

Appendix 12

Air Ventilation Assessment - Expert Evaluation Report

Prepared for

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**REZONING APPLICATION ON THE APPROVED MAI PO &
FAIRVIEW PARK OZP NO. S/YL-MP/8**

**REZONING FROM "R(D)" TO "R(C)2" ZONE AT LOT 4822
IN D.D. 104 & ADJOINING G.L., EAST OF KAM POK
ROAD, MAI PO, YUEN LONG, N.T.**

AIR VENTILATION ASSESSMENT – EXPERT EVALUATION

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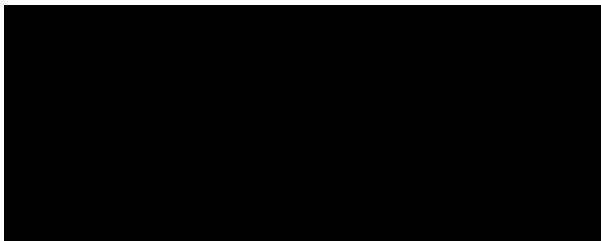
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1. INTRODUCTION

1.1 Project Background

- 1.1.1 The Application Site comprises lot no. 4822 in D.D. 104 and adjoining Government Land near Fairview Park, east of Kam Pok Road, Yuen Long, N.T. The Applicant seeks An agreement from the Town Planning Board ("TPB") to rezone the Application Site from "Residential (Group D)" ("R(D)") to "Residential (Group C) 2" ("R(C)2") with a maximum domestic plot ratio of 1.5 to echo the recent changing planning circumstances in the wider northwestern region. The Application Site which is zoned "Residential (D)" ("R(D)") under Approved Mai Po & Fairview Park Outline Zoning Plan No. S/YL-MP/8 (the OZP).
- 1.1.2 The Application Site is also the subject of a previous planning application which was approved by the Town Planning Board (TPB) under planning application no. A/YL-MP/287 in 2020 (hereinafter referred to as the Previously Approved Scheme). Both the site boundary and nature of current proposed development are about the same as that in the previous approved scheme.
- 1.1.3 Ramboll Hong Kong Limited is commissioned by the Applicant to prepare an Air Ventilation Assessment (AVA) Study Report – Expert Evaluation (EE) for the proposed development to support a Section 12A rezoning application from the environmental perspective. Architectural drawings and technical information are provided by the Project team.

1.2 Objectives

- 1.2.1 This AVA-EE report has been prepared to evaluate whether the proposed development would have any adverse impact on overall air ventilation performance in its surrounding area when compared with the building layout plan of a previously approved planning application at the Application Site (Application No. A/YL-MP/287), which will act as the Baseline Scheme.

1.3 Application Site and its Environ

- 1.3.1 The Application Site is bounded by Kam Pok Road to its immediate west and Ha Chuk Yuen Road to its immediate east, and Ha San Wai Road to the south. Existing Ngau Tam Mei Channel is located to the further west. **Figure 1.1** shows the location of the Application Site and its environ.
- 1.3.2 The Application Site is around 3.78 ha. It is currently zoned as R(D) on the OZP. The site is bounded by the said channel and Kam Pok Road to its west, "Village Type Development" ("V") zone including Chuk Yuen Tsuen, and Hang Fook Gardens to its east and "Commercial/Residential" ("C/R") to its further south. The planning intention of "R(D)" the zone is to allow a considerate low-density residential development within the zone. Thus, the Application Site is already designated by the government for residential development under the OZP.
- 1.3.3 The Application Site is a temporary public vehicle park.

1.4 Baseline Condition – Baseline Scheme

- 1.4.1 The baseline condition (i.e. Previously Approved Scheme) used for comparison of air ventilation performance in this AVA-EE exercise consists of the structures located within the Application Site under the previous Application No. A/YL-MP/287. It includes 65 two-storey houses with a maximum building height of 6.6m high (~+12mPD). The approved MLP for the Baseline Scheme is shown in **Appendix 1.1**.

- 1.4.2 This Baseline Scheme is used to compare with the current Proposed Scheme with respect to its air ventilation performance under dominant wind directions in this report.

1.5 Proposed Scheme

- 1.5.1 **Appendix 1.2** shows the indicative building layout of the Proposed Scheme. The proposed development consists of the following:
- Residential towers (T1 to T6) all with 16 residential storeys and a maximum building height of +59.85mPD each.
 - One 2-storey facility compound comprises one 6 classroom kindergarten, clubhouse, and one neighbourhood elderly centre ("NEC"). Ample landscape areas for leisure uses are proposed at the Application Site boundary.

2. SITE WIND AVAILABILITY

2.1 Site Wind Availability Data

- 2.1.1 According to the Planning Department's website, a meso-scale Regional Atmospheric Modelling System (RAMS) is used to produce a simulated 10-year wind climate at the horizontal resolution of 0.5km x 0.5km covering the whole territory of Hong Kong. The simulated wind data represents the annual, winter and summer wind condition at various levels, i.e. 200m, 300m, and 500m above terrain.
- 2.1.2 The RAMS data of grid (X: 055 Y: 077) has been extracted from the Site Wind Availability Data of the Planning Department's website.
- 2.1.3 Based on the available wind roses with different heights (i.e. 200m, 300m, and 500m), the 200m site wind availability data represents wind data that have already taken into account the topographical effect around the Application Site. Therefore, a lower level of wind roses at 200m height is selected to study the prevailing wind condition as it represents the incoming wind onto the Application Site and has considered the influence of the prevailing winds by the surrounding topography.
- 2.1.4 According to the wind roses at 200m altitude, the annual prevailing wind directions of the Application Site are NNE, NE and E while the summer prevailing wind directions for the Application Site are E, S, SSW.
- 2.1.5 **Figure 2.1** shows the relevant wind rose diagrams representing the frequency and wind speed distribution at 200m height during the annual and summer conditions. The wind frequency data under the annual and summer conditions at 200m altitude are shown in **Table 2.1** below.

Table 2.1 Summary of RAMS Data and Wind Direction

Wind Direction	% of Annual Occurrence	% of Summer Occurrence
0° (N)	2.7%	1.5%
22.5° (NNE)	12.8%	2.0%
45° (NE)	12.3%	2.1%
67.5° (ENE)	9.0%	3.6%
90° (E)	19.0%	10.3%
112.5° (ESE)	7.0%	6.5%
135° (SE)	4.0%	5.8%
157.5° (SSE)	5.0%	8.9%
180° (S)	9.4%	20.3%
202.5° (SSW)	6.5%	15.3%
225° (SW)	3.4%	8.5%
247.5° (WSW)	2.3%	4.9%
270° (W)	2.7%	5.5%
292.5° (WNW)	1.6%	2.6%
315° (NW)	1.1%	1.3%
337.5° (NNW)	1.1%	1.0%

Note: Bold characters highlighted in grey represent the selected prevailing wind directions for evaluation

2.2 Topography and Building Morphology

Topography

- 2.2.1 The Application Site is located near the existing Yau Pok Road Light Public Housing as well as Ha San Wai, Yuen Long, which is a temporary use only. The area within the Application Site Boundary is flat and has low ground elevation (ranging from 3.7mPD to +4.3mPD). The terrain in the vicinity of the Application Site is also relatively flat and have low elevation level ranging from +3.2mPD to +4.2mPD.
- 2.2.2 Around 1.7km to the southeast of the Application Site is the hilly terrain Kai Kung Leng with an elevation level up to +200mPD. However, due to its large distance away from the Site, it is not expected to affect the wind availability of the Application Site. Overall, the topography is not expected to have significant influence on Application Site's wind availability.

