HIGH SPEED CRAFT CONSULTATIVE COMMITTEE
LOCAL VESSELS ADVISORY COMMITTEE
PILOTAGE ADVISORY COMMITTEE
PORT OPERATIONS COMMITTEE

Hong Kong-Zhuhai-Macao Bridge – Hong Kong Link Road & Hong Kong Boundary Crossing Facilities and Tuen Mun-Chek Lap Kok Link

Purpose

1. The purpose of this paper is to brief members of the proposed alignment and form of three infrastructure projects, namely Hong Kong-Zhuhai-Macao Bridge (HZMB) - Hong Kong Link Road (HKLR) & Hong Kong Boundary Crossing Facilities (HKBCF); and Tuen Mun-Chek Lap Kok Link (TM-CLKL); and seek views from members on any potential impacts on marine operations. The overall layout of these three projects is shown in **Figure 1**.

Background

2. The HZMB will be of strategic importance to the future economic development of Hong Kong, Macao and the Western Pearl River Delta (PRD). The TM-CLKL together with the Tuen Mun Western Bypass (TMWB) will provide direct connections between Shenzhen Bay Port, Northwest New Territories (NWNT), the Hong Kong International Airport (HKIA) and Tung Chung.

3. The governments of Guangdong, the Hong Kong Special Administrative Region (HKSAR) 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. In parallel, the HKSAR Government appointed a consultant in March 2004 to undertake an investigation and preliminary design (I&PD) study for the Hong Kong Section (HKS) of HZMB and North Lantau Highway Connection (NLHC). At that time, it was intended that HZMB would adopt a "co-location of BCF mode" arrangement, with all boundary crossing facilities (BCF) co-located on an artificial island outside HKSAR boundary. Numerous alignment options were formulated and evaluated in the I&PD study for connecting the HZMB to the existing road network. The alignment of HZMB HKS & NLHC was endorsed in 2005. The findings of the MIA study on this endorsed alignment were presented to Port Operations Committee (POC) via POC Paper No. 1/06 on 27 January 2006 and Provisional Local Vessels Advisory Committee (PLVAC) via PLVAC Paper No. 1/2006 on 3 March 2006.

4. The National Development and Reform Commission (NDRC) also formed the HZMB Task Force in 2007 to push forward the project. The Task Force was led by the NDRC, with representatives from the Ministry of Transport, the Hong Kong and Macao Affairs Office, and the governments of Hong Kong, Guangdong and Macao as members. At its meeting on 7 January 2007, the Task Force recommended that the BCF of each government should be set up within their respective territories i.e. "separate locations of BCF mode". In light of this "separate locations of BCF mode" arrangement recommended by the Task Force, Highways

Department commissioned a site selection study in May 2007 to identify a suitable location for the HKBCF. The study, completed in early 2008, has examined various possible sites. It finally recommended the preferred location of the HKBCF at the waters off the north-east of the Airport Island.

5. At the 8th HZMB 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 will be responsible for the construction, operation, and maintenance of the Boundary Crossing Facilities (BCF) and link roads within its own territory. The HZMB Main Bridge is a 29.6km dual 3-lane carriageway in the form of bridge-cum-tunnel structure comprising an immersed tunnel of about 6.7km and would start from the artificial islands off Gongbei and Macao to the eastern artificial island west of the HKSAR boundary. The layout plan of HZMB Main Bridge is shown in **Figure 2** As a result the Government of the HKSAR will need to provide a link road connecting the HZMB Main Bridge and the HKBCF. The link road within Hong Kong, notably Hong Kong Link Road (HKLR), will replace the former HZMB HKS and NLHC.

6. In July 2008, Highways Department appointed a consultant to undertake an investigation study for the HKBCF and the recommended site location of the HKBCF at the waters off the north-east of the Airport Island from the previous site selection study was reaffirmed in view of its benefits at the strategic and macro angle.

7. According to the findings of the NWNT Traffic and Infrastructure Review conducted by the Transport Department, Tuen Mun Road, Ting Kau Bridge, Lantau Link and North Lantau Highway will be operating beyond capacity after 2016 due to the increase in cross boundary traffic, developments in the NWNT, and possible developments in North Lantau. To cope with the anticipated traffic demand, TM-CLKL and TMWB corridor is proposed to connect NWNT and North Lantau.

8. In May 2008, Highways Department appointed a consultant to undertake an investigation study and preliminary design for TM-CLKL. The recommended alignment is a dual-two-lane carriageway about 9km long connecting TMWB in the north and with the proposed HKBCF and North Lantau in the south. Upon recommendation of the HKBCF at the waters off the north-east of the Airport Island, the alignment of the TM-CLKL was adjusted to have its southern landfall alongside the east of the HKBCF, to minimise the area of reclamation.

9. A series of public consultation events have been conducted since September 2008 in which we have consulted different groups and residents of Lantau, and collected their views on the overall layout of the HKBCF, HKLR and TM-CLKL, including the HKBCF site selection and the alignments of the HKLR and TM-CLKL.

10. On 17 April 2009, we consulted the Island District Council on the proposed alignment and layout of the three projects, HKLR, HKBCF and TM-CLKL. The District Council supported the implementation of the projects. On 5 May 2009, we consulted the Tuen Mun District Council on the proposed alignment of TM-CLKL and obtained support.

Proposed Alignment of HKLR

11. The HKLR will be about 12km long with dual 3-lane carriageway, linking the HZMB

Main Bridge at the HKSAR Boundary and the HKBCF located at the north-east waters of the Airport Island. The overall alignment of HKLR is shown in **Figure 3**. The tentative commencement date of construction is 2011 for completion in 2015/16.

12. The alignment of the section of HKLR from HKSAR Boundary to Scenic Hill is basically the same as that endorsed in 2005. It will be in the form of sea viaduct connecting the HZMB Main Bridge from the HKSAR boundary to the north-west of Sha Lo Wan, then running through the Airport Channel to reach Scenic Hill. The total length of the viaduct is about 9.4 km. This section of HKLR will cross the western waters of Airport Island and the Airport Channel. The navigation widths and clearances below the bridge at these two navigation channel locations are the same as the previous ones presented to POC and PLVAC in 2006.

