



銅鑼灣

Causeway Bay

Annex D

**Replacement Pages of Air Ventilation
Assessment**

Patchway Holdings (HK) Limited

**Proposed Commercial
Development at Caroline Hill
Road, Hong Kong**

**Air Ventilation Assessment – Initial
Study**

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Issue 2 | April 2024

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number

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ARUP

4.2 Proposed Scheme

Proposed Scheme is the intended development scheme, with the same functional use as the Baseline Scheme. Amendments have been made to the building massing and T2-T3 footbridge.

The tower footprint of T2 is shifted from the north-eastern site boundary, the podium platform of T3 adjacent to south-western site boundary are lowered to connect to the street level and the footbridge between T2 and T3 are now enclosed. The development parameters are summarized in Table 6 below. The layout plan of Proposed Scheme is shown in Figure 29 and Figure 30, with details in Appendix A. Major wind enhancement features are list below. The 3D model was constructed as shown in Figure 31 and Figure 34.

- #1: T1 – 15m setback is provided from the building edge for elevated design on G/F. The elevated design consists of 15m (W) x 8.5m (H).
- #2: T2 – Building setback of min. 36m from north-eastern site boundary above 2/F.
- #3: T3 – Elevated design on 2/F apart from the core area. The effective width of the elevated design is approximately 18m wide on average measured from north-eastern site boundary. The elevated design consists of approximately 18m (W) x 10m (H). *(Note 1)*
- #4: T1 – Building setback of approximate 5m on average from the south-western boundary.
- #5: T2 – Building setback of 4m at grade from north-eastern boundary.
- #6: T3 – Building setback of 7.5m above 2F from the south-western boundary abutting the district court site.
- #7: T1 – Min. 6m Internal Street of T1 on G/F.

Table 6 Development Parameters of Proposed Scheme

Development Parameter	Proposed Scheme
Building Block(s)	2
Maximum Building Height (mPD)	+135mPD for T1/T2 +90mPD for T3

Note 1:

As the design continue to develop, the lift lobby on 2/F of T3 is enlarged to allow more room for pedestrian flow. Hence, the wind enhancement features #3 is slightly amended.

The amended elevated design on 2/F of T3 varies from approx. 21m widest to 16m narrowest with a height maintained with approx. 10m. An additional void with approx. 5m (W) x 5m (H) is located above the amended lift lobby as illustrated in Figure 36.

A qualitative discussion on the difference in ventilation performance due to the amendment would be provided in Sections 5.1 and 5.2.