Existing Building Morphology

- 2.2.3 Based on findings from the site survey, published information in the Statutory Planning Portal under the Town Planning Board regarding planned / committed developments, the Application Site as well as its adjacent areas are already designated by the government for residential development indicated in **Figure 1.1**. There are a number of existing and planned low-rise buildings surrounding the Application Site. The wind flow pattern at the Application Site may potentially be influenced by the surrounding built environment even without the proposed development at the Application Site.
- 2.2.4 Several existing developments are around the Application Site, including Fairview Park to the west (+9.9mPD to +15.5mPD), Chuk Yuen Tsuen (+6.7mPD to +17.3mPD) and La Maison Vineyard (+14.5mPD to +15.6mPD) to the northeast, Hang Fook Gardens (+12mPD to +14.6mPD), and Yau Mei San Tsuen (+6.7mPD to +17.3mPD) and Sheung Chuk Yuen (+8.3 to +19.9mPD) to the east. Then to the southeast of the Application Site are Ha San Wai (+7.2mPD to +12.4mPD), Wah On Villa (+7.8mPD to + 22.2mPD) and San Wai Tsuen (+7.8mPD to +22.2mPD). To the south of the Site are Villa Camelia (+13.6mPD to +15.8mPD), Helene Terrace (+7.6mPD to +13.7mPD), Greenery Gardens (+13.5mPD to +14.7mPD) and Man Yuen Chuen (+11.9mPD to +15.7mPD).
- 2.2.5 Potential building blockage effect due to the surrounding existing developments is considered. Southern winds would be partially blocked by the existing buildings in Villa Camelia, Helene Terrace, and Greenery Gardens and Man Yuen Chuen while NNE and NE wind would be somewhat obstructed by the existing village houses structures in Chuk Yuen Tsuen and Hang Fook Gardens. While E wind would be somewhat obstructed by nearby village houses at Wah on Villa, San Wai Tsuen, and Sheung Chuk Yuen and Hang Fook Gardens. This is not expected to be significant because the structures are relatively low-rise and cannot effectively block the incoming wind flow.
- 2.2.6 The building height information of identified existing developments was extracted from Geo-Reference Database (BG1000) provided by Survey and Mapping Office/ Lands Department.

Building Morphology – Planned Developments

- 2.2.7 There are three large-scale approved planned developments in the immediate area around the Application Site, these are the planned development of Y/YL-MP/3 to the west of the Application Site, Y/YL-MP/10 and A/YL-MP/247 to the north of the Application Site. Their site boundaries are presented in **Figure 1.1**. The land under approved application no. Y/YL-MP/3 is also the subject of an existing temporary public light housing development by the government under application no. A/YL-MP/341 in

"REC" and "R(C)" zones. Since it is temporarily use for a few years and would be removed before the operation of proposed development, it is not considered further in this study. Additionally, over 1km to the north of the Application Site is the planned San Tin Technopole (STT), while the Ngau Tam Mei New Development Area (NTM NDA) is situated beyond 400m to the east. Both planned developments are not situated in the immediate upstream location of prevailing winds, and due to the considerable distance between these developments and the Application Site, the impact on the surrounding wind environment of the Application Site is anticipated to be minor and not applicable to this assessment.

- 2.2.8 Planned development A/YL-MP/247 consists of approximately 105 two-storey houses (above a basement carpark) and ancillary facilities with a proposed wetland restoration area to the north of the development. Planned development Y/YL-MP/10 contains 10 nos. of residential towers (varying from 14 to 16 residential storeys, and from +53.55 mPD to +59.85 mPD), resident's clubhouses, transport layby, GIC facilities (Kindergarten and NEC), retails and with a maximum at +15.4 mPD). Lastly, the planned development Y/YL-MP/3 proposes 106 nos. of 2-storey houses above a basement carpark and ancillary facilities. The building heights of the three planned developments were taken from the maximum building height stated in their respective approved planning applications. **Table 2.2** highlights the surrounding building heights.
- 2.2.9 Y/YL-MP/10 and A/YL-MP/247 would block annual NNE and NE wind from reaching the Application Site. However, it is noted that there is an existing open space in between the above-mentioned development sites and the current Application Site due to the presence of existing water pond area at DSD's Chuk Yuen Stormwater Pumping Station, which acts as a buffer area.
- 2.2.10 Y/YL-MP/3 would also block W wind from reaching the Site but considering that existing Fairview Park is already to the west of this planned development and has a higher building height than this approved planning application, wind blockage from Y/YL-MP/3 is considered insignificant. Hence, taking into consideration the various planned developments, the potential air ventilation blockage cause by these structures to the dominant annual and summer wind directions is considered to be minor.

Table 2.2 Surrounding Development

Name of Development	Building Height (mPD)	Location from Application Site
Fairview Park	+9.9 to +15.5	S
Villa Camelia	+13.6 to +15.8	S
Ha San Wai	+7.2 to +12.4	SE
San Wai Tsuen	+7.8 to +22.2	SE
Sheung Chuk Yuen	+8.3 to +19.9	E
Hang Fook Gardens	+12 to +14.6	E
Chuk Yuen Tsuen	+6.7 to +17.3	NE
La Maison Vineyard	+14.5 to +15.6	NE
Yau Mei San Tsuen	+6.7 to +17.3	NE
Wah On Villa	+7.8 to + 22.2	SE
Greenery Gardens	+13.5 to +14.7	S
Man Yuen Chuen	+11.9 to +15.7	S
Helene Terrace	+7.6 to +13.7	S
Planned Development - Y/YL-MP/10	+9.9 to +59.85	N
Planned Development - A/YL-MP/247	+13.5 to ~+15.4	N
Planned Development - Y/YL-MP/3 *	+12	W

Remark: please refer to **Figure 1.1** for the locations.

* Short-term use proposed under Application No. A/YL-MP/341, is omitted as described in Section 2.2.7.

2.3 Summary of Existing Site Wind Availability

- 2.3.1 According to the wind availability data, the annual wind directions of the area are mainly from easterlies. From **Table 2.1** above, the wind probability from the E direction is 19.0%, which is considered to be the dominant wind direction for the area. NNE (12.8%) and NE (12.3%) wind are also dominant prevailing wind directions apart from the E wind.
- 2.3.2 Most existing and planned developments around the Application Site are low-rise in nature and poses minor blockage to the incoming winds excluding the planned development (Y/YL-MP/10) with maximum building heights ranged around +9.9 mPD to +59.85mPD. Incoming winds can still generally skim over and pass through the existing and planned structures to reach the Application Site and downstream areas.
- 2.3.3 Under annual wind conditions, some portion of the NNE and NE winds would be blocked by the planned Y/YL-MP/10. NNE and NE wind would also be blocked by existing Chuk Yuen Tsuen and Hang Fook Gardens before reaching the Application Site. However, a large portion these winds can still pass through the developments.
- 2.3.4 For summer winds, the wind probability of the three most dominant winds are S (20.3 %), SSW (15.3%) and E (10.3%). Summer wind blockage is also considered minor due to the low building heights in the surrounding developments. Therefore, while dominant winds are partially blocked by existing and planned developments before reaching the Application Site, overall wind flow is not expected to be affected significantly by other structures around the Application Site.

3. EXPERT EVALUATION OF AIR VENTILATION PERFORMANCE OF THE PROPOSED DEVELOPMENT

3.1 Evaluation of the Approved Scheme of Application Site

- 3.1.1 It shall be noted that the Application Site is already designated by the government for residential development under the OZP. Certain obstruction to wind flow and wind availability to surrounding areas due to the Application Site, is already expected under the land use planning view point. As mentioned in Section 1.4.1, the Application Site is also the subject of a previously approved planning application (Previously Approved Scheme), which comprises 65 two-storey houses and 1 clubhouse both with a maximum building height of 6.6m high above ground level ($\sim +12\text{mPD}$). Under the Previously Approved Scheme there is no specific air path allowed in that scheme, however, the wind may still be able to skim over the proposed low-rise houses.
- 3.1.2 The current proposed development consists of 5 residential towers with maximum building heights at about $+59.85\text{mPD}$ each. This may potentially obstruct wind flow and affect wind availability in the surrounding areas. However, the proposed development has duly accounted possible wind flow from dominant wind directions with various design measures incorporated into the current design in terms of air ventilation, which are further discussed in following paragraphs.