13. In view of residents' concerns over the original sea viaduct from Scenic Hill to the HKBCF at north-east waters of the Airport Island, the viaduct scheme is altered to a combination of tunnel and at-grade road on a strip of reclamation along east coast of Airport Island so as to minimize the visual and noise impact. For this section of HKLR, it will be in the form of a tunnel passing through the Scenic Hill, and passing underneath the existing Airport Road and Airport Express Line with a total length of about 1km. The tunnel will daylight at the reclamation at the east of the Airport Island and connect to the HKBCF by a 1.6 km long at-grade road. This design will minimise the visual impact to the Tung Chung residents. The layout of the tunnel-cum-at grade portion of HKLR is shown in **Figure 4**.

Proposed Hong Kong Boundary Crossing Facilities (HKBCF)

14. The HKBCF will be located at the north-east waters of the Hong Kong International Airport (HKIA), and about 130 hectares of land will be reclaimed (not including about 19.2 hectares of land to be reclaimed for the southern landfall of TM-CLKL) (see **Figure 5** for the proposed layout of HKBCF). The reclamation of HKBCF will provide land to accommodate the passenger-related facilities, the cargo-processing facilities and the facilities of the Government departments providing services in connection with the HKBCF. Apart from the facilities on the reclamation, there will also be provision of road access for connection of the HKBCF to the HKLR and the Airport, and an extension of the existing Automated People Mover (APM) to connect the Airport Terminal with the HKBCF in the form of a tunnel. As the alignment of the APM tunnel will affect the existing Fire Services Department (FSD)'s Eastern Rescue Berth, this Rescue Berth will need to be reprovisioned to a new location at the north-east corner of Airport Island. A basin will be created between the HKBCF reclamation and the north-east side of Airport Island in order to maintain adequate access from the north to the marine facilities in this area i.e. SkyPier fast ferry terminal, the Marine Cargo Terminal (MCT), a proposed local ferry pier, and the FSD's Rescue Berth. The tentative commencement date of construction is 2010 for completion in 2015/16.

Proposed Alignment of TM-CLKL

15. The proposed TM-CLKL and TMWB will provide a direct route linking NWNT and North Lantau, joining the Kong Sham Western Highway (KSWH), port back-up areas in NWNT, Tuen Mun River Trade Terminal (RTT), the existing EcoPark in Tuen Mun Area 38, the HKBCF, the Airport, HZMB and North Lantau developments. The new connection will significantly reduce the travelling time between the KSWH and the NWNT and North Lantau.

TM-CLKL would also serve as an alternative link road to the Airport independent of the existing Lantau Link and North Lantau Highway.

16. TM-CLKL is a dual-two-lane carriageway about 9km long connecting TMWB in the north and with the proposed HKBCF and North Lantau in the south. About 5km of the TM-CLKL is in the form of an undersea tunnel. The tunnel passes under the Urmston Road set at about 14m below the seabed. In order to allow access to the tunnel from the local road system at a reasonable gradient, reclamations are required at both ends of the tunnel to protect the transitional portion where the tunnel emerges above the seabed. The northern landfall of the tunnel is proposed to be located at Tuen Mun Area 40, with reclamation of 16.5 ha at the east of the River Trade Terminal. The southern landfall lies alongside the east of the HKBCF, with a reclamation area of 19.1 ha. From the southern landfall, the TM-CLKL is connected to the North Lantau Highway through viaducts of about 1.6 km long. (see **Figure 6** for the project layout). The tentative commencement date of construction is 2011 for completion in 2016.

Proposed Navigation Bridge Spans

Western side of Airport Island

17. The bridge span for the navigation channels at the western side of Airport Island is identical to that presented under POC Paper No. 1/06 and PLVAC Paper No. 1/2006. It is proposed to have a twin 150m spans providing for a clear navigable width of two 100m one-way shipping channels under the bridge. The twin spans are separated by a third 150m span in the middle (see **Figure 7** for the proposed bridge spans). A minimum of 41m net navigable height will be provided to ensure adequate clearance below the bridge for the very largest derrick lighters (of which approximately 1% of the local fleet will be excluded).

Airport Channel

18. The bridge crossing, the design of which was presented under POC Paper No. 1/06 and PLVAC Paper No. 1/2006, is constrained by the alignment skewness and the Airport Height Restrictions. A bridge with span length of 180m is presently proposed for the crossing which gives a net navigable width and height of 46m and 10.55m respectively (see **Figure 8** for the proposed bridge span). Various stakeholders, who are allowed to use this sea channel, including Airport Authority Hong Kong, Fire Services Department (FSD), MTR Corporation, Civil Engineering and Development Department and Fast Ferry have been consulted and the provided navigation width and height have satisfied their requirements. Islands District Council was also consulted on 2 June 2005 and 17 October 2005 and no adverse comment was raised on the proposed alignment of this section of NLHC and the channel bridge crossing.

Southern Viaduct

19. The alignment of this structure would cross the existing Tung Chung navigation channel at the south-east side of the BCF. A bridge with span length of 160m is proposed which gives a net navigable width and height of 100m and 21.3m respectively (see **Figure 9** for the proposed bridge span). These channel dimensions are consistent with those presented under POC Paper No. 1/06 and PLVAC Paper No. 1/2006, although the form of the bridge span has changed since that time. This navigation envelope will be sufficient for two-way

marine traffic for the regular users of this navigation channel and any construction activity associated with future development at Tung Chung.

Assessment of Navigation Safety

20. Upon completion of the proposed northern landfall of TM-CLKL, the waterspace between the tip of the proposed northern landfall and Urmston Road will still be adequate for the marine traffic.

21. Impact on the navigation safety, ship impact protection and radar impact assessment will be addressed in the Marine Impact Assessment.

