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Panel on Environmental Affairs

Meeting on 27 February 2017

**Background brief on the collapse of seawalls in the
Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road project
prepared by the Legislative Council Secretariat**

Purpose

This paper provides background information on the collapse of seawalls in the Hong Kong-Zhuhai-Macao Bridge ("HZMB") Hong Kong Link Road ("HKLR") project. It also gives a brief account of the major views and concerns expressed by Members on related issues.

Background

Hong Kong-Zhuhai-Macao Bridge and its related local infrastructure projects

2. HZMB is a dual three-lane carriageway in the form of bridge-cum-tunnel structure sea-crossing, linking Hong Kong, Zhuhai and Macao. The HZMB project is a major cross-boundary transport infrastructure project. According to the Administration, the construction of HZMB will significantly reduce transportation costs and time for travellers and goods on roads. It has very important strategic value in terms of further enhancement of the economic development between Hong Kong, the Mainland and Macao. With the connection by HZMB, the Western Pearl River Delta will fall within a reachable three-hour commuting radius of Hong Kong.

3. The entire HZMB project consists of two parts: (a) the HZMB Main Bridge situated in Mainland waters which is being taken forward by the HZMB Authority; and (b) the link roads and boundary crossing facilities under the responsibility of the three governments concerned.

4. In May 2009, the Finance Committee approved the funding support for the detailed design and construction of the HZMB Main Bridge. Following the State Council's formal approval of the feasibility study report of the HZMB project in

October 2009, the construction of the Main Bridge commenced in mid-December 2009. The construction cost of the HZMB Main Bridge is financed by the three governments and they will be responsible for the construction, operation and maintenance of their own boundary crossing facilities in their respective territories. The works of the HZMB Main Bridge in the Mainland waters are overseen by the HZMB Authority.

5. The key HZMB related local infrastructure projects include the Hong Kong Boundary Crossing Facilities ("HKBCF"), HKLR (which connects the HZMB Main Bridge from the Hong Kong Special Administrative Region boundary to HKBCF) and the Tuen Mun-Chek Lap Kok Link ("TM-CLKL"). A layout plan of HZMB and its related local infrastructure projects is in **Appendix I**. The supervision of the works of HKBCF, HKLR and TM-CLKL is carried out by consultants engaged by the Highways Department ("HyD").

6. On 20 January 2017, the Administration reported to the Panel on Transport that, based on the latest works progress, the three governments strived to complete the entire HZMB project, including the Main Bridge, HKBCF and HKLR, by end 2017 for early simultaneous commissioning subject to factors such as the implementation of cross-boundary transport arrangements.

Reclamation and construction of seawalls under the Hong Kong-Zhuhai-Macao Bridge project

7. HKBCF is being built on reclaimed land (i.e. artificial island) at the north-eastern waters off the Hong Kong International Airport ("the Airport"), which involves construction of seawalls. Reclamation and construction of seawalls along the east coast of the Airport island are also required for the construction of associated infrastructures/facilities including HKLR. To reduce the environmental impact of the necessary reclamation, HyD adopted non-dredge reclamation method to reduce sandfilling, release of marine suspended solids, and frequency of marine traffics.

Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road

8. The HKLR project is a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance ("EIAO") (Cap. 499) and Environmental Permit ("EP") is required for the construction and operation of HKLR. An EIA was conducted for HKLR to evaluate possible environmental impact of the project during both construction and operational phases, including potential impacts on air quality, noise, water quality, ecology such as Chinese White Dolphins, waste management, fisheries, landscape, etc., with mitigation measures recommended. The EIA report concluded that the environmental impacts arising from the project would be acceptable with the implementation of

the recommended mitigation measures. The Director of Environmental Protection approved the EIA report with conditions on 23 October 2009 and issued EP on 4 November 2009 for the HKLR project.

Movements of Hong Kong Boundary Crossing Facilities artificial island

9. According to HyD, various amounts of movement have been recorded on the HKBCF artificial island starting from 2014. In response to media enquiries in September 2015, HyD stated in its press release that the consultant had considered and anticipated that some settlement and lateral movement of the reclaimed land would occur during the construction stage. The movement of the reclaimed land during construction was generally normal. The contractor had carried out remedial measures at its own cost to ensure that the reclaimed land was structurally safe.

Major views and concerns expressed by Members

10. Some Members had expressed concerns about the environmental impacts of the HZMB project at the meeting of the Finance Committee on 18 November 2011 when the funding proposals for the local infrastructure projects of HZMB were considered, and at the meeting of the Panel on Environmental Affairs ("EA Panel") on 25 June 2014 during discussion of the impact of construction works on marine ecology. Issues related to the movements of the HKBCF artificial island were raised at the meeting of the Public Works Subcommittee when the funding proposal for works related to the reclamation and superstructures of HKBCF was considered. The major views and concerns expressed by Members are summarized in the ensuing paragraphs.

Safety assurance of the Hong Kong-Zhuhai-Macao Bridge

11. In the light of the recorded movements of the Hong Kong Boundary Crossing Facilities artificial island, some Members were worried about the structural risks of HZMB and associated local infrastructures, and the measures to protect the safety of site workers. HyD explained that it was normal for settlement of reclaimed land to occur during the construction stage. The construction of the superstructures of HKBCF started only when the settlement of the reclaimed land was stable.