3.2 Evaluation of Merit/Demerit of Design Features of the Proposed Development

- 3.2.1 The Proposed Scheme has proposed five blocks of 16 residential storeys which are located along the northeastern and southwestern edges of the Application Site and away from the site boundary to minimize potential air ventilation impacts to surrounding areas. Stepped building design has been incorporated in Proposed Scheme where building height gradually increases from north to the centre as well as from west to east direction, separation distance between buildings and site boundary has also been provided. The following good design features that are beneficial to air ventilation have been provided, such as the inclusion of building setback, wind paths of not less than 15m, and building gaps are incorporated. The details of the design measures in the site layout for enhancing the air ventilation of the proposed development and the surrounding areas are summarised below.
- Optimal building disposition favour annual and summer dominant winds by placing structures facing diagonally to incoming winds, reducing wind blockage by the structure and creating wind paths that pass through the Application Site to downstream areas.
 - Building Tower setback of at least 10m from the site boundary ensuring wind flow would pass the outer boundaries of the Application Site to downstream areas.
 - Proposed landscape area along Application Site boundary line to enhance wind penetration through the Application Site.
 - Maximized building gaps between towers with not less than 15m building gaps allowed for wind flow in between the residential towers and prevent the formation of a "wind wall". Building gaps are then incorporated.
- 3.2.2 **Figure 3.1** shows the building separations of the five residential towers in the Proposed Scheme. **Figure 3.2** to **Figure 3.5** illustrate the prevailing wind under annual and summer wind directions for the Baseline Scheme and the Proposed Scheme.

Air Paths

- 3.2.3 Under annual wind conditions, **Figures 3.2** and **3.3** have demonstrated that the air paths within the Application Site provide adequate air ventilation for NNE, NE, and E winds respectively. The building setbacks at T1, T2, and T6 allow for NNE and NE winds flow along the western portion of the Application Site while the building setbacks at T1, T3, and T5 also allow for wind to flow along the eastern and southern portions of the Application Site. The air paths from the building gap between T1 & T2, T2 & T3, and T3 & T5 allow E wind to penetrate through the Application Site while the building gap between T5 & T6 allows NNE and NE wind to flow through the Application Site, thereby providing adequate ventilation within the area. It is expected that there would be sufficient NNE, NE, and E wind availability throughout the Application Site.
- 3.2.4 Prevailing winds are able to penetrate through the Application Site via the air path previously mentioned as result of the building setback design, and an additional air path from the large building gap between T2 and T3. These air paths allow for adequate air ventilation throughout the Application Site from E, SSW, and S winds as shown in **Figures 3.3** to **3.5**. While the building setbacks at T1, T2, T3, T5, and T6 allow for southerly winds to flow along the edges of the Application Site.

Building Disposition and Development Permeability

- 3.2.5 The disposition of buildings in the Proposed Scheme is specially designed to improve air ventilation performance of the Proposed Scheme. With the provision of adequate building gaps and building setbacks in place, ample wind flow permeability within the area is anticipated. This building layout design will mitigate the potential impact due to the Proposed Scheme on the important annual and summer winds and allows as much wind to reach downstream areas.
- 3.2.6 The proposed building setbacks from the site boundary will allow for wind flow through the edge of the Application Site and allow any wind diverted by the proposed buildings to reach their respective downstream areas along the edges of the Application Site. Building separation of $\geq 15\text{m}$ for the residential towers are available within the Application Site.
- 3.2.7 At the southern portion of the Application Site, T1 & T2 has a setback of $\geq 15\text{m}$ from the western and eastern site boundaries. Setback south eastern site boundary has also been provided for proposed low-rise clubhouse building structure. Similarly, at the centre of the Site, T3 and T5 both have setbacks of $\geq 15\text{m}$ from the eastern site boundary. Lastly, at the northern part of the Site, T6 and T5 has also provided with a building setback of $\geq 15\text{m}$ from the western site boundary and from the northern site boundary.
- 3.2.8 The building gaps are positioned in a way to facilitate both annual and summer wind penetration. Building gaps of $\geq 15\text{m}$ wide for residential towers proposed within the Application Site increase the permeability of the Application Site and also provide air paths for annual and summer winds to penetrate through the Application Site to alleviate the potential impact due to the Proposed Scheme.
- 3.2.9 Additionally, open landscape areas are available throughout the Application Site in the area to facilitate wind penetration. This, together with the proposed building setbacks and building gaps, will minimize any potential impact due to the Proposed Scheme on wind ventilation.

3.3 Directional Analysis of the Development

- 3.3.1 As discussed in **Section 2.1**, it is identified that the dominant annual wind conditions are from NNE, NE and E directions while the dominant summer wind conditions are from E, S, SSW directions. The Report will evaluate the identified dominant wind

directions in the Proposed Scheme and compare it with the performance of the Baseline Scheme.

NNE and NE wind

- 3.3.2 **Figure 3.2** illustrates the prevailing wind flow from NNE & NE wind directions under the Baseline Scheme and Proposed Scheme.
- 3.3.3 NE and NNE wind will flow towards the Application Site from the vacant land north of the Application Site and above the Chuk Yuen Tsuen village houses and Hang Fook Gardens. The immediate north and northeast of the Application Site is an area with almost no structures hence, both NNE and NE wind flows to the Application Site are uninterrupted.
- 3.3.4 For the Baseline Scheme, NNE and NE winds arriving at the Application Site can generally flow through the Application Site via the low-rise building structures as well as along the outer edges of the Application Site and reach then downstream areas.
- 3.3.5 Under the Proposed Scheme, the proposed towers would partially block incoming NNE and NE winds. Nevertheless, the Proposed Scheme has implemented various mitigation measures in order to alleviate the potential impact on NNE and NE wind flows within the Application Site. For example, at the northwestern portion of the Application Site, the proposed setback of no less than 15m from T6 to the northwestern site boundary allows for both NNE and NE wind to flow along the outer northwestern boundary to reach further downstream area. At the southeastern portion of the Application Site, the proposed setback of T1 and the clubhouse building from the southeastern site boundary also allows NNE and NE winds to flow through the Application Site and reach downstream receivers such Villa Camelia. Furthermore, the Proposed Scheme also provides a building gap of no less than 15m between T5 & T6. This building gap combined with the open landscape area at the centre of the Application Site allows NNE and NE winds to penetrate through the Application Site to ventilate downstream areas. Lastly, the taller buildings in the Proposed Scheme would be able to capture high-level wind and create downwash to benefit air flow at the pedestrian level.
- 3.3.6 Overall, although the taller towers in the Proposed Scheme would partially block incoming NNE and NE winds, various above-mentioned mitigation measures such as provision of building gaps and air paths have been incorporated so as to improve the wind penetration at the Application Site. With these measures in place, significant adverse impact to NNE and NE wind performance in the area is not anticipated.

E Wind

- 3.3.7 E wind was found to be the prevailing wind direction under both summer and annual conditions. **Figure 3.3** illustrates the E wind flow in the Baseline Scheme and Proposed Scheme. Under E wind conditions, wind is able to flow freely over the open storage and low-rise village houses east of the Application Site and over Ha Chuk Yuen Road to reach the Application Site, then passes the open space at the Ngau Tam Mei Channel ("NTMC") to reach downstream areas.
- 3.3.8 At the Application Site under the Baseline Scheme, E wind reaching the Application Site would be largely undisturbed by the open storage areas and low-rise village houses east of the Application Site. Upon reaching the Application Site, E wind would further skim over the low-rise developments and flow beyond NTMC to reach the planned development to the west.
- 3.3.9 For the Proposed Scheme, although it may likely hinder certain E wind and decrease wind availability at the immediate downstream receivers, the Proposed Scheme has provided adequate building gaps and setbacks from site boundary line to accommodate E wind. For example, building setbacks of greater than 10m from site boundary line has incorporated into the design at both the north (i.e. setback of T6) and at south of

the Application Site (i.e. setback of T1). These building setbacks allow E wind to flow along the edges of the Application Site to reach further downstream receivers. In addition, the Proposed Scheme also provides several east-west building gaps of not less than 15m allowing E wind to penetrate through the Application Site. The said building gaps are formed from the separation between T1 & T2, T2 & T3, and T3 & T5, and are no less than 15m wide. The building gaps combined with the open landscape throughout the Application Site allow for E wind to penetrate through the Application Site to reach the NTMC and ventilate downstream areas.

- 3.3.10 Hence, through the provision of building gaps and building setbacks in the proposed development, the Proposed Scheme allows wind penetration through the Application Site. The proposed mitigation measures allow E wind to perform similarly to the Baseline Scheme under the Proposed Scheme and no significant adverse impact from the proposed development on the surrounding wind environment is anticipated under E wind with the proposed mitigation measures in place.