Advice Sought

22. Members are invited to express their views on any potential impacts the projects may have on marine operations.

Hong Kong-Zhuhai-Macao Bridge Hong Kong Project Management Office
Highways Department

June 2009

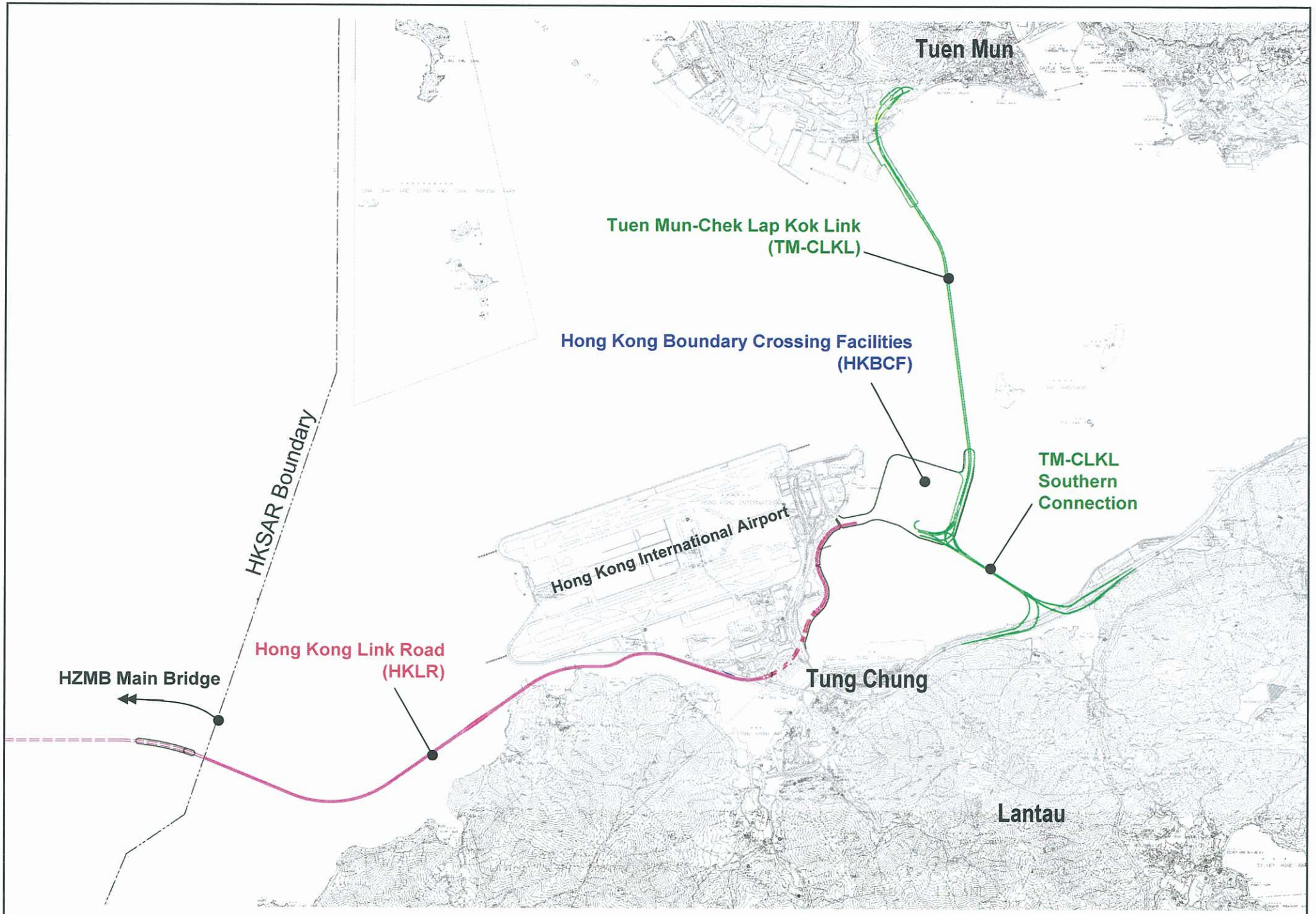


Figure 1 Overall Layout of HKLR, HKBCF & TM-CLKL

Highway Networks in PRD

