Member of the Surbana Jurong Group

Air Ventilation Assessment (AVA) Initial Study

Programme No. 81MM

Town Planning Application, Preliminary Environmental Review, Associated Studies, Topographical and Tree Survey, Tree Preservation and Removal Proposal for Redevelopment of Kwai Chung Hospital (Phases 2 & 3)

February 2018

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PREPARATION, REVIEW AND AUTHORISATION

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1 INTRODUCTION

1.1 Background

1.1.1 Kwai Chung Hospital (KCH) is a multi-disciplinary and psychiatric hospital with 920 beds located on Kwai Chung Hospital Road (the Site). Part of the Hospital Authority (HA) Kowloon West Cluster (KWC), KCH was built in 1981, but since then there has been no major renovation or refurbishment. The condition and physical setting have become outdated and KCH lacks the capability to effectively facilitate delivery of modern care and training of professionals. Moreover, the service quality and patient safety are also affected due to ward overcrowding, mixed age and mixed gender wards, as well as lack of space for provision of ambulatory services and to address the challenge of infection control issues. As such, KCH is to be redeveloped in three phases.

1.1.2 Phase 1 is the construction of a Decantation Building at the southern tip of KCH as well as Alterations and Additions (A&A) works to the existing buildings of KCH. Phase 1 has already commenced and expected to be completed in 2018/2019.

1.1.3 Phases 2 and 3 of KCH Redevelopment will involve demolition of all existing buildings and construction of a number of new hospital blocks at existing locations. A lift tower will also be constructed at Lai King Hill Road with link bridge connecting the new hospital block. Phases 2 and 3 works are expected to commence after completion of Phase 1 and the overall KCH redevelopment will tentatively be completed in 2024.

1.1.4 The Site falls mainly within the "Government, Institution or Community ("G/IC") Zone on the draft Kwai Chung Outline Zoning Plan No. S/KC/28 (the OZP). The redevelopment of KCH would be regarded as "Hospital". According to the Notes of the OZP, "Hospital" is under Column 1 of the "G/IC" and so the proposed redevelopment, i.e., hospital use, would always be permitted. However, the building height of Phases 2 and 3 will be approximately 125.1mPD, which will slightly exceed the maximum building height of 110mPD stipulated on the OZP. Therefore, an application for the minor relaxation of building height of Phases 2 and 3 (the Application Site) shall be made under Section 16 of the Town Planning Ordinance (TPB).

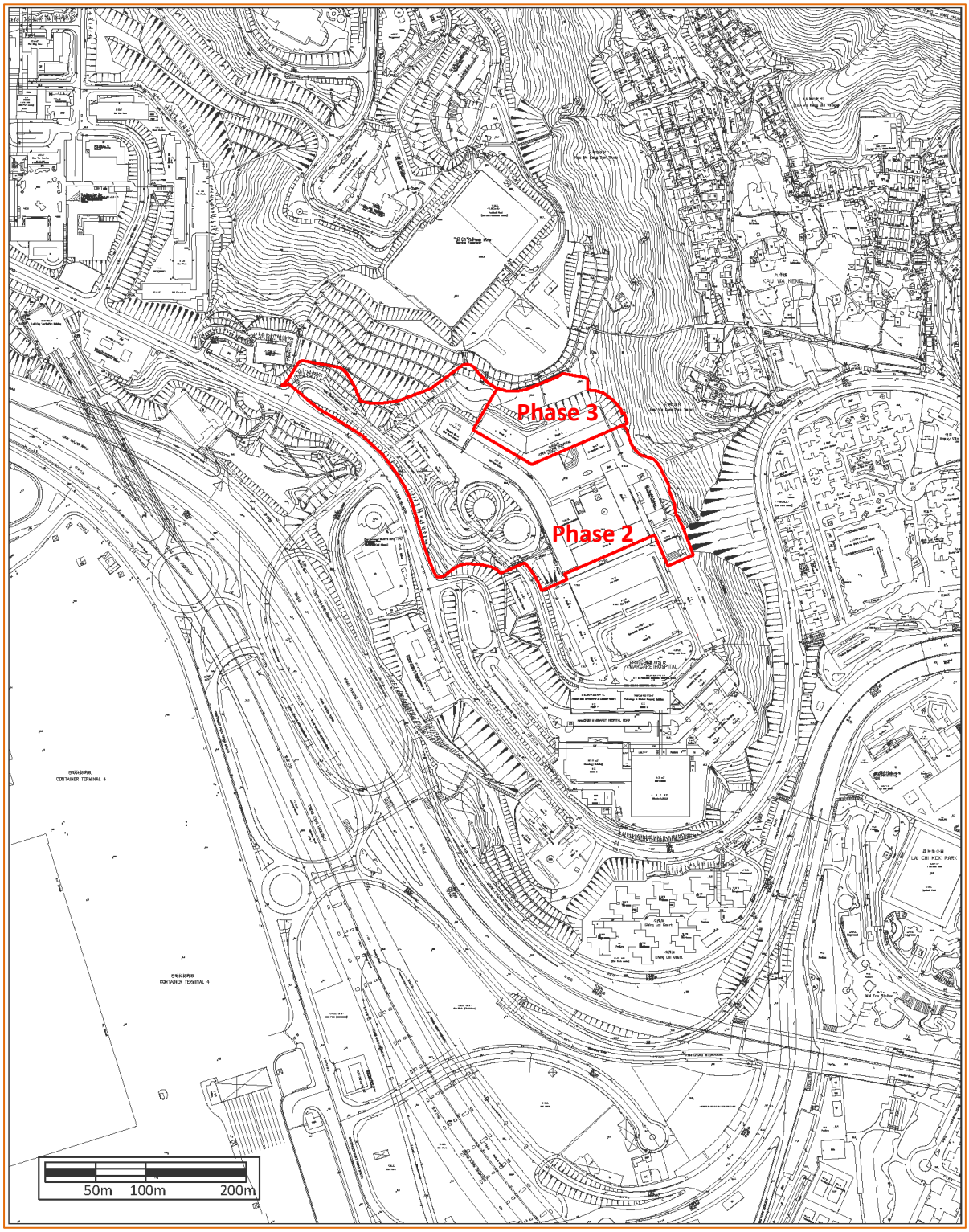
1.1.5 Urbis Limited in association with SMEC Asia Limited (SMEC) and the other consultants was commissioned in February 2017 by the Architectural Services Department (ArchSD), which is the Works Agent of HA to carry out the aforementioned Section 16 Planning Application for Phases 2 and 3.

1.1.6 This Initial Air Ventilation Assessment (AVA) Study, prepared by SMEC to support the planning application, has been carried out to assess air ventilation impacts associated with the proposed minor relaxation of building height.

1.2 Site Description

1.2.1 The Site of KCH occupies a total area of about 55,085m^2, with Phase 1 covering an area of about 5,850 m^2 and Phases 2 and 3 covering about 49,235m^2. The Site is located within the existing compound of KCH and Princess Margaret Hospital (PMH) and the boundary of each phases of redevelopment are shown on ***Figure 1-1***.

Figure 1-1 Site Location and Its Environs



1.2.2 The Site is bounded by an existing residential area (Ching Lai Court) to the south; Lai Chi Kok Bay Garden, Kei Chun Church Primary School, Nob Hill and Wah Lai Estate to the East; and Lai King Hill Road, PMH Nurses Training School and Kwai Chung Road to the West. The Site at an elevation that generally rises from 38mPD at the west to 72mPD at the east, in which the lowest elevation is 38mPD on the Kwai Chung Hospital Road at the west tip of the Site. There is an existing vehicular access to the Site from Lai King Hill Road via Kwai Chung Hospital Road, at the western end of the Site boundary.

1.3 Project Description

1.3.1 The S16 Application covers the minor relaxation of building height for Phases 2 and 3, and thus Phase 2 and 3 inclusive will be the Project Site Boundary where the air ventilation assessment will be based on.

1.3.2 The Base Scheme reflects the existing condition of Kwai Chung Hospital as shown in ***Figure 1-2***, and is used to compare with the Proposed Scheme. The existing Hospital is a bulk structure with varied building height, forming an enclosed building cluster. The building height under the Base Scheme is shown in ***Table 1-1***.

Table 1-1 Building Height Under Base Scheme

Components	Height (mPD)
Kitchen	67.4
Service block and Administrative Building	74.9
Block M and Block L	105.3
Block G and Block H	98.6
Multi-purpose Hall	71.7
Block D	59.6

1.3.3 The Proposed Scheme consists of a linked complex with a more open layout. The master block plan for the Proposed Scheme is shown in ***Figure 1-3***, with building height listed in ***Table 1-2***.

Table 1-2 Building Height Under Proposed Scheme

Components	Height (mPD)
Phase II	
Block F	97.1
Block C, Block D and Block E	119.6
Ward garden between Block C and Block D	110.0
Ward garden outside Block B and Block E	110.0
Ward garden outside Block F	87.5
Link bridge between Block E and Block F	74.0
Lift tower	92.3
Foot bridge between Block E and Lift tower	92.3
Carpark	64.0
Landscape area	68.3
Phase III	
Landscape area	68.5

Figure 1-2 Kwai Chung Hospital Redevelopment – Base Scheme

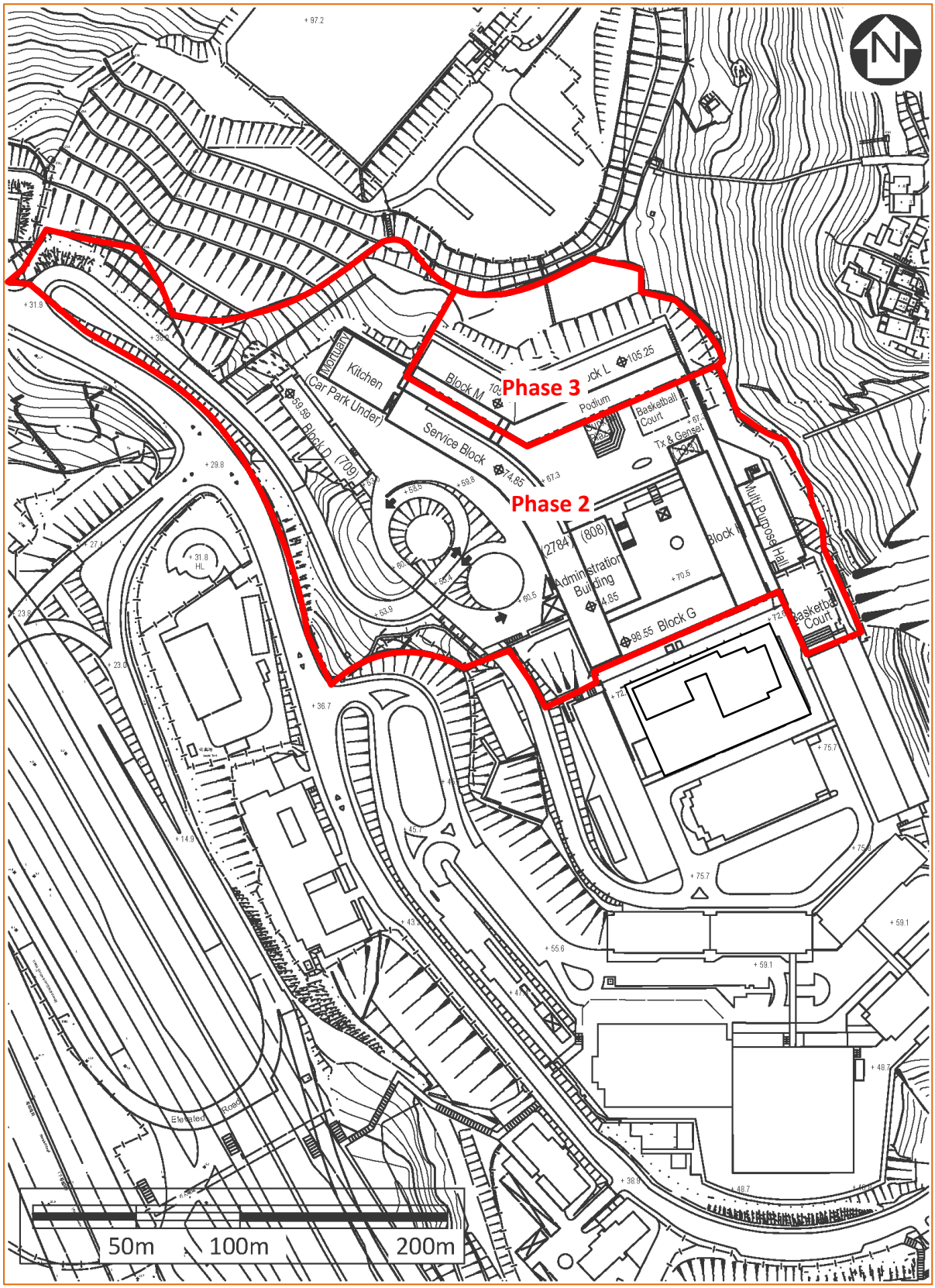
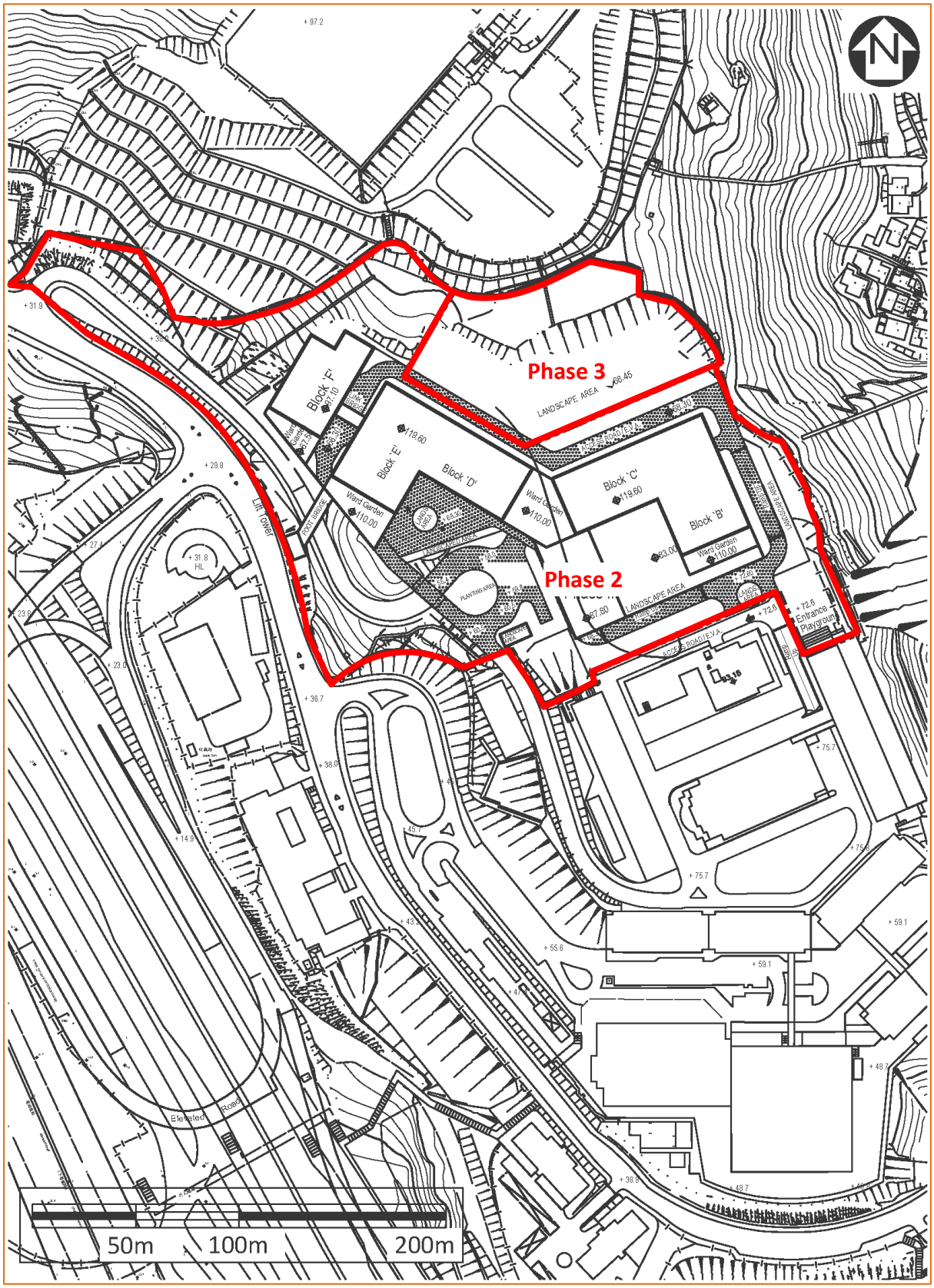


Figure 1-3 Kwai Chung Hospital Redevelopment – Proposed Scheme



1.3.4 The differences between the two Schemes are shown in ***Table 1-3*** and ***Figure 1-4***.

Table 1-3 Differences Between the Two Schemes

Base Scheme	Proposed Scheme
• Five building blocks in the area of Phase 2 and Phase 3 • Building separation distance of 2.9m between Kitchen Block and Service Block • A width of 3.4m between Phase 1 and Phase 2	• Two building blocks in the area of Phase 2, with removal of existing Block D and Multi-purpose Hall, and entire landscape area in Phase 3 • Building separation distance of 13.2m between Block E and Block F, with a link bridge on 1/F • A width of 18.4m access road between Phase 1 and Phase 2

1.3.5 A Computational Fluid Dynamics (CFD) analysis has been carried out for two Schemes:

1. **Base Scheme.** This considers the ventilation performance at the Site with the existing KCH in place.
2. **Proposed Scheme.** This considers the ventilation performance at the Site with the proposed design improvements to the Base Scheme.