S Wind

- 3.3.11 **Figure 3.4** illustrates the wind flow of the Baseline Scheme and Proposed Scheme under S wind direction.
- 3.3.12 S wind is identified as a prevailing wind direction under summer conditions. The majority of S wind within the vicinity of the Site will come from the north-south aligned open space from Kam Pok Road and the NTMC west of the Application Site. The remaining portion of S wind is anticipated to encounter some of the low-rise developments south of the Application Site such as Helene Terrace, Villa Camelia, Greenery Gardens, and Man Yuen Chuen and skim above them to further reach the Application Site.
- 3.3.13 Upon reaching the Application Site, the dense clusters of low-rise developments under the Baseline Scheme are anticipated to hinder S wind flow at a pedestrian level, thus decreasing wind flow at the immediate downstream areas north of the Application Site. High-level wind would skim above and be able to flow around or above the building clusters due to their low-rise designs.
- 3.3.14 For the Proposed Scheme, although the proposed development may likely hinder certain S winds and decrease wind availability at downstream receivers, the Proposed Scheme has provided adequate building gaps and building setbacks aligned in the north-south direction to accommodate S winds. Setbacks of greater than 10m from the western and eastern site boundary lines are proposed from T1 and T3, respectively, for S wind to flow along the outer boundary of the Application Site and ventilate further downstream areas. The Proposed Scheme also includes a large building gap between T2 & T3 together with the proposed open landscape area at the centre of the Application Site.
- 3.3.15 To sum up, although the towers under the Proposed Scheme may potentially reduce wind availability at the immediate downstream area. Nevertheless, mitigation measures have been provided under the Proposed Scheme to reduce any potential air ventilation impacts. Building setback from site boundary line has been incorporated into the design, together with Kam Pok Road and open space at NTMC to create a wider space for wind to recover. Therefore, with the mitigation measures provided under the Proposed Scheme, it is anticipated that the proposed development would not have any significant adverse air ventilation impact on the surrounding area with respect to the S wind.

SSW Wind

- 3.3.16 **Figure 3.5** illustrates the prevailing wind flow from SSW wind direction under the Baseline Scheme and Proposed Scheme.

- 3.3.17 Similar to S wind, the existing low-rise developments south of the Application Site such as Helene Terrace, Villa Camelia, Greenery Gardens, and Man Yuen Chuen would limit south-westerly wind flow to the Application Site. However, due to their low height, SSW wind would still be able to skim above them to reach the Application Site.
- 3.3.18 Under the Baseline Scheme, the proposed development is a dense cluster, which would decrease wind permeability at immediate adjacent pedestrian level within the Application Site. Therefore, a decrease in wind availability immediate downstream of the Application Site is anticipated. However, the proposed developments under the Baseline Scheme are low-rise buildings, which would allow SSW wind to skim over the low-rise buildings at the Application Site and flow further beyond.
- 3.3.19 Under the Proposed Scheme, the towers of the proposed development may potentially hinder SSW wind flow and create a wind wake in its immediate surrounding area. Nevertheless, the Proposed Scheme has provided mitigation measures in order to alleviate any potential impact arising from the wind blockage. For example, an air path is present at the southeastern portion of the Application Site as a result of the building setback of T1B from the southeastern boundary. SSW wind flowing over the low-rise structures at Villa Camelia would access this air path which skims over the proposed low-rise clubhouse and kindergarten to flow along the northeastern boundary and reach the open space east of the Application Site. On the other hand, SSW wind flowing from the NTMC and Kam Pok Road may also flow along the northwestern portion of the Application Site through the building setback between T6A from the northwestern side boundary. This setback, combined with the internal road layout, creates an air path of no less than 15m to allow SSW wind to flow along the northwestern site boundary and ventilate downstream receivers. Lastly, building gap between T5 & T6 also creates an air path of around 15m aligned in the direction of SSW wind. The building gap combined with the internal road layout allows SSW wind to penetrate through the Application Site and ventilate downstream receivers.
- 3.3.20 Overall, with the mitigation measures provided in the Proposed Scheme, such as building setbacks from site boundaries, building gaps between towers, and air paths it can allow wind penetration through the Application Site and the proposed development is not expected to cause any significant adverse impact to SSW wind performance in the area.

3.4 Summary of Relative Air Ventilation Performance

- 3.4.1 The air ventilation performance of the Baseline Scheme and the Proposed Scheme has been appraised. The current proposed development has provided various air paths from the disposition of structures, provision of open area landscape, building setback, and building gaps to benefit the air ventilation. The proposed residential towers are located away from the site boundary as far as possible together with stepped building design to reduce potential air ventilation impacts to surrounding areas, while lower non-domestic blocks are also proposed near the site boundary to allow wind to skim over. With these measures in place, it is expected to improve wind penetration through the Application Site and significant adverse impacts on the surrounding areas is not anticipated from an air ventilation perspective.

4. CONCLUSION

- 4.1.1 A qualitative assessment of the wind performance of the proposed development east of Kam Pok Road has been conducted.
- 4.1.2 According to the findings of this AVA-EE, annual prevailing wind comes from NNE, NE and E direction and summer prevailing wind comes from E, S, SSW directions. While some building blockage due to the proposed development is expected to create wind wakes in the immediate surrounding areas of the Application Site, taking into consideration of the existing topography, the location of the existing built areas, planned developments and the provision of mitigation measures incorporated into the development design, it is anticipated that the proposed development would not have significant negative air ventilation impact on the surrounding areas.
- 4.1.3 The proposed development has incorporated mitigation measures such as optimal dispositions of proposed structures, building gaps, building setback from site boundary and together with existing open spaces in adjacent area to improve the air ventilation performance. Landscape area with building setback is also proposed at the proposed development together with existing open space at NTMC, has formed a wider air path. With these design measures incorporated into the proposed development it can improve wind penetration through the proposed development and it is unlikely to impose significant adverse air ventilation impacts on the surrounding environment.