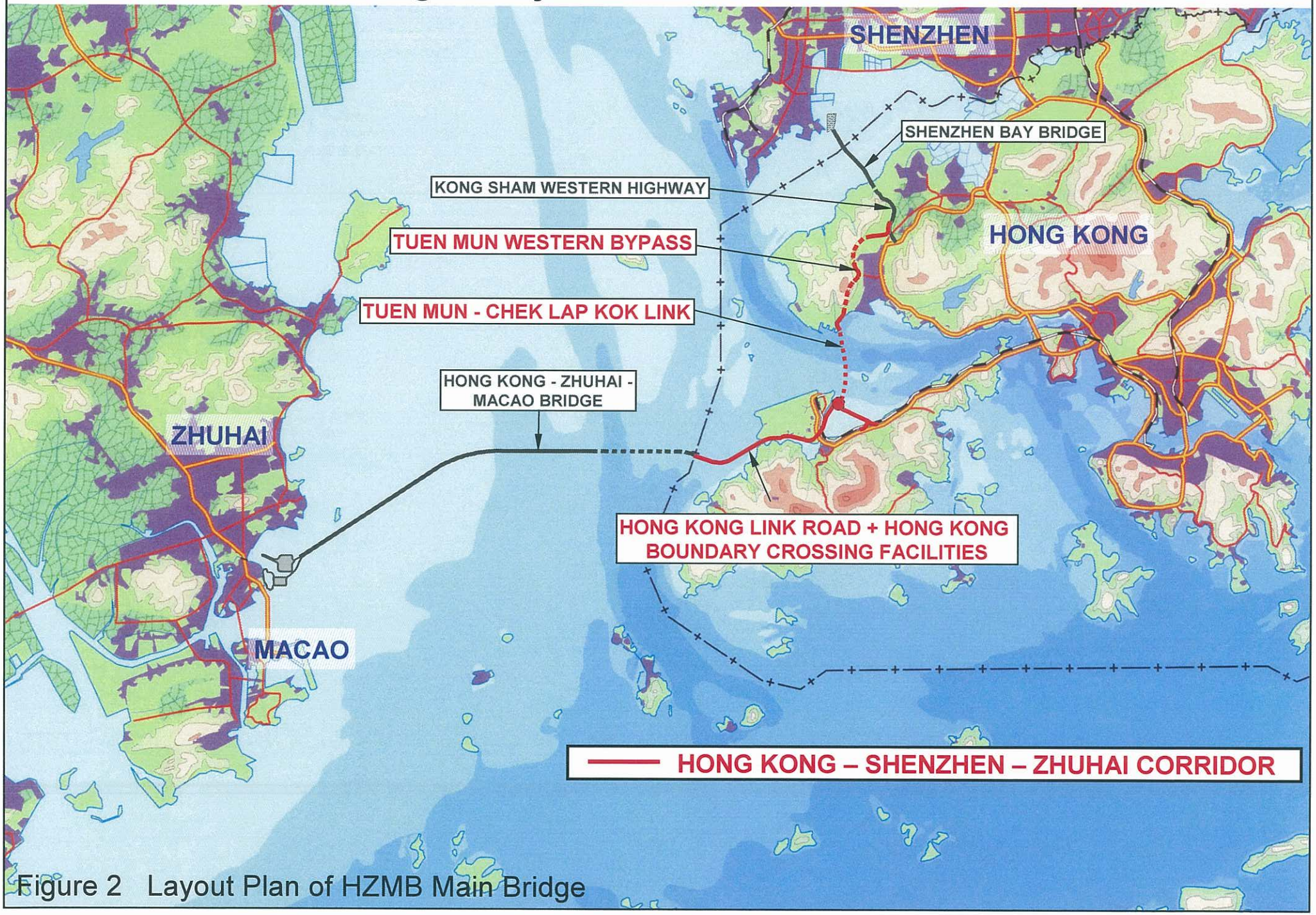


Figure 2 Layout Plan of HZMB Main Bridge

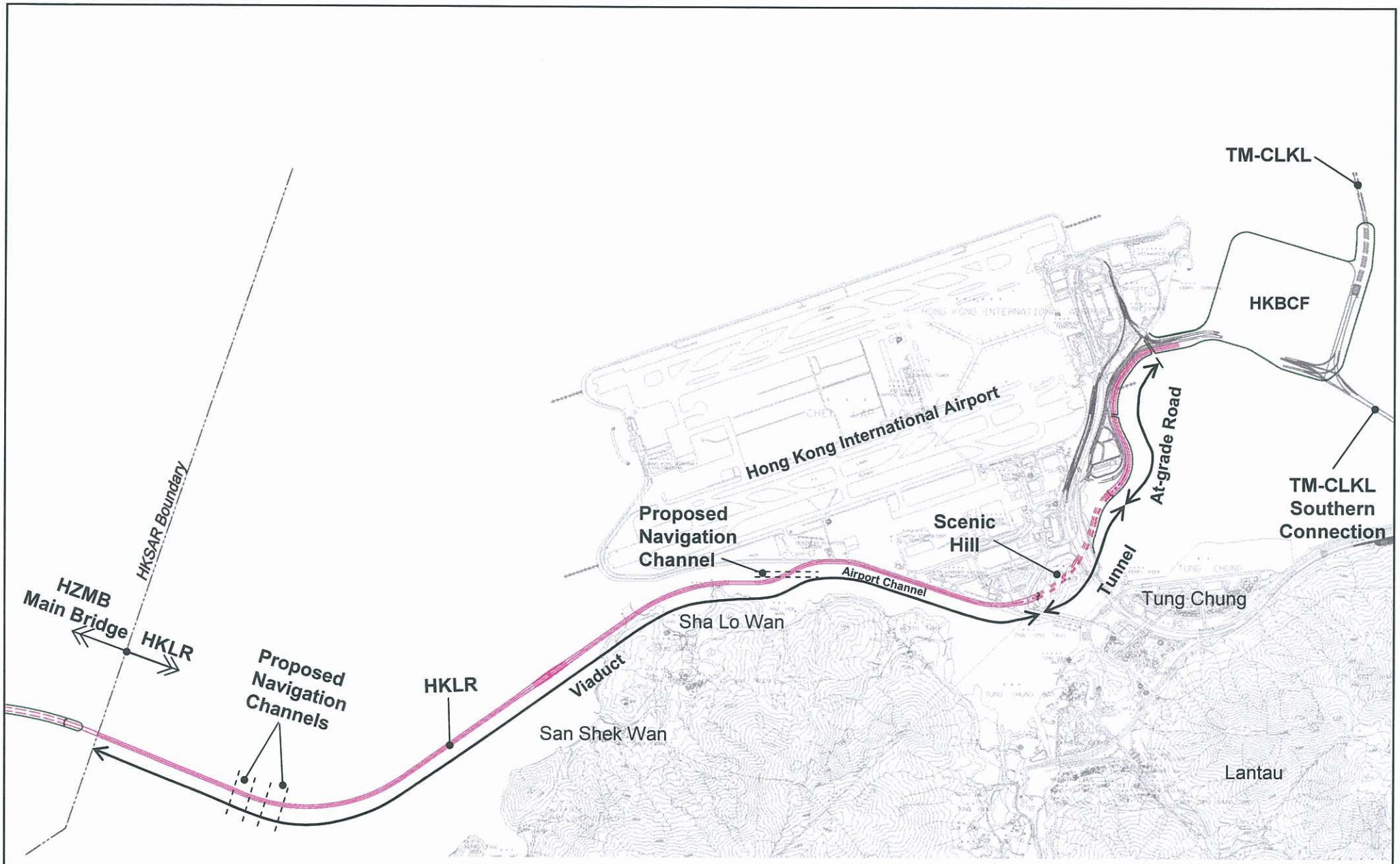


Figure 3 Proposed Alignment of HKLR