1.4 Objectives

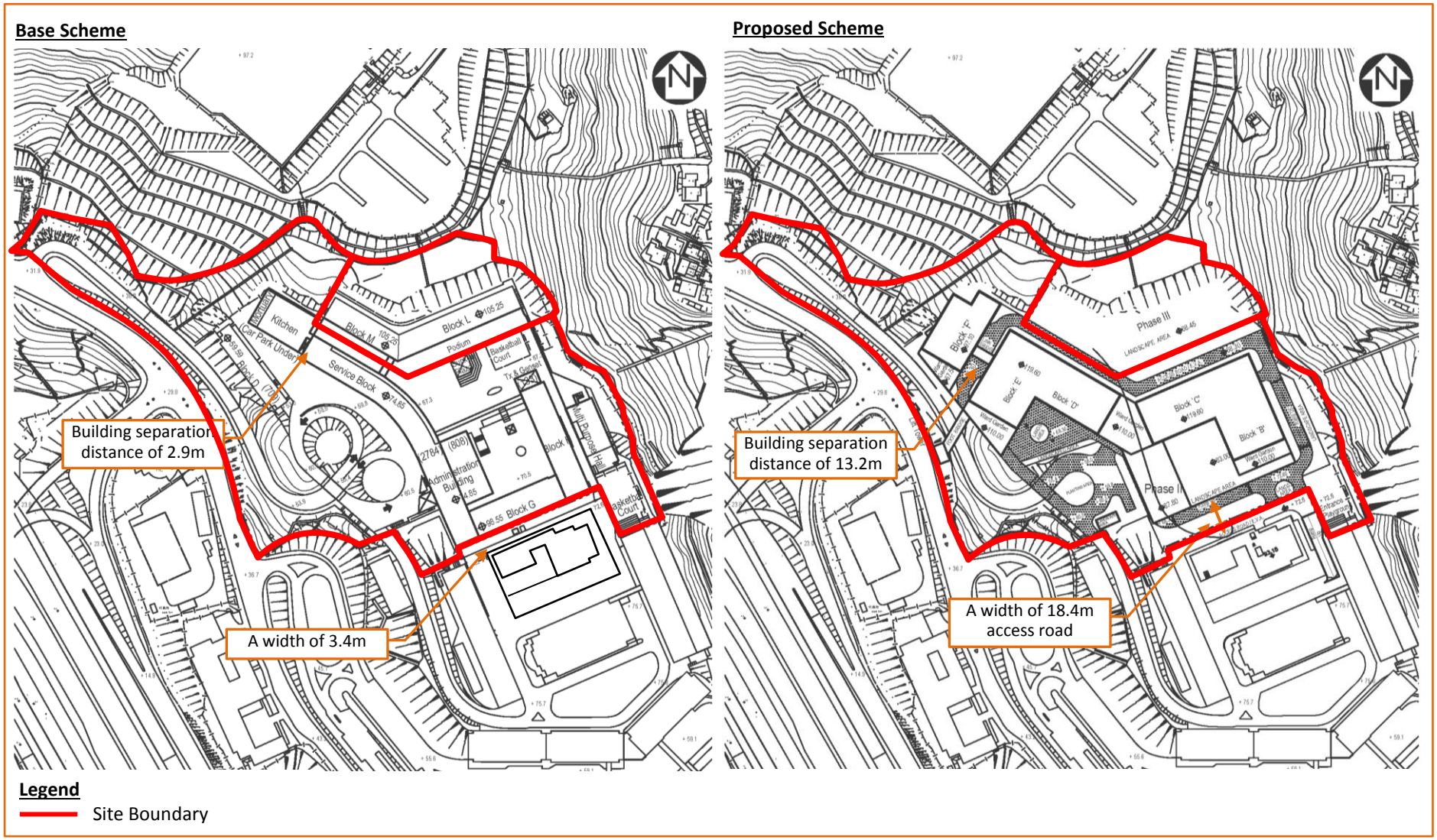
1.4.1 This Initial AVA Study assesses the potential impact on the surrounding wind environment due to the "Proposed Scheme" compared to the "Base Scheme". The AVA study follows the methodology for Initial AVA Study outlined in *Technical Circular No. 1/06 Annex A – Technical Guide for Air Ventilation Assessment for Developments in Hong Kong* published by Planning Department (PlanD).

1.4.2 The major objectives of this Initial AVA Study are to:

- Assess characteristics of the wind availability (V_∞) surrounding the Site.
- Give a general pattern of the proposed design and a quantitative estimates of wind performance at pedestrian levels (at street level) reported using Wind Velocity Ratio (VR).
- Identify the ventilation performance of the Proposed Scheme
- Demonstrate the proposed design improvements will not result in adverse ventilation performance
- Identify the ventilation performance of the Proposed Scheme and demonstrate that the proposed design improvements will not result in adverse ventilation performance when compared to the Base Scheme.

1.4.3 CFD Overall Weighted VR Contour Plots of Annual Prevailing Wind and Summer Prevailing Wind are presented in ***Appendix C***. The Overall Weighted VR Vector Plots are presented in ***Appendix D*** for reference.

Figure 1-4 Differences Between Base Scheme and Proposed Scheme



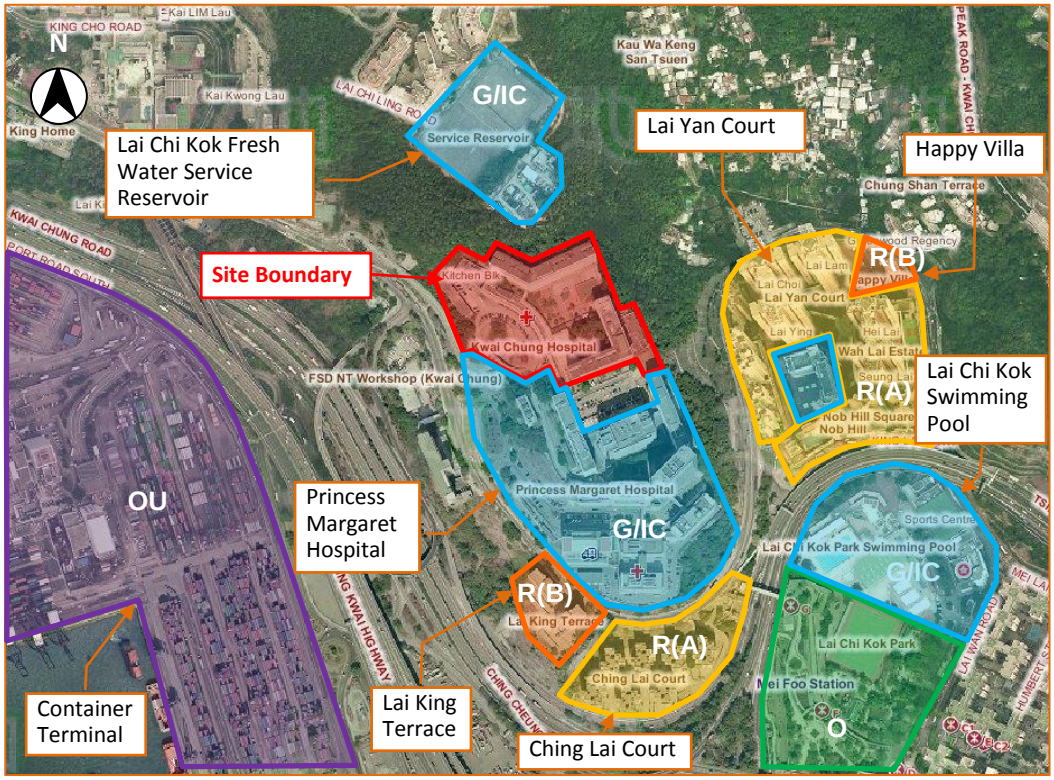
2 BACKGROUND

2.1 Site Characteristics

2.1.1 The Site is located in Kwai Chung, with a site area of 55,085 m^2. The site is currently zoned as "Government, Institution or Community (G/IC)" on the Draft Kwai Chung Outline Zoning Plan (OZP) No. OZP No. S/KC/28. The building height restriction for developments in the Site area is not more than 110 mPD as stipulated in the OZP.

2.1.2 The Project Site is located on a hill in Ha Kwai Chung of Kwai Chung Area. As illustrated in ***Figure 2-1***, to the north of the Site is the Lai Chi Kok Fresh Water Service Reservoir. Towards the east side is a cluster of residential developments, with relatively high building height, including Nob Hill Garden (118 mPD), Lai Yan Court (120 mPD), Happy Villa (75 to 77 mPD) and Wah Lai Estate (118 to 121 mPD). To the southeast, there are some low-rise developments namely Lai Chi Kok Swimming Pool (10 to 19 mPD), Mei Fu Station and some green areas. Then to the immediate south of the Site is Princess Margaret Hospital (51 to 124 mPD), while further south are more mid-rise residential developments such as Ching Lai Court (58 mPD). To the west is Princess Margaret Hospital Nurses Training School and Quarters (85 mPD), with elevated highways, roads and Container Terminal 4. The building heights of the abovementioned neighbouring developments are shown in ***Table 2-1***.

Figure 2-1 Site Location and its Environs



Source: GeoInfo Map, HKSAR Lands Department

Table 2-1 Building Height of Existing Neighbouring Developments

Name of Building	Building Height (mPD)	Location from Project Site
Chung Shan Terrace	32-50	East
Lai Yan Court	120	East
Happy Villa	75-77	East
Wah Lai Estate	118-121	East
Nob Hill	118	East
Lai Chi Kok Bay Garden	60-89	East
Lai Chi Kok Swimming Pool	10-19	Southeast
Lai Chi Kok Park Sports Centre	18	Southeast
Lai Chi Kok Public Library	24	Southeast
Lai Chi Kok Park	8	Southeast
West Rail Mei Foo Station	9	Southeast
Princess Margaret Hospital	51-124	South
Ching Lai Court	58	South
Lai King Terrace	67-70	South
Princess Margaret Hospital Nurses Training School and Quarters	85	West

3 EXPERT EVALUATION

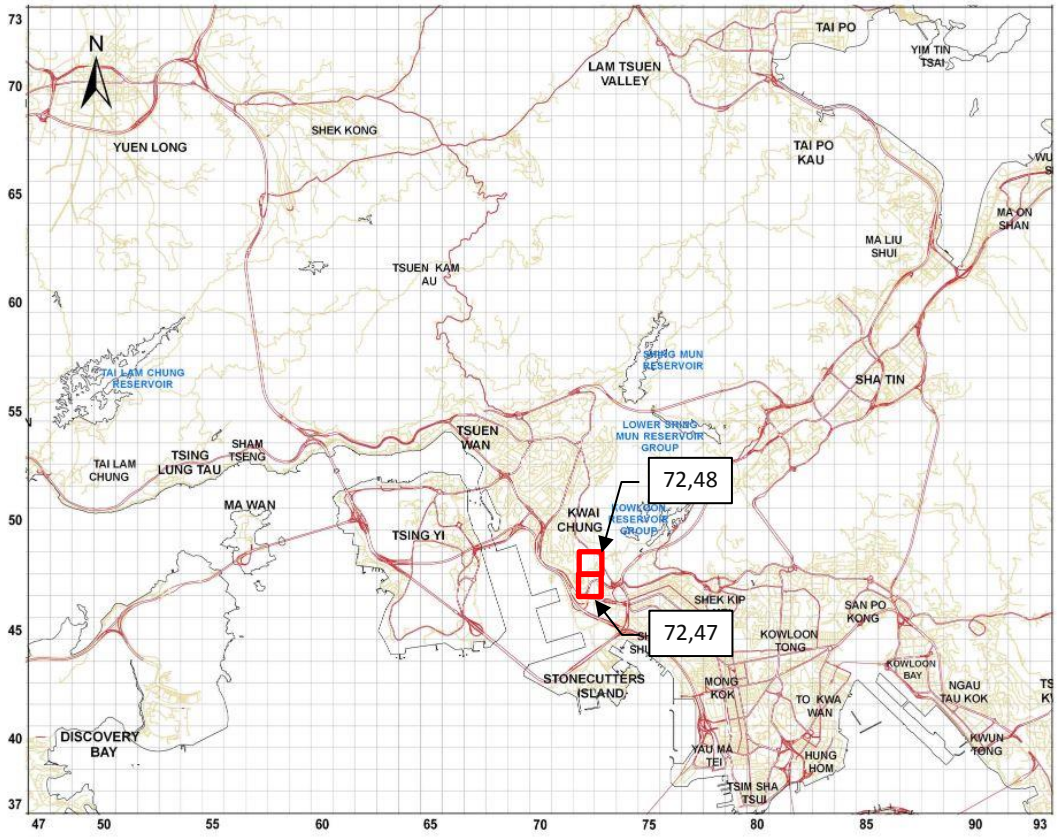
3.1 Wind Availability

3.1.1 Wind availability is essential to investigate the wind ventilation performance of the Study Area. Two sources of site wind data for this Study Area, including the simulated Regional Atmospheric Model System (RAMS) data released by PlanD and measured data from Hong Kong Observatory (HKO).

RAMS – by PlanD

3.1.2 For the Study Area, while the Project Site has covered Grid (72,48) and Grid (72,47) as indicated in ***Figure 3-1***, the majority of the Site lies on Grid (72,48). The wind data from this grid is therefore considered to be representative for the whole Site area. As such, this AVA will be based on the wind data from Grid (72,48) only.

Figure 3-1 RAMS Map Identifying the Site in Grid (72,48) and (72,47)

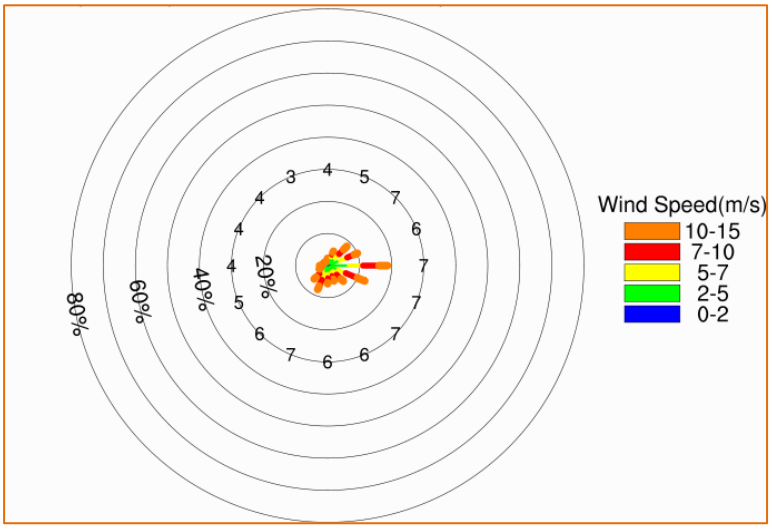


Source: RAMS Data http://www.pland.gov.hk/pland_en/info_serv/site_wind/site_wind/domain_f.html

Annual Wind Analysis

3.1.3 The RAMS Wind Roses for Grid (72,48) is shown on ***Figure 3-2***, presenting the frequency of annual wind speed and directions at the Site.

Figure 3-2 RAMS Annual Wind Rose at 500m for Grid (72,48)



3.1.4 The frequency of occurrence of wind from 16 directions is shown in ***Table 3-1***, which highlights the eight wind directions (E, ESE, ENE, NW, SSW, SE, SW and S) that cumulatively exceed the 75% frequency specified in the *Technical Guide* (actually, 77.9%) and thereby represent the annual prevailing winds.

Table 3-1 Annual Wind Availability Data from RAMS Grid (72,48)

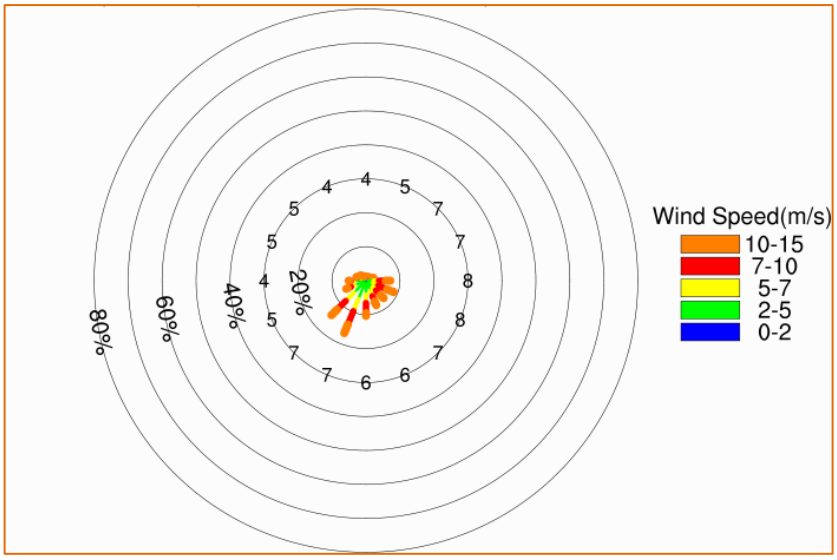
Wind Direction	Wind Speed at Elevation of 596m (m/s)	Frequency of Occurrence	
E	6.43	19.1%	77.9%
ESE	6.99	12.9%	
ENE	6.00	10.3%	
NE	6.57	8.7%	
SSW	6.61	8.1%	
SE	6.21	7.0%	
SW	6.38	6.0%	
S	5.04	5.8%	
SSE	5.64	5.2%	
NNE	5.15	5.0%	
WSW	4.29	2.8%	
W	3.20	2.5%	
N	3.11	2.3%	
WNW	3.53	1.5%	
NW	3.54	1.4%	
NNW	3.12	1.3%	

3.1.5 The occurrence of wind from eastern quadrant (E, ESE and ENE) directions comprise 42.3% of the annual wind direction in the Grid (72,48) and are therefore considered to be the most predominant winds in the Site area.

Summer Wind Analysis

3.1.6 The RAMS Wind Roses for Grid (72,48) is shown on ***Figure 3-3***, presenting the frequency of summer wind speed and directions at the Site.

Figure 3-3 RAMS Summer Wind Rose at 500m for Grid (72,48)



3.1.7 The frequency of occurrence of summer wind from 16 directions is shown in ***Table 3-2***, which highlights the eight wind directions (SSW, SW, S, ESE, SSE, SE, E and WSW) that cumulatively exceed the 75% frequency specified in the Technical Guide (actually, 81.2%) and thereby represent the summer prevailing winds.

Table 3-2 Summer Wind Availability Data from RAMS Grid (72,48)

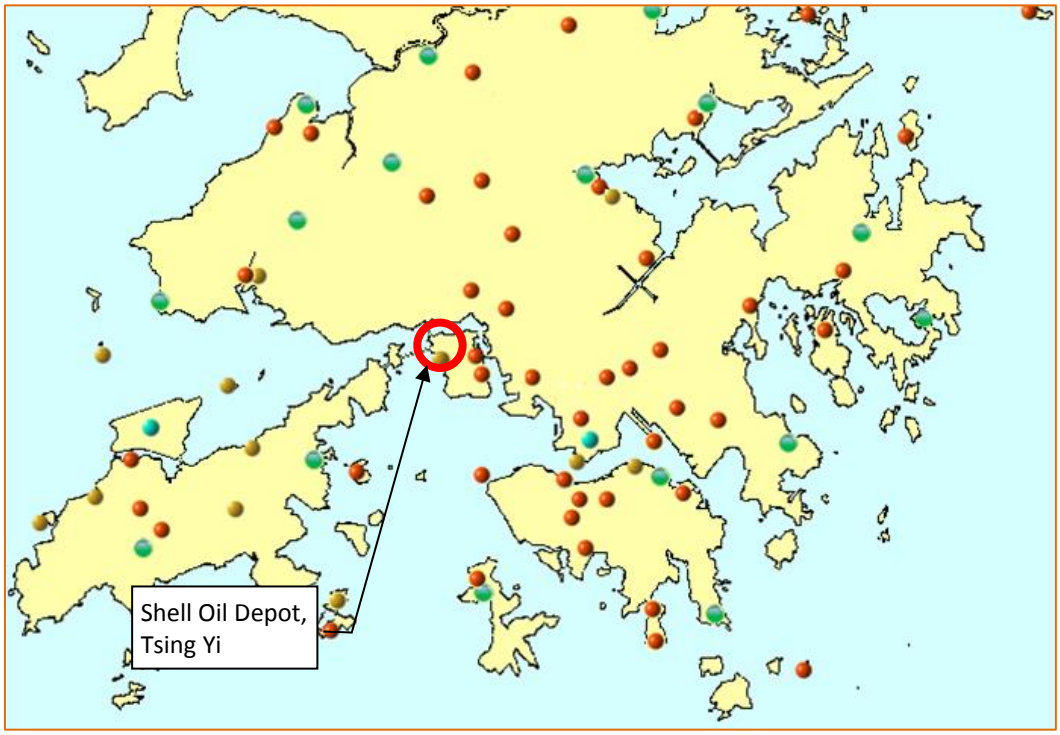
Wind Direction	Wind Speed at Elevation of 596m (m/s)	Frequency of Occurrence	
SSW	6.60	17.0%	81.2%
SW	6.59	14.6%	
S	6.54	10.7%	
ESE	7.93	9.5%	
SSE	6.16	7.9%	
SE	6.72	7.6%	
E	7.09	7.6%	
WSW	4.95	6.3%	
W	4.04	5.1%	
WNW	4.03	3.0%	
ENE	5.82	2.5%	
NW	5.14	2.2%	
NE	3.50	1.6%	
NNW	4.03	1.5%	
NNE	2.38	1.3%	
N	2.88	1.2%	

3.1.8 The occurrence of wind from southwestern quadrant (SSW, SW and S) directions comprise 42.3% of the summer wind direction in the Grid (72,48) and are therefore considered to be the most predominant winds in the Site area.