Figures

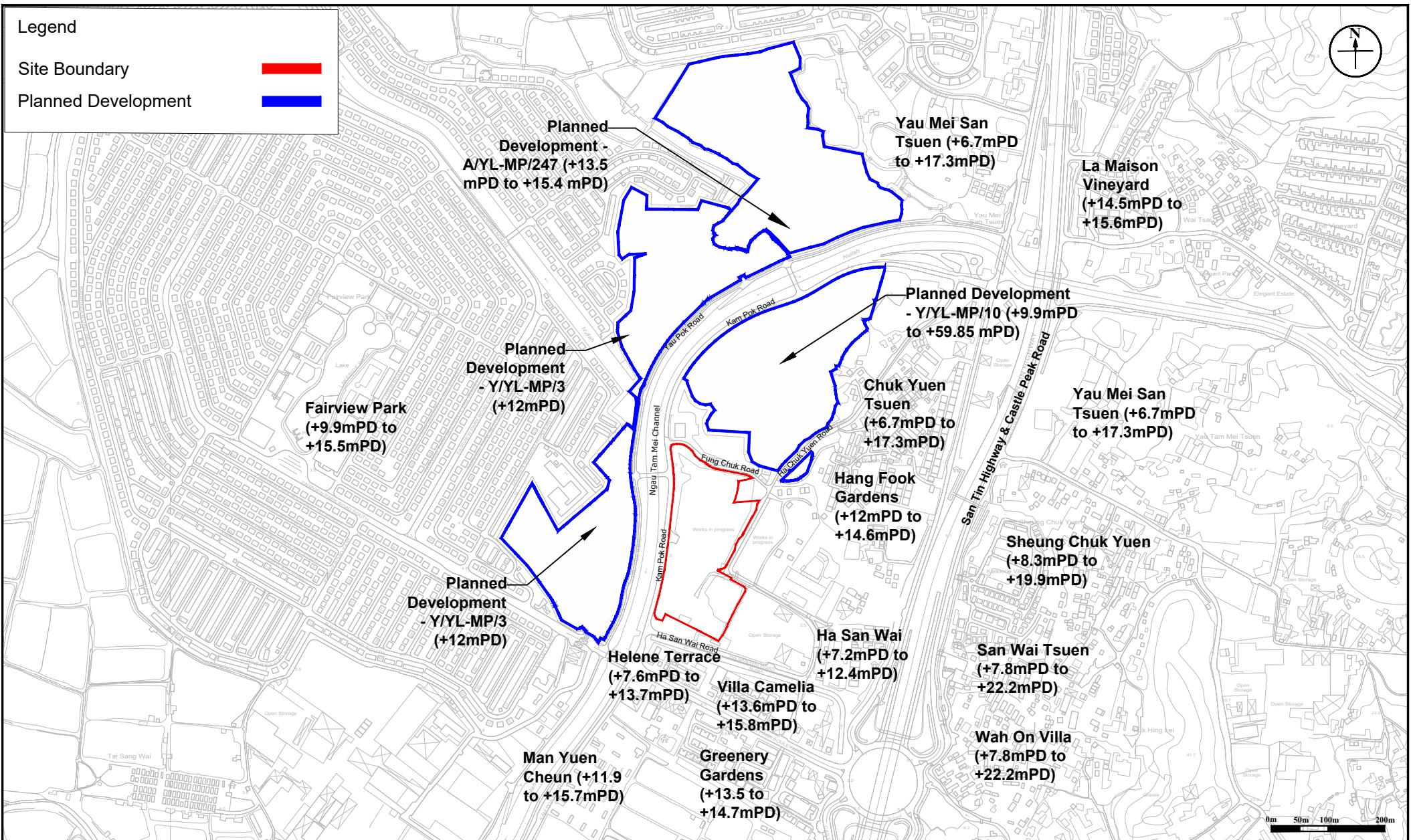


Figure: 1.1

Title: Location of Application Site and its Environ

Project: Residential (Group D)" to "Residential (Group C)2" Zone at Lot 4822 in D.D. 104 and Adjoining Government Land, East of Kam Pok Road, Mai Po, Yuen Long, New Territories.

RAMBOLL

Drawn by: II

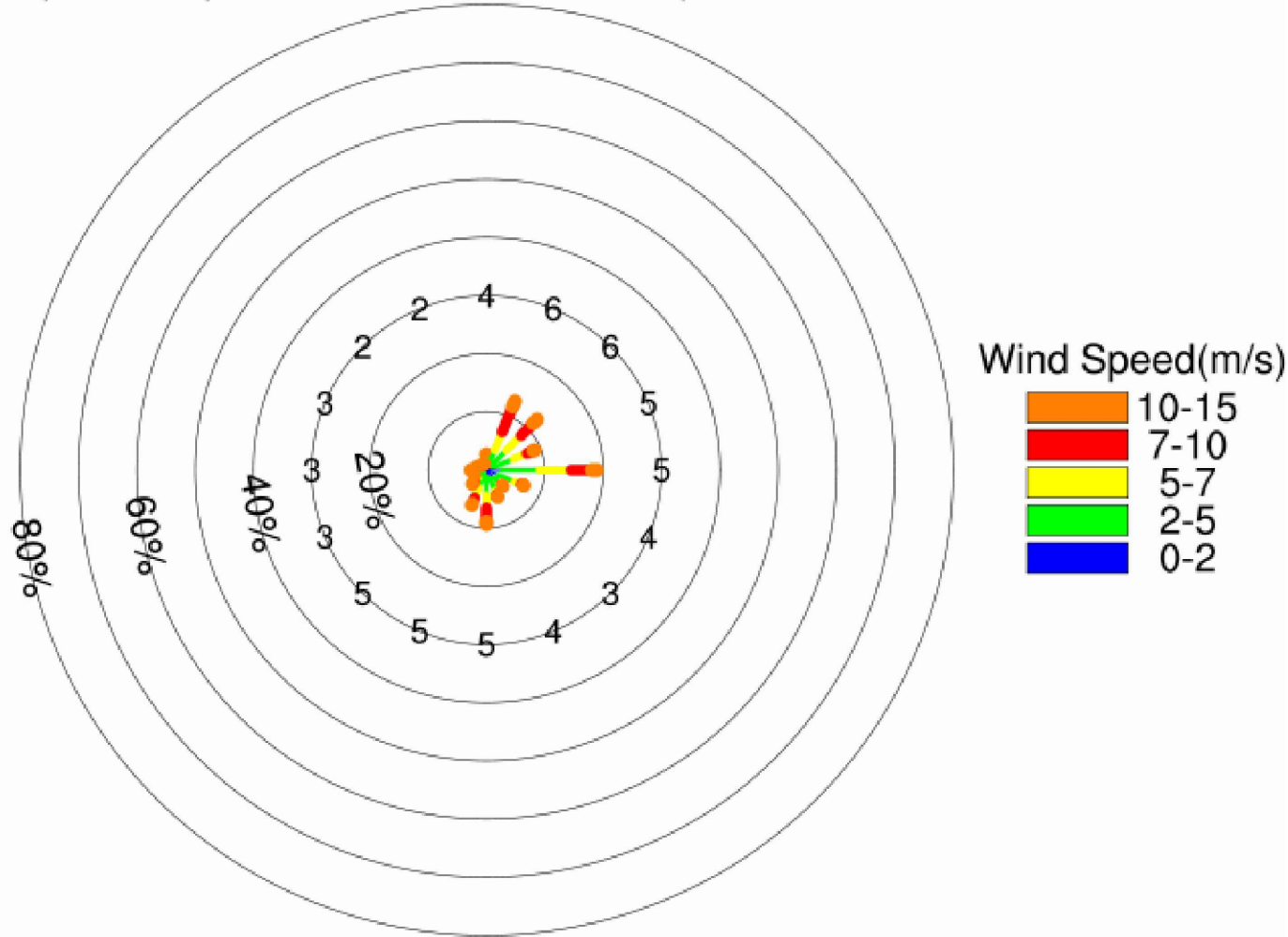
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Rev.: 1.2

Date: Jul 2025

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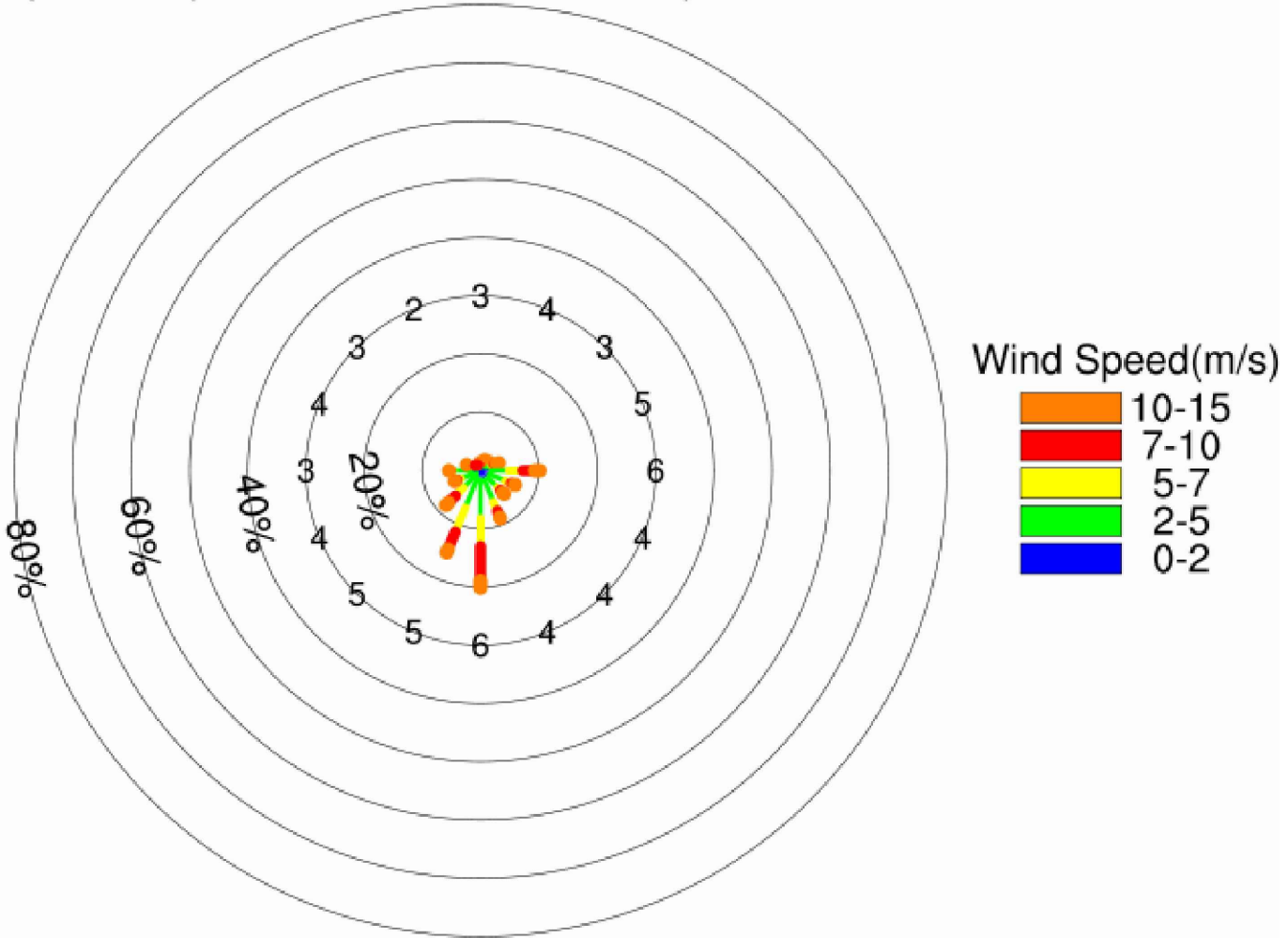
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Annual Condition

