# 銅鑼灣
# Causeway Bay

## Annex D
## 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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Job number

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# 1 Introduction

## 1.1 Background

Ove Arup & Partners Hong Kong limited (Arup) was instructed to conduct an Air Ventilation Assessment (AVA) – Initial Study for the Proposed Commercial Development at Caroline Hill Road, Hong Kong (the Application Site).

The Development site is currently zoned as "Commercial (2)" ("C(2)") on the Approved Wong Nai Chung Outline Zoning Plan (OZP) No. S/H7/21. This document is to support the Section 16 application.

The *Technical Guide for Air Ventilation Assessment for the Developments in Hong Kong (Annex A of Technical Circular No.1/06 for Air Ventilation Assessments)*[1] *(termed as AVA Technical Circular hereafter)* dated 19 July 2006 lay down the foundation of this method statement.

## 1.2 AVA Initial Study

Among all available wind data, an Initial Study will be conducted by using Computational Fluid Dynamics (CFD) techniques. It aims to achieve the following tasks:

- Initially assesses the characteristics of the wind availability of the site;
- Gives a general pattern and a rough quantitative estimate of the wind performance at the pedestrian level using Velocity VR;
- Identify the air paths within the site ascertain their effectiveness; and
- Identify good design features and problem areas if any and recommend mitigation measures.

# 2 Location and Site Characteristics

The Application Site is located at the junction of Leighton Road and Caroline Hill Road, to the northwest of the open space of South China Athletic Association.

The Study Site is generally surrounded by densely built-up area in Causeway Bay area to its northeast and northwest, with mostly high-rise buildings up to +209.7mPD with some mid-rise buildings with around +40-50mPD; a hilly range with residential towers, such as Leighton Hill with +170.7mPD, Beverly Hill with +188.3mPD, to its west and southwest; buildings from South China Athletic Association (+90.7mPD) to its immediate southeast, open space provided by several recreational spaces such as South China Athletic Association, Disciplined Services Sports and Recreational Club, So Kon Po Recreation Ground, and Indian Recreation Club, as well as a hill to further southeast. The locations of major building blocks are indicated in Figure 1, with the detailed surrounding building context shown in Figure 1.

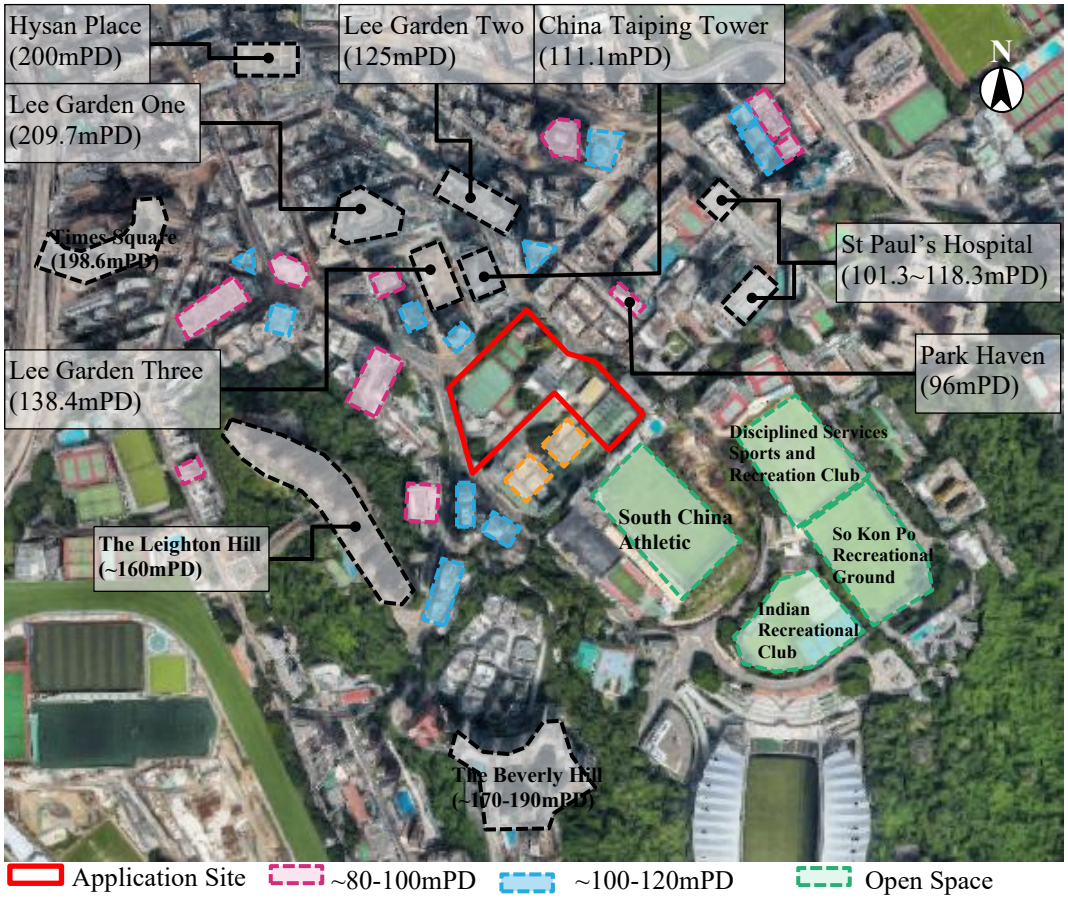


Figure 1 Site Location and Existing Surrounding Developments

## 2.1 Future Development

According to the GIS data and GeoInfo Map[1], there are several work-in-progress (WIP) sites and planned development within the Surrounding Area, which will also be considered in this AVA – Initial Study. The locations of these sites are shown in Figure 2. The building blocks of each site are shown in Appendix B.

**Planned Development**

The planned development is assumed based on the latest public information available:

- #1: 281 Gloucester Road Site - Planning Application A/H6/89
- #2: 17A and 17B Ventris Road Site – As there is no layout shown on the latest approved Planning Application A/H7/165. The building layout is assumed with Planning Application No. M/H9/11/9.
- #3: District Court at Caroline Hill Road – PWSC(2022-23)3 [1]
- #4: Planned Development on Construction of Dry Weather Flow Interceptor at Hung Hom and Causeway Bay, in Planning Application No. A/H8/437
- #5: Planned Development on 8 Leighton Road in Planning Application No. A/H7/183.

**WIP Sites**

The WIP sites is assumed based on the latest public information available:

- #6: 472 Hennessey Road; #7: 15 Matheson Street

  The building massing is assumed according to information from Building Department (BD) with full site coverage up the 24 storeys for #5[2] and latest information of 27 storeys for #6[3].

- #8: 22-24 Leighton Road; #9: 42-44 Yiu Wa Street

  As there is no publicly available information for these sites, the building massing are assumed to be full site coverage up to the maximum allowable height from Approved Causeway Bay Outline Zoning Plan (OZP) No. S/H5/17, the Approved Wong Nai Chung Outline Zoning Plan (OZP) No. S/H5/21, the Approved Wan Chai Outline Zoning Plan (OZP) No. S/H5/28, Building (Planning) Regulation.

[1] The key features of District Court at Caroline Hill Road, including building height, building gap separations, are similar between the reference and the latest information received from ArchSD as of April 11, 2024.

[1] http://www2.map.gov.hk/gih3/view/index.jsp
[2] https://m.mingpao.com/fin/dailyp2.php?node=1620759618714&issue=20210512
[3] https://www.landvision.com.hk/causeway-bay/11-15-matheson-street/b-5608/

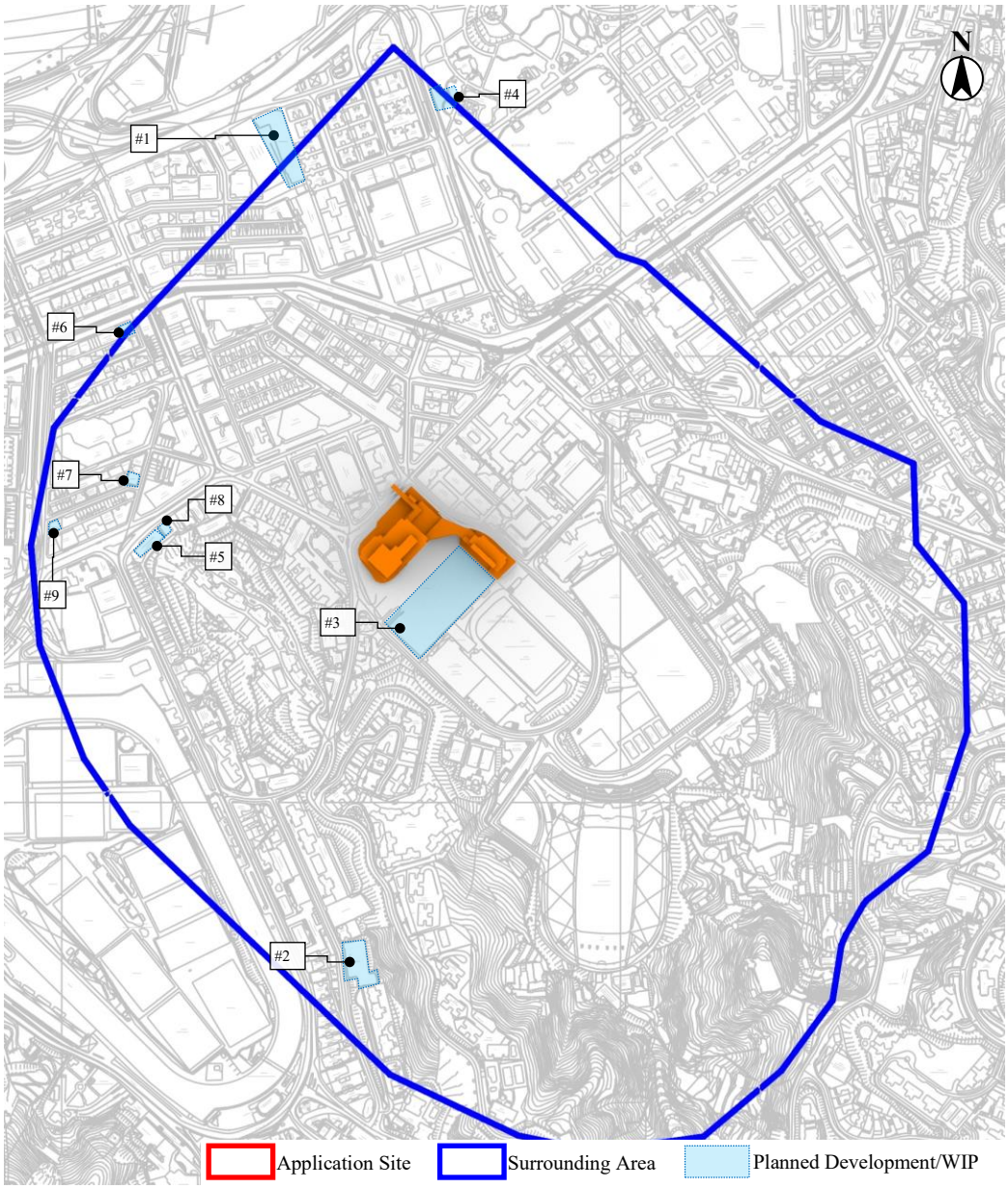


Figure 2 Location of the Planned/WIP Site around the Study Site

# 3 Proposed Methodology for Initial Study

## 3.1 Wind Data

As per the *AVA Technical Circular*[1], at least 75% of the time in a typical reference year (frequency of occurrence) would be studied under both annual and summer wind condition in the Initial Study when using a Computational Fluid Dynamics (CFD) modelling technique. Since the CFD approach is adopted for the present project's AVA, this criterion together with the following selected wind data are to be applied as the methodology.

The site wind availability of the Study Site and its surrounding is an essential parameter for AVA. As stipulated in the *AVA Technical Circular* [1] the site wind availability would be presented by using appropriate mathematical models. Planning Department (PlanD) has set up a set of simulated meso-scale data of Regional Atmospheric Modelling System (RAMS) of the territory for AVA study, which could be downloaded at Planning Department Website [2]. Simulated meso-scale data of Regional Atmospheric Modelling System (RAMS) from PlanD will therefore be adopted in this AVA Study. The location of the Development falls within the location grid (x: 083, y:033) in the RAMS database as indicated in Figure 3.

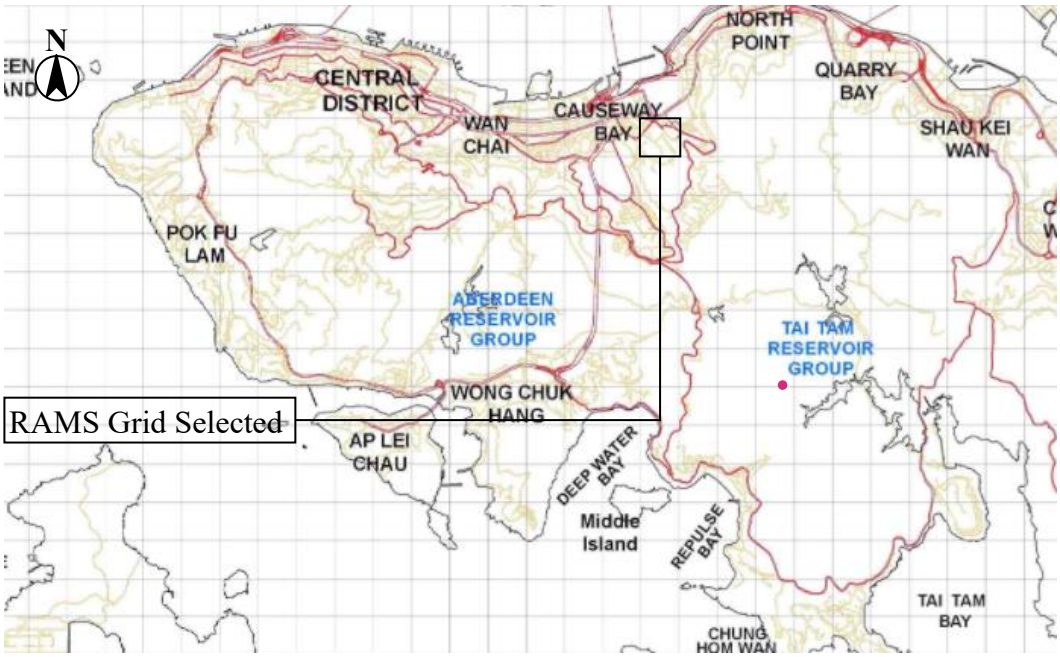


Figure 3 RAMS Grid and the Development Location

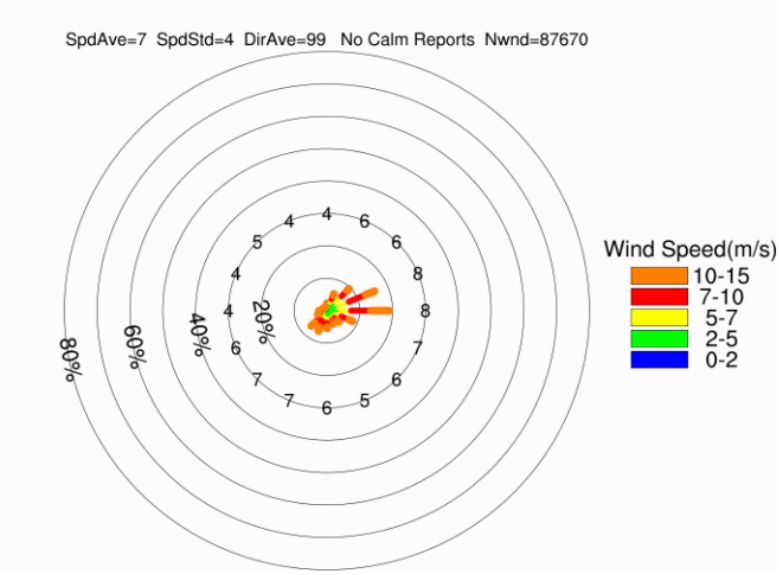


Figure 4 RAMS annual wind rose at 500mPD

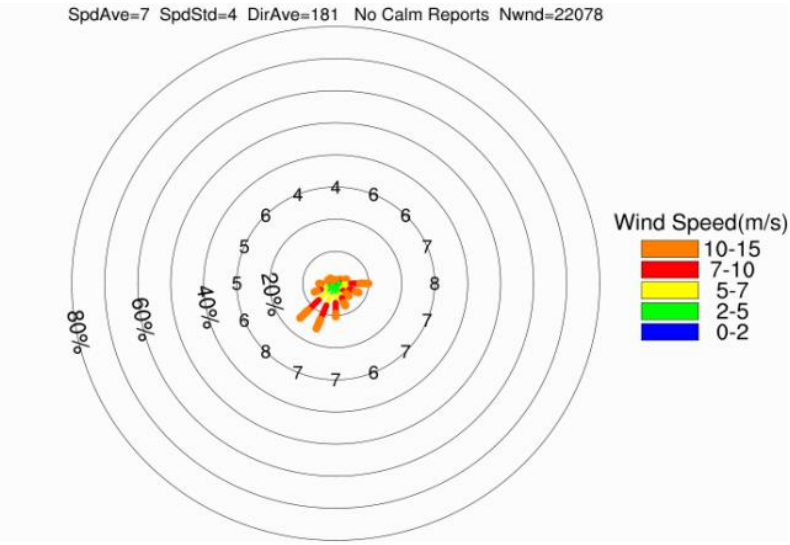


Figure 5 RAMS summer wind rose at 500mPD

### 3.1.1 Wind Directions

As mentioned in Section 3.1, the RAMS wind data of location grid (x:083, y:033) is adopted for the site wind availability in this study.

#### 3.1.1.1 Annual Prevailing Wind

Eight prevailing wind directions (highlighted in red colour in Table 1) are considered in this AVA Study which covers 78.5% of the total annual wind frequency. They are north-north-easterly (5.6%), north-easterly (9.6%), east-north-easterly (16.0%), easterly (19.3%), east-south-easterly (8.6%), south (5.6%), south-south-westerly (6.9%) and south-westerly (6.9%) winds.

Table 1 Annual Wind Frequency

| Wind Direction | N | NNE | NE | ENE | E | ESE | SE | SSE | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | 2.3% | 5.6% | 9.6% | 16.0% | 19.3% | 8.6% | 5.1% | 4.5% | |
| Wind Direction | S | SSW | SW | WSW | W | WNW | NW | NNW | Sum |
| Frequency | 5.6% | 6.9% | 6.9% | 3.1% | 2.4% | 1.3% | 1.3% | 1.3% | 78.5% |

** The wind frequency showing in red colour represents the selected winds for the CFD simulation.*

### 3.1.1.2 Summer Prevailing Wind

Eight prevailing wind directions (highlighted in red colour in Table 2) are considered in this AVA Study which covers 80.6% of the total summer wind frequency. They are easterly (10.4%), east-south-easterly (7.6%), south-easterly (5.9%), south-south-easterly (7.6%), southerly (10.7%), south-south-westerly (15.6%), south-westerly (15.8%) and west-south-westerly (7.0%) winds.

Table 2 Summer Wind Frequency

| Wind Direction | N | NNE | NE | ENE | E | ESE | SE | SSE | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency | 1.0% | 1.2% | 1.9% | 3.8% | 10.4% | 7.6% | 5.9% | 7.6% | |
| Wind Direction | S | SSW | SW | WSW | W | WNW | NW | NNW | Sum |
| Frequency | 10.7% | 15.6% | 15.8% | 7.0% | 5.1% | 2.6% | 2.3% | 1.3% | 80.6% |

** The wind frequency showing in red colour represents the recommended wind direction for the CFD simulation.*

## 3.1.2 Wind Profiles

The profiles of wind speed from the PlanD RAMS database (x:083, y:033) are shown in below.

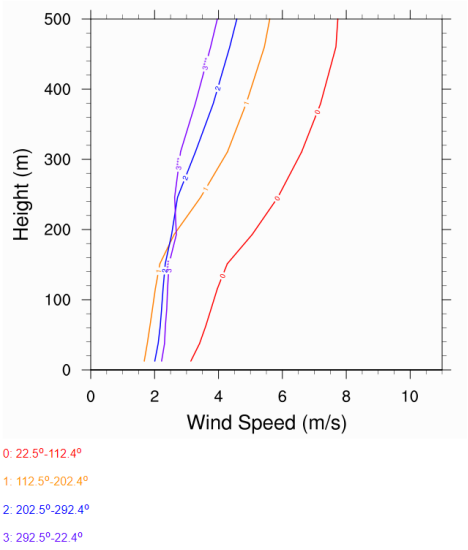


Figure 6 Normalised mean wind speed profile measured in 16 directions

The RAMS wind data is to be adopted in the AVA Initial study. It is recommended to extract the RAMS wind profile data directly as it can reflect the exact wind data. For wind data above 500m height, the velocity is assumed the same as the data at 500m. These wind data will be the input parameters in the CFD simulation.

## 3.2 Assessment and Surrounding Areas

With reference to the AVA Technical Circular [1] and the previous AVA Study from PLNQ B-1/AVA 2015[3], the Assessment Area and the Surrounding Area is extended beyond 1H and 2H from the site boundary with min. 200m and 400m respectively, as shown in Figure 7.

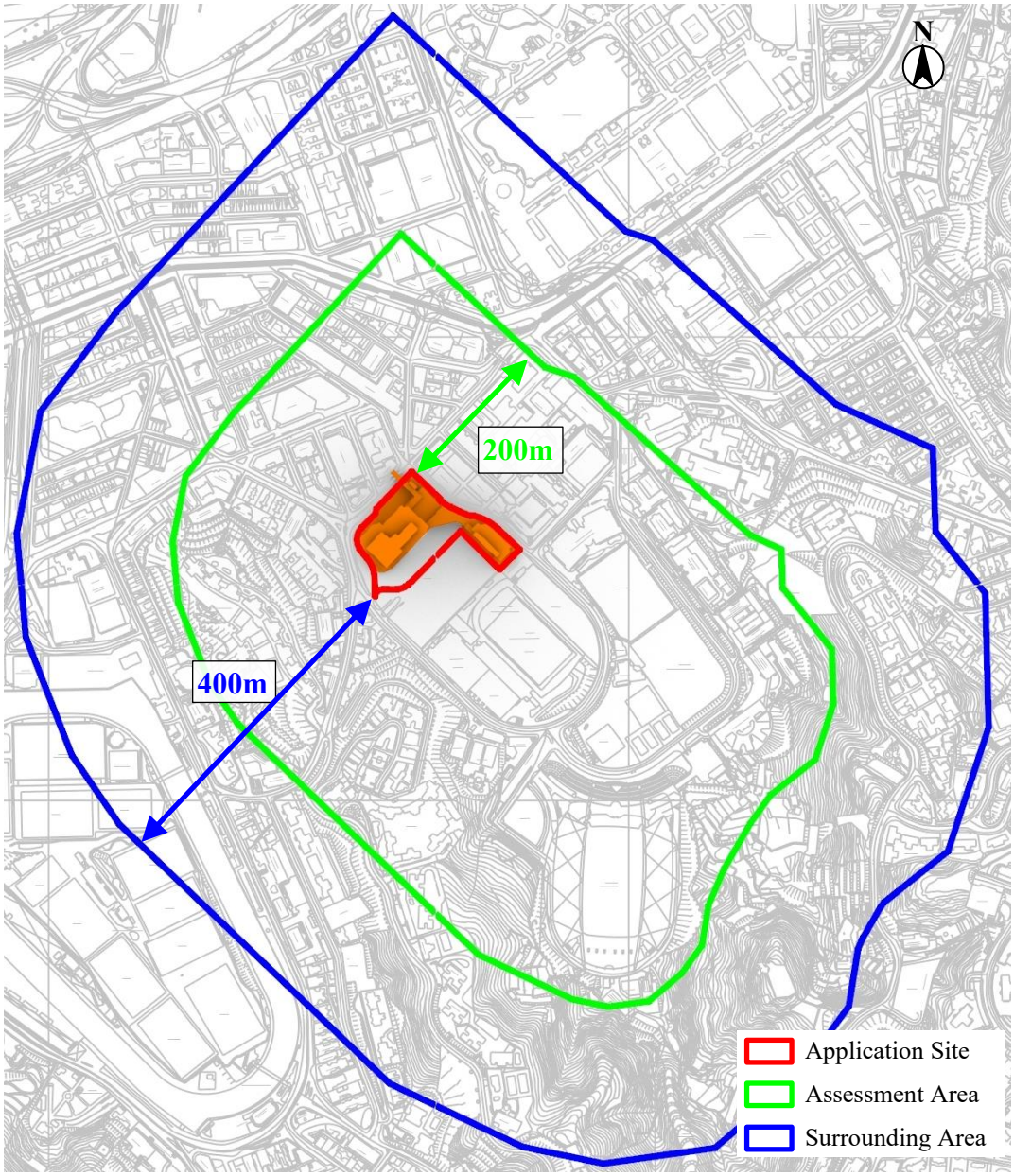


Figure 7 Application Site (red), Assessment Area (green) and Surrounding Area (blue)

Since there is no internationally recognized guideline or standard on using CFD for outdoor urban scale studies, reference was made to other CFD guidelines on different wind flow aspects to suggest a study approach for current study. The detail parameters are summarized in Table 3. The computational domain will be about 4600m (L) x 4300m (W) x 2100m (H), as shown in Figure 8. The surrounding model is shown in Figure 9 to Figure 12.

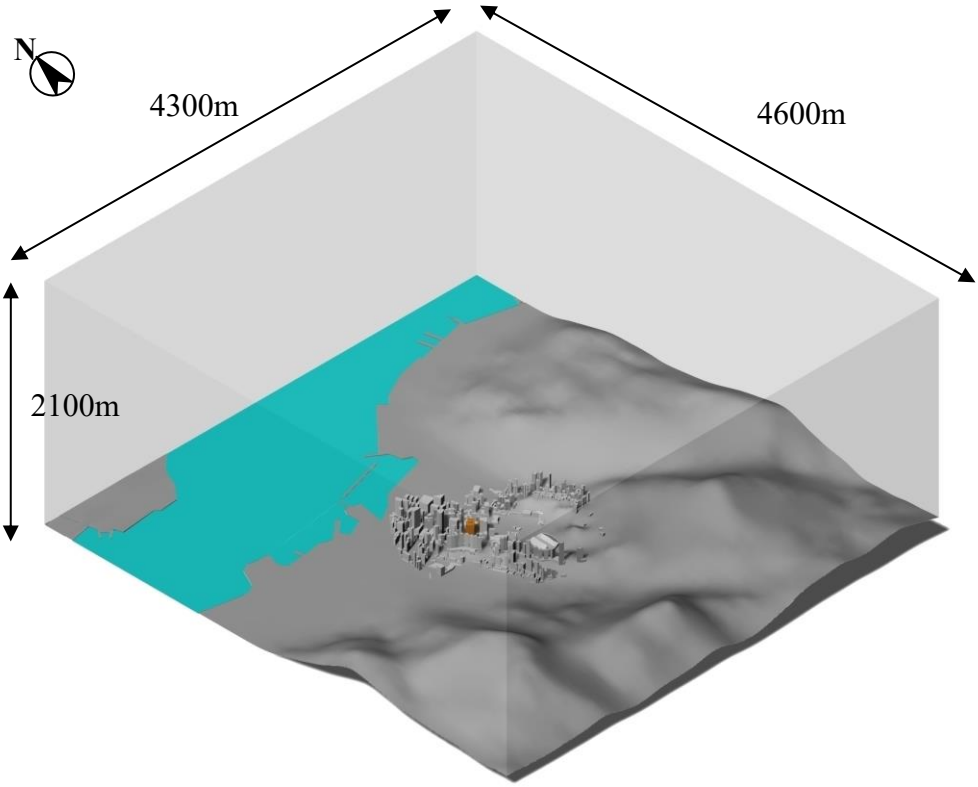


Figure 8 3D View of the Domain

Figure 9 Northerly view of Surrounding Buildings

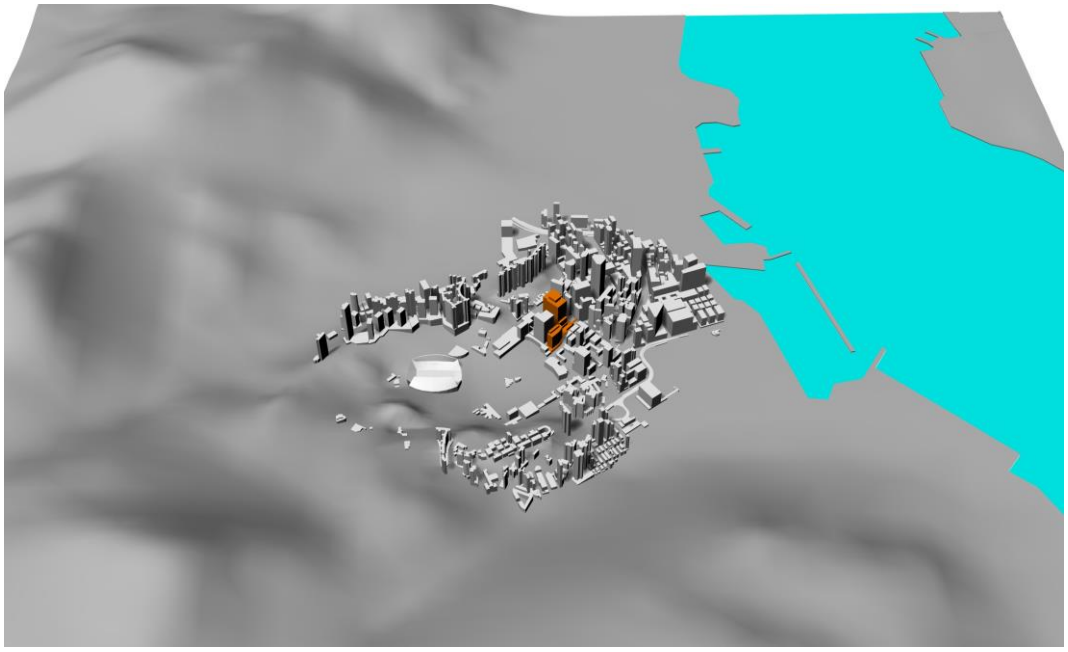

Figure 10 Easterly view of Surrounding Buildings

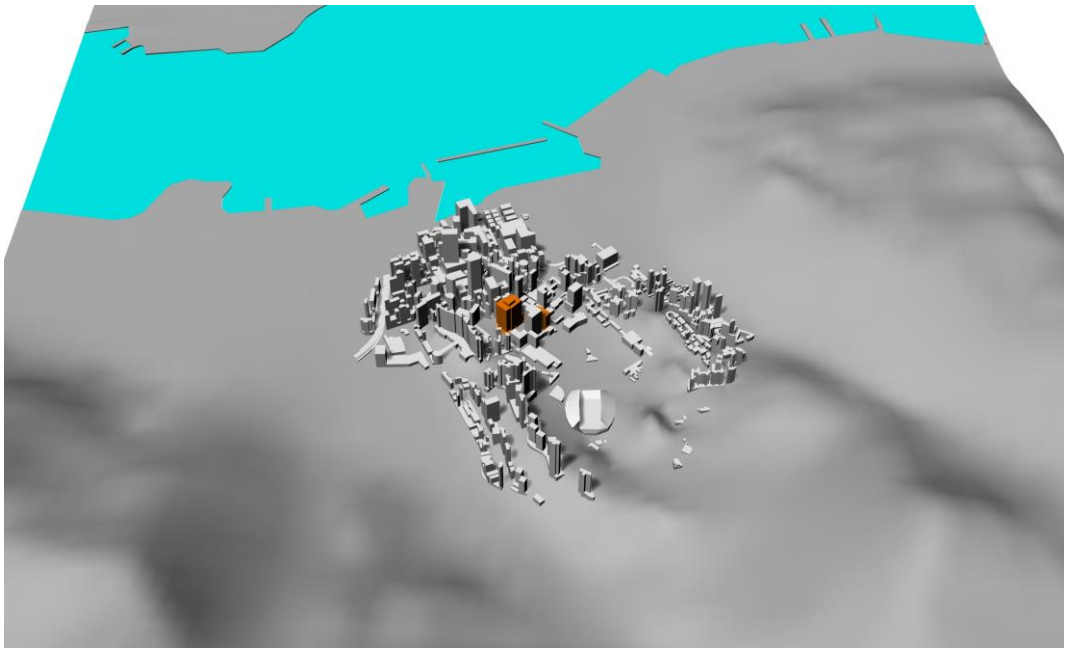

Figure 11 Southerly view of Surrounding Buildings

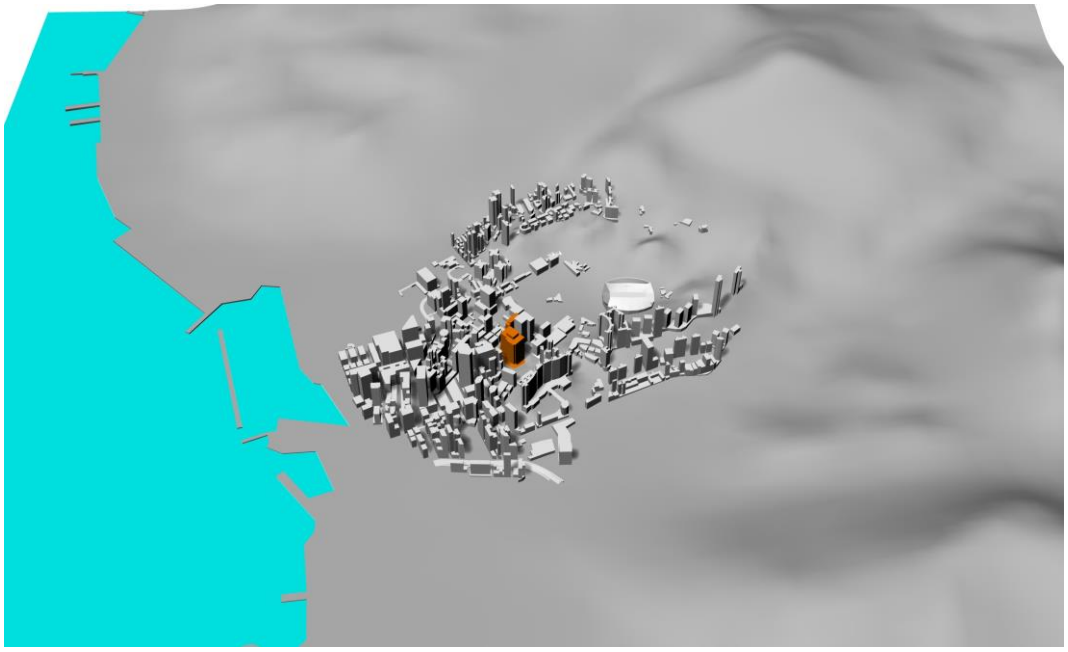

Figure 12 Westerly view of Surrounding Buildings

## 3.3 Technical Details for CFD simulation

### 3.3.1 Assessment Tool

Computational Fluid Dynamics (CFD) technique is adopted for the AVA Initial Study. A well-recognised commercial CFD package ANSYS ICEM-CFD and Ansys Fluent is used. Both software are widely used in the industry for AVA studies. With the use of three-dimensional CFD method, the local airflow distribution can be visualised in detail. The air velocity distribution within the flow domain, being affected by the site-specific design and the surrounding buildings, is simulated under the prevailing wind conditions in a year.

### 3.3.2 Mesh Setup

Body-fitted unstructured grid technique is used to fit the geometry to reflect the complexity of the development geometry. A prism layer of 3m above ground (totally 6 layers and each layer is 0.5m) is incorporated in the meshing to better capture the approaching wind as shown in Figure 13. The expansion ratio is 1.3 while the maximum blockage ratio is 3%.

Finer grid system is applied to the most concerned area based on preliminary judgement, while coarse grid system is applied to the area of surrounding buildings for better computational performance while maintaining satisfactory result. The mesh for the computational model is shown in Figure 14.

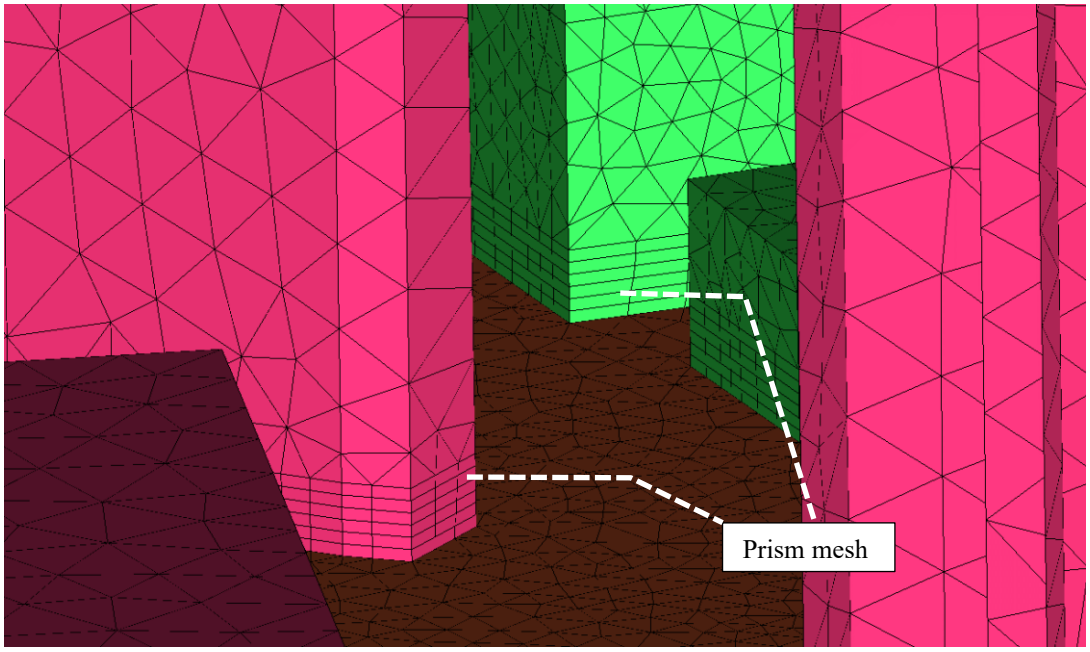


Figure 13 Prism mesh near the pedestrian level

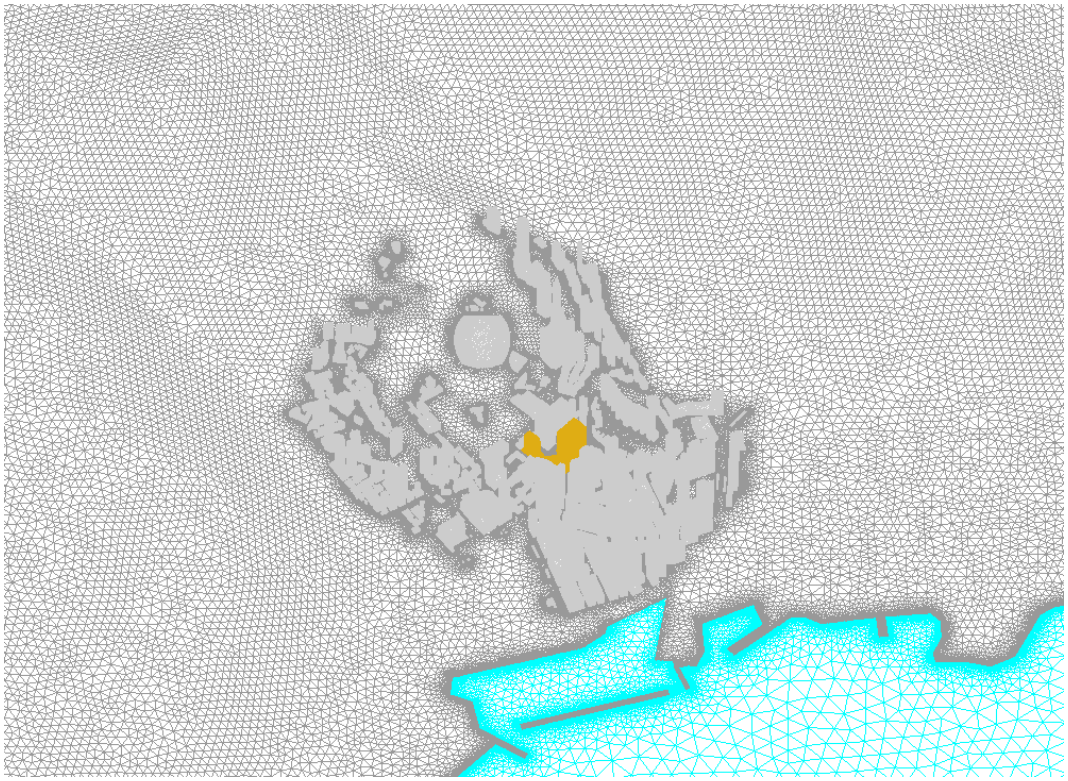

Figure 14 Mesh of the computational model

### 3.3.3 Turbulence Model

As highlighted in recent academic and industrial research literatures by CFD practitioners, the widely used standard $k$ - $\varepsilon$ turbulence model technique may not adequately model the effects of large scale turbulence around buildings and ignores the wind gusts leading to the relatively poor prediction in the recirculation regions around building. Therefore, in this CFD simulation, realizable $k - \varepsilon$ turbulence modelling method is applied. This technique provides more accurate representation of the levels of turbulence that can be expected in an urban environment.

### 3.3.4 Calculation Method

The Segregated Flow model solves the flow equations in a segregated manner. The linkage between the momentum and continuity equations is based on the predictor-corrector approach. A collocated variable arrangement and a Rhie-and-Chow-type pressure-velocity coupling combined with a SIMPLE-type algorithm is adopted. A higher order differencing scheme is applied to discretize the governing equations. The convergence criterion is set to 0.0001 on mass conservation. The calculation repeat until the solution satisfies this convergence criterion.

The prevailing wind directions are set to inlet boundary of the model with wind profile as detailed in Section 3.1.2. The downwind boundary is set to pressure with value of atmospheric pressure. The top and side boundaries are set to symmetry. In addition, to eliminate the boundary effects, the computational domain is built beyond the Surrounding Area as required in the Technical Circular.

### 3.3.5 Summary

Since there is no internationally recognized guideline or standard on using CFD for outdoor urban scale studies, reference was made to other CFD guidelines on different wind flow aspects to suggest a study approach for current study. The detail parameters are summarized in Table 3.

Table 3 Detail parameters to be adopted in the CFD

| | **CFD Model** |
|---|---|
| **Model Scale** | Real Scale model |
| **Model details** | Only include Topography, Buildings blocks, Streets/Highways, no landscape is included |
| **Domain** | 4600m(L) x 4300m(W) x 2100m(H) |
| **Assessment Area** | ≥ 1H area |
| **Surrounding building Area** | ≥ 2H area |
| **Grid Expansion Ratio** | The grid should satisfy the grid resolution requirement with maximum expansion ratio = 1.3 |
| **Prismatic layer** | 6 layer of prismatic layers and 0.5m each (i.e. total 3m above ground) |
| **Inflow boundary Condition** | Incoming wind profile as measured from RAMS |
| **Outflow boundary** | Pressure boundary condition with dynamic pressure equal to zero |

| | |
|---|---|
| **Wall boundary condition** | Logarithmic law boundary |
| **Turbulence Model** | Realisable k-ε turbulence model |
| **Solving algorithms** | Rhie and Chow SIMPLE for momentum equation<br>Hybrid model for all other equations |
| **Blockage ratio** | < 3% |
| **Convergence criteria** | Below $1.0E^{-4}$ |

## 3.4 Data Presentation

The wind speed information at pedestrian level (2m above ground) will be acquired to determine the Wind Velocity Ratio (*VR*) as stipulated in the *AVA Technical Circular*[1] and as defined as follows:

$$VR = \frac{V_p}{V_\infty}$$

where $V_p$ is the wind speed at the pedestrian height (2m above ground) and $V_\infty$ is the wind velocity at the top of the boundary layer (defined as the height where wind is unaffected by urban roughness and determined by the topographical studies). Measurement will be taken in the following areas within the "Assessment Area":

- Along the Development boundary (defined as "Perimeter" test-points), such that the Site-Spatial Average Velocity Ratio (*SVR*) can be determined (as per the *AVA Technical Circular* [1]); and
- Throughout the Assessment Area other than the perimeter test-points (defined as "Overall" Test-points), such that the Local Spatial Average Velocity Ratio (LVR) can be determined by taking an average of all overall and perimeter test-points (as per the *AVA Technical Circular*[1]).

## 3.5 Locations of Test Points

As per the technical circular, three types of test point – perimeter test point and overall test point will be adopted to assess the wind performance. The allocation of these test points will be distributed evenly as stated in the *AVA Technical Circular* [1].

### 3.5.1 Perimeter Test Points

A total number of 42 perimeter test points (**Brown spots**), namely P points, are positioned at intervals of around 15m along the project site boundary in accordance with the *AVA Technical Circular*[1]. The locations of perimeter test points are shown in Figure 15 below.

### 3.5.2 Overall Test Points

A total number of 198 overall test points (**Blue spots**), namely O points, are evenly distributed in open areas within the assessment area, such as the streets and places where pedestrian frequently access, and their locations are shown in Figure 16.

### 3.5.3 Special Test Points

A total number of 28 special test points, namely S points (**Purple spots**), evenly distributed in open areas within the Study Site. Their locations are shown in Figure 17 to Figure 18.

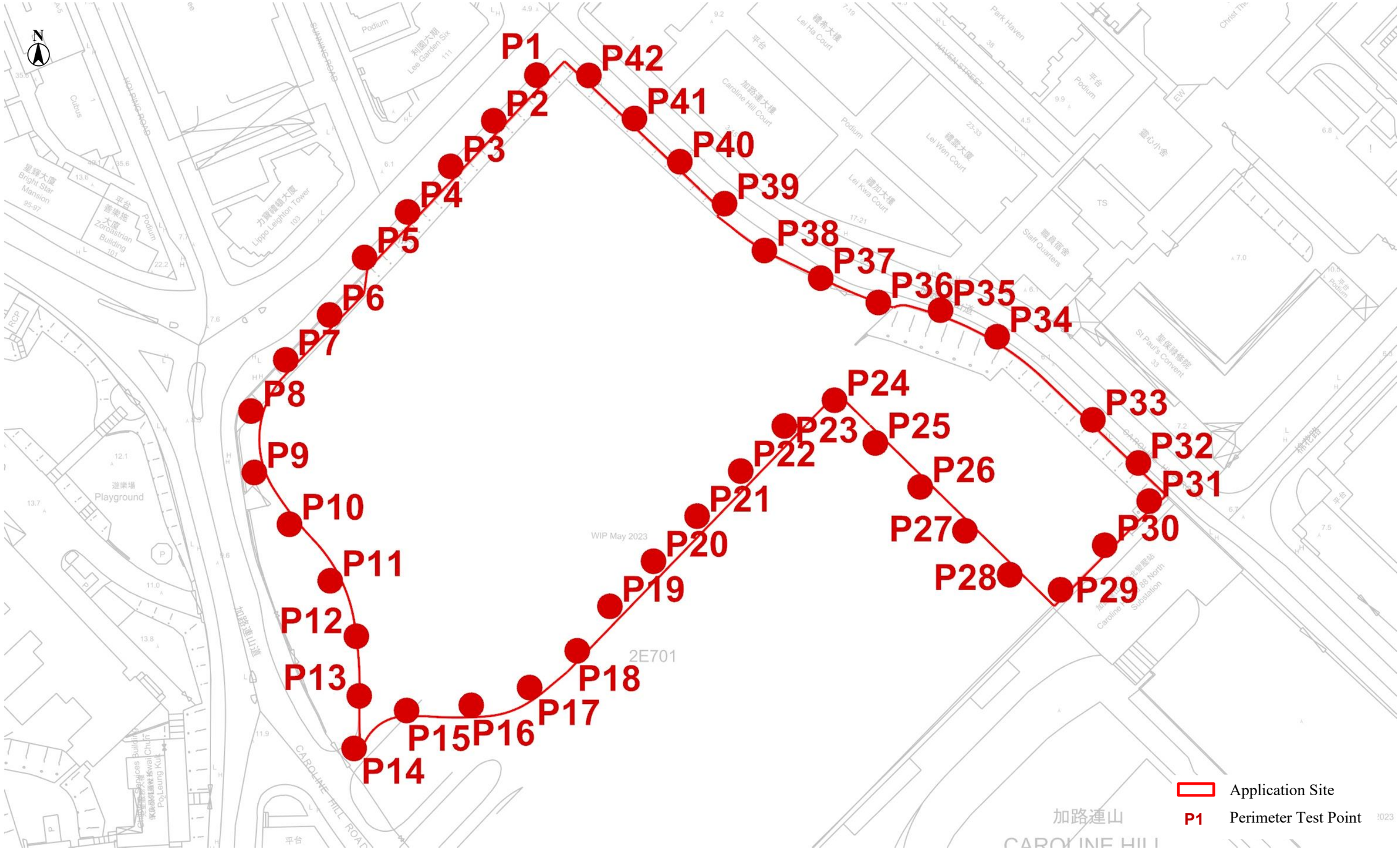


Figure 15 Location of Perimeter Test Points

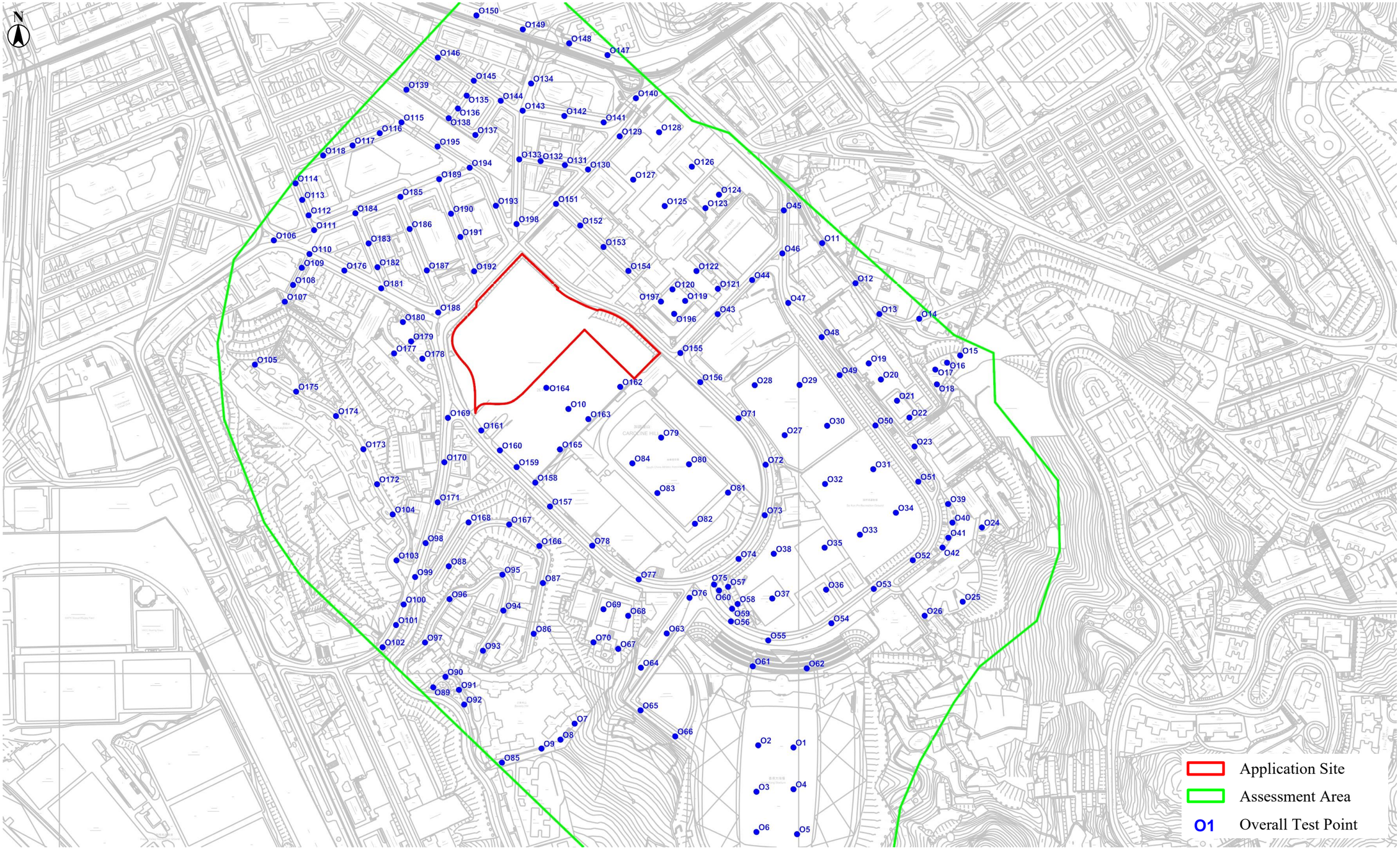


Figure 16 Location of Overall Test Points

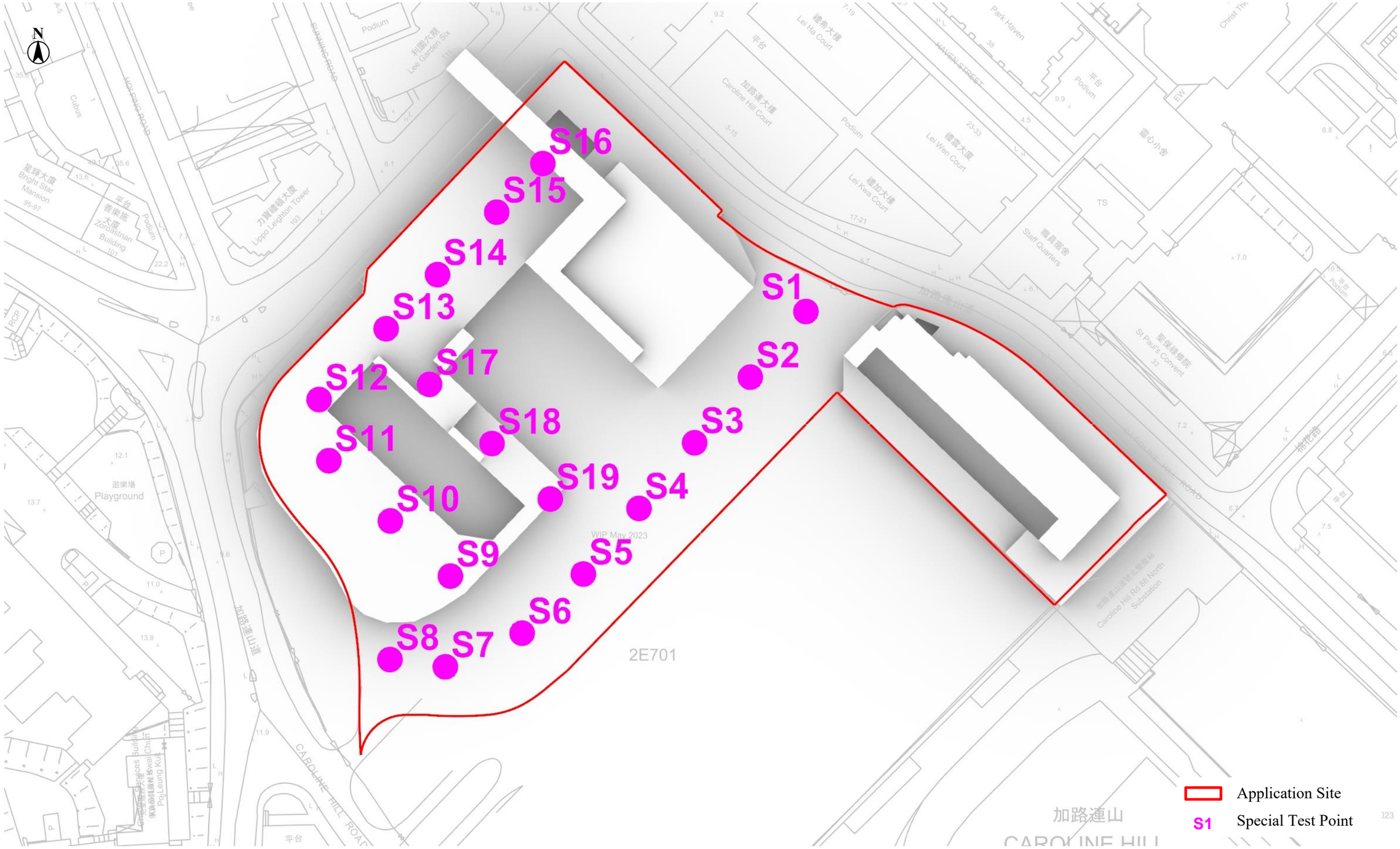


Figure 17 Location of Special Test Points on Street Level and G/F

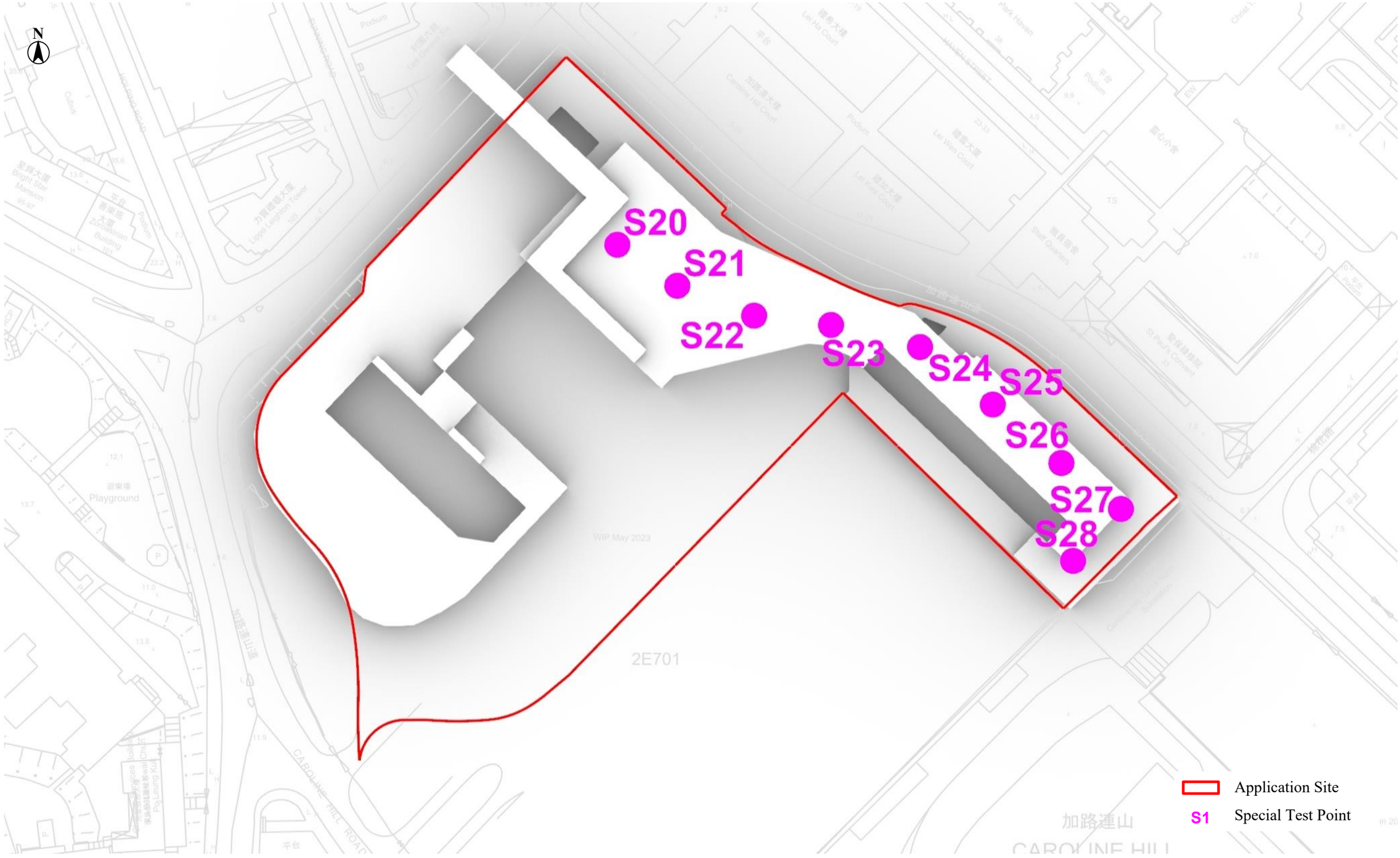


Figure 18 Location of Special Test Points on Podium Level

## 3.6 Focus Areas

Within the Proposed Assessment Area given in Figure 19, Figure 20 and Figure 21 a total of 51 focus areas are proposed. The associated test points for focus areas are tabulated in Table 4.