Climatological information Services – HKO

3.1.9 Other than RAMS data, reference has been made to the nearest Hong Kong Observatory (HKO) weather station with wind measurement at Shell Oil Depot, Tsing Yi, the location of which is shown in ***Figure 3-4***.

Figure 3-4 Location of the Nearest Weather Station with Wind Measurement to Site



3.1.10 The annual and monthly wind roses measured at from the Shell Oil Deport Weather Station from 1998 to 2016 are presented in ***Figure 3-5***. It clearly measures and represents the wind condition at the nearby area, including the subject site. As analysed by the wind roses, wind from the ESE direction is the most dominant throughout the year, capturing over 30% of the time. In the majority, annual winds are mainly dominated by the easterly winds, similar to the results obtained from the RAMS data.

3.1.11 Monthly wind roses at the Shell Oil Depot, Tsing Yi Weather Station from 1998 to 2016 are shown in ***Figure 3-6***. Summer wind is represented by the wind roses from June to August. As observed in the wind roses, summer winds are mainly dominated by the SE winds, together accounting over 50% of the summer time. In the majority, summer winds are mainly dominated by the southerly winds, similar to the results obtained from the RAMS data.

Figure 3-5 Annual Wind Rose Measured at Shell Oil Depot, Tsing Yi Weather Station (1998-2016)

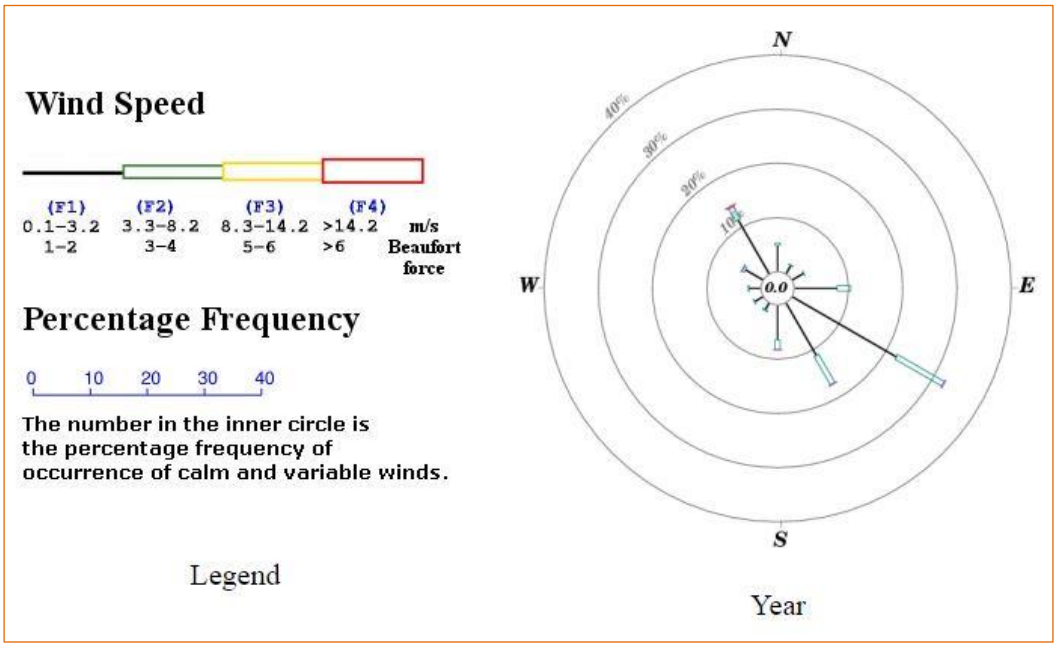
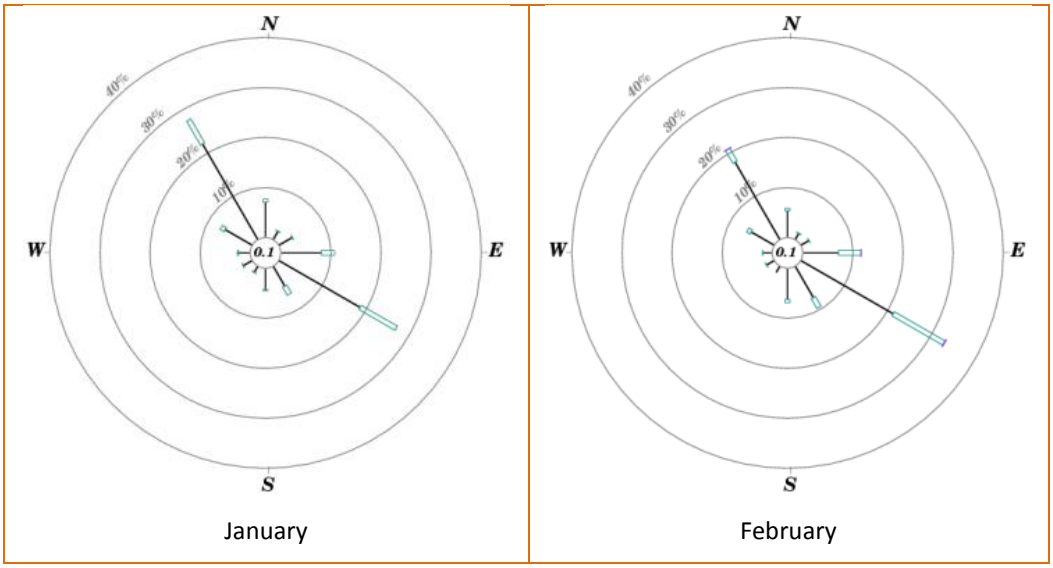
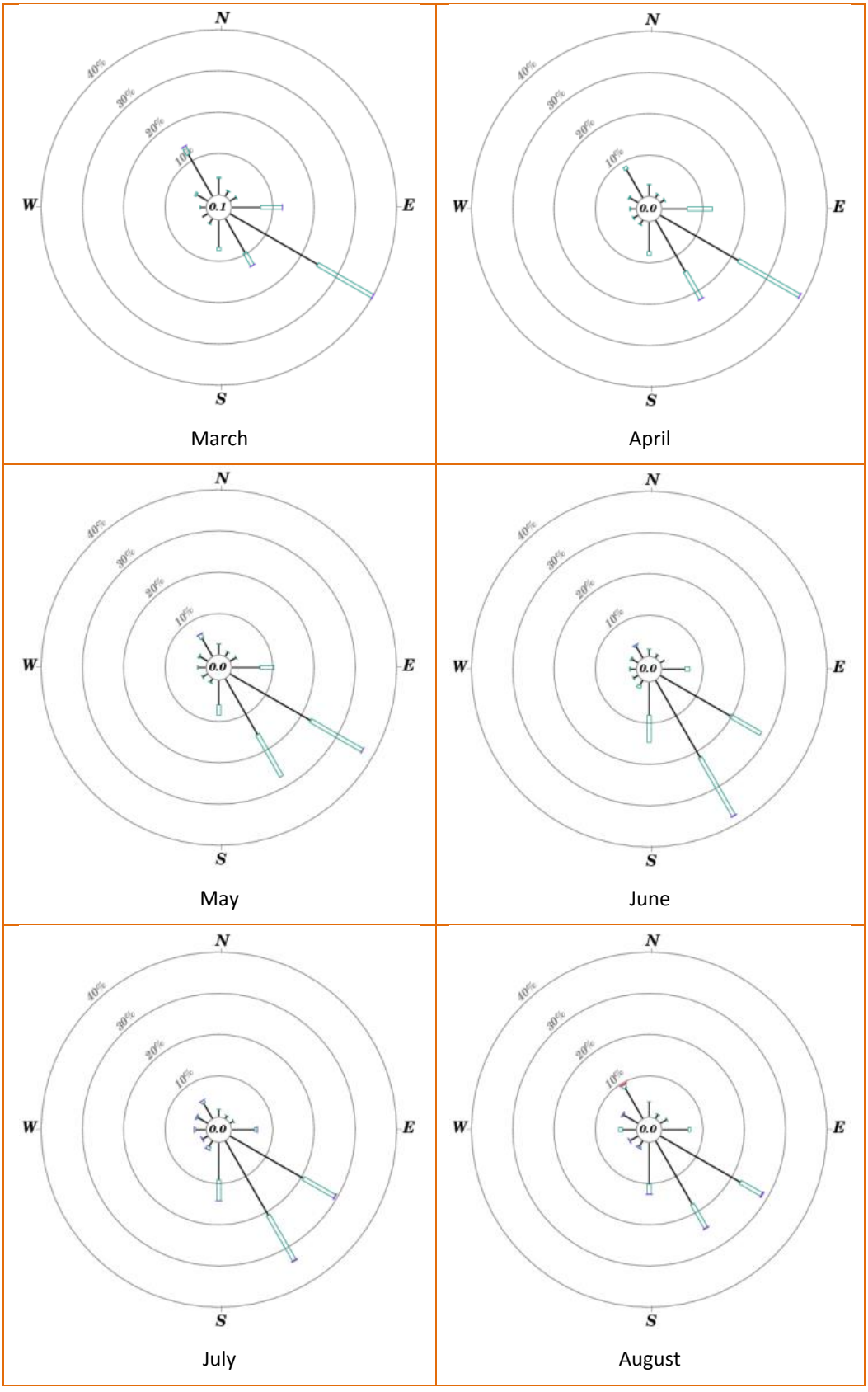


Figure 3-6 Monthly Wind Roses Measured at Shell Oil Depot, Tsing Yi Weather Station (1998-2016)




N
W
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S
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July
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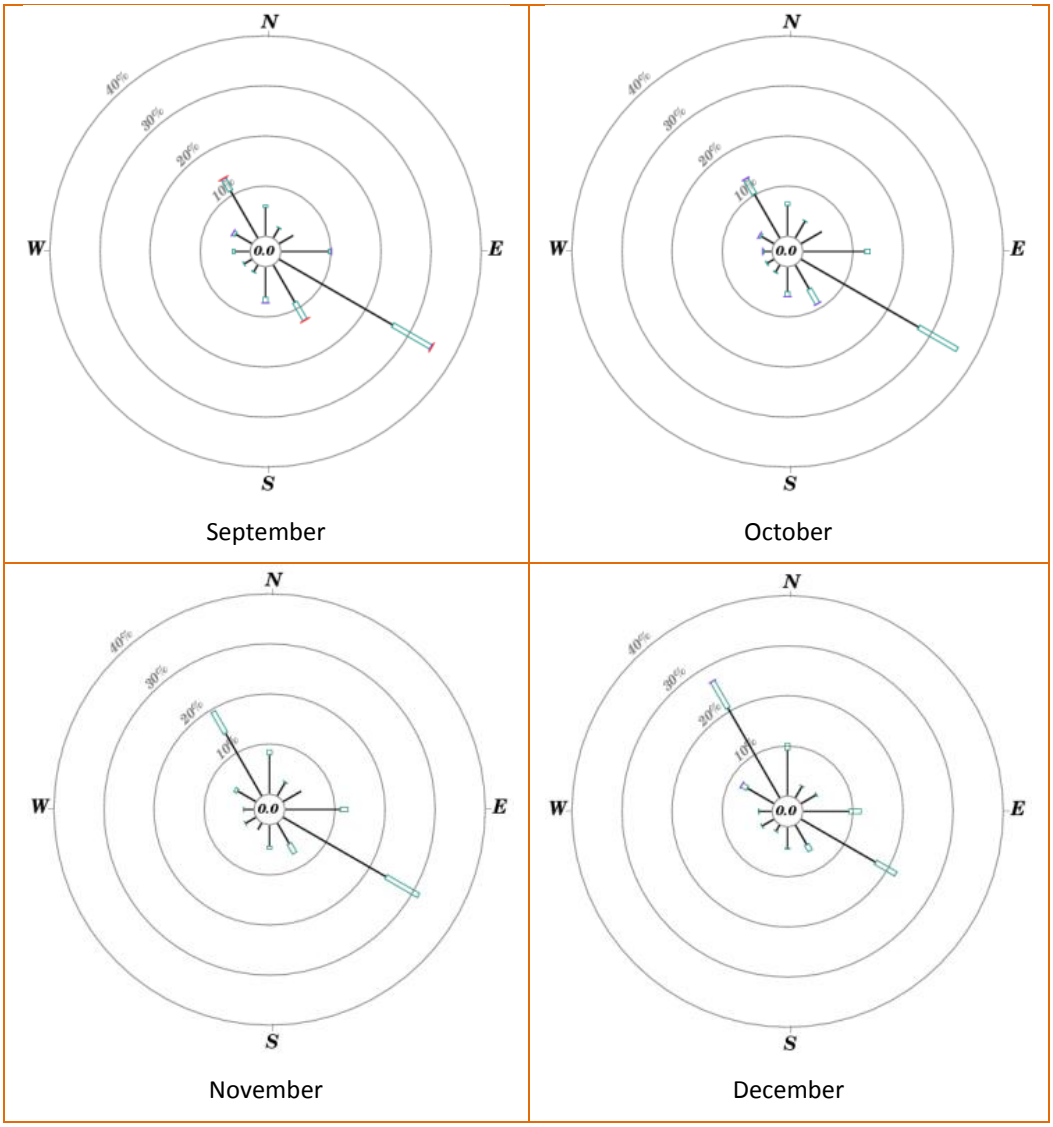
August



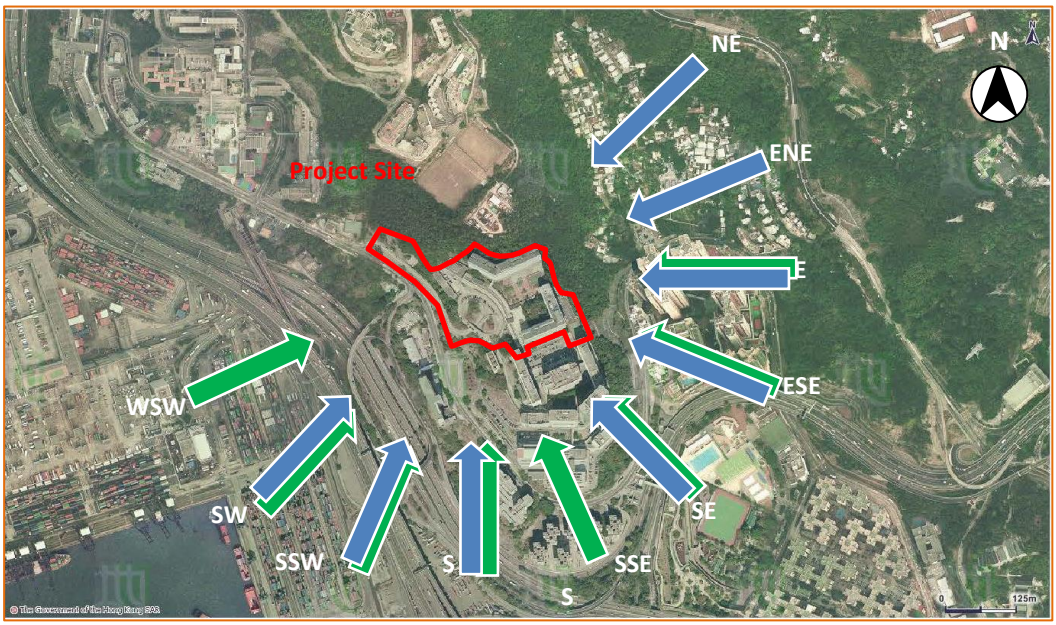
September | October

November | December

3.2 Wind Environment of Existing Condition

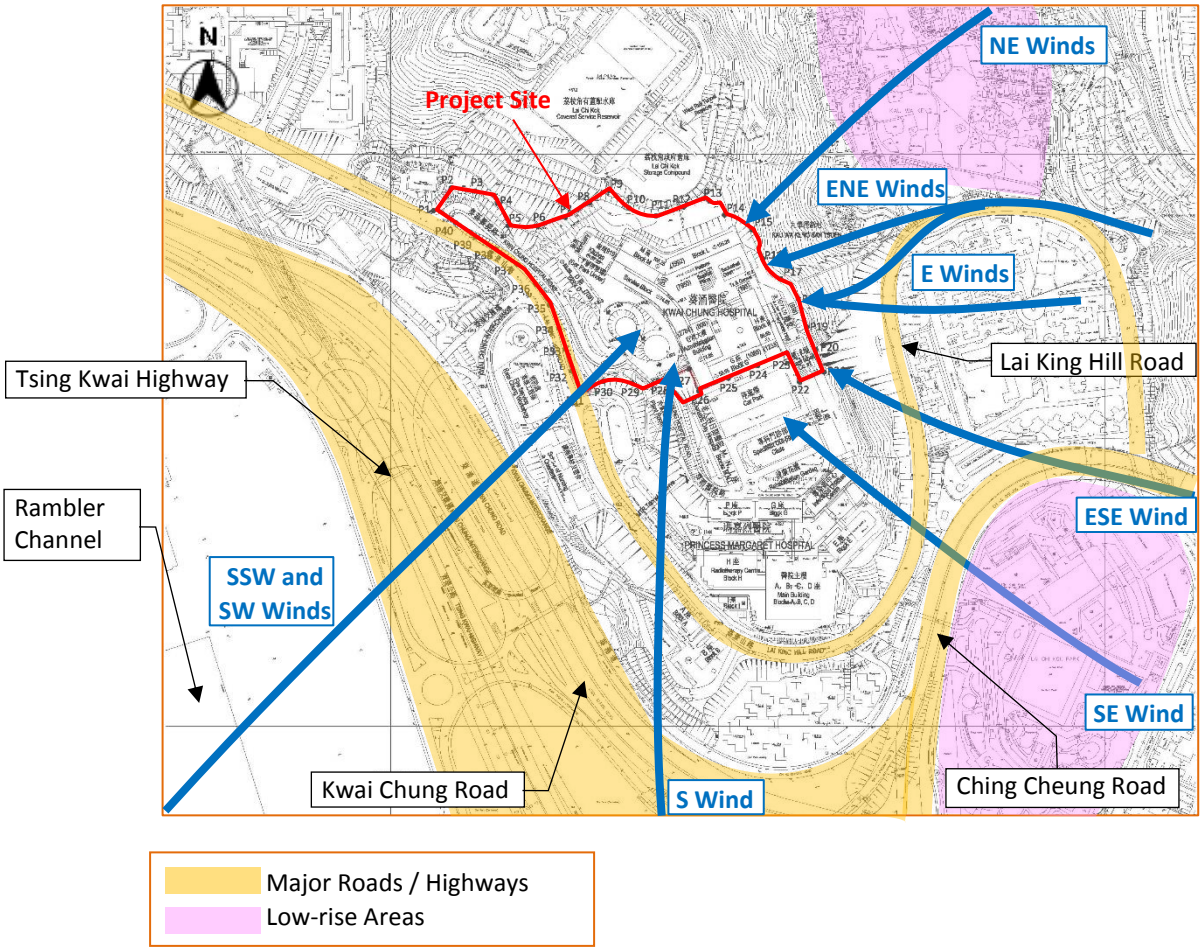
3.2.1 Based on the site wind availability information discussed above, the Site and the areas in proximity rely on E, ESE, ENE, NE, SSW, SE, SW and S winds for ventilation during the year. The summer prevailing wind comes from SSW, SW, S, ESE, SSE, SE, E and WSW directions. Therefore, any blockage of these prevailing winds, identified in ***Figure 3-7***, should be avoided.