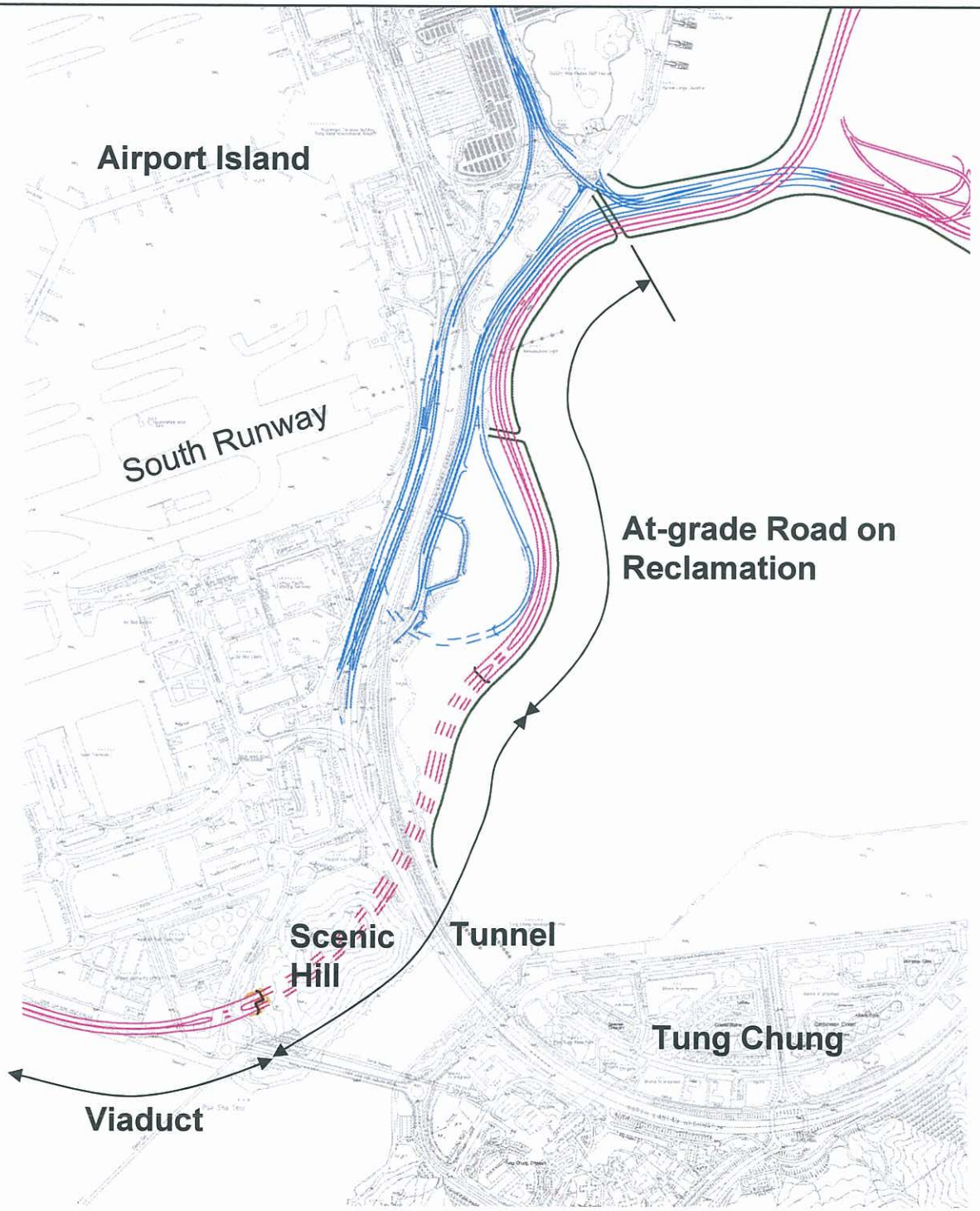


Figure 4 Tunnel-cum-At grade Portion of HKLR

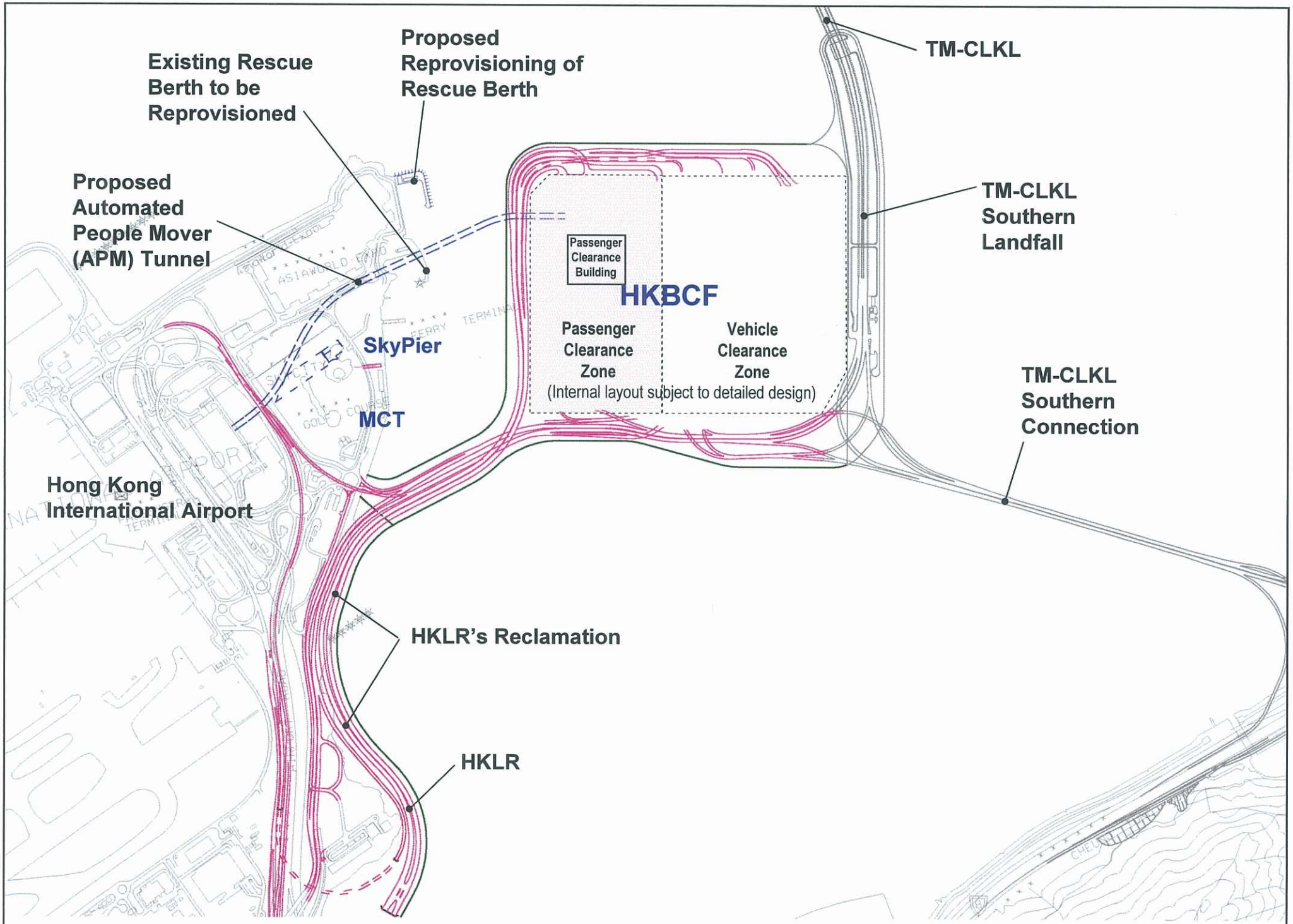


Figure 5 Proposed Layout of HKBCF

