

Section 16 Planning Application for Amendments to Approved Scheme (No. A/K20/121) and Proposed Flat Use at West Kowloon Cultural District

Appendix 3

AIR VENTILATION REVIEW

May 2025



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Air Ventilation Review

1.1 Background

- 1.1.1 The purpose of this Section 16 application (Application) is to develop a mixed-used residential development with some Retail / Dining / Entertainment (RDE) uses on the Approved West Kowloon Cultural District Development Plan No. S/K20/WKCD/2 (DP). This will help the West Kowloon Cultural District (WKCD or the District) achieve its overall planning intention of building a diverse and vibrant District.
- 1.1.2 The Applicant, West Kowloon Cultural District Authority, proposes the technical reshuffling of a portion of the residential Gross Floor Area (GFA) from OU(MU)4 zone to OU(MU)3 zone and to apply for 'Flat' use. The Building Height Restrictions (BHR) and GFA proposed in this Application adopts the development criteria established from the previous approved planning application No. A/K20/121 in 2014 (2014 Approved Scheme) and will also form part of this Application.

1.2 Purpose

1.2.1 The purpose of this Air Ventilation Review (AVR) is to demonstrate that the Indicative Scheme has brought no significant change compared to the previous approved scheme in terms of air ventilation. The previous approved scheme considered in this review is the latest version which was adopted in 2017 for discharging the approval condition (c) under the Section 16 planning approval no. A/K20/121. In general, there is no change to the maximum permissible BHR, and the total GFA remains the same as that of the previous approved scheme. In addition, the Non-Building Areas (NBAs) in the Indicative Scheme boundary area, as stipulated in the DP, are complied with.

1.3 2017 Approved Scheme and Indicative Scheme

- 1.3.1 The 2017 Approved Scheme is the approved indicative scheme from the accepted Air Ventilation Assessment- Initial Study (AVA-IS) report dated May 2017 for compliance with approval condition (c) under the Section 16 planning approval no. A/K20/121.
- 1.3.2 The Indicative Scheme comprises seven residential towers with recreational facilities ancillary to the domestic part of the buildings. Some RDE facilities are provided on the ground and first floors of the podiums to enhance the vibrancy of the development. Under the Indicative Scheme, Towers 1 to 2 will have a maximum building height of +100mPD, and Towers 3 to 7 will have a maximum building height of +84mPD, both measured to the main roof level. The podium, with RDE and residential clubhouse uses, will have a building height of +21.65mPD and will be located below the residential towers within the Indicative Scheme.
- 1.3.3 To enhance the connectivity and circulation within the site and the surrounding buildings within the WKCD, there are three indicative footbridges across the three NBAs, the details of the indicative footbridges are illustrated in Appendix 1:

Western footbridge is side-open and connects the second floor of the podium between Tower 1 and the Artist Square Towers Project. The Western footbridge is a single storey structure measuring about 7m overall width, about 5m in height, 12m in length within the NBA, and with a minimum of 8.5m clearance below the footbridge from the ground floor,



Central footbridge connects the first podium floor between Tower 2 and Tower 3. The footbridge is fully enclosed on 1/F with a roof that serves as a landscape deck, measuring about 7m in overall width, about 5m in height, 12m in length within the NBA, and with a minimum of 4.5 m clearance below the footbridge from the ground floor and

Eastern footbridge connects the first podium floor between Tower 5 and Tower 6. The footbridge is fully enclosed on 1/F with a roof that serves as a landscape deck, measuring about 7m in overall width, about 5m in height, 12m in length within the NBA, and with a minimum of 4.5 m clearance below the footbridge from the ground floor.

1.3.4 The parameters of the proposed footbridges are listed in the table below:

	Western NBA	Central NBA	Eastern NBA	Total
NBA Area	804.05 m ²	791.88 m ²	679.58 m ²	2,275.51 m ²
Area of Coverage of Footbridge	84 m²	84 m ² **	84 m ² **	252 m²**
Total Area of Coverage	84 m²	84 m ²	84 m²	252 m²
Percentage of Coverage	10.45%	10.61%	12.36%	11.07% *

Note:

1.3.5 It is noted that the maximum permissible BHR remains unchanged between the 2017 Approved Scheme and the Indicative Scheme. An overlay plan is shown in the Appendix 2.

1.4 Site Wind Availability

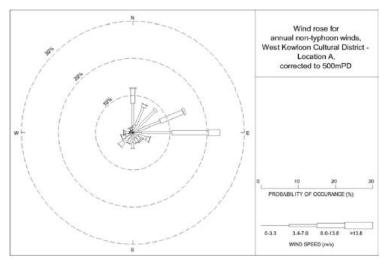
Experimental Wind Data

1.4.1 The wind data sets from the recent detailed study on the Air Ventilation Assessment (AVA) as summarized in the "The Approved AVA in approval condition (c) of Planning Application No. A/K20/121 for West Kowloon Cultural District, Hong Kong" (by West Kowloon Cultural District Authority, Ove Arup & Partners Hong Kong Ltd, May 2017) is referred.

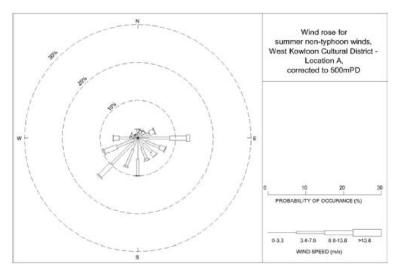
^{*}Average percentage of coverage

^{**1/}F Footbridges and its 2/F Landscape Deck overlap in footprint





Annual Condition at 500mPD



Summer Condition at 500mPD

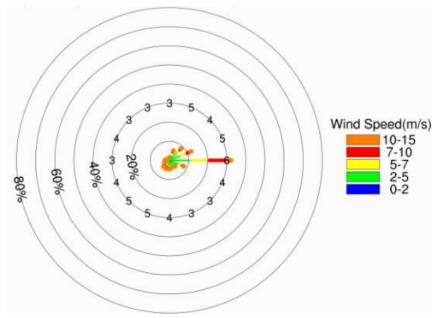
1.4.2 According to the experimental wind data, the annual prevailing winds come from E, ENE and N directions whereas the summer prevailing winds come from SW, E and S.

Regional Atmospheric Modelling System (RAMS)

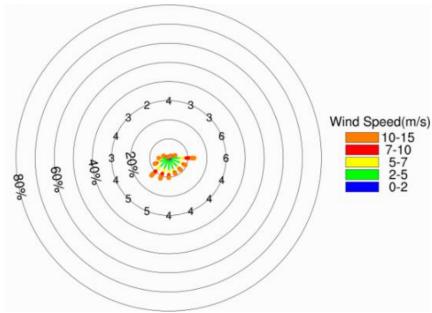
1.4.3 The Subject Site is covered by RAMS wind data by grids: (X:078, Y:038), (X:077 Y:039), (X:078 Y:039), and (X:077 Y:038). However, the identified prevailing winds in the concerned grids are the same, thus it has been extracted from the Planning Department's website for Subject Site wind availability data (at 200m). The annual prevailing winds come from E, ENE and NE directions whereas the summer prevailing winds come from E, SW and SSW. Below are the Wind roses extracted from the Planning Department's website.







Annual Condition at 200m

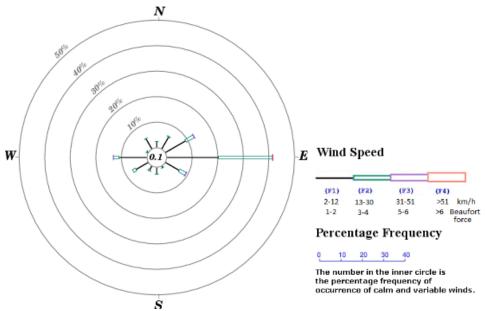


Summer Condition at 200m

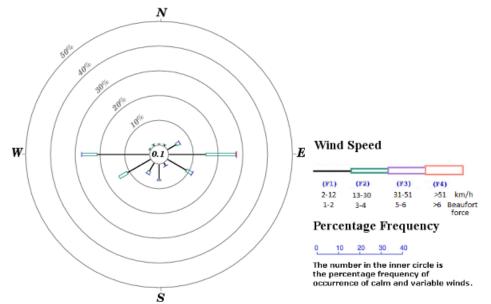
Hong Kong Observatory (HKO) Weather Data

1.4.4 The nearest wind station of HKO is located at Tsim Sha Tsui area. The wind data is collected at the 32 m elevation above the mean sea-level and at the HKO Station. The annual prevailing wind and summer prevailing wind with highest percentage frequency both comes from E as per HKO data. Below is the annual wind rose (1991-2020), July wind rose (1991-2020), August wind rose (1991-2020) and September wind rose (1991-2020) extracted from HKO website.



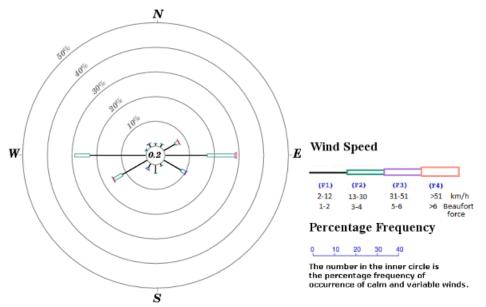


Annual wind rose for HKO station (1991-2020)

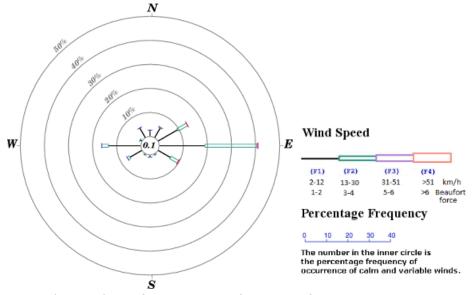


July wind rose for HKO station (1991-2020)





August wind rose for HKO station (1991-2020)



September wind rose for HKO station (1991-2020)

Summary of Existing Site Wind Availability

1.4.5 The experimental wind data has been corrected to 500 mPD, making it more suitable for Computational Fluid Dynamics (CFD) studies, this adjustment is particularly relevant for its application in the AVA-IS report dated May 2017 for compliance with approval condition (c) under the S16 planning approval no. A/K20/121. On the other hand, the wind data from HKO is collected at 32 mPD and may not adequately consider topographical effects. The RAMS data, collected at 200 m, accurately reflects wind conditions at the urban canopy level and takes into account the influences of topography and building morphology. Therefore, it is the most relevant for this study and has been adopted accordingly.