Figure 3-7 Annual and Summer Prevailing Wind Directions



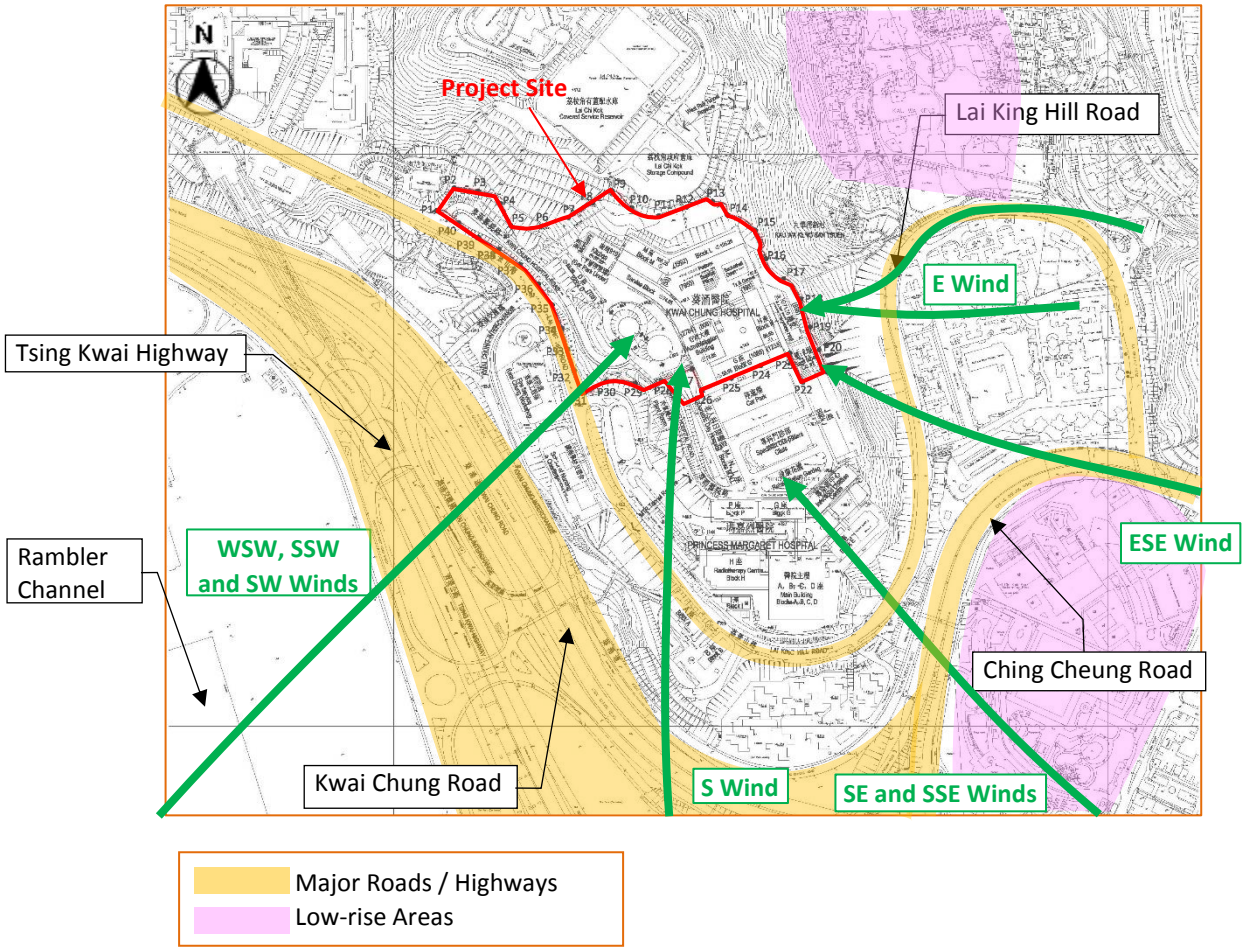
3.2.2 The wind corridors under prevailing annual wind conditions are marked in ***Figure 3-8***, which enhance and promote ventilation performance surrounding the Study Area. Considering the site locating on a hilly terrain, winds from prevailing directions will reach the site rather easily in a sense that fewer blockage exists at the elevation, compared to a site on a flat area. The NE wind is able to skim over the low-rise development in Kau Wa Keng, and glide along the open space and slope to the north-east of the site. The ENE and E winds are brought by Lai King Hill Road where the ENE wind arrive the site by skimming over the open space without any obstructions. Part of the E wind will continue to follow Lai King Hill Road and reach the Site at a southern position through the slope, while part of the E wind will penetrate through the building separation between Wah Fung Garden and Lai Chi Kok Bay Garden. The ESE wind travels along Ching Cheung Road whereas the SE wind will skim over the low-rise area in Lai Chi Kok Swimming Pool and Mei Foo Station. Yet the SE wind will be blocked by the Princess Margret Hospital, which impedes the wind performance at this direction. The S wind will skim over the highway network in the south and reach the Site by flowing along the west side of Princess Margret Hospital. For the SSW and SW winds, they are able to pass through the Rambler Channel, Container Terminal and the highway network of Tsing Kwai Highway and Kwai Chung Road.

Figure 3-8 Major Wind Corridors Surrounding the Site at Annual Condition



3.2.3 The wind corridors under prevailing annual wind conditions are marked in ***Figure 3-9***. The wind performance under summer prevailing wind would be essentially the same as that for annual condition, except for the SSE and WSW winds that only prevail in summer time. The SSE summer wind would have a similar effect with SE wind, which will skim over the low-rise area in Lai Chi Kok Swimming Pool and Mei Foo Station, meanwhile being blocked by the Princess Margret Hospital. For WSW summer wind, The WSW wind would have a comparable effect with SW and SSW winds, which passes through Rambler Channel and the Container Terminal and then skim over the low-elevated highway network of Tsing Kwai Highway and Kwai Chung Road to arrive the south-western part of the Site.

Figure 3-9 Major Wind Corridors Surrounding the Site at Summer Condition



3.2.4 The existing residential developments located at the east of the Site will likely create blockage and weaken the incoming prevailing wind from the east direction. Nevertheless, Lai King Hill Road and the building separation are still able to bring along the easterlies toward the Site.

3.2.5 The number of roads and highways surrounding the Site area provides abundant wind availability. Winds from multiple directions are able to travel along the roads as wind tunnels and facilitate the ventilation performance of the Site area. Since the Site is located on relatively hilly terrain, the prevailing wind could arrive the Site freely. The openness of the Site area in the west results in minimal blockage of westerlies and this may allow the reattachment of wind at pedestrian level. In spite of that, Princess Margaret Hospital situating to the south of the Site has blocked the southerlies and it impedes the wind movement at the South direction.

3.2.6 The pedestrian level ventilation performance in the close proximity of the Site, including the areas within the Site that are accessible to pedestrian, will depend on the building design and layout of the Proposed Scheme. Such analysis provides an assessment of the air ventilation performance to the Site as a whole.

4 ASSESSMENT METHODOLOGY

4.1 Project Assessment and Surrounding Areas

4.1.1 In considering site coverage, the Assessment Area evaluating the immediate effects to the development has covered a perpendicular distance of 125m from the Site boundary (1H, H being the tallest building on site). The Surrounding Area has therefore been set as twice the perpendicular distance for the Assessment Area, equivalent to 250m from the Site (2H). Such selection of Surrounding Area gives a reasonable and representative context to the Assessment Area.

4.2 Test Points

Perimeter Test Points

4.2.1 Perimeter Test Points are positioned on the project site boundary to assess the effect of the Project on the Assessment Area. With reference to the *Technical Guide*, 30 -50 no. Perimeter Test Points should be used. In this case, 40 perimeter test points have been selected along the perimeter of the site, as shown in ***Figure 4-1***. Each point is 20m to 35m centre to centre. The Site Boundary, with Phase 2 and 3 inclusive, is used to set the perimeter test point as it is able to demonstrate a more comprehensive assessment as a whole.

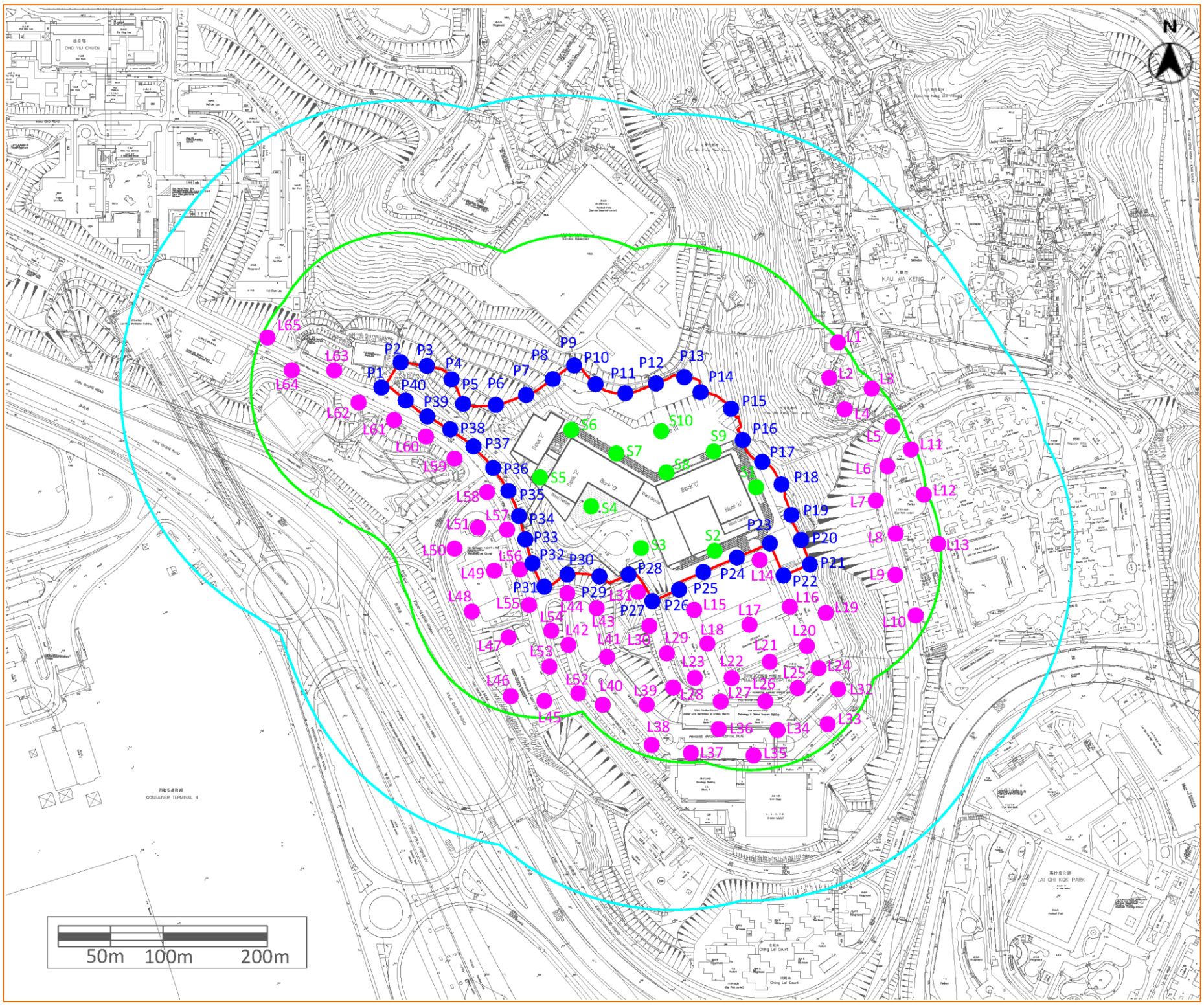
Overall Test Points

4.2.2 Overall Test Points are evenly distributed and positioned at open spaces, on streets and at other places where pedestrians frequently access. With reference to the *Technical Guide,* around 50 to 80 no. Overall Test Points are required. In this case, 65 no. Overall Test Points have been selected, as shown in ***Figure 4-1***.

Special Test Points

4.2.3 With reference to the *Technical Guide*, Special Test Points may be used to provide additional information to assessment the air ventilation performance. As shown in ***Figure 4-1***, 10 no. Special Test Points have been selected within the Site under Proposed Scheme at open spaces and at wind enhancement features areas to evaluate the ventilation performance at these areas.

Figure 4-1 Test Points for this Assessment



Key

- Project Site Boundary
- Assessment Area = 1H = 125m
- Surrounding Area = 2H = 250m
- Perimeter Test Points (P1 – P40)
- Overall Test Points (L1 – L65)
- Special Test Points (S1 – S10)

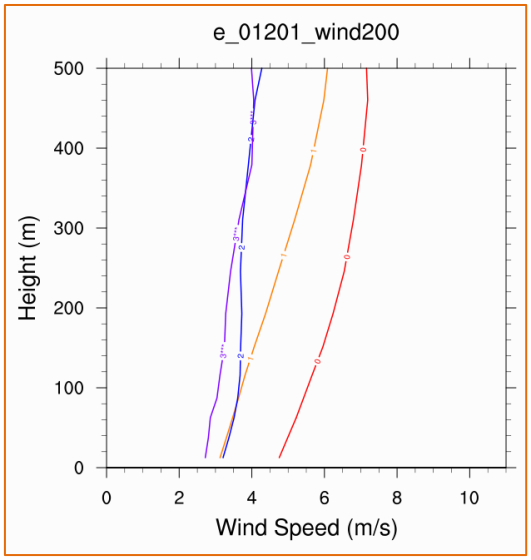
4.3 Assessment Parameters

Wind Profile

4.3.1 The Proposed Redevelopment covers both Grid (72,48) and Grid (72,47), but the majority of the Site lies on Grid (72,48). Therefore, the wind profile of different wind directions is provided for this Grid.

4.3.2 As shown in ***Figure 4-2***, the red colour wind profile ("0") represents wind direction at 22.5˚ to 112.4˚; the orange colour wind profile ("1") represents wind direction at 112.5˚ to 202.4˚; the blue colour wind profile ("2") represents wind direction at 202.5˚ to 292.4˚; the purple colour wind profile represents wind direction at 292.5˚ to 22.4˚.

Figure 4-2 Wind Profile at RAMS Data Grid (72,48)



Site Spatial Average Velocity (SVR) and Local Spatial Average Velocity (LVR)

4.3.3 Site Spatial Average Velocity Ratio (SVR) is used to evaluate how the Proposed Redevelopment impacts the wind environment in the immediate vicinity. The SVR is the average of VR values of all Perimeter Test Points.

4.3.4 Local Spatial Average Velocity Ratio (LVR) is used to evaluate the development impacts the wind environment in the local area. The LVR is the average of all Perimeter Test Points and Overall Test Points.

4.4 Assessment Methodology and Assumptions

Geometry and Domain Setting

4.4.1 CFD simulation software ANSYS FLUENT was used to calculate the wind speed around the two schemes and surrounding area. This includes noise barriers, elevated structures, planned and committed developments. The 3-dimensional models for the two Schemes are illustrated in ***Figure 4-3*** to ***Figure 4-10***.

