (\$ million)	(B) – (A) Difference (\$ million)
(a) Reclamation	5,950.1	5,103.3	(846.8)
(i) Construction of seawall for the HKBCF island	2,395.3	2,243.4	(151.9)
(ii) Reclamation for the HKBCF island	3,419.5	2,681.0	(738.5)
(iii) Reclamation at the east coast of the Airport Island for roads connecting to the Airport	135.3	178.9	43.6
(b) At-grade roads	1,126.0	1,226.8	100.8
(c) Viaducts and vehicles underpasses	2,766.2	4,598.8	1,832.6
(i) Viaducts and elevated roads	2,056.6	3,609.2	1,552.6
(ii) Vehicles underpasses	466.8	597.8	131.0
(iii) Miscellaneous structures / retaining structures for roads and abutments	242.8	391.8	149.0
(d) Footbridges and subways	153.6	296.4	142.8
(e) Drainage works, sewerage works, waterworks and common utilities enclosures ¹	1,043.7	2,143.3	1,099.6
(i) Drainage works (including box culverts, pipe works and pump sumps)	542.4	1,292.5	750.1
(ii) Sewerage works	59.1	121.0	61.9
(iii) Waterworks	123.9	250.2	126.3
(iv) Diversion of waterworks, sewerage works and drainage works on Airport Island	91.3	91.3	0.0
(v) Common utilities enclosures	227.0	388.3	161.3

¹ The common utilities enclosures will accommodate utilities underground to avoid road digging for maintenance in future.

	(A) Approved Project Estimate (\$ million)	(B) Latest Project Estimate (\$ million)	(B) – (A) Difference (\$ million)
(f) Pedestrian area and other external works	546.2	473.2	(73.0)
(i) Pedestrian area (including installation of covers and lighting)	340.0	277.4	(62.6)
(ii) Travellators in bus area / public transport interchange (PTI)	68.3	68.3	0.0
(iii) Car parks	56.5	97.3	40.8
(iv) Fencing	81.4	30.2	(51.2)
(g) Electrical and Mechanical (E&M) works for roads, viaducts, underpasses, common utilities enclosures, footbridges and subways	429.2	578.1	148.9
(h) Building piling	817.8	1,263.5	445.7
(i) Buildings ²	3,687.4	3,881.4	194.0
(i) Passenger Clearance Building	2,552.6	2,725.9	173.3
(ii) Other Buildings	1,134.8	1,155.5	20.7
(j) Building services	1,458.2	1,927.3	469.1
(i) Passenger Clearance Building	1,049.7	1,074.7	25.0
(ii) Other Buildings	408.5	852.6	441.4
(k) Kiosks for vehicle clearance	348.2	651.5	303.3
(l) Furniture and equipment ³	1,216.3	1,083.9	(132.4)
(m) Additional energy conservation measures	125.0	151.5	26.5
(n) Traffic control and surveillance system (TCSS)	194.8	86.4	(108.4)

² The building cost mainly covers the superstructures and fitting-out works of the buildings.

³ The estimated cost of furniture and equipment is based on the list of furniture and equipment items required, including general office furniture and equipment items required, as well as specialized operation equipment (e.g. baggage X-ray scanners; narcotic and explosive detectors; infra-red thermometers; broadcasting and telecommunications systems; vehicle X-ray scanning systems; fire engines; crowd control devices; etc). We will seek separate funding from the Finance Committee for installing computer systems to support the operations of the Immigration Department at the Hong Kong control point under the Capital Works Reserve Fund Head 710 – Computerisation.

	(A) Approved Project Estimate (\$ million)	(B) Latest Project Estimate (\$ million)	(B) – (A) Difference (\$ million)
(o) Landscape works	431.5	431.5	0.0
(p) Environmental mitigation measures including environmental monitoring and auditing	120.7	328.7	208.0
(q) Consultants' fees	253.0	253.0	0.0
(i) Contract administration	140.3	140.3	0.0
(ii) Management of resident site staff (RSS)	105.9	105.9	0.0
(iii) Independent Environmental Project Office (ENPO) ⁴ and independent environmental checker services	6.8	6.8	0.0
(r) Remuneration of RSS	1,443.2	1,443.2	0.0
(s) Electrical and Mechanical Services Trading Fund (EMSTF) charges ⁵	35.5	35.5	0.0
(t) Duty visits outside Hong Kong ⁶	1.9	1.9	0.0
(u) Contingencies	2,214.8	1,651.5	(563.3)
Sub-total	24,363.3	27,610.7	3,247.4
	(in September 2011 prices)	(in September 2011 prices)	
(v) Provision for price adjustment	6,070.6	8,284.3	2,213.7
Total	30,433.9	35,895.0	5,461.1
	(in MOD prices)	(in MOD prices)	

⁴ The Environmental Permit for the HKBCF project requires the setting up of an independent ENPO before the commencement of the HKBCF construction to oversee the cumulative environmental impacts arising from the HKBCF project and other concurrent projects in the adjoining area and to liaise closely with the Mainland project teams for the HZMB.

⁵ Since the establishment of the EMSTF on 1 August 1996 under the Trading Funds Ordinance (Cap. 430), the EMSTF charges government departments for design and technical consultancy services for E&M installations provided by Electrical and Mechanical Services Department. The services rendered for this project include checking consultants' submissions on all E&M installations and providing technical advice to the Government on all E&M works and their impacts on the Project.

⁶ Duty visits outside Hong Kong in connection with the Project include quality control visits or acceptance tests of specialized operation equipment, curtain wall / cladding factories, material workshops, green features etc. The costs of air passage, subsistence allowances, etc, are subject to the relevant provisions in the Civil Services Regulations.

As regards **item (b) (at-grade roads), item (c) (viaducts and vehicles underpasses), item (d) (footbridges and subways), item (e) (drainage works, sewerage works, waterworks and common utilities enclosures), item (g) E&M works for roads, viaducts, underpasses, common utilities enclosures, footbridges and subways), item (h) (building piling), item (i) (buildings), item (j) (building services), item (k) (kiosks for vehicle clearance), item (m) (additional energy conservation measures) and item (p) (environmental mitigation measures including environmental monitoring and auditing)**, the net increase of \$4,971.3 million is mainly due to the higher-than-expected returned tender prices of the superstructure works.

2. As regards **item (a) (reclamation) and item (n) (traffic control and surveillance system)**, the variations reflect the awarded tenders prices for items (a) and (n) being lower than those allowed for in the Approved Project Estimate by \$955.2 million.

3. As regards **item (f) (pedestrian area and other external works)**, the decrease of \$73.0 million is mainly due to the design revision in the public transport interchanges.

4. As regards **item (l) (furniture and equipment)**, the decrease of \$132.4 million is mainly due to the design revision in the furniture and equipment.

5. As regards **item (u) (contingencies)**, we have drawn down \$563.3 million from the contingencies to partly cover the cost increase in the items mentioned in paragraph 1 above. The remaining sum of \$1,651.5 million has to be retained as contingencies for meeting unexpected expenditures required for completing the remaining works.

6. As regards **item (v) (provision for price adjustment)**, an increase of \$2,213.7 million in price adjustment is based on the increase in the latest price adjustment factors promulgated by the Government, as well as the latest anticipated cash flow of the Project. Details are given in paragraphs 17 and 18 of the main paper and **Enclosure 4**.