Cumulative impacts of marine works in the western waters of Hong Kong

12. Noting that a lot of major infrastructure projects were under construction or planning near Lantau Island, some Members expressed concern about the cumulative impacts of these projects on marine ecology and fisheries resources of

the affected waters. In their views, the environmental monitoring and enforcement work in infrastructural projects were generally lax, and pollution mitigation measures were ineffective.

13. The Administration stressed that the cumulative impacts of a proposed project and other on-going/planned projects in the same water areas had been or would be taken into account in the relevant EIA studies with a view to adopting environmentally acceptable schemes/designs and associated mitigation measures for taking forward the projects. For instance, the construction contract documents and EPs of the HZMB local infrastructure projects had imposed stringent conditions requiring the contractors to employ environmental teams to monitor water quality, air, noise, waste management, ecology, as well as landscape and visual impact on the environment. As required by the EPs, an Independent Environmental Project Office was set up to oversee the cumulative environmental impact arising from the HZMB local infrastructure projects and other concurrent projects in the adjoining area, to ensure compliance with the environmental laws in Hong Kong. HyD engaged environmental consultants to audit the environmental monitoring work carried out by the environmental teams and check the effectiveness of the mitigation measures.

Reclamation method

14. Noting that the non-dredge reclamation method adopted for the HZMB local infrastructure projects was the first of its kind in Hong Kong, Members enquired whether the Administration had studied the viability of adopting such method in Hong Kong, and how the Administration would ensure the environmental performance of the reclamation method and monitor contractors' compliance with the required environmental standard.

15. The Administration pointed out that it had conducted overseas visits on the non-dredge reclamation method in Osaka, Japan. Although the method was new in Hong Kong, its technical level was within local engineering capability. With such reclamation method, a series of interlocking large diameter steel cells would be sunk and penetrated through the marine mud and rest on the underlying firmer alluvium to form a perimeter seawall. Dredging and disposal of marine mud would almost be completely avoided. The method had been used in Japan, Singapore and the United States, and proven to be environmental friendly. The reclamation method was also adopted for the construction of the western and eastern artificial islands of the HZMB Main Bridge.

Latest development

Media reports on the collapse of two seawalls in the Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road project

16. In February 2017, the media reported that two seawalls on the reclaimed land along the east coast of the Airport island had collapsed in 2014 due to irregular extensions ("the Incident"), and HyD was alleged to have failed to disclose the Incident at that time. The media reports have aroused public concerns about the environmental impacts arising from the collapse of the seawalls, and the efficacy of the Administration's monitoring of the reclamation works of the HZMB project.

17. Following media reports of the Incident, some Members had written to EA Panel or the Panel on Transport requesting the Panels to discuss the matter. The Members' letters are hyperlinked in Appendix II. On 20 February 2017, Dr Hon KWOK Ka-ki had written to seek the President's permission to ask an urgent question on related issues at a Council meeting without notice, and the application was not approved. In the relevant letters, Members expressed concerns about the adverse environmental impacts arising from the collapse of the seawalls of the HZMB project as the resulting outflow and depositing of large quantities of fill materials (e.g. rocks and sand) into the sea appeared to have extended the reclaimed land substantially beyond the approved scope and posed threats to the coastal marine ecology. Besides, the contractor was alleged to have made use of the extended reclaimed land as part of its works site. Some Members were concerned whether HyD had intended to cover up the Incident by not disclosing it until the matter was exposed by the media. To allay public concerns, these Members urged the Administration to explain the case, including the reasons leading to the Incident, the remedial measures taken, and impacts of the Incident.

18. EA Panel will meet with the Administration on 27 February 2017 to discuss issues arising from the collapse of seawalls in the HZMB HKLR project.

Relevant papers

19. A list of relevant papers is set out in **Appendix II**.



圖則名稱 drawing title	設計 designed Y P TSOI 06/08/15	繪圖 drawn K L LEUNG 06/08/15	圖則編號 drawing no. HZM8003QR-PD0015	比例 scale 1:200000
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**Collapse of seawalls in the
Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road project**

List of relevant papers

Date of meeting	Event	Paper
25 June 2014	Meeting of the Panel on Environmental Affairs ("EA Panel")	Administration's paper on "Impact of construction works on important species, marine ecology and the fisheries industry" (LC Paper No. CB(1)1648/13-14(01)) Minutes of meeting (LC Paper No. CB(1)2068/13-14)
18 November 2011	Meeting of the Finance Committee	Minutes of meeting (LC Paper No. FC74/11-12)
1 December 2015	Meeting of the Public Works Subcommittee	Minutes of meeting (LC Paper No. PWSC61/15-16)

Letters from Members of the Legislative Council on issues relating to the collapse of the seawalls of the Hong Kong-Zhuhai-Macao Bridge project

Date of letters	Letters
20 February 2017	Letter from Hon Dennis KWOK (Chinese version only) (LC Paper No. CB(1)592/16-17(01))
20 February 2017	Joint letter from Dr Hon KWOK Ka-ki and Hon Jeremy TAM Man-ho (Chinese version only) (LC Paper No. CB(4)598/16-17(01))
20 February 2017	Letter from Hon Claudia MO (Chinese version only) (LC Paper No. CB(4)598/16-17(02))
20 February 2017	Letter from Hon Michael TIEN (Chinese version only) (LC Paper No. CB(4)598/16-17(03))