Figure 4-3 3D Model for the Base Scheme

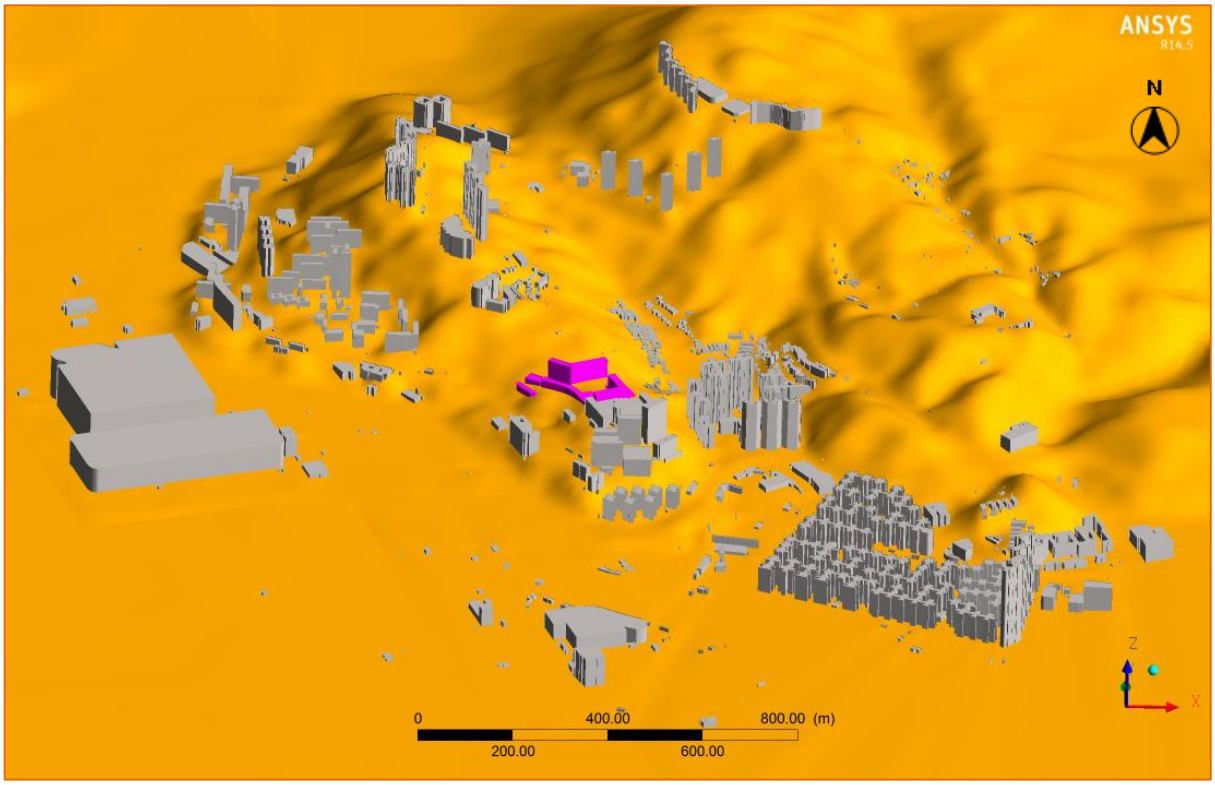


Figure 4-4 3D Model for the Base Scheme

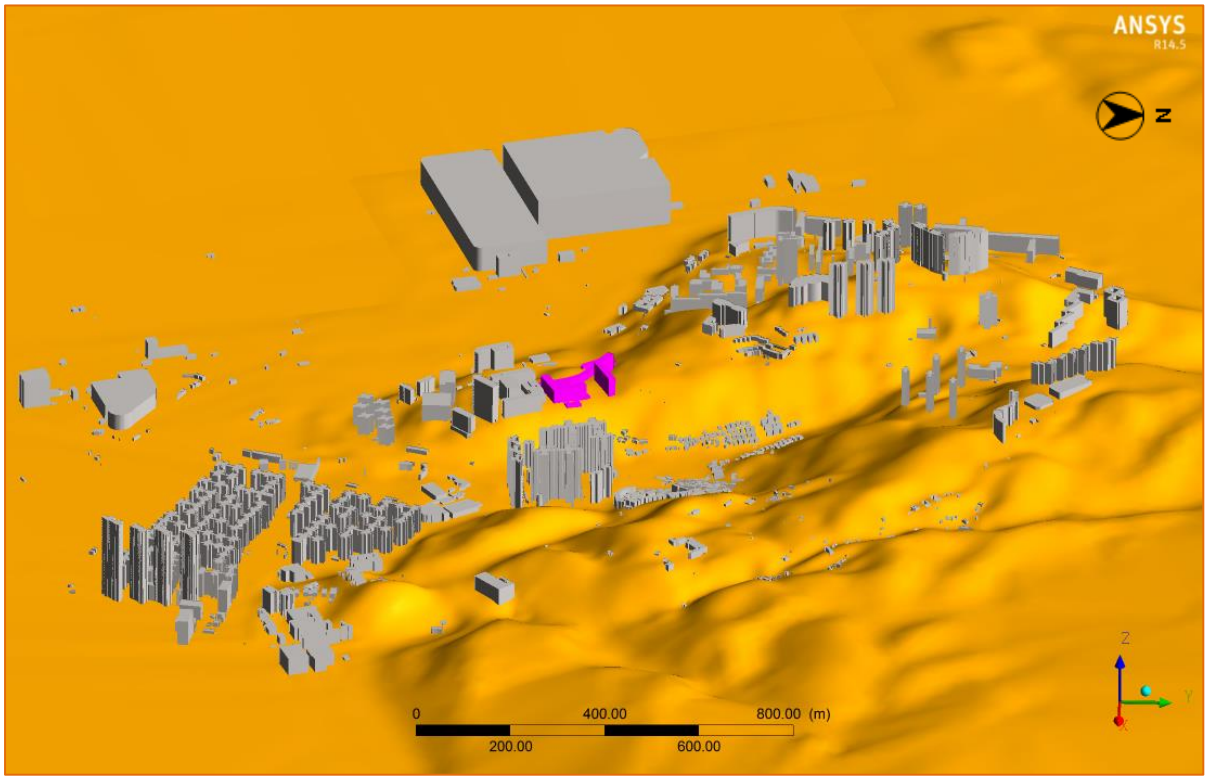


Figure 4-5 3D Model for the Base Scheme

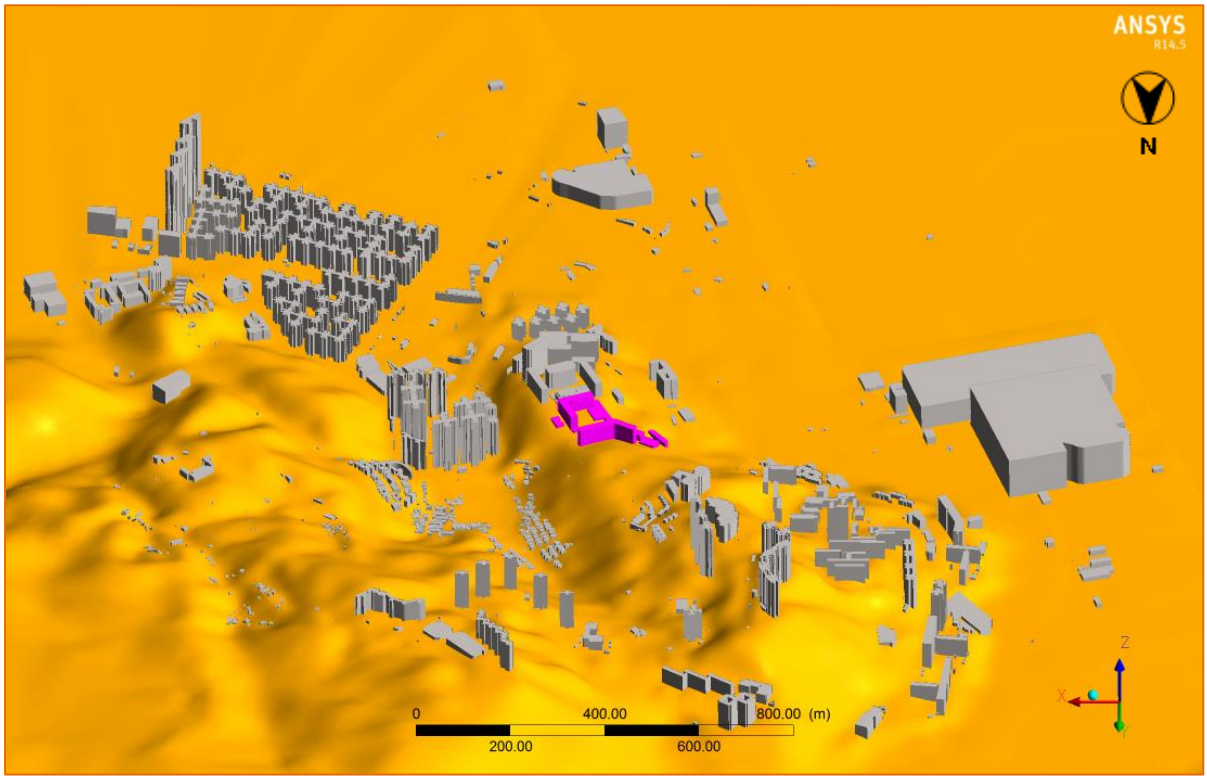


Figure 4-6 3D Model for the Base Scheme

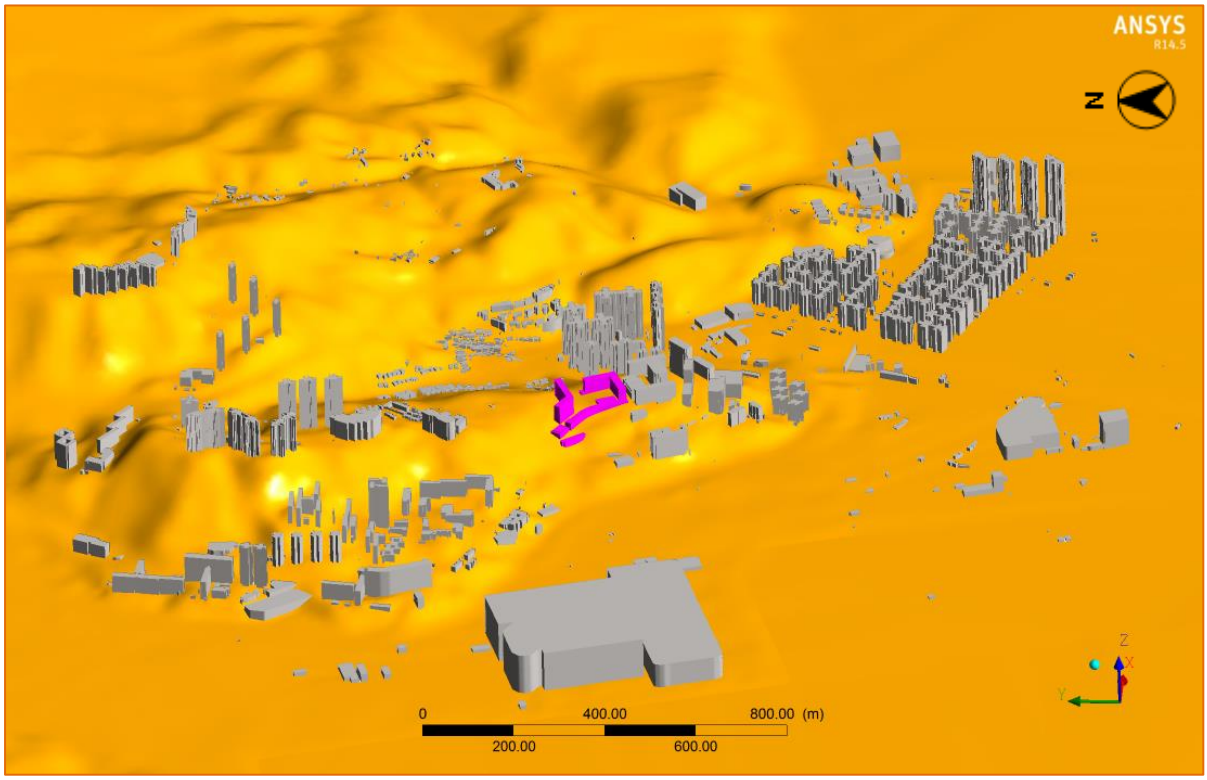


Figure 4-7 3D Model for the Proposed Scheme

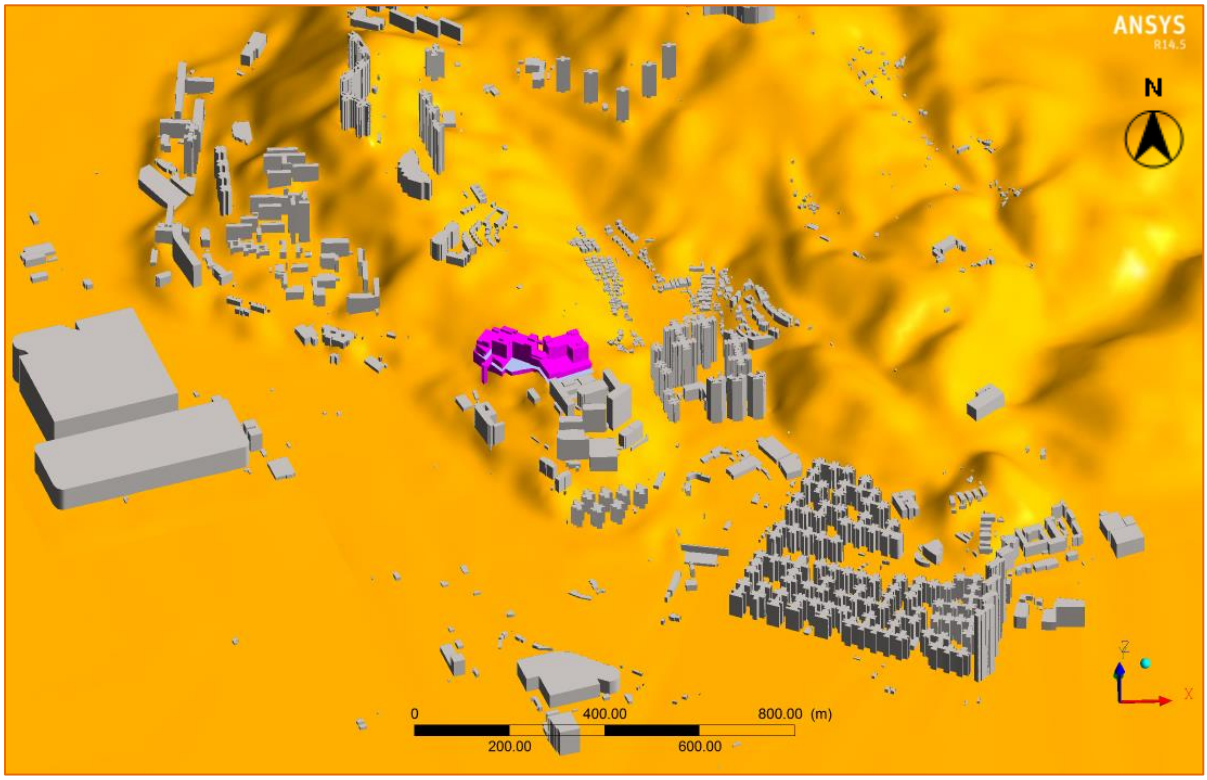


Figure 4-8 3D Model for the Proposed Scheme

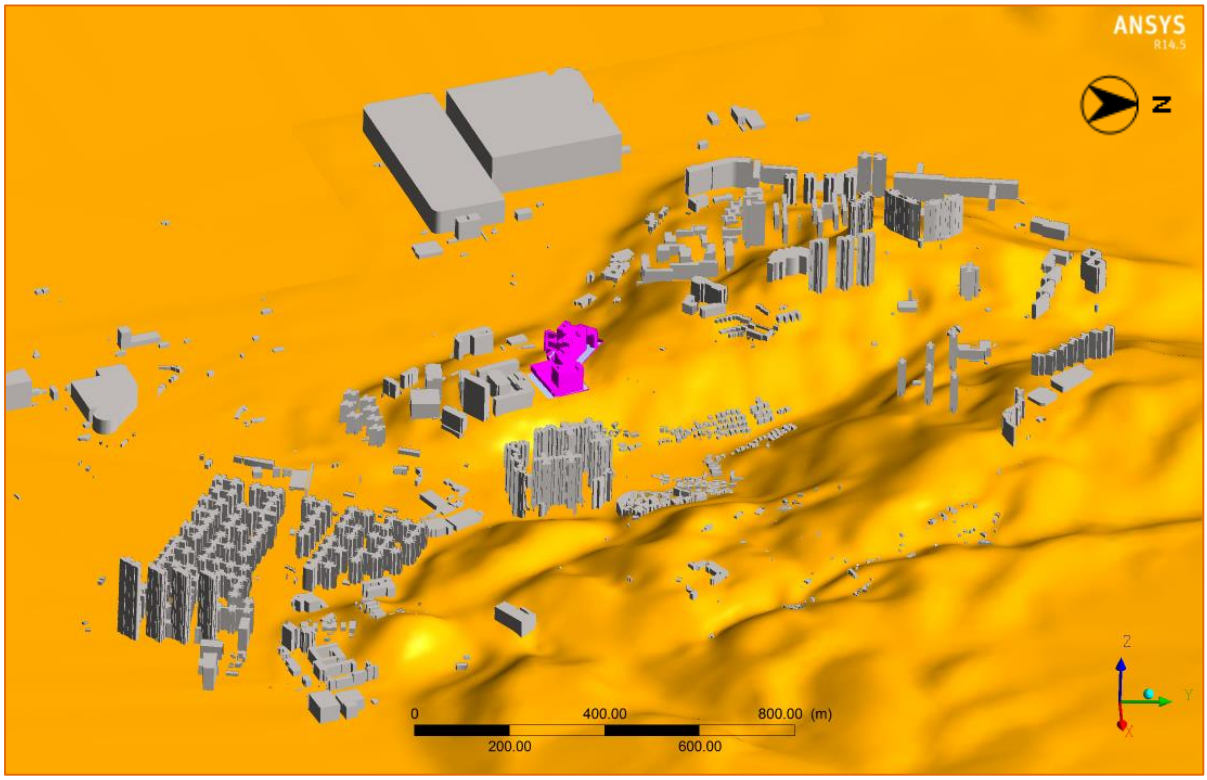


Figure 4-9 3D Model for the Proposed Scheme

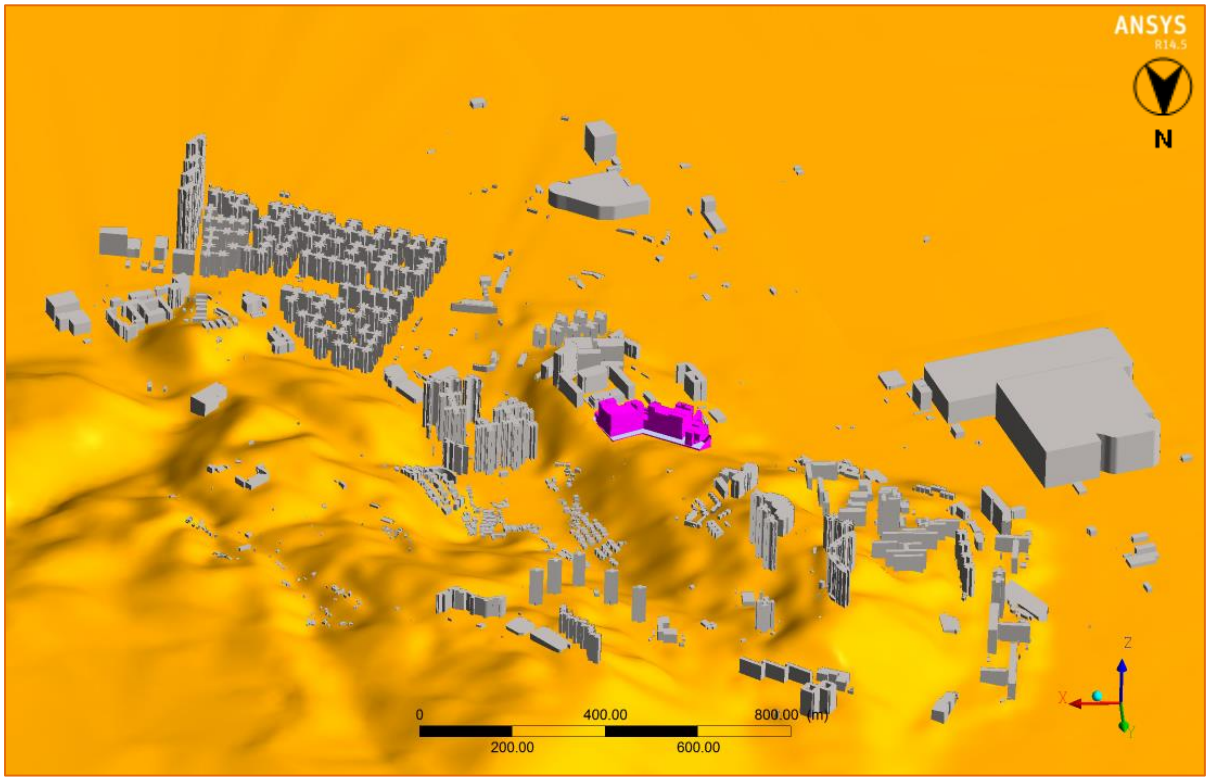
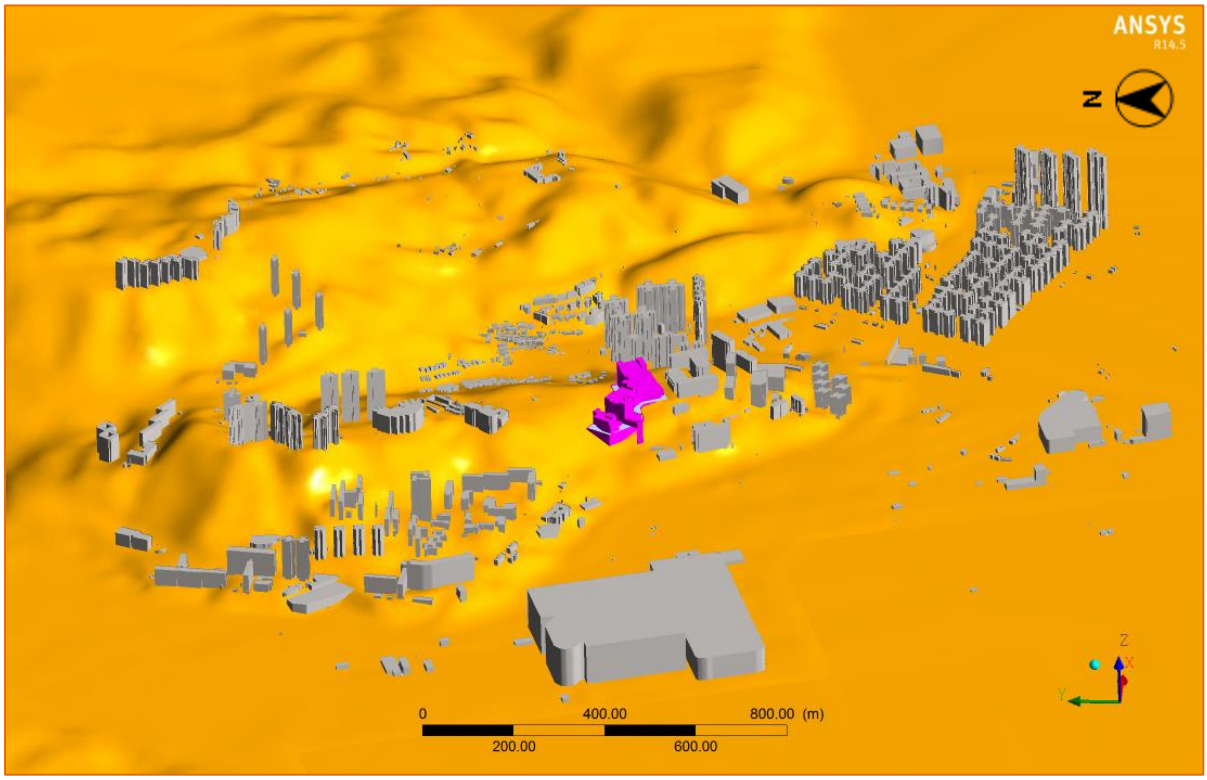


Figure 4-10 3D Model for the Proposed Scheme



Domain Size

4.4.2 The dimensions of the domain are shown below and in ***Figure 4-11*** and ***Figure 4-12***.

- X-direction = 5,000m
- Y-direction = 5,000m
- Z-direction = 1,090m

4.4.3 The boundaries of the computational domain are at least 5H away from the modelled buildings in accordance with COST Action C14 (European Co-operation in Science and Technology, 2004).