1.5 Important Pedestrian Areas

- 1.5.1 Following are the nearby important pedestrian areas that the public would access nearby:
 - Open space within WKCD;
 - Waterfront Promenade;
 - Roads surrounding the Austin Road West Alignment (Austin Road West, Lin Cheung Road and The Avenue within WKCD) and
 - Nearby residential developments.

1.6 Wind Flow under Annual Condition and Summer Condition

1.6.1 Figures 3a, 3b, 3c and 4a, 4b, 4c show the illustrations of annual wind flows of the Baseline Scheme (i.e. 2017 Approved Scheme) and the Indicative Scheme respectively. Below section discuss the annual wind flows of the area under the Baseline Scheme and Indicative Scheme. The wind flow of the Baseline Scheme is referring to the CFD finding in its Initial Study prepared in 2017.

Annual Condition/Summer Condition - East Wind

- 1.6.2 East wind is the annual prevailing and summer wind as mentioned in section 1.4.3. Figure 3a shows East wind flowing under the Baseline Scheme for Annual and Summer wind conditions, while Figure 4a shows the E wind flowing under the Indicative Scheme.
- 1.6.3 Under annual prevailing east wind, the future building blocks at the eastern portion of the WKCD may obstruct East wind from reaching the site and downstream areas such as M+ Museum and the future WestK Performing Arts Centre. The East wind would mainly flow along Austin Road West and The Avenue within the WKCD development from east to west. With the presence of compact buildings at upstream area (P01 to P15), as shown in Figure 3a and 4a, the wind flow of the site under both Baseline Scheme and Indicative Scheme would be similar. East wind will flow along The Avenue, if any, and Austin Road West towards the downwind area, and these breezeways would not be blocked by the Indicative Scheme. Setbacks from the northern podium edges towards Austin Road West have been incorporated into the building design under the Indicative Scheme to facilitate the wind flow along Austin Road West.
- 1.6.4 It is noted that both Baseline Scheme and Indicative Scheme maintained a similar building setback from the northern boundary. The incoming East wind would flow through the proposed building setback area and penetrate to the surrounding areas. Therefore, the unfavorable impact in terms of the wind environment on the surrounding areas is expected to be minimized. Air ventilation performance of both schemes under East wind are considered comparable.

Annual Condition - NE and ENE Winds

- 1.6.5 Under NE and ENE wind directions, the existing high-rise developments in Jordan, The Austin, Grand Austin, the Austin Station as well as the future office development on the top of the Hong Kong West Kowloon Station to the northeast will block and reduce the wind availability to the Site and the downwind area. NE and ENE wind will mainly flow along Lin Cheung Road and then reach the Austin Road West Alignment.
- 1.6.6 Figure 3b shows the wind flow of NE and ENE winds under the Baseline Scheme. Both NE and ENE winds are expected to be mainly flowing westwards along Austin Road West, and flow across the building separations between P16 and P14 to the south, reaching the waterfront promenade. A portion of NE wind is likely to be diverted towards the NBA between P17 and P19.



- 1.6.7 Figures 4b shows the expected wind flow of NE and ENE winds under the Indicative Scheme. Generally, the NE and ENE wind will flow along Austin Road West, the building separation between T5 and T6, and that between P14 and P16, same as that under the Baseline Scheme. A building setback from northern edge of the podium of the Indicative Scheme would facilitate the wind flow along Austin Road West. Also, the major wind flow to the waterfront promenade along the building separation between the P14 and P16 is not affected under the Indicative Scheme.
- 1.6.8 For the wind flowing along the NBA between T5 and T6, generally the wind can flow along the site similar to the Baseline Scheme with the eastern footbridge. As mentioned in Section 1.6.6 above, there may be a portion of wind flowing across this NBA. For the eastern footbridge connecting the podiums between T5 and T6, although it is air conditioned at 1/F, there is a clearance of at least 4.5m allowing wind flow through the NBA at the pedestrian level.
- 1.6.9 Although there may be a slightly reduction in the wind flow at this localized area near the NBA, the two major air paths (Austin Road West and the building separation between P14 and P16) are maintained in the Indicative Scheme. Hence, it is expected that overall wind performance of the WKCD area under both Baseline Scheme and Indicative Scheme is similar.

Summer Condition - SW and SSW Winds

- 1.6.10 Figure 3c shows the wind flow of south-west (SW) and south south-west (SSW) wind under the Baseline Scheme, while Figure 4c show the SW and SSW wind flow under the Indicative Scheme.
- 1.6.11 Under summer prevailing SW and SSW winds for the Baseline Scheme, the major wind flow area is the building separation between P18 and P15 that the winds flow across the WKCD and reach the downwind area.
- 1.6.12 Figure 4c shows the illustration of wind flow of the Indicative Scheme for SW and SSW winds respectively. The expected wind flows of these two prevailing summer winds for the overall WKCD area are similar to that under the Baseline Scheme. All the major wind paths under the Indicative Scheme are kept. Under the Indicative Scheme, a tower setback at the western end of the site is provided to facilitate the wind flow from waterfront promenade to the downwind Austin Road West.
- 1.6.13 For the two NBAs within the Indicative Scheme Boundary as well as the NBA between T1 and the Artist Square Towers Project, it is expected that the winds can still flow across the pedestrian level as there is no obstruction at the ground level. For the two indicative footbridges within the site, the 1/F footbridges are air-conditioned with a roof that serves as landscape deck. Additionally, there is a minimum clearance of 4.5m below these two footbridges, allowing wind to pass through underneath. The wind flow through these two NBAs may be slightly reduced due to the presence of these connections, i.e. there may be a localized reduction at the area immediately north of the NBAs. Additionally, the Western footbridge is a single storey and opensided linking the 2/F podium of the Indicative Scheme to the adjacent Artist Square Towers Project to its west. The localized reduction of wind flow at this NBA is considered minimal. However, the overall wind performance of the surrounding areas including the Austin Road West is not expected to be significantly affected. The major wind flows to the downwind area such as Austin Road West and Lin Cheung Road are coming from other air paths away from the site and from the downwash wind captured by the high-rise buildings behind, such as The Harbourside



development. These major wind flows are not affected by the Indicative Scheme, and it is expected that the wind performance of the WKCD area would be comparable between the Baseline Scheme and Indicative Scheme.

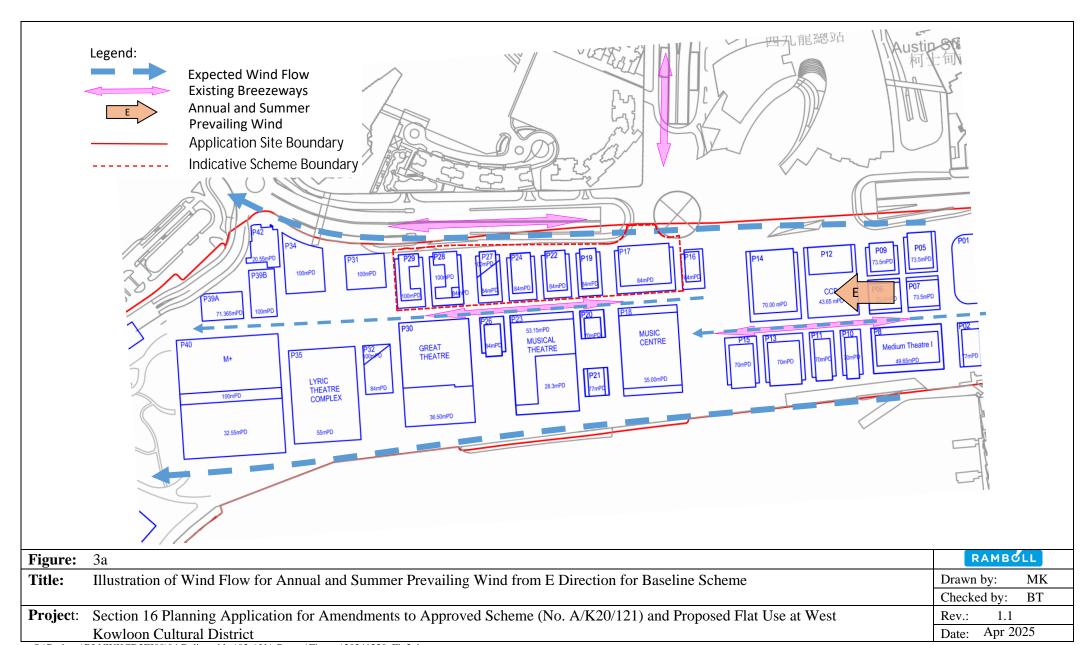
1.7 Conclusion

- 1.7.1 After considering the potential air ventilation impacts of the Indicative Scheme, the layout of the Indicative Scheme has incorporated good design measures to maintain its air ventilation performance. Taking into consideration of the existing topography, the location of the existing built areas and the provision of mitigation measures, such as building setbacks along the north site boundary with building separations and comparable building heights, it is considered that the Indicative Scheme should not have any significant adverse impact on the surrounding environment.
- 1.7.2 There is no change to the maximum permissible BHR, and the total GFA remains the same as that of the previously approved scheme. For providing a better circulation amongst the podiums of the Indication Scheme, there are indicative footbridges fully enclosed on the 1/F of the podiums with a roof that serves as landscape deck across the two NBAs with a minimum clearance of 4.5m below the footbridges from ground level. The Western footbridge is a single storey structure measuring about 7m overall width, about 5m in height, 12m in length within the NBA, and with a minimum of 8.5m clearance below the footbridge from the ground floor. These proposed circulation structures may slightly reduce the wind flow across the NBAs but the overall wind performance of the WKCD and surrounding areas would not be significantly affected. The major wind paths of the areas, such as the Austin Road West, The Avenue, the building separation between blocks P16 and P14 are not affected under the Indicative Scheme.
- 1.7.3 In addition, the Indicative Scheme has incorporated effective mitigation measures such as building setbacks along the north site boundary with building separations and comparable building heights. Therefore, with the proposed design measures in place, the Indicative Scheme would unlikely impose a significant impact on the surrounding sites from air ventilation perspective when compared with the 2017 Approved Scheme.
- 1.7.4 The Indicative Scheme adopted the following good air ventilation measures:
 - 8m to 10m setbacks at G/F to 2/F of northern podium edges from Austin Road West;
 - ~6m tower setback from Tower 1 to the western site boundary and
 - The 12m wide requirement for NBAs are respected, between Towers 2 and 3, and Towers 5 and 6 respectively, except for the provision of footbridges.