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Summer Condition

Figure: 2.1

Title: RAMS Annual and Summer Wind Roses Representing V_{∞} of the Area under Concern at 200m Above Ground (X:055 Y:077)

Project: Residential (Group D)” to “Residential (Group C)2” Zone at Lot 4822 in D.D. 104 and Adjoining Government Land, East of Kam Pok Road, Mai Po, Yuen Long, New Territories.

RAMBOLL

Drawn by: II
Checked by: HN
Rev.: 1.0
Date: Apr 2025

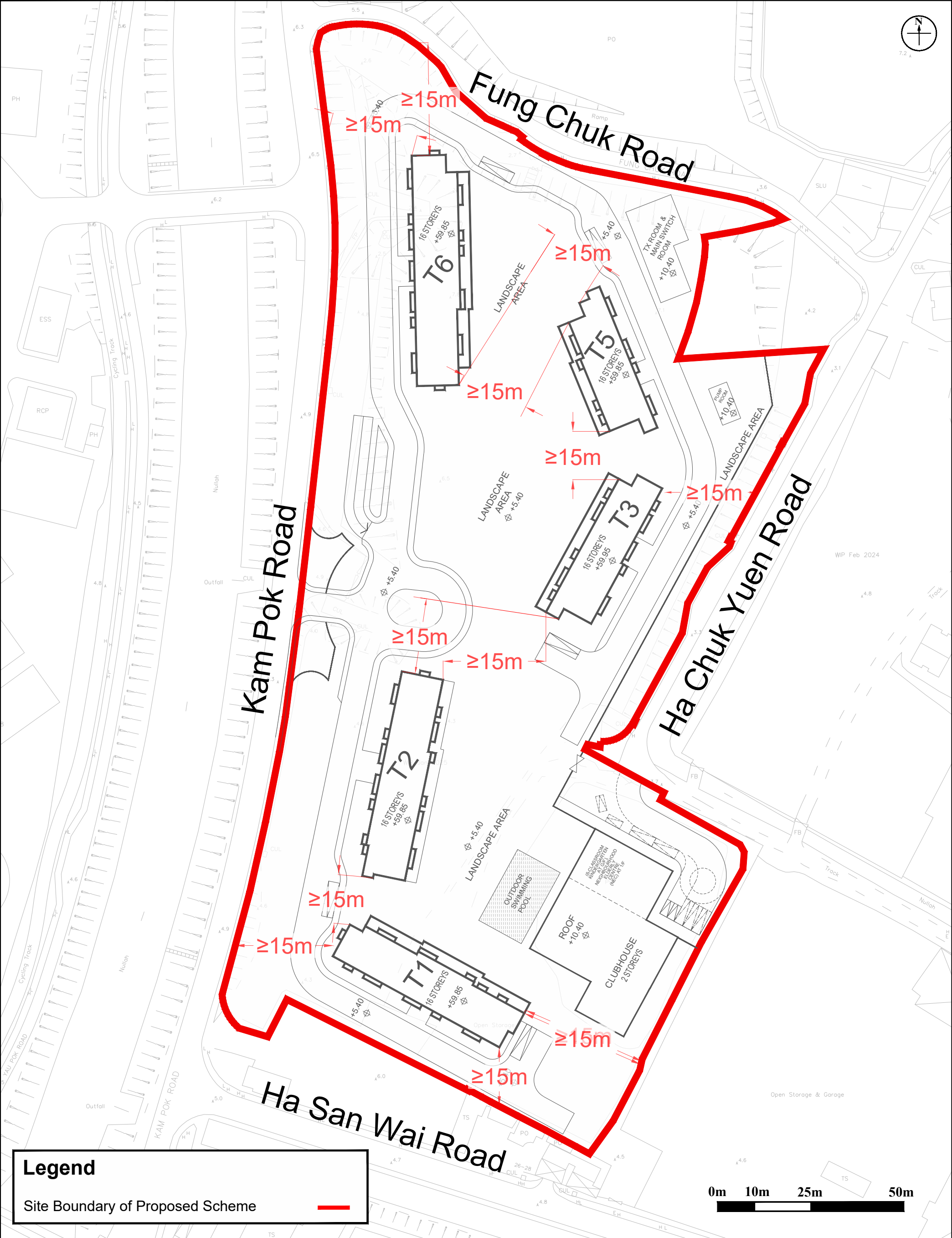


Figure: 3.1	RAMBOLL	
	Drawn by:	II
	Checked by:	HN
	Rev.:	1.1
Project: Residential (Group D) to "Residential (Group C)2" Zone at Lot 4822 in D.D. 104 and Adjoining Government Land, East of Kam Pok Road, Mai Po, Yuen Long, New Territories.	Date:	Jul 2025



Figure: 3.2		RAMBOLL	
Title: Illustration of Annual Wind Flow (NNE & NE)		Drawn by: II	
Project: Residential (Group D) to "Residential (Group C)2" Zone at Lot 4822 in D.D. 104 and Adjoining Government Land, East of Kam Pok Road, Mai Po, Yuen Long, New Territories.		Checked by: HN	
		Rev.: 1.2	
		Date: Jul 2025	