Figure 4-11 Side View of Domain Dimensions

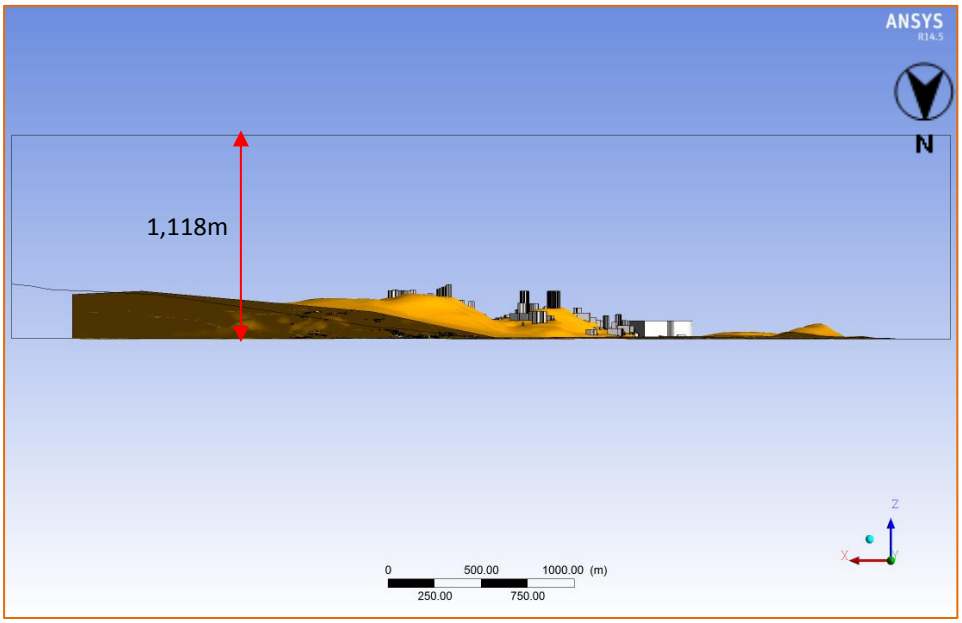
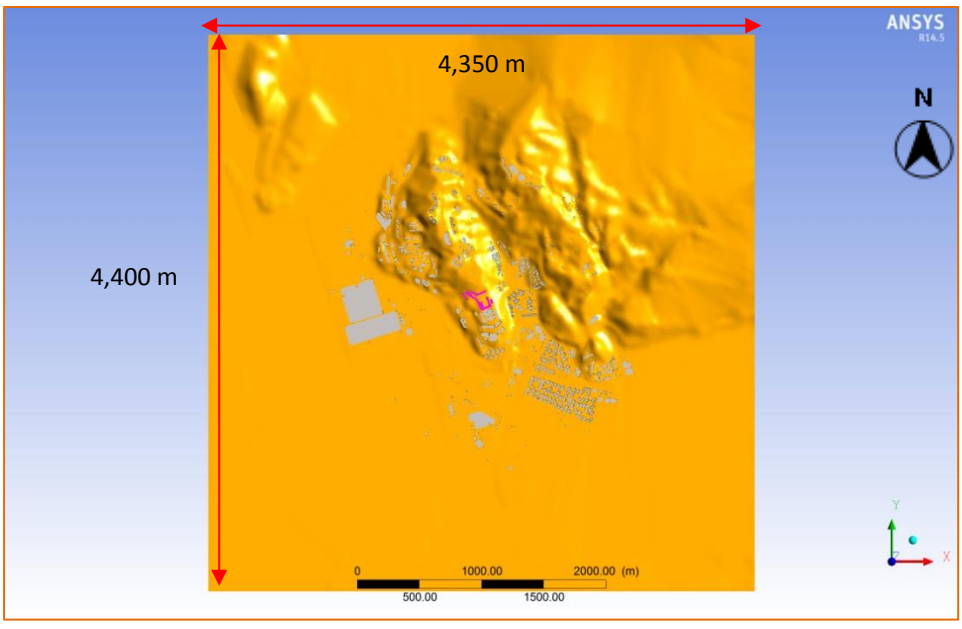


Figure 4-12 Plan View of Domain Dimensions



4.5 Simulation Meshing

4.5.1 ANSYS FLUENT was used to construct the unstructured grid. To produce a more precise result at higher resolution, the grid size along the x-axis and y-axis near the Site have smaller intervals than those located further from the Site location.

4.5.2 The grid arrangement within the pedestrian level (2m above ground) was refined to facilitate the pedestrian wind environment study. Four prism layers at 2m above ground are incorporated in the meshing to provide better resolution at lower levels along the z-axis.

4.5.3 The grid expansion ratio is 1.2, which does not exceed the ratio of 1.3 recommended in COST Action C14.

4.5.4 Several assumptions of each boundary condition were made, and these comply with the recommendations of COST Action C14:

1. Top of the computation domain: Symmetry
2. Inlet of the computation domain: Velocity Inlet
3. Outlet of the computation domain: Pressure outlet
4. Prism Layers above ground: 4 layers, total 2m
5. Blockage Ratio: Below 3%

4.5.5 There are more than sixteen million cells within the domains for the two Schemes.

4.5.6 Special Discretization is used for this model with the following assumptions:

1. Gradient: Green-Gauss Node Based
2. Pressure: Second Order
3. Momentum: Second Order
4. Turbulent Kinetic Energy: Second Order
5. Specific Dissipation Rate: Second Order

4.6 Turbulence Model

4.6.1 The turbulence model adopted in this AVA Study is a realizable k-epsilon turbulence model converged to the second order. A termination criterion of 0.001 has been used in the simulation for residuals of the variables (i.e. velocity, pressures and turbulence parameters).

5 ANNUAL AND SUMMER WIND RESULTS AND ANALYSIS

5.1 Annual Overall Pattern of Ventilation Performance

5.1.1 ***Figure 5-1*** and ***Figure 5-2*** show the overall pattern of ventilation performance at annual wind directions.

5.1.2 Under annual wind conditions, the extensive road networks allow the prevailing wind to penetrate through the Site. VRs are shown to be high at major roads, such as Lai King Hill Road and Ching Cheung Road. Relatively high VRs are identified on the eastern portion of the Site. The open area north of the Site also facilitates wind movement, and thus results in a rather high VR. Nevertheless, the western portion of the Site generally experiences a lower VR due to the impedance of the Hospital block. Generally speaking, the ventilation performance under Proposed Scheme shows resemblance to that in the Base Scheme throughout the year.

Figure 5-1 Contour Plot of Annual Average VR at 2m Pedestrian Level for Base Scheme

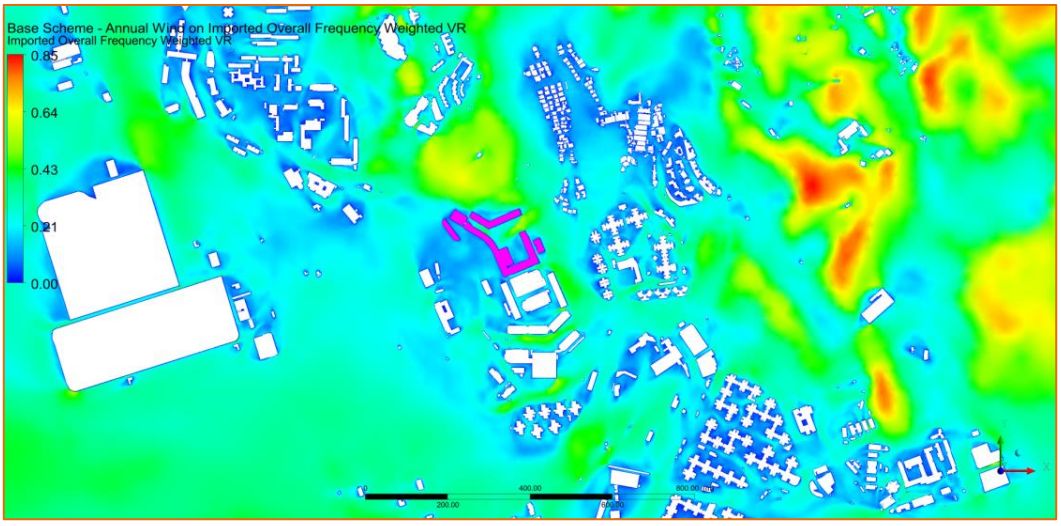
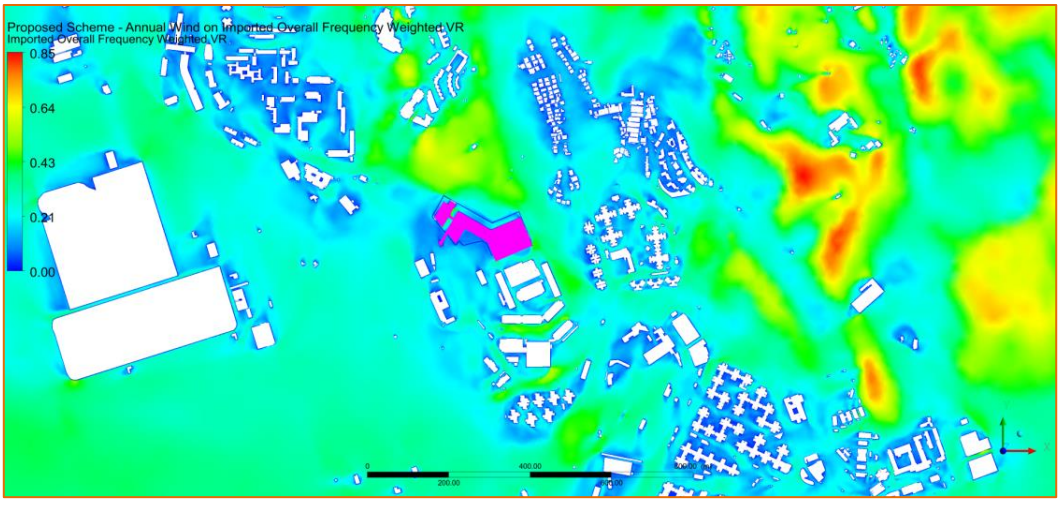


Figure 5-2 Contour Plot of Annual Average VR at 2m Pedestrian Level for Proposed Scheme



5.2 Summer Overall Pattern of Ventilation Performance

5.2.1 ***Figure 5-3*** and ***Figure 5-4*** show the overall pattern of ventilation performance at summer wind directions.

5.2.2 Under summer wind conditions, the Site is ventilated by the prevailing winds coming from the southwest. The highway networks of Kwai Chung Road and Tsing Kwai Highway show a moderately high VR, as compared to the annual wind conditions. Therefore, the western portion of the Site is generally more ventilated. Major roads such as Lai King Hill Road, Ching Cheung Road, and even the secondary road of Margret Hospital Road remain as a major air path for air movement. The ventilation performance for Proposed Scheme is similar to that of the Base Scheme under summer wind.

Figure 5-3 Contour Plot of Summer Average VR at 2m Pedestrian Level for Base Scheme

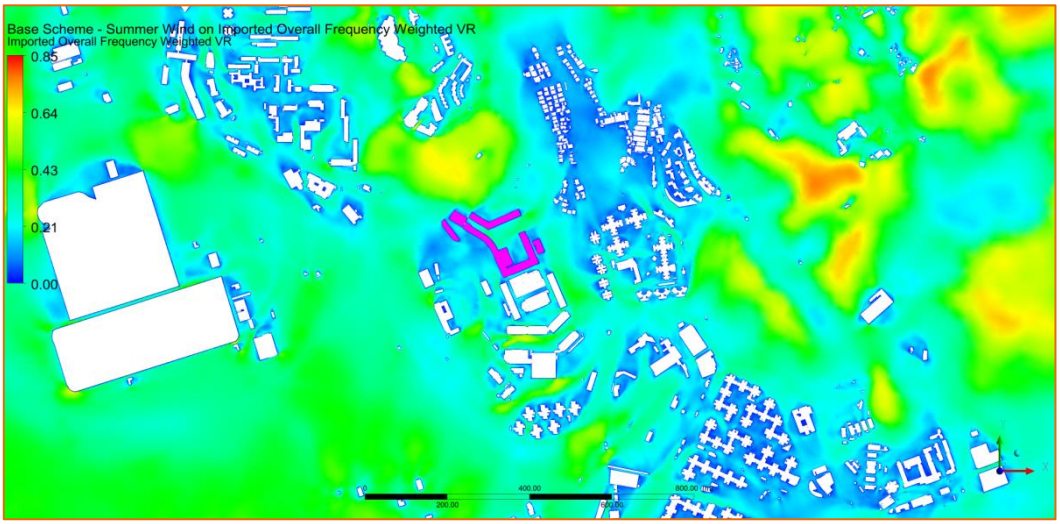
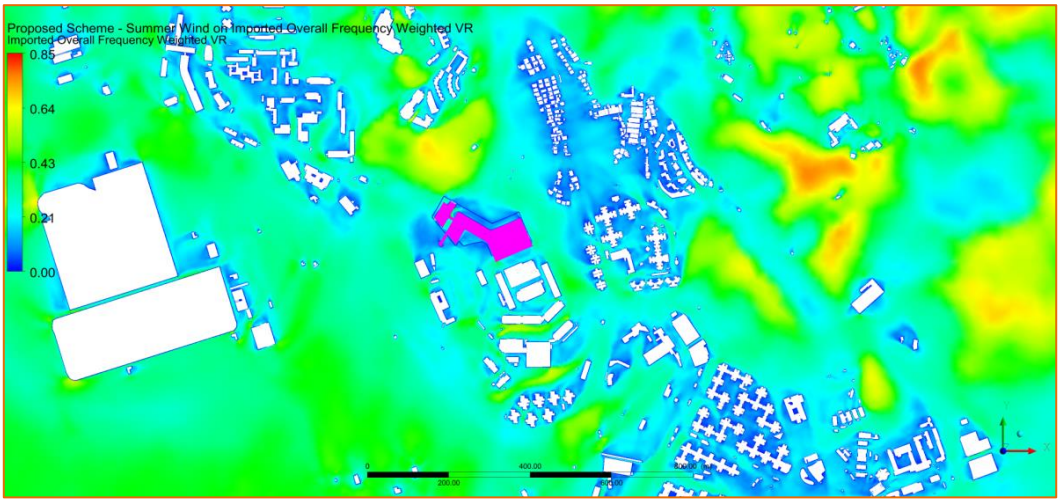


Figure 5-4 Contour Plot of Summer Average VR at 2m Pedestrian Level for Proposed Scheme



5.3 Annual Wind Velocity Ratio Results

5.3.1 Test points are grouped based on the Focus Areas as shown on ***Figure 5-5***. There are altogether 40 no. Perimeter Test Points (with prefix "P"), 65 no. Overall Test Points (with prefix "L") and 10 no. Special Test Points (with prefix "S").

5.3.2 The average weighted SVR, LVR and VR values for Special Test Points values for the Base Scheme and Proposed Scheme of the annual wind condition and summer wind condition are shown in ***Table 5-1*** and ***Table 5-2*** respectively. Details of the wind velocity ratios are presented in ***Appendix B***.

Annual Wind Condition

5.3.3 A summary of the overall VR for the Base Scheme and Proposed Scheme under annual wind condition is provided in ***Table 5-1***.

Table 5-1 Overall VR for Base Scheme and Proposed Scheme under Annual Wind Condition

Parameter	Wind Velocity Ratios		Difference
	Base Scheme	Proposed Scheme	
SVR_w (Perimeter Test Points)	0.27	0.26	-0.01
LVR_w (Perimeter Test Points and Overall Test Points)	0.23	0.23	0.00
VR_w for Special Test Points	-	0.20	-

Summer Wind Condition

5.3.4 A summary of the overall VR for the Base Scheme and Proposed Scheme under summer wind condition is provided in ***Table 5-2***.

Table 5-2 Overall VR for Base Scheme and Proposed Scheme under Summer Wind Condition

Parameter	Wind Velocity Ratios		Difference
	Base Scheme	Proposed Scheme	
SVR_w (Perimeter Test Points)	0.21	0.21	0.00
LVR_w (Perimeter Test Points and Overall Test Points)	0.19	0.19	0.00
VR_w for Special Test Points	-	0.14	-

Annual Wind Condition

5.3.5 A summary of VR for different focus area groups under annual wind condition is provided in ***Table 5-3***.

Table 5-3 Summary of Average Weighted VR for Different Focus Area Groups under Annual Wind Condition

Focus Area Group	Focus Area Description	Test Points	Average Weighted Velocity Ratio		Difference
			Base Scheme	Proposed Scheme	
G0	Perimeter Test Points	P1 – P40	0.27	0.26	-0.01
G1	Kau Wa Keng San Tseun	L1 – L4	0.15	0.14	-0.01
G2	Lai King Hill Road 1	L5 – L10	0.19	0.19	0.00
G3	Wah Fung Garden	L11 – L13	0.21	0.22	0.01
G4	Kwai Chung Hospital Phase 1	L14 – L15	0.23	0.21	-0.02
G5	Princess Margaret Hospital 1	L16 – L23	0.18	0.20	0.02
G6	Princess Margaret Hospital Road	L24 – L31	0.20	0.19	-0.01
G7	Princess Margaret Hospital 2	L32 – L37	0.31	0.33	0.02
G8	Hospital Car Park	L38 – L44	0.18	0.19	0.01
G9	Princess Margaret Hospital School of General Nursing & Qtrs	L45 – L47	0.15	0.11	-0.04
G10	FSD NT Workshop (Kwai Chung)	L48 – L51	0.14	0.16	0.02
G11	Lai King Hill Road 2	L52 – L65	0.20	0.21	0.01
G12	Kwai Chung Hospital Phase 2 & 3	S1 - S10	-	0.20	-

5.3.6 Under annual wind condition, the overall air ventilation performance of the focus area groups perform slightly better in the Proposed Scheme than Base Scheme in G3, G5, G7, G8, G10 and G11. Group like G2 performs equally well in both Base Scheme and Proposed Scheme. There is a slight drop in VR at G0, G1, G4, G6 and G9 but the differences are considered minimal. From the VR reduction, the Princess Margaret Hospital School of General Nursing & Quarters (G9) would experience comparatively worse air ventilation among other Focus Areas with respect to the Proposed Redevelopment.