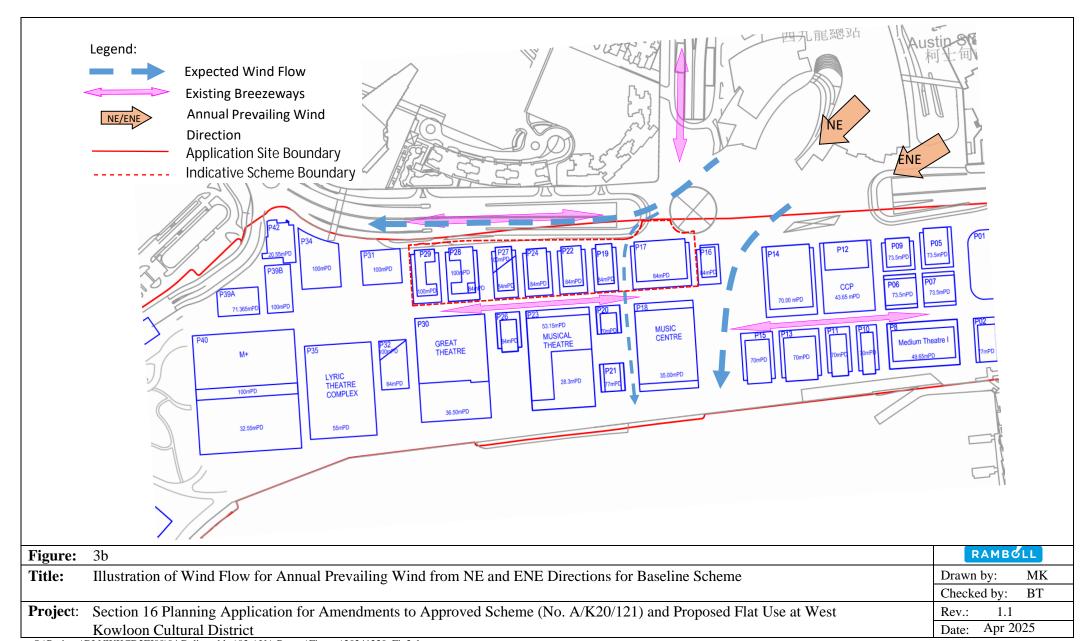




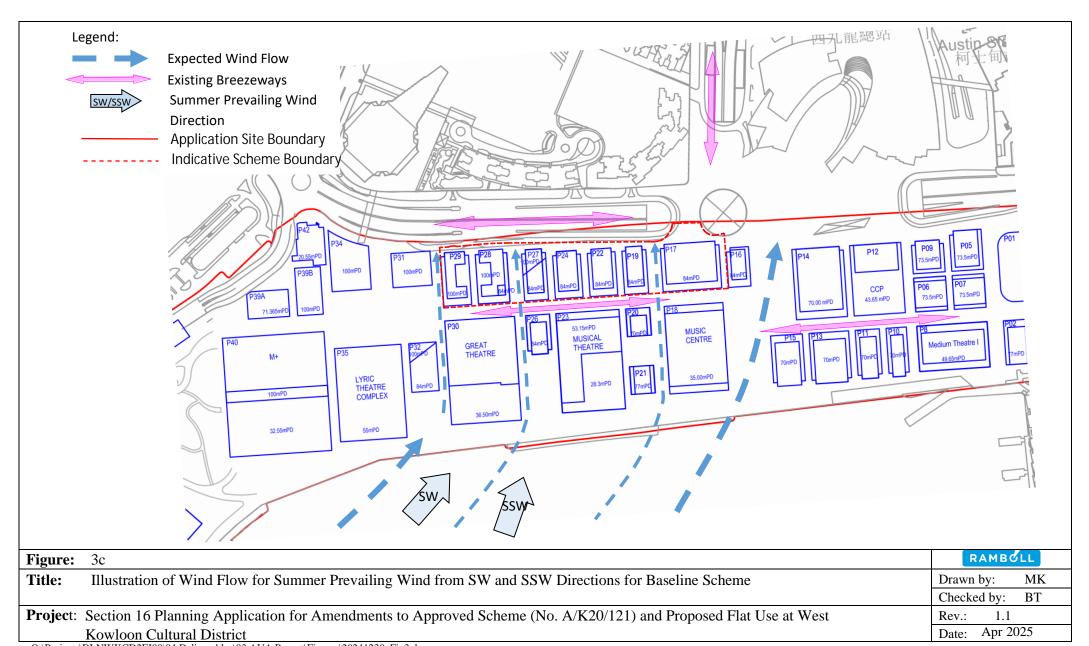
Figures



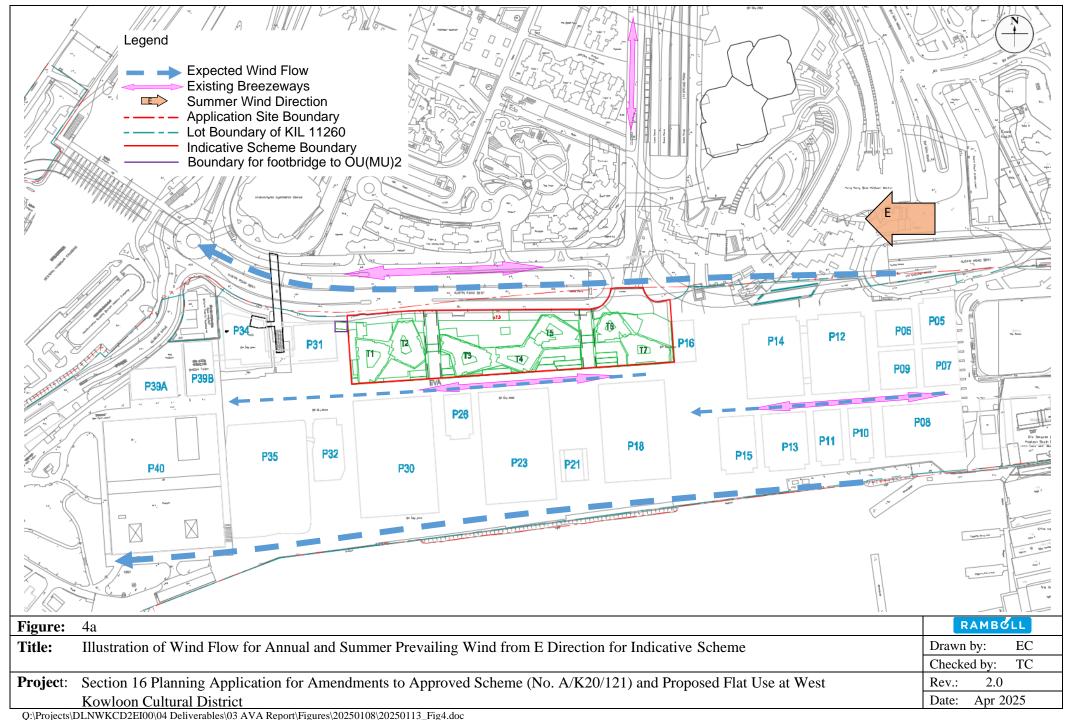
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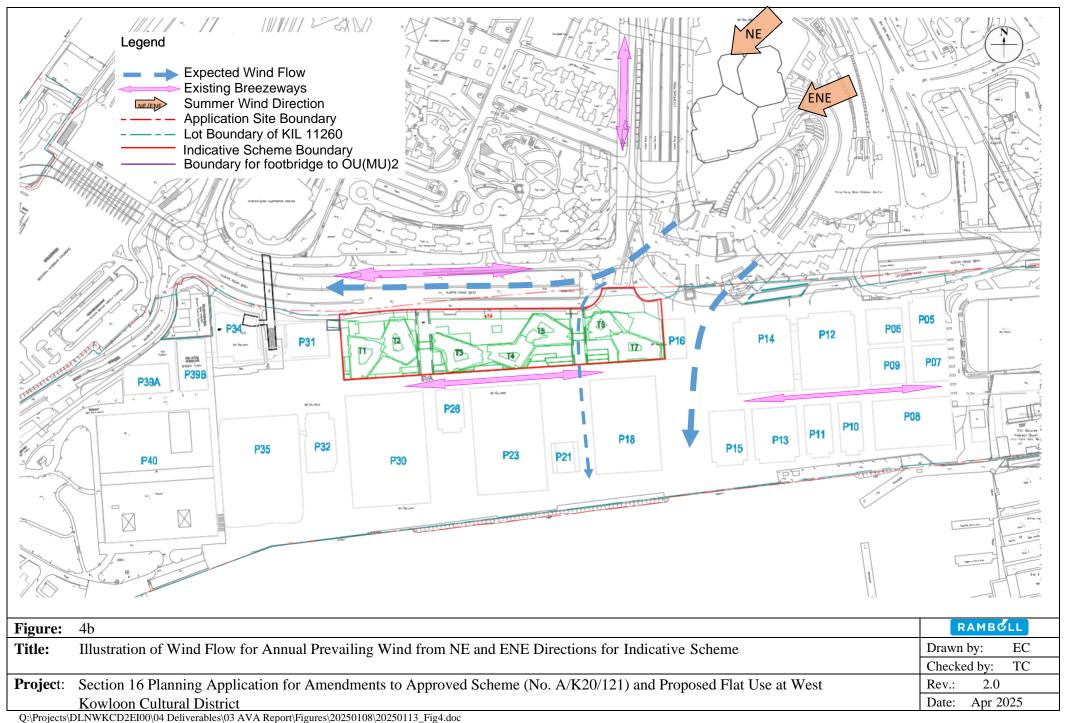