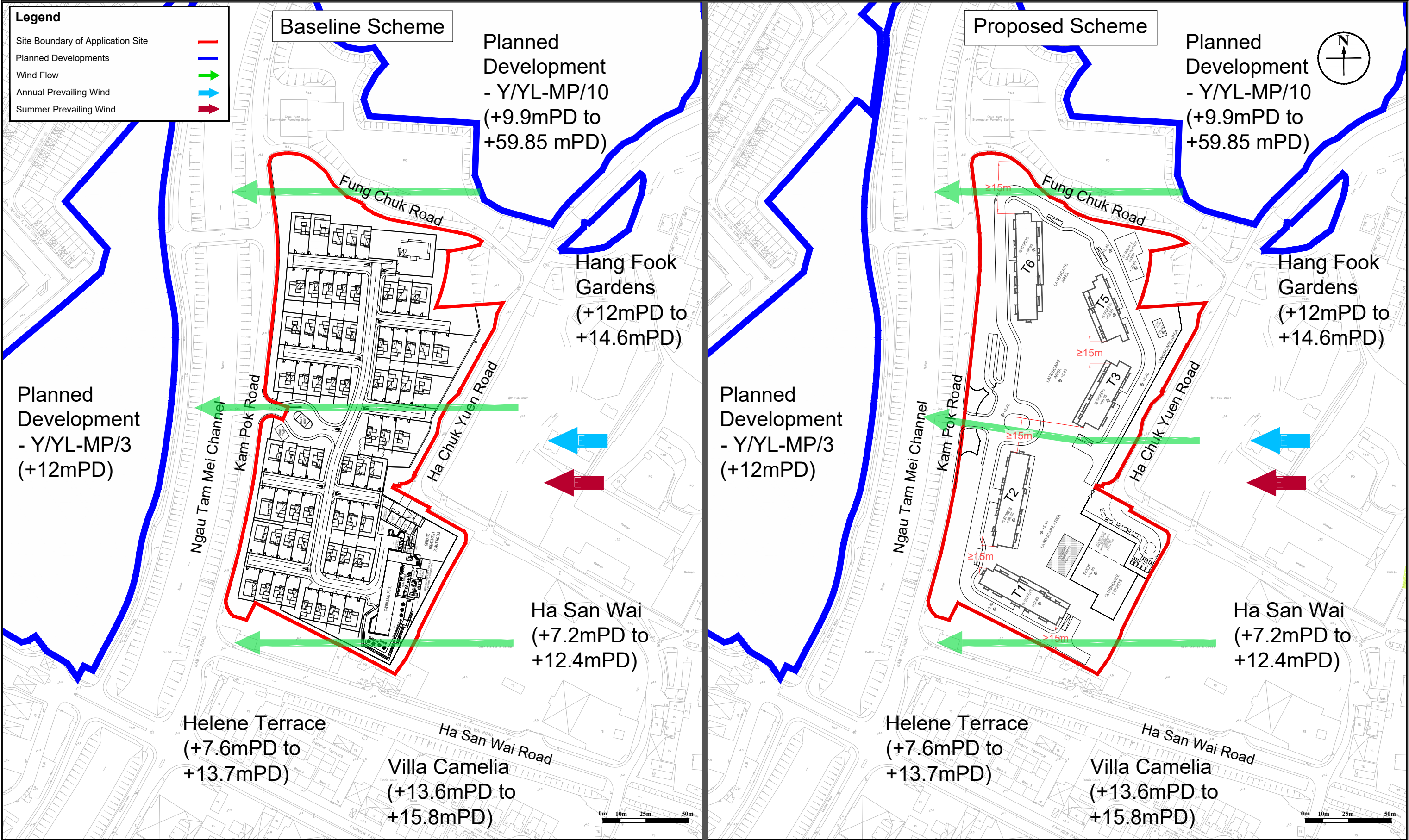


Figure: 3.3		RAMBOLL	
Title: Illustration of Annual & Summer Wind Flow (E)		Drawn by: II	
Project: Residential (Group D) to "Residential (Group C)2" Zone at Lot 4822 in D.D. 104 and Adjoining Government Land, East of Kam Pok Road, Mai Po, Yuen Long, New Territories.		Checked by: HN	
		Rev.: 1.2	
		Date: Jul 2025	

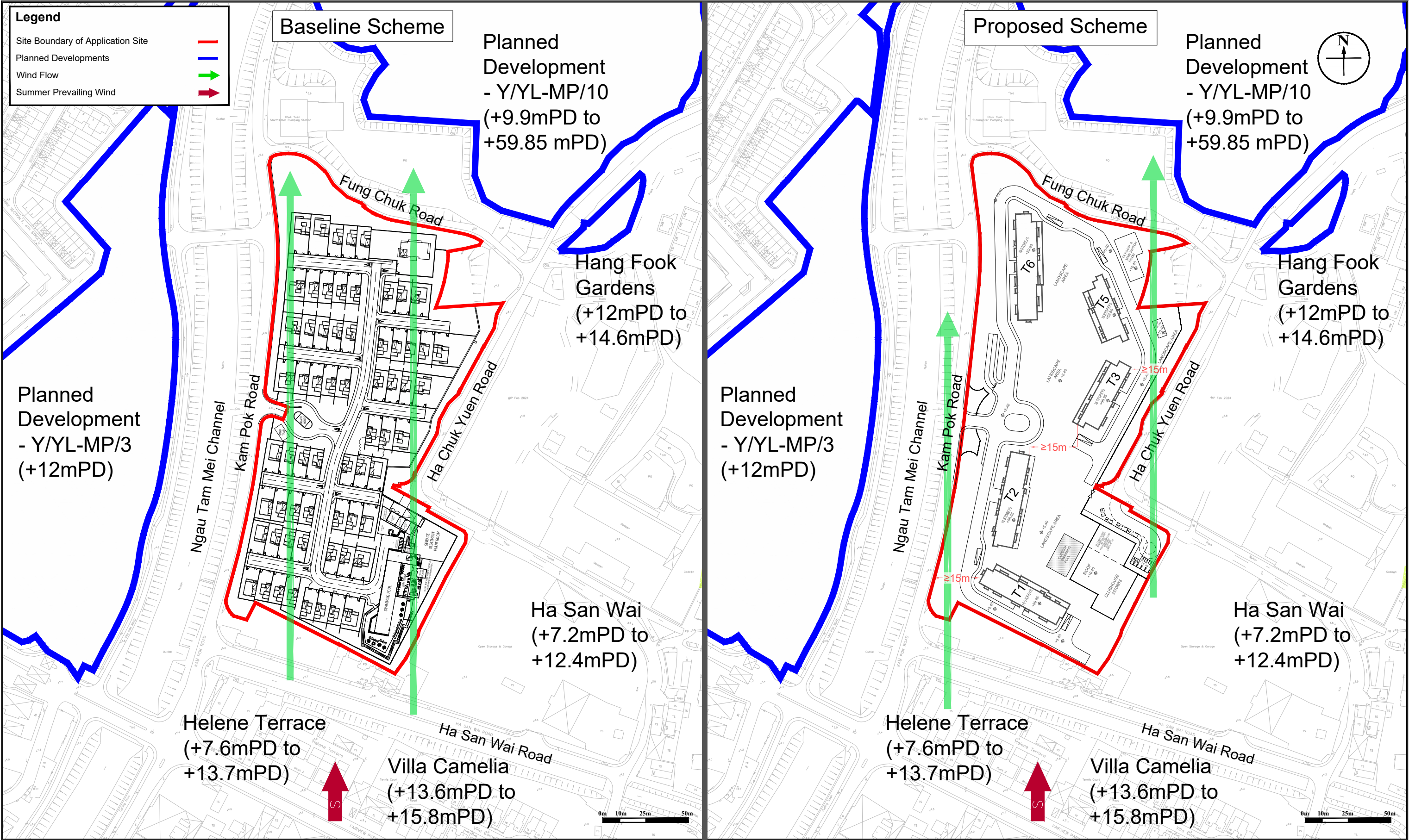


Figure: 3.4		RAMBOLL	
Title: Illustration of Summer Wind Flow (S)		Drawn by: II	
Project: Residential (Group D) to "Residential (Group C)2" Zone at Lot 4822 in D.D. 104 and Adjoining Government Land, East of Kam Pok Road, Mai Po, Yuen Long, New Territories.		Checked by: HN	
		Rev.: 1.2	
		Date: Jul 2025	



Figure: 3.5		RAMBOLL	
Title: Illustration of Summer Wind Flow (SSW)		Drawn by: II	
Project: Residential (Group D) to "Residential (Group C)2" Zone at Lot 4822 in D.D. 104 and Adjoining Government Land, East of Kam Pok Road, Mai Po, Yuen Long, New Territories.		Checked by: HN	
		Rev.: 1.2	
		Date: Jul 2025	

Appendix 1.1

Master Layout Plan of the Approved Scheme



S.16 APPLICATION FOR PROPOSED HOUSE DEVELOPMENT WITH MINOR RELAXATION OF BUILDING HEIGHT RESTRICTION FROM 6M TO 6.6M, AND FILLING OF POND/LAND AND EXCAVATION OF LAND AT VARIOUS LOTS IN D.D. 104 AND ADJOINING GOVERNMENT LAND (TO BE KNOWN AS 4822 IN D.D. 104), MAI PO, YUEN LONG

PROJ. NO.	1413 KPR	DWG NO.	P01
PROJECT	RESIDENTIAL DEVELOPMENT KAM POK ROAD NEW TERRITORIES	DRAWING	MASTER LAYOUT PLAN
		REV	V