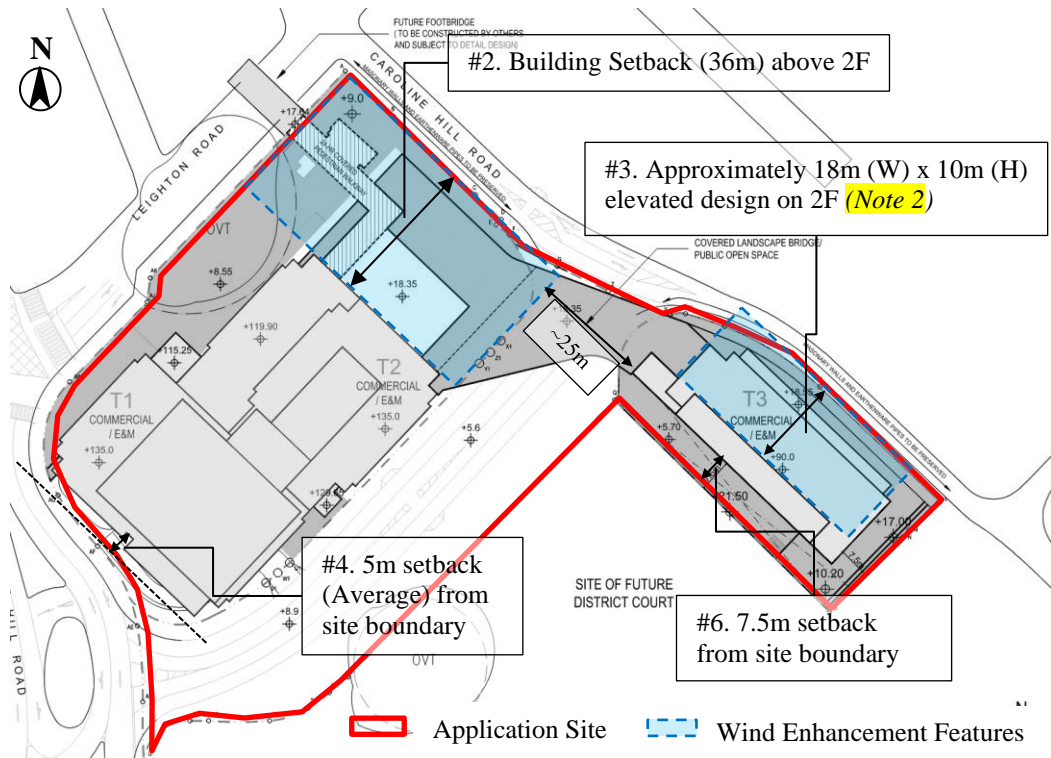


Figure 29 Proposed Scheme – Master Layout Plan

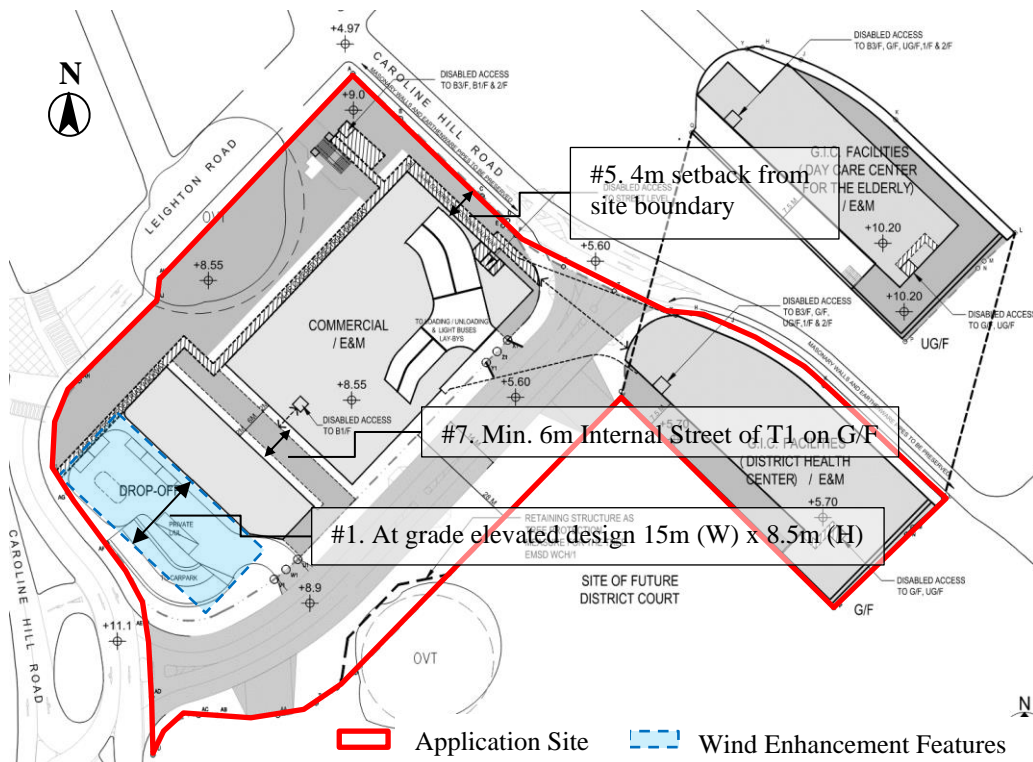


Figure 30 Proposed Scheme – GF Layout Plan

Note 2: Approx. min.16m (W) x 10m (H) amended elevated design as discussed in Section 4.2.