Table 4 Focus Areas and Corresponding Test Points

| | **Focus Area** | **Test Points** |
|---|---|---|
| 1 | Yee Wo Street | O147-O150 |
| 2 | Fung Un Street | O135, O136, O138, O145 |
| 3 | Jardine's Bazaar | O143-O146 |
| 4 | Jardine's Crescent | O137-O139, O144 |
| 5 | Yun Ping Road | O115, O193-O195 |
| 6 | Lan Fong Road | O115-O118 |
| 7 | Lee Garden Road | O111-O114 |
| 8 | Hysan Avenue | O106, O184, O185, O189, O194 |
| 9 | Sun Wui Road | O181-O184 |
| 10 | Hoi Ping Road | O185-O188 |
| 11 | Leighton Lane | O107-O110 |
| 12 | Sunning Road | O189-O192 |
| 13 | Playground of Po Leung Kuk | O177-O180 |
| 14 | Leighton Hill Road | O103-O105, O172-O175 |
| 15 | Link Road | O98, O99, O169-O171 |
| 16 | Elevated Road to Bevely Hill | O86-O88, O166-O168 |
| 17 | Happy View Terrace | O93-O97 |
| 18 | Broadwood Road | O99-O102 |
| 19 | Rest Garden on Broadwood Road | O89-O92 |
| 20 | Road south of Beverly Hill | O7-O9, O85 |
| 21 | Confucius Hall Secondary School | O67-O70 |
| 22 | Stadium Path | O63-O66, O76 |
| 23 | Hong Kong Stadium | O1-O6, O61, O62 |
| 24 | Eastern Hospital Road Sitting-out Area 1 | O57-O60 |
| 25 | Easter Hospital Road | O45-O56 |
| 26 | Tung Wah Eastern Hospital | O24-O26 |
| 27 | Indian Recreation Club | O35-O38 |
| 28 | Caroline Hill Road | P32-P42, O71-O78, O155-O161 |
| 29 | Eastern Hospital Road Sitting-out Area 2 | O39-O42 |
| 30 | South China Stadium | O79-O84 |
| 31 | So Kon Po Recreation Ground | O31-O34 |
| 32 | Proposed District Court | O10, O158-O165 |
| 33 | Sir Ellis Kadoorie (S) Primary School | O19-O22 |
| 34 | Disciplined Services Sports and Recreational Club | O27-O30 |
| 35 | Ka Ning Path Rest Garden | O15-O18 |
| 36 | Cotton Path Road | O43, O44, O46, O155 |
| 37 | St. Paul's Convent | O119, O120, O196, O197 |
| 38 | Ka Ning Road | O11-O14 |
| 39 | Haven Street | O151-O154 |
| 40 | St. Paul's Hospital | O121-O124 |

| | | |
|---|---|---|
| 41 | St. Paul's Convent School | O125-O128 |
| 42 | Leighton Road | P1-P8, O106, O110, O129, O130, O151, O176, O188 |
| 43 | Keswick Street | O130-O133 |
| 44 | Pennington Street | O133, O134, O143, O198 |
| 45 | Irvine Street | O140-O143 |
| 46 | Internal Street of T1 on G/F | S13, S17-S19 |
| 47 | Elevated Design of T1 on G/F | S9-S11 |
| 48 | Access Road within Application Site | S1-S8 |
| 49 | Open Space of T1&2 on G/F | S9-S19 |
| 50 | Open Space of T2 on Podium Level | S20-S23 |
| 51 | Elevated Design of T3 on Podium Level | S24-S28 |


Figure 19 Location of Focus Area

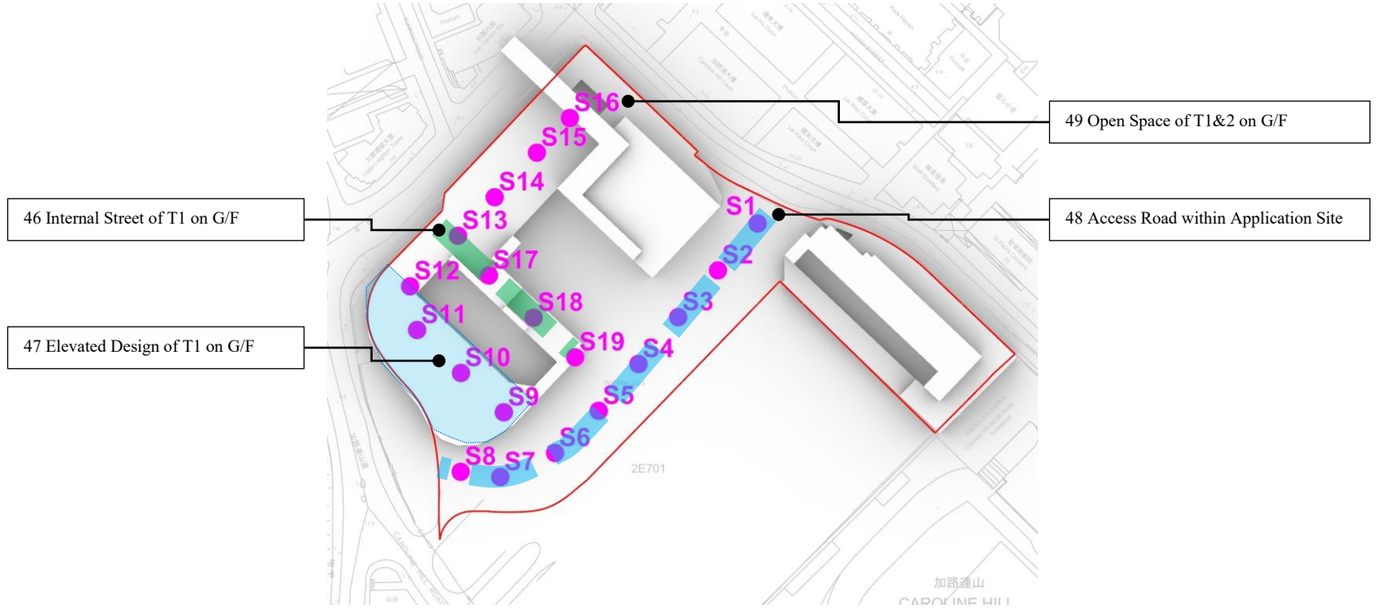


Figure 20 Location of Focus Area within Application Site - G/F

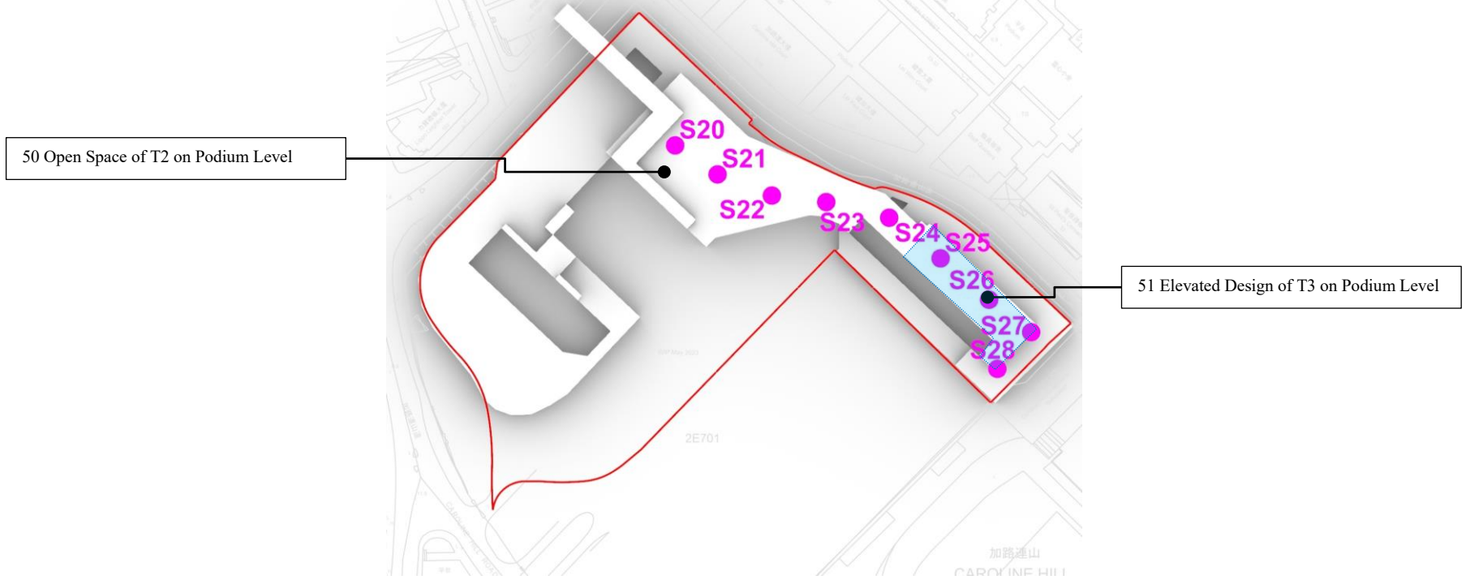


Figure 21 Location of Focus Area within Application Site - Podium Level

# 4 Design Schemes for Initial Study

Two schemes will be analysed and compared in this AVA Initial Study, namely the Baseline Scheme and the Proposed Scheme.

## 4.1 Baseline Scheme

Proposed Scheme is the previously approved scheme under Planning Application No. A/H7/181. The development parameters are summarized in Table 5 below. The layout plan of Baseline Scheme is shown in Figure 22 and Figure 23, with details in Appendix A. Major wind enhancement features are list below. The 3D model was constructed as shown in Figure 24 to Figure 27.

- #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 – Proposed building setback of min. 23m from north-eastern 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 measured from north-eastern site boundary. The elevated design consists of approximately 18m (W) x 10m (H).
- #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.

Table 5 Development Parameters of Baseline Scheme

| **Development Parameter** | **Baseline Scheme** |
|---|---|
| Building Block(s) | 2 |
| Main Roof Height (mPD) | +135mPD for T1&2<br>+90mPD for T3 |

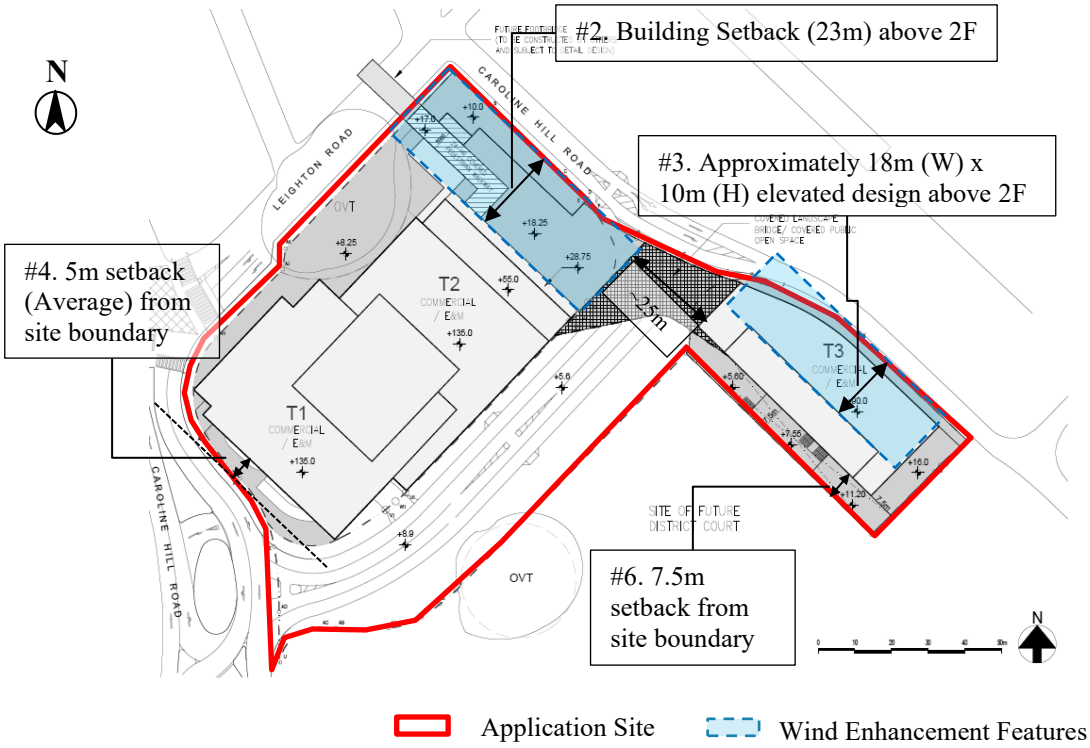


Figure 22 Baseline Scheme – Master Layout Plan

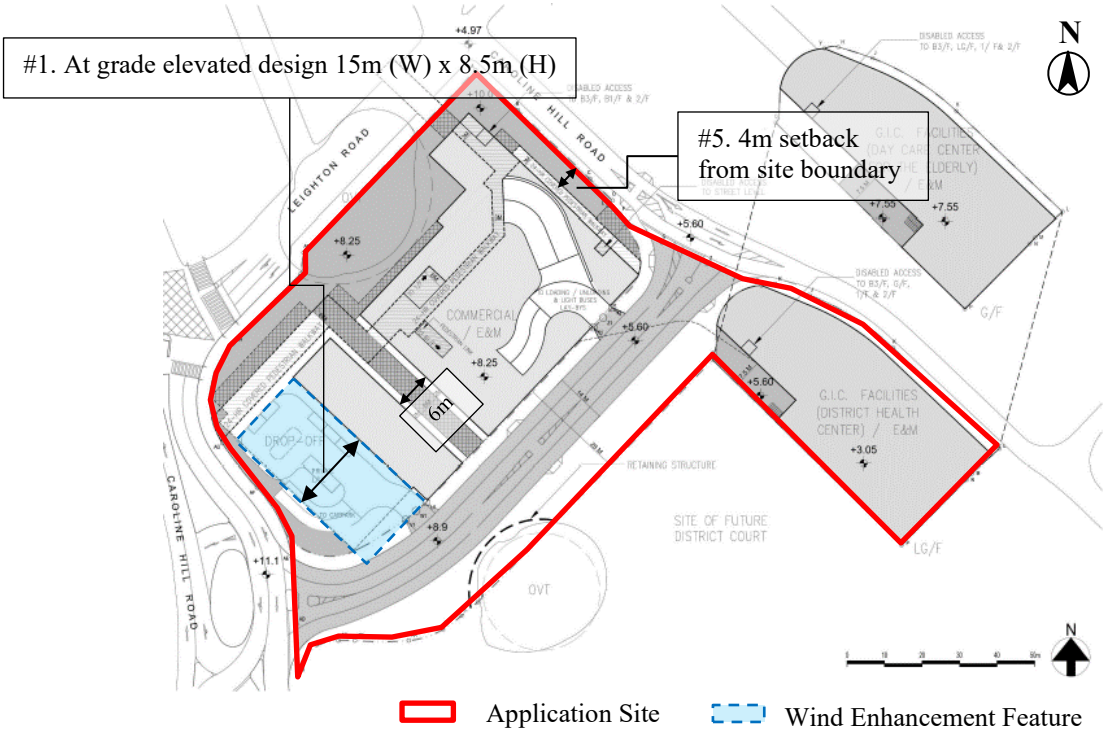


Figure 23 Baseline Scheme – GF Layout Plan

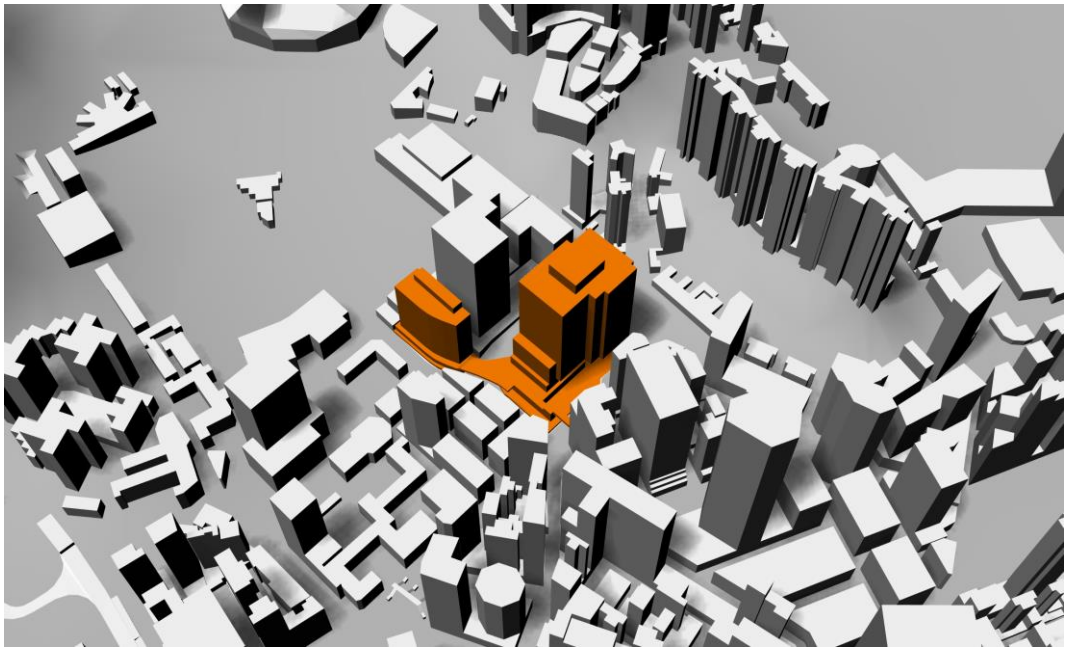

Figure 24 Northerly view of Baseline Scheme

Figure 25 Easterly view of Baseline Scheme

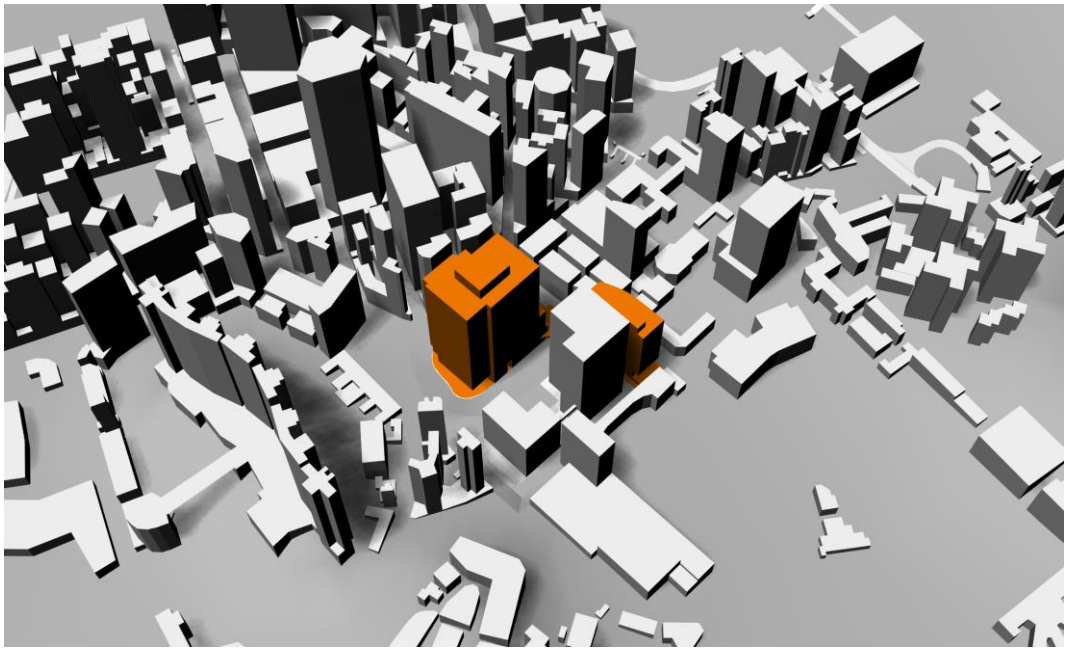

Figure 26 Southerly view of Baseline Scheme

Figure 27 Westerly view of Baseline Scheme

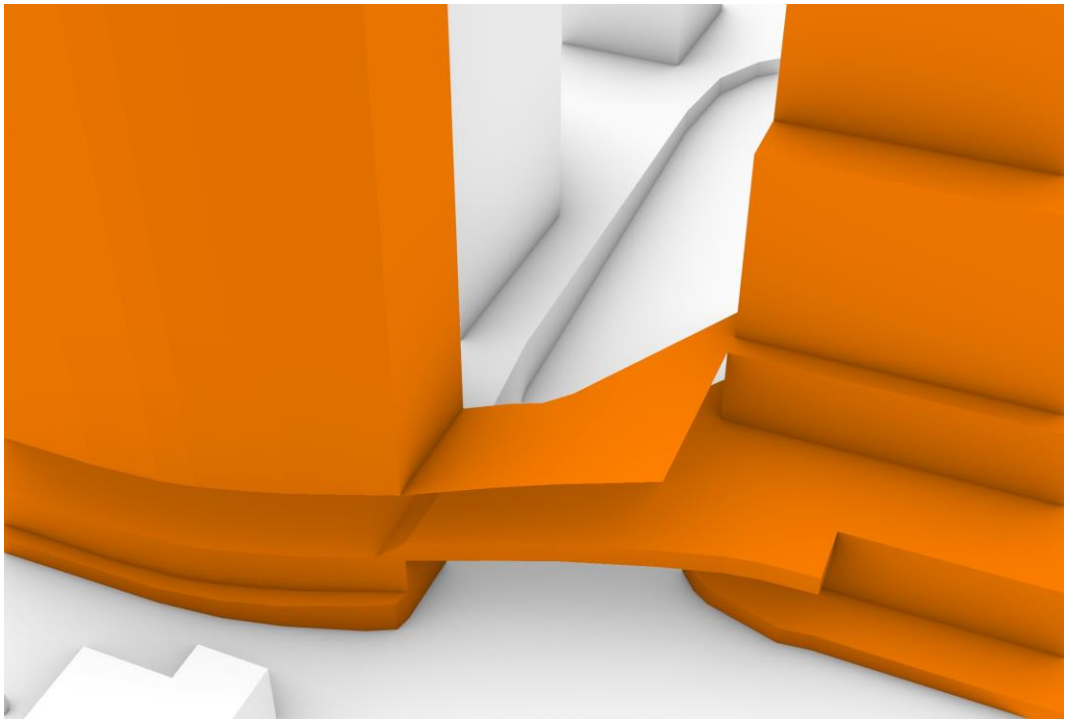

Figure 28 T2-T3 Footbridge of Baseline Scheme

## 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 adopted in the analysis is shown in Figure 29 and Figure 30.

As the design develops, there is a minor amendment to feature #3. It is expected to have an insignificant impact on wind performance, and the analysis would remain valid. Please refer to Section 6 for detailed discussion of the amendment. Please refer to Appendix A for the layout plan after the amendment.

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 13.4m (H).
- #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<br>+90mPD for T3 |

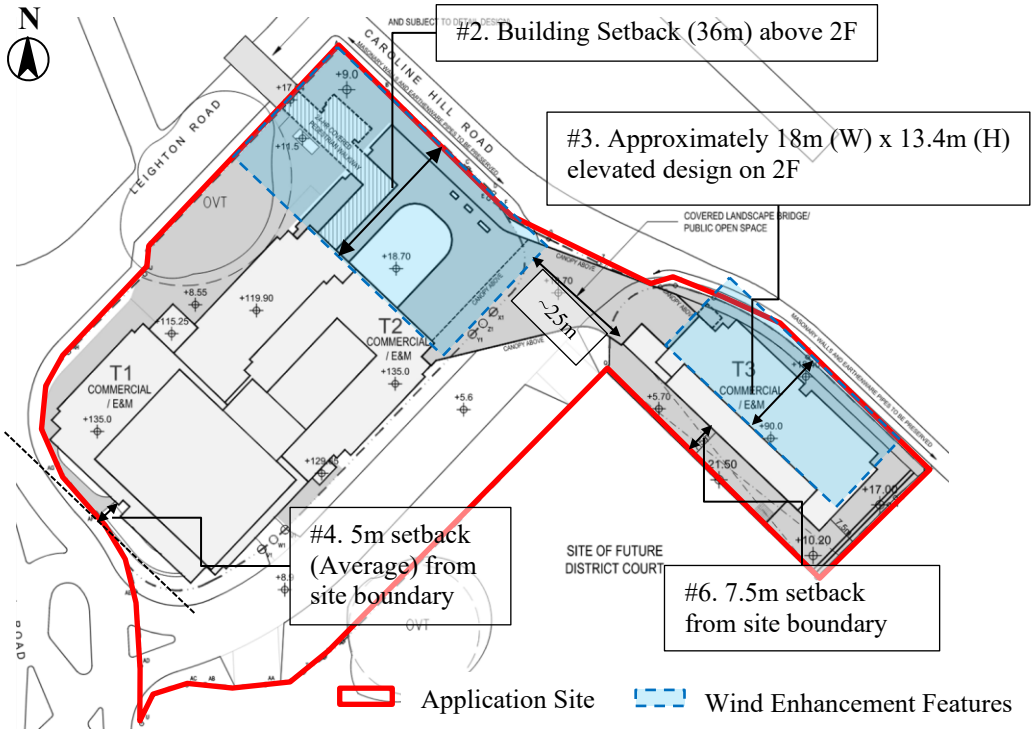


Figure 29 Proposed Scheme – Master Layout Plan

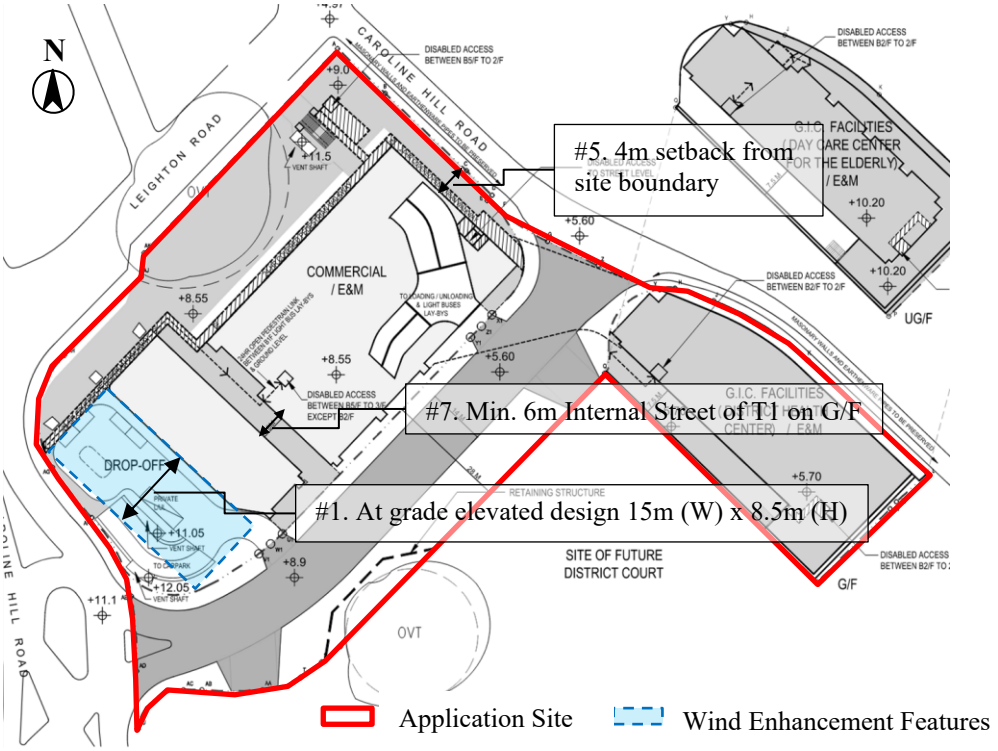


Figure 30 Proposed Scheme – GF Layout Plan

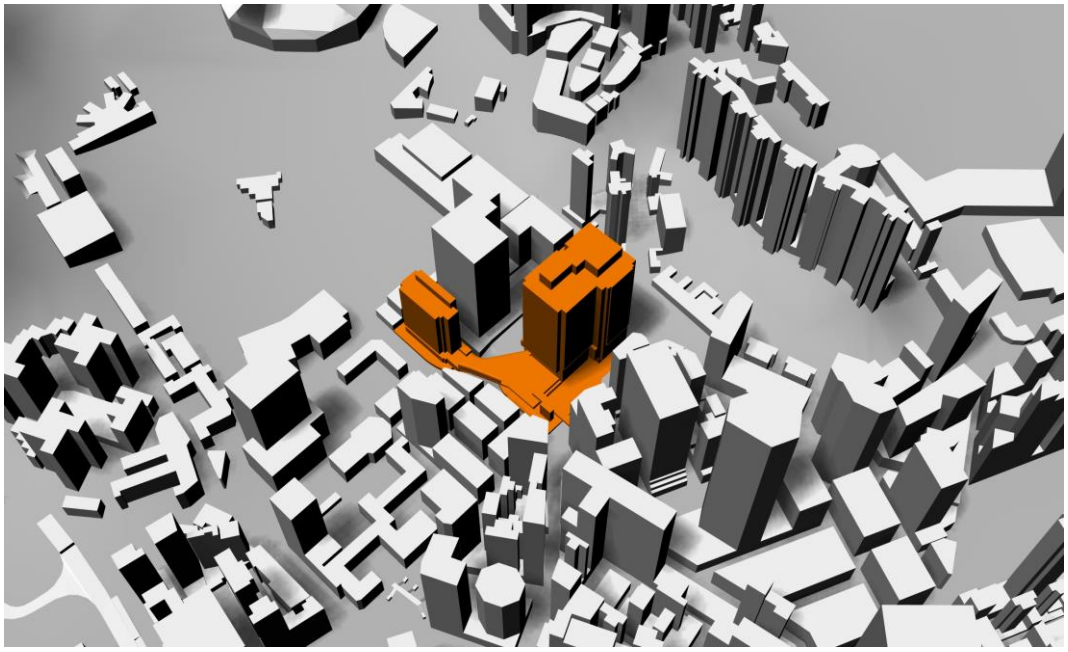

Figure 31 Northerly view of Proposed Scheme

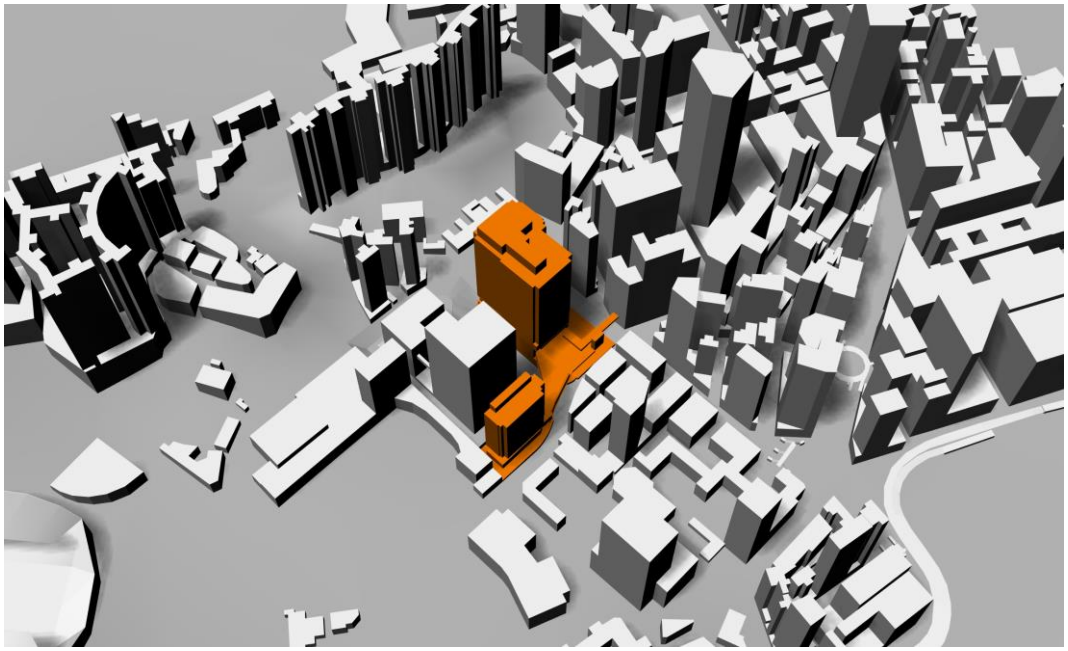

Figure 32 Easterly view of Proposed Scheme

Figure 33 Southerly view of Proposed Scheme

Figure 34 Westerly view of Proposed Scheme

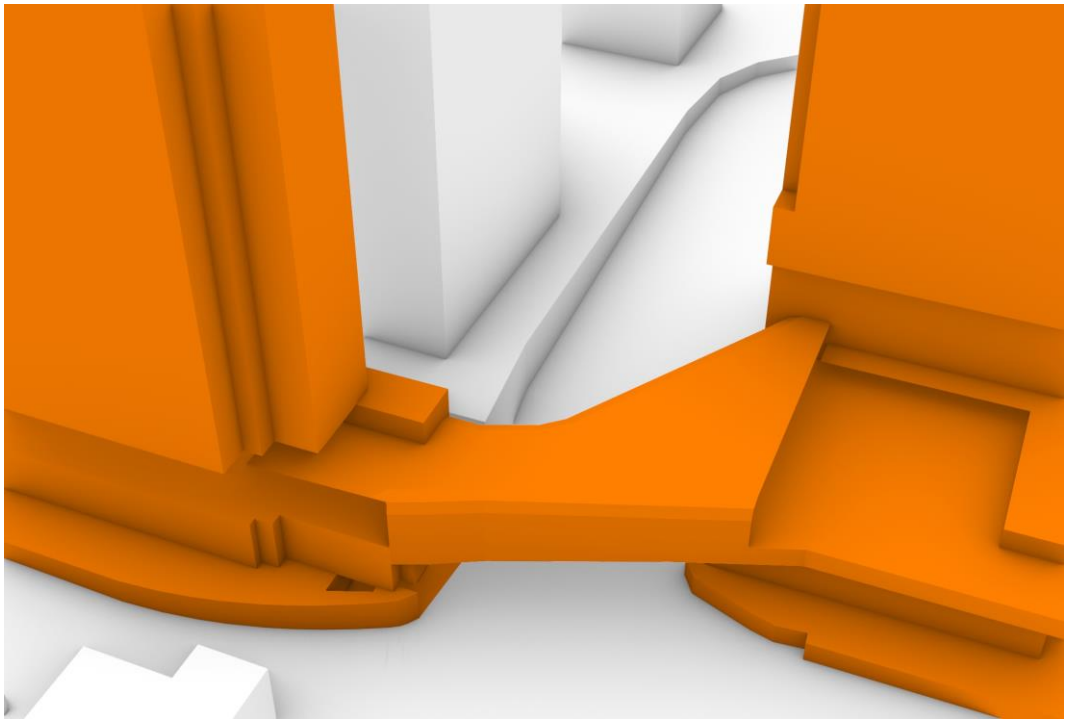

Figure 35 T2-T3 Footbridge of Proposed Scheme

# 5 Results and Discussion

The detailed contour and vector plots for each wind directions are shown in Appendix C and Appendix D.

## 5.1 Overall Pattern of Ventilation Performance under Annual Wind Condition

The overall wind performance of Baseline and Proposed Schemes under annual wind condition is presented in Figure 36 and Figure 37 respectively. Under annual wind conditions, prevailing winds are mostly from E quadrant, the Application Site is located at the leeward side of mid to high-rise developments and open space provided by recreational area with hilly terrain of Grandview Mansion to the further side. T1 and T2 are partially shielded by Proposed District Court. Surrounding wind environment is dominated by upwind developments and hilly terrain, except for some localized difference around the Application Site.

Incoming winds would be diverted to reach the Application Site from Caroline Hill Road, Leighton Road and Cotton Path. Some high-level incoming winds would skim over the mid-rise developments and open space to reach the Application Site from prevailing wind direction. The incoming wind directions are illustrated by **Black** arrows in Figure 36 and Figure 37 respectively.

Under both Schemes, downwash effect would be observed on T2, T3 and Proposed District Court. Under Baseline Scheme, larger frontal area of T3 would induce more prominent downwash effect. Downwash wind would ventilate the T3 podium and further travel to Caroline Hill Road, where slightly higher VR would be observed, illustrated by **Purple** arrow in Figure 36.

Under Baseline Scheme, the larger façade of T2 would also divert some incoming wind towards Access Road within Application Site. While under Proposed Scheme, the enclosed T2-T3 footbridge would also divert some incoming wind towards Access Road within Application Site. Different in ventilation pattern would be observed illustrated by **Red** arrow in Figure 36 and Figure 37 respectively.

Under Proposed Scheme, the enclosed T2-T3 footbridge under Proposed Scheme would shield the T2 podium, where slightly lower VR would be observed, illustrated by **Red** circle in Figure 37.

The larger T3 building setback from north-eastern site boundary enhanced wind permeability, more incoming wind from Caroline Hill Road would continue to travel along, where slightly higher VR would be observed, illustrated by **Purple** arrow in Figure 37.

In addition, larger building setback of T2 under Proposed Scheme allows incoming wind to skim over the T2 podium to ventilate Leighton Road and Playground of Po Leung Kuk on the leeward side, where slightly higher VR would be observed, illustrated by **Blue** arrow in Figure 37.

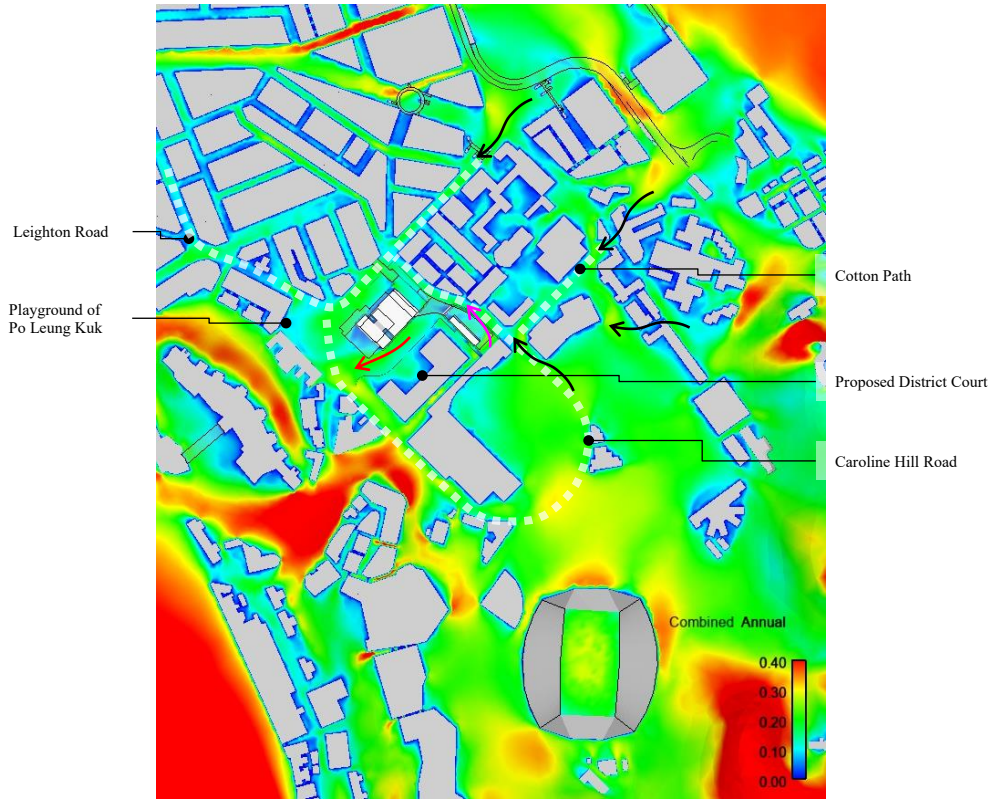


Figure 36 Contour plot of annual weighted VR under Baseline Scheme

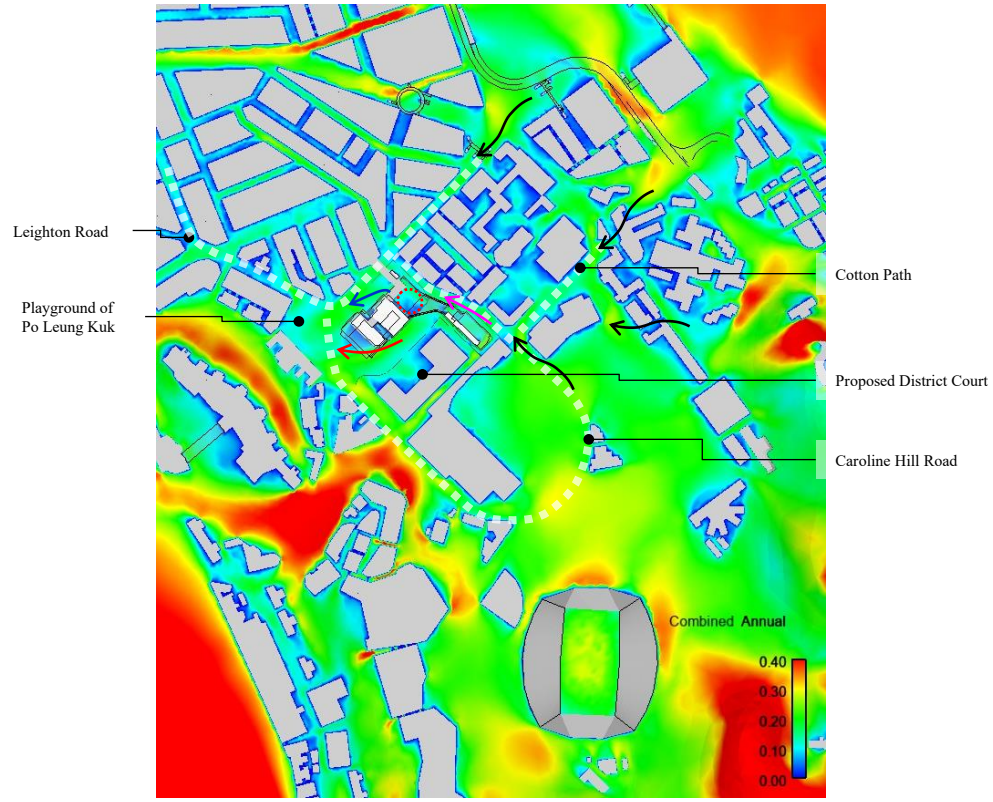


Figure 37 Contour plot of annual weighted VR under Proposed Scheme

## 5.2 Overall Pattern of Ventilation Performance under Summer Wind Condition

The overall wind performance of Baseline and Proposed Schemes under summer wind condition is presented in Figure 38 and Figure 39 respectively.

Under summer condition, the prevailing winds are mostly from SW quadrant. The Application Site is located at the leeward side of density built mid to high-rise developments and hilly terrain of Beverly Hill. T1 and T2 are shielded by The Leighton Hill, while T3 is shielded by Proposed District Court. Surrounding wind environment is relatively calm and dominated by upwind developments and hilly terrain, except for some localized difference around the Application Site.

Due to the upwind developments and hilly terrain, incoming winds would be diverted to reach the Application Site from Leighton Road, Sunning Road, Yun Ping Road and Caroline Hill Road. The incoming wind directions are illustrated by **Black** arrows in Figure 38 and Figure 39 respectively.

Under both Schemes, downwash effect would be observed on Proposed District Court.

Under Baseline Scheme, mid-level incoming wind from Yun Ping Road and Pennington Street would flow through T2-T3 footbridge and ventilate the Access Road within Application Site, where slightly higher VR would be observed, illustrated by **Purple** arrow in Figure 38.

Under Proposed Scheme, due to the larger building setback of T3 from north-eastern site boundary and larger T3 core, incoming wind from Caroline Hill Road would enter and be channelled to ventilate the T3 podium, where slightly higher VR would be observed, illustrate by **Black** circle in Figure 39.

Under Proposed Schene, the enclosed T2-T3 footbridge would divert some incoming wind to street level, together with the larger building setback of T3 from north-eastern site boundary, where slightly higher VR on part of the Access Road within Application Site and Caroline Hill Road would be observed, illustrate by **White** arrows in Figure 39.

Under Proposed Schene, due to the less prominent wind traveling from the north-west along Caroline Hill Road, the incoming wind from the opposite direction would be less limited to travel along the same road, where slightly higher VR would be observed, illustrated by **Red** circle in Figure 39.

Under both Scheme, incoming wind from Yun Ping Road and Pennington Street would travel along north-western site boundary. Under Baseline Scheme, the incoming wind would continue to travel to ventilate the Elevated Design of T1 on G/F. While under Proposed Scheme, the incoming wind would be diverted toward Caroline Hill Road. Where different in ventilation pattern would be observed, illustrated by **Red** arrow in Figure 38 and Figure 39 respectively.

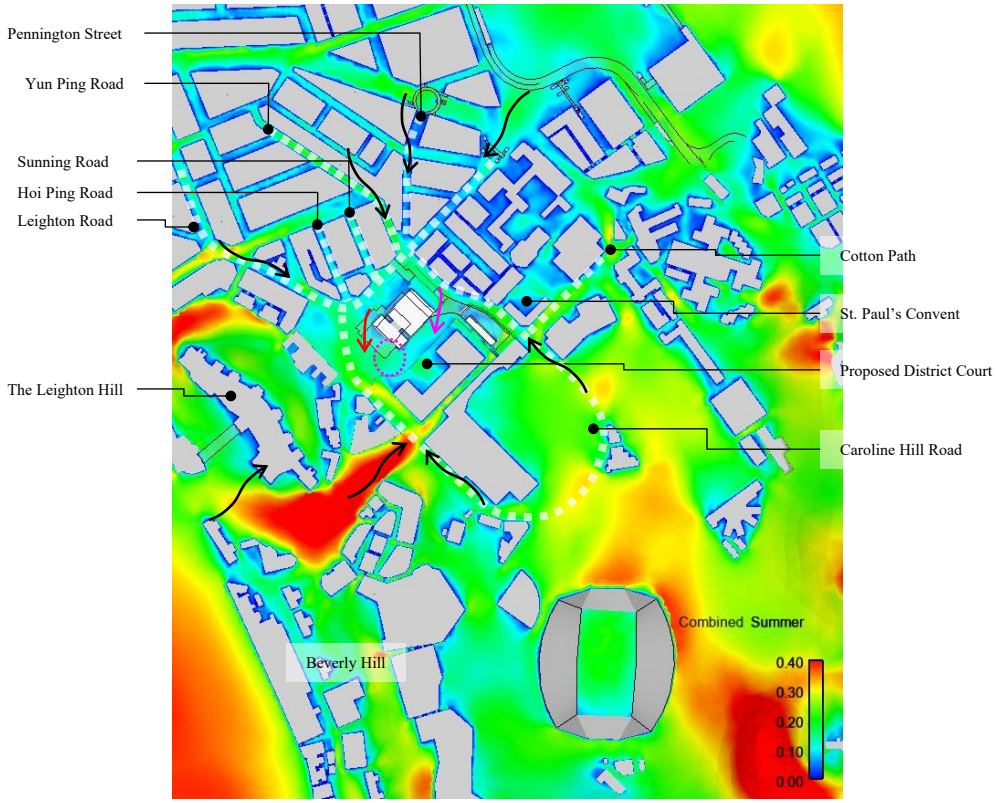


Figure 38 Contour plot of summer weighted VR under Baseline Scheme

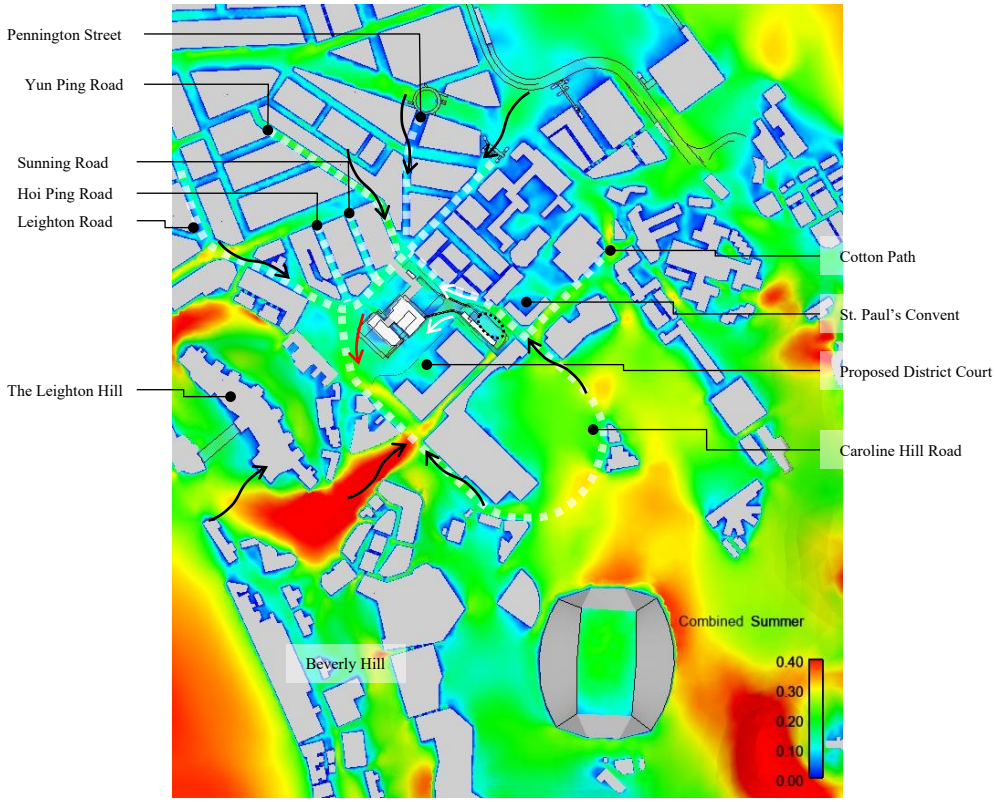


Figure 39 Contour plot of summer weighted VR under Proposed Scheme

## 5.3 Directional Analysis

### 5.3.1 NNE Wind

The overall wind performance of Baseline and Proposed Schemes under NNE wind is presented in Figure 40 and Figure 41, respectively.

The Application Site is located at the leeward side of densely built high-rise developments. Surrounding wind environment is relatively calm and dominated by upwind developments, except for some localized difference around the Application Site.

Due to the surrounding buildings, incoming wind would be diverted to reach the Application from Sun Wui Road, Hoi Ping Road, Sunning Road, Yun Ping Road, and Leighton Road. Some high-level wind would skim over the mid-rise buildings to reach the Application Site from north-east. The incoming wind directions are illustrated by **Black** arrows in Figure 40 and Figure 41, respectively.

Under both Scheme, stepping building height of T3 (lower) and Proposed District Court (taller) allows induced downwash effect on both buildings. Under Baseline Scheme, due larger frontal area of T3 more downwashed wind be induced to ventilate the Proposed District Court podium, where slightly higher VR would be observed, illustrated by **White** circle in Figure 40.

Under Baseline Scheme, mid-level incoming wind from Leighton Road would pass through the T2-T3 footbridge to ventilate the Access Road within Application Site, where slightly higher VR would be observed, illustrated by **Purple** circle in Figure 40.

Under Proposed Scheme, less podium setback of T1 from north-western site boundary divert the incoming wind from Leighton Road towards Playground of Po Leung Kuk, while shielded the Elevated Design of T1 on G/F, where slightly higher VR on Playground of Po Leung Kuk and slightly lower VR on Elevated Design of T1 on G/F would be observed, illustrated by **Red** arrow in Figure 41.

Due to less prominent wind from Leighton Road traveling towards The Leighton Hill, downwash effect from The Leighton Hill would be more prominent, where slightly higher VR would be observed, illustrated by **Red** circle in Figure 41.

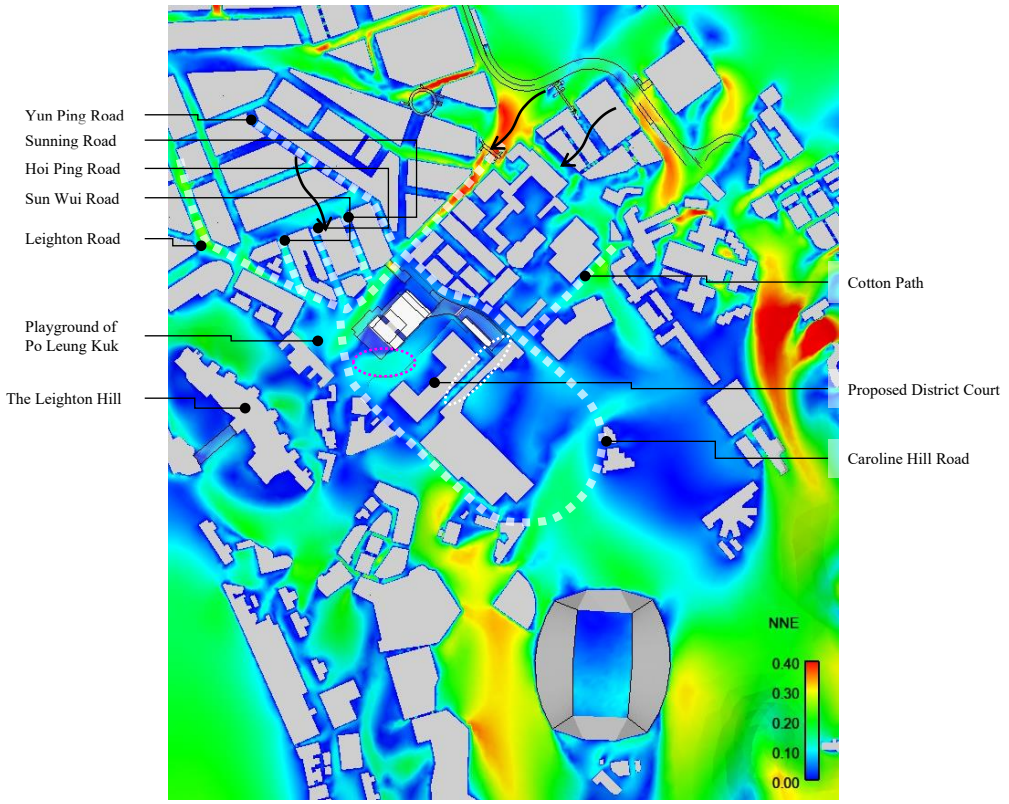


Figure 40 Contour plot of VR of Baseline Scheme under NNE wind

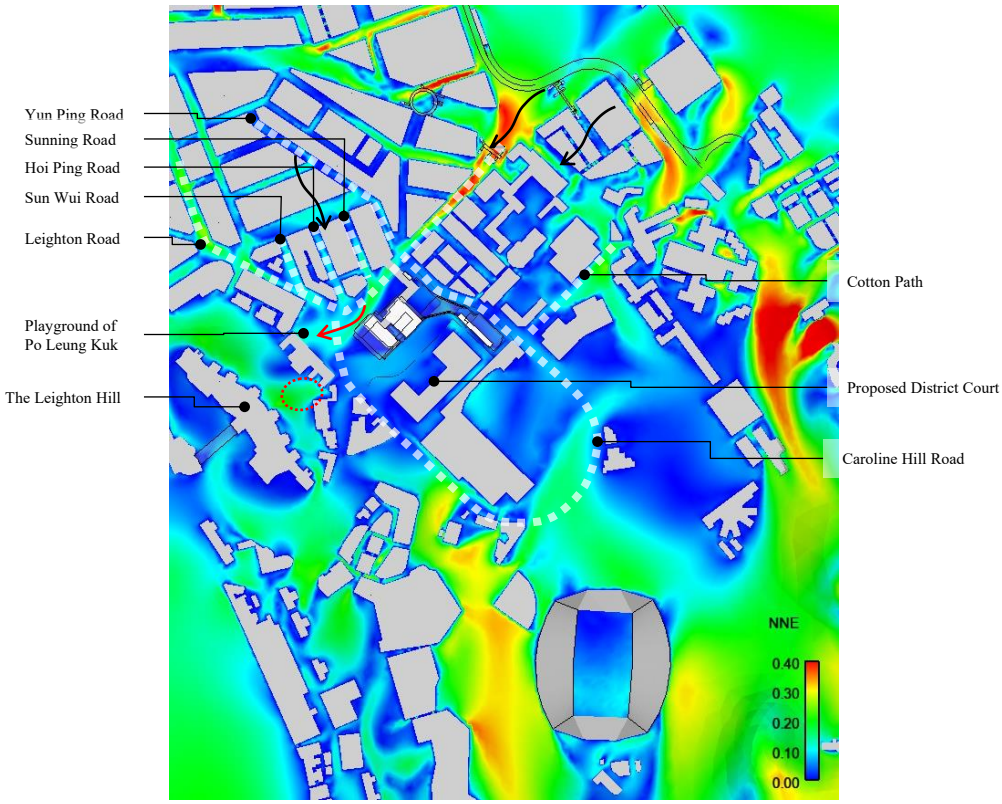


Figure 41 Contour plot of VR of Proposed Scheme under NNE wind

### 5.3.2 NE Wind

The overall wind performance of Baseline and Proposed Schemes under NE wind is presented in Figure 42 and Figure 43 respectively.

The Application Site is located at the leeward side of densely built high-rise developments. Surrounding wind environment is dominated by upwind developments, except for some localized difference around the Application Site.

Due to the surrounding buildings, incoming wind would be diverted to reach the Application from Leighton Road. Some high-level wind would skim over the mid-rise building to reach the Application Site from prevailing wind direction. The incoming wind direction is illustrated by **Black** arrows in Figure 42 and Figure 43 respectively.

Under both Schemes, downwash effect would be observed on T2, T3 and Proposed District Court.

Under Baseline Scheme, due to the larger setback of T1 podium from north-western boundary, incoming wind would continue to travel along north-western site boundary and Leighton Road to ventilate the leeward side, where slightly higher VR Playground of Po Leung Kuk would be observed, illustrated by **Black** circles in Figure 42. While, under Proposed Scheme, the incoming wind would be diverted away from the north-western site boundary to travel along Leighton Road and enter Sun Wui Road and Hoi Ping Road, where slightly higher VR would be observed, illustrated by **Black** circle in Figure 43.

In addition, under Proposed Scheme, the enclosed T2-T3 footbridge would divert some incoming wind to street level, together with the larger T3 building setback from north-eastern site boundary, slightly higher VR on Caroline Hill Road would be observed, illustrated by **White** arrow in Figure 43.

However, the footbridge would also shield some incoming wind from reaching the T2 podium, where slightly lower VR would be observed, illustrated by **White** circle in Figure 43.