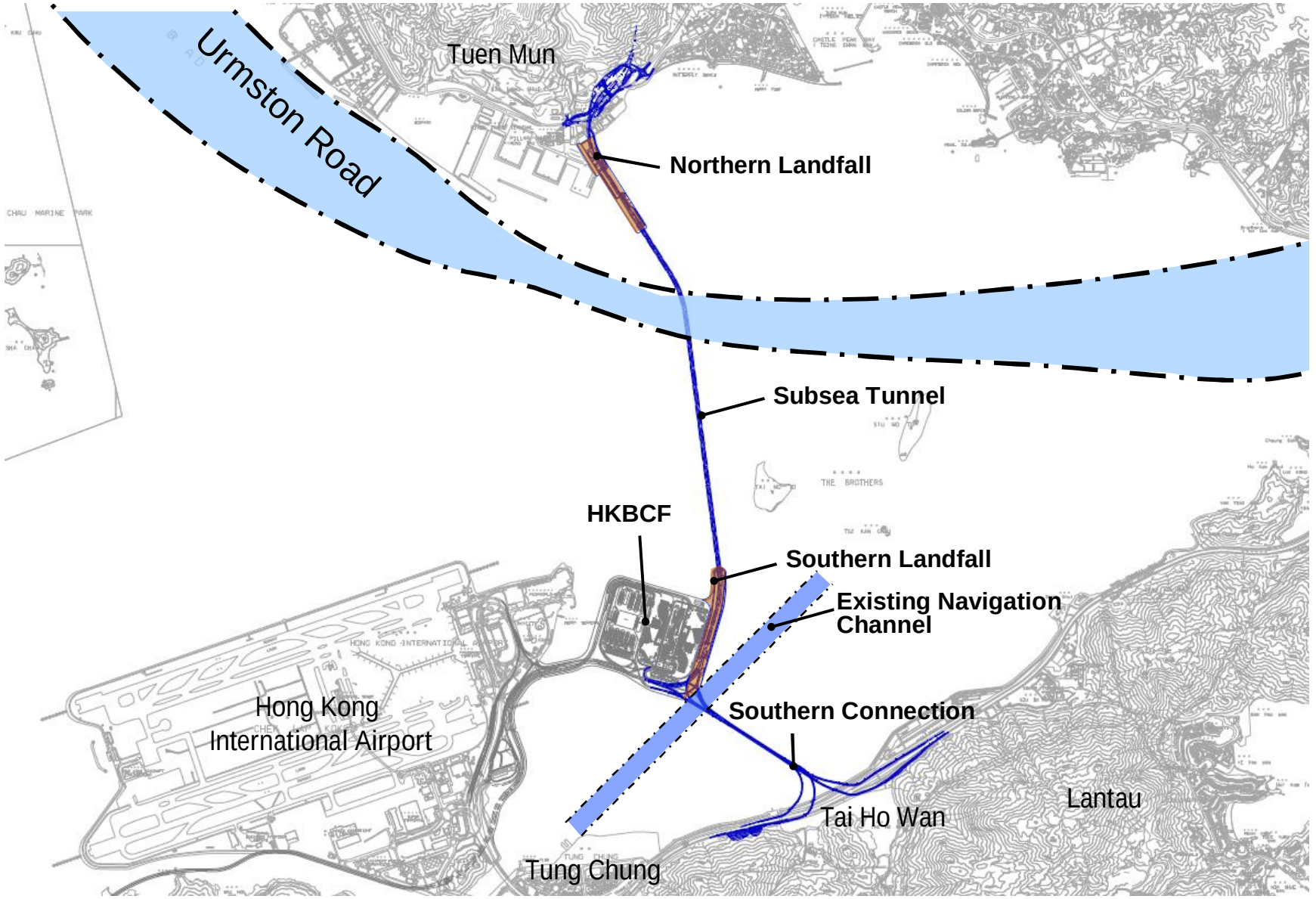


Figure 6 Proposed Alignment of TM-CLKL

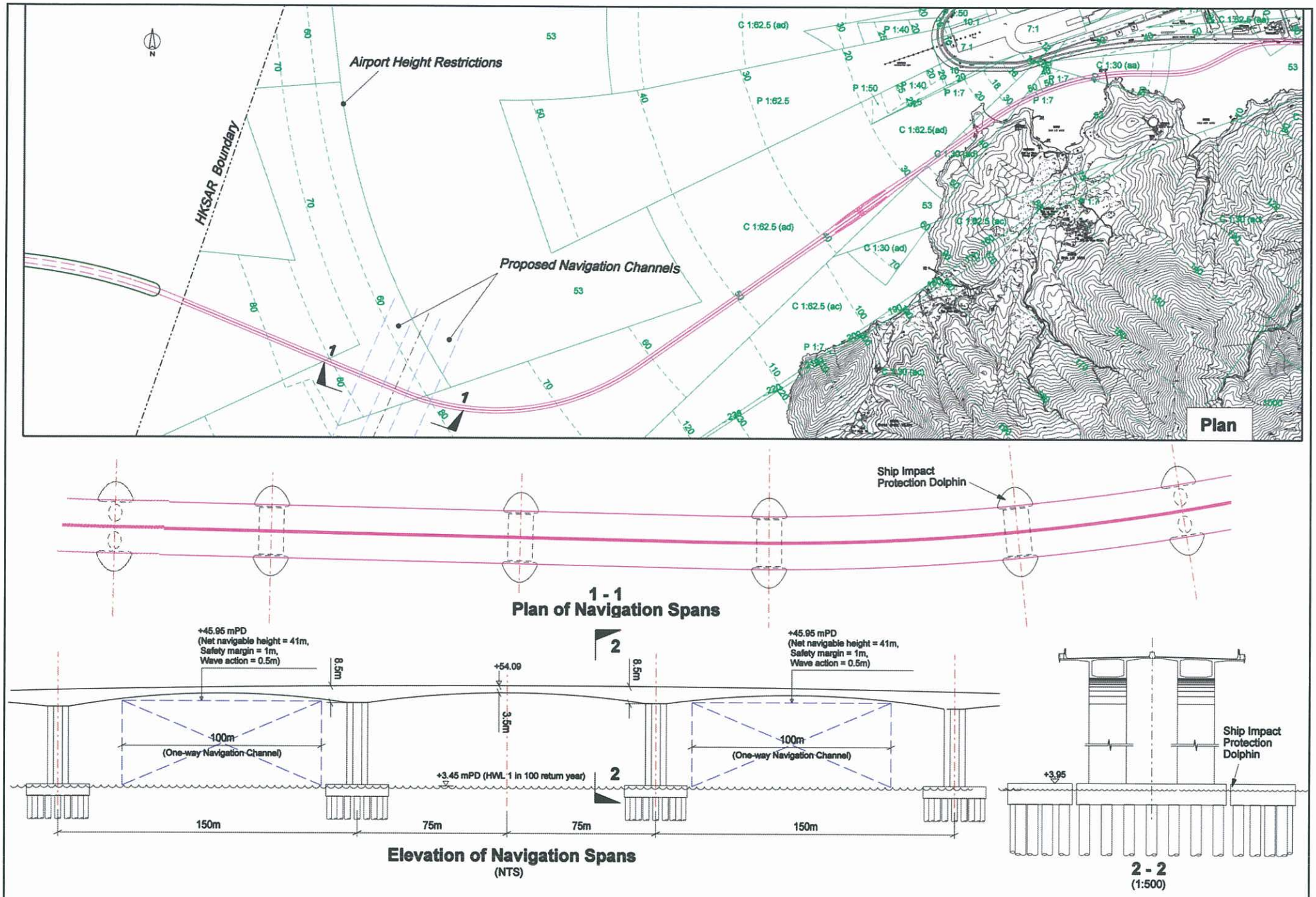
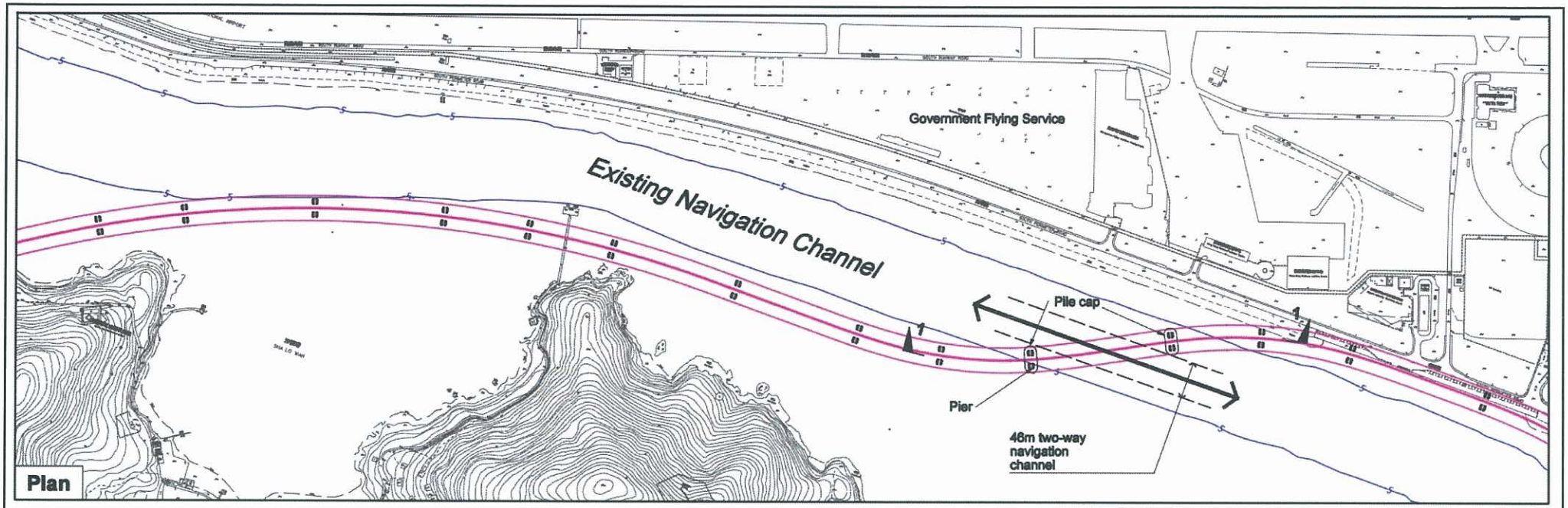