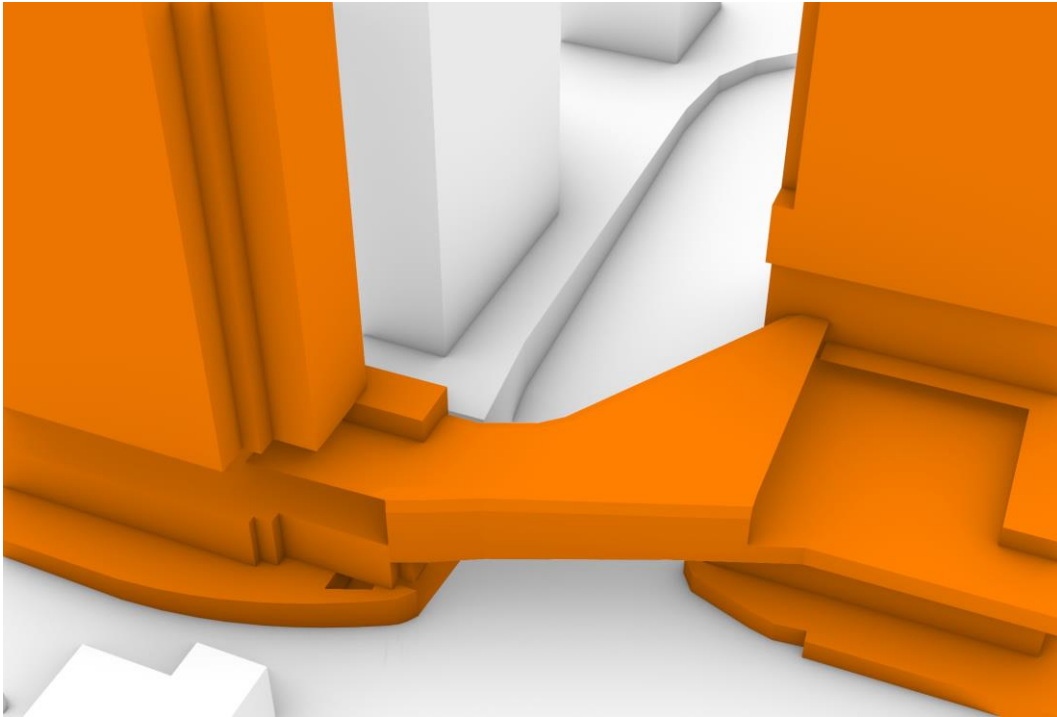


Figure 35 T2-T3 Footbridge of Proposed Scheme

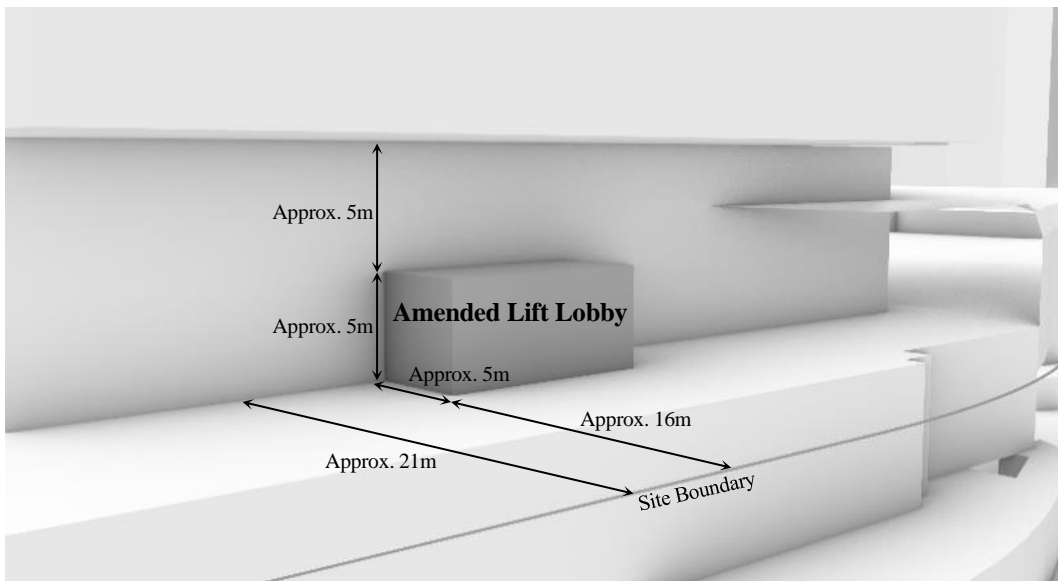


Figure 36 Amended Elevated Design on 2/F of T3.