SCALE / SIZE	1:1000 (A3)
DATE	2019.09.24
STATUS	DESIGN PROGRESS

Appendix 1.2

Master Layout Plan of the Proposed Scheme

LEGEND

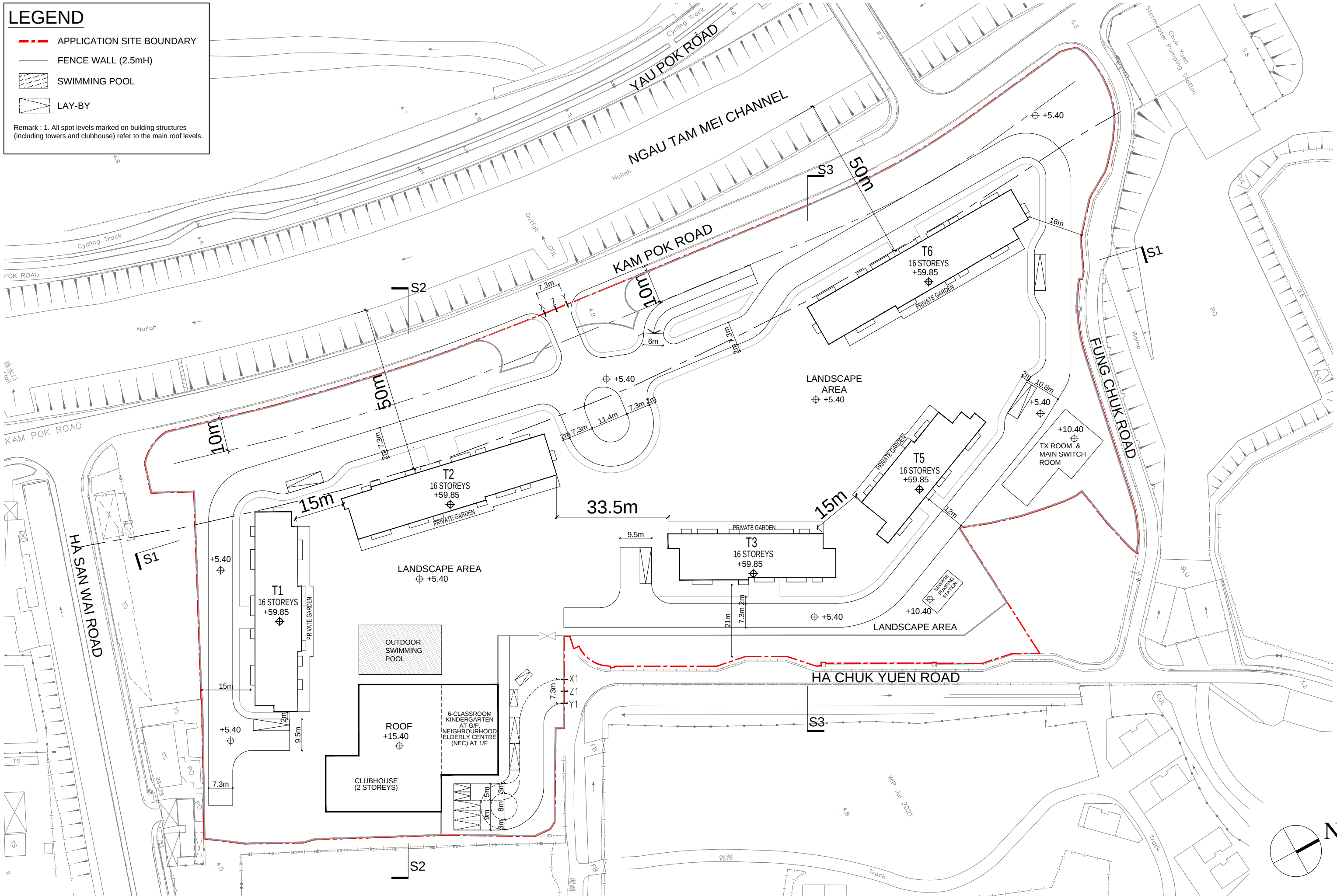
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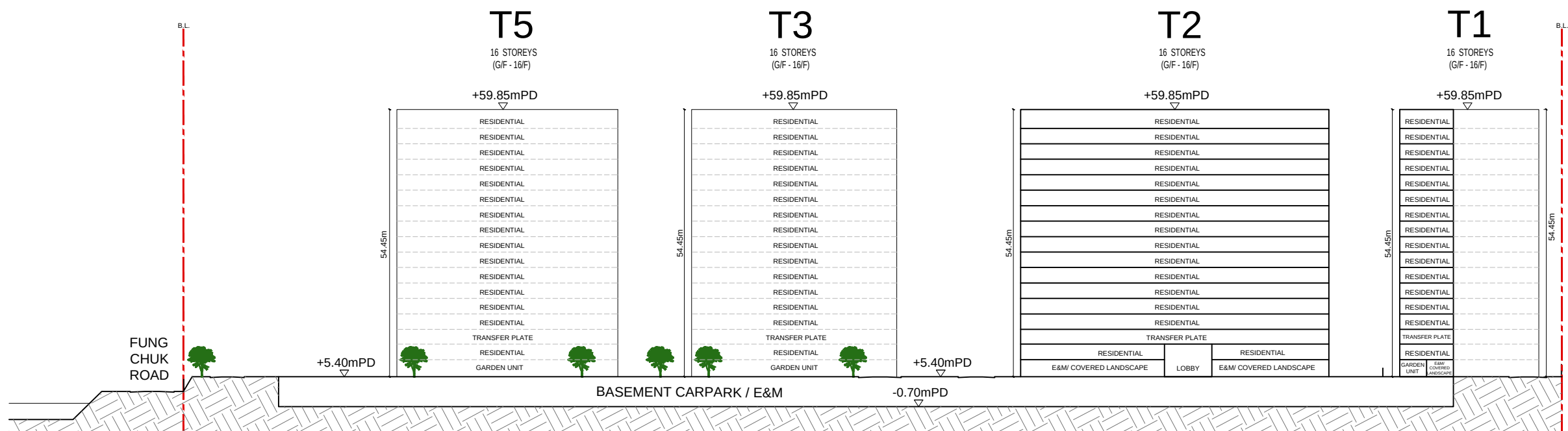
FENCE WALL (2.5mH)

SWIMMING POOL

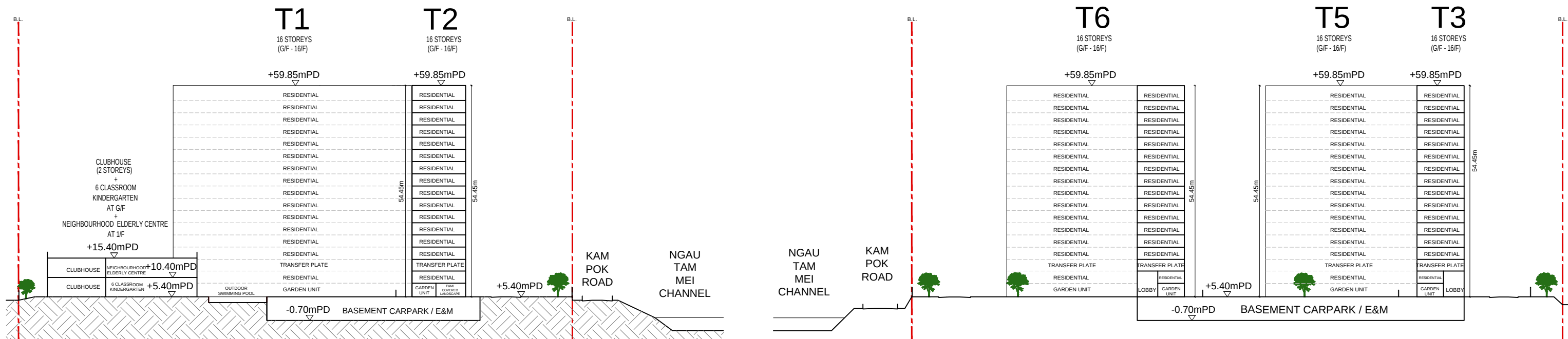
LAY-BY

Remark : 1. All spot levels marked on building structures (including towers and clubhouse) refer to the main roof levels.





SECTION S1-S1



SECTION S2-S2

SECTION S3-S3