Summer Wind Condition

5.3.7 A summary of VR for different Focus Area Groups under summer wind condition is provided in ***Table 5-4***.

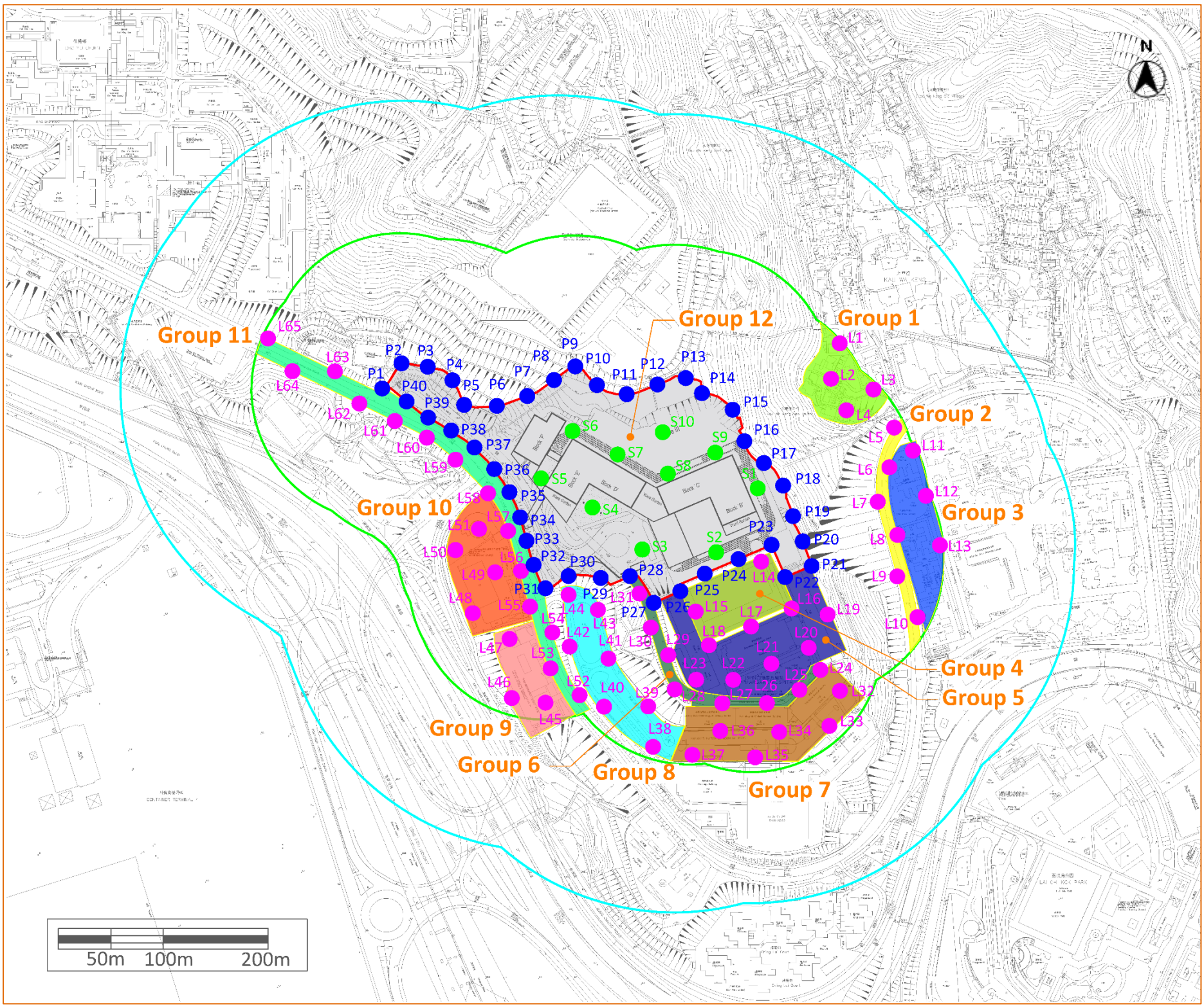
Table 5-4 Summary of Average Weighted VR for Different Focus Area Groups under Summer Wind Condition

Focus Area Group	Focus Area Description	Test Points	Average Weighted Velocity Ratio		Difference
			Base Scheme	Proposed Scheme	
G0	Perimeter Test Points	P1 – P40	0.21	0.21	0.00
G1	Kau Wa Keng San Tseun	L1 – L4	0.08	0.07	-0.01
G2	Lai King Hill Road 1	L5 – L10	0.12	0.12	0.00
G3	Wah Fung Garden	L11 – L13	0.16	0.17	0.01
G4	Kwai Chung Hospital Phase 1	L14 – L15	0.14	0.15	0.01
G5	Princess Margaret Hospital 1	L16 – L23	0.16	0.17	0.01
G6	Princess Margaret Hospital Road	L24 – L31	0.20	0.19	-0.01
G7	Princess Margaret Hospital 2	L32 – L37	0.29	0.30	0.01
G8	Hospital Car Park	L38 – L44	0.20	0.20	0.00
G9	Princess Margaret Hospital School of General Nursing & Qtrs	L45 – L47	0.13	0.13	0.00
G10	FSD NT Workshop (Kwai Chung)	L48 – L51	0.16	0.16	0.00
G11	Lai King Hill Road 2	L52 – L65	0.19	0.19	0.00
G12	Kwai Chung Hospital Phase 2 & 3	S1 - S10	-	0.14	-

5.3.8 Under summer wind condition, the overall air ventilation performance of the focus area groups perform slightly better in the Proposed Scheme than Base Scheme in G3, G4, G5 and G7. Groups like G0, G2, G8, G9, G10 and G11 perform equally well in both Base Scheme and the Proposed Scheme. There is a slight drop in VR at G1 and G6 but the differences are considered minimal.

5.3.9 The average VR results for all test points and focus area groups under annual and summer wind conditions provide a clearer understanding of the wind environment at different wind directions. These are presented in the form of bar charts, as shown in ***Figures 5-6*** to ***5-11***.

Figure 5-5 Focus Areas



Key

- Project Site Boundary
- Assessment Area = 1H = 125m
- Surrounding Area = 2H = 250m
- Perimeter Test Points (P1 – P40)
- Overall Test Points (L1 – L65)
- Special Test Points (S1 – S10)

Group	Focus Area Description	Test Points
G1	Kau Wa Keng San Tseun	L1 – L4
G2	Lai King Hill Road 1	L5 – L10
G3	Wah Fung Garden	L11 – L13
G4	Kwai Chung Hospital Phase 1	L14 – L15
G5	Princess Margaret Hospital 1	L16 – L23
G6	Princess Margaret Hospital Road	L24 – L31
G7	Princess Margaret Hospital 2	L32 – L37
G8	Hospital Car Park	L38 – L44
G9	Princess Margaret Hospital School of General Nursing & Qtrs	L45 – L47
G10	FSD NT Workshop (Kwai Chung)	L48 – L51
G11	Lai King Hill Road 2	L52 – L65
G12	Kwai Chung Hospital Phase 2 & 3	S1 – S10

Figure 5-6 VR Plot for Perimeter Test Points (Annual Wind Condition)

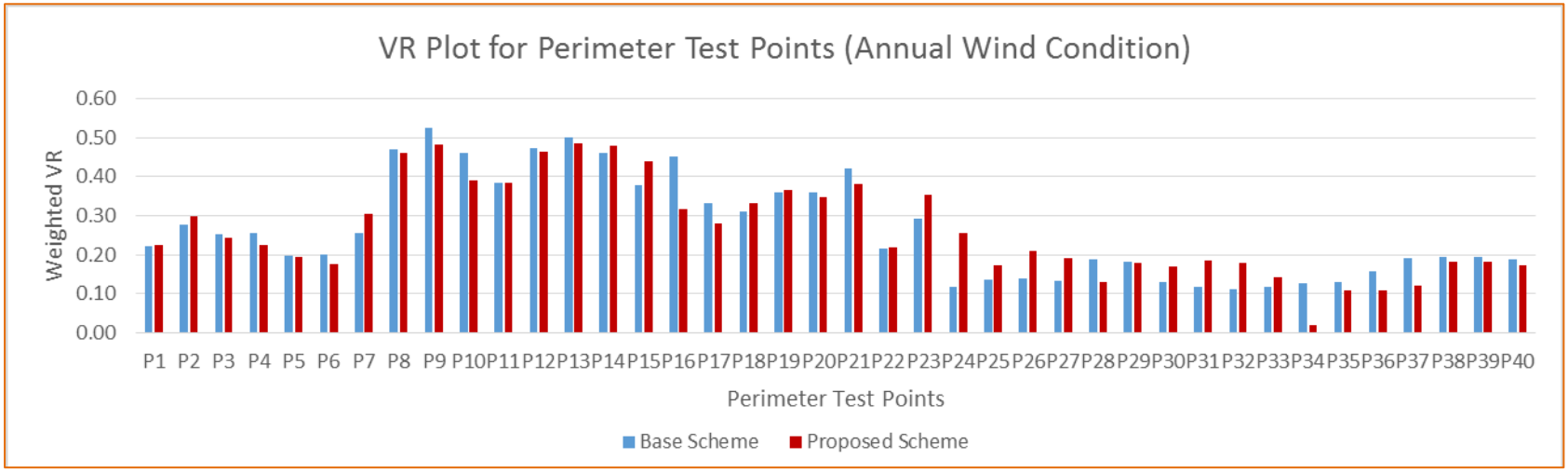


Figure 5-7 VR Plot for Perimeter Test Points (Summer Wind Condition)

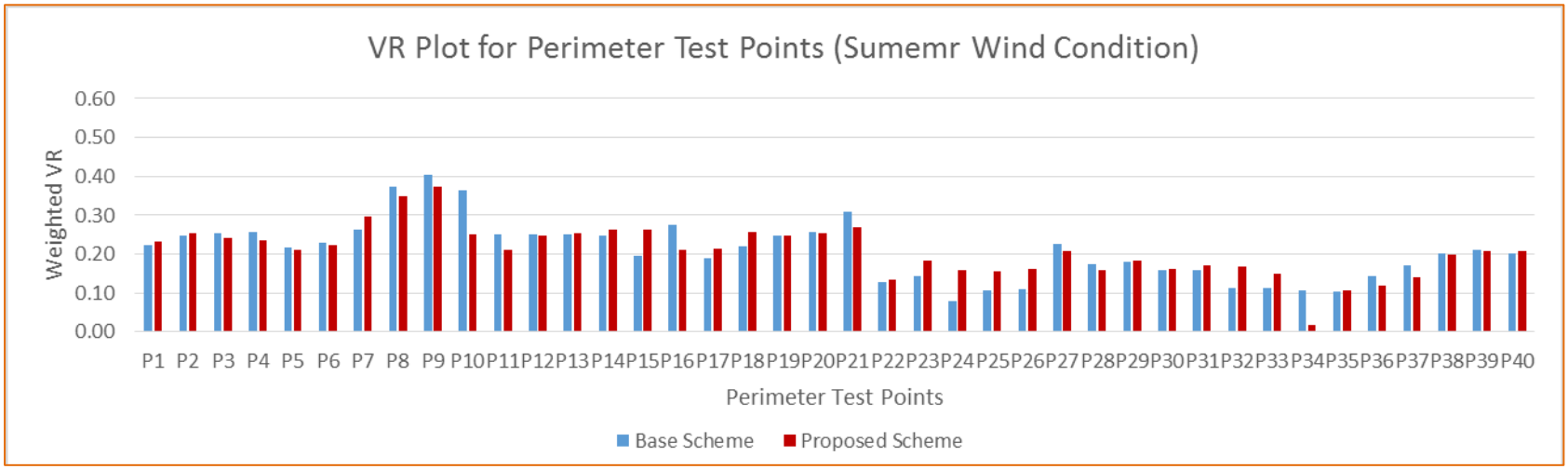


Figure 5-8 VR Plot for Overall Test Points (Annual Wind Condition)

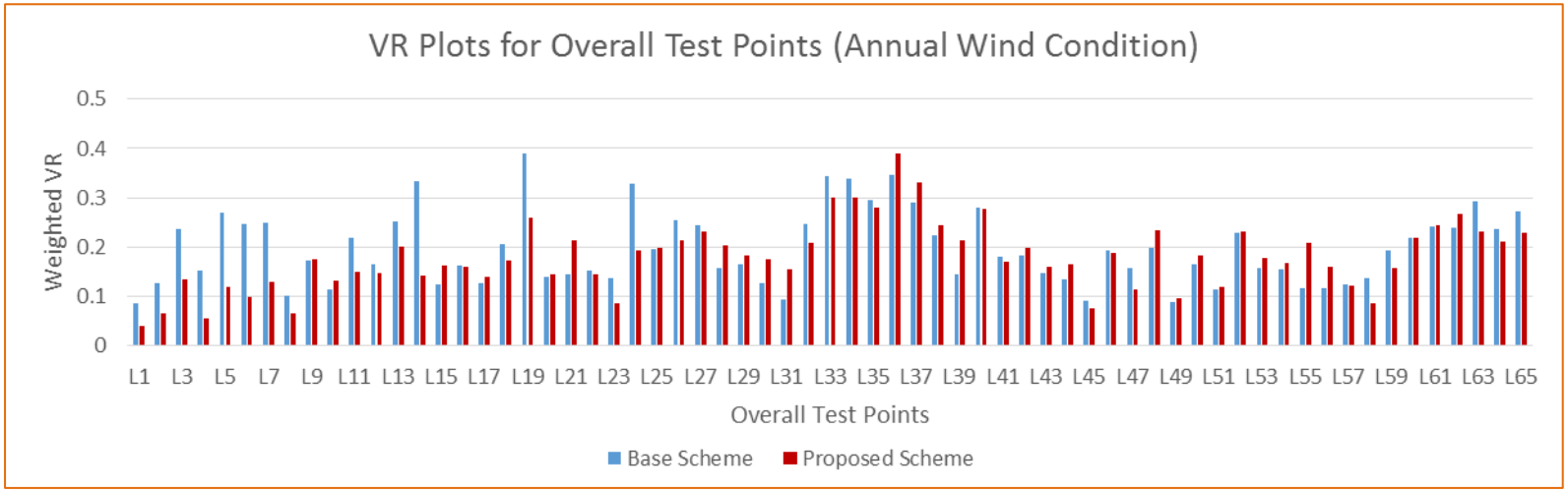


Figure 5-9 VR Plot for Overall Test Points (Summer Wind Condition)

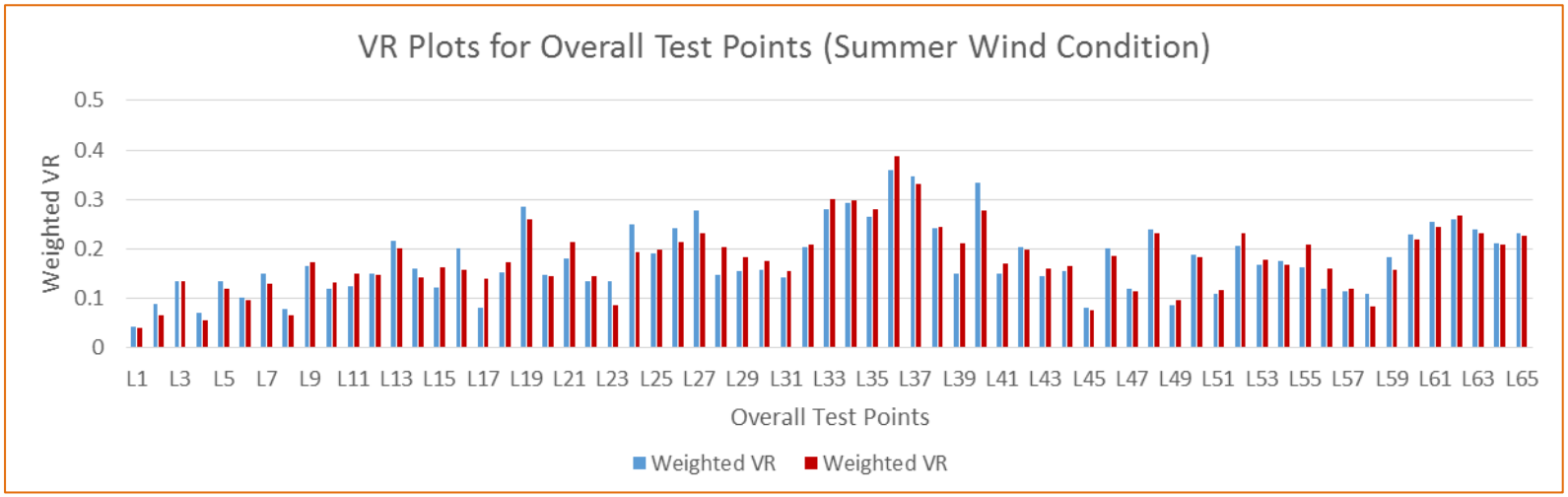


Figure 5-10 VR Plot per Focus Area Groups (Annual Wind Condition)

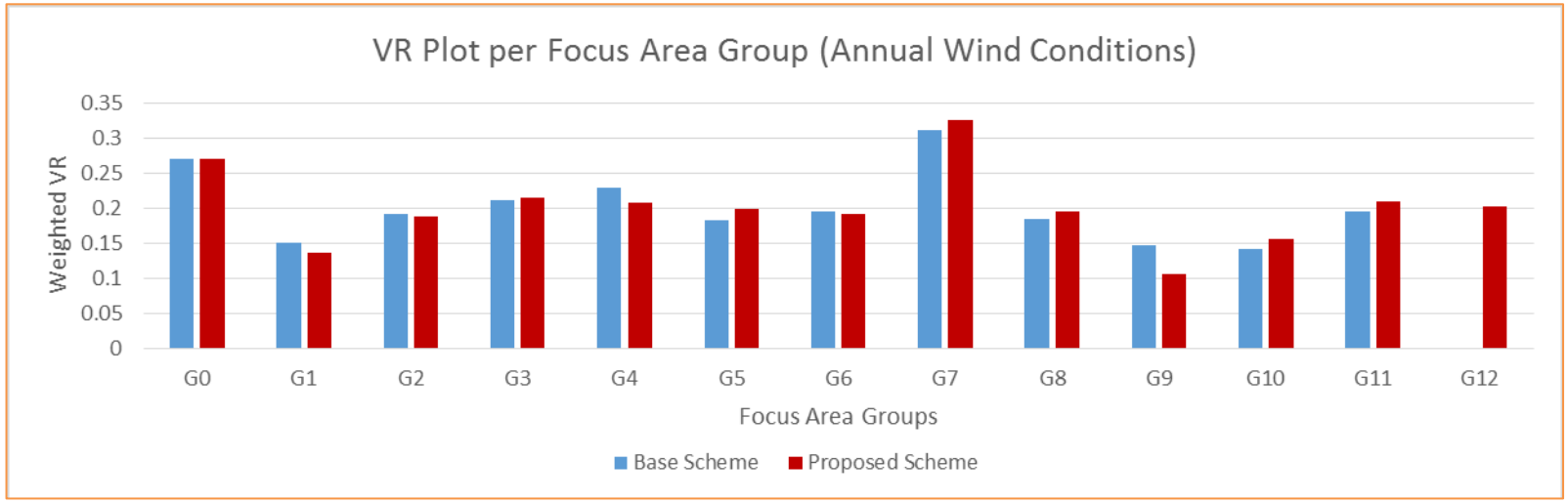
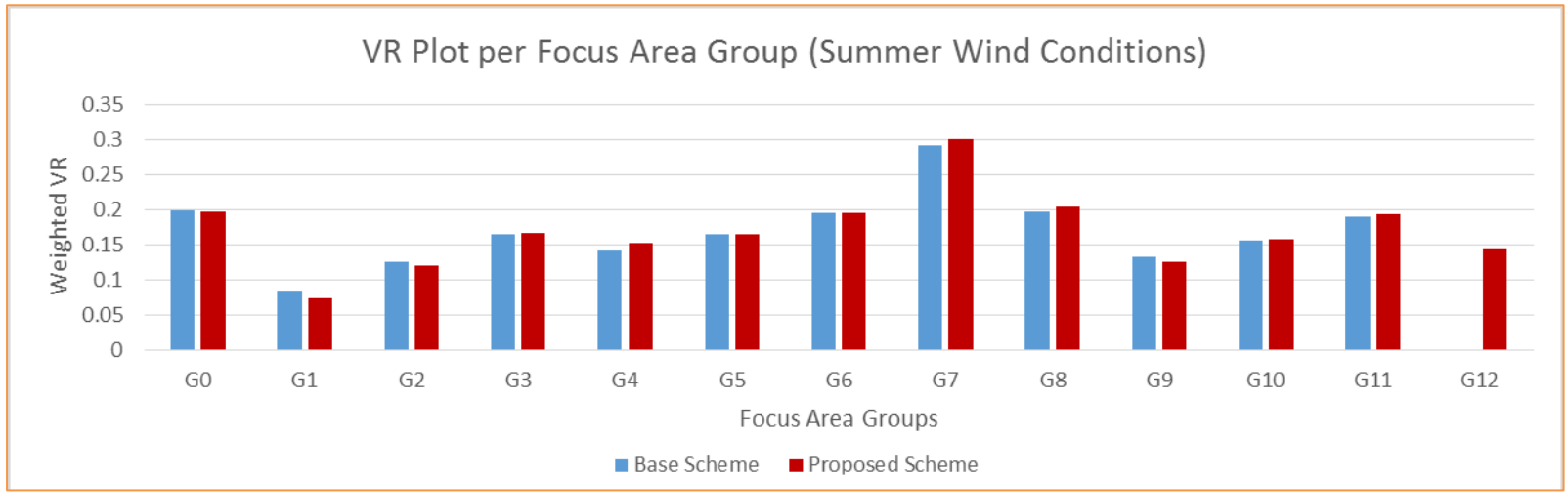


Figure 5-11 VR Plot per Focus Area Groups (Summer Wind Condition)



5.4 Annual Site Air Ventilation Assessment

5.4.1 A summary of Site VRs for the Proposed Redevelopment under annual prevailing wind directions is provided in ***Table 5-5***.