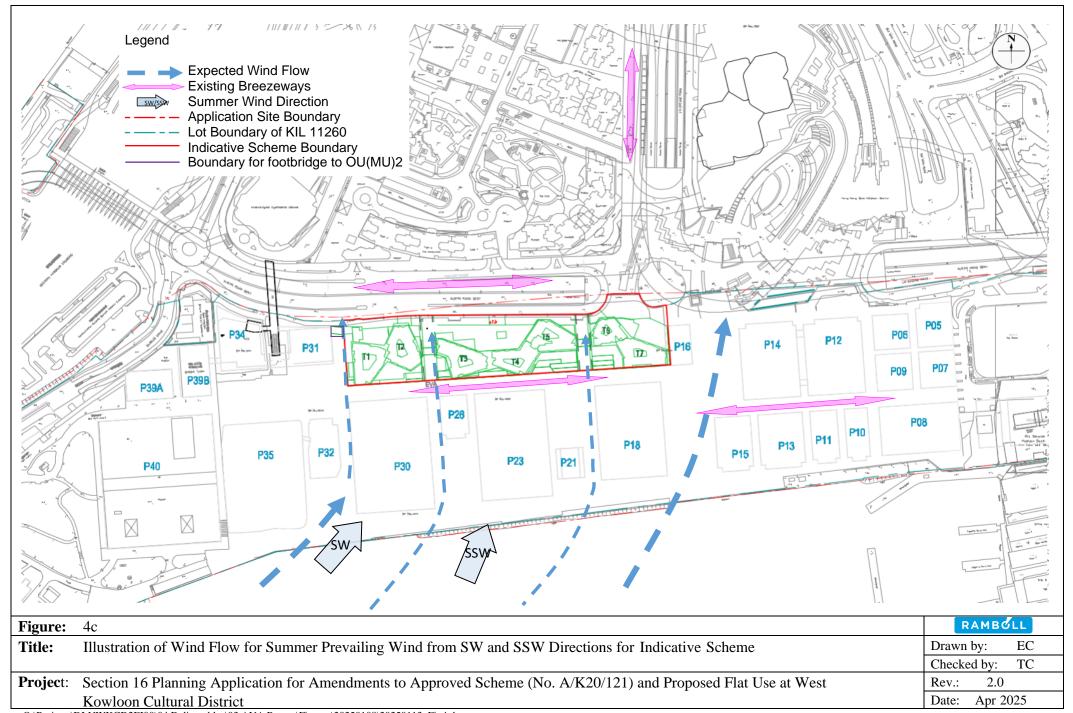
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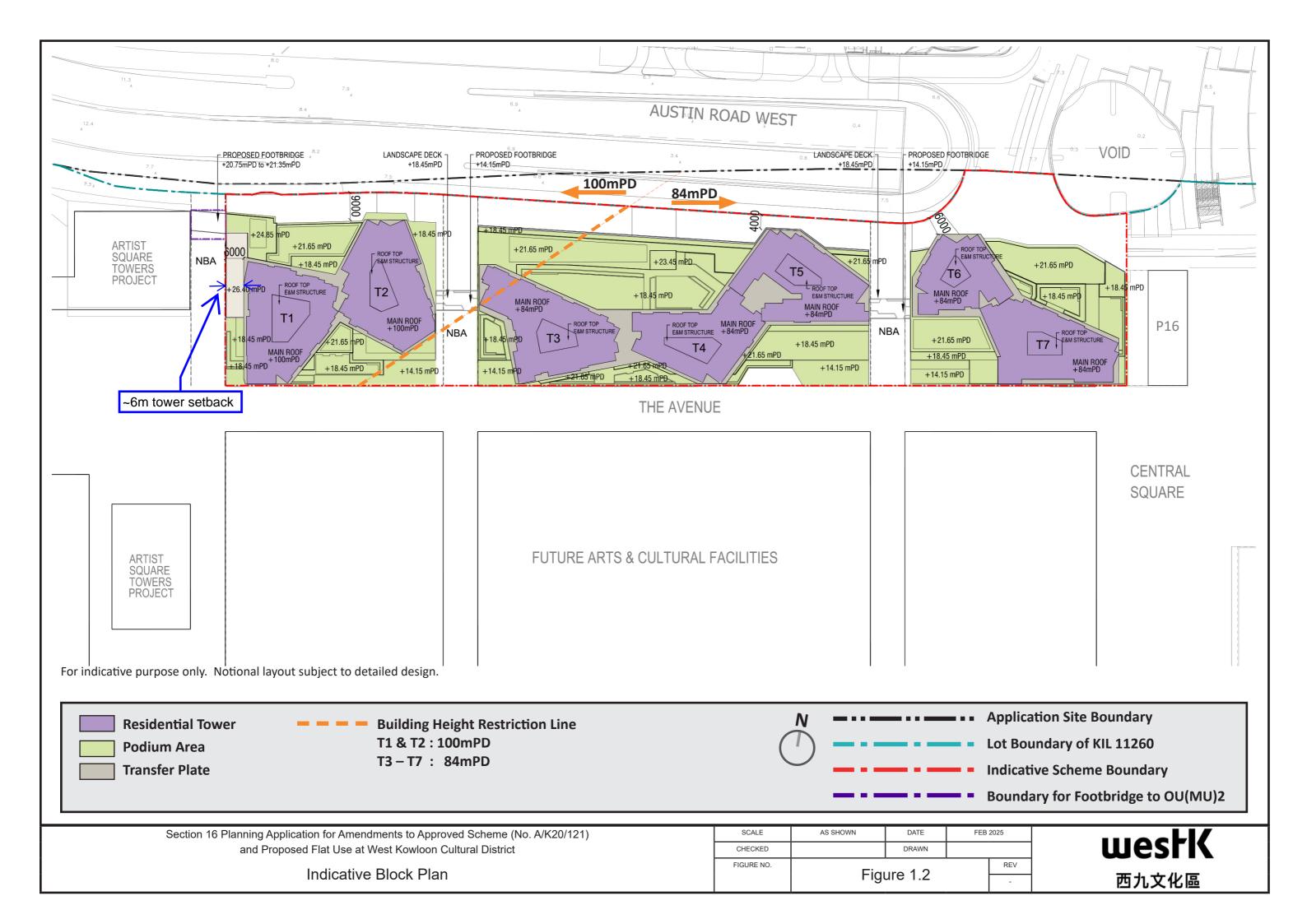