Minor amendment on wind enhancement features #3

For the amended elevated design on 2/F of T3, two incoming air streams would be concerned including incoming wind from eastern side along Caroline Hill Road and from the south-western side.

For incoming wind from eastern side, the amended lift lobby is a minor extension from core structure and away from the north-eastern site boundary, which minimize the blockage. The elevated design with at least 16m (W) x 10m (H) are free of obstruction for eastern wind. With additional 5m(W) x 5m (H) void atop the amended lift lobby, the effectiveness of the void would be insignificantly affected. Wind from eastern side would still be able to flow through underneath the tower and the influence on Caroline Hill Road would be minimal.

For incoming wind from south-western direction, the elongated shape of core structure would dominate the wind environment and cast a localized wind shadow at the elevated area under T3. The amended lift lobby would fall within shadow zone and the influence from the amendment on ventilation performance would be insignificant.

Minor amendment on wind enhancement features #3

Similar to annual condition, the concerned air stream for the amended elevated design on 2/F of T3 would be from eastern side along Caroline Hill Road and from the south-western side.

Similar to annual condition, for incoming wind from eastern side, minimized blockage from the amended lift lobby, together with the provision of elevated design and void above amended lift lobby, wind from eastern side would be able to flow through underneath the tower, and the influence on Caroline Hill Road would be minimal.

Similar to annual condition, for incoming wind from south-western direction, the amended lift lobby would fall within the shadow zone casted by the elongated core structure, the influence from the amendment would be insignificant.

6 Conclusion

An Air Ventilation Assessment (AVA) – Initial Study was conducted to assess the ventilation performance of Baseline Scheme and Proposed Scheme in accordance to *the AVA Technical Circular*.

Two schemes were assessed using Computational Fluid Dynamics (CFD) techniques. A series CFD simulation using Realizable k- ϵ turbulence model were performed under annual and summer wind conditions with reference to *the AVA Technical Circular*. For annual wind condition, NNE, NE, ENE, E, ESE, S, SSW and SW were selected which gives total wind frequency of 78.5% over a year while E, ESE, SE, SSE, S, SSW, SW and WSW were selected for summer condition, which gives total wind frequency of 80.6%.

The Velocity Ratio (VR) as proposed by *the AVA Technical Circular* was employed to assess the ventilation performance under different schemes and its impact to the surroundings.

With reference to *the AVA Technical Circular*, 42 perimeter test points and 198 overall test points and 28 special test points were allocated to assess the ventilation performance in the Application Site and Assessment Area.

The simulation results show the Proposed Scheme would achieve similar ventilation performance as Baseline along the Application Site boundary and in the Surrounding Area under both annual and summer conditions. Also, the surrounding wind environment are dominated by densely built-up area of Causeway Bay and hilly terrain at the southern side. Ventilation impact from the Proposed Scheme would be minimal.

An amendment on 2/F of T3 were proposed as the design develop as illustrated in Figure 36. A qualitative discussion is provided in Sections 5.1 and 5.2. The overall ventilation performance along the Site Boundary and Assessment Area due to the amendment would be minimal with confined difference near the amended lift lobby. The quantitative analysis and conclusion in this AVA would remains valid.

Major wind enhancement features are maintained with similar performance as Baseline Scheme including:

- #1. T1 – 15m (W) x 8.5m (H) elevated design of T1 on G/F, and
- #3. T3 – Approximately min. 16m (W) x 10m (H) on average elevated design of T3 on podium level, and
- #4: T1 – Building setback of approximate 5m on average from the south-western boundary, and
- #5: T2 – Building setback of 4m at grade from north-eastern boundary, and
- #6: T3 – Building setback of 7.5m above 2F from the south-western boundary abutting the district court site.
- #7: T1 – Min. 6m internal street of T1 on G/F.