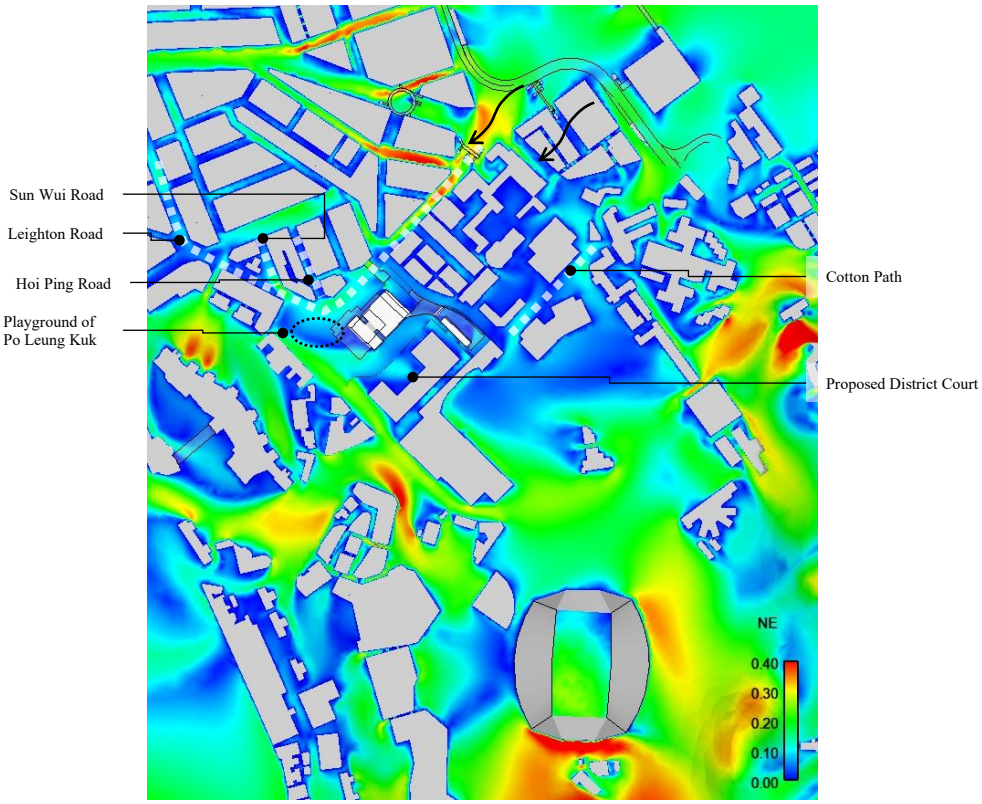


Figure 42 Contour plot of VR of Baseline Scheme under NE wind

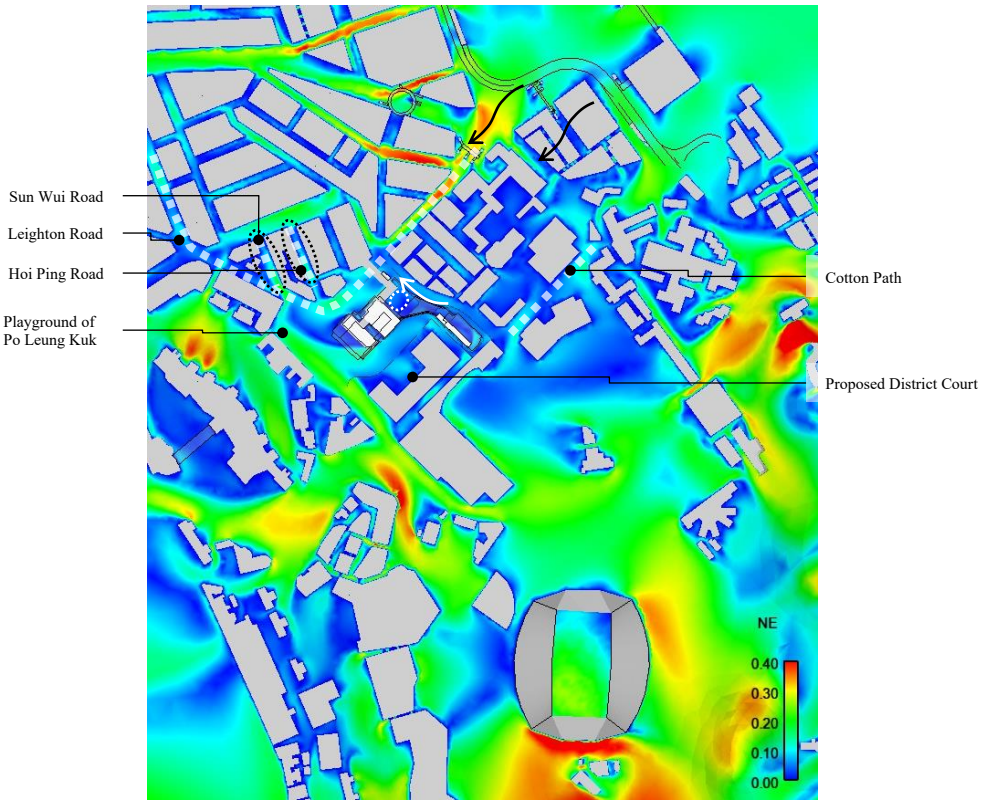


Figure 43 Contour plot of VR of Proposed Scheme under NE wind

### 5.3.3 ENE Wind

The overall wind performance of Baseline and Proposed Schemes under ENE wind is presented in Figure 44 and Figure 45respectively.

The Application Site is located at the leeward side of densely built mid to high-rise developments. Surrounding wind environment is dominated by upwind developments, except for some localized difference around the Application Site.

Due to the surrounding buildings, incoming wind would be diverted to reach the Application from Leighton Road and Cotton Path. Some high-level wind would skim over the mid-rise building to reach the Application Site from north-east. The incoming wind directions are illustrated by **Black** arrows in Figure 44 and Figure 45 respectively.

Under both Schemes, downwash effect would be observed on T2, T3 and Proposed District Court. Under Baseline Scheme, due to larger frontal area of T3 more downwashed wind would be induced to ventilate Proposed District Court, where slightly higher VR would be observed, illustrated by **Red** circle in Figure 44. Under Proposed Scheme, larger T3 core and higher T3 podium would divert downwashed wind from Proposed District Court to ventilate the area under enclosed T2-T3 footbridge, where slightly higher VR would be observed, illustrated by **Red** circle in Figure 45.

Under Baseline Scheme, due to larger south-eastern façade of T2, the downwash effect from T2 would be more prominent. The donwashed wind that reach the T2 podium would further travel to the street level to ventilate Caroline Hill Road, Leighton Road and other streets towards the leeward side. Slightly higher VR would be observed, illustrated by **Blue** arrows in Figure 44.

Under Proposed Scheme, the larger building setback of T2 on podium level allows incoming wind to skim over and ventilate the north-western site boundary, where slightly higher VR would be observed, illustrated by **Blue** arrow in Figure 45.

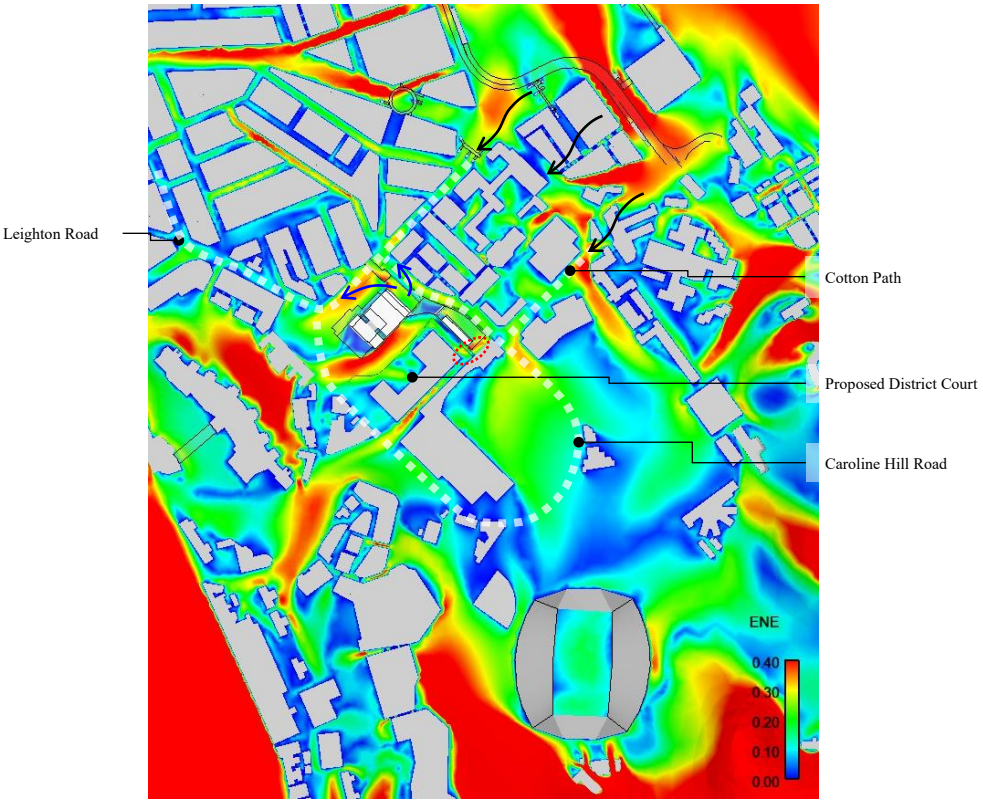


Figure 44 Contour plot of VR of Baseline Scheme under ENE wind

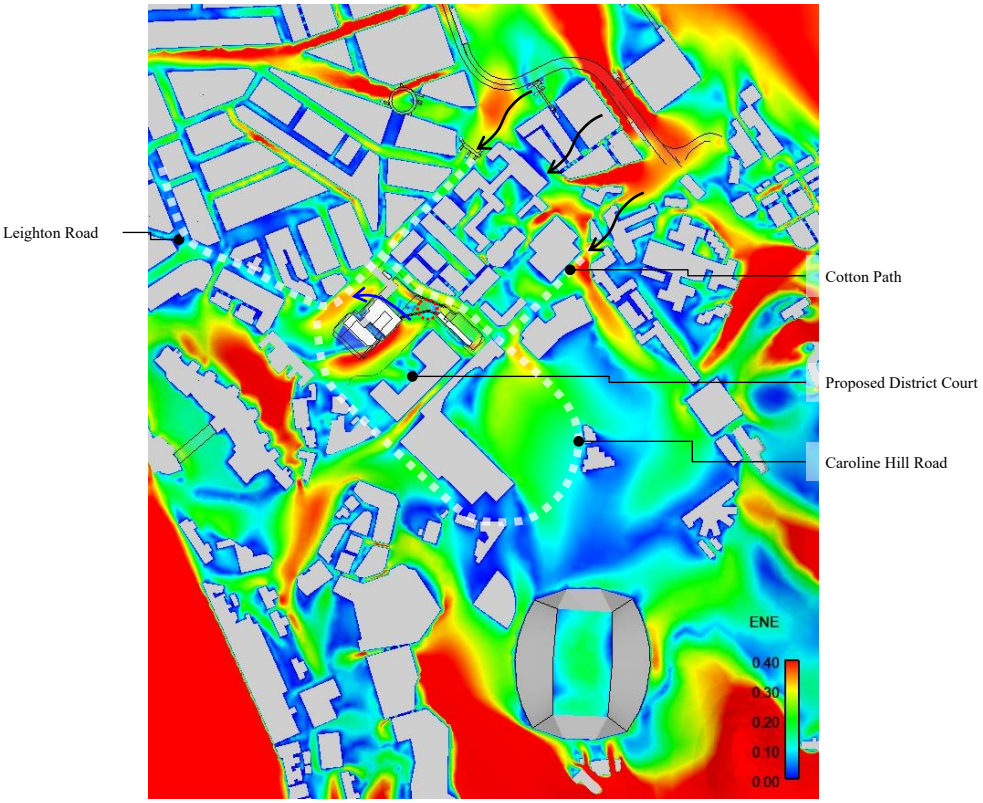


Figure 45 Contour plot of VR of Proposed Scheme under ENE wind

### 5.3.4 E Wind

The overall wind performance of Baseline and Proposed Schemes under E wind is presented in Figure 46 and Figure 47 respectively.

The Application Site is located at the leeward side of mid to high-rise development with hilly terrain of Grandview Mansion on further side. Surrounding wind environment is dominated by upwind developments and hilly terrain, except for some localized difference around the Application Site.

Due to surrounding buildings and hilly terrain, incoming wind would be diverted to reach the Application from Caroline Hill Road and Cotton Path. Some high-level wind would skim over the mid-rise building to reach the Application Site from the north-east direction. The incoming wind directions are illustrated by **Black** arrows Figure 46 and Figure 47 respectively.

Under both Schemes, downwash effect would be observed on T2, T3 and Proposed District Court. Under Baseline Scheme, due to the larger frontal area of T3, more downwashed wind from T3 would ventilate the T3 podium and Caroline Hill Road., slightly higher VR would be observed, illustrated by **Purple** arrow in Figure 46.

Under Proposed Scheme, the setback of T2 enhanced the wind permeability, incoming wind would skim over the T2 podium to ventilate the north-western site boundary and Leighton Road, where slightly higher VR would be observed, illustrated by **Black** circles in Figure 47.

Under Proposed Scheme, the enclosed T2-T3 footbridge would divert some incoming wind towards street level, together with the larger building setback of T3 from north-eastern site boundary, slightly higher VR on Caroline Hill Road would be observed, illustrated by **Red** arrows in Figure 47.

However, the footbridge would also shield incoming wind from reaching the T2 Podium, where slightly lower VR would be observed, illustrated by **Red** circle in Figure 47.

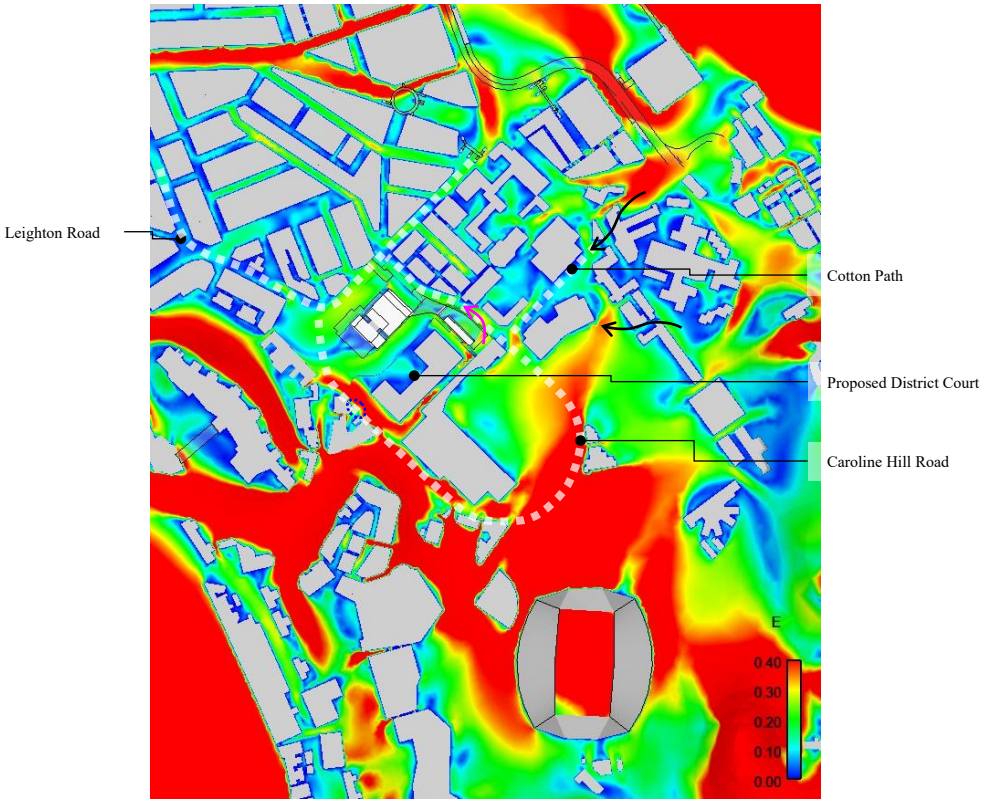


Figure 46 Contour plot of VR of Baseline Scheme under E wind

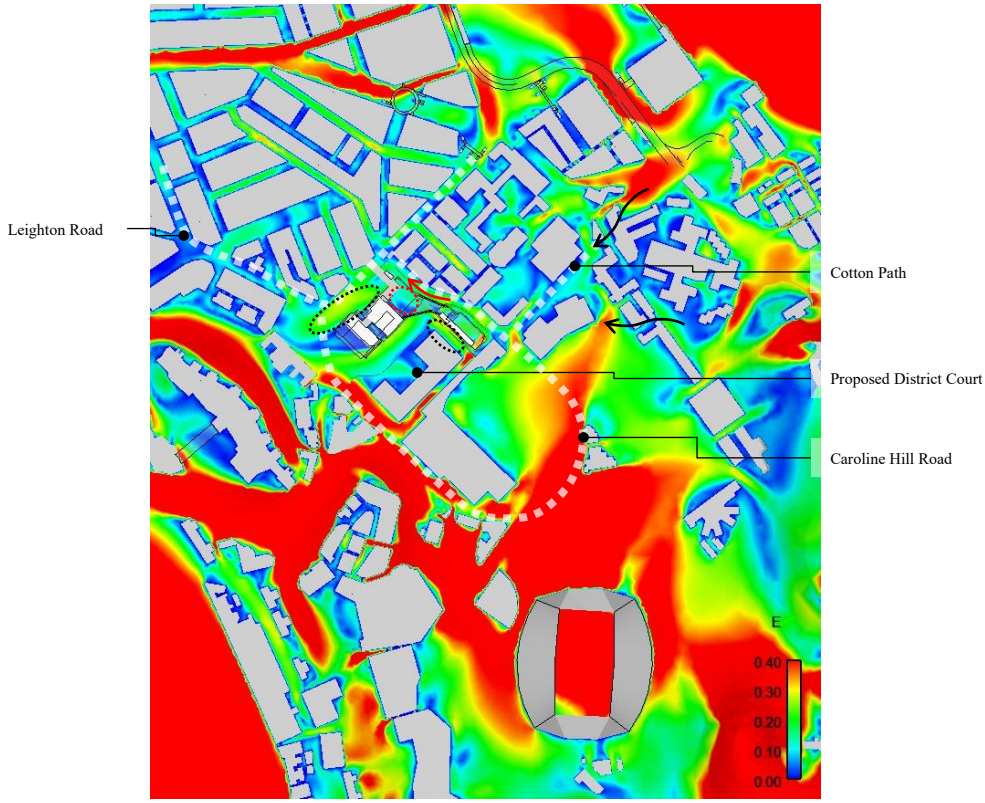


Figure 47 Contour plot of VR of Proposed Scheme under E wind

### 5.3.5 ESE Wind

The overall wind performance of Baseline and Proposed Schemes under ESE wind is presented in Figure 48 and Figure 49 respectively.

The Application Site is located at the leeward side of mid-rise building and open space provided by recreational area with hilly terrain of Grandview Mansion on further side, Also T1&T2 are partially shield by Proposed District Court. Surrounding wind environment is dominated by upwind developments and hilly terrain, except for some localized difference around the Application Site.

Due to the surrounding building and hilly terrain, incoming wind would be diverted to reach the Application from Caroline Hill Road. Some high-level wind would skim over the mid-rise building to reach the Application Site from prevailing wind direction. The incoming wind directions are illustrated by **Black** arrows Figure 48 and Figure 49 respectively.

Under both Schemes, downwash effect would be observed on T1, T2, T3 and Proposed District Court. Under Baseline Scheme, due to larger frontal area of T3 more downwashed wind would be induced to ventilate the T3 podium, where slightly higher VR would be observed, illustrated by **Blue** circle in Figure 48.

Also, the larger frontal area of T2 and T3 would induce more prominent downwash effect to ventilate the Access Riad within Application Site and Caroline hill road, where slightly higher VR would be observed, illustrated by **Blue** arrows in Figure 48.

Under Proposed Scheme, the Internal Street of T1 on G/F would divert incoming wind to further ventilate the Hoi Ping Road, where slightly higher VR would be observed, illustrated by **Blue** arrow in Figure 49.

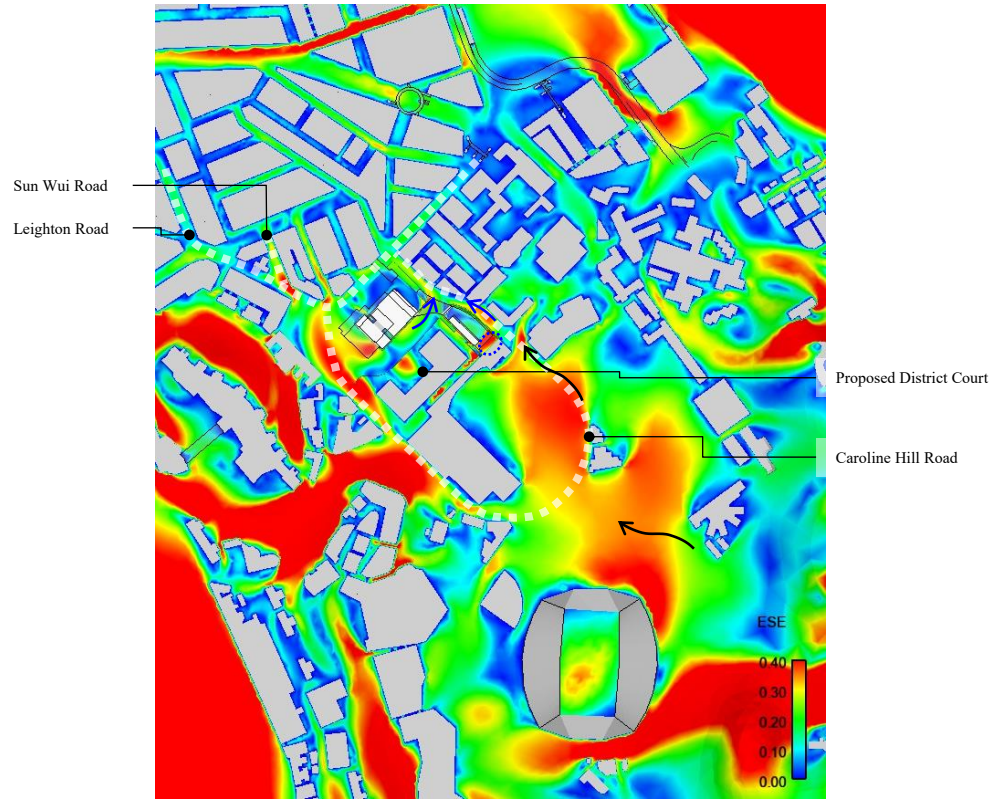


Figure 48 Contour plot of VR of Baseline Scheme under ESE wind

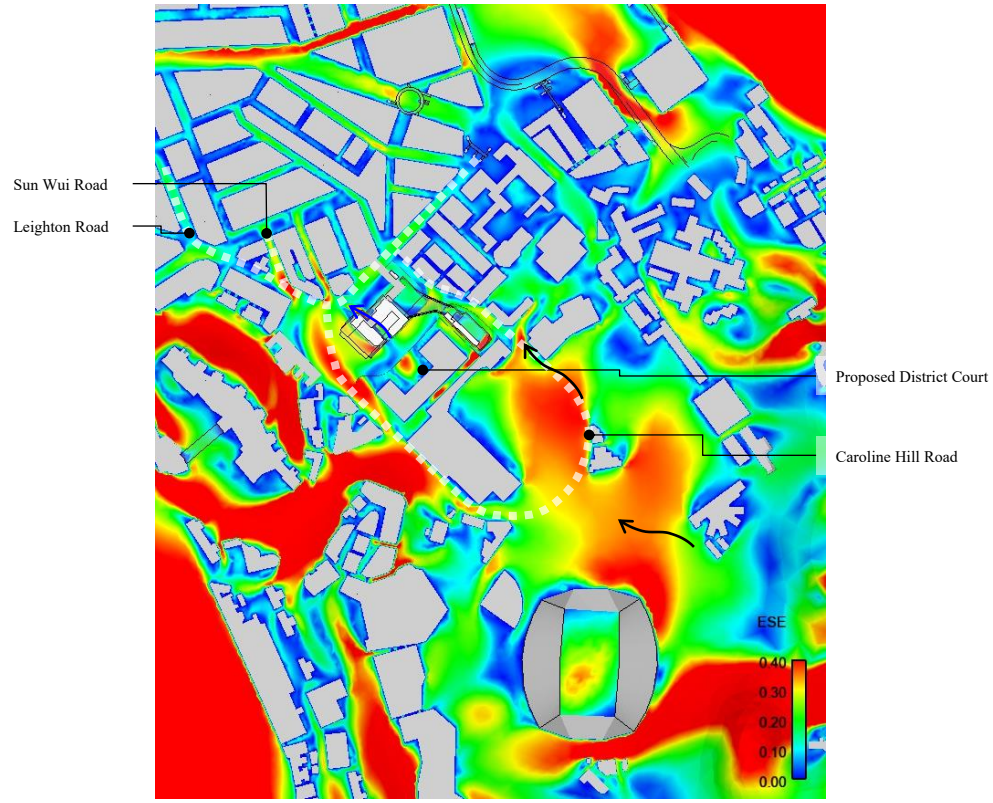


Figure 49 Contour plot of VR of Proposed Scheme under ESE wind

### 5.3.6 SE Wind

The overall wind performance of Baseline and Proposed Schemes under SE wind is presented in Figure 50 and Figure 51 respectively.

The Application Site is located at the leeward side of South China Stadium and open space provided by recreational area with hilly terrain on further side. Also, T1&T2 are shielded by Proposed District Court. Surrounding wind environment is dominated by upwind developments and hilly terrain, except for some localized difference around the Application Site.

Due to the hilly terrain and surrounding buildings, incoming wind would be diverted to reach the Application from Caroline Hill Road. Some high- level wind would reach the T3 from prevailing wind direction with relatively low obstruction. The incoming wind direction is illustrated by **Black** arrows Figure 50 and Figure 51 respectively.

Under both Schemes, downwash effect would be observed on T3 and Proposed District Court. Under Baseline Scheme, due to the larger frontal area of T3 more downwashed wind would be induced to ventilate the T3 podium and to further ventilate the streets at the leeward side such as St. Paul's Convent. Slightly higher VR would be observed, illustrated by **Blue** arrow in Figure 50.

Under Proposed Scheme, the enclosed T2-T3 footbridge would divert the incoming wind to the street level, together with the larger building setback of T3 from north-eastern site boundary, slightly higher VR on Access Road within Application Site would be observed, illustrated by **White** arrow in Figure 51.

However, the footbridge would also shield the T2 podium, where slightly lower VR would be observed, illustrated by **White** circle in Figure 51.

Under Proposed Scheme, the larger building setback of T2 allows incoming wind to skim over the T2 podium and ventilate Leighton Road and Sunning Road, where slightly higher VR can be observed, illustrated by **Red** arrow in Figure 51.

Due to the smaller frontal area of T3 under Proposed Scheme, more mid and high level winds would be diverted towards Lok Sing Centre at the far leeward side, and induce more prominent downwash effect to ventilate the Gloucester Road and Yee Wo Stret, where slightly higher VR would be observed, illustrated by **Blue** circles in Figure 51.

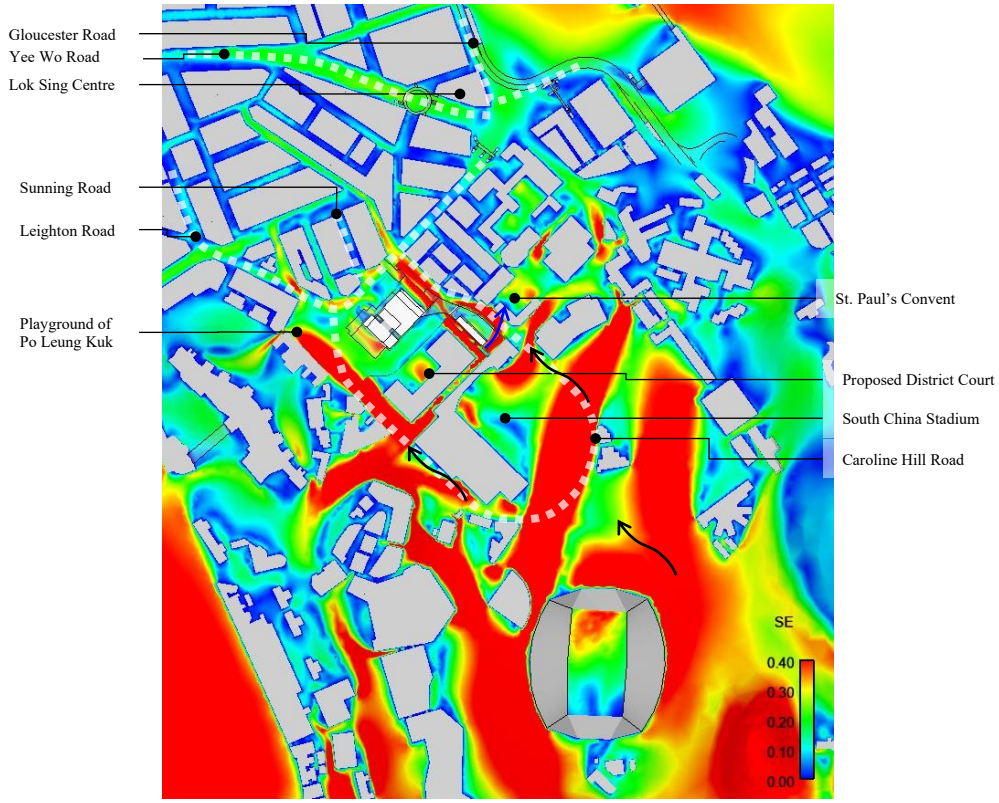


Figure 50 Contour plot of VR of Baseline Scheme under SE wind

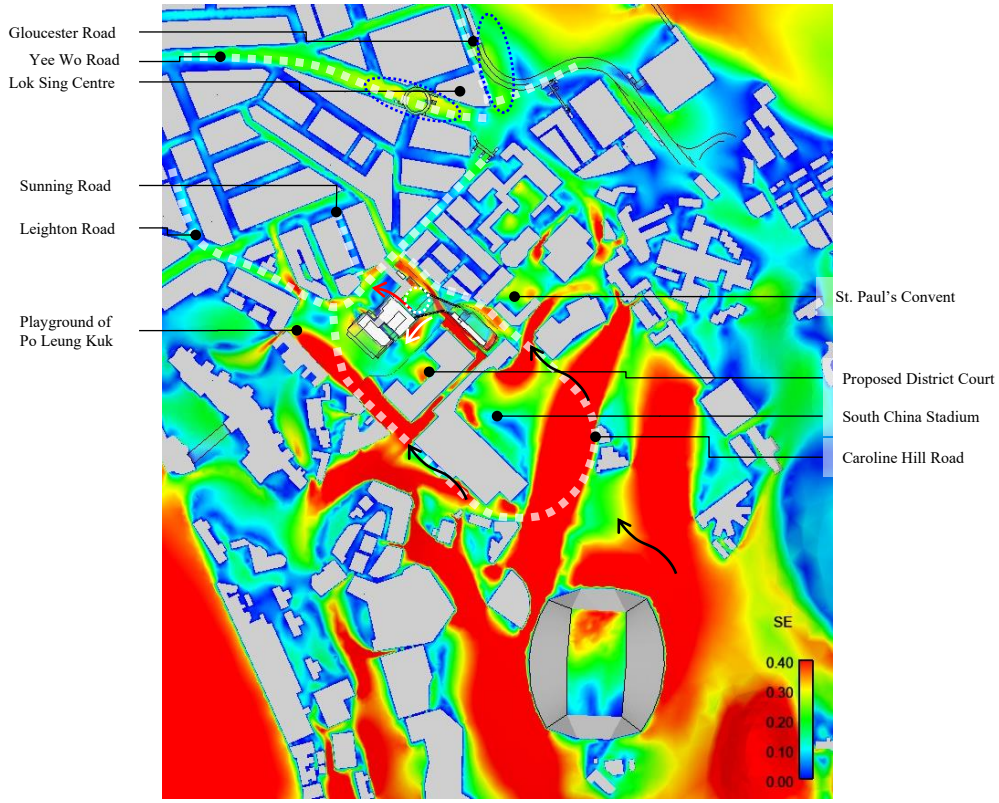


Figure 51 Contour plot of VR of Proposed Scheme under SE wind

### 5.3.7 SSE Wind

The overall wind performance of Baseline and Proposed Schemes under SSE wind is presented in Figure 52 and Figure 53 respectively.

The Application Site is located at the leeward side of Hong Kong Stadium and hilly terrain on further side. Also, T1&T2 are shielded and T3 are partially shielded by Proposed District Court respectively. Surrounding wind environment is dominated by upwind developments and hilly terrain, except for some localized difference around the Application Site.

Due to the hilly terrain, incoming wind would reach the Application from Caroline Hill Road. Some high-level wind would skim over the Hong Kong Stadium and open space to reach the T3 from prevailing wind direction. The incoming wind directions are illustrated by **Black** arrows in Figure 52 and Figure 53 respectively.

Under both Schemes, downwash effect would be observed on T3 and Proposed District Court. Under Baseline Scheme, due larger frontal area of T3 more downwashed wind would be induced to ventilate the T3 podium, where slightly higher VR would be observed, illustrated by **Black** circle in Figure 52.

Also, under Baseline Scheme, the larger façade of T2 would divert some high-level towards Access Road within Application Site and Elevated Design of T1 on G/F, where slightly higher VR would be observed, illustrated by **Red** circle in Figure 52.

Under Proposed Scheme, the larger building setback of T2 allows incoming wind to skim over the T2 podium and ventilate the Leighton Road and Yun Ping Road, where slightly higher VR can be observed, illustrated by **Red** arrow in Figure 53.

In addition, the enclosed T2-T3 footbridge would divert the incoming wind to the street level, together with the larger building setback of T3 from north-eastern site boundary, slightly higher VR on Access Road within Application Site and Caroline Hill Road would be observed, illustrated by **White** arrow in Figure 53.

However, the footbridge would also shield the podium of T2 where slightly lower VR would be observed, illustrated by **White** circle in Figure 53.

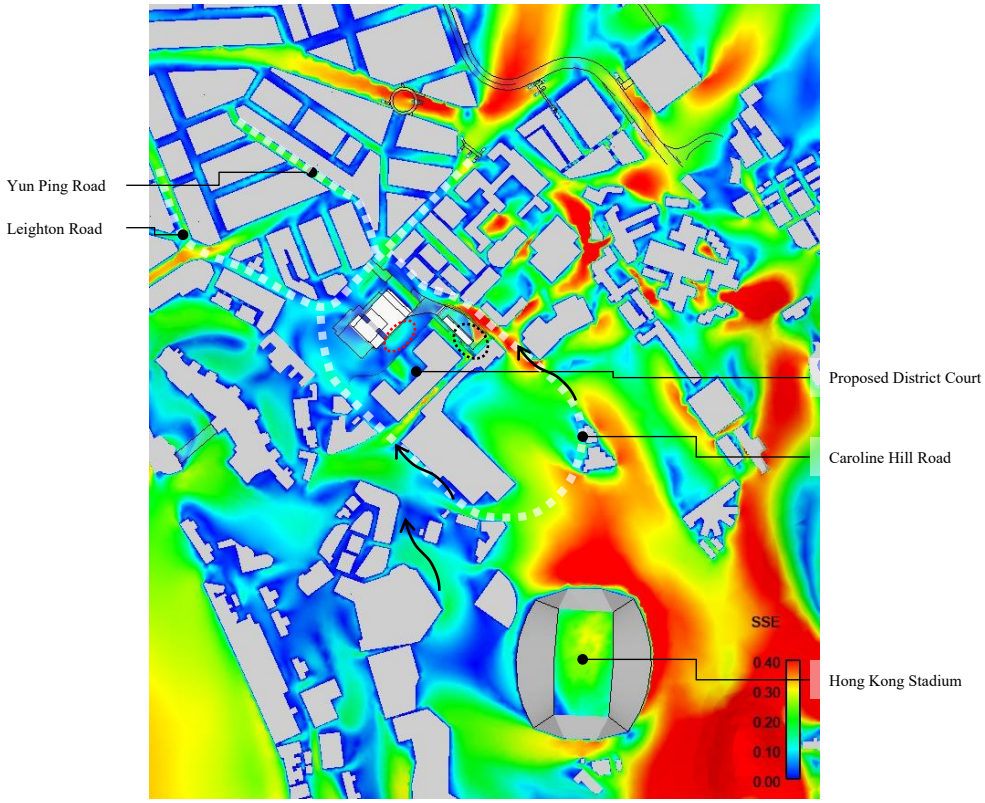


Figure 52 Contour plot of VR of Baseline Scheme under SSE wind

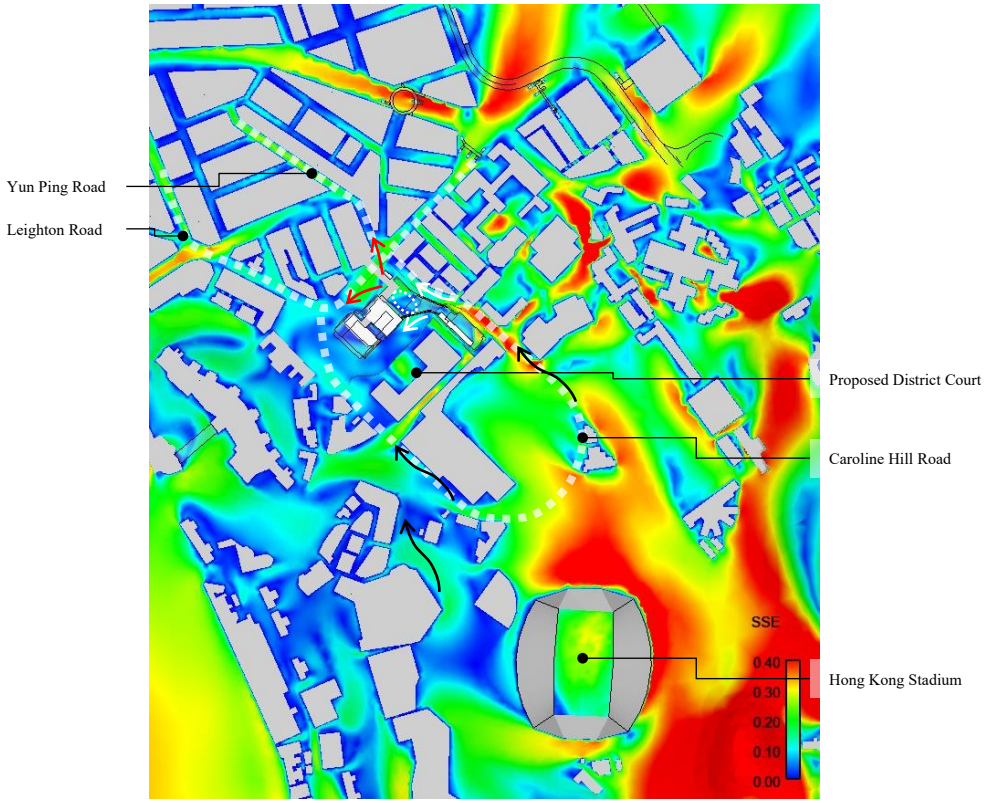


Figure 53 Contour plot of VR of Proposed Scheme under SSE wind

### 5.3.8 S Wind

The overall wind performance of Baseline and Proposed Schemes under S wind is presented in Figure 54 and Figure 55 respectively.

The Application Site is located at the leeward side Beverly Hill. Also, T1, T2 and T3 are partially shielded by Proposed District Court. Surrounding wind environment is relatively calm and dominated by upwind developments and hilly terrain, except for some localized difference around the Application Site.

Due to the upwind developments and hilly terrain, incoming wind would be diverted to reach the Application from Caroline Hill Road, Leighton Road and Yun Ping Road. Some high-level wind would flow around Beverly Hill to reach the T3 from prevailing wind direction. The incoming wind directions are illustrated by **Black** arrows Figure 54 and Figure 55 respectively.

Under both Schemes, downwash effect would be observed on T1 and Proposed District Court.

Under both Schemes, incoming wind from northern Caroline Hill Road would recirculate toward the Access Road within Application Site to recover the wind shadow. Under Baseline Scheme, the incoming wind would enter the Access Road within Application Site. While under Proposed Scheme, the enclosed T2-T3 footbridge and larger building setback of T3 from north-eastern site boundary would divert the incoming wind to travel along Caroline Hill Road, where different in ventilation pattern would be observed, illustrated by **Red** arrow in Figure 54 and Figure 55 respectively.

Under Proposed Scheme, due to smaller podium setback of T1 from north-western boundary, incoming wind from Leighton Road would be diverted towards Hoi Ping Road, where slightly higher VR would be observed, illustrated by **White** arrow in Figure 55.

However, it would shield the Caroline Hill Road on the leeward side, where slightly higher VR would be observed, illustrated by **Red** circle in Figure 55.

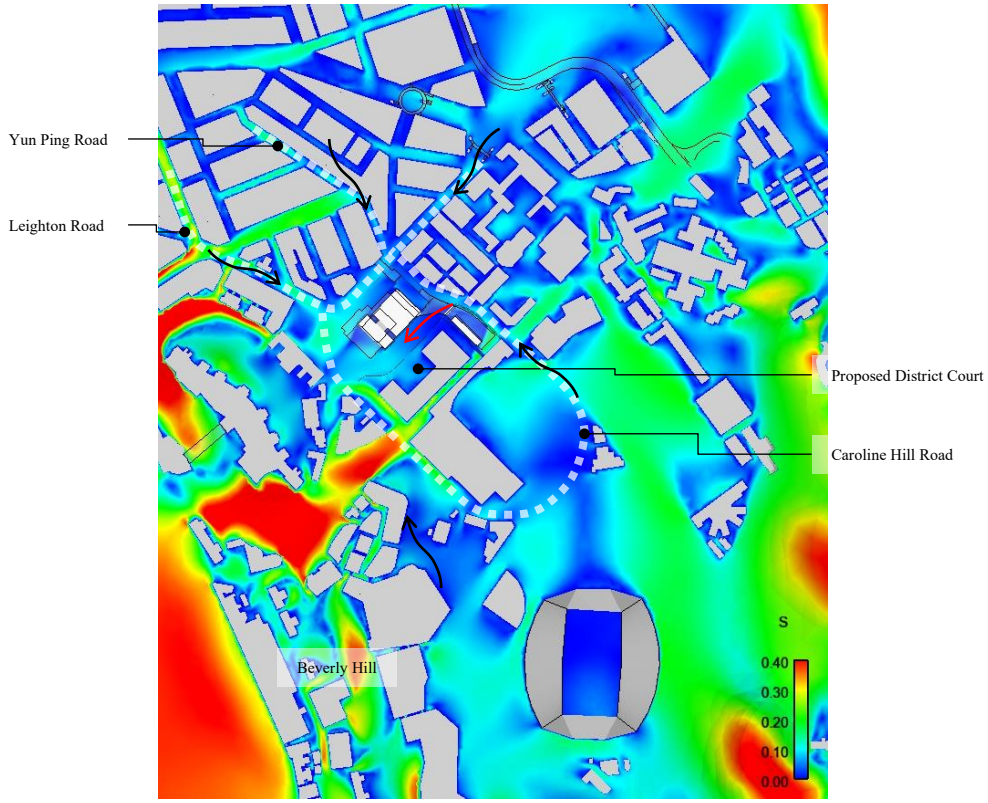


Figure 54 Contour plot of VR of Baseline Scheme under S wind

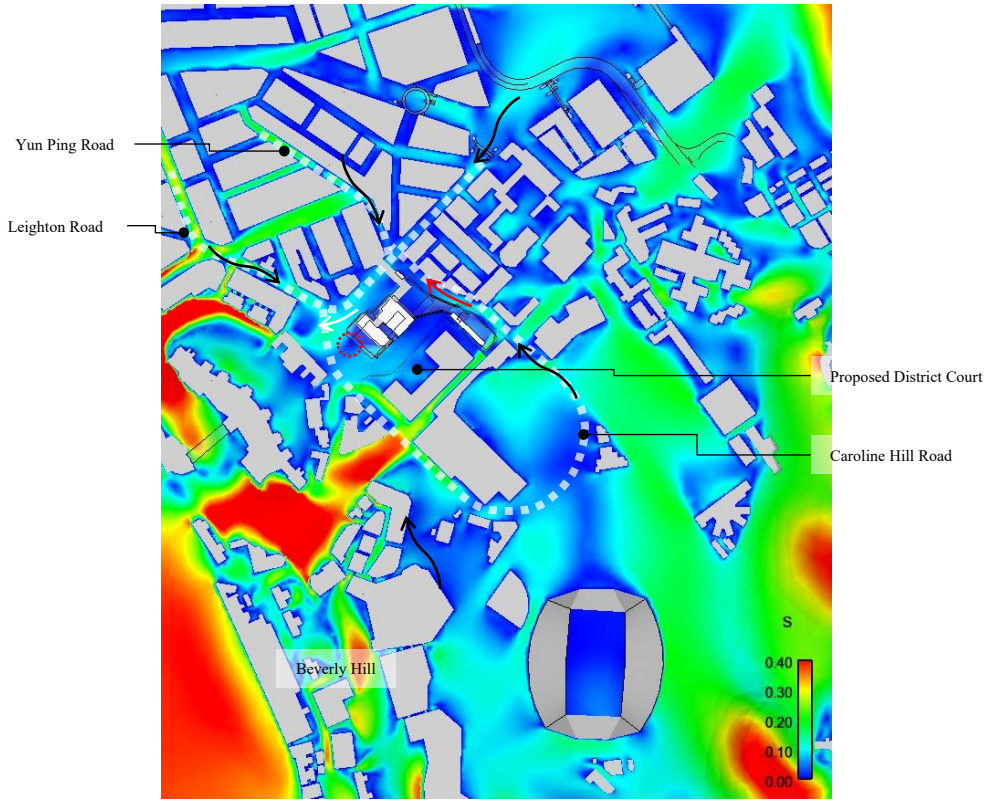


Figure 55 Contour plot of VR of Proposed Scheme under S wind

### 5.3.9 SSW Wind

The overall wind performance of Baseline and Proposed Schemes under SSW wind is presented in Figure 56 and Figure 57 respectively.

The Application Site is located at the leeward side Beverly Hill. Also, T1, T2 and T3 are partially shielded by Proposed District Court. Surrounding wind environment is relatively calm and dominated by upwind developments and hilly terrain, except for some localized difference around the Application Site.

Due to the upwind developments and hilly terrain, incoming wind would be diverted to reach the Application from Caroline Hill Road, Leighton Road and Yun Ping Road. Some high-level wind would reach the T3 from prevailing wind direction. The incoming wind directions are illustrated by **Black** arrows Figure 56 and Figure 57 respectively.

Under both Schemes, downwash effect would be observed on T1 and Proposed District Court. Under Baseline Scheme, due to the smaller T3 core, incoming wind from Caroline Hill Road would pass through the T3 podium to ventilate the Proposed District Court podium, where slightly higher VR would be observed, illustrated by **Black** circle in Figure 56.

Under Baseline Scheme, permeable T2-T3 footbrige allows incoming wind to pass through and ventilate the leeward side where slightly higher VR on Caroline Hill Road would be observed, illustrated by **Red** arrow in Figure 56.

Under Proposed Scheme, larger building setback of T3 from north-eastern site boundary and larger T3 core channel more incoming wind from Caroline Hill Road into enclosed T2-T3 footbridge to ventilate T2 podium, where slightly lower VR would be observed, illustrated by **Red** arrow in Figure 57.

In addition, Internal Street of T1 on G/F and protruded T2 podium would divert incoming wind to flow from Access Road within Application Site to north-western site boundary, where slightly higher VR would be observed, illustrated by **Purple** arrow in Figure 57.

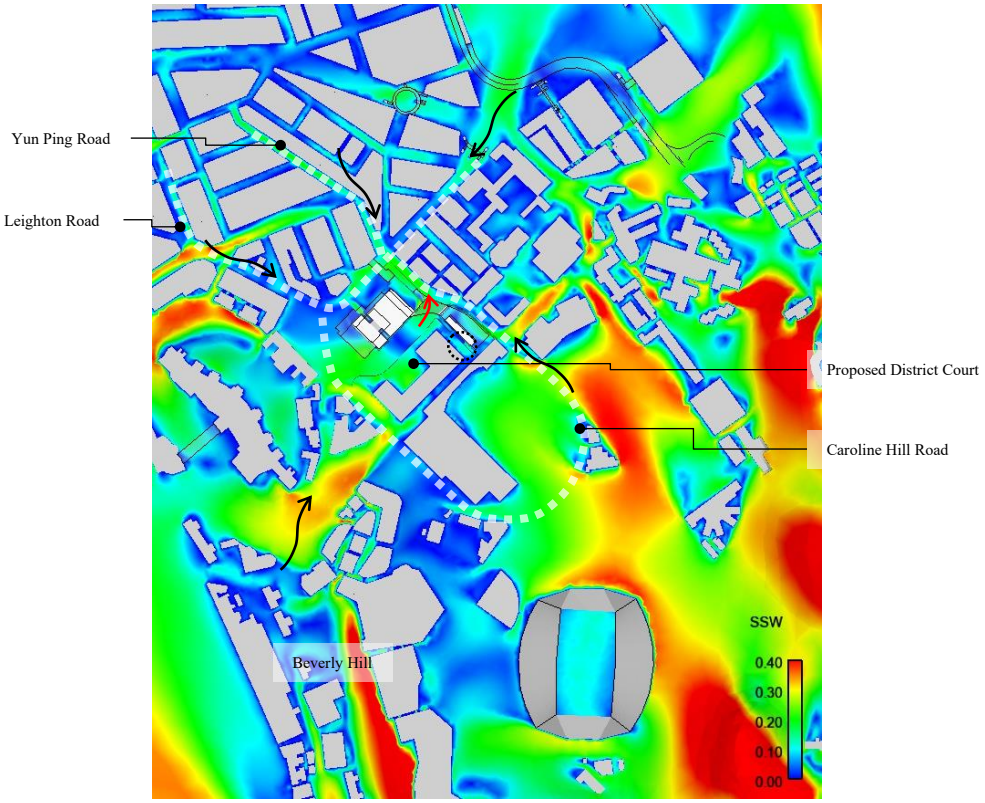


Figure 56 Contour plot of VR of Baseline Scheme under SSW wind

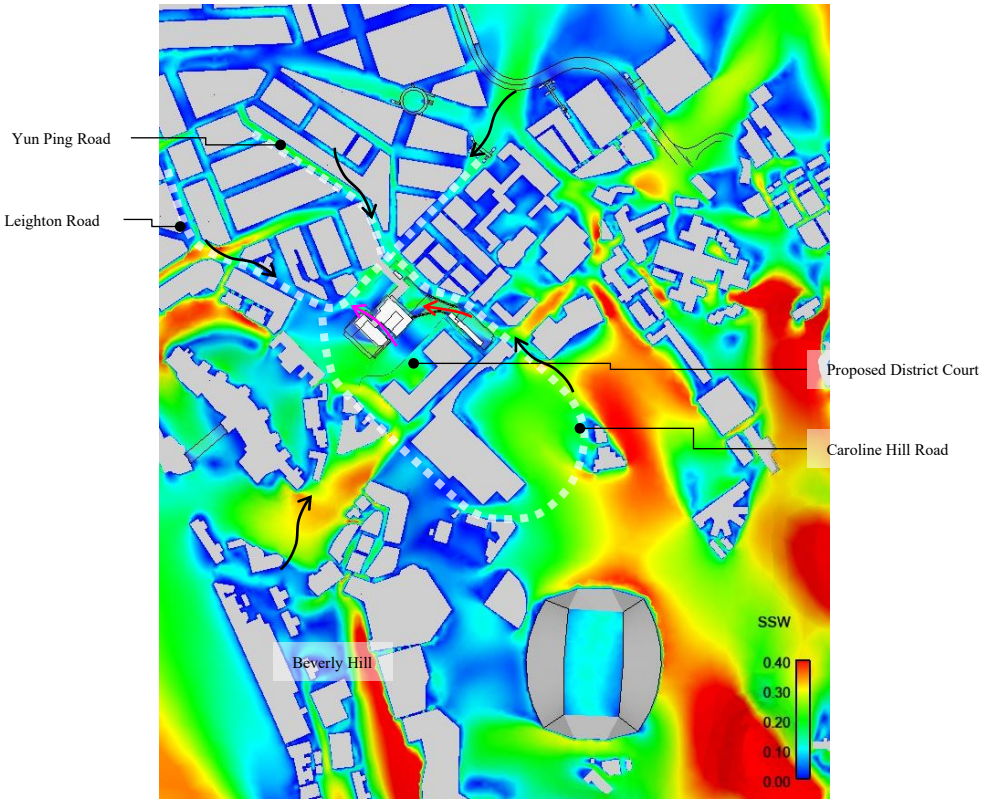


Figure 57 Contour plot of VR of Proposed Scheme under SSW wind

### 5.3.10 SW Wind

The overall wind performance of Baseline and Proposed Schemes under SW wind is presented in Figure 58 and Figure 59 respectively.

The Application Site is located at the leeward side of density built mid to high-rise developments at higher elevation. T1 and T2 are shielded by The Leighton Hill, while T3 is shielded by Proposed District Court. Surrounding wind environment is dominated by upwind developments and hilly terrain, except for some localized difference around the Application Site.

Due to the upwind developments and hilly terrain, incoming wind would be diverted to reach the application site from Leighton Road, Hoi Ping Road, Sunning Road, Yun Ping Road and Caroline Hill Road. Some high-level wind would skim over the mid-rise buildings to reach the T1 from prevailing wind direction. The incoming wind directions are illustrated by **Black** arrows in Figure 58 and Figure 59 respectively.

Under both Schemes, downwash effect would be observed on Proposed District Court. Under Baseline Scheme, due to the smaller T3 core the downwashed wind from Proposed District Cour would travel towards T3 podium, where slightly higher VR would be observed, illustrated by **Black** circle in Figure 58.

However, the air stream would continue to travel towards St. Paul's Convent and limit the incoming wind from Cotton Path, where slightly lower VR would be observed, illustrated by **Red** circle in Figure 58.

On other hand, under Proposed Scheme, due to less prominent air stream traveling from Proposed District Court to T3 podium, together with larger building setback of T3 from north-eastern site boundary, more incoming wind from Caroline Hill Road would reach the T3 podium, where slightly lower VR would be observed, illustrated by. **Purple** circle in Figure 59.

Under Baseline Scheme, mid-level incoming wind from Yun Ping Road and Pennington Street would flow through the T2-T3 footbridge and ventilate the Access Road within Application Site, where slightly higher VR would be observed, illustrated by **Purple** arrow in Figure 58.

Under both Scheme, incoming wind from Yun Ping Road and Pennington Street would travel along north-western site boundary. Under Baseline Scheme, due to larger setback of T1 podium from north-western site boundary, the incoming wind would continue to travel to ventilate the Elevated Design of T1 on G/F. While under Proposed Scheme, Internal Street of T1 on G/F and protruded T1 podium would divert incoming wind towards Access Road within Application Site. Where different in ventilation pattern would be observed, illustrated by **Red** arrow in Figure 58 and Figure 59 respectively.

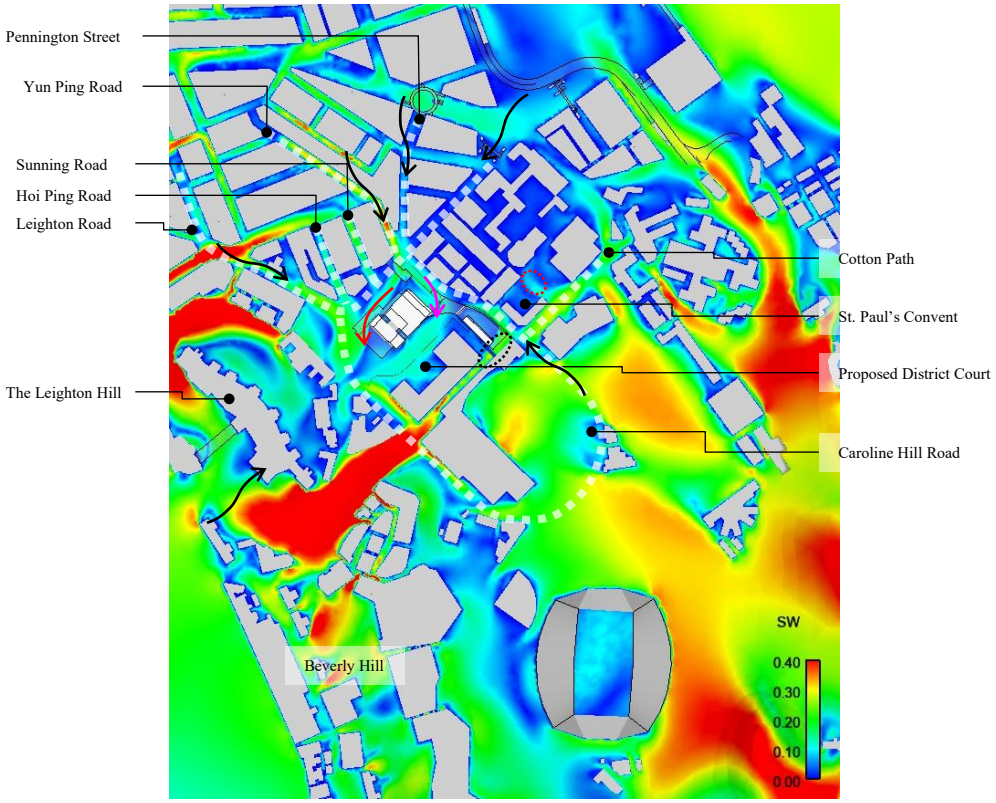


Figure 58 Contour plot of VR of Baseline Scheme under SW wind

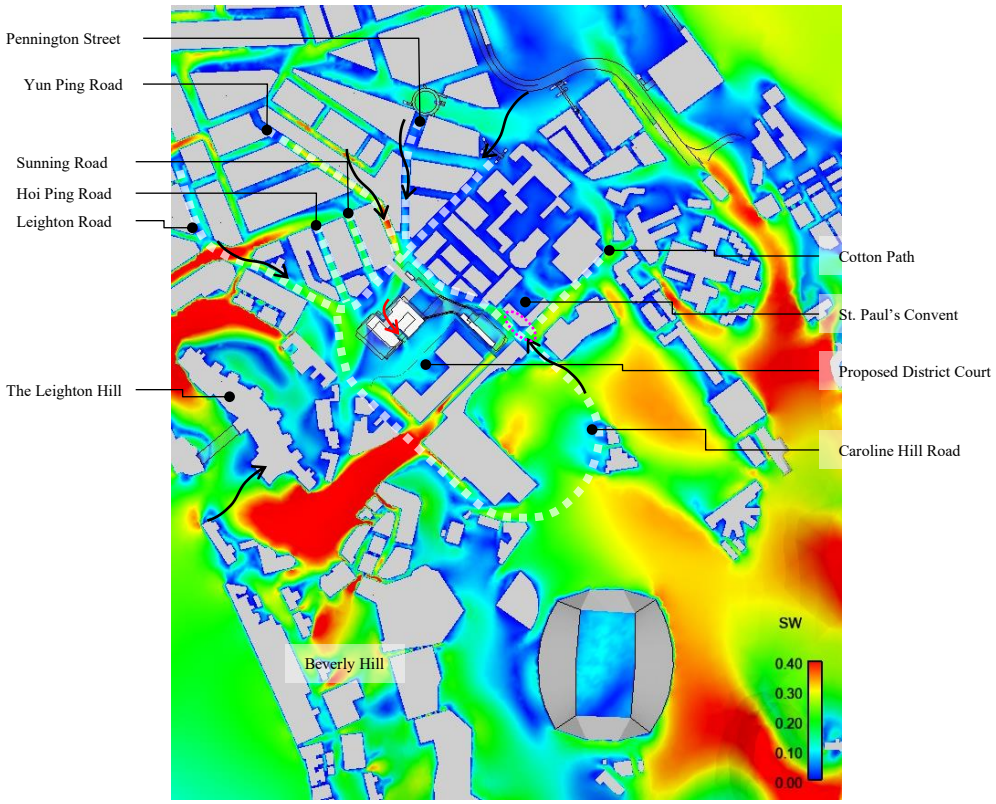


Figure 59 Contour plot of VR of Proposed Scheme under SW wind

### 5.3.11 WSW Wind

The overall wind performance of Baseline and Proposed Schemes under WSW wind is presented in Figure 60 and Figure 61 respectively.