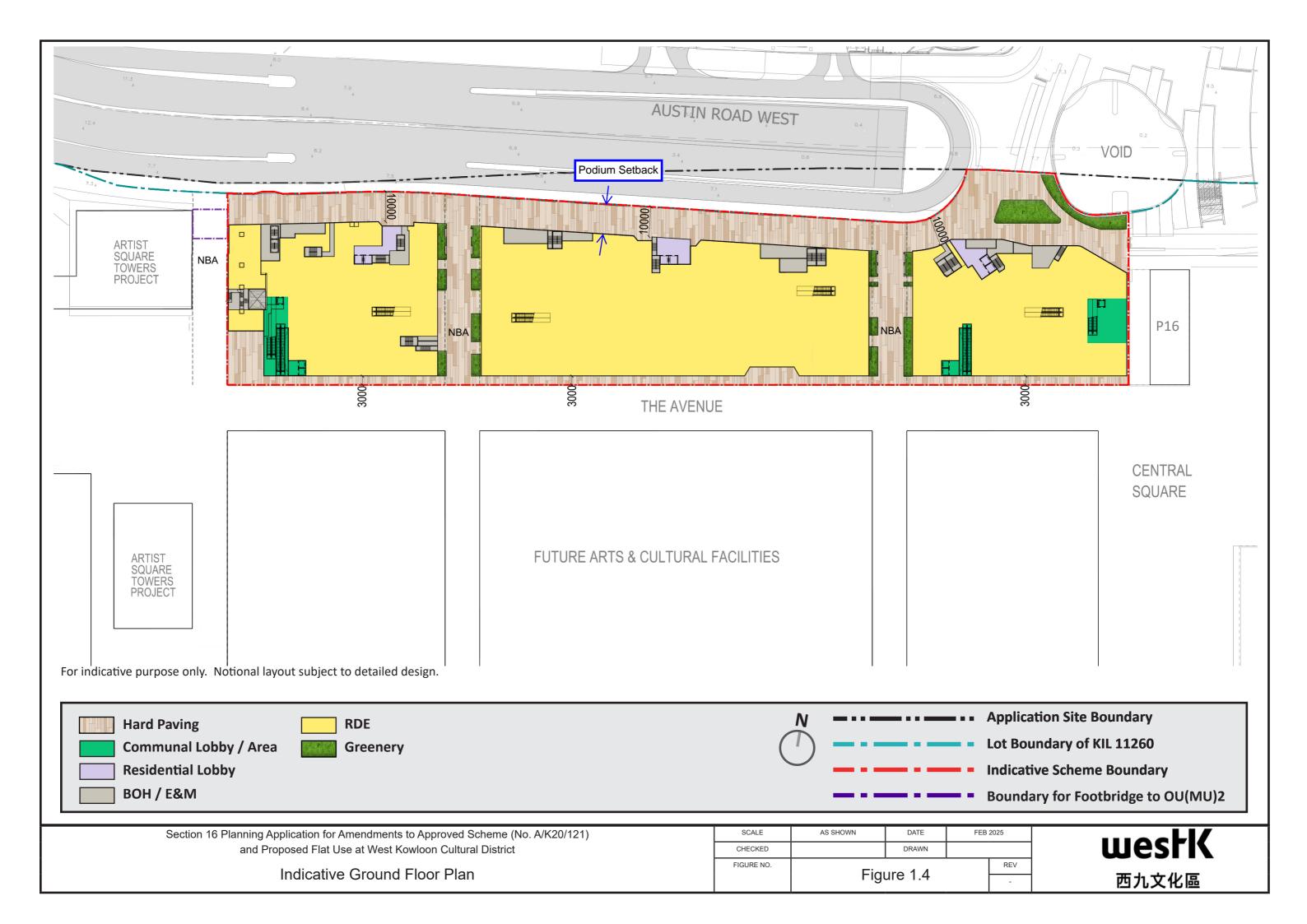


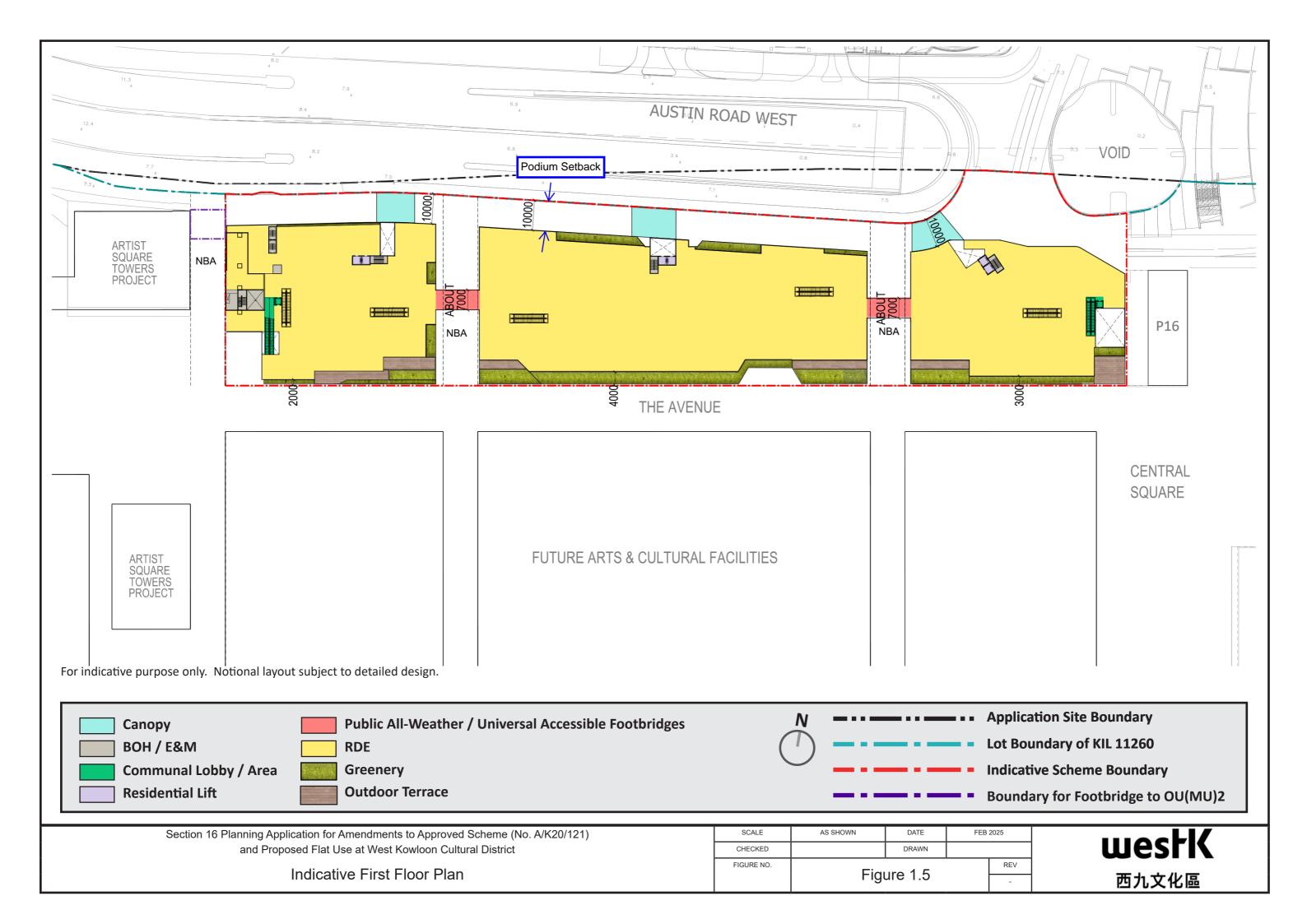
Appendix 1

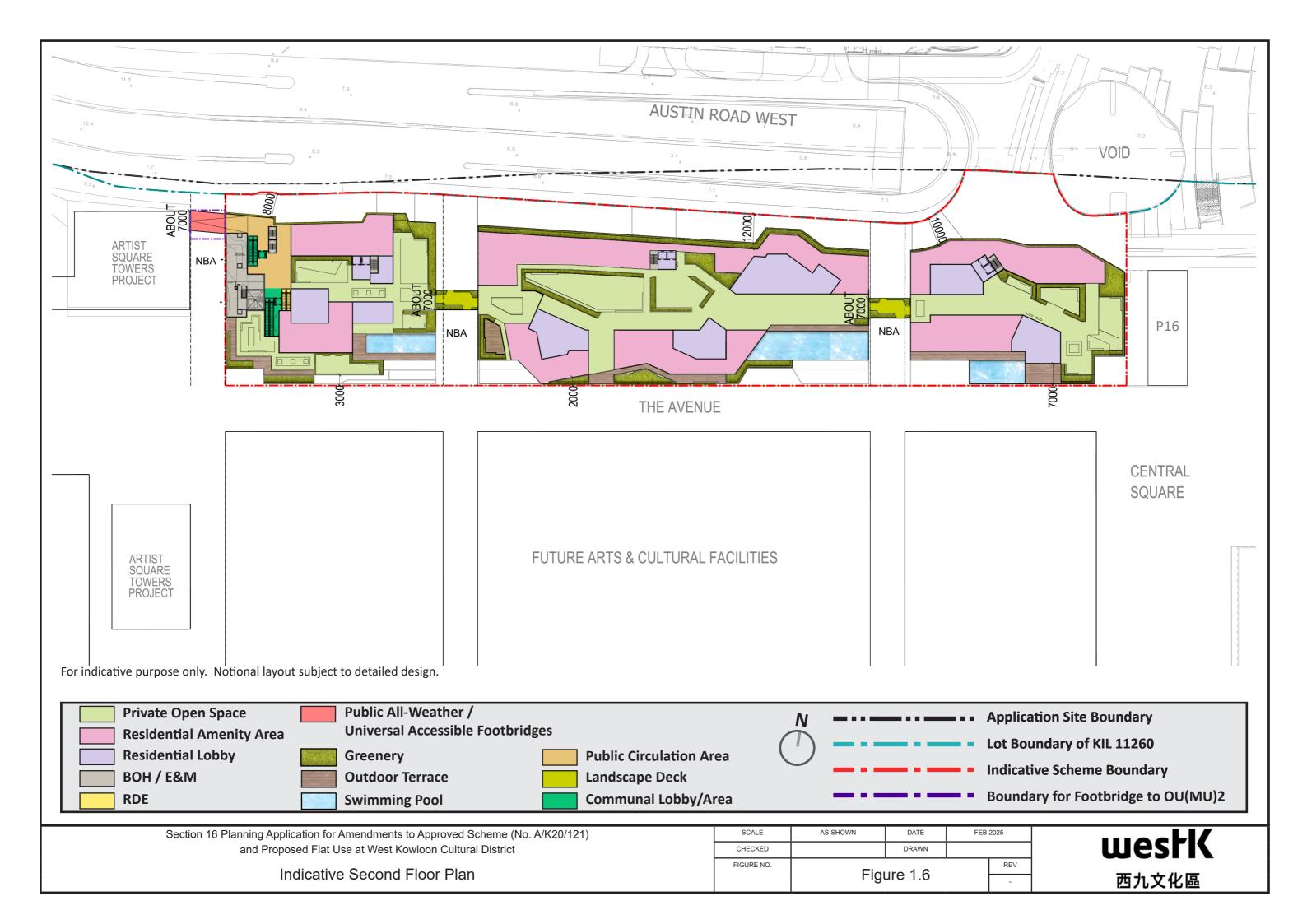
Layout and Section Plans of the Indicative Scheme