Figure 7 Navigation Spans at Western Side of Airport Island



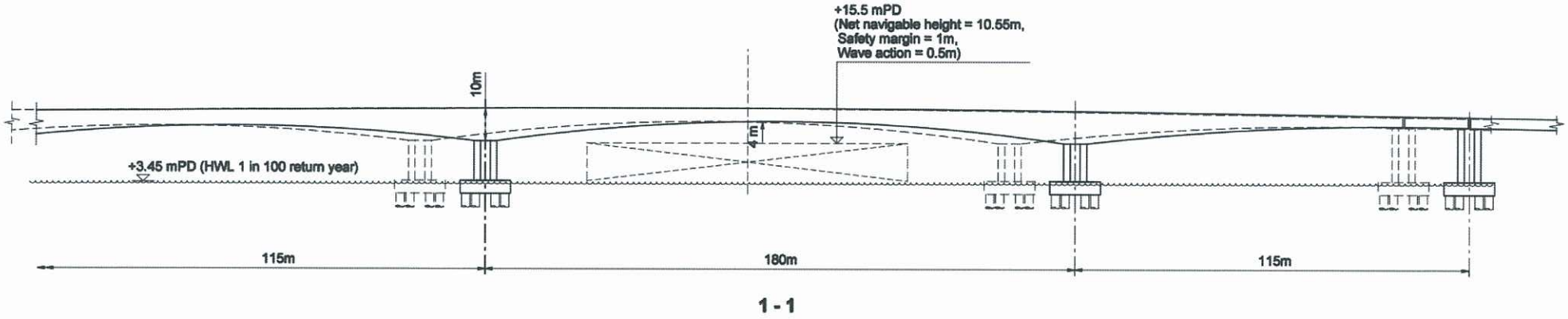


Figure 8 Navigation Span at Airport Channel

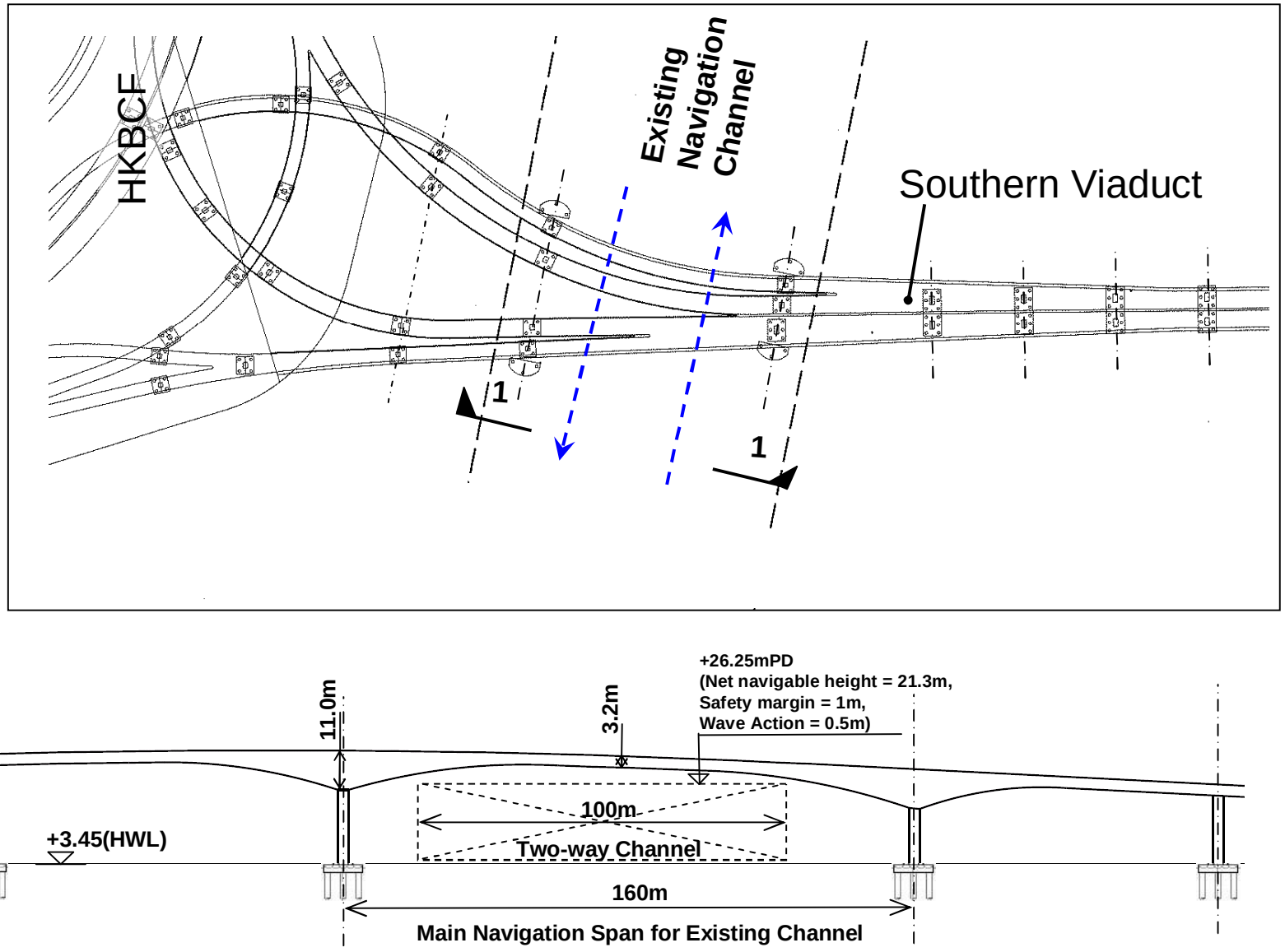


Figure 9 Navigation Span of Southern Viaduct