The Application Site is located at the leeward side of density built mid to high-rise developments at higher elevation. T1 and T2 are shielded by The Leighton Hill, while T3 is shielded by Proposed District Court. Surrounding wind environment is dominated by upwind developments and hilly terrain, except for some localized difference around the Application Site.

Due to the upwind developments and hilly terrain, incoming wind would be diverted to reach the application site from Leighton Road, Hoi Ping Road, Sunning Road, Yun Ping Road, Pennington Street and Caroline Hill Road. The incoming wind directions are illustrated by **Black** arrows in Figure 60 and Figure 61 respectively.

Under Baseline Scheme, the incoming wind traveling along the building separation between Proposed District Court and South China Stadium would continue to ventilate the T3 podium due smaller T3 core, where slightly higher VR would be observed, illustrated by **Black** circle in Figure 60.

Under Baseline Scheme, mid-level incoming wind from Yun Ping Road and Pennington Street would flow through the T2-T3 footbridge and ventilate the Access Road within Application Site, where slightly higher VR would be observed, illustrated by **Purple** arrow in Figure 60.

Under Proposed Scheme, the incoming wind from Yun Ping Road and Pennington Street would be channelled by the enclosed T2-T3 footbridge to ventilate the podium of T3 where slightly higher VR would be observed, illustrated by **Purple** arrow in Figure 61.

Under Proposed Scheme, due to the wider separation of Internal Street of T1 on G/F, more incoming wind from Leighton Road, Hoi Ping Road and Sunning Road would enter to ventilate the Access Road within the Application Site, where slightly higher VR would be observed, illustrated by **Red** arrow in Figure 61.

Under Proposed Scheme, less setback of T1 podium from north-western site boundary, the incoming wind from Hoi Ping Road would be limited towards the Elevated Design of T1 on G/F and Caroline Hill Road, where slightly lower VR would be observed, illustrated by **Black** circle in Figure 61.

However, more wind would be diverted towards the Caroline Hill Road where slightly higher VR would be observed, illustrated by **Blue** arrow in Figure 61.

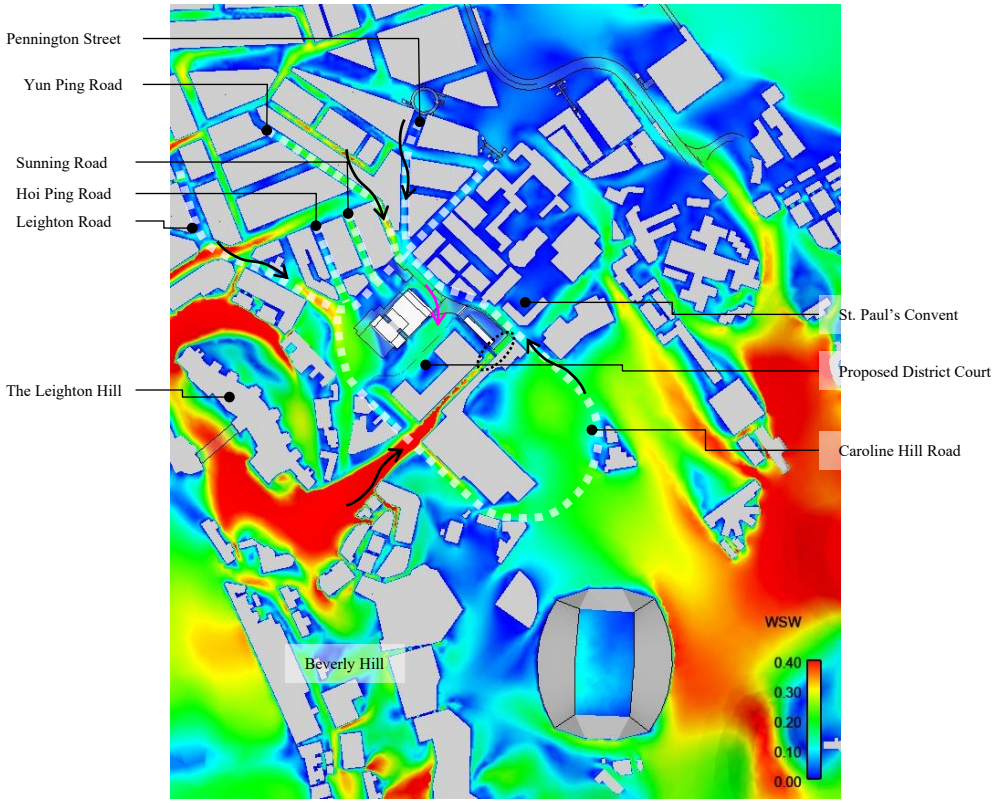


Figure 60 Contour plot of VR of Baseline Scheme under WSW wind

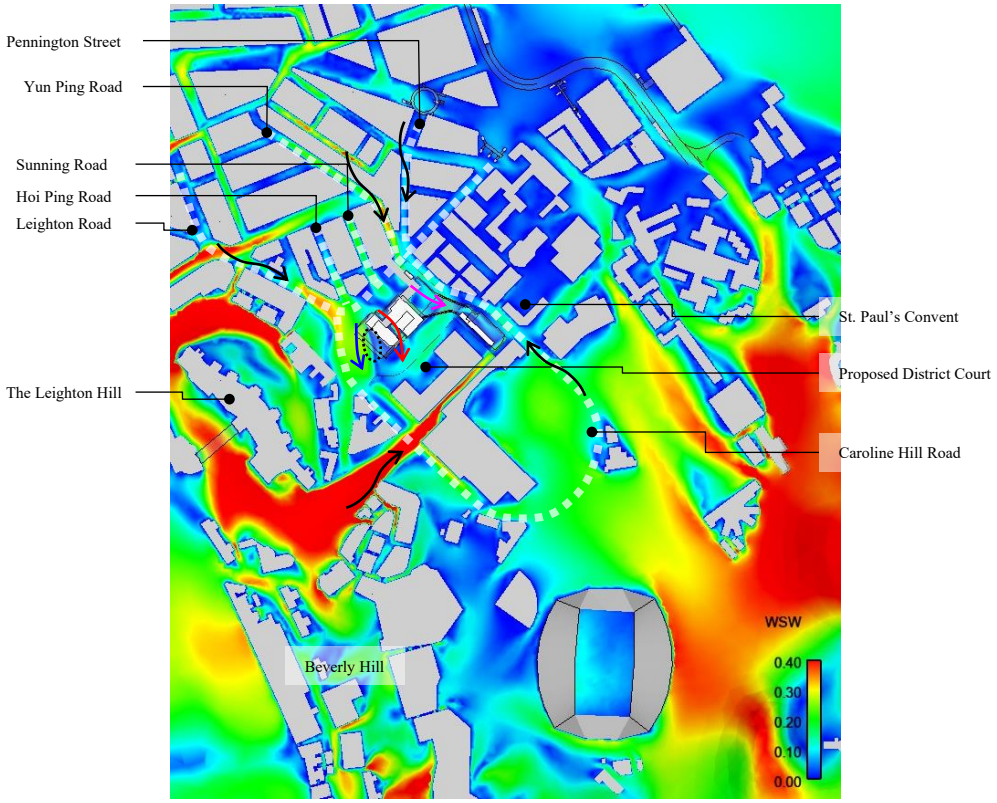


Figure 61 Contour plot of VR of Proposed Scheme under WSW wind

### 5.3.12 SVR and LVR

The average Velocity Ratios of all test points are determined and extracted. The results of all test points are presented in Appendix E. According to the *AVA Technical Circular*, the Velocity Ratio (VR) at each test point is assessed and the SVR and the LVR under the annual and summer conditions are determined and reported to assess the impact of Proposed Scheme to the wind environment, comparing Baseline Scheme. The SVR and LVR value of the test points are summarized as follows:

Table 7 Annual SVR and LVR for Baseline and Proposed Schemes

| | **Baseline Scheme** | **Proposed Scheme** |
|---|---|---|
| **SVR** | 0.16 | 0.15 |
| **LVR** | 0.19 | 0.19 |

Table 8 Summer SVR and LVR for Baseline and Proposed Schemes

| | **Baseline Scheme** | **Proposed Scheme** |
|---|---|---|
| **SVR** | 0.14 | 0.14 |
| **LVR** | 0.18 | 0.18 |

The result indicates that, due to the densely built-up area and hilly terrain in surrounding areas, both Scheme would achieve similar ventilation performance along the Application Site boundary and in the Surrounding Area, under annual and summer conditions.

## 5.4 Focus Areas

Within the Assessment Area and Application Site given in Figure 19 to Figure 21 respectively, a total of 51 focus areas are proposed. The associated test points and averaged VR for focus areas are tabulated in Table 9.

Table 9 Focus Areas and Corresponding Test Points

| | **Focus Area** | **Annual Condition** | | **Summer Condition** | |
|---|---|---|---|---|---|
| | | **Baseline** | **Proposed** | **Baseline** | **Proposed** |
| 1 | Yee Wo Street | 0.23 | 0.23 | 0.18 | 0.18 |
| 2 | Fung Un Street | 0.11 | 0.11 | 0.10 | 0.10 |
| 3 | Jardine's Bazaar | 0.21 | 0.21 | 0.13 | 0.13 |
| 4 | Jardine's Crescent | 0.12 | 0.12 | 0.14 | 0.14 |
| 5 | Yun Ping Road | 0.19 | 0.19 | 0.20 | 0.20 |
| 6 | Lan Fong Road | 0.17 | 0.17 | 0.13 | 0.13 |
| 7 | Lee Garden Road | 0.10 | 0.10 | 0.14 | 0.14 |
| 8 | Hysan Avenue | 0.15 | 0.15 | 0.20 | 0.20 |
| 9 | Sun Wui Road | 0.13 | 0.13 | 0.17 | 0.17 |
| 10 | Hoi Ping Road | 0.13 | **0.14** | 0.14 | 0.14 |
| 11 | Leighton Lane | 0.18 | 0.18 | 0.21 | 0.21 |
| 12 | Sunning Road | 0.12 | **0.13** | 0.12 | **0.13** |
| 13 | Playground of Po Leung Kuk | 0.13 | 0.13 | 0.12 | 0.12 |
| 14 | Leighton Hill Road | 0.30 | 0.30 | 0.22 | 0.22 |

| | | | | | |
|---|---|---|---|---|---|
| 15 | Link Road | 0.27 | 0.27 | 0.27 | 0.27 |
| 16 | Elevated Road to Bevely Hill | 0.35 | 0.35 | 0.30 | 0.30 |
| 17 | Happy View Terrace | 0.20 | 0.20 | 0.21 | 0.21 |
| 18 | Broadwood Road | 0.42 | 0.42 | 0.39 | 0.39 |
| 19 | Rest Garden on Broadwood Road | 0.11 | 0.11 | 0.17 | 0.17 |
| 20 | Road south of Beverly Hill | 0.30 | 0.30 | 0.29 | 0.29 |
| 21 | Confucius Hall Secondary School | 0.26 | 0.26 | 0.15 | 0.15 |
| 22 | Stadium Path | 0.21 | 0.21 | 0.17 | 0.17 |
| 23 | Hong Kong Stadium | 0.28 | 0.28 | 0.23 | 0.23 |
| 24 | Eastern Hospital Road Sitting-out Area 1 | 0.28 | 0.28 | 0.28 | 0.28 |
| 25 | Easter Hospital Road | 0.21 | 0.21 | 0.26 | 0.26 |
| 26 | Tung Wah Eastern Hospital | 0.11 | 0.11 | 0.14 | 0.14 |
| 27 | Indian Recreation Club | 0.27 | 0.27 | 0.30 | 0.30 |
| 28 | Caroline Hill Road | **0.20** | 0.19 | **0.20** | 0.19 |
| 29 | Eastern Hospital Road Sitting-out Area 2 | 0.13 | 0.13 | 0.18 | 0.18 |
| 30 | South China Stadium | 0.18 | 0.18 | 0.20 | 0.20 |
| 31 | So Kon Po Recreation Ground | 0.22 | 0.22 | 0.27 | 0.27 |
| 32 | Proposed District Court | 0.21 | 0.21 | 0.23 | 0.23 |
| 33 | Sir Ellis Kadoorie (S) Primary School | 0.12 | 0.12 | 0.15 | 0.15 |
| 34 | Disciplined Services Sports and Recreational Club | 0.19 | 0.19 | 0.26 | 0.26 |
| 35 | Ka Ning Path Rest Garden | 0.22 | 0.22 | 0.18 | 0.18 |
| 36 | Cotton Path Road | 0.16 | 0.16 | 0.21 | 0.21 |
| 37 | St. Paul's Convent | **0.09** | 0.08 | 0.09 | 0.09 |
| 38 | Ka Ning Road | 0.12 | 0.12 | 0.17 | 0.17 |
| 39 | Haven Street | 0.12 | 0.12 | 0.08 | 0.08 |
| 40 | St. Paul's Hospital | 0.13 | 0.13 | 0.09 | 0.09 |
| 41 | St. Paul's Convent School | 0.08 | 0.08 | 0.07 | 0.07 |
| 42 | Leighton Road | 0.16 | 0.16 | 0.13 | **0.14** |
| 43 | Keswick Street | 0.13 | 0.13 | 0.09 | 0.09 |
| 44 | Pennington Street | 0.13 | 0.13 | 0.09 | 0.09 |
| 45 | Irvine Street | 0.17 | 0.17 | 0.10 | 0.10 |
| 46 | Internal Street of T1 on G/F | **0.14** | 0.12 | **0.13** | 0.12 |
| 47 | Elevated Design of T1 on G/F | 0.09 | **0.12** | **0.13** | 0.11 |
| 48 | Access Road within Application Site | **0.15** | 0.14 | 0.12 | 0.12 |
| 49 | Open Space of T1&2 on G/F | 0.19 | 0.19 | 0.20 | 0.20 |
| 50 | Open Space of T2 on Podium Level | 0.15 | 0.15 | 0.17 | 0.17 |
| 51 | Elevated Design of T3 on Podium Level | 0.15 | 0.15 | 0.19 | 0.19 |

**Annual Condition**

Under annual condition, the prevailing wind are mostly from E quadrant.

Under Baseline Scheme, due to the larger frontal area of T2 and T3, more prominent downwash effect would be induced to ventilate the podium and street level such as ***Caroline Hill Road***, ***St. Paul's Convent***, ***Access Road within Application Site*** and ***Internal Road of T1 on G/F***.

While under Proposed Scheme, the enclosed T2-T3 footbridge would also divert some incoming wind to ventilate the street level such as ***Elevated Design of T1 on G/F***.

Under Proposed Scheme, the larger building setback of T2 allows more incoming wind to skim over the T2 podium, and ventilate the leeward side including ***Hoi Ping Road*** and ***Sunning Road***.

**Summer Condition**

Under summer condition, the prevailing winds are mostly from SW quadrant.

Under Proposed Scheme, the larger building setback of T2 enhanced the wind permeability, more incoming wind would pass through and further skim over T2 podium and ventilate the leeward side such as ***Sunning Road*** and ***Leighton Road***.

Under Baseline Scheme, incoming wind from Yun Ping Road and Pennington Street would flow along the north-eastern site boundary to ventilate the leeward side including ***Caroline Hill Road, Internal Road of T1 on G/F*** and ***Elevated Design of T1 on G/F***

# 6 Minor Amendment on Proposed Scheme

As the design continue to develop, the lift lobby on 2/F of T3 is enlarged to allow more room for pedestrian flow. This result in an amendment to the elevated design on 2/F of T3 including an extension of lift lobby towards the elevated void with approx. 5m (W) x 5m (H) x 15m (L). The amended elevated void varies from approx. 21m widest to 16m narrowest with a height maintained with approx. 13.4m. An additional void with approx. 5m (W) x 8.4m (H) is located above the amended lift lobby. An illustration diagram is shown in Figure 62.

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 due to the following reasons:

Podium level incoming wind would reach T3 from the eastern side along Caroline Hill Road and from the south-western side under both annual and summer conditions.

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 13.4m (H) are free of obstruction for eastern wind. With additional 5m(W) x 8.4m (H) void atop the 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. Some localized impact may be observed at the landscape deck under T3 within the Site, 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.

In summary, the amendment would impose insignificant ventilation impact to wind performance along the site boundary and assessment area, the simulation discussed in previous sections remained valid after the amendment.

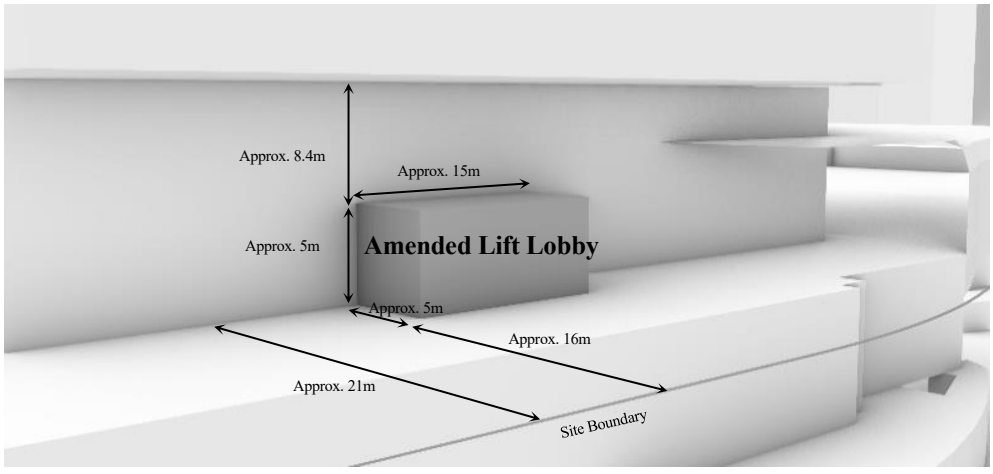


Figure 62 Amended Elevated Void on 2/F of T3

# 7 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.

Although a minor amendment will be made to the Proposed Scheme, the simulation results of this report would remain valid as discussed in Section 6. 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.

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 16~21m (W) x 13.4m (H) elevated design with additional void of approximately 5m (W) x 8.4m (H) above extended lift lobby 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, and
- #7: T1 – Min. 6m internal street of T1 on G/F.

Although the enclosed T2-T3 footbridge reduced the permeability across the Application Site, following major wind enhancement feature improved wind permeability across T2 podium to mitigate the ventilation impact:

- #2. 36m building setback from north-eastern site boundary above 2/F

# 8 Reference

[1] Annex A of Technical Circular No. 1/06 issued by the Housing, Planning and Lands Bureau pertaining specifically to Air Ventilation Assessments, 19th July, 2006

(https://www.devb.gov.hk/filemanager/en/content_679/hplb-etwb-tc-01-06.pdf)

[2] Planning Department RAMS Data (http://www.pland.gov.hk/pland_en/info_serv/site_wind/site_wind/)

[3] AVA Report for PLNQ B-1/AVA 2015 (https://www.pland.gov.hk/pland_en/info_serv/ava_register/ProjInfo/AVRG142_AVA_FinalReport.pdf)

# Appendix A

Layout Plans of Baseline, Proposed Schemes

# A1 Layout Plan of Baseline Scheme

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE — NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL
- PUBLIC OPEN SPACE
- PUBLIC OPEN SPACE (COVERED)
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- G.I.C. FACILITIES (PERFORMING ARTS & CULTURAL FACILITIES)
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING/UNLOADING
- UNEXCAVATED
- 24-HR COVERED PEDESTRIAN WALKWAY
- PEDESTRIAN LINK

FUTURE FOOTBRIDGE
(TO BE CONSTRUCTED BY OTHERS
AND SUBJECT TO DETAIL DESIGN)

CAROLINE HILL ROAD

LEIGHTON ROAD

24-HR COVERED PEDESTRIAN WALKWAY

COVERED LANDSCAPE BRIDGE/
COVERED PUBLIC OPEN SPACE

OVT

+10.0

+17.0

+8.25

+18.25

+28.75

+55.0

+135.0

+5.6

+8.9

T1
COMMERCIAL
/ E&M
+135.0

T2
COMMERCIAL
/ E&M
+135.0

T3
COMMERCIAL
/ E&M
+90.0

+5.60

+8.60

+12.30

+16.0

7.5m

7.5m

OVT

SITE OF FUTURE
DISTRICT COURT

A B C D E F G H J K L M N P Z Y X1 Z1 Y1 O AK AJ AH AG AF AE AD AC AB AA T S R U1 W1 V1 U

0 10 20 30 40 50m

N

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|
| – | 1st SUBMISSION | | | | 3-2022 |

| Rev. | Description | Drawn | Checked | Approved | Date |
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B.D. Ref.
F.S.D. Ref.
D.L.O. Ref.
Drawn Date 3-2022
Checked Date 3-2022
Approved Date 3-2022
Cad File No.

RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title
LAYOUT PLAN (ALL LEVELS)

Project No. 21105HK
Scale 1:750 (A3) Issue Date MAR 2022
Drawing No. MLP -001

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE (NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL)
- PUBLIC OPEN SPACE
- PUBLIC OPEN SPACE (COVERED)
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- G.I.C. FACILITIES (PERFORMING ARTS & CULTURAL FACILITIES)
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING/UNLOADING
- UNEXCAVATED
- 24-HR COVERED PEDESTRIAN WALKWAY
- PEDESTRIAN LINK

LEIGHTON ROAD

CAROLINE HILL ROAD

+4.97

+10.0

+8.25

+8.25

+8.9

+11.1

+5.60

+5.60

+5.60

+4.10

OVT

COMMERCIAL / E&M

DROP-OFF

PRIVATE L/UL

TO CARPARK

TO LOADING / UNLOADING & LIGHT BUSES LAY-BYS

TO 1/F

TO B1/F

PEDESTRIAN LINK

24-HR COVERED PEDESTRIAN WALKWAY

3M

6M

2M

14M

28M

DISABLED ACCESS TO B3/F, B1/F & 2/F

DISABLED ACCESS TO STREET LEVEL

DISABLED ACCESS TO B3/F, LG/F, 1/ F& 2/F

DISABLED ACCESS TO B3/F, G/F, 1/F & 2/F

G.I.C. FACILITIES (DAY CARE CENTER FOR THE ELDERLY) / E&M

7.5M

+8.60

+8.60

G/F

G.I.C. FACILITIES (DISTRICT HEALTH CENTER) / E&M

LG/F

RETAINING STRUCTURE

SITE OF FUTURE DISTRICT COURT

A B C D E F G H J K L M N O P Q R S T U V W X Y Z AA AB AC AD AE AF AG AH AJ AK U1 V1 W1 X1 Y1 Z1

0 10 20 30 40 50m

N

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|
| – | 1st SUBMISSION | | | | 3-2022 |

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B.D. Ref.

F.S.D. Ref.

D.L.O. Ref.

Drawn Date 3-2022

Checked Date 3-2022

Approved Date 3-2022

Cad File No.

RONALD LU & PARTNERS

呂元祥建築師事務所

Project Title

PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title

GROUND FLOOR PLAN

Project No. 21105HK

Scale 1:750 (A3) Issue Date MAR 2022

Drawing No. MLP-006

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE (NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL)
- PUBLIC OPEN SPACE
- PUBLIC OPEN SPACE (COVERED)
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- G.I.C. FACILITIES (PERFORMING ARTS & CULTURAL FACILITIES)
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING/UNLOADING
- UNEXCAVATED
- 24-HR COVERED PEDESTRIAN WALKWAY
- PEDESTRIAN LINK

LEIGHTON ROAD

CAROLINE HILL ROAD

OVT

24-HR COVERED PEDESTRIAN WALKWAY

TO G/F

6M

TO 2/F

COMMERCIAL / E&M +13.25

6M

DISABLED ACCESS TO B3/F, LG/F, G/F & 2/F

G.I.C. FACILITIES (CHILD CARE CENTER) / E&M +12.30

7.5M

+12.30

RETAINING STRUCTURE

SITE OF FUTURE DISTRICT COURT

OVT

CAROLINE HILL ROAD

A B C D E F G Z Y H J K L M N O P Q R S T U U1 V1 W1 X1 Y1 Z1 AA AB AC AD AE AF AG AH AJ AK

N

0 10 20 30 40 50m

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|---|---|---|---|---|---|
| – | 1st SUBMISSION | | | | 3-2022 |

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Drawn Date 3-2022

Checked Date 3-2022

Approved Date 3-2022

Cad File No.

RONALD LU & PARTNERS

呂元祥建築師事務所

Project Title

PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title

FIRST FLOOR PLAN

Project No. 21105HK

Scale 1:750 (A3) Issue Date MAR 2022

Drawing No. MLP-007

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE — NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL
- PUBLIC OPEN SPACE
- PUBLIC OPEN SPACE (COVERED)
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- G.I.C. FACILITIES (PERFORMING ARTS & CULTURAL FACILITIES)
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING/UNLOADING
- UNEXCAVATED
- 24-HR COVERED PEDESTRIAN WALKWAY
- PEDESTRIAN LINK

FUTURE FOOTBRIDGE (TO BE CONSTRUCTED BY OTHERS AND SUBJECT TO DETAIL DESIGN)

CONNECTION POINT FOR FUTURE FOOTBRIDGE

DISABLED ACCESS TO B3/F, B1/F & G/F

LEIGHTON ROAD

CAROLINE HILL ROAD

OVT

+17.5

6M

24-HR COVERED PEDESTRIAN WALKWAY

+18.25

TO 1/F

COMMERCIAL/ E&M

+18.25

COVERED LANDSCAPE BRIDGE/ COVERED PUBLIC OPEN SPACE

DISABLED ACCESS TO B3/F, LG/F, G/F & 1/F

COVERED PUBLIC OPEN SPACE/ COMMUNAL PODIUM GARDEN

+16.0

25.4M

15.5M

11M

15.9M

7.5M

BUILDING LINE ABOVE

COMMERCIAL / E&M

+16.0

+16.0

RETAINING STRUCTURE

SITE OF FUTURE DISTRICT COURT

OVT

CAROLINE HILL ROAD

A AJ AK AH AG AF AE AD AC AB AA T S R U U1 W1 V1 X1 Y Z G F E D C B H J K L M N P

0 10 20 30 40 50m

N

| Rev. | Description | Drawn | Checked | Approved | Date |
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Cad File No.

RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title
SECOND FLOOR PLAN

Project No. 21105HK
Scale 1:750 (A3) Issue Date MAR 2022
Drawing No. MLP -008

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE (NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL)
- PUBLIC OPEN SPACE
- PUBLIC OPEN SPACE (COVERED)
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- G.I.C. FACILITIES (PERFORMING ARTS & CULTURAL FACILITIES)
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING/UNLOADING
- UNEXCAVATED
- 24-HR COVERED PEDESTRIAN WALKWAY
- PEDESTRIAN LINK

LEIGHTON ROAD

CAROLINE HILL ROAD

CAROLINE HILL ROAD

OVT

COMMERCIAL/
E&M
+23.25

COMMERCIAL
/E&M
+27.60

SITE OF FUTURE
DISTRICT COURT

OVT

A B C D E F G Z Y H J K L M N P Q X1 Z1 Y1 U1 W1 V1 AK AJ AH AG AF AE AD AC AB AA T S R U

7.5M

7.5M

N

0 10 20 30 40 50m

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RONALD LU & PARTNERS

呂元祥建築師事務所

Project Title

PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title

THIRD FLOOR PLAN

Project No. 21105HK

Scale 1:750 (A3) Issue Date MAR 2022

Drawing No. MLP -009

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE — NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL
- PUBLIC OPEN SPACE
- PUBLIC OPEN SPACE (COVERED)
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- G.I.C. FACILITIES (PERFORMING ARTS & CULTURAL FACILITIES)
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING/UNLOADING
- UNEXCAVATED
- 24-HR COVERED PEDESTRIAN WALKWAY
- PEDESTRIAN LINK

LEIGHTON ROAD

CAROLINE HILL ROAD

OVT

COMMERCIAL/ E&M +28.75

G.I.C. FACILITIES (PERFORMING ARTS & CULTURAL FACILITIES ) +28.75

COMMERCIAL /E&M +35.0

7.5M

7.5M

SITE OF FUTURE DISTRICT COURT

OVT

A B C D E F G Z Y H J K L M N P Q X1 Z1 Y1 U1 W1 V1 AK AJ AH AG AF AE AD AC AB AA T S R U

N

0 10 20 30 40 50m

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Cad File No.

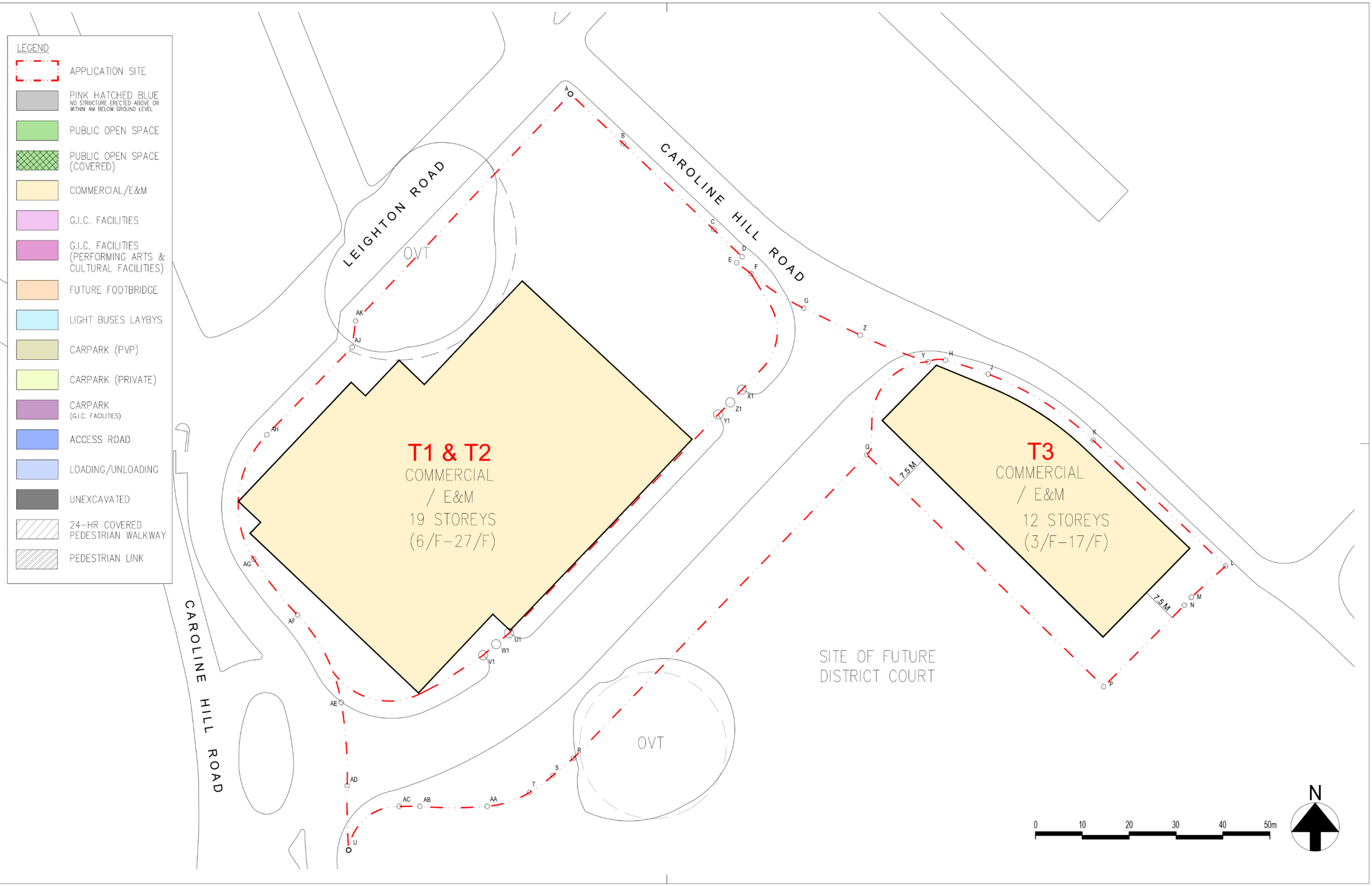
RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title
FIFTH FLOOR PLAN

Project No. 21105HK
Scale 1:750 (A3) Issue Date MAR 2022
Drawing No. MLP -010

Drawing Purpose




| Rev. | Description | Drawn | Checked | Approved | Date |
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| | | |
|---|---|---|
| Drawn | Date | 3-2022 |
| Checked | Date | 3-2022 |
| Approved | Date | 3-2022 |

Cad File No.

RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title

PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title

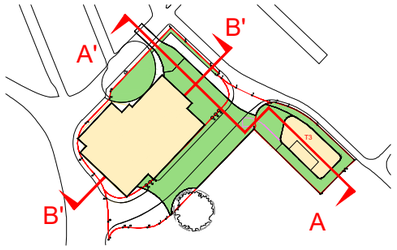
TYPICAL FLOOR PLAN

Project No. 21105HK

Scale 1:750 (A3) Issue Date MAR 2022

Drawing No. MLP-011

Drawing Purpose




SITE
(EDGED RED)

SITE
(EDGED BLUE)

LEE GARDEN SIX

T1 & T2

T3

+135.00 mPD
26 CLUB 26
25 25
23 23
22 22
21 COMMERCIAL / E&M 21
20 20
19 19
18 18
17 17
16 16
15 15
12 12
11 11
10 10
9 COMMERCIAL / E&M 9
8 8
7 7
6 6
5 +40.00 mPD 5
LOUNGE / CLUB LOBBY
MF +35.00 mPD
OFFICE SHUTTLE LOBBY / ART LIBARY
4 +30.00 mPD 4
E&M FLOOR
3 +23.25 mPD 3
COMMERCIAL / E&M
2 +18.25 mPD 2
COMMERCIAL / E&M
1 +13.25 mPD 1
COMMERCIAL / E&M
G +8.25 mPD G
COMMERCIAL / E&M
B1 +2.05 mPD
LOADING / UNLOADING
B2 -4.95 mPD
CARPARK (PRIVATE)
B3 -8.85 mPD
CARPARK (PRIVATE)
B4 -12.40 mPD
CARPARK (PRIVATE)
B5 -15.95 mPD
-18.00 mPD

+90.0 mPD
17
16
15
12
11
10 COMMERCIAL / E&M
9
8
7
6
5
3 E&M FLOOR +27.60 mPD
PRIVATE OPEN SPACE
2 +16.0 mPD
1 +11.25 mPD GOV. ACC. (CCC)
G +7.55 mPD GOV. ACC. (ECC)
LG +3.05 mPD GOV. ACC. (DHC)
B2 -3.35mPD E&M
B3 -8.85 mPD CARPARK (PVP)
B4 -12.40 mPD CARPARK (PVP)
B5 -15.95 mPD CARPARK (PRIVATE)
-18.00 mPD

11 STOREYS
7400
1600
4750
3700
4500
6400
5500
3550
3550

+18.0 mPD
+5.75 mPD
2300
4000
LIGHT BUSES LAY-BYS
CARPARK (PVP)
CARPARK (PRIVATE)
CARPARK (PRIVATE)
CARPARK (PRIVATE)

+17.5 mPD
+16.85 mPD
+5.00 mPD
FOOTBRIDGE L5

HIGH ZONE
MID ZONE
20 STOREYS
LOW ZONE 2
LOW ZONE 1
LOW ZONE
5000
5000
6750
5000
5000
5000
6200
7000
3900
3550

1:700

# A2 Layout Plan of Proposed Scheme

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE — NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL
- PUBLIC OPEN SPACE
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING & UNLOADING CARPARK (PVP)
- UNEXCAVATED
- 24-HR PEDESTRIAN WALKWAY
- PUBLIC OPEN SPACE WITH 24-HR PEDESTRIAN WALKWAY
- PEDESTRIAN LINK
- E&M
- CIRCULATION/ E&M

FUTURE FOOTBRIDGE
( TO BE CONSTRUCTED BY OTHERS
AND SUBJECT TO DETAIL DESIGN)

CAROLINE HILL ROAD

MASONARY WALLS AND EARTHENWARE PIPES TO BE PRESERVED

LEIGHTON ROAD

24-HR COVERED PEDESTRIAN WALKWAY

OVT

+9.0
+17.64
+11.5
+18.70
+8.55
+119.90
+115.25
+135.0
+5.6
+129.65
+8.9
+18.70
+5.70
+18.40
+90.0
+21.50
+17.00
+10.20

T1
COMMERCIAL
/ E&M

T2
COMMERCIAL
/ E&M

T3
COMMERCIAL
/ E&M

CANOPY ABOVE

COVERED LANDSCAPE BRIDGE/
PUBLIC OPEN SPACE

7.5m

SITE OF FUTURE
DISTRICT COURT

OVT

CAROLINE HILL ROAD

MASONARY WALLS AND EARTHENWARE PIPES TO BE PRESERVED

0 10 20 30 40 50m

N

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|
| – | 1st SUBMISSION | | | | 3-2022 |
| A | 1st AMENDMENT | | | | 9-2023 |
| B | 2nd AMENDMENT | | | | 1-2024 |

| Rev. | Description | Drawn | Checked | Approved | Date |
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F.S.D. Ref.
D.L.O. Ref.
Drawn Date 1-2024
Checked Date 1-2024
Approved Date 1-2024
Cad File No.

RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title
LAYOUT PLAN (ALL LEVELS)

Project No. 21105HK
Scale 1:750 (A3) Issue Date Sept 2024
Drawing No. MLP -001

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE — NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL
- PUBLIC OPEN SPACE
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING & UNLOADING CARPARK (PVP)
- UNEXCAVATED
- 24-HR PEDESTRIAN WALKWAY
- PUBLIC OPEN SPACE WITH 24-HR PEDESTRIAN WALKWAY
- PEDESTRIAN LINK
- E&M
- CIRCULATION / E&M

LEIGHTON ROAD

CAROLINE HILL ROAD

CAROLINE HILL ROAD

+4.97

+9.0

+11.5 VENT SHAFT

MASONARY WALLS AND EARTHENWARE PIPES TO BE PRESERVED

DISABLED ACCESS BETWEEN B5/F TO 2/F

24HR COVERED PEDESTRIAN WALKWAY

DISABLED ACCESS TO STREET LEVEL

+5.60

COMMERCIAL / E&M

+8.55

24HR OPEN PEDESTRAIN LINK BETWEEN B1/F LIGHT BUS LAY-BYS & GROUND LEVEL

TO LOADING / UNLOADING & LIGHT BUSES LAY-BYS

+8.55

+5.60

DISABLED ACCESS BETWEEN B5/F TO 3/F EXCEPT B2/F

6M

14M

28M

RETAINING STRUCTURE

DROP-OFF

PRIVATE LOT

+11.05 VENT SHAFT

TO CARPARK

+12.05 VENT SHAFT

+11.1

+8.9

SITE OF FUTURE DISTRICT COURT

OVT

OVT

G.I.C. FACILITIES (DAY CARE CENTER FOR THE ELDERLY) / E&M

+10.20

7.5M

DISABLED ACCESS BETWEEN B2/F TO 2/F

+10.20

DISABLED ACCESS BETWEEN B2/F TO 2/F

UG/F

DISABLED ACCESS BETWEEN B2/F TO 2/F

MASONARY WALLS AND EARTHENWARE PIPES TO BE PRESERVED

G.I.C. FACILITIES (DISTRICT HEALTH CENTER) / E&M

7.5M

+5.70

+5.70

DISABLED ACCESS BETWEEN B2/F TO 2/F

G/F

N

0 10 20 30 40 50m

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|
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| A | 1st AMENDMENT | | | | 9-2023 |
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Approved Date 1-2024

Cad File No.

RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title
GROUND FLOOR PLAN

Project No. 21105HK

Scale 1:750 (A3) Issue Date Sept 2024

Drawing No. MLP -006

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE — NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL
- PUBLIC OPEN SPACE
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING & UNLOADING CARPARK (PVP)
- UNEXCAVATED
- 24-HR PEDESTRIAN WALKWAY
- PUBLIC OPEN SPACE WITH 24-HR PEDESTRIAN WALKWAY
- PEDESTRIAN LINK
- E&M
- CIRCULATION / E&M

LEIGHTON ROAD

CAROLINE HILL ROAD

CAROLINE HILL ROAD

OVT

24-HR COVERED PEDESTRIAN WALKWAY

COMMERCIAL / E&M +13.70

G.I.C. FACILITIES (CHILD CARE CENTER) / E&M +13.90

DISABLED ACCESS BETWEEN B2/F TO 2/F

RETAINING STRUCTURE

SITE OF FUTURE DISTRICT COURT

OVT

DISABLED ACCESS BETWEEN B2/F TO 2/F

6M 2M 6M 2M 7.5M

A B C D E F G Z Y H J K L M N P Q R T U V W1 U1 V1 X1 Z1 Y1 AA AB AC AD AE AF AG AH AJ AK

0 10 20 30 40 50m

N

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|
| – | 1st SUBMISSION | | | | 3-2022 |
| A | 1st AMENDMENT | | | | 9-2023 |
| B | 2nd AMENDMENT | | | | 1-2024 |

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D.L.O. Ref.

Drawn Date 1-2024

Checked Date 1-2024

Approved Date 1-2024

Cad File No.

RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

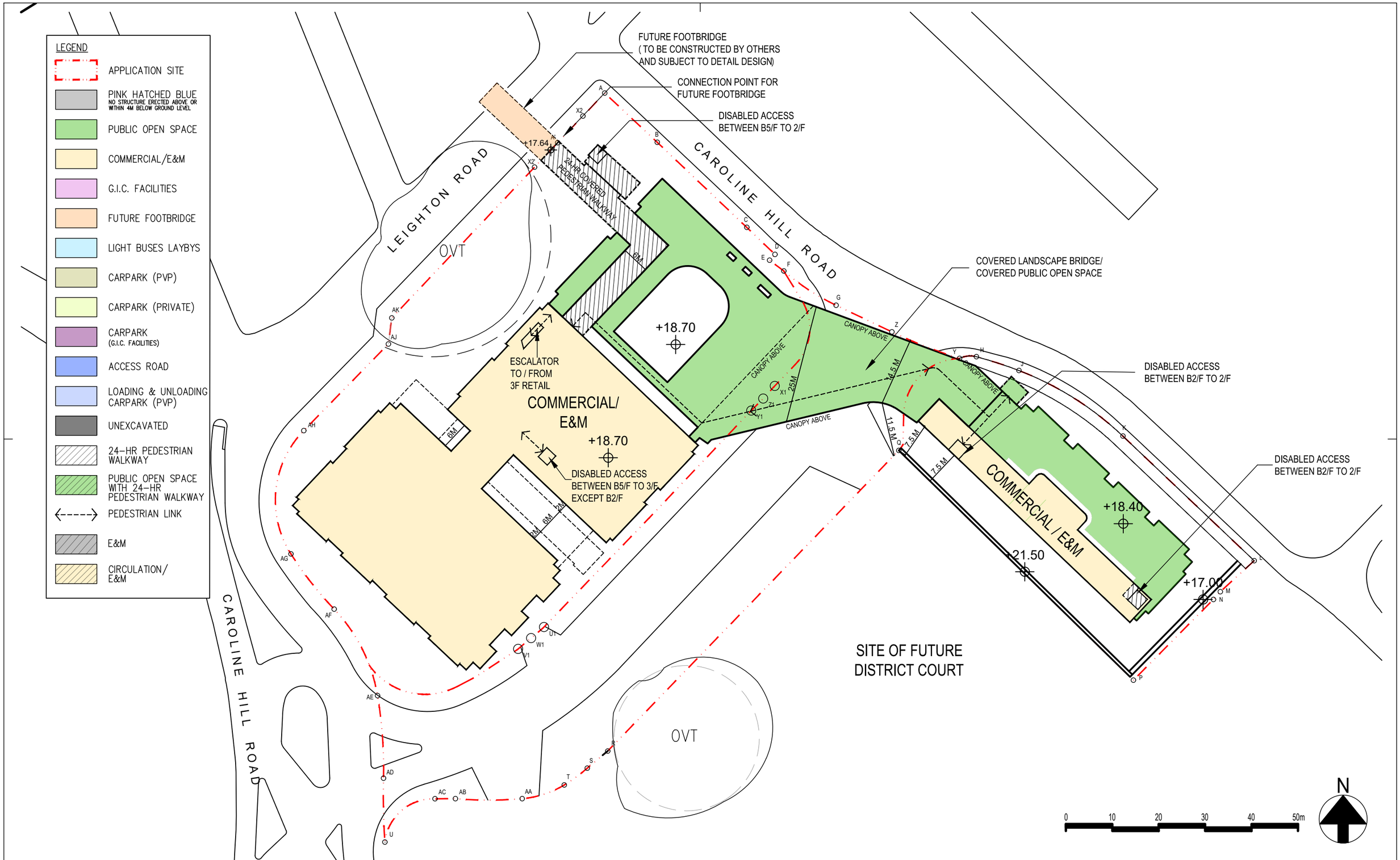
Drawing Title
FIRST FLOOR PLAN

Project No. 21105HK

Scale 1:750 (A3) Issue Date Sept 2024

Drawing No. MLP-007

Drawing Purpose




| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|
| – | 1st SUBMISSION | | | | 3-2022 |
| A | 1st AMENDMENT | | | | 9-2023 |
| B | 2nd AMENDMENT | | | | 1-2024 |

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|---|---|---|---|---|---|

Check all measurements on site. Do not scale off drawings.

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B.D. Ref.

F.S.D. Ref.

D.L.O. Ref.

Drawn Date 1-2024

Checked Date 1-2024

Approved Date 1-2024

Cad File No.

RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title
SECOND FLOOR PLAN

Project No. 21105HK

Scale 1:750 (A3) Issue Date Sept 2024

Drawing No. MLP -008

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE — NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL
- PUBLIC OPEN SPACE
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING & UNLOADING CARPARK (PVP)
- UNEXCAVATED
- 24-HR PEDESTRIAN WALKWAY
- PUBLIC OPEN SPACE WITH 24-HR PEDESTRIAN WALKWAY
- PEDESTRIAN LINK
- E&M
- CIRCULATION/ E&M

LEIGHTON ROAD

CAROLINE HILL ROAD

CAROLINE HILL ROAD

OVT

OVT

E&M
+28.70

E&M
+31.80

7.5M

7.5M

SITE OF FUTURE
DISTRICT COURT

A B C D E F G Z Y H J K L M N P Q R S T U V V1 W W1 X X1 Y1 Z1 AA AB AC AD AE AF AG AH AJ AK

0 10 20 30 40 50m

N

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|
| – | 1st SUBMISSION | | | | 3-2022 |
| A | 1st AMENDMENT | | | | 9-2023 |
| B | 2nd AMENDMENT | | | | 1-2024 |

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|



B.D. Ref.
F.S.D. Ref.
D.L.O. Ref.
Drawn Date 1-2024
Checked Date 1-2024
Approved Date 1-2024
Cad File No.

RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title
FORTH FLOOR PLAN

Project No. 21105HK
Scale 1:750 (A3)
Issue Date Sept 2024
Drawing No. MLP -009.1

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE — NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL
- PUBLIC OPEN SPACE
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING & UNLOADING CARPARK (PVP)
- UNEXCAVATED
- 24-HR PEDESTRIAN WALKWAY
- PUBLIC OPEN SPACE WITH 24-HR PEDESTRIAN WALKWAY
- PEDESTRIAN LINK
- E&M
- CIRCULATION / E&M

LEIGHTON ROAD

CAROLINE HILL ROAD

CAROLINE HILL ROAD

OVT

OVT

ESCALATOR TO / FROM 2F RETAIL

ESCALATOR TO / FROM 5F PACF

COMMERCIAL / E&M +23.70

E&M +31.80

7.5M

7.5M

SITE OF FUTURE DISTRICT COURT

A B C D E F G Z Y H J K L M N P Q X1 Z1 Y1 U1 W1 V1 U T S R AA AB AC AD AE AF AG AH AJ AK

N

0 10 20 30 40 50m

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|
| – | 1st SUBMISSION | | | | 3-2022 |
| A | 1st AMENDMENT | | | | 9-2023 |
| B | 2nd AMENDMENT | | | | 1-2024 |

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|

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B.D. Ref.

F.S.D. Ref.

D.L.O. Ref.

Drawn Date 1-2024

Checked Date 1-2024

Approved Date 1-2024

Cad File No.

RONALD LU & PARTNERS

呂元祥建築師事務所

Project Title

PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title

THIRD FLOOR PLAN

Project No. 21105HK

Scale 1:750 (A3) Issue Date Jan 2024

Drawing No. MLP-009

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE — NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL
- PUBLIC OPEN SPACE
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING & UNLOADING CARPARK (PVP)
- UNEXCAVATED
- 24-HR PEDESTRIAN WALKWAY
- PUBLIC OPEN SPACE WITH 24-HR PEDESTRIAN WALKWAY
- PEDESTRIAN LINK
- E&M
- CIRCULATION/ E&M

LEIGHTON ROAD

CAROLINE HILL ROAD

OVT

G.I.C.FACILITIES
( PERFORMING ARTS & CULTURAL FACILITIES )
+34.60

COMMERCIAL/ E&M
+34.60

ESCALATOR TO / FROM 3F RETAIL

COMMERCIAL /E&M
+35.70

7.5M

7.5M

SITE OF FUTURE DISTRICT COURT

OVT

A B C D E F G Z Y H J K L M N P Q R S T U V V1 W W1 X X1 Y1 Z1 AA AB AC AD AE AF AG AH AJ AK

0 10 20 30 40 50m

N

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|
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F.S.D. Ref.
D.L.O. Ref.
Drawn Date 1-2024
Checked Date 1-2024
Approved Date 1-2024
Cad File No.

RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title
FIFTH FLOOR PLAN

Project No. 21105HK
Scale 1:750 (A3)
Issue Date Sept 2024
Drawing No. MLP -010

Drawing Purpose

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE (NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL)
- PUBLIC OPEN SPACE
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING & UNLOADING CARPARK (PVP)
- UNEXCAVATED
- 24-HR PEDESTRIAN WALKWAY
- PUBLIC OPEN SPACE WITH 24-HR PEDESTRIAN WALKWAY
- PEDESTRIAN LINK
- E&M
- CIRCULATION/ E&M

LEIGHTON ROAD

CAROLINE HILL ROAD

CAROLINE HILL ROAD

OVT

OVT

T1 & T2
COMMERCIAL
/ E&M
19 STOREYS
( 6/F-27/F)

T3
COMMERCIAL
/ E&M
12 STOREYS
( 3/F-17/F)

7.5M

7.5M

SITE OF FUTURE
DISTRICT COURT

A B C D E F G Z Y H J K L M N P Q R S T U V V1 W W1 U1 X X1 Z1 Y1 AA AB AC AD AE AF AG AH AJ AK

0 10 20 30 40 50m

N

| Rev. | Description | Drawn | Checked | Approved | Date |
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F.S.D. Ref.

D.L.O. Ref.

Drawn Date 1-2024

Checked Date 1-2024

Approved Date 1-2024

Cad File No.

RONALD LU & PARTNERS

呂元祥建築師事務所

Project Title

PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title

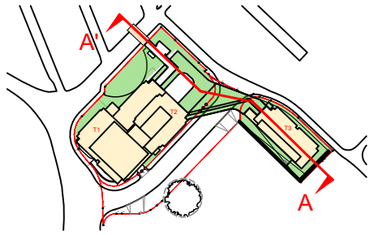
TYPICAL FLOOR PLAN

Project No. 21105HK

Scale 1:750 (A3) Issue Date Sept 2024

Drawing No. MLP -011

Drawing Purpose




SITE
(EDGED RED)

SITE
(PINK HATCHED BLUE)

SITE
(EDGED BLUE)

LEIGHTON ROAD

LEE GARDEN SIX

T1 & T2

+135.00 mPD

27 27
26 26
25 25
23 23
22 22
21 21
20 20
19 19
18 18
17 COMMERCIAL / E&M 17
16 16
15 15
12 12
11 11
10 10
9 9
8 8
7 7
6 6
5 PERFORMING ARTS & CULTURAL FACILITIES 5
+34.60 mPD
4 E&M 4
+28.70 mPD
3 COMMERCIAL / E&M 3
+23.70 mPD
2 COMMERCIAL / E&M +18.70 mPD 2
+18.70 mPD
1 COMMERCIAL / E&M +13.70 mPD 1
G COMMERCIAL / E&M +8.55 mPD G
LIGHT BUSES LAY-BYS
COMMERCIAL / E&M +2.80 mPD B1
CARPARK (PVP)
LOADING & UNLOADING -4.35 mPD B2
CARPARK (PVP)
CARPARK (PRIVATE) -8.25 mPD B3
CARPARK (PRIVATE) -11.80 mPD B4
CARPARK (PRIVATE) -15.35 mPD B5
-18.00 mPD

19 STOREYS

T3

+90.0 mPD

17
16
15
12
11
10 COMMERCIAL / E&M
9
8
7
6
5
E&M
3 +31.80 mPD

12 STOREYS

COVERED PUBLIC OPEN SPACE

COVERED LANDSCAPE BRIDGE/
COVERED PUBLIC OPEN SPACE

2 +18.40 mPD
1 +13.90 mPD G.I.C. FACILITIES (CCC) / E&M
UG +10.20 mPD G.I.C. FACILITIES (DE) / E&M
G +5.70 mPD G.I.C. FACILITIES (DHC) / E&M
B2M +0.90 mPD E&M
B2 -4.35mPD CARPARK (PVP)

+6.65 mPD
4000
CARPARK (G.I.C. FACILITIES)

FUTURE FOOTBRIDGE
(TO BE CONSTRUCTED BY OTHERS & SUBJECT TO DETAIL DESIGN)

+7.64 mPD
+16.80 mPD
+5.00 mPD

13400 4500 3700 4500 4800 5250

8500 5900 2500 2100 5000 5150 5750 7150 3900 3550 3550

0 10 20 30 40 50m

LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE (NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL)
- PUBLIC OPEN SPACE
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- PERFORMING ARTS & CULTURAL FACILITIES
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING/UNLOADING
- UNEXCAVATED
- E&M

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D.L.O. Ref.
Drawn Date 1-2024
Checked Date 1-2024
Approved Date 1-2024
Cad File No.

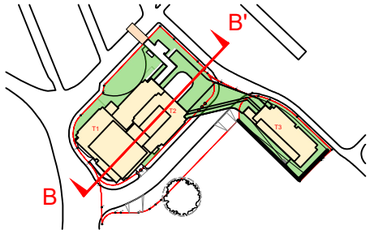
RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title
SECTION AA'

Project No. 21105HK
Scale 1:750 (A3)
Issue Date Sept 2024
Drawing No. MLP -012

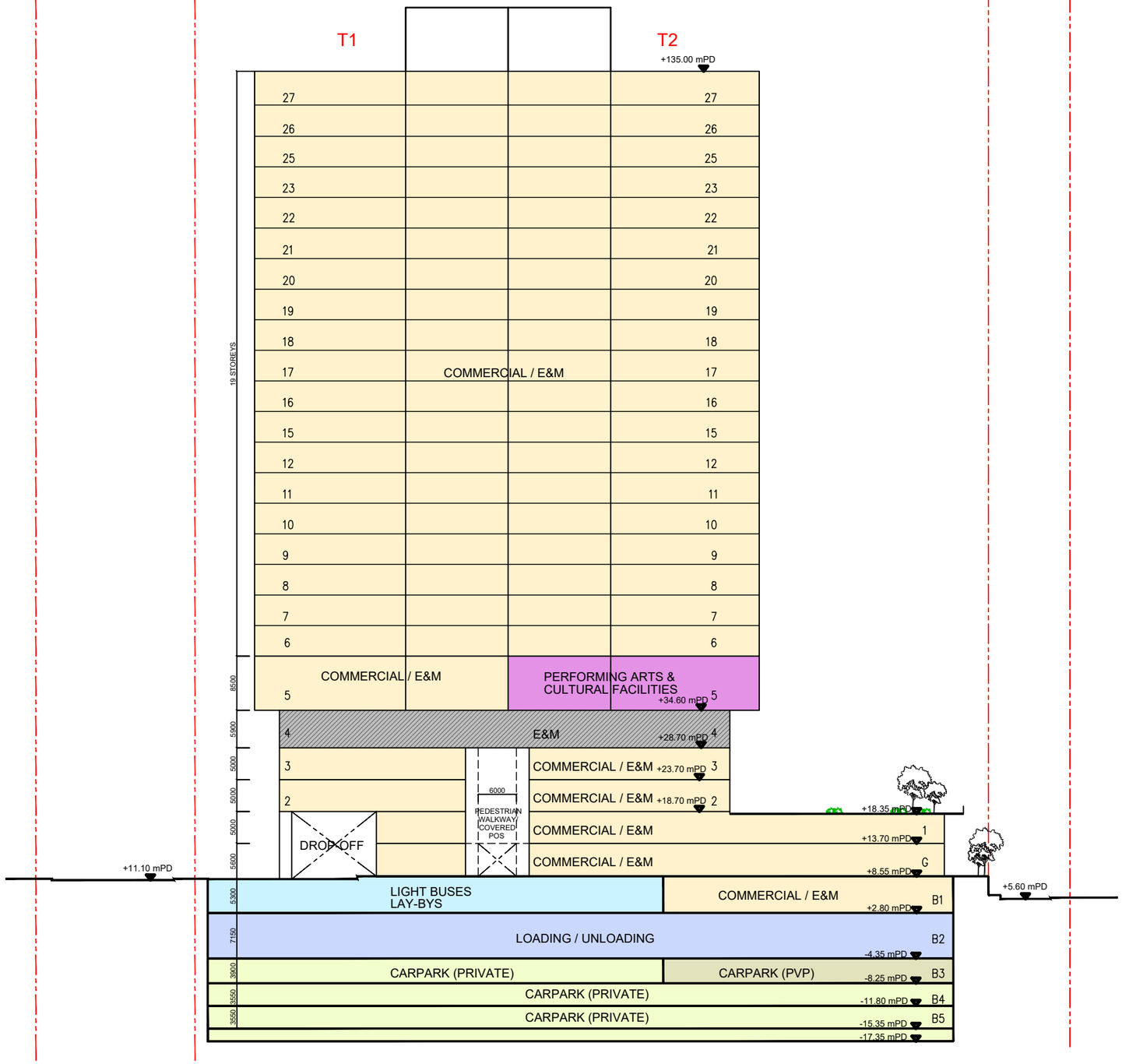
Drawing Purpose




CAROLINE HILL ROAD (WEST)

SITE
(EDGED BLUE)

CAROLINE HILL ROAD (EAST)




LEGEND

- APPLICATION SITE
- PINK HATCHED BLUE (NO STRUCTURE ERECTED ABOVE OR WITHIN 4M BELOW GROUND LEVEL)
- PUBLIC OPEN SPACE
- COMMERCIAL/E&M
- G.I.C. FACILITIES
- PERFORMING ARTS & CULTURAL FACILITIES
- FUTURE FOOTBRIDGE
- LIGHT BUSES LAYBYS
- CARPARK (PVP)
- CARPARK (PRIVATE)
- CARPARK (G.I.C. FACILITIES)
- ACCESS ROAD
- LOADING/UNLOADING
- UNEXCAVATED
- E&M

| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|
| – | 1st SUBMISSION | | | | 3-2022 |
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| Rev. | Description | Drawn | Checked | Approved | Date |
|---|---|---|---|---|---|

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B.D. Ref.
F.S.D. Ref.
D.L.O. Ref.
Drawn Date 1-2024
Checked Date 1-2024
Approved Date 1-2024
Cad File No.