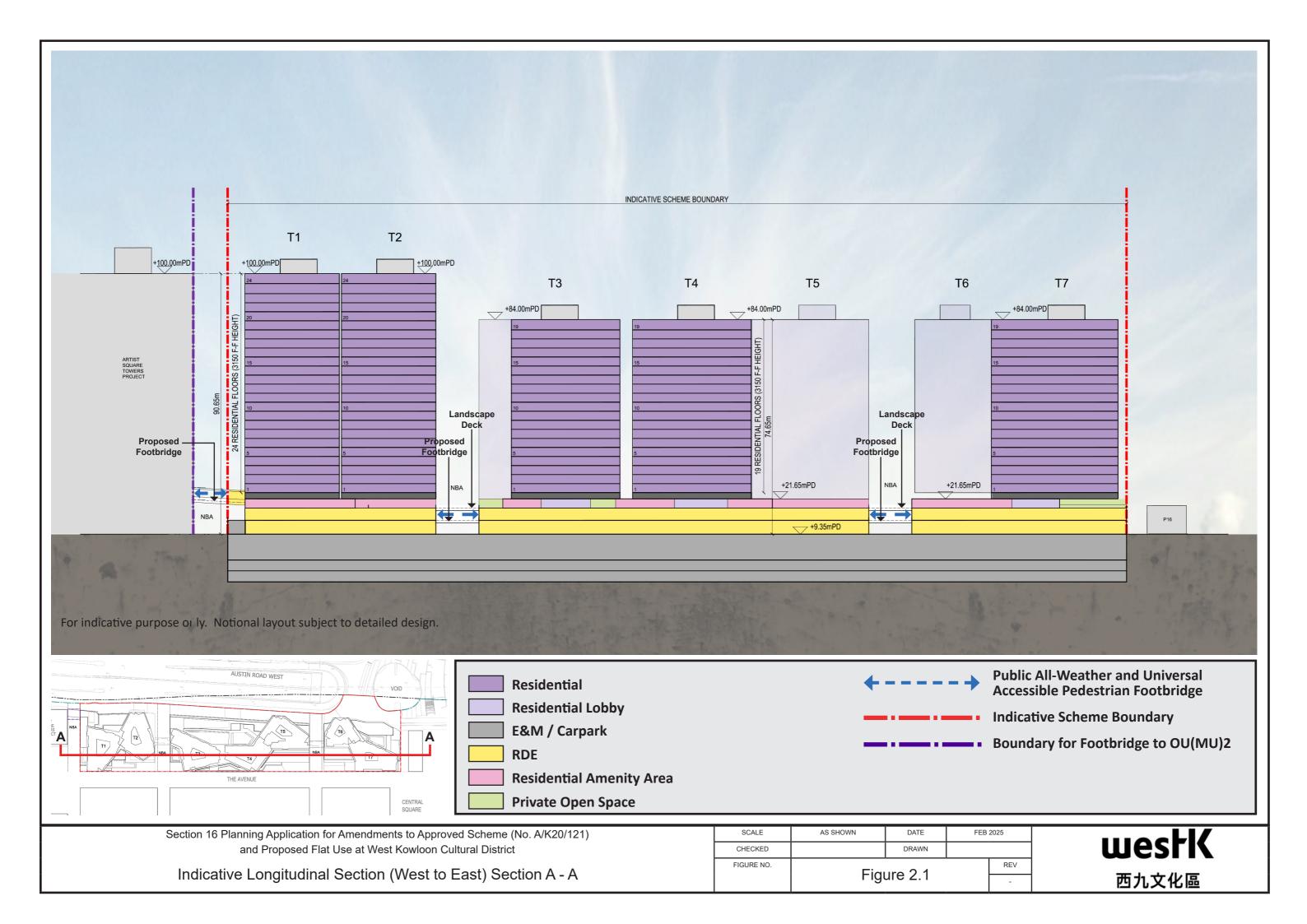


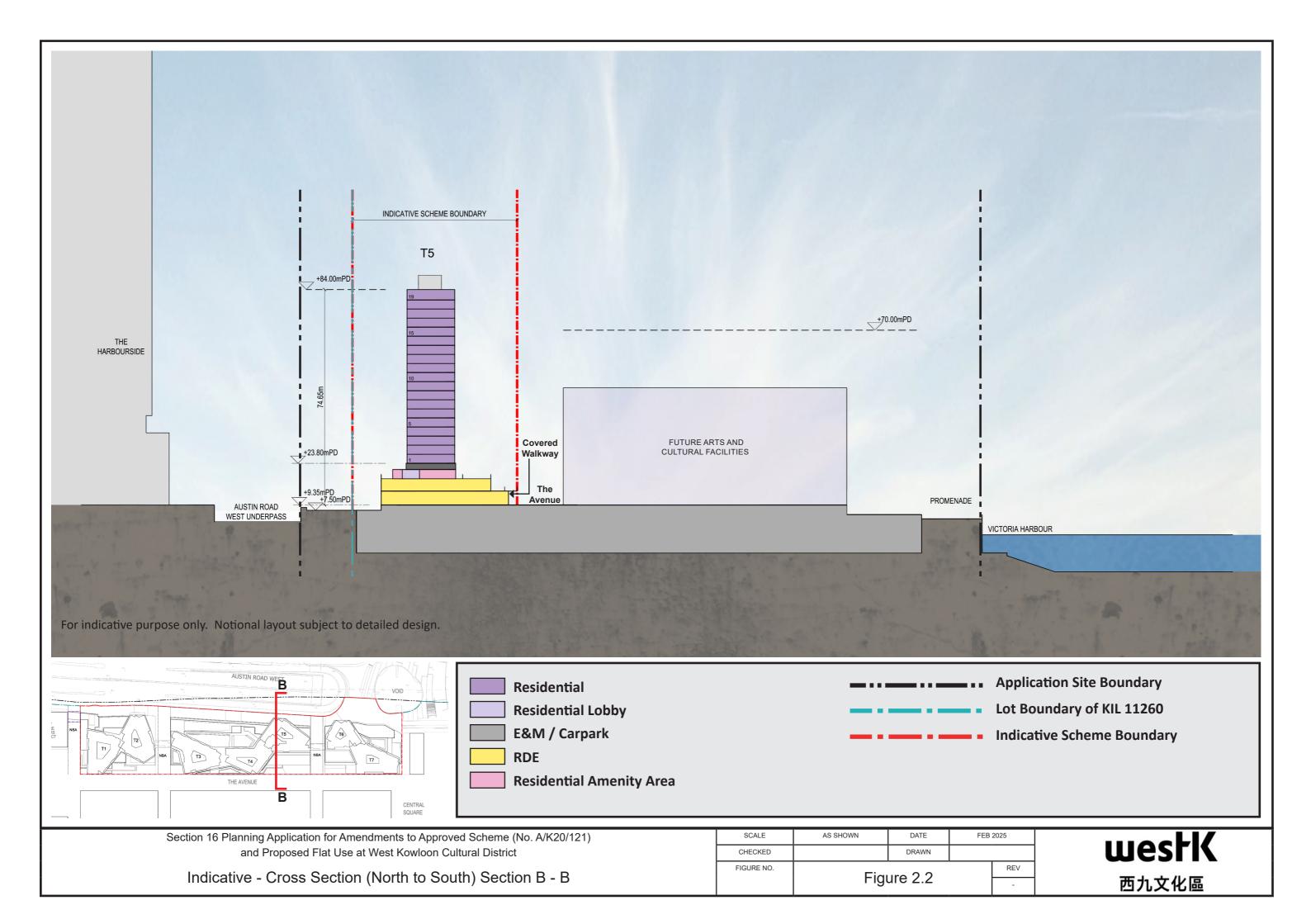


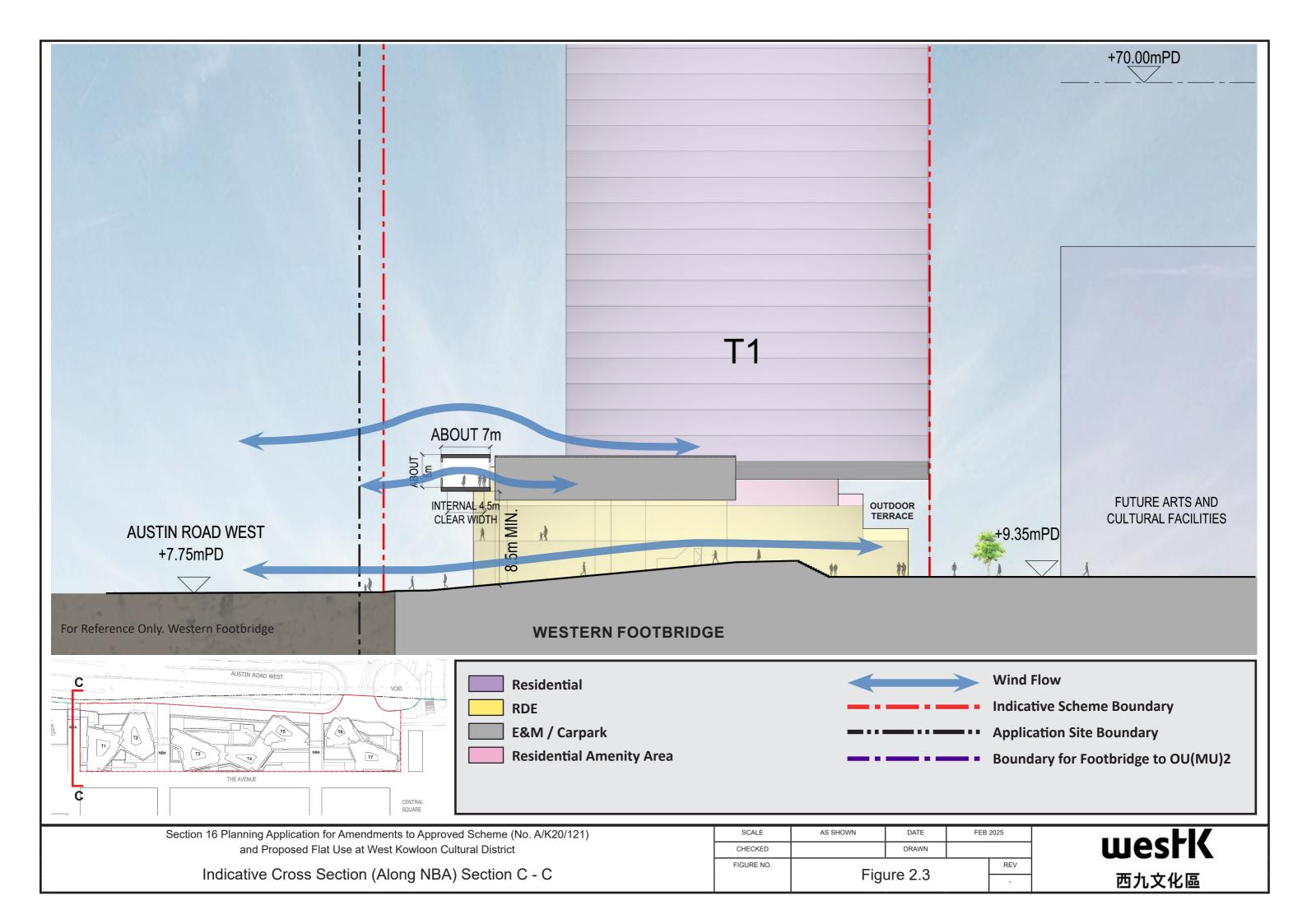


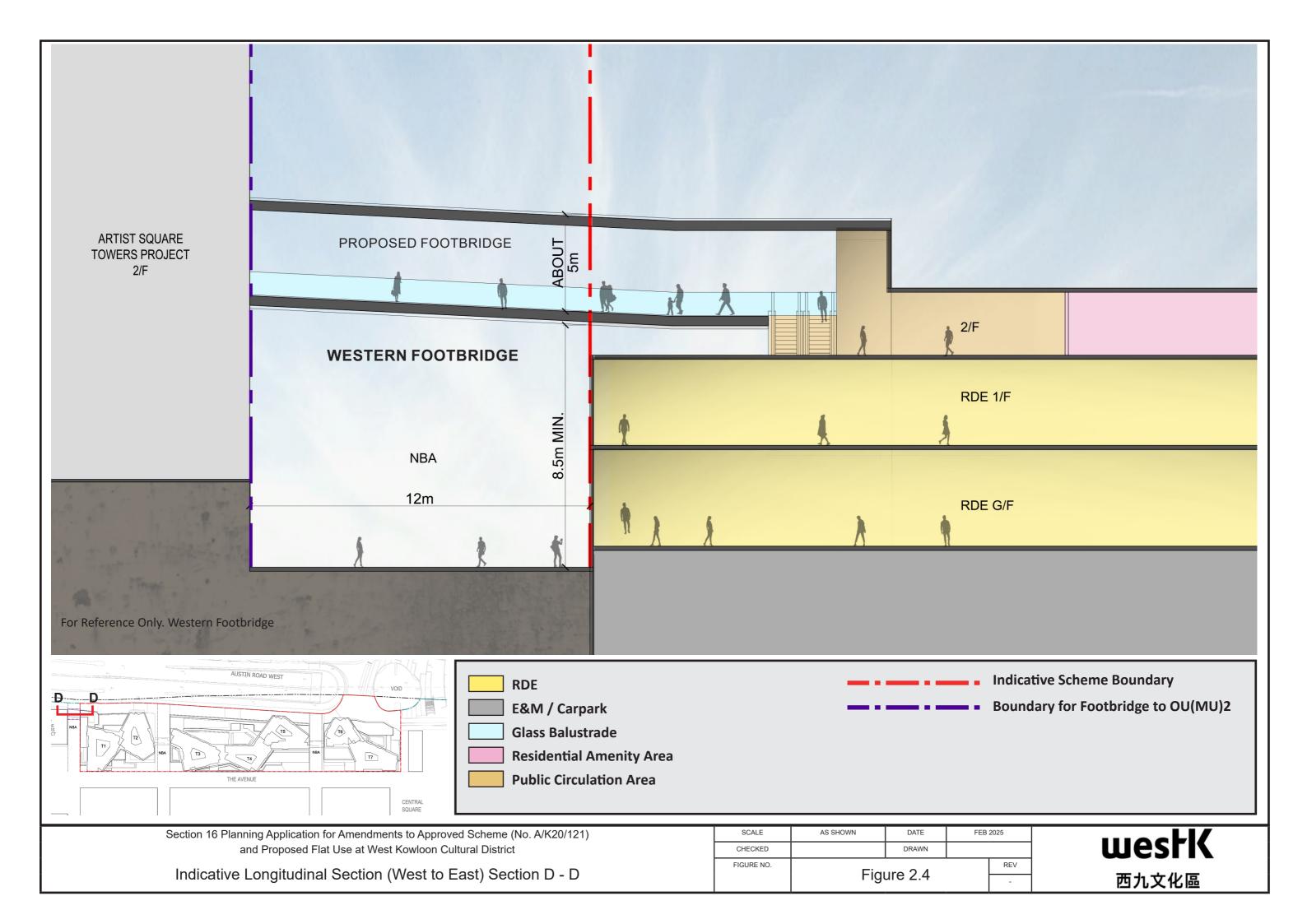


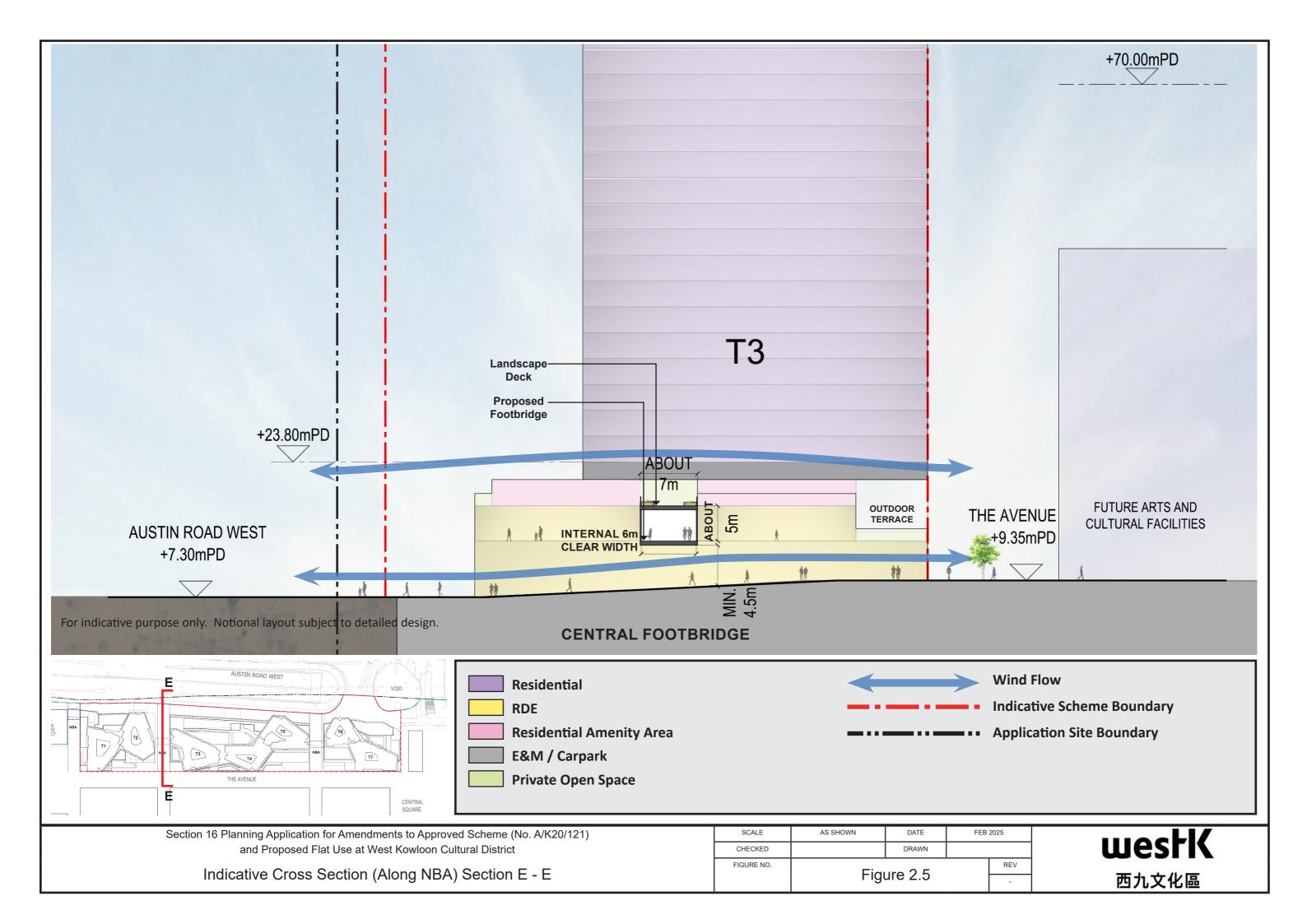


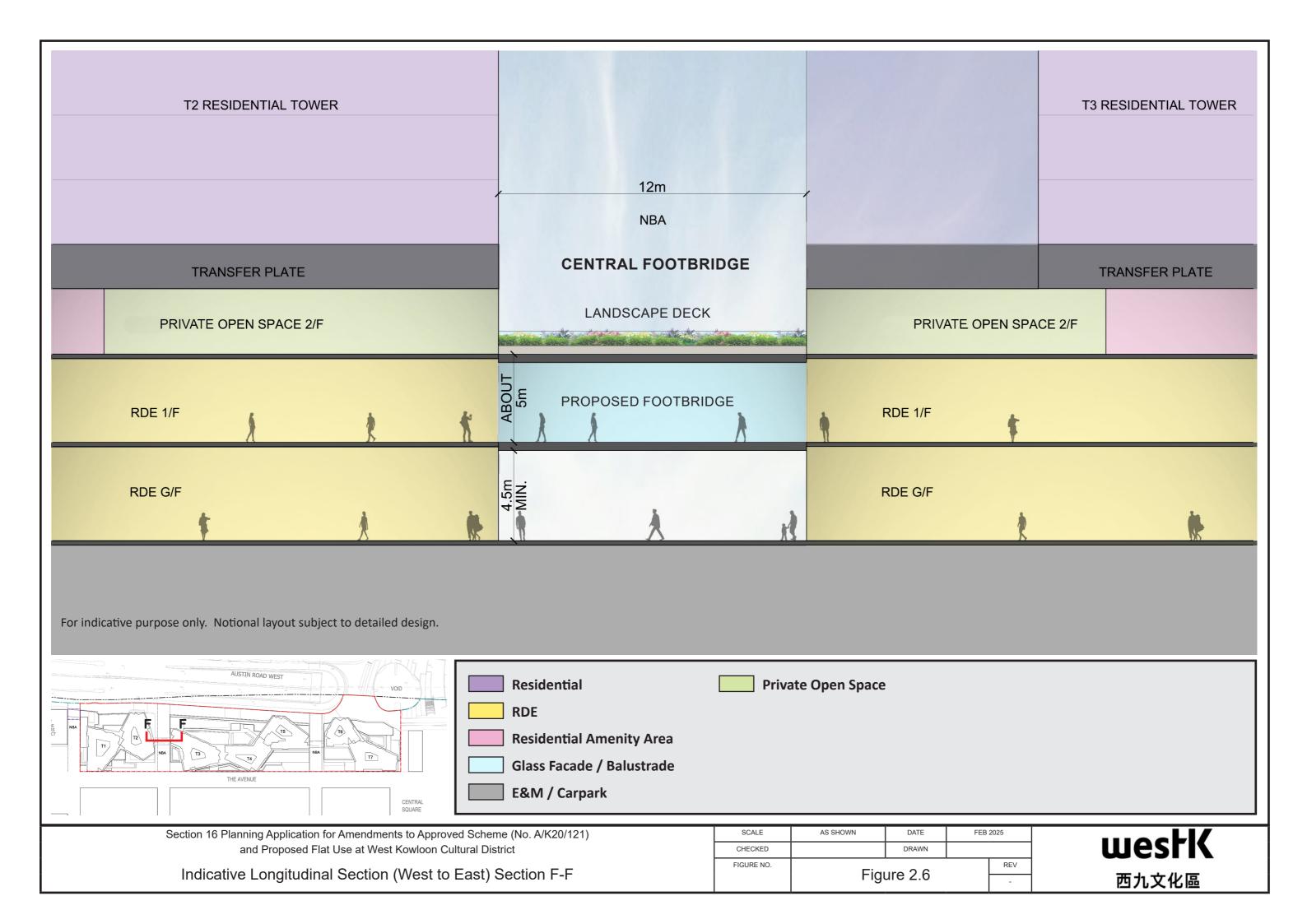


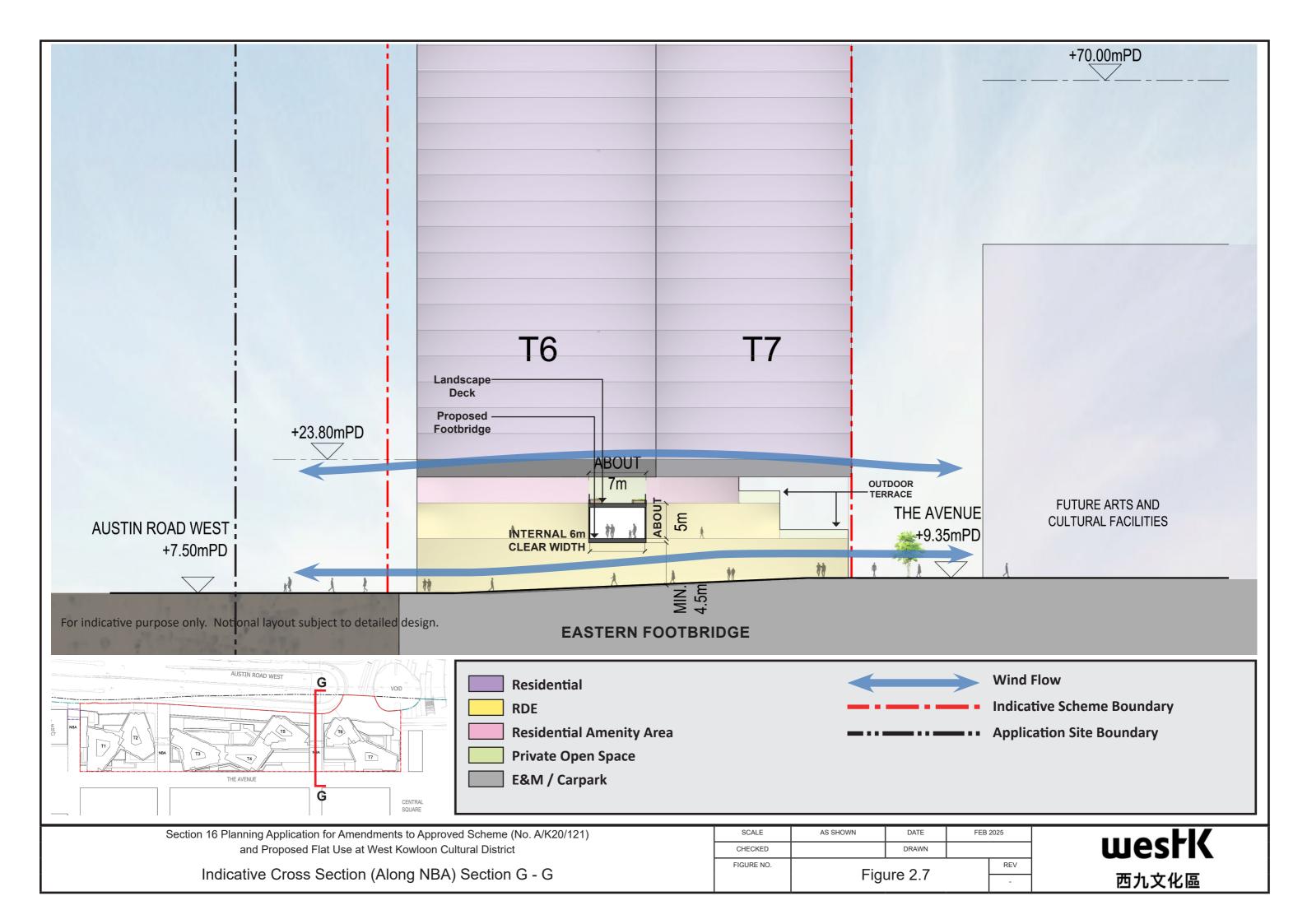