RONALD LU & PARTNERS
呂元祥建築師事務所

Project Title
PROPOSED COMMERCIAL DEVELOPMENT ON IL NO.8945 AT CAROLINE HILL ROAD, CAUSEWAY BAY, HONG KONG

Drawing Title
SECTION BB'

Project No. 21105HK
Scale 1:750 (A3) Issue Date Sept 2024
Drawing No. MLP -013

Drawing Purpose

# Appendix B

Layout Plan of Planned Development within Surrounding Area

# B1 Layout Plan of Planned Development within Surrounding

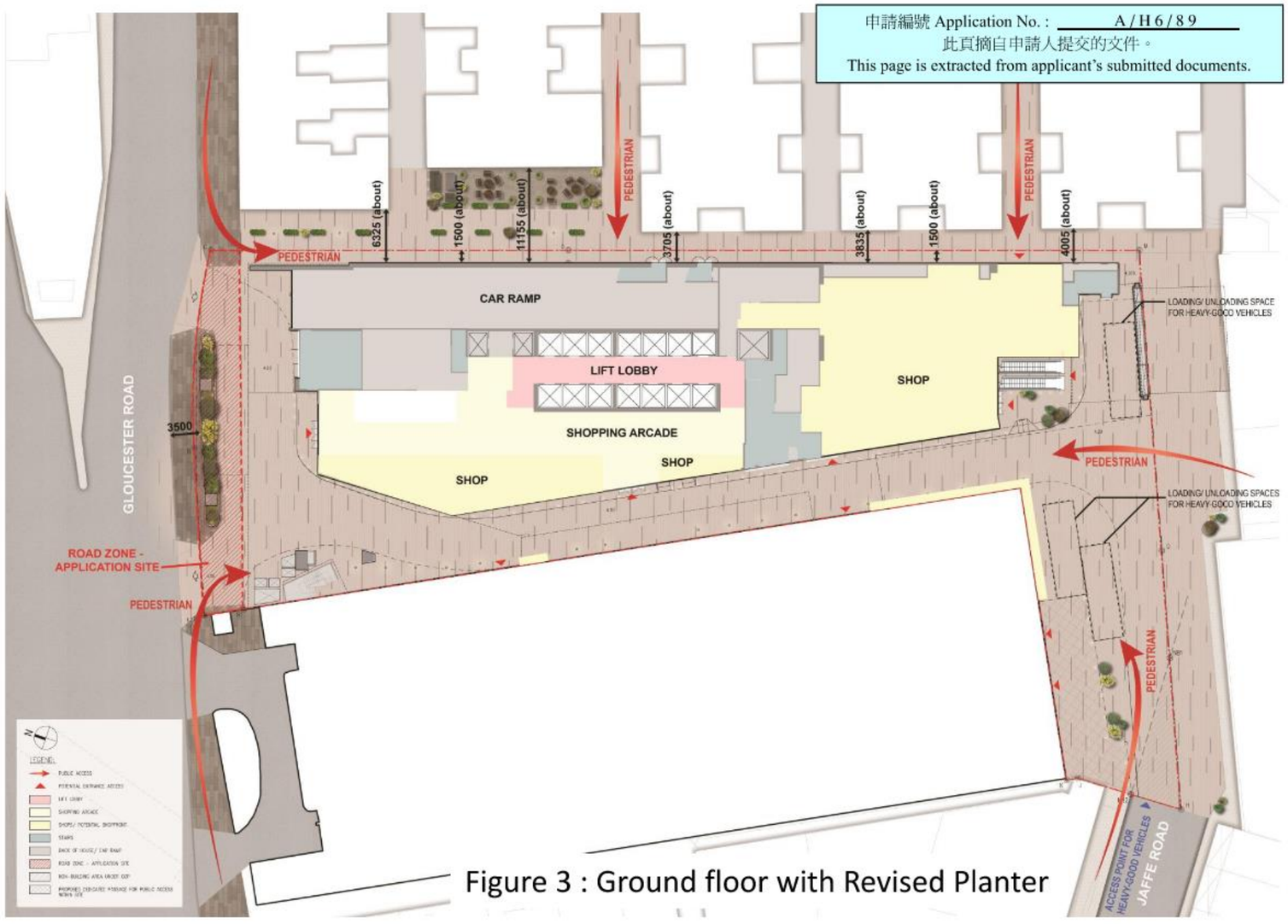
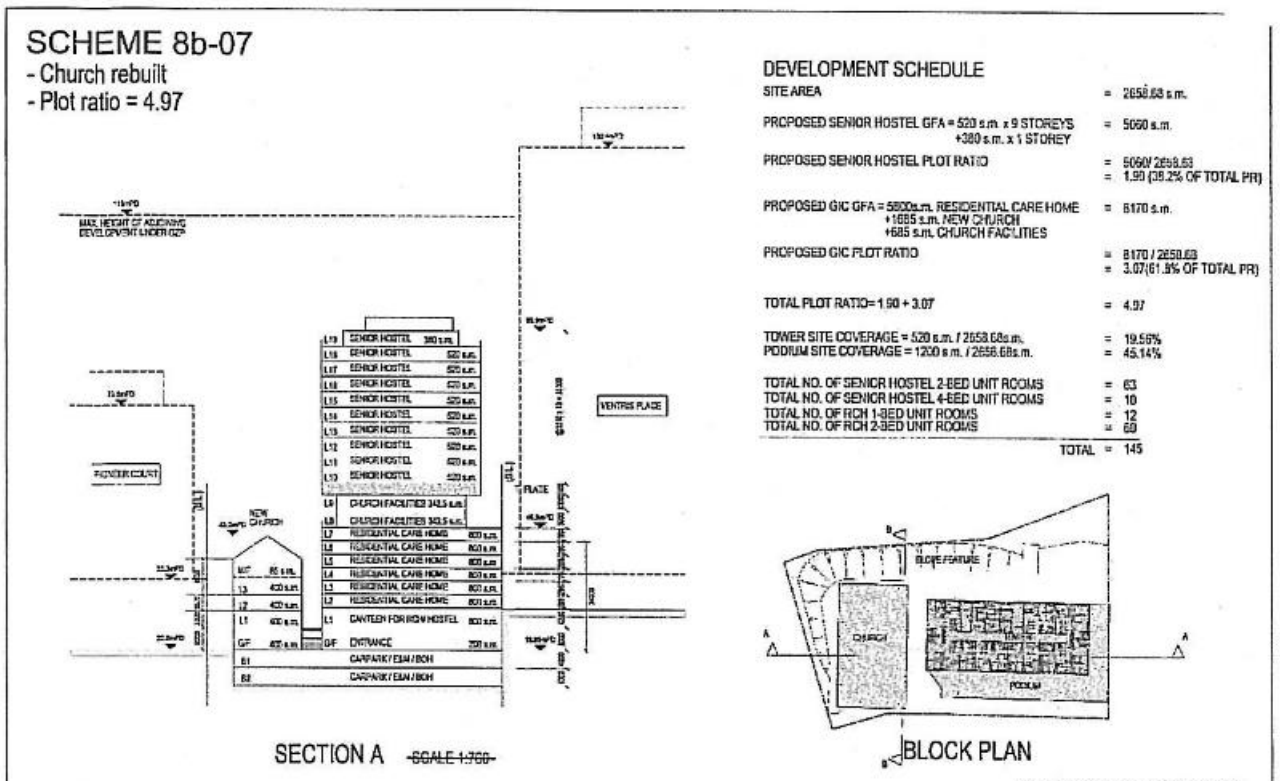
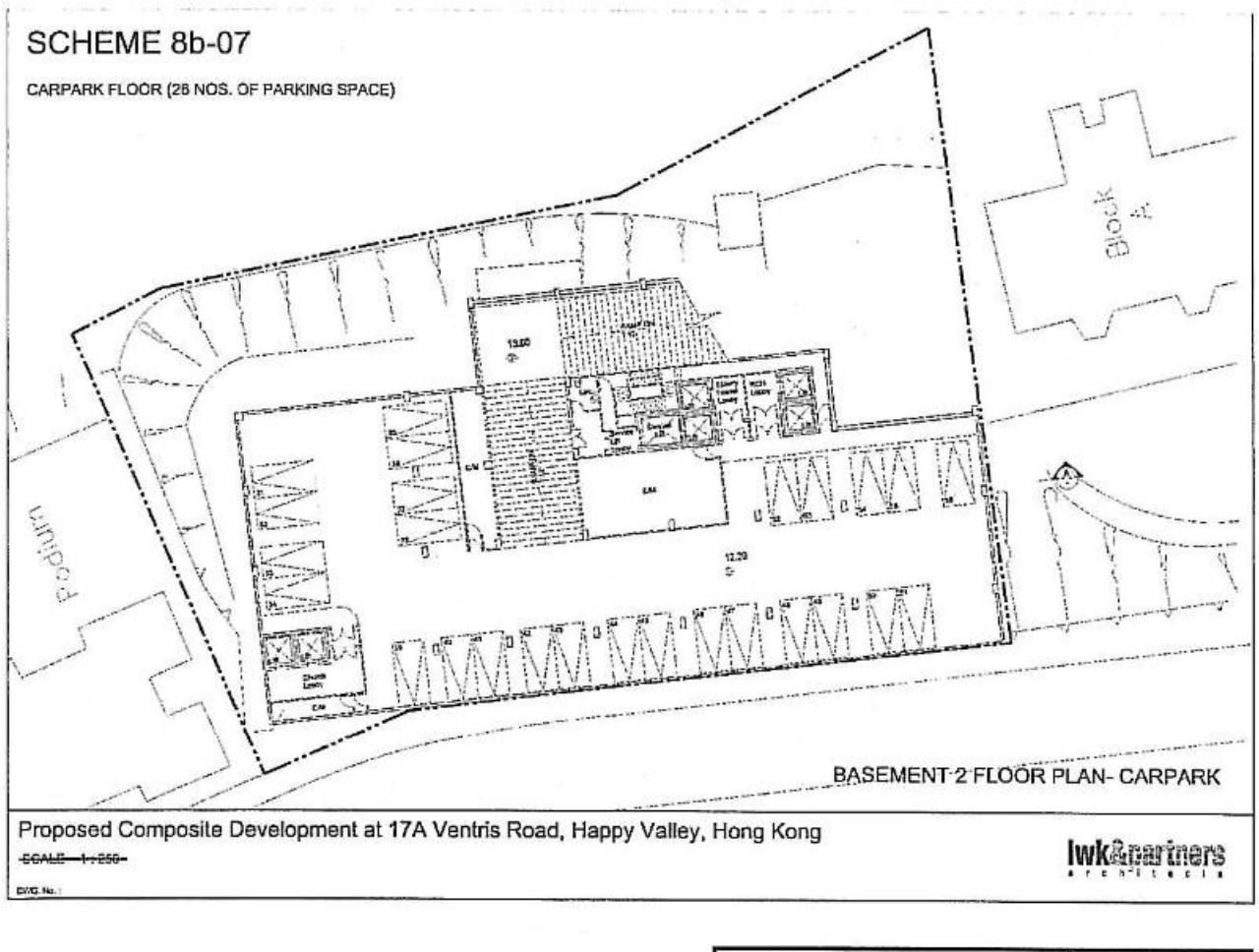



Figure B 1 #1 281 Gloucester Road Site




資料來源：由擬議人提供
SOURCE : SUBMITTED BY THE PROPONENT

| 參考編號 REFERENCE No. | 繪圖 DRAWING |
|---|---|
| M/H7/11/9 | 1 |

Figure B 2 #2 17A and 17B Ventris Road Site -1

資料來源：由擬議人提供
SOURCE : SUBMITTED BY THE PROPONENT

| 參考編號 REFERENCE No. | 繪圖 DRAWING |
|---|---|
| M/H7/11/9 | 9 |

Figure B 3 #2 17A and 17B Ventris Road Site - 2

附件2 ENCLOSURE 2

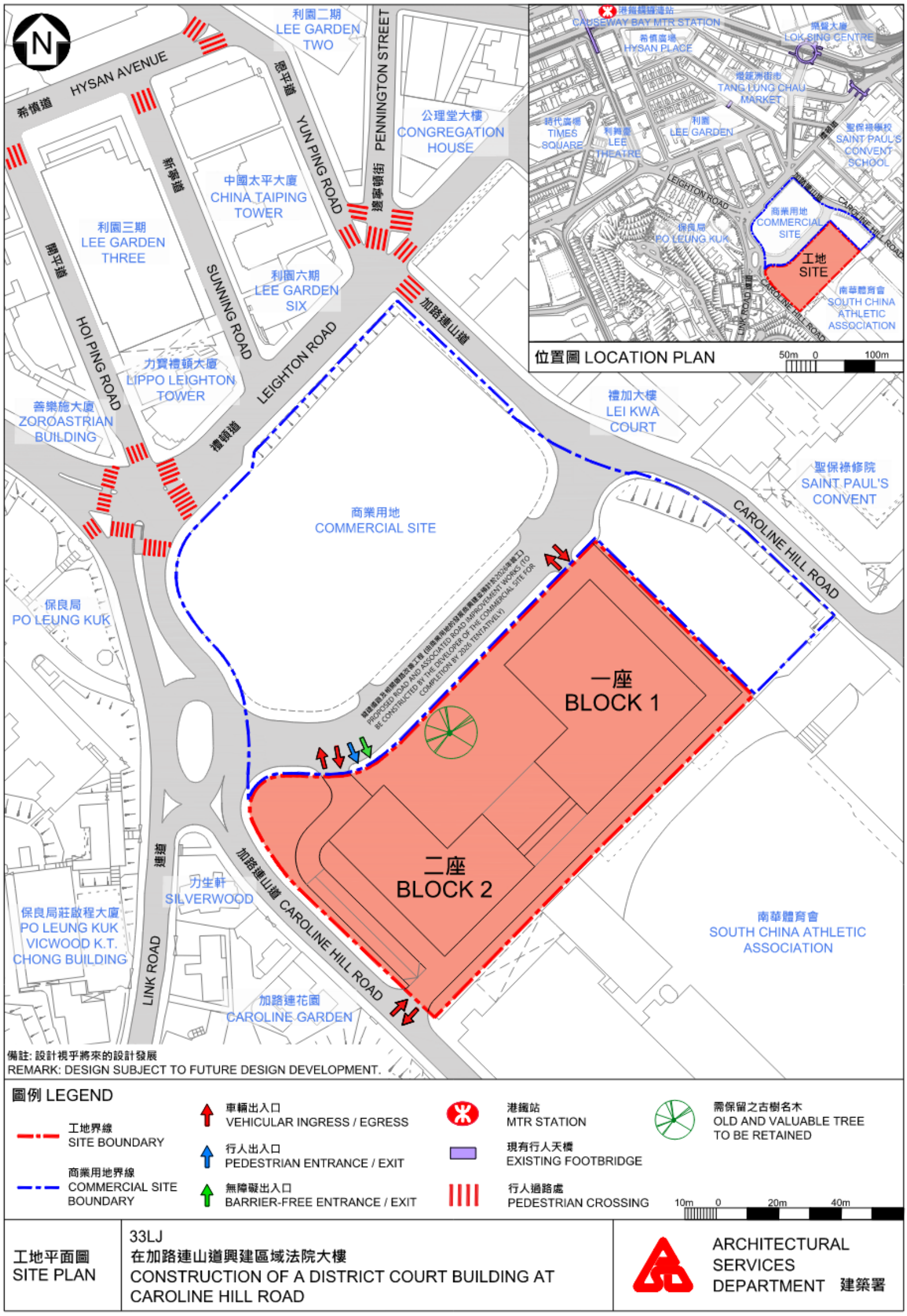



Figure B 4 #3 District Court at Caroline Hill Road – Layout

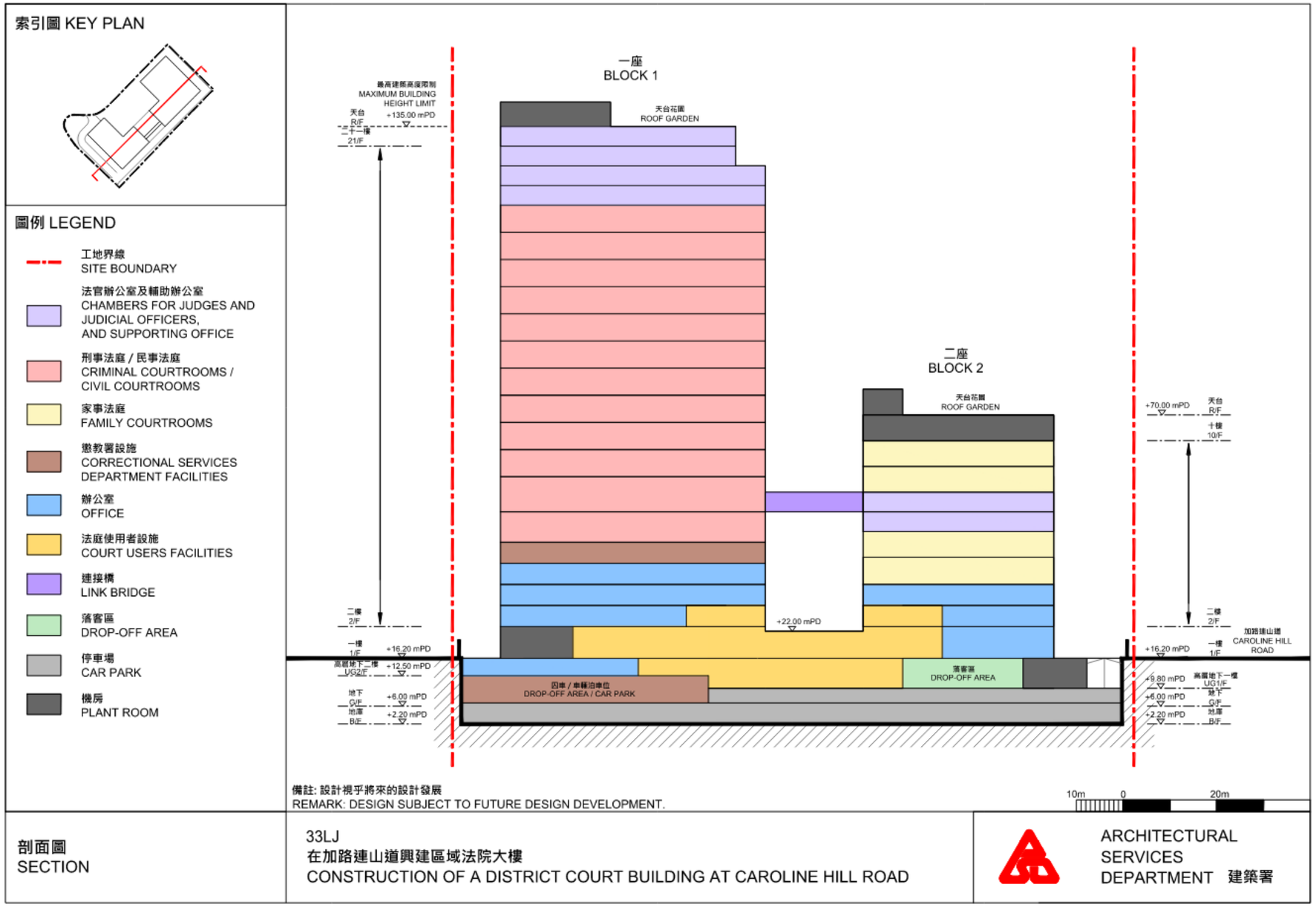



Figure B 5 #3 District Court at Caroline Hill Road - Section


| | | | | |
|---|---|---|---|---|
| 香港特別行政區政府渠務署 THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION DRAINAGE SERVICES DEPARTMENT | BINNIES HONG KONG LIMITED 賓尼斯工程顧問有限公司 | Project Title: AGREEMENT NO. CE 79/2019 (DS) – CONSTRUCTION OF DRY WEATHER FLOW INTERCEPTOR AT HUNG HOM AND CAUSEWAY BAY – INVESTIGATION, DESIGN AND CONSTRUCTION | Drawing Title: PHOTOMONTAGE | Drawing no. FIGURE 11<br>Prepared WJB / Checked SW / Scale NTS |

Plot Date: 2022/5/18 16:28:14
File Name: Y:\Daily Work\20220518\B1405682-A3

Figure B 6 #4 Planned Development on Construction of Dry Weather Flow Interceptor at Hung Hom and Causeway Bay

# Appendix C

Contour Plots of Velocity Ratio (VR)