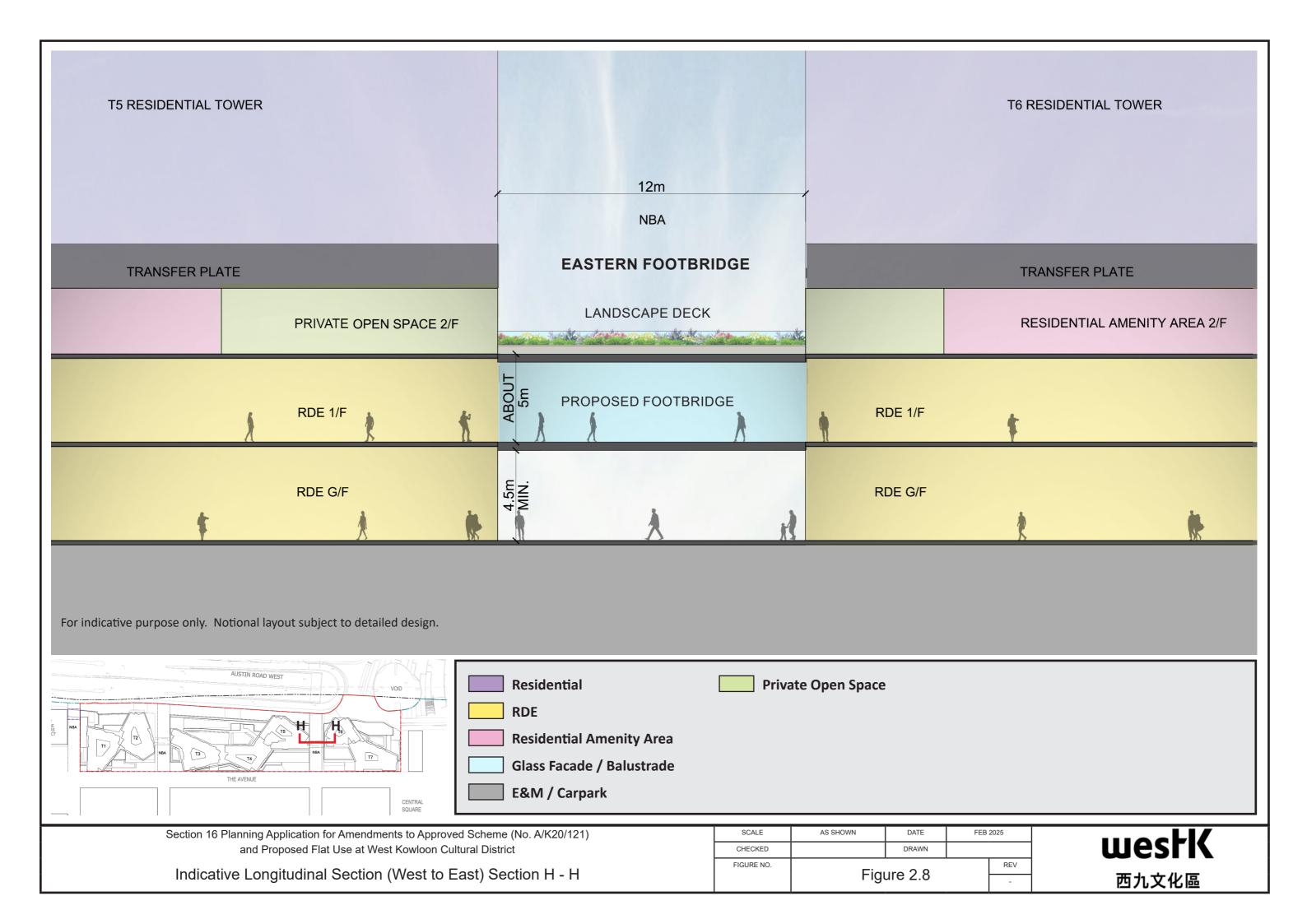














Appendix 2

Overlay Plan of the 2017 Approved Scheme and the Indicative Scheme