# C1 Baseline Scheme

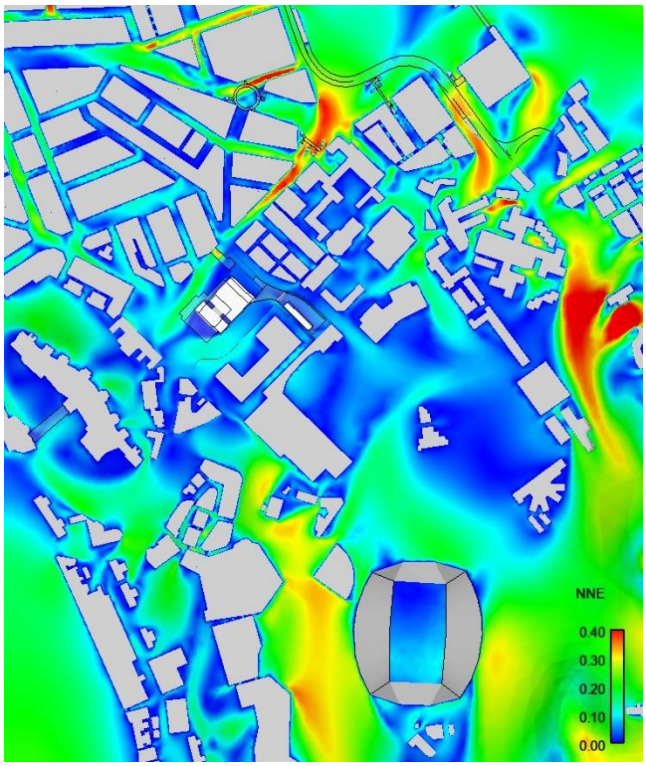



Figure C 1 Contour Plot of VR under NNE Wind

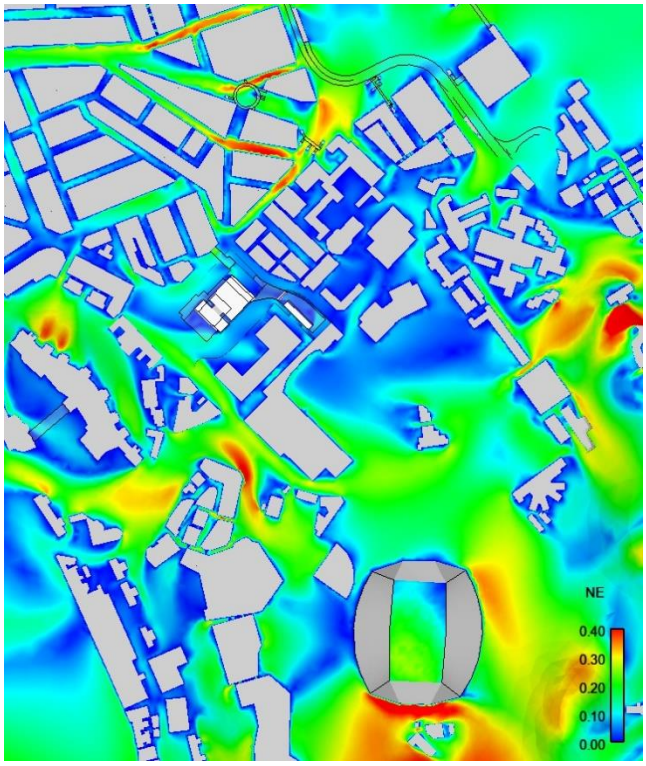



Figure C 2 Contour Plot of VR under NE Wind

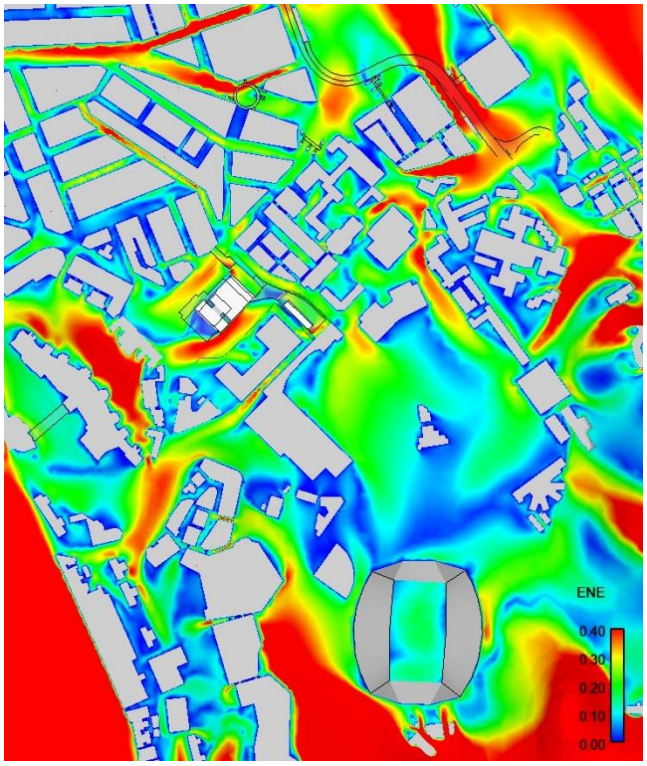



Figure C 3 Contour Plot of VR under ENE Wind

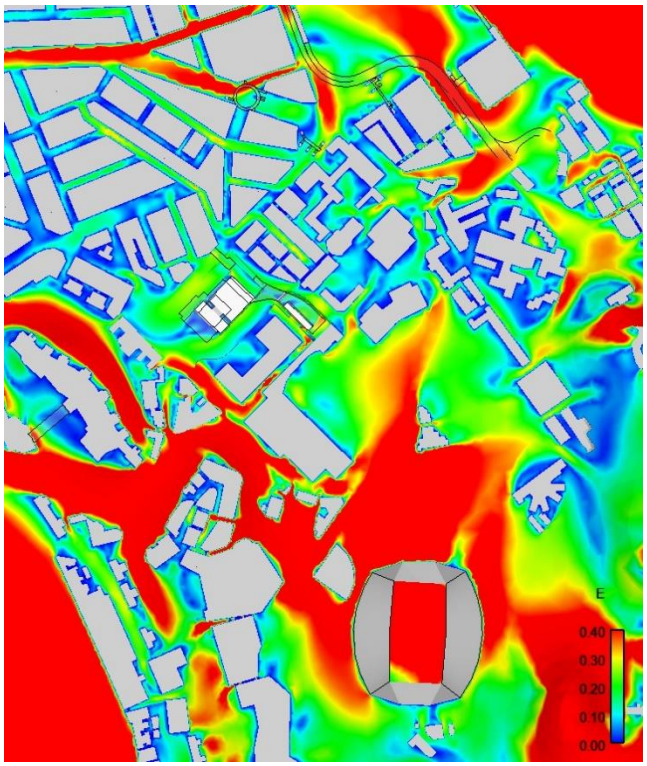



Figure C 4 Contour Plot of VR under E Wind

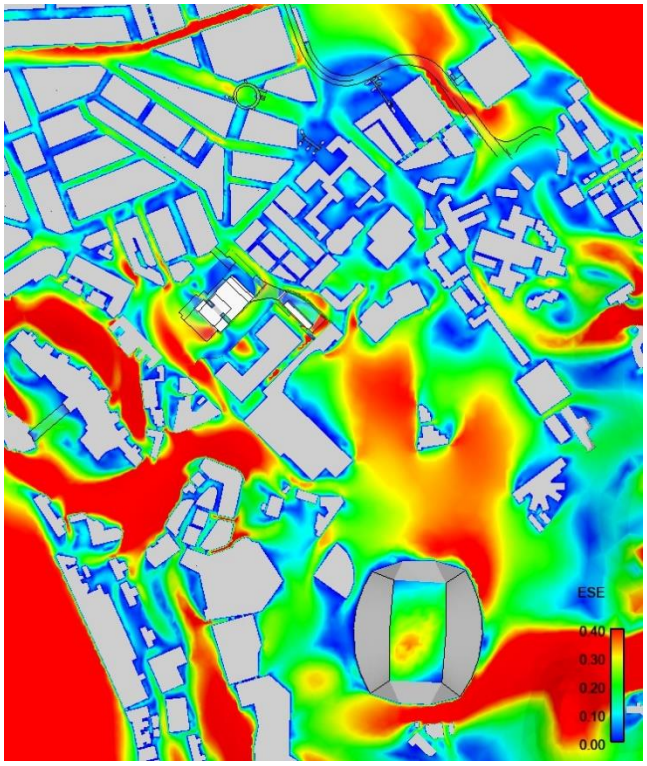



Figure C 5 Contour Plot of VR under ESE Wind

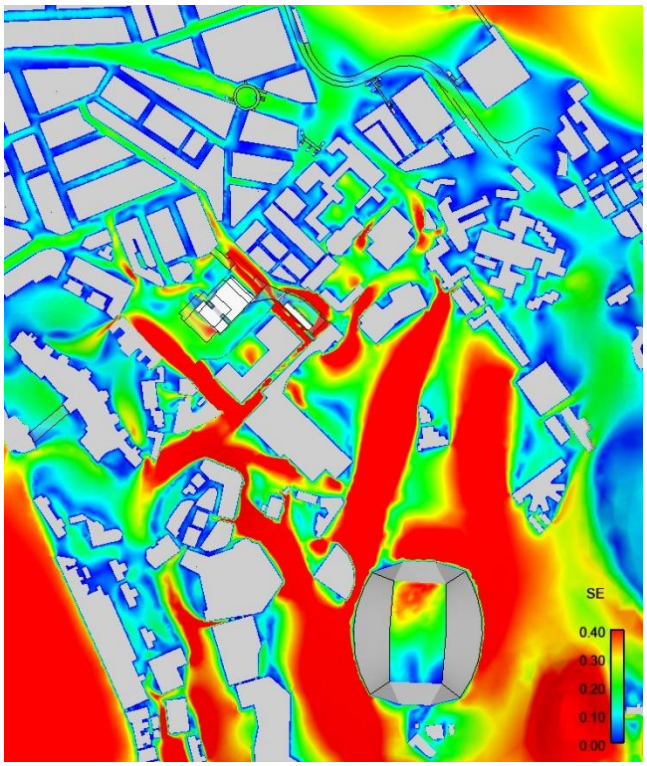



Figure C 6 Contour Plot of VR under SE Wind

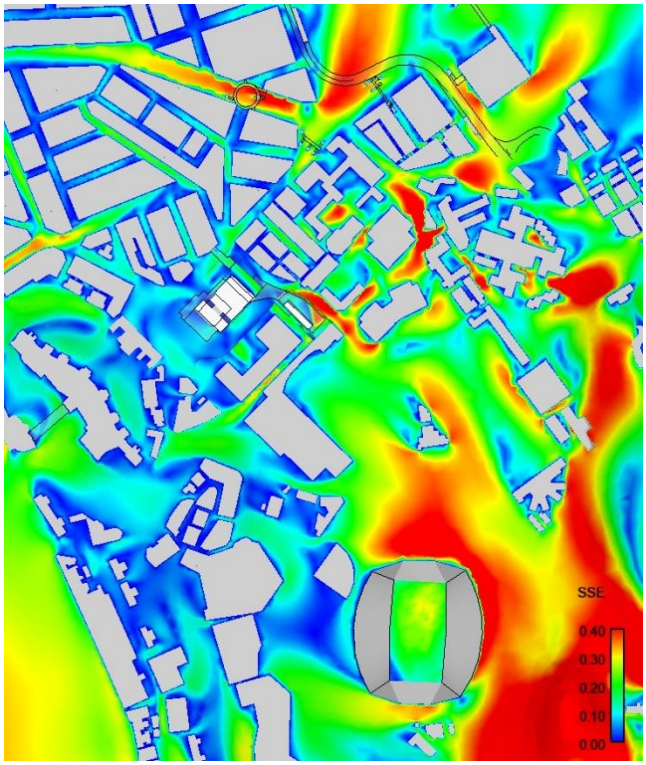



Figure C 7 Contour Plot of VR under SSE Wind

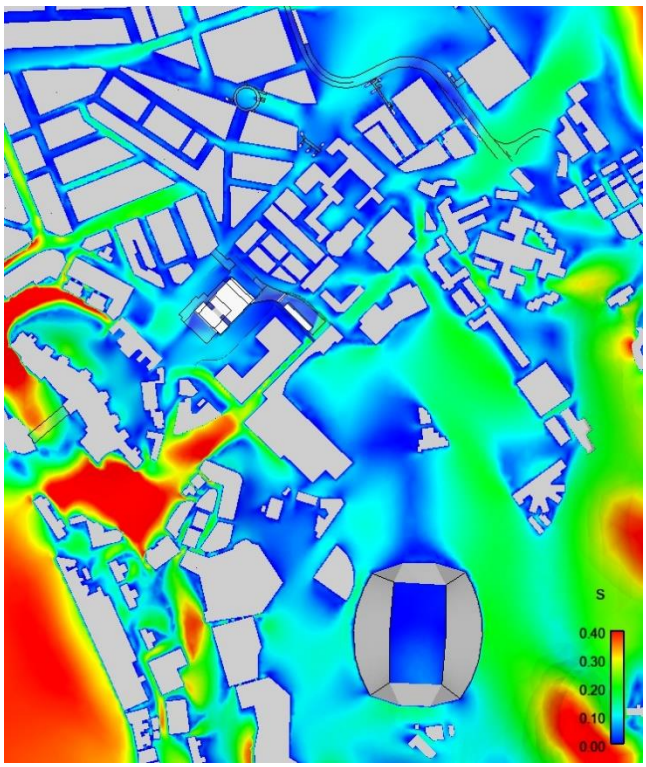



Figure C 8 Contour Plot of VR under S Wind

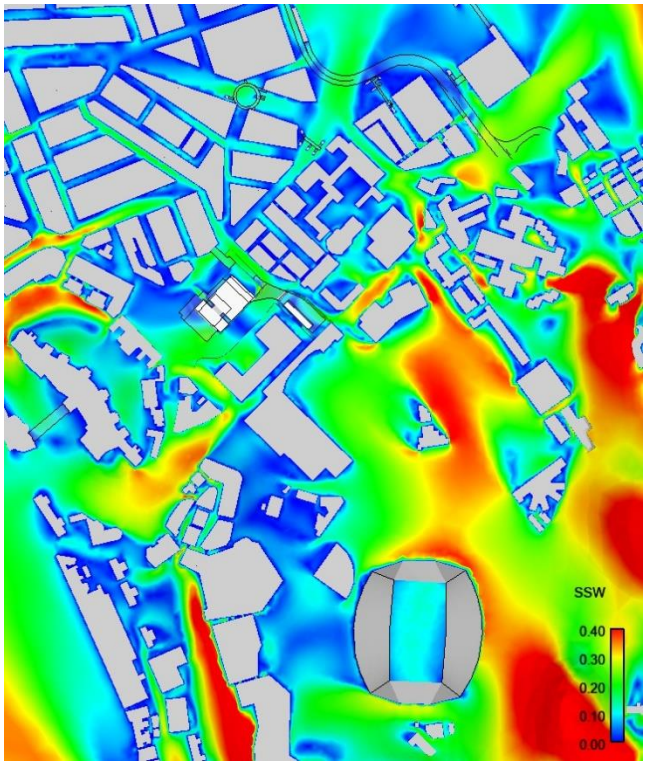



Figure C 9 Contour Plot of VR under SSW Wind

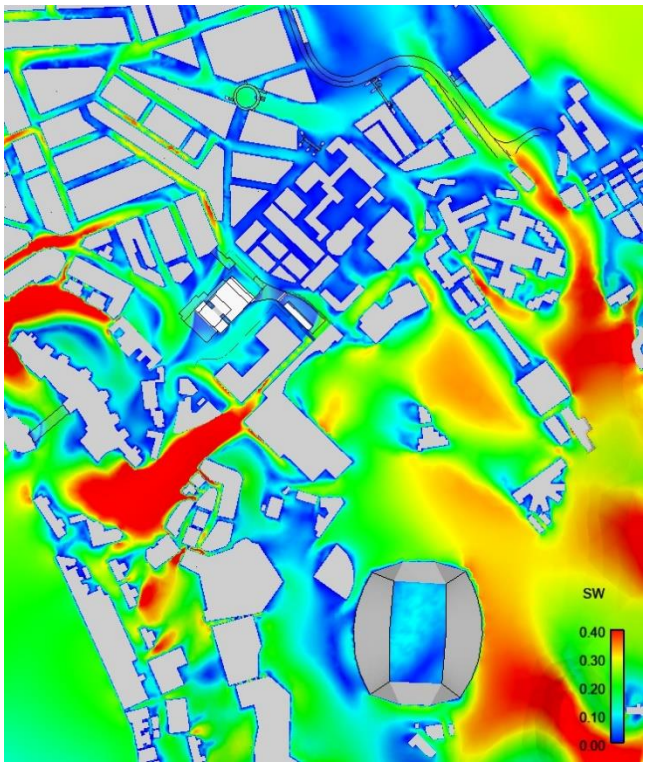



Figure C 10 Contour Plot of VR under SW Wind

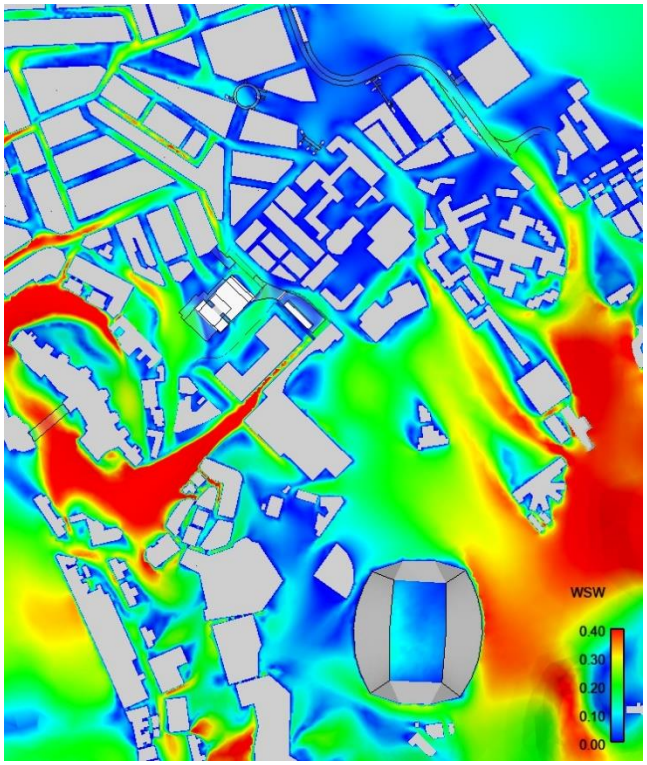



Figure C 11 Contour Plot of VR under WSW Wind

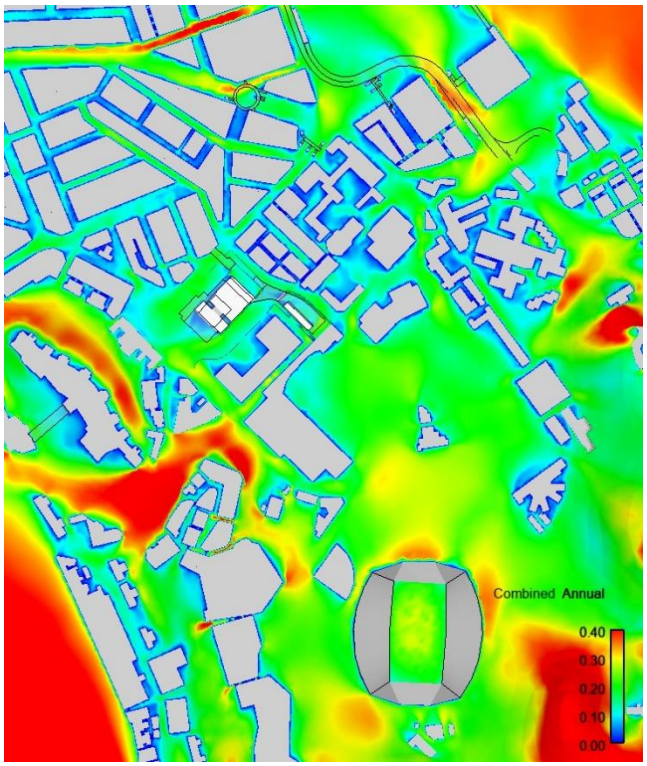



Figure C 12 Annual Weighted Average Contour Plot of VR

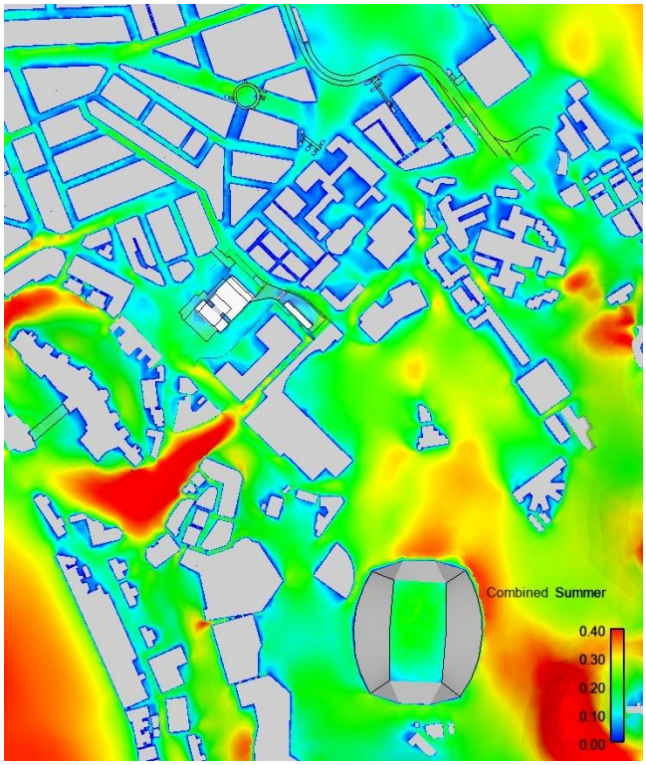



Figure C 13 Summer Weighted Average Contour Plot of VR

# C2 Baseline Scheme (Computational Domain)

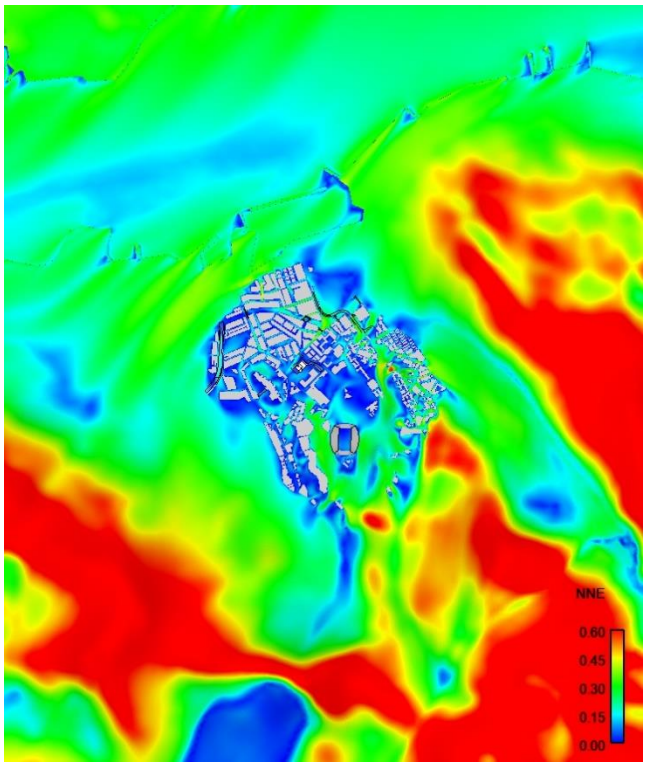



Figure C 14 Contour Plot of VR under NNE Wind

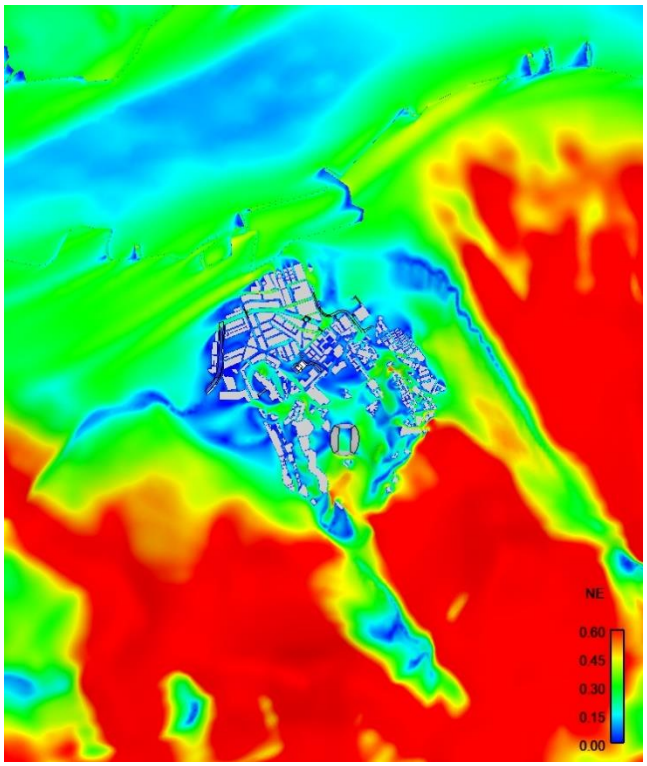



Figure C 15 Contour Plot of VR under NE Wind

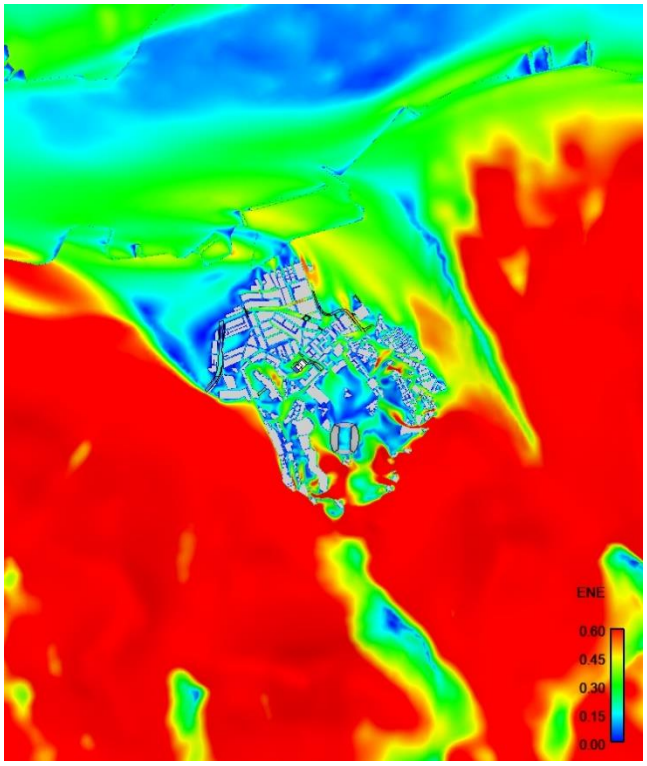



Figure C 16 Contour Plot of VR under ENE Wind

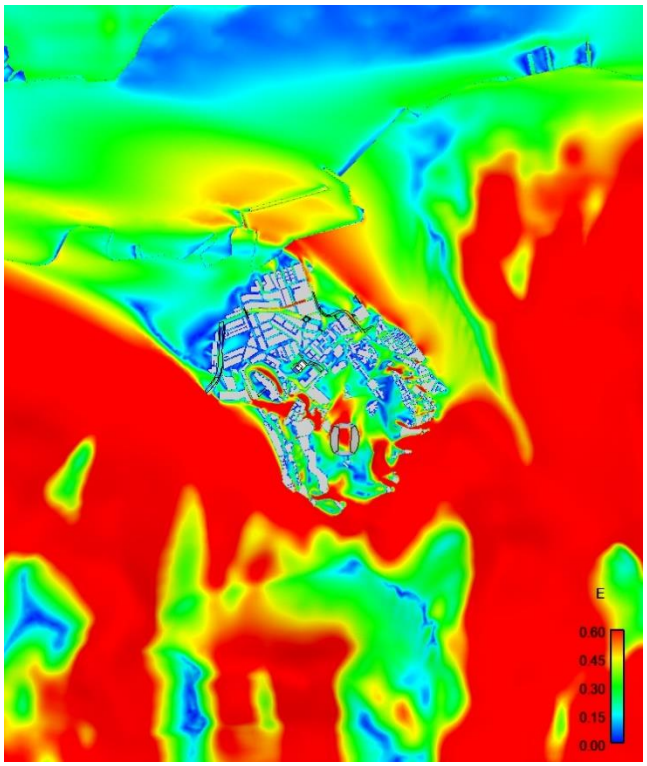



Figure C 17 Contour Plot of VR under E Wind

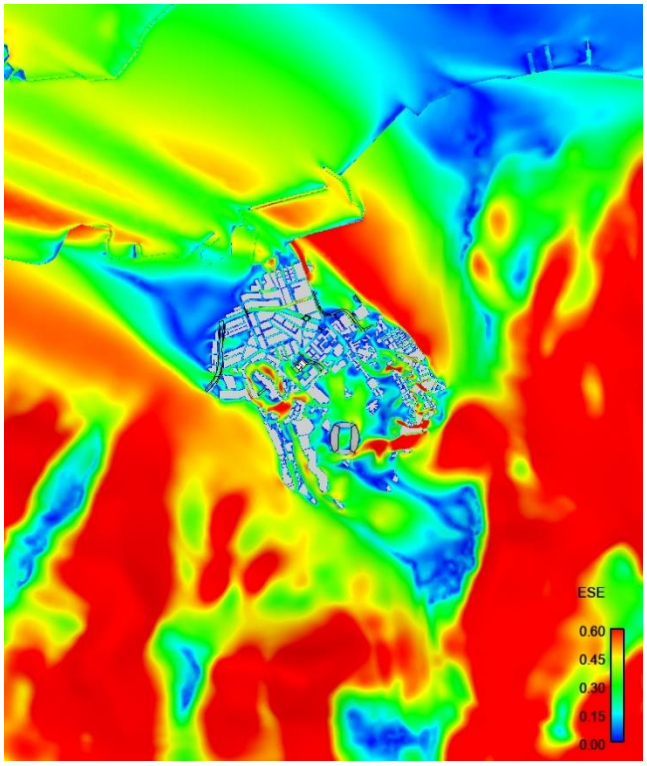



Figure C 18 Contour Plot of VR under ESE Wind

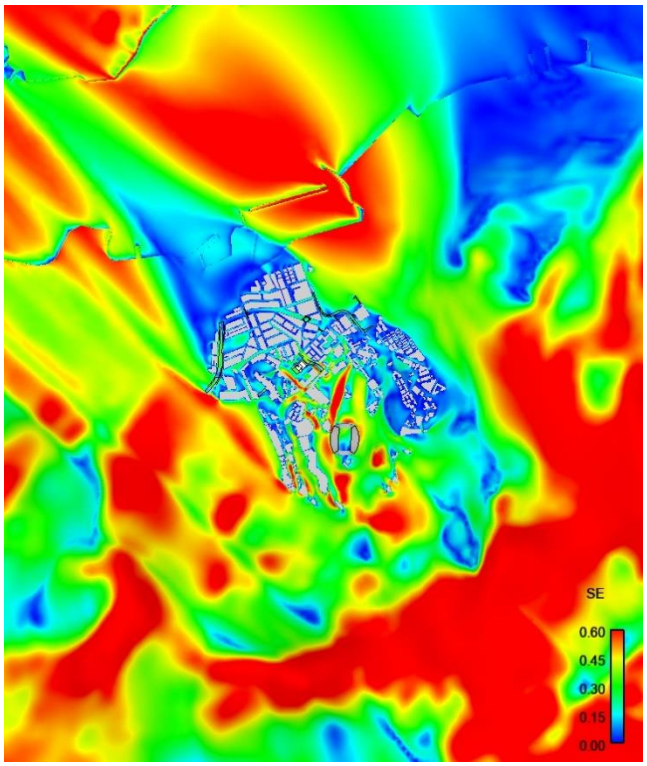



Figure C 19 Contour Plot of VR under SE Wind

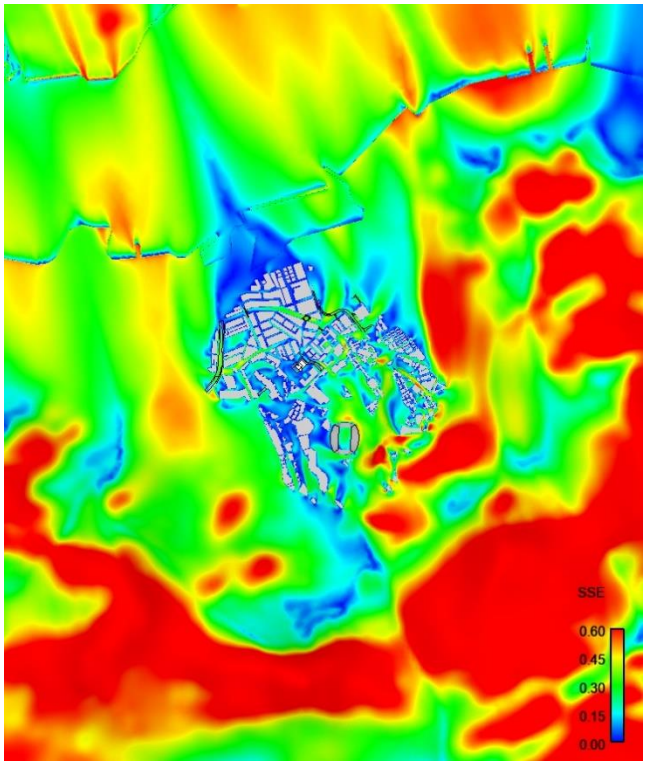



Figure C 20 Contour Plot of VR under SSE Wind

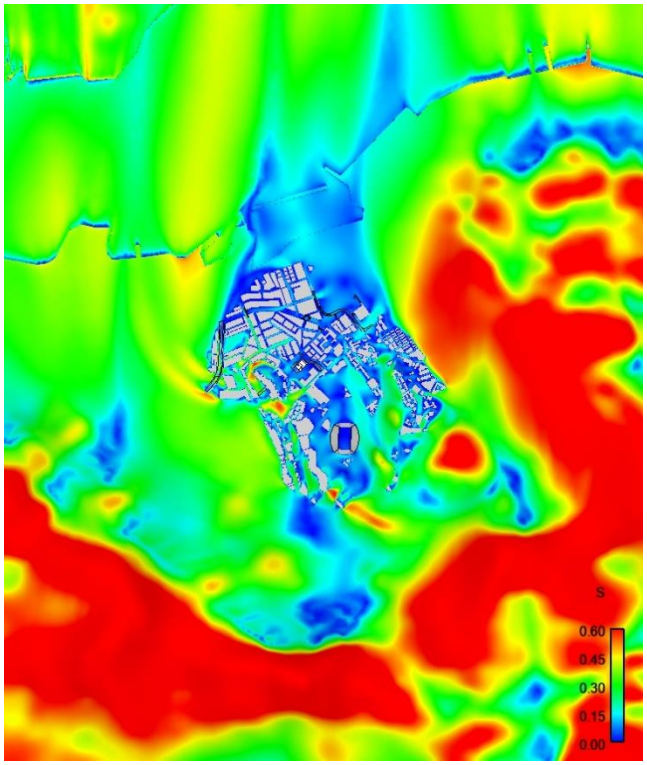



Figure C 21 Contour Plot of VR under S Wind

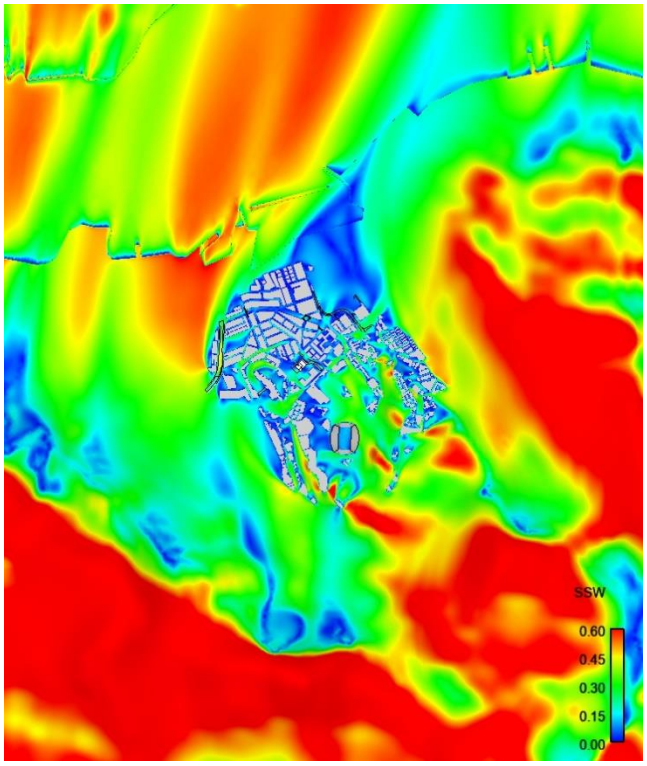



Figure C 22 Contour Plot of VR under SSW Wind

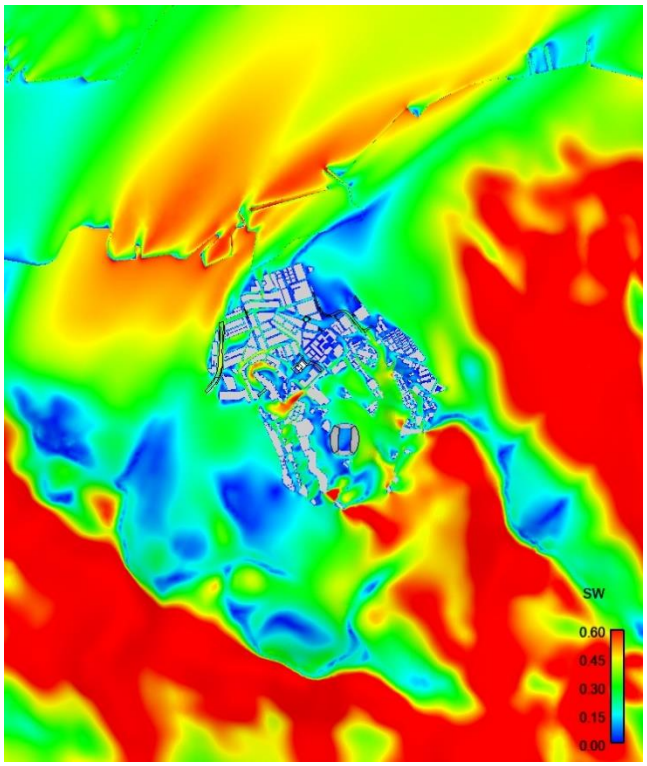



Figure C 23 Contour Plot of VR under SW Wind

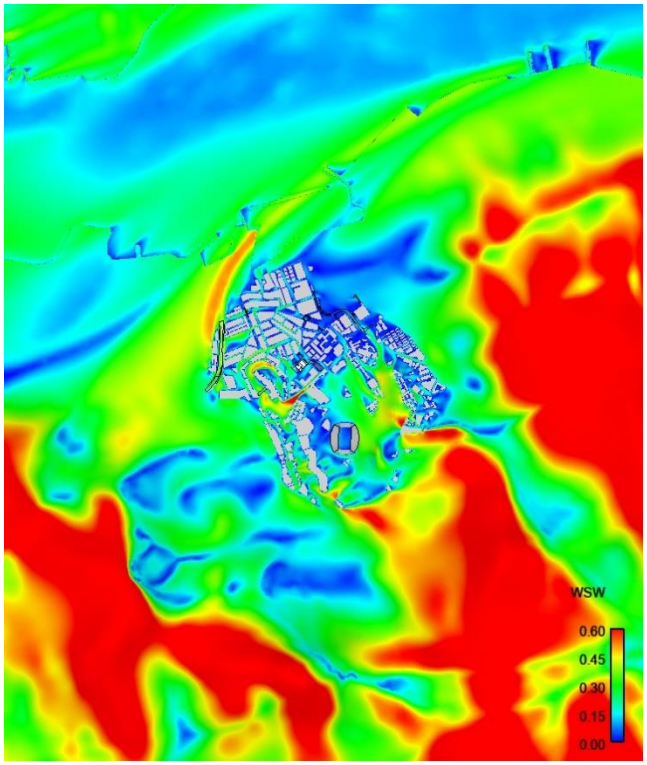



Figure C 24 Contour Plot of VR under WSW Wind

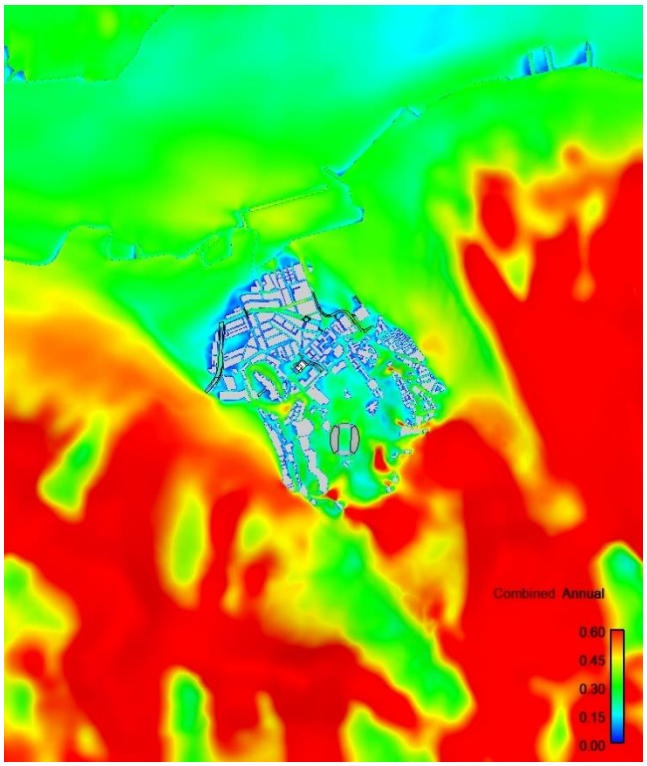



Figure C 25 Annual Weighted Average Contour Plot of VR

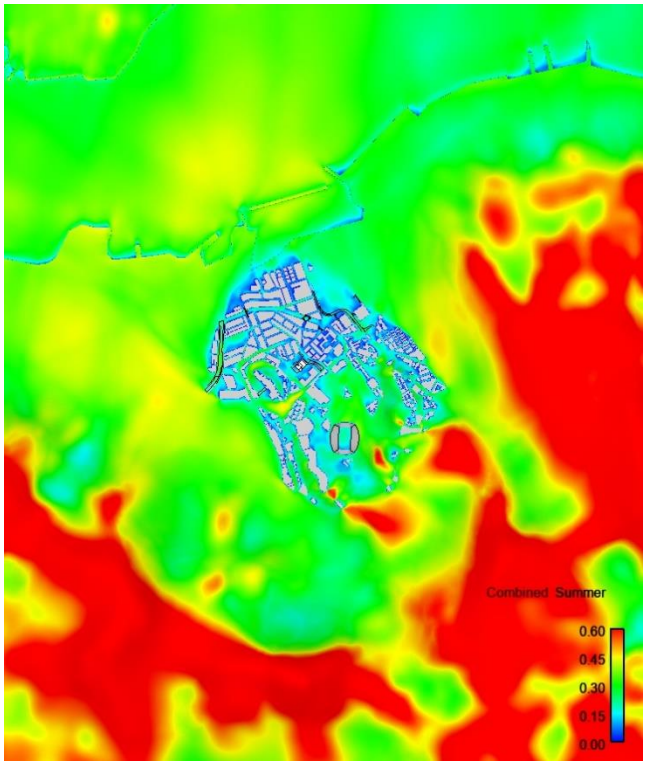



Figure C 26 Summer Weighted Average Contour Plot of VR

# C3 Proposed Scheme

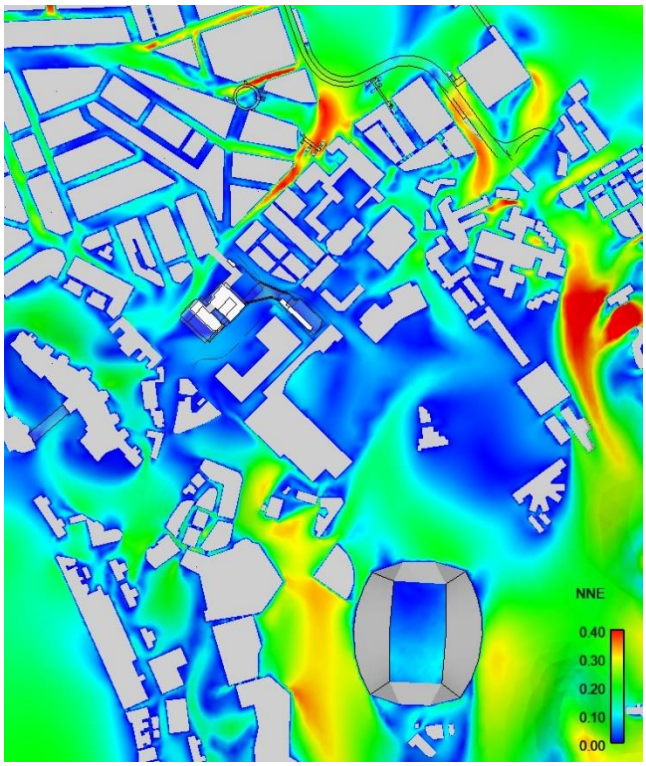



Figure C 27 Contour Plot of VR under NNE Wind

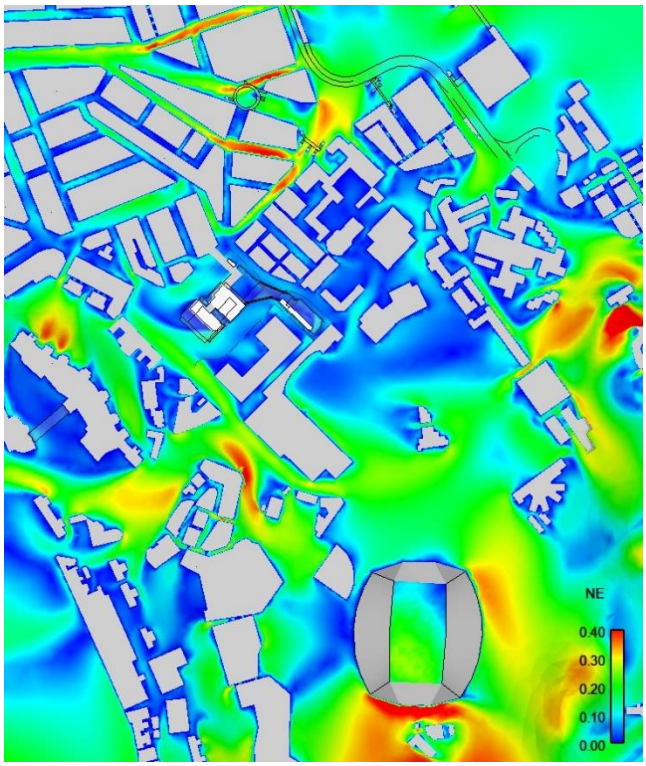



Figure C 28 Contour Plot of VR under NE Wind

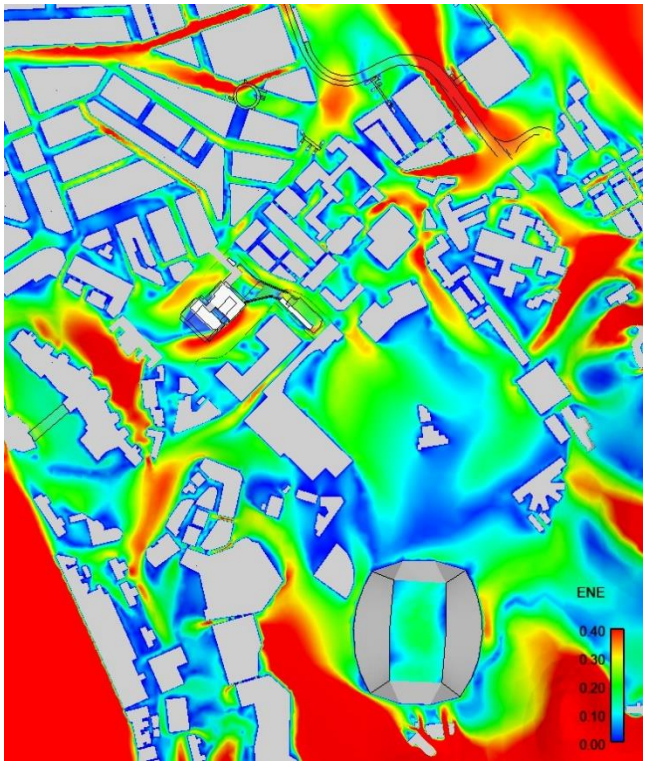



Figure C 29 Contour Plot of VR under ENE Wind

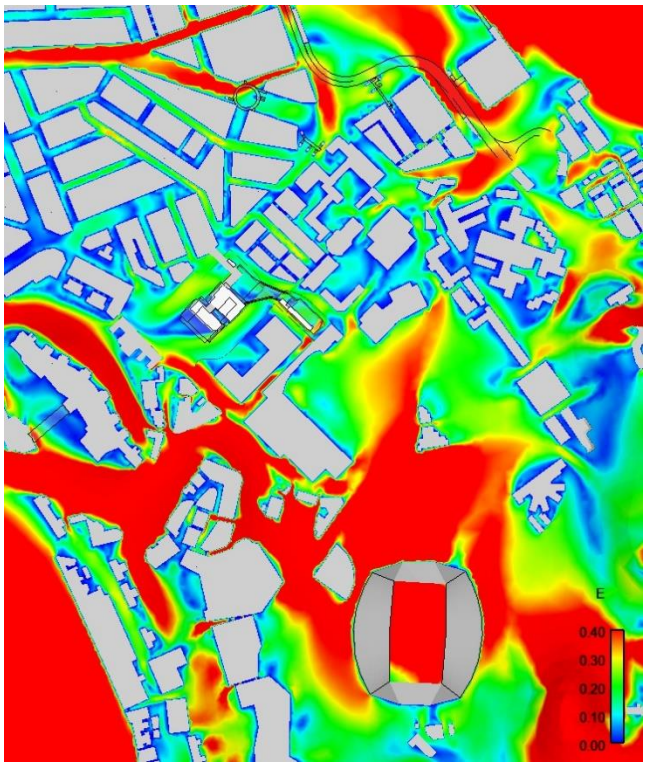



Figure C 30 Contour Plot of VR under E Wind

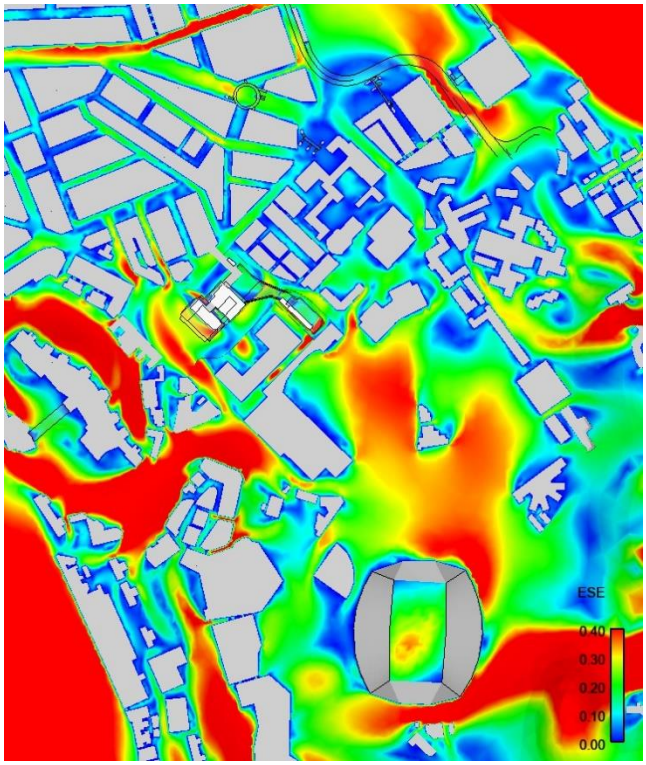



Figure C 31 Contour Plot of VR under ESE Wind

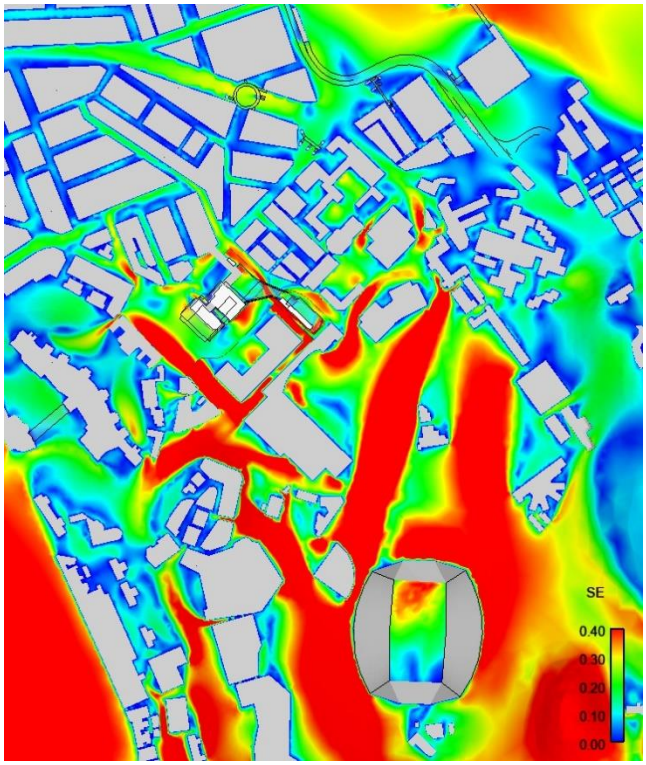



Figure C 32 Contour Plot of VR under SE Wind

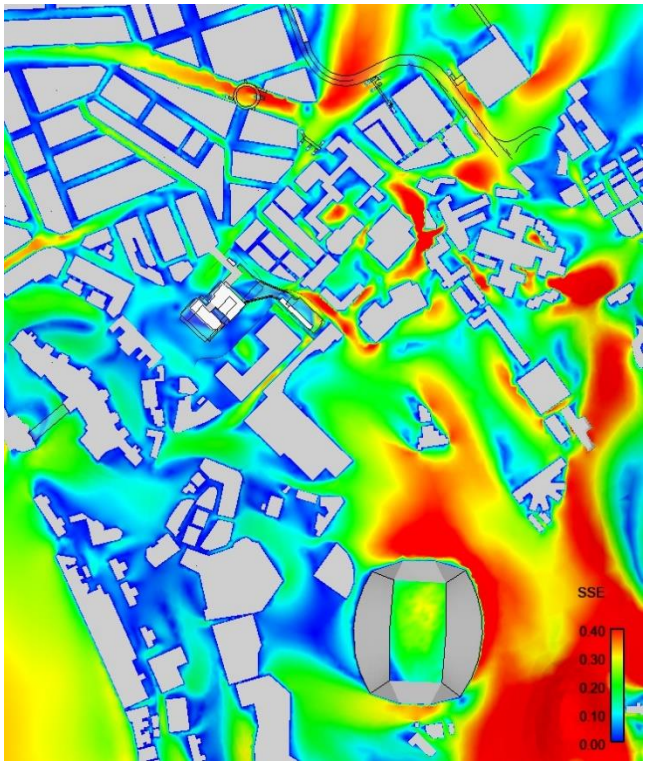



Figure C 33 Contour Plot of VR under SSE Wind

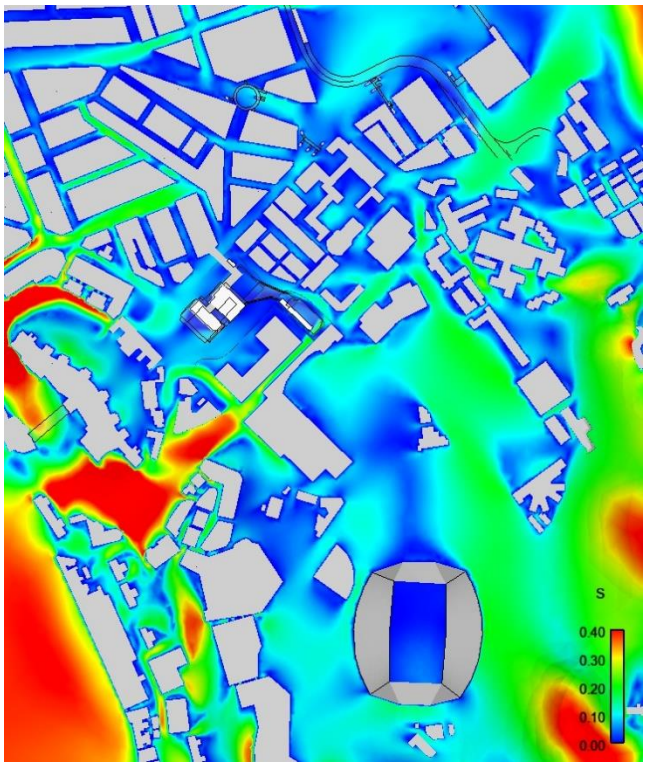



Figure C 34 Contour Plot of VR under S Wind

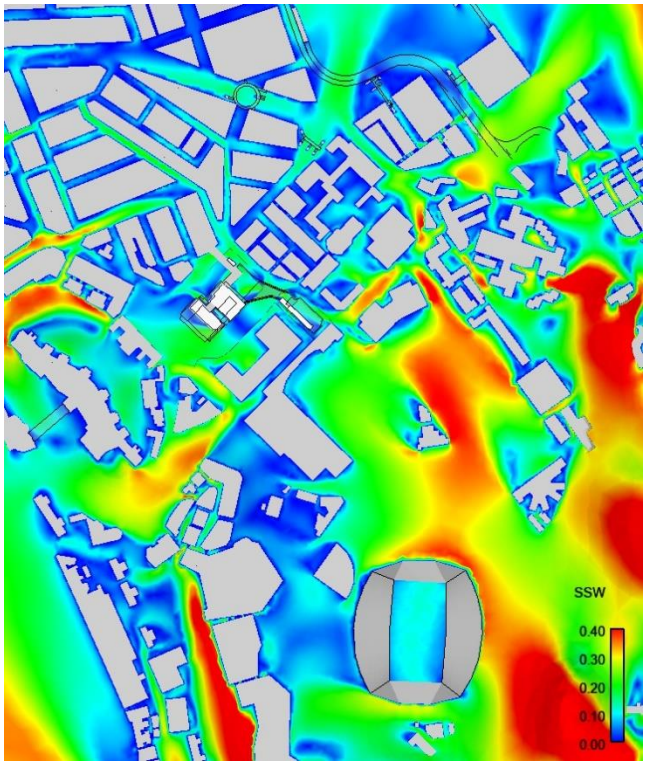



Figure C 35 Contour Plot of VR under SSW Wind

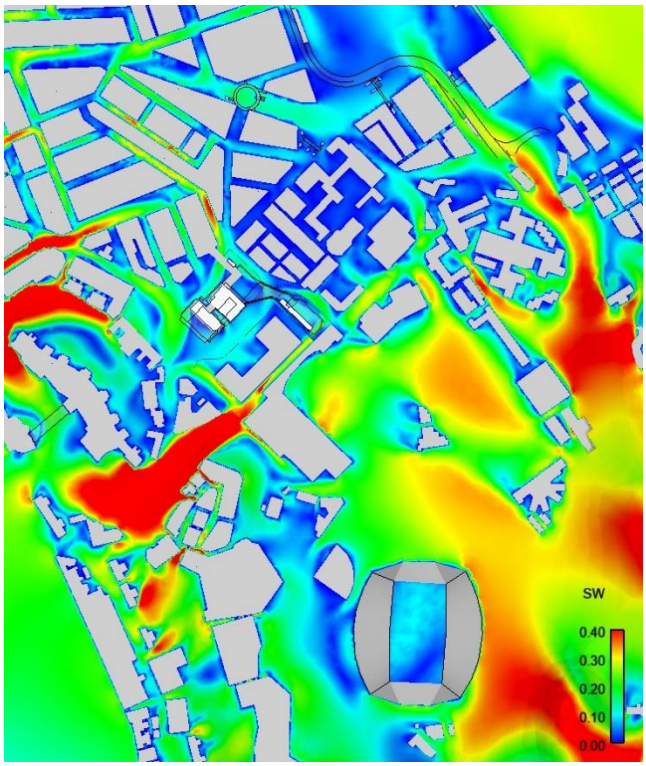



Figure C 36 Contour Plot of VR under SW Wind

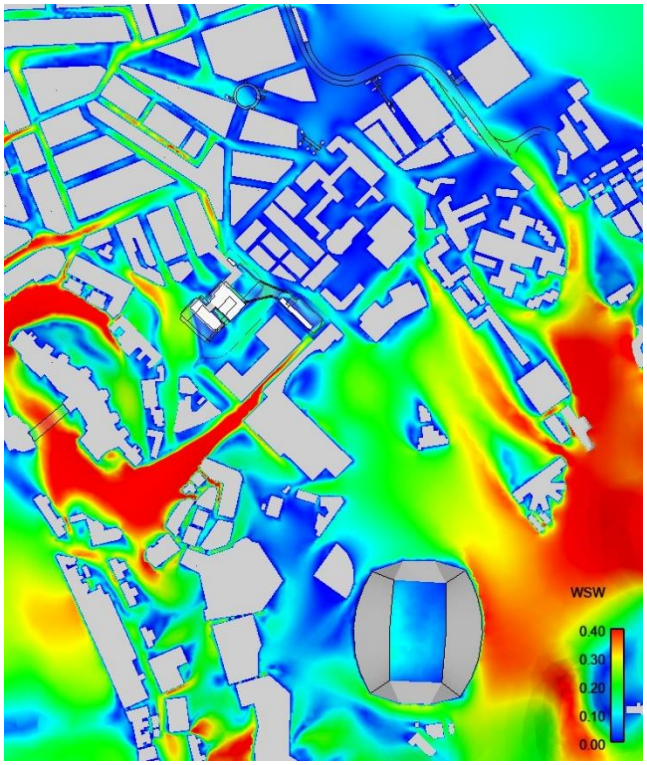



Figure C 37 Contour Plot of VR under WSW Wind

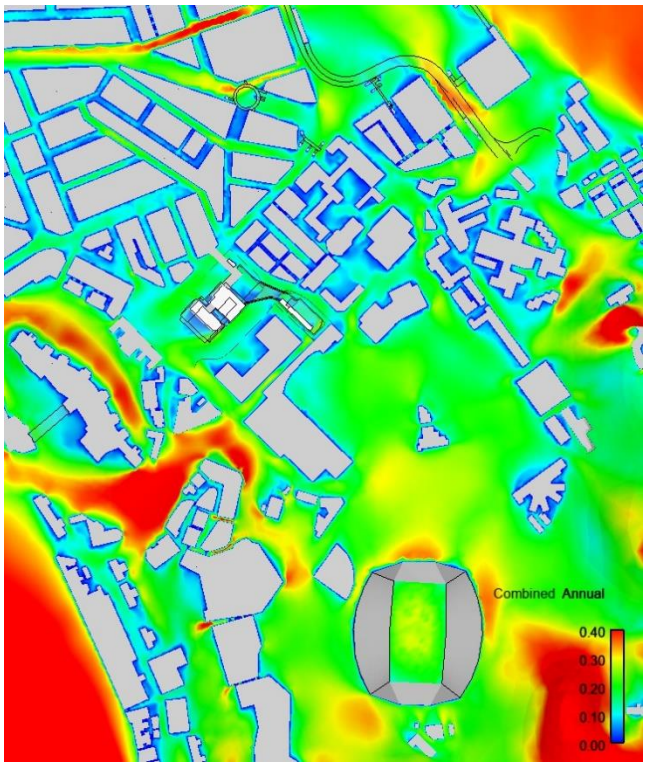



Figure C 38 Annual Weighted Average Contour Plot of VR

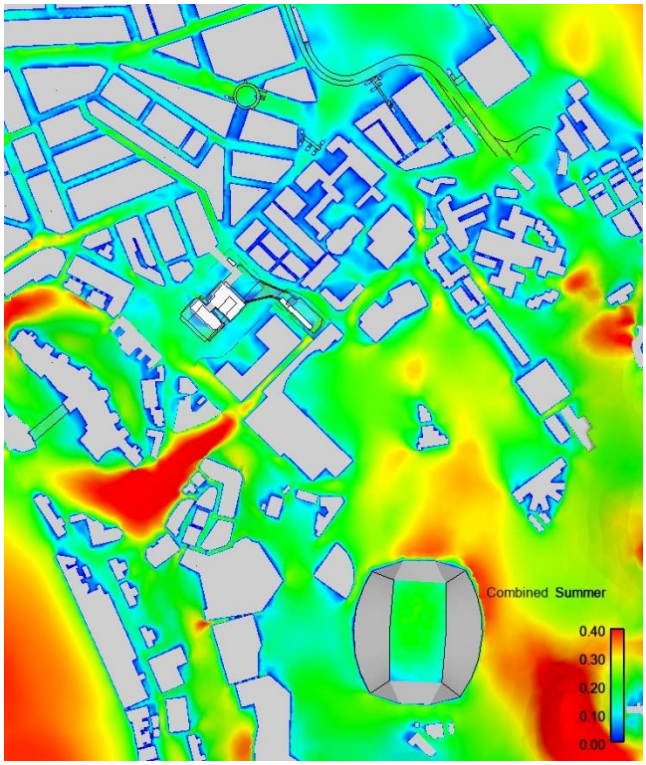



Figure C 39 Summer Weighted Average Contour Plot of VR

# C4 Proposed Scheme (Computational Domain)

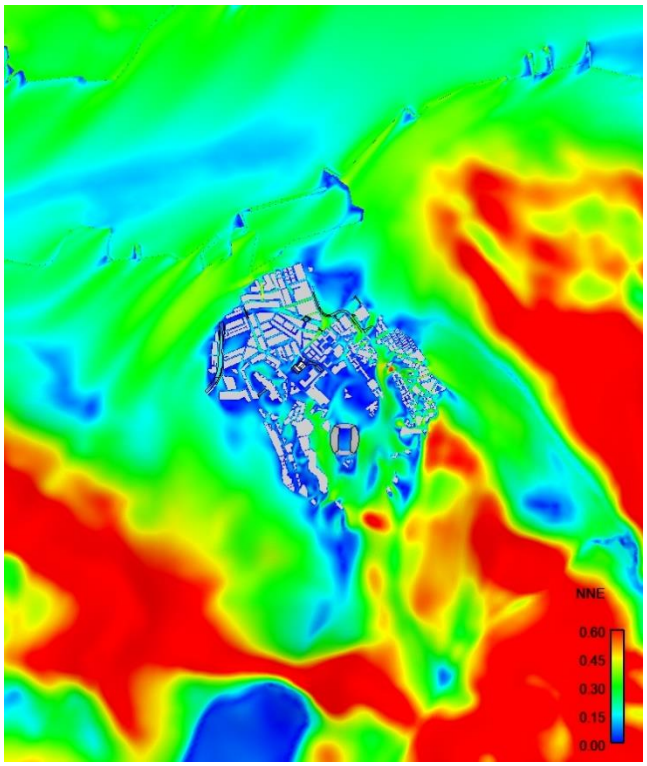



Figure C 40 Contour Plot of VR under NNE Wind

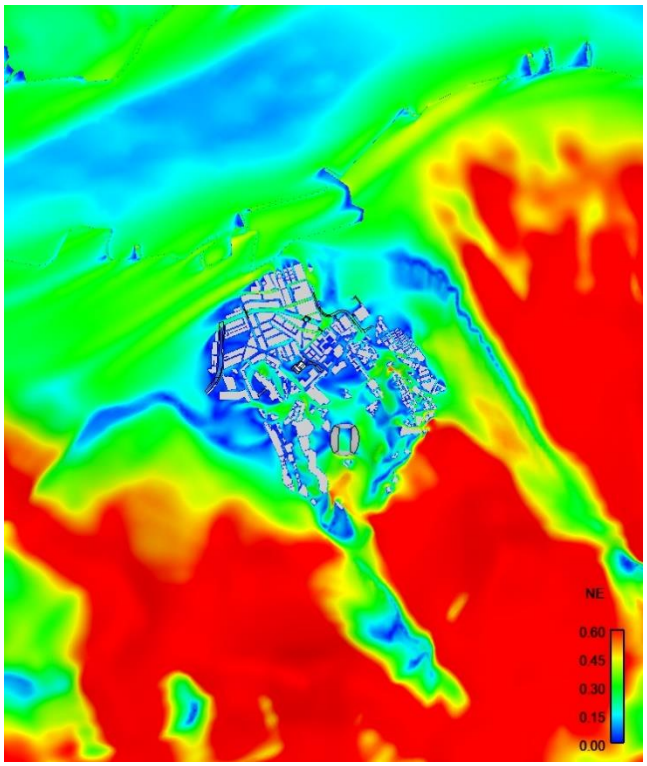



Figure C 41 Contour Plot of VR under NE Wind

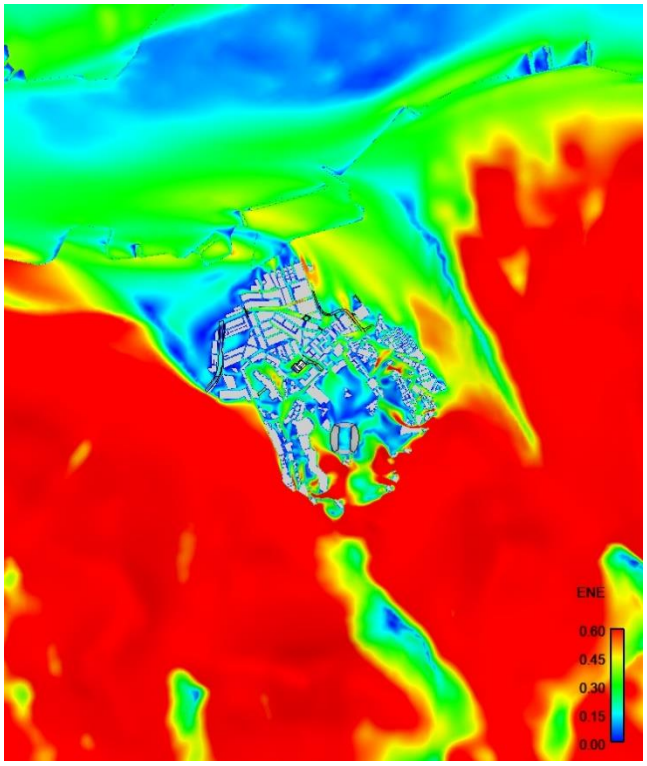



Figure C 42 Contour Plot of VR under ENE Wind

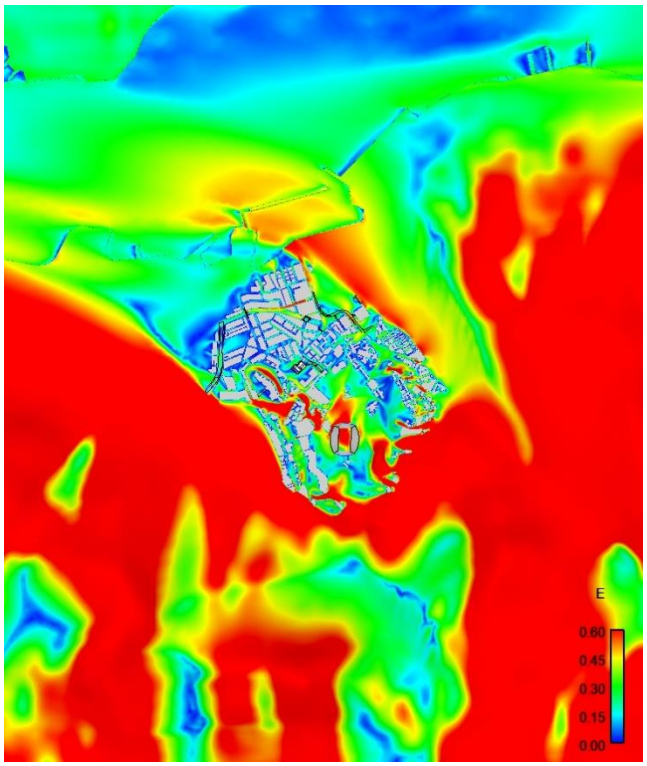



Figure C 43 Contour Plot of VR under E Wind

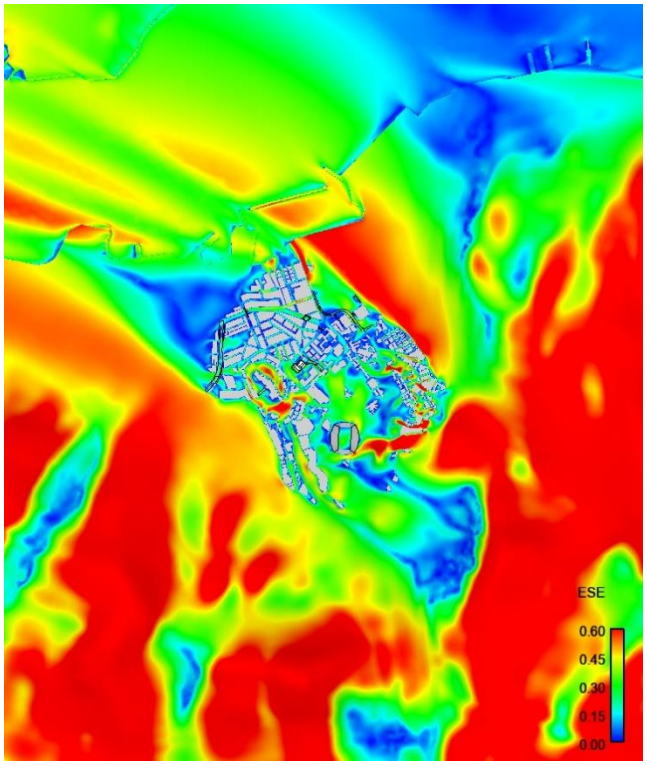



Figure C 44 Contour Plot of VR under ESE Wind

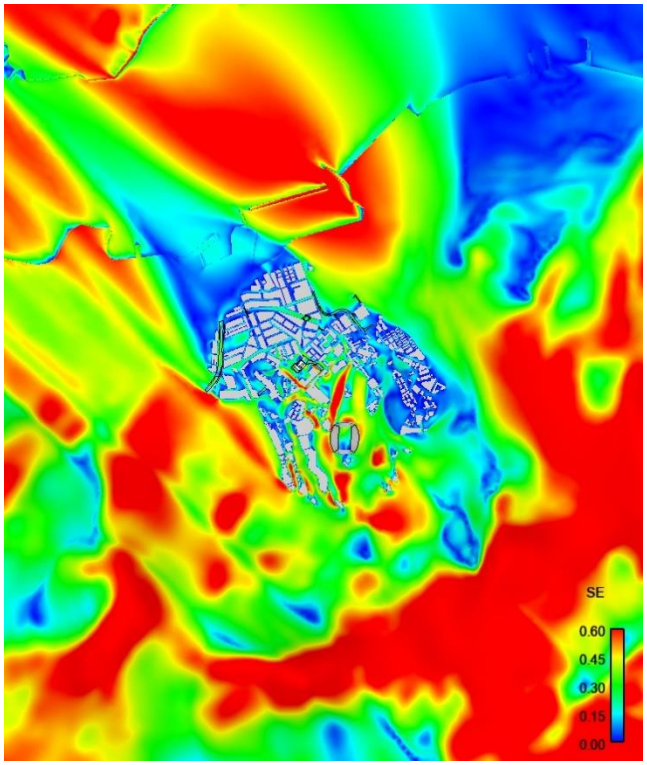



Figure C 45 Contour Plot of VR under SE Wind

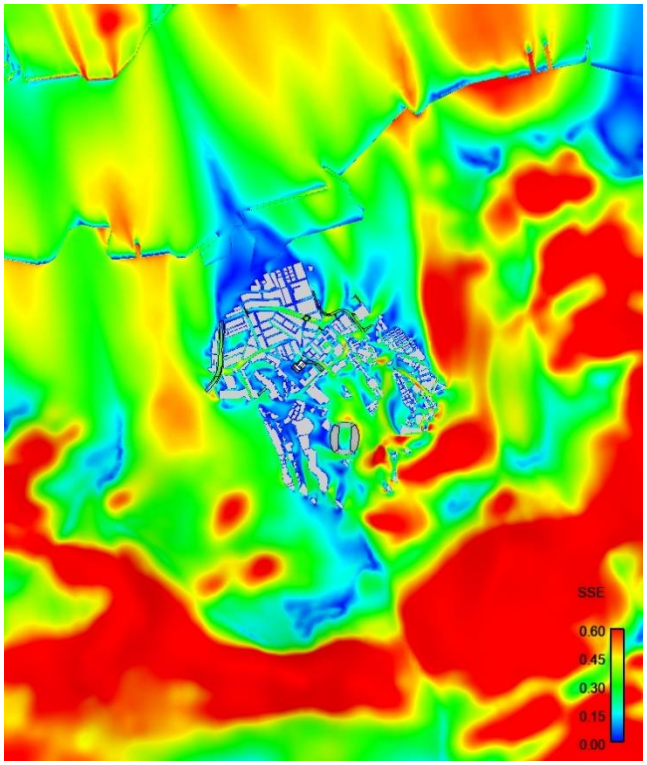



Figure C 46 Contour Plot of VR under SSE Wind

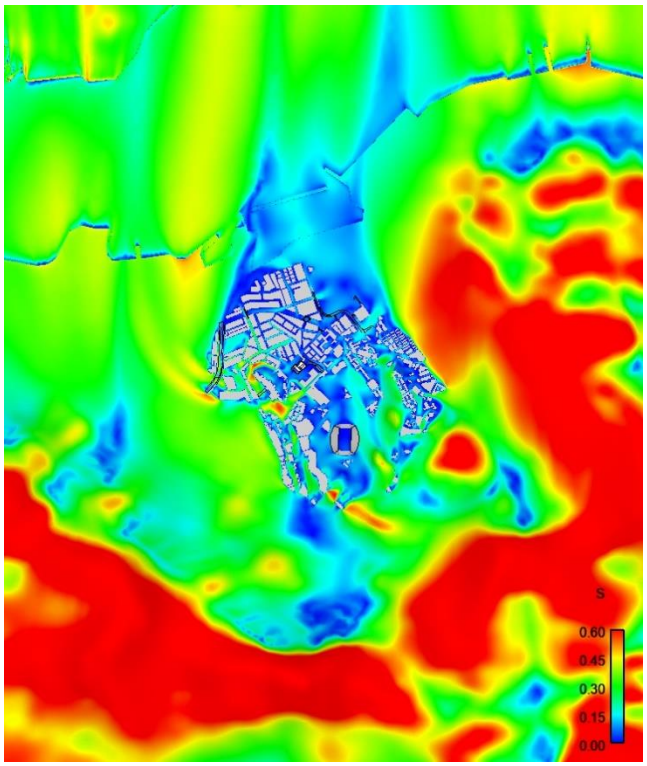



Figure C 47 Contour Plot of VR under S Wind

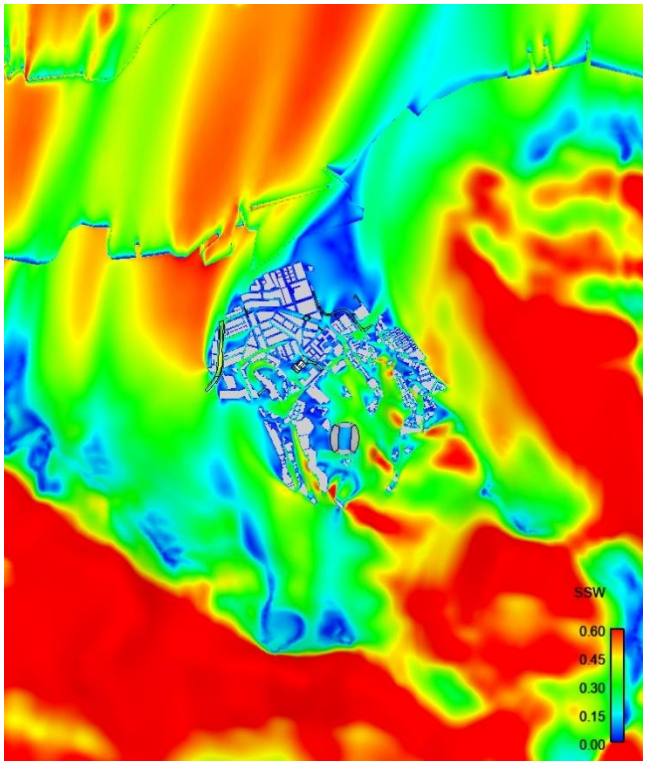



Figure C 48 Contour Plot of VR under SSW Wind

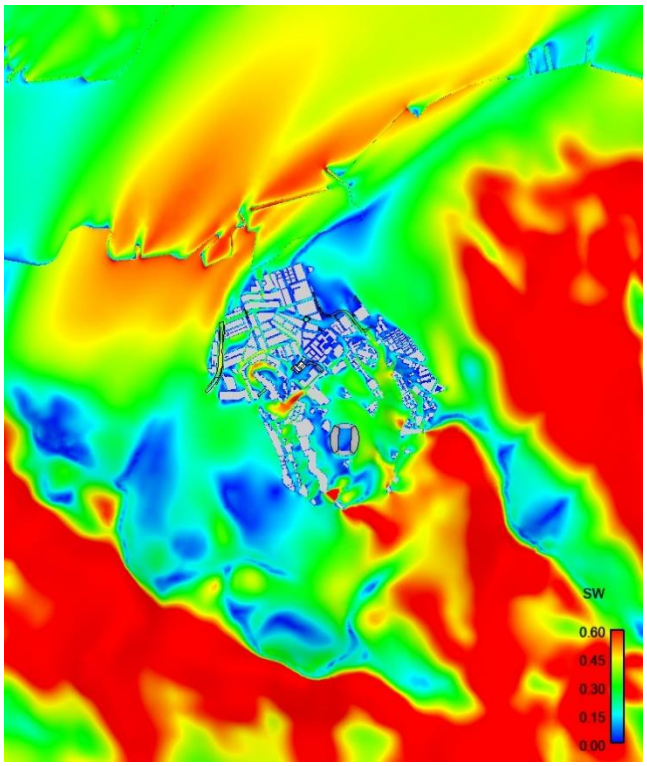



Figure C 49 Contour Plot of VR under SW Wind

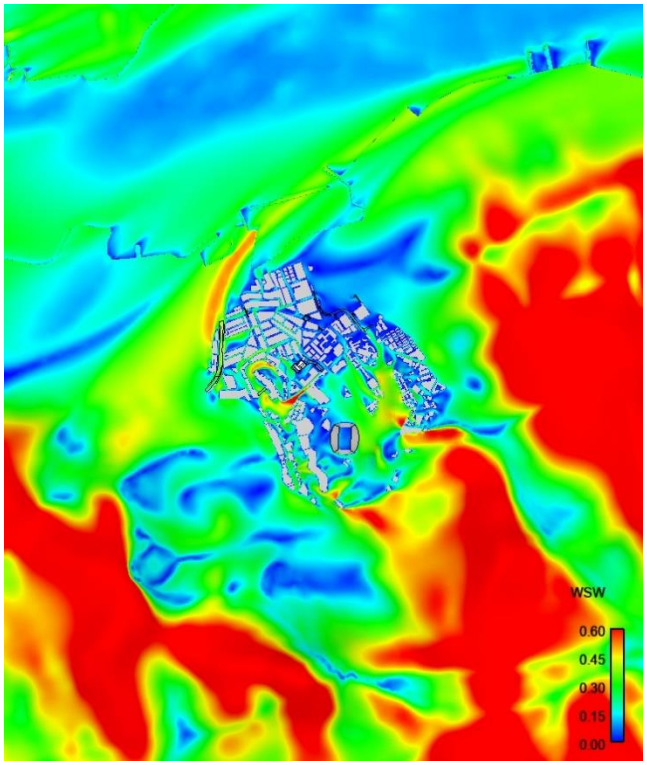



Figure C 50 Contour Plot of VR under WSW Wind

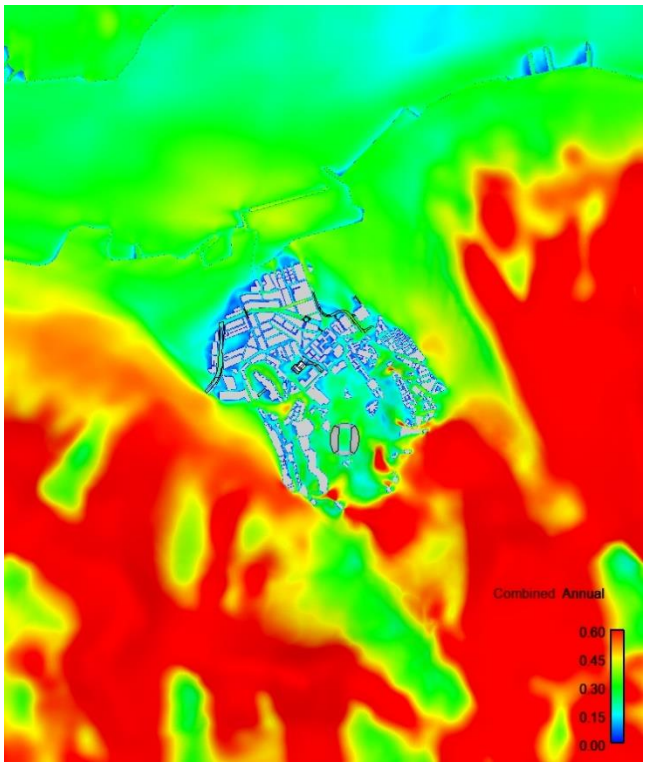



Figure C 51 Annual Weighted Average Contour Plot of VR

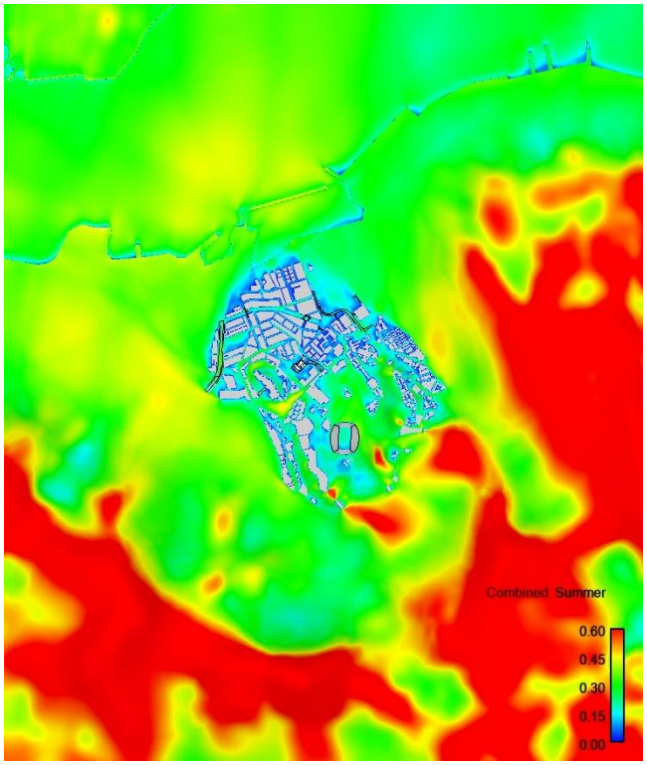



Figure C 52 Summer Weighted Average Contour Plot of VR

# Appendix D

Vector Plots of Velocity Ratio (VR)

# D1 Baseline Scheme

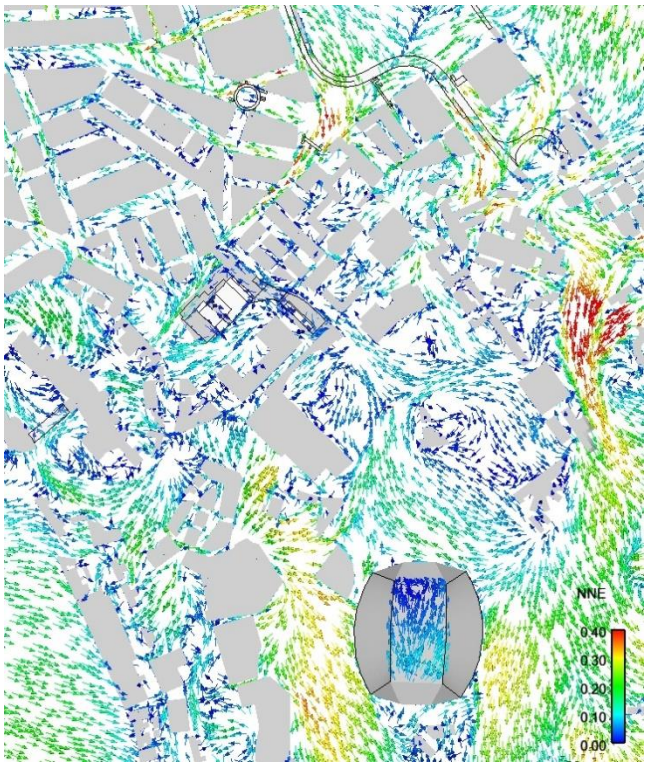



Figure D 1 Vector Plot of VR under NNE Wind

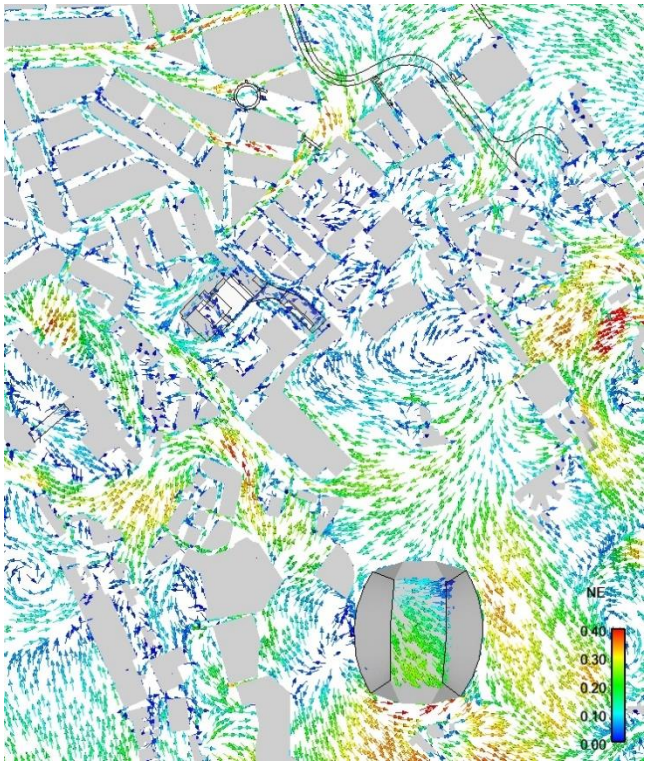



Figure D 2 Vector Plot of VR under NE Wind

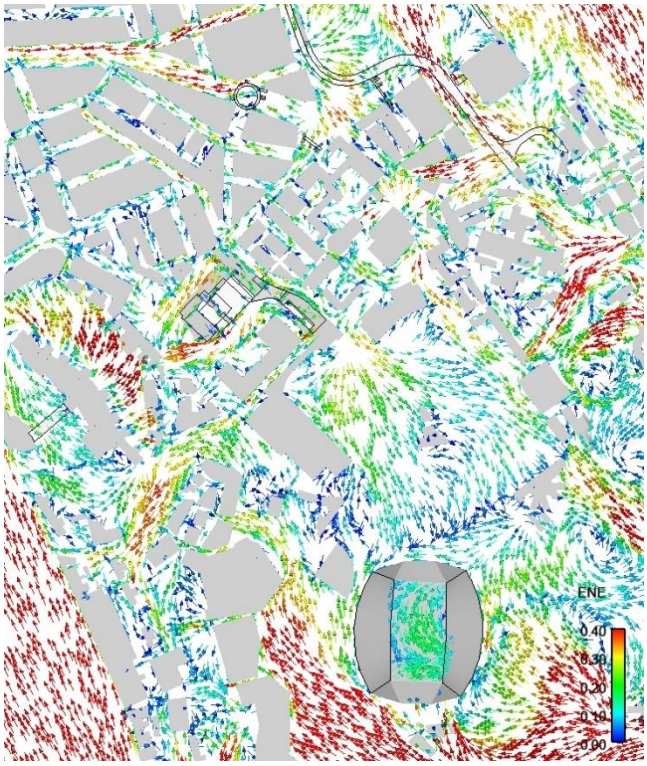



Figure D 3 Vector Plot of VR under ENE Wind

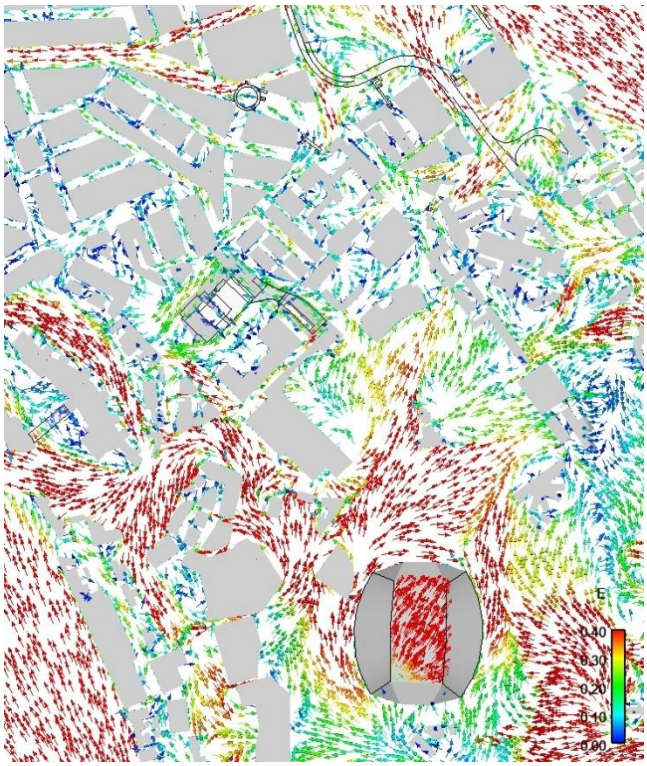



Figure D 4 Vector Plot of VR under E Wind

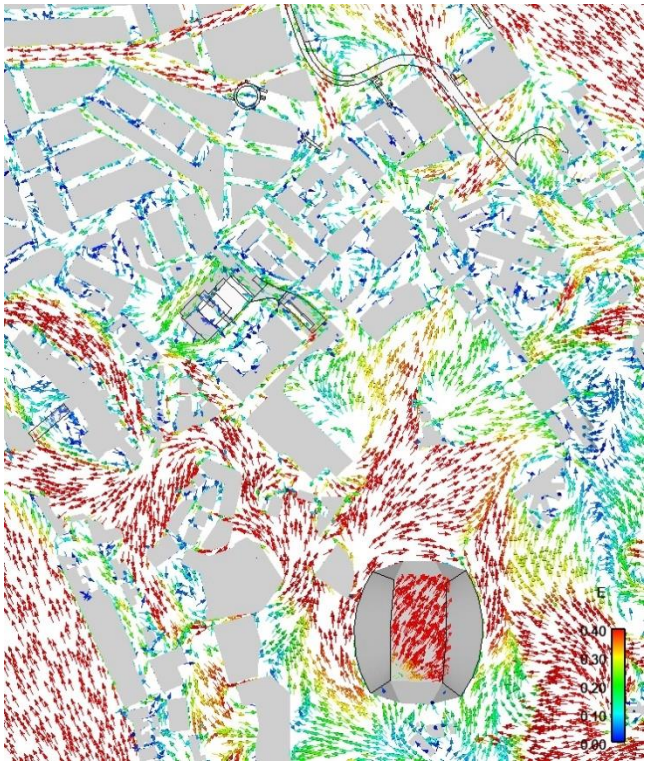



Figure D 5 Vector Plot of VR under ESE Wind

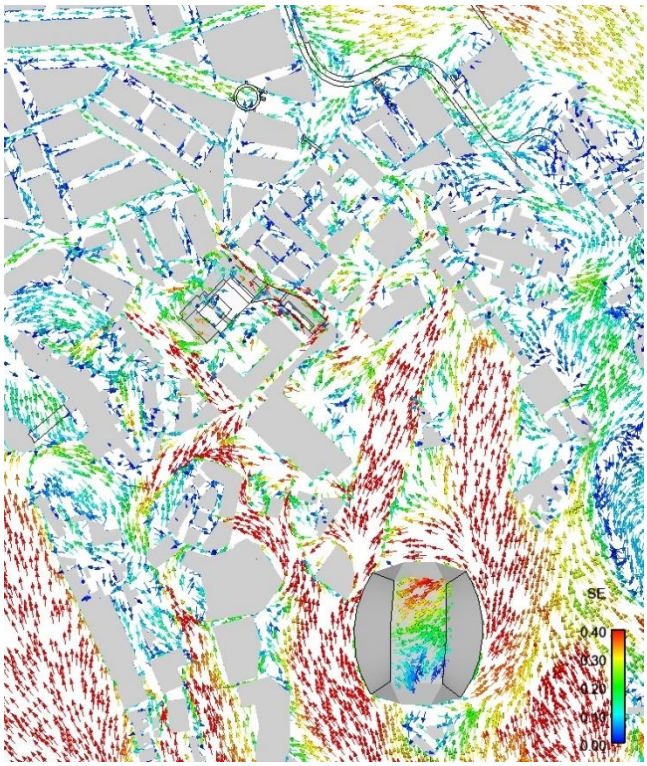



Figure D 6 Vector Plot of VR under SE Wind

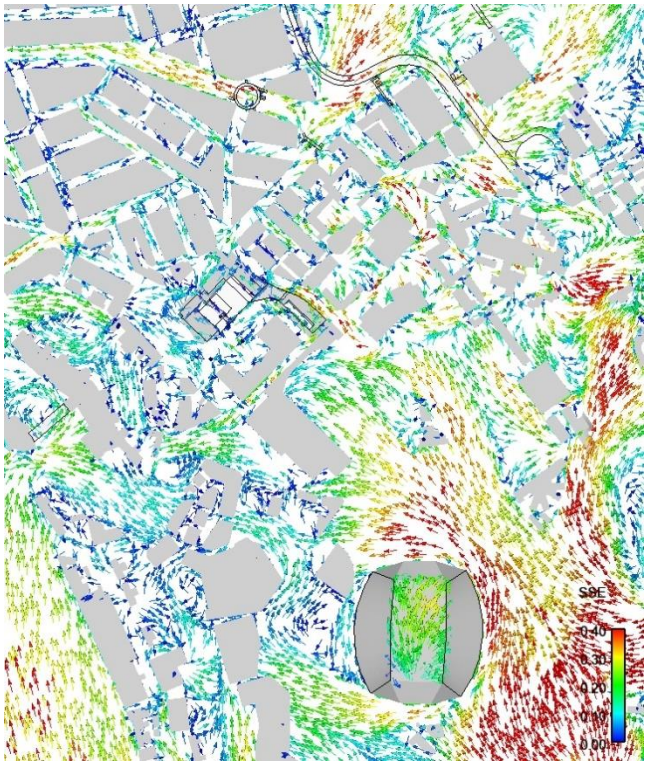



Figure D 7 Vector Plot of VR under SSE Wind

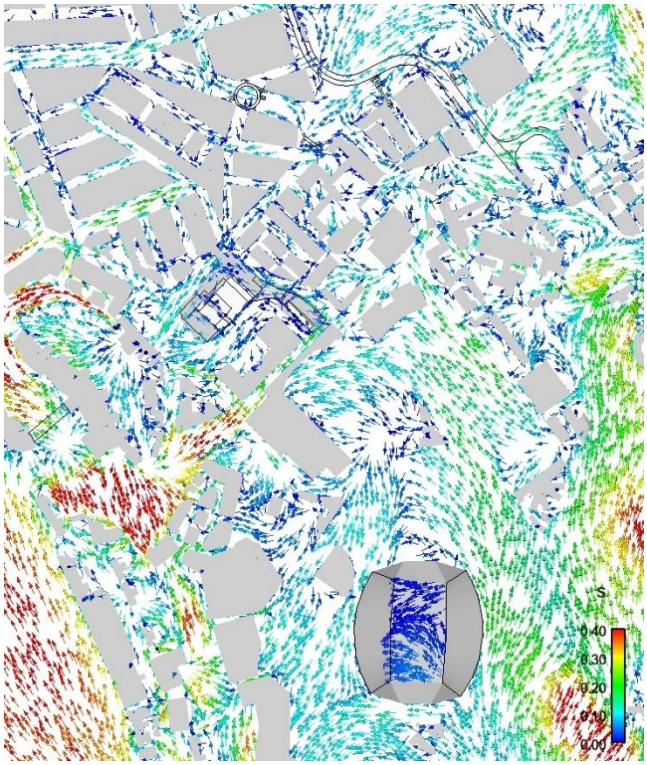



Figure D 8 Vector Plot of VR under S Wind

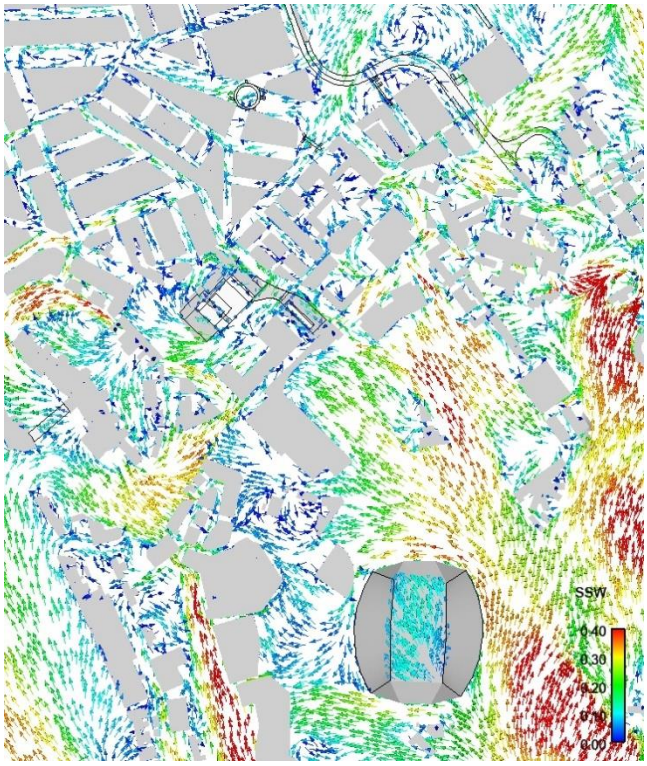



Figure D 9 Vector Plot of VR under SSW Wind

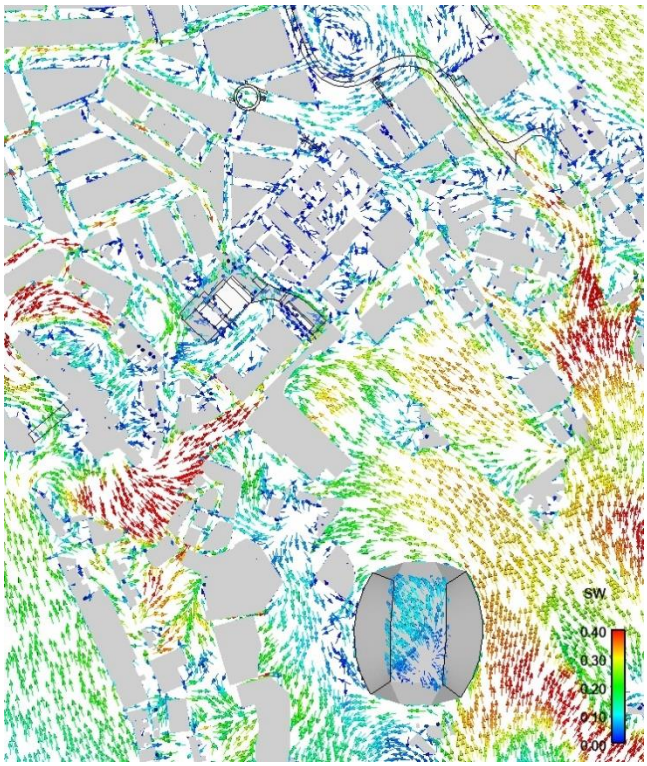



Figure D 10 Vector Plot of VR under SW Wind

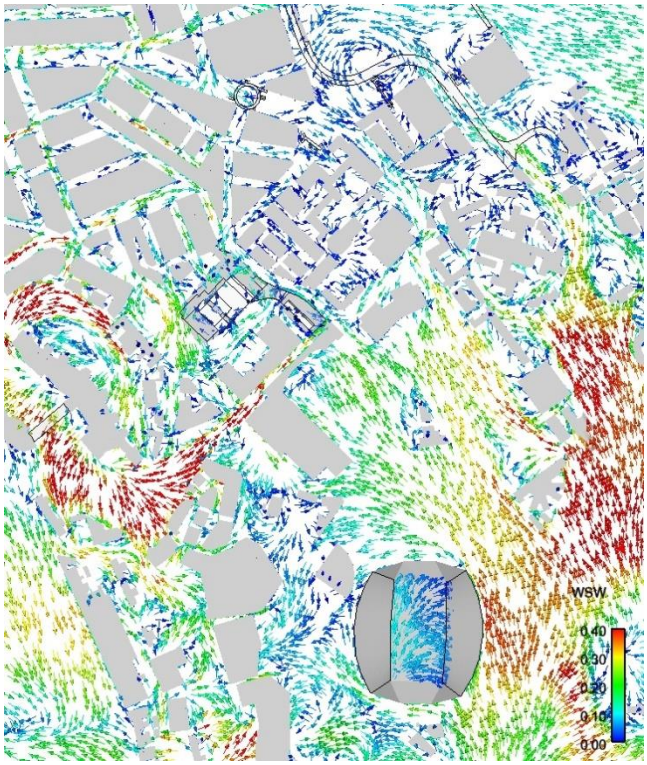



Figure D 11 Vector Plot of VR under WSW Wind

# D2 Proposed Scheme

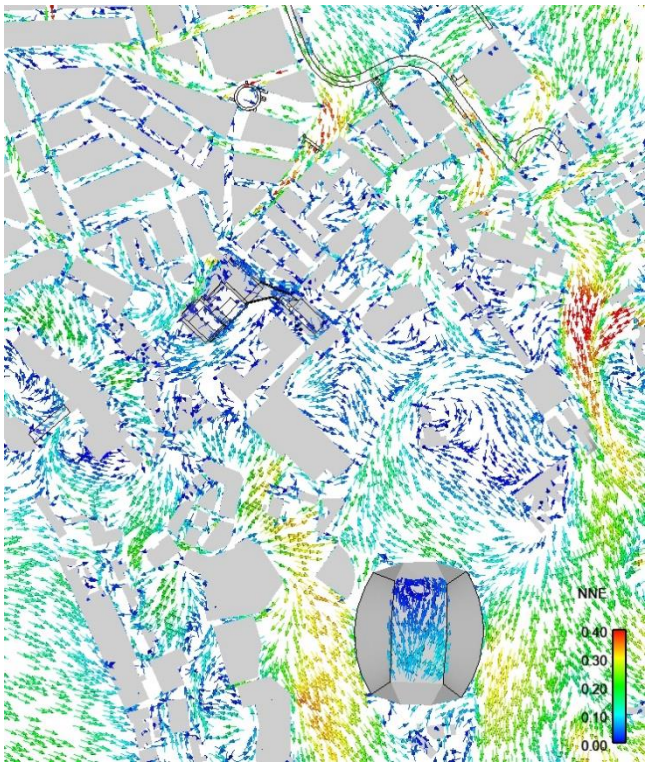



Figure D 12 Vector Plot of VR under NNE Wind

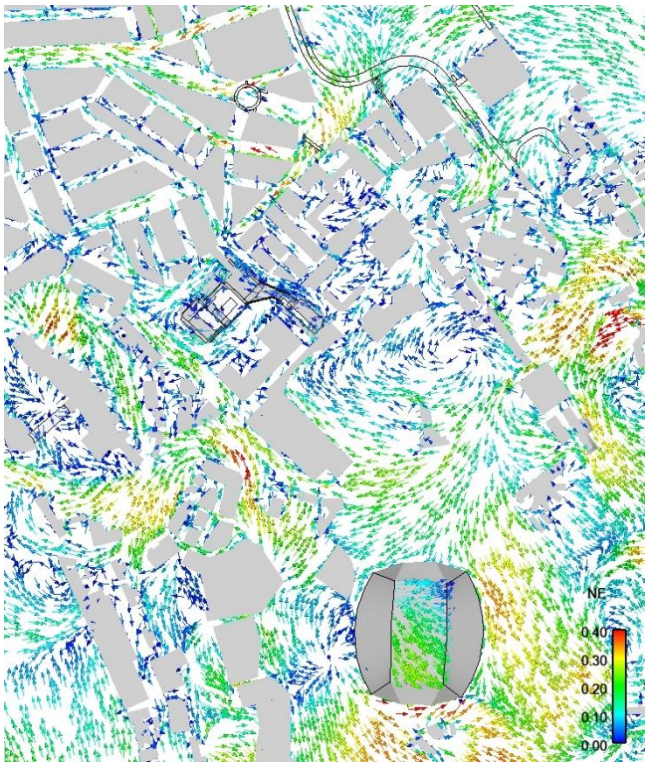



Figure D 13 Vector Plot of VR under NE Wind

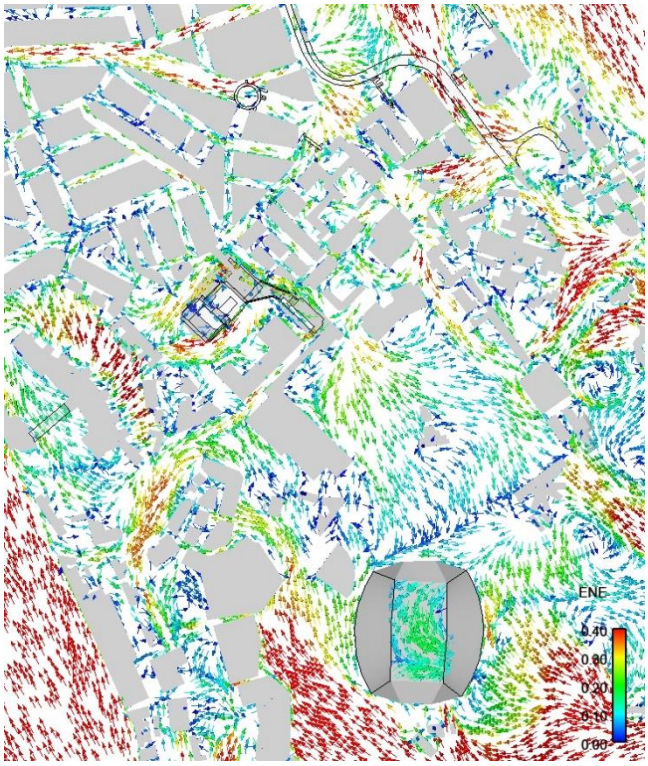



Figure D 14 Vector Plot of VR under ENE Wind

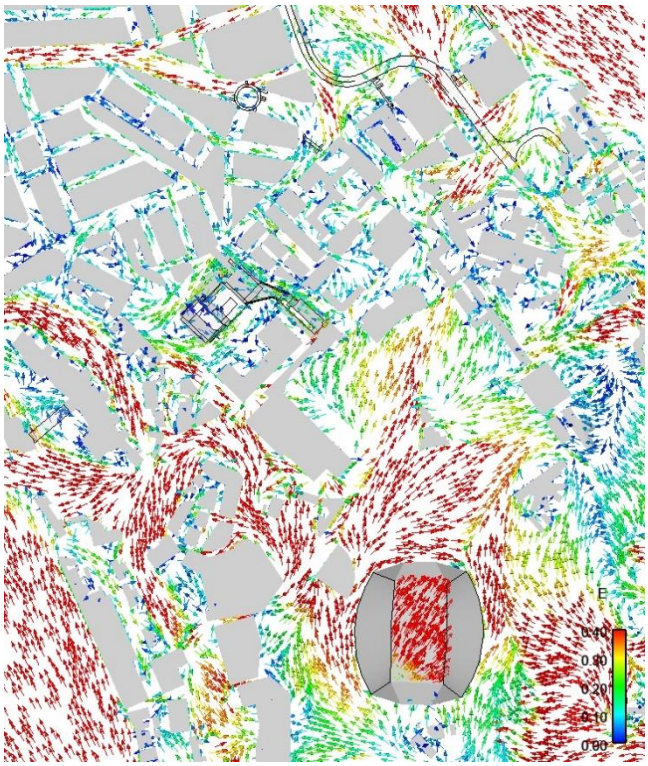



Figure D 15 Vector Plot of VR under E Wind

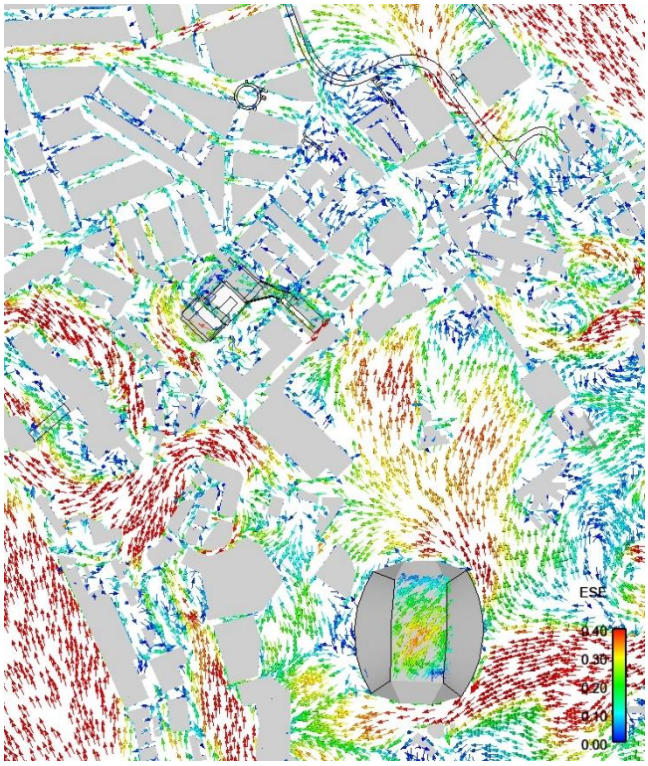



Figure D 16 Vector Plot of VR under ESE Wind

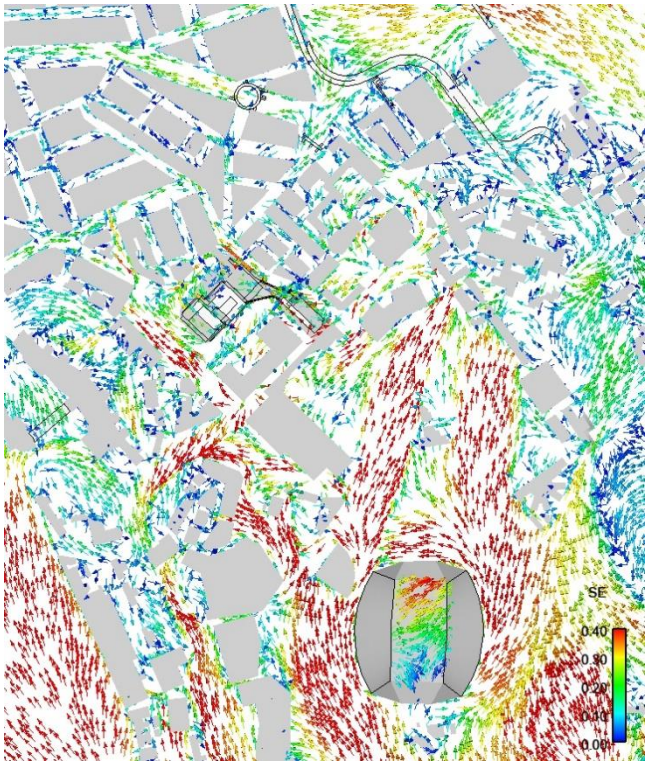



Figure D 17 Vector Plot of VR under SE Wind

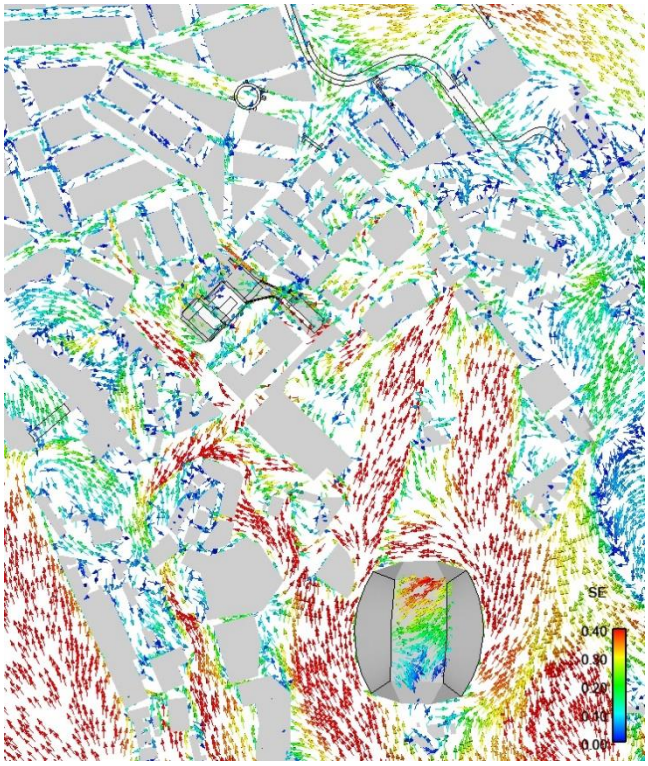



Figure D 18 Vector Plot of VR under SSE Wind

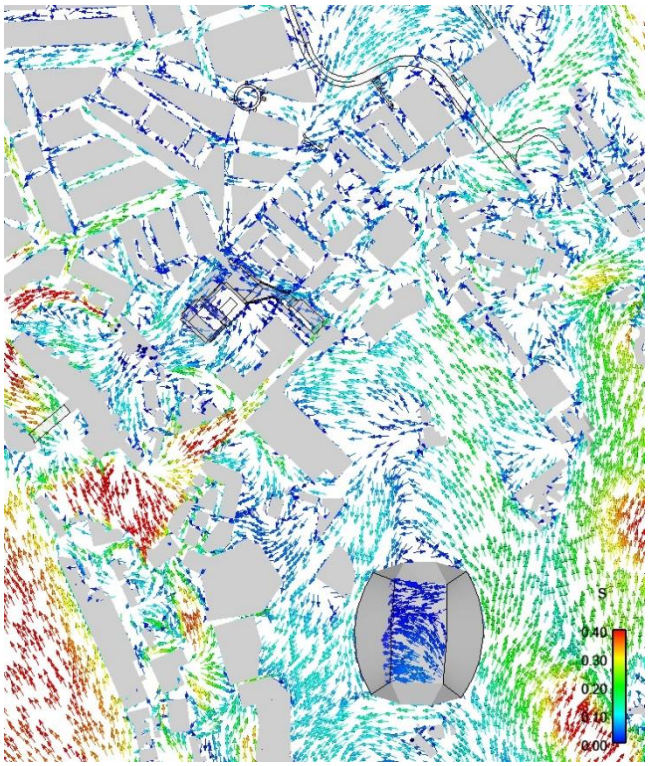



Figure D 19 Vector Plot of VR under S Wind

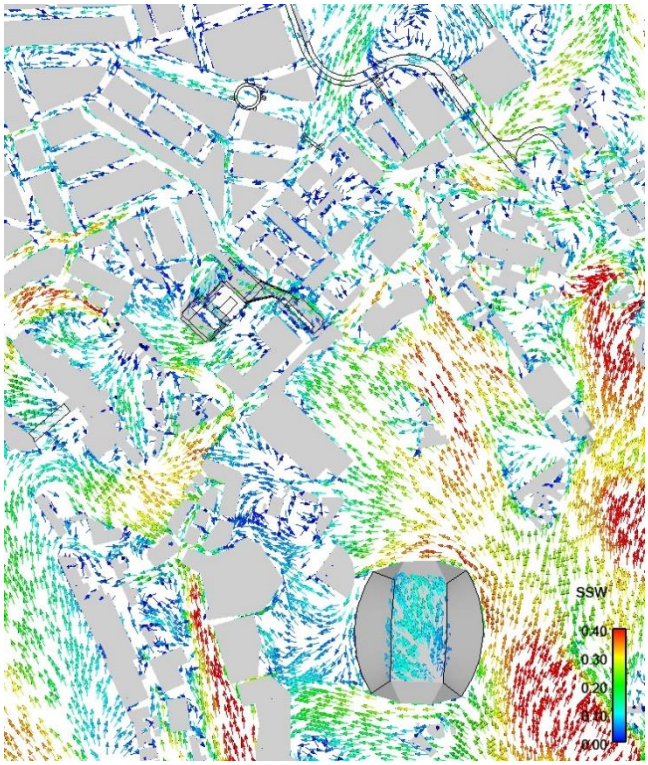



Figure D 20 Vector Plot of VR under SSW Wind

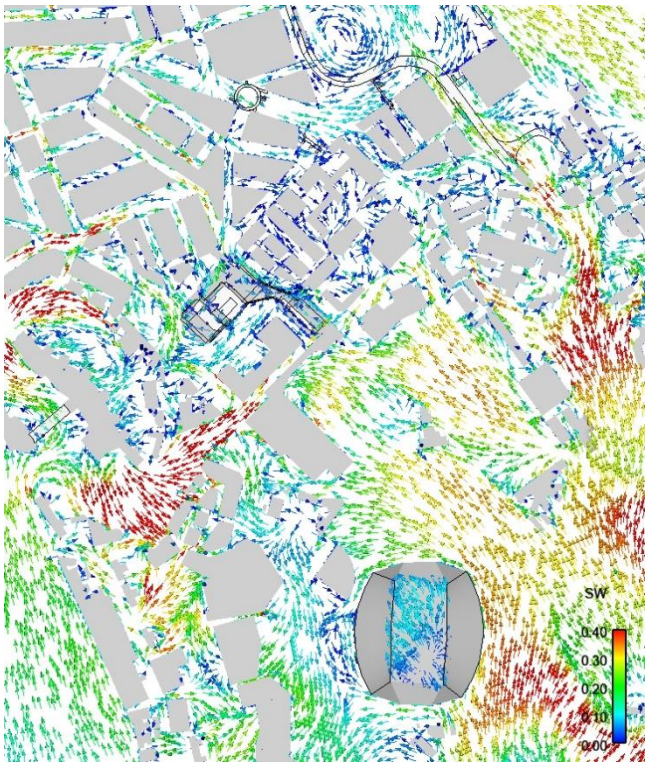



Figure D 21 Vector Plot of VR under SW Wind

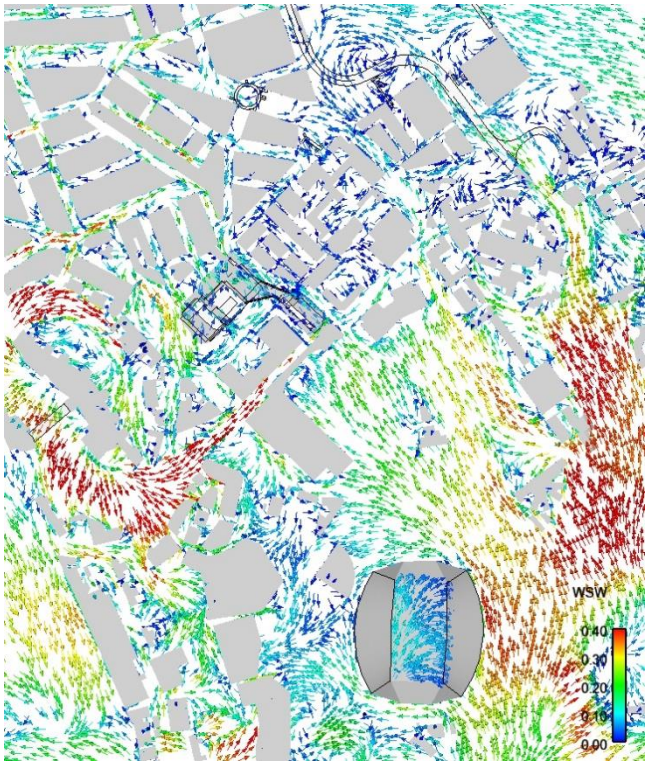



Figure D 22 Vector Plot of VR under WSW Wind

# Appendix E

Velocity Ratio (VR) at Test Points

# E1 Baseline Scheme

Table E1 Velocity Ratio of Perimeter Test Points

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P1 | 0.04 | 0.06 | 0.23 | 0.13 | 0.16 | 0.23 | 0.16 | 0.07 | 0.14 | 0.15 | 0.14 |
| P2 | 0.10 | 0.11 | 0.32 | 0.23 | 0.09 | 0.09 | 0.16 | 0.09 | 0.08 | 0.12 | 0.02 |
| P3 | 0.12 | 0.10 | 0.34 | 0.22 | 0.10 | 0.10 | 0.16 | 0.08 | 0.10 | 0.05 | 0.06 |
| P4 | 0.15 | 0.10 | 0.35 | 0.24 | 0.09 | 0.08 | 0.11 | 0.08 | 0.11 | 0.06 | 0.14 |
| P5 | 0.19 | 0.12 | 0.34 | 0.27 | 0.13 | 0.22 | 0.06 | 0.09 | 0.09 | 0.04 | 0.04 |
| P6 | 0.18 | 0.12 | 0.32 | 0.27 | 0.16 | 0.08 | 0.10 | 0.09 | 0.04 | 0.03 | 0.06 |
| P7 | 0.17 | 0.10 | 0.30 | 0.25 | 0.14 | 0.20 | 0.06 | 0.10 | 0.04 | 0.10 | 0.10 |
| P8 | 0.16 | 0.08 | 0.27 | 0.23 | 0.26 | 0.18 | 0.05 | 0.11 | 0.06 | 0.17 | 0.22 |
| P9 | 0.13 | 0.06 | 0.23 | 0.20 | 0.29 | 0.22 | 0.06 | 0.11 | 0.06 | 0.19 | 0.23 |
| P10 | 0.07 | 0.03 | 0.21 | 0.07 | 0.30 | 0.21 | 0.07 | 0.07 | 0.12 | 0.18 | 0.22 |
| P11 | 0.07 | 0.11 | 0.16 | 0.14 | 0.31 | 0.21 | 0.08 | 0.08 | 0.18 | 0.04 | 0.20 |
| P12 | 0.12 | 0.11 | 0.40 | 0.23 | 0.25 | 0.20 | 0.09 | 0.09 | 0.20 | 0.07 | 0.17 |
| P13 | 0.11 | 0.10 | 0.35 | 0.17 | 0.18 | 0.19 | 0.06 | 0.09 | 0.20 | 0.10 | 0.14 |
| P14 | 0.08 | 0.20 | 0.18 | 0.30 | 0.38 | 0.45 | 0.09 | 0.11 | 0.16 | 0.16 | 0.06 |
| P15 | 0.12 | 0.07 | 0.31 | 0.13 | 0.10 | 0.14 | 0.04 | 0.09 | 0.18 | 0.11 | 0.08 |
| P16 | 0.10 | 0.06 | 0.25 | 0.11 | 0.07 | 0.13 | 0.05 | 0.08 | 0.16 | 0.10 | 0.07 |
| P17 | 0.10 | 0.07 | 0.26 | 0.10 | 0.06 | 0.13 | 0.05 | 0.09 | 0.16 | 0.12 | 0.10 |
| P18 | 0.10 | 0.06 | 0.26 | 0.09 | 0.06 | 0.08 | 0.07 | 0.08 | 0.14 | 0.12 | 0.13 |
| P19 | 0.09 | 0.05 | 0.27 | 0.08 | 0.07 | 0.07 | 0.03 | 0.07 | 0.10 | 0.12 | 0.14 |
| P20 | 0.08 | 0.04 | 0.28 | 0.07 | 0.08 | 0.08 | 0.02 | 0.05 | 0.03 | 0.13 | 0.14 |
| P21 | 0.06 | 0.05 | 0.27 | 0.09 | 0.09 | 0.08 | 0.03 | 0.04 | 0.05 | 0.13 | 0.15 |
| P22 | 0.04 | 0.06 | 0.25 | 0.08 | 0.08 | 0.10 | 0.03 | 0.02 | 0.10 | 0.11 | 0.14 |
| P23 | 0.02 | 0.06 | 0.24 | 0.06 | 0.06 | 0.10 | 0.03 | 0.01 | 0.14 | 0.07 | 0.11 |
| P24 | 0.06 | 0.09 | 0.21 | 0.26 | 0.23 | 0.52 | 0.20 | 0.01 | 0.13 | 0.04 | 0.09 |
| P25 | 0.05 | 0.07 | 0.17 | 0.24 | 0.26 | 0.53 | 0.22 | 0.01 | 0.04 | 0.03 | 0.08 |
| P26 | 0.04 | 0.06 | 0.15 | 0.24 | 0.23 | 0.52 | 0.20 | 0.02 | 0.07 | 0.05 | 0.06 |
| P27 | 0.05 | 0.05 | 0.17 | 0.26 | 0.23 | 0.52 | 0.17 | 0.03 | 0.11 | 0.06 | 0.05 |
| P28 | 0.07 | 0.08 | 0.31 | 0.34 | 0.35 | 0.57 | 0.22 | 0.06 | 0.11 | 0.08 | 0.06 |
| P29 | 0.06 | 0.08 | 0.22 | 0.30 | 0.37 | 0.49 | 0.20 | 0.16 | 0.08 | 0.27 | 0.23 |
| P30 | 0.06 | 0.06 | 0.24 | 0.26 | 0.37 | 0.40 | 0.14 | 0.15 | 0.05 | 0.25 | 0.22 |
| P31 | 0.07 | 0.07 | 0.27 | 0.28 | 0.40 | 0.44 | 0.20 | 0.13 | 0.12 | 0.20 | 0.18 |
| P32 | 0.07 | 0.02 | 0.20 | 0.19 | 0.24 | 0.34 | 0.30 | 0.12 | 0.23 | 0.19 | 0.14 |
| P33 | 0.05 | 0.03 | 0.23 | 0.27 | 0.28 | 0.42 | 0.36 | 0.13 | 0.19 | 0.19 | 0.16 |
| P34 | 0.03 | 0.05 | 0.23 | 0.19 | 0.30 | 0.45 | 0.36 | 0.09 | 0.03 | 0.14 | 0.12 |
| P35 | 0.03 | 0.06 | 0.27 | 0.18 | 0.30 | 0.46 | 0.25 | 0.08 | 0.03 | 0.10 | 0.09 |
| P36 | 0.04 | 0.05 | 0.16 | 0.18 | 0.12 | 0.26 | 0.13 | 0.06 | 0.13 | 0.03 | 0.05 |
| P37 | 0.05 | 0.06 | 0.18 | 0.20 | 0.23 | 0.25 | 0.10 | 0.07 | 0.14 | 0.05 | 0.05 |
| P38 | 0.06 | 0.05 | 0.19 | 0.18 | 0.33 | 0.47 | 0.10 | 0.05 | 0.21 | 0.11 | 0.12 |
| P39 | 0.06 | 0.06 | 0.24 | 0.18 | 0.19 | 0.41 | 0.02 | 0.05 | 0.18 | 0.11 | 0.12 |
| P40 | 0.06 | 0.06 | 0.23 | 0.16 | 0.22 | 0.40 | 0.03 | 0.04 | 0.18 | 0.12 | 0.12 |
| P41 | 0.05 | 0.06 | 0.21 | 0.13 | 0.24 | 0.40 | 0.04 | 0.02 | 0.19 | 0.12 | 0.12 |
| P42 | 0.04 | 0.06 | 0.16 | 0.13 | 0.24 | 0.40 | 0.05 | 0.03 | 0.20 | 0.12 | 0.11 |

Table E2 Velocity Ratio of Overall Test Points

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| O1 | 0.04 | 0.13 | 0.18 | 0.77 | 0.25 | 0.33 | 0.33 | 0.01 | 0.13 | 0.09 | 0.05 |
| O2 | 0.03 | 0.19 | 0.15 | 0.80 | 0.22 | 0.39 | 0.27 | 0.01 | 0.12 | 0.09 | 0.10 |
| O3 | 0.08 | 0.27 | 0.13 | 0.67 | 0.35 | 0.20 | 0.24 | 0.02 | 0.12 | 0.10 | 0.11 |
| O4 | 0.08 | 0.22 | 0.19 | 0.72 | 0.31 | 0.21 | 0.27 | 0.03 | 0.11 | 0.06 | 0.08 |
| O5 | 0.11 | 0.26 | 0.16 | 0.57 | 0.10 | 0.07 | 0.19 | 0.05 | 0.08 | 0.05 | 0.05 |
| O6 | 0.09 | 0.28 | 0.18 | 0.38 | 0.28 | 0.12 | 0.15 | 0.04 | 0.11 | 0.06 | 0.09 |
| O7 | 0.05 | 0.11 | 0.20 | 0.05 | 0.25 | 0.22 | 0.02 | 0.23 | 0.11 | 0.05 | 0.10 |
| O8 | 0.17 | 0.15 | 0.18 | 0.34 | 0.37 | 0.45 | 0.06 | 0.11 | 0.33 | 0.22 | 0.24 |
| O9 | 0.05 | 0.29 | 0.29 | 0.87 | 0.51 | 0.64 | 0.07 | 0.36 | 0.40 | 0.39 | 0.38 |
| O10 | 0.07 | 0.11 | 0.09 | 0.31 | 0.38 | 0.49 | 0.15 | 0.13 | 0.08 | 0.22 | 0.07 |
| O11 | 0.05 | 0.03 | 0.11 | 0.13 | 0.02 | 0.08 | 0.18 | 0.13 | 0.13 | 0.06 | 0.04 |
| O12 | 0.05 | 0.13 | 0.10 | 0.07 | 0.24 | 0.15 | 0.35 | 0.19 | 0.31 | 0.37 | 0.20 |
| O13 | 0.03 | 0.10 | 0.10 | 0.15 | 0.29 | 0.29 | 0.29 | 0.14 | 0.22 | 0.35 | 0.18 |
| O14 | 0.05 | 0.10 | 0.07 | 0.04 | 0.24 | 0.11 | 0.13 | 0.05 | 0.11 | 0.07 | 0.09 |
| O15 | 0.06 | 0.31 | 0.47 | 0.28 | 0.16 | 0.08 | 0.26 | 0.05 | 0.06 | 0.26 | 0.29 |
| O16 | 0.03 | 0.30 | 0.24 | 0.24 | 0.28 | 0.08 | 0.22 | 0.05 | 0.10 | 0.28 | 0.27 |
| O17 | 0.03 | 0.27 | 0.13 | 0.23 | 0.30 | 0.12 | 0.18 | 0.06 | 0.14 | 0.27 | 0.17 |
| O18 | 0.04 | 0.28 | 0.33 | 0.26 | 0.26 | 0.10 | 0.18 | 0.08 | 0.15 | 0.24 | 0.07 |
| O19 | 0.03 | 0.03 | 0.06 | 0.13 | 0.09 | 0.18 | 0.15 | 0.07 | 0.17 | 0.11 | 0.13 |
| O20 | 0.04 | 0.10 | 0.11 | 0.14 | 0.13 | 0.25 | 0.24 | 0.10 | 0.24 | 0.15 | 0.14 |
| O21 | 0.04 | 0.10 | 0.17 | 0.12 | 0.13 | 0.29 | 0.22 | 0.09 | 0.22 | 0.14 | 0.08 |
| O22 | 0.05 | 0.12 | 0.21 | 0.16 | 0.15 | 0.35 | 0.12 | 0.06 | 0.12 | 0.09 | 0.05 |
| O23 | 0.05 | 0.08 | 0.28 | 0.19 | 0.16 | 0.23 | 0.36 | 0.17 | 0.33 | 0.22 | 0.13 |
| O24 | 0.06 | 0.20 | 0.07 | 0.20 | 0.18 | 0.07 | 0.14 | 0.03 | 0.07 | 0.23 | 0.33 |
| O25 | 0.02 | 0.03 | 0.04 | 0.06 | 0.04 | 0.05 | 0.14 | 0.03 | 0.05 | 0.17 | 0.23 |
| O26 | 0.06 | 0.12 | 0.06 | 0.23 | 0.19 | 0.25 | 0.14 | 0.09 | 0.14 | 0.18 | 0.22 |
| O27 | 0.10 | 0.09 | 0.15 | 0.25 | 0.20 | 0.39 | 0.32 | 0.14 | 0.37 | 0.31 | 0.23 |
| O28 | 0.05 | 0.06 | 0.13 | 0.31 | 0.31 | 0.41 | 0.16 | 0.09 | 0.25 | 0.21 | 0.15 |
| O29 | 0.02 | 0.03 | 0.07 | 0.31 | 0.09 | 0.45 | 0.16 | 0.15 | 0.33 | 0.31 | 0.24 |
| O30 | 0.08 | 0.08 | 0.08 | 0.21 | 0.21 | 0.26 | 0.22 | 0.16 | 0.35 | 0.34 | 0.26 |
| O31 | 0.03 | 0.18 | 0.11 | 0.25 | 0.33 | 0.43 | 0.17 | 0.15 | 0.28 | 0.34 | 0.29 |
| O32 | 0.01 | 0.21 | 0.10 | 0.23 | 0.15 | 0.24 | 0.34 | 0.16 | 0.39 | 0.29 | 0.29 |
| O33 | 0.01 | 0.14 | 0.14 | 0.41 | 0.36 | 0.45 | 0.32 | 0.18 | 0.36 | 0.21 | 0.31 |
| O34 | 0.03 | 0.13 | 0.16 | 0.32 | 0.33 | 0.39 | 0.11 | 0.10 | 0.16 | 0.28 | 0.19 |
| O35 | 0.03 | 0.21 | 0.07 | 0.48 | 0.34 | 0.35 | 0.32 | 0.14 | 0.35 | 0.30 | 0.24 |
| O36 | 0.08 | 0.18 | 0.08 | 0.49 | 0.34 | 0.35 | 0.34 | 0.13 | 0.33 | 0.32 | 0.26 |
| O37 | 0.14 | 0.19 | 0.08 | 0.58 | 0.32 | 0.20 | 0.35 | 0.06 | 0.27 | 0.28 | 0.23 |
| O38 | 0.09 | 0.24 | 0.10 | 0.55 | 0.33 | 0.18 | 0.34 | 0.04 | 0.29 | 0.30 | 0.22 |
| O39 | 0.06 | 0.16 | 0.11 | 0.21 | 0.13 | 0.15 | 0.29 | 0.09 | 0.19 | 0.21 | 0.32 |
| O40 | 0.06 | 0.19 | 0.07 | 0.23 | 0.11 | 0.13 | 0.24 | 0.06 | 0.12 | 0.27 | 0.37 |
| O41 | 0.04 | 0.19 | 0.05 | 0.14 | 0.10 | 0.13 | 0.20 | 0.09 | 0.18 | 0.25 | 0.26 |
| O42 | 0.02 | 0.16 | 0.05 | 0.04 | 0.07 | 0.14 | 0.14 | 0.11 | 0.19 | 0.27 | 0.21 |
| O43 | 0.09 | 0.07 | 0.07 | 0.05 | 0.12 | 0.38 | 0.32 | 0.16 | 0.34 | 0.28 | 0.16 |
| O44 | 0.12 | 0.05 | 0.18 | 0.10 | 0.16 | 0.22 | 0.30 | 0.11 | 0.27 | 0.20 | 0.18 |
| O45 | 0.16 | 0.10 | 0.34 | 0.18 | 0.22 | 0.45 | 0.55 | 0.18 | 0.38 | 0.23 | 0.20 |
| O46 | 0.22 | 0.13 | 0.41 | 0.17 | 0.16 | 0.31 | 0.42 | 0.13 | 0.26 | 0.19 | 0.15 |
| O47 | 0.15 | 0.08 | 0.32 | 0.08 | 0.06 | 0.15 | 0.16 | 0.18 | 0.38 | 0.33 | 0.16 |
| O48 | 0.12 | 0.06 | 0.33 | 0.26 | 0.09 | 0.35 | 0.28 | 0.13 | 0.34 | 0.22 | 0.29 |

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| O49 | 0.10 | 0.03 | 0.27 | 0.22 | 0.04 | 0.26 | 0.10 | 0.19 | 0.35 | 0.31 | 0.31 |
| O50 | 0.07 | 0.08 | 0.13 | 0.12 | 0.24 | 0.41 | 0.24 | 0.19 | 0.34 | 0.31 | 0.34 |
| O51 | 0.05 | 0.18 | 0.20 | 0.21 | 0.25 | 0.19 | 0.27 | 0.14 | 0.24 | 0.29 | 0.37 |
| O52 | 0.01 | 0.11 | 0.07 | 0.21 | 0.19 | 0.16 | 0.09 | 0.06 | 0.09 | 0.17 | 0.11 |
| O53 | 0.04 | 0.20 | 0.07 | 0.36 | 0.34 | 0.44 | 0.31 | 0.18 | 0.32 | 0.33 | 0.32 |
| O54 | 0.12 | 0.19 | 0.05 | 0.42 | 0.37 | 0.38 | 0.35 | 0.13 | 0.32 | 0.31 | 0.28 |
| O55 | 0.16 | 0.16 | 0.05 | 0.67 | 0.32 | 0.40 | 0.42 | 0.04 | 0.27 | 0.25 | 0.18 |
| O56 | 0.13 | 0.17 | 0.11 | 0.53 | 0.26 | 0.49 | 0.31 | 0.10 | 0.20 | 0.23 | 0.16 |
| O57 | 0.14 | 0.22 | 0.16 | 0.58 | 0.28 | 0.63 | 0.28 | 0.09 | 0.21 | 0.24 | 0.19 |
| O58 | 0.15 | 0.19 | 0.13 | 0.56 | 0.28 | 0.45 | 0.31 | 0.09 | 0.21 | 0.25 | 0.18 |
| O59 | 0.14 | 0.19 | 0.13 | 0.55 | 0.26 | 0.51 | 0.31 | 0.10 | 0.20 | 0.24 | 0.17 |
| O60 | 0.14 | 0.22 | 0.13 | 0.58 | 0.27 | 0.69 | 0.28 | 0.10 | 0.19 | 0.23 | 0.17 |
| O61 | 0.12 | 0.14 | 0.06 | 0.86 | 0.21 | 0.43 | 0.40 | 0.03 | 0.32 | 0.23 | 0.14 |
| O62 | 0.19 | 0.09 | 0.13 | 0.67 | 0.39 | 0.58 | 0.46 | 0.03 | 0.37 | 0.26 | 0.17 |
| O63 | 0.15 | 0.09 | 0.04 | 0.48 | 0.27 | 0.35 | 0.12 | 0.09 | 0.12 | 0.18 | 0.11 |
| O64 | 0.25 | 0.22 | 0.01 | 0.57 | 0.27 | 0.36 | 0.06 | 0.10 | 0.04 | 0.09 | 0.07 |
| O65 | 0.31 | 0.07 | 0.16 | 0.44 | 0.04 | 0.29 | 0.02 | 0.03 | 0.10 | 0.03 | 0.01 |
| O66 | 0.29 | 0.04 | 0.15 | 0.36 | 0.03 | 0.28 | 0.04 | 0.03 | 0.09 | 0.05 | 0.03 |
| O67 | 0.29 | 0.25 | 0.10 | 0.71 | 0.11 | 0.24 | 0.12 | 0.05 | 0.03 | 0.07 | 0.04 |
| O68 | 0.26 | 0.18 | 0.07 | 0.61 | 0.10 | 0.16 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 |
| O69 | 0.06 | 0.24 | 0.13 | 0.64 | 0.05 | 0.29 | 0.05 | 0.04 | 0.03 | 0.05 | 0.02 |
| O70 | 0.32 | 0.27 | 0.25 | 0.66 | 0.19 | 0.57 | 0.13 | 0.05 | 0.03 | 0.09 | 0.07 |
| O71 | 0.08 | 0.05 | 0.23 | 0.33 | 0.37 | 0.45 | 0.22 | 0.10 | 0.24 | 0.25 | 0.19 |
| O72 | 0.10 | 0.09 | 0.15 | 0.42 | 0.39 | 0.68 | 0.11 | 0.02 | 0.10 | 0.08 | 0.13 |
| O73 | 0.08 | 0.07 | 0.12 | 0.52 | 0.37 | 0.54 | 0.11 | 0.01 | 0.10 | 0.08 | 0.11 |
| O74 | 0.15 | 0.25 | 0.15 | 0.60 | 0.31 | 0.66 | 0.29 | 0.07 | 0.23 | 0.26 | 0.20 |
| O75 | 0.14 | 0.23 | 0.12 | 0.59 | 0.27 | 0.70 | 0.27 | 0.09 | 0.19 | 0.23 | 0.17 |
| O76 | 0.18 | 0.17 | 0.06 | 0.51 | 0.20 | 0.54 | 0.21 | 0.09 | 0.15 | 0.18 | 0.13 |
| O77 | 0.06 | 0.25 | 0.02 | 0.34 | 0.26 | 0.28 | 0.19 | 0.09 | 0.16 | 0.24 | 0.19 |
| O78 | 0.19 | 0.23 | 0.14 | 0.51 | 0.25 | 0.49 | 0.05 | 0.16 | 0.02 | 0.25 | 0.24 |
| O79 | 0.01 | 0.05 | 0.26 | 0.18 | 0.24 | 0.24 | 0.15 | 0.11 | 0.20 | 0.28 | 0.16 |
| O80 | 0.06 | 0.07 | 0.24 | 0.24 | 0.33 | 0.13 | 0.21 | 0.09 | 0.23 | 0.27 | 0.21 |
| O81 | 0.10 | 0.09 | 0.17 | 0.32 | 0.36 | 0.64 | 0.23 | 0.03 | 0.24 | 0.14 | 0.20 |
| O82 | 0.05 | 0.20 | 0.21 | 0.24 | 0.32 | 0.24 | 0.26 | 0.04 | 0.22 | 0.16 | 0.14 |
| O83 | 0.02 | 0.18 | 0.21 | 0.16 | 0.09 | 0.18 | 0.20 | 0.05 | 0.19 | 0.32 | 0.19 |
| O84 | 0.04 | 0.12 | 0.17 | 0.15 | 0.08 | 0.16 | 0.14 | 0.06 | 0.14 | 0.19 | 0.10 |
| O85 | 0.04 | 0.23 | 0.33 | 0.64 | 0.32 | 0.60 | 0.08 | 0.13 | 0.21 | 0.37 | 0.28 |
| O86 | 0.18 | 0.17 | 0.23 | 0.50 | 0.32 | 0.41 | 0.11 | 0.06 | 0.05 | 0.09 | 0.16 |
| O87 | 0.24 | 0.34 | 0.05 | 0.78 | 0.22 | 0.39 | 0.04 | 0.02 | 0.05 | 0.20 | 0.11 |
| O88 | 0.06 | 0.26 | 0.32 | 0.78 | 0.50 | 0.11 | 0.06 | 0.31 | 0.32 | 0.53 | 0.53 |
| O89 | 0.14 | 0.10 | 0.09 | 0.06 | 0.10 | 0.22 | 0.04 | 0.08 | 0.19 | 0.26 | 0.25 |
| O90 | 0.15 | 0.07 | 0.14 | 0.06 | 0.23 | 0.29 | 0.06 | 0.23 | 0.22 | 0.44 | 0.28 |
| O91 | 0.04 | 0.02 | 0.06 | 0.08 | 0.09 | 0.06 | 0.06 | 0.09 | 0.29 | 0.18 | 0.09 |
| O92 | 0.08 | 0.03 | 0.04 | 0.07 | 0.07 | 0.05 | 0.04 | 0.11 | 0.26 | 0.23 | 0.17 |
| O93 | 0.15 | 0.14 | 0.11 | 0.24 | 0.11 | 0.04 | 0.01 | 0.16 | 0.14 | 0.32 | 0.09 |
| O94 | 0.08 | 0.10 | 0.05 | 0.17 | 0.05 | 0.07 | 0.04 | 0.18 | 0.12 | 0.25 | 0.26 |
| O95 | 0.11 | 0.10 | 0.09 | 0.05 | 0.08 | 0.07 | 0.03 | 0.20 | 0.23 | 0.35 | 0.46 |
| O96 | 0.12 | 0.20 | 0.18 | 0.45 | 0.39 | 0.13 | 0.08 | 0.21 | 0.22 | 0.36 | 0.30 |
| O97 | 0.13 | 0.14 | 0.21 | 0.48 | 0.34 | 0.12 | 0.05 | 0.18 | 0.17 | 0.26 | 0.24 |

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| O98 | 0.05 | 0.19 | 0.30 | 0.50 | 0.40 | 0.47 | 0.15 | 0.25 | 0.28 | 0.48 | 0.38 |
| O99 | 0.12 | 0.29 | 0.36 | 0.74 | 0.60 | 0.36 | 0.11 | 0.42 | 0.33 | 0.54 | 0.45 |
| O100 | 0.15 | 0.31 | 0.32 | 0.71 | 0.59 | 0.27 | 0.12 | 0.51 | 0.30 | 0.51 | 0.43 |
| O101 | 0.18 | 0.28 | 0.31 | 0.60 | 0.54 | 0.27 | 0.10 | 0.47 | 0.28 | 0.43 | 0.41 |
| O102 | 0.21 | 0.27 | 0.32 | 0.54 | 0.52 | 0.17 | 0.08 | 0.29 | 0.07 | 0.26 | 0.24 |
| O103 | 0.13 | 0.28 | 0.25 | 0.64 | 0.61 | 0.22 | 0.09 | 0.45 | 0.35 | 0.56 | 0.52 |
| O104 | 0.09 | 0.11 | 0.33 | 0.35 | 0.27 | 0.25 | 0.08 | 0.04 | 0.11 | 0.06 | 0.18 |
| O105 | 0.16 | 0.29 | 0.32 | 0.32 | 0.31 | 0.06 | 0.06 | 0.10 | 0.07 | 0.05 | 0.05 |
| O106 | 0.16 | 0.05 | 0.17 | 0.05 | 0.20 | 0.19 | 0.28 | 0.20 | 0.31 | 0.45 | 0.37 |
| O107 | 0.07 | 0.21 | 0.23 | 0.07 | 0.15 | 0.07 | 0.09 | 0.29 | 0.29 | 0.39 | 0.35 |
| O108 | 0.12 | 0.19 | 0.28 | 0.08 | 0.10 | 0.07 | 0.14 | 0.29 | 0.25 | 0.35 | 0.32 |
| O109 | 0.15 | 0.14 | 0.21 | 0.10 | 0.14 | 0.03 | 0.12 | 0.30 | 0.28 | 0.31 | 0.34 |
| O110 | 0.15 | 0.11 | 0.13 | 0.10 | 0.12 | 0.07 | 0.08 | 0.19 | 0.18 | 0.22 | 0.23 |
| O111 | 0.13 | 0.09 | 0.05 | 0.15 | 0.07 | 0.21 | 0.30 | 0.20 | 0.31 | 0.35 | 0.34 |
| O112 | 0.10 | 0.07 | 0.06 | 0.06 | 0.17 | 0.13 | 0.06 | 0.03 | 0.08 | 0.11 | 0.12 |
| O113 | 0.06 | 0.04 | 0.09 | 0.06 | 0.07 | 0.03 | 0.02 | 0.02 | 0.12 | 0.18 | 0.19 |
| O114 | 0.09 | 0.05 | 0.12 | 0.07 | 0.08 | 0.03 | 0.04 | 0.04 | 0.16 | 0.23 | 0.24 |
| O115 | 0.07 | 0.09 | 0.34 | 0.23 | 0.20 | 0.21 | 0.23 | 0.08 | 0.20 | 0.29 | 0.23 |
| O116 | 0.11 | 0.05 | 0.20 | 0.13 | 0.17 | 0.09 | 0.06 | 0.13 | 0.04 | 0.08 | 0.06 |
| O117 | 0.13 | 0.07 | 0.29 | 0.19 | 0.20 | 0.12 | 0.10 | 0.14 | 0.05 | 0.07 | 0.04 |
| O118 | 0.11 | 0.09 | 0.28 | 0.18 | 0.19 | 0.09 | 0.07 | 0.13 | 0.06 | 0.04 | 0.03 |
| O119 | 0.06 | 0.03 | 0.09 | 0.10 | 0.16 | 0.32 | 0.14 | 0.03 | 0.04 | 0.04 | 0.04 |
| O120 | 0.02 | 0.04 | 0.12 | 0.11 | 0.19 | 0.28 | 0.19 | 0.09 | 0.13 | 0.03 | 0.04 |
| O121 | 0.03 | 0.04 | 0.25 | 0.13 | 0.19 | 0.18 | 0.19 | 0.11 | 0.18 | 0.11 | 0.04 |
| O122 | 0.07 | 0.05 | 0.20 | 0.10 | 0.15 | 0.19 | 0.11 | 0.04 | 0.10 | 0.04 | 0.02 |
| O123 | 0.07 | 0.03 | 0.22 | 0.17 | 0.03 | 0.08 | 0.14 | 0.03 | 0.06 | 0.02 | 0.04 |
| O124 | 0.12 | 0.06 | 0.30 | 0.25 | 0.07 | 0.06 | 0.10 | 0.01 | 0.07 | 0.05 | 0.06 |
| O125 | 0.05 | 0.03 | 0.15 | 0.14 | 0.08 | 0.22 | 0.38 | 0.11 | 0.08 | 0.03 | 0.04 |
| O126 | 0.05 | 0.03 | 0.13 | 0.11 | 0.10 | 0.23 | 0.08 | 0.04 | 0.03 | 0.03 | 0.02 |
| O127 | 0.06 | 0.04 | 0.15 | 0.08 | 0.07 | 0.06 | 0.04 | 0.06 | 0.03 | 0.01 | 0.01 |
| O128 | 0.09 | 0.07 | 0.11 | 0.07 | 0.05 | 0.12 | 0.12 | 0.04 | 0.05 | 0.03 | 0.07 |
| O129 | 0.31 | 0.25 | 0.20 | 0.19 | 0.08 | 0.17 | 0.29 | 0.11 | 0.14 | 0.05 | 0.07 |
| O130 | 0.38 | 0.36 | 0.15 | 0.15 | 0.14 | 0.06 | 0.06 | 0.08 | 0.09 | 0.02 | 0.07 |
| O131 | 0.05 | 0.07 | 0.09 | 0.14 | 0.09 | 0.08 | 0.01 | 0.05 | 0.06 | 0.03 | 0.03 |
| O132 | 0.06 | 0.08 | 0.19 | 0.21 | 0.19 | 0.17 | 0.09 | 0.06 | 0.10 | 0.03 | 0.04 |
| O133 | 0.03 | 0.09 | 0.17 | 0.21 | 0.19 | 0.16 | 0.11 | 0.05 | 0.10 | 0.07 | 0.09 |
| O134 | 0.01 | 0.06 | 0.03 | 0.11 | 0.10 | 0.05 | 0.05 | 0.01 | 0.04 | 0.05 | 0.02 |
| O135 | 0.01 | 0.03 | 0.05 | 0.06 | 0.05 | 0.02 | 0.03 | 0.02 | 0.01 | 0.07 | 0.04 |
| O136 | 0.02 | 0.10 | 0.11 | 0.14 | 0.13 | 0.06 | 0.09 | 0.03 | 0.01 | 0.11 | 0.11 |
| O137 | 0.01 | 0.03 | 0.04 | 0.06 | 0.03 | 0.03 | 0.04 | 0.02 | 0.07 | 0.17 | 0.19 |
| O138 | 0.02 | 0.06 | 0.08 | 0.10 | 0.10 | 0.04 | 0.06 | 0.03 | 0.13 | 0.38 | 0.39 |
| O139 | 0.02 | 0.03 | 0.02 | 0.07 | 0.06 | 0.02 | 0.05 | 0.04 | 0.03 | 0.28 | 0.27 |
| O140 | 0.33 | 0.30 | 0.26 | 0.10 | 0.04 | 0.16 | 0.27 | 0.06 | 0.13 | 0.06 | 0.07 |
| O141 | 0.08 | 0.26 | 0.12 | 0.14 | 0.10 | 0.05 | 0.12 | 0.05 | 0.04 | 0.09 | 0.09 |
| O142 | 0.22 | 0.39 | 0.23 | 0.20 | 0.21 | 0.05 | 0.12 | 0.09 | 0.12 | 0.08 | 0.06 |
| O143 | 0.21 | 0.35 | 0.23 | 0.22 | 0.22 | 0.07 | 0.04 | 0.08 | 0.10 | 0.10 | 0.11 |
| O144 | 0.19 | 0.35 | 0.31 | 0.32 | 0.32 | 0.15 | 0.20 | 0.09 | 0.15 | 0.17 | 0.20 |
| O145 | 0.13 | 0.26 | 0.22 | 0.23 | 0.23 | 0.09 | 0.11 | 0.02 | 0.12 | 0.12 | 0.07 |
| O146 | 0.05 | 0.24 | 0.20 | 0.21 | 0.22 | 0.03 | 0.05 | 0.02 | 0.06 | 0.18 | 0.04 |

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| O147 | 0.16 | 0.08 | 0.25 | 0.21 | 0.16 | 0.18 | 0.36 | 0.10 | 0.10 | 0.12 | 0.02 |
| O148 | 0.07 | 0.17 | 0.18 | 0.11 | 0.21 | 0.21 | 0.44 | 0.11 | 0.12 | 0.12 | 0.05 |
| O149 | 0.25 | 0.33 | 0.49 | 0.52 | 0.31 | 0.24 | 0.38 | 0.07 | 0.16 | 0.14 | 0.10 |
| O150 | 0.11 | 0.19 | 0.38 | 0.41 | 0.25 | 0.23 | 0.34 | 0.04 | 0.09 | 0.13 | 0.12 |
| O151 | 0.20 | 0.21 | 0.07 | 0.17 | 0.19 | 0.10 | 0.08 | 0.05 | 0.07 | 0.02 | 0.04 |
| O152 | 0.05 | 0.05 | 0.10 | 0.25 | 0.10 | 0.05 | 0.18 | 0.03 | 0.10 | 0.03 | 0.01 |
| O153 | 0.04 | 0.06 | 0.19 | 0.28 | 0.12 | 0.04 | 0.22 | 0.06 | 0.05 | 0.01 | 0.03 |
| O154 | 0.07 | 0.06 | 0.18 | 0.15 | 0.05 | 0.06 | 0.09 | 0.03 | 0.05 | 0.01 | 0.03 |
| O155 | 0.08 | 0.04 | 0.18 | 0.24 | 0.14 | 0.12 | 0.35 | 0.12 | 0.19 | 0.17 | 0.07 |
| O156 | 0.09 | 0.06 | 0.33 | 0.20 | 0.26 | 0.37 | 0.35 | 0.09 | 0.26 | 0.18 | 0.20 |
| O157 | 0.10 | 0.27 | 0.17 | 0.40 | 0.37 | 0.13 | 0.11 | 0.19 | 0.07 | 0.27 | 0.21 |
| O158 | 0.06 | 0.11 | 0.26 | 0.30 | 0.10 | 0.56 | 0.18 | 0.27 | 0.07 | 0.39 | 0.51 |
| O159 | 0.03 | 0.25 | 0.09 | 0.42 | 0.29 | 0.55 | 0.02 | 0.05 | 0.19 | 0.07 | 0.03 |
| O160 | 0.03 | 0.23 | 0.09 | 0.44 | 0.33 | 0.57 | 0.04 | 0.05 | 0.22 | 0.08 | 0.03 |
| O161 | 0.07 | 0.24 | 0.09 | 0.46 | 0.40 | 0.62 | 0.11 | 0.06 | 0.25 | 0.15 | 0.05 |
| O162 | 0.09 | 0.09 | 0.14 | 0.36 | 0.41 | 0.59 | 0.23 | 0.19 | 0.04 | 0.28 | 0.29 |
| O163 | 0.10 | 0.11 | 0.31 | 0.28 | 0.38 | 0.35 | 0.29 | 0.19 | 0.06 | 0.25 | 0.37 |
| O164 | 0.08 | 0.10 | 0.12 | 0.13 | 0.33 | 0.32 | 0.11 | 0.05 | 0.17 | 0.06 | 0.04 |
| O165 | 0.05 | 0.06 | 0.33 | 0.38 | 0.19 | 0.45 | 0.28 | 0.24 | 0.11 | 0.34 | 0.41 |
| O166 | 0.15 | 0.39 | 0.19 | 0.99 | 0.51 | 0.42 | 0.13 | 0.09 | 0.07 | 0.18 | 0.14 |
| O167 | 0.10 | 0.30 | 0.21 | 0.75 | 0.49 | 0.42 | 0.21 | 0.13 | 0.05 | 0.20 | 0.07 |
| O168 | 0.06 | 0.20 | 0.24 | 0.44 | 0.47 | 0.54 | 0.20 | 0.39 | 0.32 | 0.57 | 0.50 |
| O169 | 0.07 | 0.10 | 0.17 | 0.23 | 0.16 | 0.22 | 0.11 | 0.15 | 0.25 | 0.16 | 0.19 |
| O170 | 0.03 | 0.04 | 0.13 | 0.11 | 0.06 | 0.08 | 0.04 | 0.06 | 0.09 | 0.09 | 0.19 |
| O171 | 0.03 | 0.17 | 0.07 | 0.61 | 0.36 | 0.10 | 0.13 | 0.23 | 0.17 | 0.14 | 0.21 |
| O172 | 0.09 | 0.21 | 0.26 | 0.59 | 0.42 | 0.26 | 0.13 | 0.11 | 0.17 | 0.07 | 0.24 |
| O173 | 0.12 | 0.17 | 0.46 | 0.56 | 0.42 | 0.16 | 0.14 | 0.08 | 0.14 | 0.10 | 0.21 |
| O174 | 0.06 | 0.10 | 0.46 | 0.53 | 0.41 | 0.10 | 0.07 | 0.14 | 0.09 | 0.12 | 0.11 |
| O175 | 0.12 | 0.24 | 0.16 | 0.36 | 0.31 | 0.21 | 0.15 | 0.23 | 0.20 | 0.14 | 0.12 |
| O176 | 0.10 | 0.03 | 0.12 | 0.04 | 0.09 | 0.17 | 0.13 | 0.07 | 0.07 | 0.14 | 0.13 |
| O177 | 0.10 | 0.17 | 0.11 | 0.09 | 0.07 | 0.42 | 0.08 | 0.05 | 0.09 | 0.16 | 0.20 |
| O178 | 0.11 | 0.08 | 0.15 | 0.16 | 0.35 | 0.39 | 0.08 | 0.13 | 0.08 | 0.06 | 0.13 |
| O179 | 0.09 | 0.05 | 0.21 | 0.17 | 0.24 | 0.22 | 0.06 | 0.06 | 0.06 | 0.07 | 0.11 |
| O180 | 0.04 | 0.06 | 0.14 | 0.14 | 0.18 | 0.14 | 0.10 | 0.05 | 0.04 | 0.08 | 0.11 |
| O181 | 0.10 | 0.12 | 0.06 | 0.20 | 0.36 | 0.25 | 0.13 | 0.12 | 0.09 | 0.18 | 0.27 |
| O182 | 0.10 | 0.12 | 0.12 | 0.06 | 0.33 | 0.28 | 0.11 | 0.11 | 0.08 | 0.08 | 0.13 |
| O183 | 0.13 | 0.07 | 0.04 | 0.04 | 0.29 | 0.27 | 0.13 | 0.15 | 0.07 | 0.04 | 0.06 |
| O184 | 0.04 | 0.11 | 0.08 | 0.13 | 0.25 | 0.26 | 0.18 | 0.20 | 0.26 | 0.31 | 0.29 |
| O185 | 0.10 | 0.15 | 0.04 | 0.10 | 0.20 | 0.08 | 0.09 | 0.21 | 0.20 | 0.21 | 0.18 |
| O186 | 0.09 | 0.04 | 0.04 | 0.10 | 0.26 | 0.14 | 0.10 | 0.07 | 0.04 | 0.11 | 0.07 |
| O187 | 0.07 | 0.09 | 0.14 | 0.16 | 0.35 | 0.17 | 0.10 | 0.05 | 0.07 | 0.15 | 0.15 |
| O188 | 0.11 | 0.13 | 0.14 | 0.11 | 0.29 | 0.31 | 0.12 | 0.06 | 0.05 | 0.16 | 0.21 |
| O189 | 0.11 | 0.12 | 0.12 | 0.15 | 0.07 | 0.06 | 0.08 | 0.18 | 0.04 | 0.10 | 0.13 |
| O190 | 0.05 | 0.06 | 0.15 | 0.19 | 0.09 | 0.08 | 0.12 | 0.05 | 0.10 | 0.22 | 0.22 |
| O191 | 0.11 | 0.08 | 0.07 | 0.14 | 0.08 | 0.04 | 0.14 | 0.06 | 0.10 | 0.18 | 0.19 |
| O192 | 0.11 | 0.10 | 0.17 | 0.12 | 0.21 | 0.25 | 0.08 | 0.03 | 0.14 | 0.13 | 0.17 |
| O193 | 0.06 | 0.22 | 0.23 | 0.21 | 0.18 | 0.33 | 0.04 | 0.07 | 0.14 | 0.37 | 0.32 |
| O194 | 0.06 | 0.08 | 0.26 | 0.22 | 0.16 | 0.19 | 0.14 | 0.09 | 0.11 | 0.24 | 0.19 |
| O195 | 0.04 | 0.04 | 0.30 | 0.19 | 0.15 | 0.15 | 0.19 | 0.11 | 0.17 | 0.31 | 0.22 |

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| O196 | 0.06 | 0.02 | 0.12 | 0.04 | 0.12 | 0.17 | 0.09 | 0.03 | 0.05 | 0.03 | 0.03 |
| O197 | 0.05 | 0.04 | 0.14 | 0.15 | 0.18 | 0.16 | 0.19 | 0.08 | 0.05 | 0.04 | 0.03 |
| O198 | 0.05 | 0.15 | 0.15 | 0.14 | 0.09 | 0.07 | 0.12 | 0.01 | 0.04 | 0.09 | 0.10 |

Table E3 Velocity Ratio of Special Test Points

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S1 | 0.04 | 0.03 | 0.06 | 0.10 | 0.22 | 0.40 | 0.06 | 0.03 | 0.17 | 0.08 | 0.10 |
| S2 | 0.05 | 0.06 | 0.13 | 0.17 | 0.19 | 0.11 | 0.05 | 0.02 | 0.17 | 0.11 | 0.16 |
| S3 | 0.06 | 0.07 | 0.31 | 0.19 | 0.22 | 0.13 | 0.09 | 0.03 | 0.11 | 0.12 | 0.16 |
| S4 | 0.08 | 0.06 | 0.34 | 0.16 | 0.19 | 0.15 | 0.09 | 0.05 | 0.02 | 0.11 | 0.13 |
| S5 | 0.10 | 0.07 | 0.33 | 0.14 | 0.06 | 0.17 | 0.06 | 0.07 | 0.08 | 0.12 | 0.13 |
| S6 | 0.11 | 0.09 | 0.32 | 0.16 | 0.11 | 0.18 | 0.03 | 0.09 | 0.16 | 0.12 | 0.11 |
| S7 | 0.11 | 0.09 | 0.33 | 0.17 | 0.08 | 0.18 | 0.06 | 0.09 | 0.18 | 0.11 | 0.04 |
| S8 | 0.12 | 0.10 | 0.39 | 0.20 | 0.20 | 0.18 | 0.08 | 0.09 | 0.20 | 0.08 | 0.17 |
| S9 | 0.04 | 0.11 | 0.04 | 0.12 | 0.38 | 0.30 | 0.10 | 0.09 | 0.20 | 0.07 | 0.03 |
| S10 | 0.01 | 0.03 | 0.01 | 0.05 | 0.32 | 0.33 | 0.08 | 0.05 | 0.13 | 0.04 | 0.10 |
| S11 | 0.03 | 0.02 | 0.11 | 0.05 | 0.24 | 0.32 | 0.05 | 0.04 | 0.04 | 0.16 | 0.18 |
| S12 | 0.12 | 0.08 | 0.28 | 0.22 | 0.14 | 0.23 | 0.07 | 0.10 | 0.03 | 0.13 | 0.10 |
| S13 | 0.09 | 0.08 | 0.26 | 0.22 | 0.27 | 0.30 | 0.05 | 0.07 | 0.21 | 0.12 | 0.02 |
| S14 | 0.04 | 0.09 | 0.26 | 0.23 | 0.04 | 0.16 | 0.08 | 0.05 | 0.05 | 0.12 | 0.07 |
| S15 | 0.01 | 0.08 | 0.26 | 0.20 | 0.04 | 0.11 | 0.05 | 0.04 | 0.02 | 0.09 | 0.04 |
| S16 | 0.01 | 0.04 | 0.11 | 0.12 | 0.04 | 0.11 | 0.02 | 0.02 | 0.05 | 0.04 | 0.02 |
| S17 | 0.01 | 0.09 | 0.13 | 0.10 | 0.32 | 0.31 | 0.01 | 0.03 | 0.22 | 0.05 | 0.07 |
| S18 | 0.01 | 0.12 | 0.20 | 0.15 | 0.33 | 0.31 | 0.01 | 0.03 | 0.23 | 0.12 | 0.17 |
| S19 | 0.01 | 0.05 | 0.13 | 0.08 | 0.16 | 0.17 | 0.02 | 0.03 | 0.09 | 0.11 | 0.15 |
| S20 | 0.04 | 0.09 | 0.30 | 0.20 | 0.07 | 0.31 | 0.11 | 0.03 | 0.11 | 0.06 | 0.13 |
| S21 | 0.03 | 0.04 | 0.22 | 0.18 | 0.05 | 0.33 | 0.12 | 0.04 | 0.09 | 0.10 | 0.12 |
| S22 | 0.04 | 0.02 | 0.24 | 0.19 | 0.28 | 0.46 | 0.19 | 0.06 | 0.26 | 0.09 | 0.13 |
| S23 | 0.07 | 0.06 | 0.28 | 0.24 | 0.32 | 0.56 | 0.19 | 0.07 | 0.15 | 0.03 | 0.11 |
| S24 | 0.04 | 0.05 | 0.28 | 0.15 | 0.04 | 0.10 | 0.12 | 0.03 | 0.10 | 0.05 | 0.04 |
| S25 | 0.04 | 0.03 | 0.22 | 0.15 | 0.11 | 0.20 | 0.08 | 0.04 | 0.08 | 0.06 | 0.05 |
| S26 | 0.05 | 0.01 | 0.18 | 0.19 | 0.16 | 0.18 | 0.06 | 0.03 | 0.11 | 0.04 | 0.04 |
| S27 | 0.05 | 0.07 | 0.31 | 0.30 | 0.41 | 0.44 | 0.23 | 0.15 | 0.09 | 0.23 | 0.16 |
| S28 | 0.06 | 0.06 | 0.34 | 0.25 | 0.35 | 0.43 | 0.14 | 0.15 | 0.06 | 0.22 | 0.20 |

Table E4 Velocity Ratio of Perimeter Test Points

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P1 | 0.04 | 0.05 | 0.21 | 0.11 | 0.14 | 0.21 | 0.20 | 0.06 | 0.12 | 0.10 | 0.13 |
| P2 | 0.09 | 0.08 | 0.28 | 0.20 | 0.21 | 0.10 | 0.22 | 0.08 | 0.13 | 0.19 | 0.07 |
| P3 | 0.12 | 0.08 | 0.25 | 0.18 | 0.19 | 0.15 | 0.21 | 0.07 | 0.13 | 0.05 | 0.04 |
| P4 | 0.16 | 0.10 | 0.29 | 0.22 | 0.17 | 0.16 | 0.19 | 0.08 | 0.14 | 0.08 | 0.16 |
| P5 | 0.19 | 0.12 | 0.33 | 0.27 | 0.14 | 0.19 | 0.16 | 0.08 | 0.13 | 0.03 | 0.05 |
| P6 | 0.16 | 0.11 | 0.32 | 0.26 | 0.33 | 0.20 | 0.07 | 0.09 | 0.16 | 0.04 | 0.10 |
| P7 | 0.12 | 0.10 | 0.32 | 0.25 | 0.20 | 0.28 | 0.08 | 0.09 | 0.04 | 0.09 | 0.16 |
| P8 | 0.12 | 0.05 | 0.29 | 0.21 | 0.28 | 0.28 | 0.03 | 0.10 | 0.06 | 0.19 | 0.22 |
| P9 | 0.10 | 0.04 | 0.25 | 0.02 | 0.28 | 0.26 | 0.05 | 0.09 | 0.08 | 0.21 | 0.25 |
| P10 | 0.01 | 0.02 | 0.05 | 0.07 | 0.27 | 0.24 | 0.07 | 0.01 | 0.15 | 0.17 | 0.26 |
| P11 | 0.04 | 0.12 | 0.26 | 0.15 | 0.27 | 0.21 | 0.08 | 0.06 | 0.19 | 0.05 | 0.24 |
| P12 | 0.08 | 0.11 | 0.39 | 0.22 | 0.23 | 0.19 | 0.08 | 0.08 | 0.19 | 0.07 | 0.17 |
| P13 | 0.08 | 0.10 | 0.30 | 0.16 | 0.19 | 0.21 | 0.07 | 0.08 | 0.19 | 0.08 | 0.17 |
| P14 | 0.05 | 0.20 | 0.14 | 0.32 | 0.35 | 0.46 | 0.08 | 0.10 | 0.17 | 0.12 | 0.08 |
| P15 | 0.08 | 0.07 | 0.27 | 0.12 | 0.11 | 0.15 | 0.06 | 0.08 | 0.17 | 0.10 | 0.04 |
| P16 | 0.07 | 0.05 | 0.23 | 0.10 | 0.06 | 0.11 | 0.06 | 0.07 | 0.16 | 0.10 | 0.08 |
| P17 | 0.06 | 0.06 | 0.23 | 0.11 | 0.10 | 0.17 | 0.06 | 0.08 | 0.16 | 0.10 | 0.09 |
| P18 | 0.06 | 0.06 | 0.22 | 0.11 | 0.10 | 0.19 | 0.03 | 0.07 | 0.14 | 0.11 | 0.11 |
| P19 | 0.06 | 0.06 | 0.24 | 0.08 | 0.10 | 0.18 | 0.02 | 0.06 | 0.10 | 0.11 | 0.12 |
| P20 | 0.05 | 0.04 | 0.27 | 0.08 | 0.11 | 0.22 | 0.03 | 0.04 | 0.03 | 0.12 | 0.12 |
| P21 | 0.04 | 0.05 | 0.28 | 0.08 | 0.11 | 0.21 | 0.06 | 0.02 | 0.05 | 0.11 | 0.13 |
| P22 | 0.01 | 0.06 | 0.26 | 0.08 | 0.08 | 0.10 | 0.04 | 0.01 | 0.10 | 0.10 | 0.12 |
| P23 | 0.01 | 0.07 | 0.24 | 0.07 | 0.06 | 0.07 | 0.07 | 0.01 | 0.12 | 0.09 | 0.10 |
| P24 | 0.10 | 0.09 | 0.21 | 0.26 | 0.21 | 0.56 | 0.19 | 0.01 | 0.13 | 0.03 | 0.02 |
| P25 | 0.08 | 0.07 | 0.16 | 0.22 | 0.25 | 0.52 | 0.18 | 0.01 | 0.08 | 0.04 | 0.03 |
| P26 | 0.06 | 0.05 | 0.11 | 0.21 | 0.23 | 0.53 | 0.19 | 0.02 | 0.10 | 0.04 | 0.05 |
| P27 | 0.07 | 0.03 | 0.15 | 0.26 | 0.23 | 0.53 | 0.16 | 0.02 | 0.07 | 0.05 | 0.04 |
| P28 | 0.07 | 0.08 | 0.22 | 0.31 | 0.34 | 0.49 | 0.19 | 0.08 | 0.08 | 0.07 | 0.08 |
| P29 | 0.05 | 0.08 | 0.22 | 0.27 | 0.34 | 0.46 | 0.20 | 0.13 | 0.07 | 0.22 | 0.16 |
| P30 | 0.05 | 0.07 | 0.26 | 0.27 | 0.35 | 0.37 | 0.16 | 0.15 | 0.04 | 0.22 | 0.16 |
| P31 | 0.05 | 0.07 | 0.25 | 0.26 | 0.30 | 0.21 | 0.16 | 0.12 | 0.10 | 0.18 | 0.11 |
| P32 | 0.06 | 0.03 | 0.19 | 0.12 | 0.17 | 0.24 | 0.23 | 0.12 | 0.22 | 0.17 | 0.12 |
| P33 | 0.05 | 0.04 | 0.22 | 0.26 | 0.25 | 0.32 | 0.30 | 0.12 | 0.19 | 0.18 | 0.13 |
| P34 | 0.03 | 0.05 | 0.24 | 0.19 | 0.24 | 0.32 | 0.32 | 0.11 | 0.06 | 0.14 | 0.09 |
| P35 | 0.04 | 0.07 | 0.29 | 0.20 | 0.23 | 0.30 | 0.21 | 0.11 | 0.03 | 0.13 | 0.05 |
| P36 | 0.04 | 0.06 | 0.20 | 0.19 | 0.15 | 0.13 | 0.17 | 0.08 | 0.14 | 0.08 | 0.02 |
| P37 | 0.04 | 0.06 | 0.19 | 0.19 | 0.25 | 0.13 | 0.11 | 0.07 | 0.14 | 0.05 | 0.09 |
| P38 | 0.07 | 0.05 | 0.23 | 0.17 | 0.18 | 0.48 | 0.12 | 0.05 | 0.07 | 0.11 | 0.12 |
| P39 | 0.07 | 0.07 | 0.25 | 0.18 | 0.05 | 0.41 | 0.14 | 0.05 | 0.05 | 0.13 | 0.12 |
| P40 | 0.06 | 0.06 | 0.23 | 0.16 | 0.09 | 0.35 | 0.12 | 0.04 | 0.12 | 0.13 | 0.13 |
| P41 | 0.05 | 0.06 | 0.18 | 0.14 | 0.10 | 0.35 | 0.09 | 0.02 | 0.15 | 0.13 | 0.11 |
| P42 | 0.04 | 0.05 | 0.12 | 0.15 | 0.09 | 0.35 | 0.02 | 0.04 | 0.17 | 0.12 | 0.10 |

Table E5 Velocity Ratio of Overall Test Points

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| O1 | 0.04 | 0.14 | 0.17 | 0.76 | 0.25 | 0.33 | 0.33 | 0.01 | 0.13 | 0.09 | 0.06 |
| O2 | 0.02 | 0.19 | 0.15 | 0.80 | 0.22 | 0.39 | 0.27 | 0.01 | 0.11 | 0.09 | 0.10 |
| O3 | 0.07 | 0.27 | 0.14 | 0.67 | 0.35 | 0.20 | 0.24 | 0.02 | 0.12 | 0.10 | 0.11 |
| O4 | 0.08 | 0.22 | 0.19 | 0.72 | 0.32 | 0.21 | 0.27 | 0.03 | 0.11 | 0.06 | 0.09 |
| O5 | 0.11 | 0.26 | 0.16 | 0.57 | 0.10 | 0.07 | 0.19 | 0.05 | 0.08 | 0.05 | 0.05 |
| O6 | 0.09 | 0.28 | 0.17 | 0.39 | 0.28 | 0.12 | 0.15 | 0.04 | 0.11 | 0.05 | 0.09 |
| O7 | 0.05 | 0.10 | 0.20 | 0.05 | 0.25 | 0.22 | 0.02 | 0.23 | 0.11 | 0.05 | 0.10 |
| O8 | 0.17 | 0.14 | 0.18 | 0.34 | 0.37 | 0.45 | 0.05 | 0.11 | 0.33 | 0.22 | 0.25 |
| O9 | 0.06 | 0.29 | 0.29 | 0.87 | 0.51 | 0.64 | 0.07 | 0.36 | 0.40 | 0.39 | 0.38 |
| O10 | 0.06 | 0.12 | 0.10 | 0.33 | 0.40 | 0.48 | 0.15 | 0.12 | 0.07 | 0.22 | 0.06 |
| O11 | 0.05 | 0.03 | 0.11 | 0.13 | 0.02 | 0.09 | 0.18 | 0.14 | 0.13 | 0.06 | 0.05 |
| O12 | 0.04 | 0.13 | 0.10 | 0.07 | 0.23 | 0.15 | 0.35 | 0.19 | 0.31 | 0.37 | 0.18 |
| O13 | 0.03 | 0.09 | 0.09 | 0.16 | 0.29 | 0.29 | 0.29 | 0.14 | 0.22 | 0.35 | 0.17 |
| O14 | 0.05 | 0.10 | 0.07 | 0.03 | 0.24 | 0.11 | 0.13 | 0.05 | 0.11 | 0.07 | 0.09 |
| O15 | 0.06 | 0.31 | 0.47 | 0.28 | 0.14 | 0.07 | 0.26 | 0.06 | 0.07 | 0.26 | 0.29 |
| O16 | 0.02 | 0.30 | 0.24 | 0.24 | 0.27 | 0.08 | 0.22 | 0.05 | 0.10 | 0.28 | 0.27 |
| O17 | 0.03 | 0.27 | 0.13 | 0.23 | 0.30 | 0.11 | 0.18 | 0.06 | 0.14 | 0.27 | 0.18 |
| O18 | 0.03 | 0.28 | 0.33 | 0.26 | 0.27 | 0.10 | 0.18 | 0.08 | 0.15 | 0.24 | 0.08 |
| O19 | 0.02 | 0.03 | 0.06 | 0.12 | 0.09 | 0.18 | 0.15 | 0.06 | 0.17 | 0.11 | 0.13 |
| O20 | 0.04 | 0.10 | 0.11 | 0.13 | 0.13 | 0.25 | 0.24 | 0.10 | 0.25 | 0.15 | 0.14 |
| O21 | 0.05 | 0.10 | 0.17 | 0.12 | 0.13 | 0.29 | 0.22 | 0.09 | 0.22 | 0.14 | 0.08 |
| O22 | 0.05 | 0.12 | 0.20 | 0.15 | 0.15 | 0.35 | 0.12 | 0.06 | 0.12 | 0.09 | 0.05 |
| O23 | 0.06 | 0.08 | 0.27 | 0.19 | 0.16 | 0.22 | 0.36 | 0.17 | 0.33 | 0.22 | 0.13 |
| O24 | 0.06 | 0.20 | 0.07 | 0.23 | 0.18 | 0.07 | 0.14 | 0.03 | 0.07 | 0.23 | 0.33 |
| O25 | 0.02 | 0.03 | 0.04 | 0.05 | 0.04 | 0.05 | 0.14 | 0.03 | 0.05 | 0.17 | 0.23 |
| O26 | 0.06 | 0.12 | 0.06 | 0.23 | 0.19 | 0.25 | 0.14 | 0.09 | 0.14 | 0.18 | 0.22 |
| O27 | 0.10 | 0.10 | 0.14 | 0.26 | 0.20 | 0.39 | 0.32 | 0.14 | 0.38 | 0.31 | 0.23 |
| O28 | 0.03 | 0.06 | 0.13 | 0.32 | 0.31 | 0.42 | 0.16 | 0.10 | 0.25 | 0.21 | 0.15 |
| O29 | 0.02 | 0.03 | 0.07 | 0.32 | 0.09 | 0.43 | 0.16 | 0.15 | 0.33 | 0.31 | 0.24 |
| O30 | 0.07 | 0.08 | 0.08 | 0.21 | 0.21 | 0.26 | 0.22 | 0.16 | 0.35 | 0.34 | 0.27 |
| O31 | 0.03 | 0.18 | 0.11 | 0.26 | 0.33 | 0.43 | 0.17 | 0.15 | 0.28 | 0.34 | 0.29 |
| O32 | 0.02 | 0.21 | 0.10 | 0.23 | 0.15 | 0.25 | 0.34 | 0.16 | 0.40 | 0.29 | 0.29 |
| O33 | 0.01 | 0.13 | 0.13 | 0.42 | 0.36 | 0.45 | 0.32 | 0.18 | 0.36 | 0.21 | 0.31 |
| O34 | 0.03 | 0.13 | 0.16 | 0.32 | 0.33 | 0.39 | 0.11 | 0.10 | 0.16 | 0.28 | 0.20 |
| O35 | 0.03 | 0.21 | 0.07 | 0.48 | 0.34 | 0.36 | 0.32 | 0.14 | 0.35 | 0.30 | 0.25 |
| O36 | 0.08 | 0.18 | 0.08 | 0.48 | 0.34 | 0.35 | 0.34 | 0.13 | 0.33 | 0.32 | 0.27 |
| O37 | 0.14 | 0.19 | 0.07 | 0.57 | 0.32 | 0.20 | 0.35 | 0.06 | 0.27 | 0.29 | 0.23 |
| O38 | 0.09 | 0.24 | 0.09 | 0.54 | 0.33 | 0.18 | 0.34 | 0.05 | 0.29 | 0.30 | 0.22 |
| O39 | 0.06 | 0.16 | 0.11 | 0.19 | 0.13 | 0.15 | 0.29 | 0.09 | 0.19 | 0.21 | 0.32 |
| O40 | 0.06 | 0.18 | 0.06 | 0.26 | 0.11 | 0.13 | 0.24 | 0.06 | 0.12 | 0.27 | 0.37 |
| O41 | 0.04 | 0.18 | 0.05 | 0.19 | 0.09 | 0.13 | 0.20 | 0.08 | 0.18 | 0.25 | 0.26 |
| O42 | 0.02 | 0.16 | 0.04 | 0.08 | 0.06 | 0.13 | 0.14 | 0.11 | 0.19 | 0.27 | 0.22 |
| O43 | 0.09 | 0.07 | 0.07 | 0.06 | 0.12 | 0.41 | 0.27 | 0.16 | 0.35 | 0.28 | 0.15 |
| O44 | 0.12 | 0.05 | 0.18 | 0.09 | 0.16 | 0.27 | 0.31 | 0.11 | 0.27 | 0.20 | 0.17 |
| O45 | 0.16 | 0.10 | 0.34 | 0.19 | 0.22 | 0.45 | 0.55 | 0.17 | 0.38 | 0.23 | 0.19 |
| O46 | 0.21 | 0.13 | 0.41 | 0.17 | 0.17 | 0.31 | 0.42 | 0.13 | 0.26 | 0.19 | 0.15 |
| O47 | 0.14 | 0.08 | 0.32 | 0.09 | 0.06 | 0.16 | 0.16 | 0.18 | 0.39 | 0.32 | 0.15 |
| O48 | 0.11 | 0.05 | 0.32 | 0.26 | 0.09 | 0.33 | 0.28 | 0.13 | 0.34 | 0.22 | 0.29 |

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| O49 | 0.09 | 0.03 | 0.26 | 0.22 | 0.04 | 0.26 | 0.10 | 0.19 | 0.35 | 0.31 | 0.31 |
| O50 | 0.06 | 0.08 | 0.12 | 0.12 | 0.24 | 0.41 | 0.24 | 0.19 | 0.34 | 0.31 | 0.34 |
| O51 | 0.05 | 0.17 | 0.20 | 0.22 | 0.25 | 0.19 | 0.27 | 0.13 | 0.25 | 0.29 | 0.37 |
| O52 | 0.01 | 0.11 | 0.07 | 0.24 | 0.19 | 0.16 | 0.09 | 0.06 | 0.09 | 0.17 | 0.11 |
| O53 | 0.04 | 0.20 | 0.07 | 0.36 | 0.34 | 0.44 | 0.31 | 0.18 | 0.32 | 0.33 | 0.32 |
| O54 | 0.12 | 0.19 | 0.06 | 0.42 | 0.37 | 0.38 | 0.35 | 0.13 | 0.32 | 0.31 | 0.28 |
| O55 | 0.16 | 0.16 | 0.04 | 0.67 | 0.32 | 0.40 | 0.42 | 0.04 | 0.27 | 0.25 | 0.18 |
| O56 | 0.13 | 0.16 | 0.10 | 0.52 | 0.26 | 0.49 | 0.31 | 0.10 | 0.20 | 0.23 | 0.16 |
| O57 | 0.14 | 0.22 | 0.15 | 0.58 | 0.29 | 0.64 | 0.28 | 0.09 | 0.21 | 0.25 | 0.19 |
| O58 | 0.14 | 0.19 | 0.12 | 0.55 | 0.28 | 0.45 | 0.31 | 0.09 | 0.22 | 0.25 | 0.19 |
| O59 | 0.14 | 0.18 | 0.12 | 0.54 | 0.27 | 0.51 | 0.31 | 0.09 | 0.21 | 0.24 | 0.17 |
| O60 | 0.14 | 0.21 | 0.12 | 0.57 | 0.27 | 0.69 | 0.28 | 0.10 | 0.19 | 0.24 | 0.18 |
| O61 | 0.12 | 0.14 | 0.07 | 0.86 | 0.22 | 0.43 | 0.40 | 0.03 | 0.32 | 0.23 | 0.14 |
| O62 | 0.19 | 0.09 | 0.14 | 0.67 | 0.39 | 0.58 | 0.46 | 0.04 | 0.37 | 0.26 | 0.18 |
| O63 | 0.15 | 0.08 | 0.03 | 0.48 | 0.27 | 0.35 | 0.12 | 0.09 | 0.12 | 0.18 | 0.11 |
| O64 | 0.26 | 0.23 | 0.01 | 0.57 | 0.28 | 0.36 | 0.06 | 0.10 | 0.04 | 0.09 | 0.07 |
| O65 | 0.31 | 0.07 | 0.15 | 0.44 | 0.04 | 0.29 | 0.02 | 0.03 | 0.10 | 0.02 | 0.01 |
| O66 | 0.29 | 0.04 | 0.15 | 0.36 | 0.03 | 0.28 | 0.04 | 0.03 | 0.09 | 0.05 | 0.03 |
| O67 | 0.29 | 0.25 | 0.10 | 0.71 | 0.12 | 0.24 | 0.12 | 0.06 | 0.03 | 0.07 | 0.04 |
| O68 | 0.26 | 0.19 | 0.07 | 0.61 | 0.10 | 0.16 | 0.03 | 0.04 | 0.02 | 0.02 | 0.02 |
| O69 | 0.06 | 0.24 | 0.13 | 0.64 | 0.05 | 0.29 | 0.05 | 0.04 | 0.03 | 0.05 | 0.02 |
| O70 | 0.32 | 0.27 | 0.26 | 0.66 | 0.20 | 0.57 | 0.13 | 0.04 | 0.03 | 0.09 | 0.07 |
| O71 | 0.07 | 0.05 | 0.23 | 0.34 | 0.37 | 0.46 | 0.23 | 0.10 | 0.24 | 0.25 | 0.19 |
| O72 | 0.10 | 0.09 | 0.15 | 0.41 | 0.39 | 0.69 | 0.11 | 0.02 | 0.10 | 0.08 | 0.13 |
| O73 | 0.08 | 0.07 | 0.11 | 0.51 | 0.37 | 0.53 | 0.11 | 0.01 | 0.10 | 0.08 | 0.11 |
| O74 | 0.15 | 0.25 | 0.14 | 0.59 | 0.31 | 0.67 | 0.29 | 0.06 | 0.23 | 0.26 | 0.20 |
| O75 | 0.14 | 0.22 | 0.10 | 0.58 | 0.27 | 0.70 | 0.27 | 0.09 | 0.19 | 0.23 | 0.18 |
| O76 | 0.17 | 0.16 | 0.06 | 0.51 | 0.21 | 0.54 | 0.21 | 0.10 | 0.15 | 0.18 | 0.13 |
| O77 | 0.07 | 0.25 | 0.02 | 0.33 | 0.26 | 0.28 | 0.19 | 0.09 | 0.16 | 0.23 | 0.19 |
| O78 | 0.18 | 0.23 | 0.14 | 0.51 | 0.25 | 0.49 | 0.05 | 0.16 | 0.02 | 0.24 | 0.24 |
| O79 | 0.02 | 0.04 | 0.25 | 0.18 | 0.24 | 0.24 | 0.16 | 0.11 | 0.20 | 0.28 | 0.17 |
| O80 | 0.06 | 0.07 | 0.24 | 0.25 | 0.33 | 0.14 | 0.21 | 0.10 | 0.23 | 0.27 | 0.22 |
| O81 | 0.11 | 0.09 | 0.17 | 0.32 | 0.36 | 0.64 | 0.23 | 0.04 | 0.24 | 0.14 | 0.21 |
| O82 | 0.04 | 0.20 | 0.20 | 0.24 | 0.32 | 0.23 | 0.26 | 0.05 | 0.22 | 0.16 | 0.14 |
| O83 | 0.04 | 0.18 | 0.20 | 0.15 | 0.09 | 0.18 | 0.20 | 0.05 | 0.19 | 0.32 | 0.20 |
| O84 | 0.07 | 0.12 | 0.16 | 0.15 | 0.08 | 0.16 | 0.14 | 0.06 | 0.14 | 0.20 | 0.11 |
| O85 | 0.04 | 0.23 | 0.33 | 0.64 | 0.32 | 0.60 | 0.08 | 0.13 | 0.21 | 0.37 | 0.28 |
| O86 | 0.18 | 0.17 | 0.22 | 0.50 | 0.32 | 0.41 | 0.11 | 0.06 | 0.05 | 0.09 | 0.16 |
| O87 | 0.24 | 0.34 | 0.07 | 0.78 | 0.22 | 0.39 | 0.05 | 0.02 | 0.05 | 0.20 | 0.11 |
| O88 | 0.09 | 0.26 | 0.32 | 0.78 | 0.50 | 0.08 | 0.06 | 0.32 | 0.32 | 0.54 | 0.53 |
| O89 | 0.14 | 0.10 | 0.08 | 0.06 | 0.10 | 0.22 | 0.04 | 0.08 | 0.19 | 0.26 | 0.25 |
| O90 | 0.15 | 0.07 | 0.14 | 0.06 | 0.23 | 0.29 | 0.06 | 0.24 | 0.22 | 0.44 | 0.28 |
| O91 | 0.04 | 0.03 | 0.06 | 0.07 | 0.09 | 0.06 | 0.06 | 0.10 | 0.29 | 0.18 | 0.09 |
| O92 | 0.08 | 0.03 | 0.04 | 0.07 | 0.07 | 0.05 | 0.04 | 0.11 | 0.26 | 0.23 | 0.17 |
| O93 | 0.16 | 0.14 | 0.09 | 0.25 | 0.11 | 0.04 | 0.01 | 0.15 | 0.14 | 0.32 | 0.09 |
| O94 | 0.09 | 0.10 | 0.05 | 0.17 | 0.05 | 0.08 | 0.04 | 0.18 | 0.12 | 0.25 | 0.26 |
| O95 | 0.11 | 0.10 | 0.09 | 0.05 | 0.08 | 0.07 | 0.03 | 0.20 | 0.23 | 0.35 | 0.46 |
| O96 | 0.11 | 0.19 | 0.18 | 0.45 | 0.39 | 0.13 | 0.07 | 0.21 | 0.22 | 0.36 | 0.30 |
| O97 | 0.14 | 0.14 | 0.21 | 0.48 | 0.34 | 0.13 | 0.05 | 0.18 | 0.17 | 0.26 | 0.24 |

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| O98 | 0.09 | 0.18 | 0.28 | 0.51 | 0.41 | 0.46 | 0.14 | 0.27 | 0.28 | 0.48 | 0.39 |
| O99 | 0.14 | 0.29 | 0.35 | 0.75 | 0.61 | 0.35 | 0.11 | 0.44 | 0.33 | 0.54 | 0.46 |
| O100 | 0.15 | 0.31 | 0.31 | 0.71 | 0.59 | 0.26 | 0.12 | 0.52 | 0.30 | 0.51 | 0.43 |
| O101 | 0.17 | 0.28 | 0.29 | 0.60 | 0.54 | 0.26 | 0.10 | 0.48 | 0.28 | 0.43 | 0.41 |
| O102 | 0.21 | 0.27 | 0.26 | 0.54 | 0.53 | 0.15 | 0.08 | 0.29 | 0.07 | 0.26 | 0.25 |
| O103 | 0.12 | 0.28 | 0.24 | 0.64 | 0.61 | 0.22 | 0.09 | 0.46 | 0.35 | 0.56 | 0.52 |
| O104 | 0.10 | 0.11 | 0.33 | 0.35 | 0.26 | 0.25 | 0.07 | 0.03 | 0.11 | 0.06 | 0.17 |
| O105 | 0.16 | 0.28 | 0.25 | 0.30 | 0.32 | 0.06 | 0.06 | 0.08 | 0.06 | 0.05 | 0.05 |
| O106 | 0.17 | 0.05 | 0.15 | 0.03 | 0.20 | 0.19 | 0.28 | 0.19 | 0.31 | 0.46 | 0.37 |
| O107 | 0.08 | 0.21 | 0.24 | 0.08 | 0.15 | 0.08 | 0.09 | 0.27 | 0.28 | 0.39 | 0.35 |
| O108 | 0.13 | 0.15 | 0.28 | 0.08 | 0.10 | 0.07 | 0.14 | 0.29 | 0.25 | 0.35 | 0.32 |
| O109 | 0.16 | 0.12 | 0.22 | 0.09 | 0.13 | 0.06 | 0.14 | 0.30 | 0.28 | 0.31 | 0.34 |
| O110 | 0.16 | 0.11 | 0.18 | 0.11 | 0.10 | 0.12 | 0.07 | 0.19 | 0.18 | 0.22 | 0.23 |
| O111 | 0.13 | 0.08 | 0.06 | 0.15 | 0.07 | 0.22 | 0.30 | 0.20 | 0.31 | 0.35 | 0.34 |
| O112 | 0.10 | 0.09 | 0.06 | 0.05 | 0.17 | 0.12 | 0.04 | 0.04 | 0.08 | 0.11 | 0.12 |
| O113 | 0.06 | 0.04 | 0.10 | 0.07 | 0.08 | 0.02 | 0.03 | 0.05 | 0.12 | 0.18 | 0.19 |
| O114 | 0.08 | 0.05 | 0.13 | 0.08 | 0.08 | 0.03 | 0.05 | 0.06 | 0.16 | 0.23 | 0.24 |
| O115 | 0.07 | 0.10 | 0.32 | 0.23 | 0.17 | 0.18 | 0.26 | 0.16 | 0.21 | 0.29 | 0.23 |
| O116 | 0.12 | 0.05 | 0.21 | 0.14 | 0.16 | 0.07 | 0.06 | 0.17 | 0.04 | 0.08 | 0.06 |
| O117 | 0.13 | 0.07 | 0.30 | 0.20 | 0.19 | 0.10 | 0.10 | 0.18 | 0.05 | 0.08 | 0.04 |
| O118 | 0.12 | 0.10 | 0.26 | 0.19 | 0.18 | 0.06 | 0.07 | 0.17 | 0.06 | 0.04 | 0.03 |
| O119 | 0.05 | 0.03 | 0.09 | 0.08 | 0.14 | 0.29 | 0.13 | 0.03 | 0.04 | 0.04 | 0.03 |
| O120 | 0.02 | 0.05 | 0.12 | 0.11 | 0.17 | 0.27 | 0.17 | 0.09 | 0.13 | 0.04 | 0.03 |
| O121 | 0.03 | 0.05 | 0.26 | 0.11 | 0.18 | 0.17 | 0.18 | 0.11 | 0.19 | 0.11 | 0.04 |
| O122 | 0.07 | 0.05 | 0.19 | 0.11 | 0.15 | 0.19 | 0.12 | 0.04 | 0.11 | 0.04 | 0.02 |
| O123 | 0.07 | 0.04 | 0.22 | 0.17 | 0.03 | 0.07 | 0.13 | 0.03 | 0.07 | 0.03 | 0.04 |
| O124 | 0.12 | 0.07 | 0.30 | 0.25 | 0.06 | 0.06 | 0.09 | 0.01 | 0.07 | 0.04 | 0.06 |
| O125 | 0.05 | 0.03 | 0.15 | 0.14 | 0.07 | 0.26 | 0.37 | 0.11 | 0.09 | 0.03 | 0.04 |
| O126 | 0.05 | 0.03 | 0.12 | 0.11 | 0.10 | 0.24 | 0.09 | 0.05 | 0.04 | 0.03 | 0.02 |
| O127 | 0.06 | 0.04 | 0.15 | 0.08 | 0.06 | 0.10 | 0.08 | 0.05 | 0.02 | 0.01 | 0.02 |
| O128 | 0.09 | 0.07 | 0.11 | 0.07 | 0.04 | 0.12 | 0.12 | 0.04 | 0.05 | 0.02 | 0.07 |
| O129 | 0.31 | 0.25 | 0.21 | 0.19 | 0.09 | 0.19 | 0.28 | 0.11 | 0.15 | 0.05 | 0.07 |
| O130 | 0.38 | 0.36 | 0.15 | 0.15 | 0.14 | 0.06 | 0.07 | 0.07 | 0.09 | 0.02 | 0.07 |
| O131 | 0.05 | 0.08 | 0.11 | 0.14 | 0.11 | 0.08 | 0.08 | 0.05 | 0.05 | 0.03 | 0.03 |
| O132 | 0.06 | 0.09 | 0.19 | 0.21 | 0.20 | 0.14 | 0.13 | 0.05 | 0.08 | 0.02 | 0.04 |
| O133 | 0.02 | 0.09 | 0.17 | 0.20 | 0.20 | 0.14 | 0.14 | 0.05 | 0.12 | 0.07 | 0.09 |
| O134 | 0.01 | 0.06 | 0.03 | 0.11 | 0.09 | 0.05 | 0.04 | 0.01 | 0.05 | 0.05 | 0.02 |
| O135 | 0.01 | 0.03 | 0.04 | 0.06 | 0.05 | 0.05 | 0.02 | 0.03 | 0.01 | 0.07 | 0.04 |
| O136 | 0.01 | 0.10 | 0.11 | 0.14 | 0.13 | 0.09 | 0.09 | 0.03 | 0.01 | 0.11 | 0.11 |
| O137 | 0.01 | 0.03 | 0.04 | 0.06 | 0.03 | 0.04 | 0.04 | 0.02 | 0.07 | 0.17 | 0.19 |
| O138 | 0.02 | 0.06 | 0.08 | 0.11 | 0.10 | 0.06 | 0.06 | 0.01 | 0.12 | 0.38 | 0.38 |
| O139 | 0.02 | 0.03 | 0.03 | 0.07 | 0.06 | 0.04 | 0.05 | 0.01 | 0.02 | 0.28 | 0.28 |
| O140 | 0.33 | 0.30 | 0.27 | 0.10 | 0.04 | 0.17 | 0.27 | 0.06 | 0.13 | 0.05 | 0.07 |
| O141 | 0.08 | 0.26 | 0.12 | 0.14 | 0.11 | 0.07 | 0.11 | 0.05 | 0.02 | 0.09 | 0.09 |
| O142 | 0.22 | 0.39 | 0.23 | 0.20 | 0.21 | 0.07 | 0.10 | 0.09 | 0.09 | 0.08 | 0.06 |
| O143 | 0.21 | 0.35 | 0.24 | 0.22 | 0.22 | 0.04 | 0.04 | 0.08 | 0.08 | 0.10 | 0.11 |
| O144 | 0.19 | 0.35 | 0.31 | 0.32 | 0.32 | 0.14 | 0.19 | 0.09 | 0.14 | 0.17 | 0.20 |
| O145 | 0.13 | 0.26 | 0.22 | 0.23 | 0.23 | 0.03 | 0.10 | 0.02 | 0.12 | 0.12 | 0.07 |
| O146 | 0.05 | 0.24 | 0.20 | 0.21 | 0.22 | 0.04 | 0.04 | 0.03 | 0.08 | 0.18 | 0.04 |

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| O147 | 0.16 | 0.08 | 0.25 | 0.21 | 0.17 | 0.26 | 0.36 | 0.10 | 0.12 | 0.12 | 0.02 |
| O148 | 0.07 | 0.17 | 0.18 | 0.11 | 0.22 | 0.29 | 0.43 | 0.11 | 0.13 | 0.12 | 0.05 |
| O149 | 0.24 | 0.33 | 0.49 | 0.52 | 0.31 | 0.29 | 0.38 | 0.07 | 0.14 | 0.14 | 0.10 |
| O150 | 0.11 | 0.19 | 0.38 | 0.41 | 0.26 | 0.27 | 0.33 | 0.03 | 0.12 | 0.13 | 0.12 |
| O151 | 0.20 | 0.21 | 0.07 | 0.17 | 0.19 | 0.15 | 0.07 | 0.03 | 0.06 | 0.02 | 0.05 |
| O152 | 0.05 | 0.05 | 0.12 | 0.25 | 0.07 | 0.11 | 0.20 | 0.04 | 0.07 | 0.02 | 0.02 |
| O153 | 0.03 | 0.06 | 0.20 | 0.27 | 0.11 | 0.04 | 0.23 | 0.06 | 0.04 | 0.01 | 0.04 |
| O154 | 0.07 | 0.06 | 0.18 | 0.14 | 0.05 | 0.04 | 0.10 | 0.03 | 0.03 | 0.01 | 0.04 |
| O155 | 0.07 | 0.05 | 0.19 | 0.26 | 0.21 | 0.26 | 0.36 | 0.11 | 0.20 | 0.17 | 0.07 |
| O156 | 0.08 | 0.06 | 0.32 | 0.21 | 0.26 | 0.36 | 0.31 | 0.08 | 0.24 | 0.15 | 0.17 |
| O157 | 0.08 | 0.27 | 0.17 | 0.41 | 0.37 | 0.14 | 0.10 | 0.19 | 0.07 | 0.27 | 0.21 |
| O158 | 0.06 | 0.11 | 0.25 | 0.27 | 0.12 | 0.51 | 0.22 | 0.27 | 0.07 | 0.40 | 0.53 |
| O159 | 0.02 | 0.25 | 0.08 | 0.42 | 0.30 | 0.55 | 0.02 | 0.06 | 0.19 | 0.06 | 0.04 |
| O160 | 0.01 | 0.23 | 0.09 | 0.45 | 0.32 | 0.59 | 0.05 | 0.06 | 0.23 | 0.06 | 0.03 |
| O161 | 0.03 | 0.23 | 0.13 | 0.46 | 0.38 | 0.62 | 0.11 | 0.10 | 0.24 | 0.13 | 0.05 |
| O162 | 0.08 | 0.09 | 0.09 | 0.38 | 0.43 | 0.61 | 0.25 | 0.20 | 0.08 | 0.29 | 0.30 |
| O163 | 0.07 | 0.12 | 0.28 | 0.23 | 0.38 | 0.35 | 0.29 | 0.19 | 0.07 | 0.27 | 0.38 |
| O164 | 0.02 | 0.09 | 0.11 | 0.10 | 0.32 | 0.27 | 0.21 | 0.03 | 0.16 | 0.05 | 0.06 |
| O165 | 0.05 | 0.06 | 0.35 | 0.40 | 0.20 | 0.49 | 0.31 | 0.25 | 0.11 | 0.34 | 0.44 |
| O166 | 0.13 | 0.38 | 0.19 | 0.97 | 0.52 | 0.44 | 0.13 | 0.09 | 0.07 | 0.17 | 0.14 |
| O167 | 0.09 | 0.29 | 0.21 | 0.70 | 0.50 | 0.42 | 0.20 | 0.13 | 0.05 | 0.20 | 0.08 |
| O168 | 0.08 | 0.18 | 0.24 | 0.43 | 0.48 | 0.53 | 0.20 | 0.40 | 0.32 | 0.57 | 0.51 |
| O169 | 0.05 | 0.09 | 0.07 | 0.22 | 0.18 | 0.23 | 0.11 | 0.16 | 0.25 | 0.15 | 0.18 |
| O170 | 0.03 | 0.04 | 0.13 | 0.11 | 0.07 | 0.08 | 0.04 | 0.07 | 0.08 | 0.10 | 0.18 |
| O171 | 0.03 | 0.17 | 0.11 | 0.61 | 0.36 | 0.10 | 0.13 | 0.24 | 0.16 | 0.04 | 0.19 |
| O172 | 0.08 | 0.21 | 0.26 | 0.59 | 0.41 | 0.27 | 0.13 | 0.13 | 0.17 | 0.08 | 0.22 |
| O173 | 0.13 | 0.18 | 0.44 | 0.64 | 0.42 | 0.17 | 0.14 | 0.08 | 0.13 | 0.09 | 0.21 |
| O174 | 0.11 | 0.08 | 0.43 | 0.55 | 0.40 | 0.08 | 0.08 | 0.14 | 0.09 | 0.17 | 0.11 |
| O175 | 0.12 | 0.21 | 0.12 | 0.36 | 0.33 | 0.14 | 0.16 | 0.19 | 0.20 | 0.15 | 0.11 |
| O176 | 0.11 | 0.04 | 0.11 | 0.07 | 0.07 | 0.23 | 0.14 | 0.09 | 0.09 | 0.15 | 0.11 |
| O177 | 0.11 | 0.17 | 0.12 | 0.08 | 0.08 | 0.42 | 0.08 | 0.10 | 0.12 | 0.17 | 0.20 |
| O178 | 0.10 | 0.14 | 0.16 | 0.08 | 0.34 | 0.38 | 0.05 | 0.12 | 0.11 | 0.07 | 0.10 |
| O179 | 0.11 | 0.06 | 0.22 | 0.17 | 0.26 | 0.20 | 0.06 | 0.07 | 0.08 | 0.07 | 0.12 |
| O180 | 0.04 | 0.03 | 0.17 | 0.13 | 0.16 | 0.12 | 0.11 | 0.05 | 0.07 | 0.08 | 0.11 |
| O181 | 0.10 | 0.10 | 0.09 | 0.11 | 0.36 | 0.31 | 0.13 | 0.13 | 0.08 | 0.18 | 0.27 |
| O182 | 0.10 | 0.14 | 0.13 | 0.12 | 0.34 | 0.30 | 0.12 | 0.10 | 0.09 | 0.08 | 0.14 |
| O183 | 0.13 | 0.09 | 0.07 | 0.03 | 0.31 | 0.30 | 0.14 | 0.13 | 0.08 | 0.04 | 0.05 |
| O184 | 0.03 | 0.11 | 0.05 | 0.14 | 0.26 | 0.27 | 0.18 | 0.21 | 0.26 | 0.31 | 0.30 |
| O185 | 0.10 | 0.15 | 0.08 | 0.10 | 0.23 | 0.08 | 0.07 | 0.21 | 0.20 | 0.22 | 0.17 |
| O186 | 0.09 | 0.07 | 0.06 | 0.13 | 0.28 | 0.15 | 0.07 | 0.04 | 0.05 | 0.11 | 0.07 |
| O187 | 0.08 | 0.15 | 0.15 | 0.17 | 0.38 | 0.22 | 0.11 | 0.07 | 0.08 | 0.16 | 0.15 |
| O188 | 0.10 | 0.12 | 0.16 | 0.14 | 0.25 | 0.28 | 0.12 | 0.06 | 0.07 | 0.18 | 0.23 |
| O189 | 0.12 | 0.15 | 0.14 | 0.17 | 0.08 | 0.09 | 0.08 | 0.19 | 0.03 | 0.10 | 0.13 |
| O190 | 0.04 | 0.05 | 0.19 | 0.19 | 0.11 | 0.09 | 0.12 | 0.05 | 0.10 | 0.22 | 0.21 |
| O191 | 0.11 | 0.07 | 0.16 | 0.15 | 0.11 | 0.06 | 0.14 | 0.06 | 0.09 | 0.18 | 0.19 |
| O192 | 0.13 | 0.09 | 0.18 | 0.15 | 0.18 | 0.25 | 0.08 | 0.03 | 0.12 | 0.14 | 0.18 |
| O193 | 0.06 | 0.22 | 0.23 | 0.21 | 0.16 | 0.26 | 0.03 | 0.06 | 0.13 | 0.37 | 0.33 |
| O194 | 0.07 | 0.08 | 0.28 | 0.22 | 0.16 | 0.19 | 0.16 | 0.11 | 0.12 | 0.24 | 0.20 |
| O195 | 0.04 | 0.03 | 0.29 | 0.18 | 0.10 | 0.10 | 0.22 | 0.16 | 0.18 | 0.31 | 0.22 |

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| O196 | 0.05 | 0.02 | 0.13 | 0.04 | 0.08 | 0.15 | 0.08 | 0.03 | 0.05 | 0.04 | 0.03 |
| O197 | 0.04 | 0.04 | 0.15 | 0.13 | 0.16 | 0.20 | 0.16 | 0.08 | 0.05 | 0.03 | 0.03 |
| O198 | 0.05 | 0.14 | 0.12 | 0.14 | 0.05 | 0.05 | 0.12 | 0.01 | 0.11 | 0.09 | 0.10 |

Table E6 Velocity Ratio of Special Test Points

| Points | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S1 | 0.07 | 0.02 | 0.14 | 0.08 | 0.22 | 0.33 | 0.07 | 0.03 | 0.16 | 0.09 | 0.12 |
| S2 | 0.04 | 0.06 | 0.18 | 0.16 | 0.19 | 0.22 | 0.11 | 0.02 | 0.15 | 0.08 | 0.14 |
| S3 | 0.04 | 0.08 | 0.32 | 0.19 | 0.24 | 0.32 | 0.09 | 0.02 | 0.10 | 0.09 | 0.14 |
| S4 | 0.05 | 0.07 | 0.32 | 0.18 | 0.20 | 0.33 | 0.07 | 0.04 | 0.02 | 0.10 | 0.12 |
| S5 | 0.06 | 0.07 | 0.28 | 0.15 | 0.08 | 0.18 | 0.03 | 0.06 | 0.08 | 0.10 | 0.12 |
| S6 | 0.07 | 0.08 | 0.26 | 0.14 | 0.06 | 0.09 | 0.05 | 0.08 | 0.15 | 0.11 | 0.10 |
| S7 | 0.08 | 0.09 | 0.29 | 0.15 | 0.07 | 0.13 | 0.07 | 0.08 | 0.18 | 0.10 | 0.08 |
| S8 | 0.08 | 0.10 | 0.33 | 0.17 | 0.17 | 0.15 | 0.08 | 0.08 | 0.19 | 0.08 | 0.05 |
| S9 | 0.07 | 0.13 | 0.41 | 0.25 | 0.34 | 0.21 | 0.09 | 0.09 | 0.21 | 0.09 | 0.03 |
| S10 | 0.01 | 0.02 | 0.04 | 0.02 | 0.33 | 0.22 | 0.05 | 0.01 | 0.12 | 0.03 | 0.05 |
| S11 | 0.01 | 0.02 | 0.03 | 0.02 | 0.29 | 0.27 | 0.02 | 0.01 | 0.03 | 0.05 | 0.19 |
| S12 | 0.10 | 0.03 | 0.24 | 0.06 | 0.11 | 0.18 | 0.07 | 0.07 | 0.03 | 0.12 | 0.13 |
| S13 | 0.06 | 0.05 | 0.21 | 0.18 | 0.28 | 0.16 | 0.05 | 0.06 | 0.14 | 0.11 | 0.11 |
| S14 | 0.02 | 0.09 | 0.28 | 0.23 | 0.04 | 0.07 | 0.17 | 0.05 | 0.05 | 0.12 | 0.09 |
| S15 | 0.01 | 0.08 | 0.31 | 0.18 | 0.01 | 0.04 | 0.15 | 0.04 | 0.06 | 0.16 | 0.02 |
| S16 | 0.01 | 0.04 | 0.13 | 0.10 | 0.04 | 0.03 | 0.02 | 0.01 | 0.04 | 0.03 | 0.13 |
| S17 | 0.04 | 0.08 | 0.04 | 0.08 | 0.38 | 0.30 | 0.10 | 0.02 | 0.21 | 0.14 | 0.16 |
| S18 | 0.05 | 0.04 | 0.05 | 0.08 | 0.21 | 0.18 | 0.05 | 0.01 | 0.12 | 0.13 | 0.16 |
| S19 | 0.03 | 0.07 | 0.19 | 0.14 | 0.08 | 0.17 | 0.02 | 0.05 | 0.07 | 0.09 | 0.13 |
| S20 | 0.04 | 0.05 | 0.16 | 0.11 | 0.14 | 0.23 | 0.13 | 0.02 | 0.13 | 0.05 | 0.05 |
| S21 | 0.03 | 0.01 | 0.10 | 0.11 | 0.15 | 0.14 | 0.07 | 0.03 | 0.21 | 0.05 | 0.10 |
| S22 | 0.02 | 0.02 | 0.05 | 0.10 | 0.10 | 0.14 | 0.07 | 0.03 | 0.07 | 0.05 | 0.05 |
| S23 | 0.04 | 0.03 | 0.20 | 0.18 | 0.17 | 0.21 | 0.09 | 0.05 | 0.15 | 0.06 | 0.07 |
| S24 | 0.04 | 0.04 | 0.27 | 0.10 | 0.13 | 0.13 | 0.09 | 0.03 | 0.15 | 0.09 | 0.09 |
| S25 | 0.03 | 0.02 | 0.22 | 0.17 | 0.15 | 0.14 | 0.07 | 0.04 | 0.13 | 0.11 | 0.07 |
| S26 | 0.04 | 0.02 | 0.19 | 0.16 | 0.13 | 0.11 | 0.07 | 0.04 | 0.12 | 0.09 | 0.07 |
| S27 | 0.04 | 0.07 | 0.29 | 0.33 | 0.43 | 0.37 | 0.25 | 0.17 | 0.10 | 0.26 | 0.16 |
| S28 | 0.07 | 0.08 | 0.31 | 0.32 | 0.41 | 0.43 | 0.19 | 0.18 | 0.04 | 0.27 | 0.22 |