Table 5-5 Summary of Site VRs for the Proposed Redevelopment Under Annual Prevailing Wind Directions

Annual Prevailing Wind Direction	Base Scheme	Proposed Scheme	VR Change Due to Proposed Scheme
E	0.37	0.33	-0.04
ESE	0.20	0.20	0.00
ENE	0.29	0.31	0.02
NE	0.30	0.31	0.01
SSW	0.22	0.22	0.00
SE	0.15	0.18	0.03
SW	0.24	0.22	-0.02
S	0.21	0.24	0.03
Overall	0.27	0.26	-0.01

5.5 Summer Site Air Ventilation Assessment

5.5.1 A summary of Site VRs for the Proposed Redevelopment under summer prevailing wind directions is provided in ***Table 5-6***.

Table 5-6 Summary of Site VRs for the Proposed Redevelopment Under Summer Prevailing Wind Directions

Summer Prevailing Wind Direction	Base Scheme	Proposed Scheme	VR Change Due to Proposed Scheme
SSW	0.22	0.22	0.00
SW	0.24	0.21	-0.03
S	0.16	0.19	0.03
ESE	0.17	0.17	0.00
SSE	0.14	0.16	0.02
SE	0.14	0.16	0.02
E	0.33	0.30	-0.03
WSW	0.28	0.26	-0.02
Overall	0.21	0.21	0.00

5.6 Site Air Ventilation Assessment Findings

5.6.1 Three major differences are incorporated in the Proposed Redevelopment of KCH with respect to air ventilation performance, including a reduction from five building blocks to two in Phase 2 and addition of an entire landscape area in Phase 3, increase of building separation distance from 2.9m to 13.2m, and widening of access road between Phase 1 and Phase 2 from 3.4m to 18.4m.

5.6.2 SVR indicates how the Proposed Redevelopment impacts the wind environment in the immediate vicinity, with reference to the perimeter test points. In terms of the perimeter test points, P22 to P26 explained the effect of the access road widening between Phase 1 and Phase 2 since all test points show an increase in weighted VR under both annual and summer conditions.

5.6.3 Under annual wind condition, the prevailing winds are E, ESE, ENE, NE, SSW, SE, SW and S. The majority of the prevailing winds are in the east and southwest domain. Most annual prevailing wind directions have showed an increase or constant VR, except for the E and SW directions having a decreased VR. In spite of that, the overall Site VR reduced by 0.01 from 0.27 to 0.26. However, the drop is considered minimal and the wind environment at the Project Site will not be noticeably affected.

5.6.4 Under summer wind condition, the prevailing winds are SSW, SW, S, ESE, SSE, SE, E and WSW. The majority of the prevailing winds are in the southwest and east domain. Most summer prevailing wind directions have showed an increase or constant VR, except for the SW, E and WSW directions having a decreased VR. In spite of that, the overall Site VR has remained the same as 0.21 in both Schemes, indicating the Proposed Scheme would have no significant impact on the site ventilation performance with respect to the Proposed Redevelopment throughout the year.

5.7 Annual Local Air Ventilation Assessment

5.7.1 A summary of Local VRs for the Proposed Redevelopment under annual prevailing wind directions is provided in ***Table 5-7***.

Table 5-7 Summary of Local VRs for the Proposed Redevelopment Under Annual Prevailing Wind Directions

Annual Prevailing Wind Direction	Base Scheme	Proposed Scheme	VR Change Due to Proposed Scheme
E	0.30	0.28	-0.02
ESE	0.17	0.17	0.00
ENE	0.25	0.27	0.02
NE	0.24	0.25	0.01
SSW	0.18	0.18	0.00
SE	0.13	0.14	0.01
SW	0.20	0.19	-0.01
S	0.24	0.26	0.02
Overall	0.23	0.23	0.00

5.8 Summer Local Air Ventilation Assessment

5.8.1 A summary of Local VRs for the Proposed Redevelopment under summer prevailing wind directions is provided in ***Table 5-8***.

Table 5-8 Summary of Local VRs for the Proposed Redevelopment Under Summer Prevailing Wind Directions

Summer Prevailing Wind Direction	Base Scheme	Proposed Scheme	VR Change Due to Proposed Scheme
SSW	0.18	0.18	0.00
SW	0.19	0.18	-0.01
S	0.19	0.20	0.01
ESE	0.15	0.15	0.00
SSE	0.16	0.17	0.01
SE	0.12	0.13	0.01
E	0.27	0.26	-0.01
WSW	0.23	0.23	0.00
Overall	0.19	0.19	0.00

5.9 Local Air Ventilation Assessment Findings

5.9.1 The ventilation performance of the pedestrian accessible areas within the vicinity of the Site will generally be unaffected by the Proposed Redevelopment of the hospital. The LVR at annual wind condition remains at 0.23 at both Schemes. The overall LVR at summer wind condition remains at 0.19 at both Schemes. It can be suggested that the change of building layout and the incorporation of the design features will, generally speaking, not affect the wind ventilation performance in the Proposed Scheme, and have a slight improvement to the surrounding environment.

Wind Performance Under Wind Direction E

5.9.2 E contributes an average of 19.1% under annual wind condition and 7.6% under summer wind condition. The LVR of E wind direction decreases from 0.30 in the Base Scheme to 0.28 in the Proposed Scheme under annual wind condition, and decreases from 0.27 in Base Scheme to 0.26 in Proposed Scheme under summer wind condition, with a 0.02 and 0.01 reduction respectively. At this direction, Lai King Hill Road is the major wind corridor. The E wind tends to flow towards the Site in the landscape area of Phase 3 and the open slope north of the Site. The VR increases in Phase 3 as it gets closer to the northern side of Block C and Block D in Phase 2. With the addition of the entire landscape area in Phase 3, the openness nature of the area facilitates the penetration of E wind. Also, the larger building separation distance between Block F and Block E has allowed wind to penetrate through as the contour plot has shown prominent indication of higher VR. Therefore, western portion of the Site could be ventilated by E wind. In addition to that, the removal of Multi-purpose Hall and the enlarged width of access road between Phase 1 and Phase 2 allow unobstructed E wind to be diverted to the southern tip of Phase 2 building. A combination of these two effect has resulted in an increase of VR along lower half of Lai King Hill Road in Group 11. The vector plot pattern under the E wind is generally the same for areas facing east to the Site, namely Group 1, 2 and 3. As the E wind approaches the Site, it is diverted by Kau Wa Keng San Tsuen and arrives the Site from the NE direction. In the Base Scheme, the Hospital has an open area in the middle and part of the E wind is able to enter the atrium of the Hospital. In the Proposed Scheme, the Site becomes a consolidated block and the E wind will not be able to enter. Instead, the wind is diverted to the south, which reach Princess Margaret Hospital. Therefore, under the Proposed Scheme, the VRs in Princess Margaret Hospital are generally higher, implying a better air ventilation performance in that area. Overall speaking, the Proposed Scheme would result in a slightly worse ventilation performance considering the minor drop in LVR.

Wind Performance Under Wind Direction ESE

5.9.3 ESE contributes an average of 12.9% under annual wind condition and 9.5% under summer wind condition. The LVR of ESE wind direction remains as 0.17 and 0.15 under annual and summer wind condition respectively. At this direction, Ching Cheung Road is the major wind corridor. ESE wind also reaches the Site from the low-rise area in Kau Wa Keng. The addition of landscape area in Phase 3 has improved the VR along the northern boundary of the Site and facilitate the air ventilation around that area. Also, the widened access road between Phase 1 and Phase 2 acts as a local air path, which significantly increases the VR along the southern boundary of the Site, as shown in the apparent change of vector. Considerable increase of VR is shown in the southern portion of the Site, bringing the ESE wind to the west. Therefore, the VR in the immediate west

of the Site, which is Group 8 has experienced a higher VR. Considering the overall VR for ESE wind remains unchanged, the Proposed Scheme would have no significant impact on the local air ventilation performance in general.

Wind Performance Under Wind Direction ENE

5.9.4 ENE contributes an average of 10.3% under annual wind condition. The LVR of ENE wind direction increases from 0.25 in the Base Scheme to 0.27 in the Proposed Scheme under annual wind condition, with a 0.02 increment in velocity ratio. As ENE wind approaches the Assessment Area, the wind is primarily redistributed by Lai King Hill Road. When the wind arrives the eastern side of the Site, it is diverted to the south, facilitating air movement in Princess Margaret Hospital and Hospital Car Park. Therefore, the VRs in Group 5, 7, and 8 are higher. Furthermore, considerable amount of air movement is identified in the landscape area of Phase 3. The ENE wind is also able to penetrate through the building separation between Block E and Block F, which is then brought to the west of Block F. The air movement in the west of the Site has then been improved. Therefore, the Proposed Redevelopment has benefited the surrounding area of the Site in terms of air ventilation, and in general favours the local air ventilation.

Wind Performance Under Wind Directions NE

5.9.5 NE contributes an average of 8.7% under annual wind. The LVR of NE wind direction increases from 0.24 to 0.25 under annual wind condition. The NE wind mainly reaches the site through the low-rise area in Kau Wa Keng and Lai King Hill Road. The landscape area in Phase 3 has a higher VR and more air movement as indicated in the vector plots. The enlarged building separation distance between Block E and Block F allows more NE wind to travel directly through the access road and reach the south of Block F. In the Proposed Scheme, more NE wind is able to reach the south-eastern part of Block B, due to the removal of Multi-purpose Hall from the Base Scheme. Wind will circulate in the area between Phase 1 and Phase 2. Generally speaking, the Proposed Redevelopment would marginally improve the air ventilation performance in the surrounding area. Compared to the Base Scheme, the Hospital Block now occupies the area that used to be opened, all NE wind arriving at the Site would be directed to flow towards the southern portion. Such air path facilitates the ventilation performance at Princess Margaret Hospital, which has been proven by the increase of VR in Groups 5, 6 and 7. Apart from Group 9, all focus areas in the downstream region under NE wind, i.e. the southwest of the site, experience an increase in VR.

Wind Performance Under Wind Direction SSW

5.9.6 SSW contributes an average of 8.1% under annual wind condition and 17.0% under summer wind condition. The LVR of SSW wind direction remains at 0.18 in both schemes and under both annual wind condition. At SSW direction, the Rambler Channel is the major wind corridor, in which the SSW wind travels across the Container Terminal and highway network before reaching the Site. The SSW wind is able to pass through the larger building separation distance between Block E and Block F and flow along the edge of Block F. The wind will then divert to the east to ventilate the landscape area in Phase 3. The SSW wind circulates around the landscape area in Phase 3 and northern portion of the Site. However, there is a slight drop in VR in G1, at the downstream region under SSW wind, meaning that the Proposed Scheme may have potential air ventilation impact on Kau Wa Keng San Tsuen. Under SSW, the Princess Margaret Hospital (G5 and G7) has

shown a higher VR, in which the air ventilation is facilitated. Therefore, the Proposed Development would not affect the ventilation performance in the surrounding area throughout the year, in particular summer time.

Wind Performance Under Wind Directions SE

5.9.7 SE contributes an average of 7.0% under annual wind condition and 7.6% under summer wind condition. The LVR of SE wind direction increases from 0.13 in Base Scheme to 0.14 in Proposed Scheme under annual wind direction, and from 0.12 in Base Scheme to 0.13 in Proposed Scheme under summer wind direction. The SE wind in the whole surrounding area is rather calm, as shown in the contour plots. The major wind corridor facilitating SE wind is Ching Cheung Road. As the wind approaches the Site, it either gets diverted to the north or redistributed to the south, which is Princess Margaret Hospital (G5 and G7). The lower part of Princess Margaret Hospital (G7) and the Hospital Car Park (G8) will therefore experience a higher VR. Most test points in G9 and all test points in G10 and G11 will experience an increase in VR, partly because of the increased width of access road between Phase 1 and 2, which facilitates the local ventilation performance. Therefore, the air ventilation has improved under SE wind direction throughout the year and during summer time.

Wind Performance Under Wind Directions SW

5.9.8 SW contributes an average of 6.0% under annual wind condition and 14.6% under summer wind condition. The VR change is a reduction of 0.1 under annual and summer wind conditions in Proposed Scheme, when compared to the Base Scheme. At SW direction, the Rambler Channel is the major wind corridor, in which the SW wind travels across the Container Terminal and Kwai Chung Road before reaching the Site. With respect to the enlarged building separation distance between Block E and Block F, that section of the access road is ventilated. The wind passes along the edge of Block F and continue to travel to the northern part of the Site. The SVR in northern portion of the site along the perimeter has also been weakened due to the change of building blocks layout. On the other hand, more wind can penetrate through the wider space between Phase 1 and Phase 2. The downstream area under SW wind, which is the northeast of the Site, mainly G1 will have a lower VR. In the Base Scheme, the Hospital Block is not occupied compared to the Proposed Scheme, which allows wind penetration. The SW wind flows from the open space in the atrium to G1. However in the Proposed Scheme, the Hospital becomes a consolidated block, which eliminated the open area for facilitating air movement. Such a removal of air path will therefore worsen the air ventilation performance in that particular area. Nevertheless, with the incorporation of the mitigation measures described in ***Section 6***, the worsened situation shall be alleviated. Generally speaking, the air ventilation performance under Proposed Scheme would be marginally worse than Base Scheme throughout the year and especially in summer time.

Wind Performance Under Wind Directions S

5.9.9 S contributes an average of 5.8% under annual wind condition and 10.7% under summer wind condition. The LVR of S wind direction increases from 0.24 in Base Scheme to 0.26 in Proposed Scheme under annual wind condition and increases from 0.19 to 0.20 under summer wind conditions. At S direction, the major wind corridor is Kwai Chung Road and Lai King Hill Road. More S wind is able to flow along the edge of Block F to reach the

northern part of the Site due to the removal of Block D in the Base Scheme. Lai King Hill Road and Princess Margaret Hospital Road, as categorized as G11 and G6 has experienced higher VR in general, meaning the ventilation performance at pedestrian level will be improved. The increased width of access road between Phase 1 and 2 has benefited the local ventilation performance as reflected by the increased VR along the southern perimeter. Therefore, the Proposed Redevelopment has benefited the surrounding area of the Site in terms of air ventilation, especially during summer time.

Wind Performance Under Wind Direction SSE

5.9.10 SSE contributes 7.9% under summer wind condition. The LVR increases from 0.16 in Base Scheme to 0.17 in Proposed Scheme under summer wind condition, with a 0.01 increment. The wind under SSE direction is rather calm, indicated by the relatively low VR. Under wind direction SSE, the major wind corridor is Lai King Hill Road and Kwai Chung Road. The SSE wind arrives Lai King Hill Road at the bottom of Princess Margret Hospital and is diverted to both the east and the west along the road. More air movement is present along the edge of Block F and in the eastern portion of the Site. The increased building separation between Block E and Block F introduces more wind movement, and thus slightly better ventilation. Areas to the west of the Site, including G8, 9, 10 and 11 generally experience a higher VR since the Proposed Scheme will allow more air path for SSE wind. Under the Proposed Scheme, the SSE wind is able to enter the centre of the Hospital Block and circulate in that atrium, yet it could not penetrate to the western portion as it is blocked by the Service Block. However in the Proposed Scheme, the widened access road will serve as a major air path for wind penetration from the east to the west, and the downstream area will be ventilated. Generally speaking, the Proposed Redevelopment does not impose significant impact to the local wind environment, and the air ventilation in the summer time under SSE has performed slightly better.

Wind Performance Under Wind Direction WSW

5.9.11 WSW contributes 6.3% under summer wind condition. The LVR remains at 0.23 in both schemes under summer wind condition. Under WSW wind direction, the major wind corridors are Kwai Chung Road and Container Terminal. Some of the WSW arrives the Site from the north-western direction as well. The WSW wind is able to pass through the widened building separation between Block E and Block F, which brings the wind to the northern side of Block E. In addition, the larger width between Phase 1 and Phase 2 allows more WSW to infiltrate in, bringing more wind to the eastern border of the Site. The VR in G7, namely the Princess Margret Hospital has increased, meaning a better ventilation performance in that area. However, the VR in G11, i.e. Lai King Hill Road is lowered. As such, the Proposed Redevelopment would not affect the overall ventilation performance in the nearby area.

5.10 Annual Special Test Points Assessment

5.10.1 A summary of Special VRs for the Proposed Redevelopment under annual prevailing wind directions is provided in ***Table 5-9***.

Table 5-9 Summary of Special VRs for the Proposed Redevelopment Under Annual Prevailing Wind Directions

Annual Prevailing Wind Direction	Base Scheme	Proposed Scheme
E	-	0.26
ESE	-	0.15
ENE	-	0.28
NE	-	0.23
SSW	-	0.11
SE	-	0.11
SW	-	0.17
S	-	0.23
Overall	**-**	**0.20**

5.11 Summer Special Test Points Assessment

5.11.1 A summary of Special VRs for the Proposed Redevelopment under summer prevailing wind directions is provided in ***Table 5-10***.

Table 5-10 Summary of Special VRs for the Proposed Redevelopment Under Summer Prevailing Wind Directions

Summer Prevailing Wind Direction	Base Scheme	Proposed Scheme
SSW	-	0.11
SW	-	0.16
S	-	0.18
ESE	-	0.14
SSE	-	0.12
SE	-	0.10
E	-	0.23
WSW	-	0.13
Overall	**-**	**0.14**

5.12 Special Test Points Assessment Findings

5.12.1 Special Test Points are designated within the Site and are not included in the Site and Local Air Ventilation Assessments. They are positioned at areas that will have potential impact arising from the incorporation of good design features in the Proposed Scheme. Since the building layout in the Proposed Scheme has differed from that in the Base Scheme, comparison of VR among the two schemes is considered to be inappropriate. Therefore, the VR for Special Test Points are only used to analyse the potential effect from the good design elements.

5.12.2 Test points S1 is positioned on the eastern portion of the Site and on the new access road arising from the removal of Multi-purpose Hall in the Base Scheme. S2, S3 and S4 are positioned in the landscape area, which is considered to be an open space that potentially facilitate air movement. S5 and S6 are located at the junction of the increased building separation distance between Block E and Block F. S7, S8, S9 and S10 are positioned in the newly-introduced landscape area in Phase 3, which is a rather open area promoting air ventilation.

5.12.3 Generally speaking, the VR for Special Test Points have a similar performance compared to the LVR. Obvious improvement is observed under ENE wind, E wind and S wind, which have a VR of 0.28, 0.26 and 0.23.

5.12.4 The VR under ENE wind appear to be much higher that both SVR and LVR. The VR for test point S6 and S8 are particularly high, recorded as 0.42 and 0.41. The access wind brought by Lai King Hill Road in the east has benefited the air ventilation performance north of the Site along the new access road. The landscape area in Phase 3 has also helped in facilitating air movement within that local area.

5.12.5 The VR under E wind appears to be higher than both SVR and LVR. The VR for test point S4, S6 and S10 are particularly high, being 0.42, 0.40 and 0.60 respectively. It implies that the access road surrounding building leads to a better ventilation performance. The landscape area in Phase 3 is also believed to have benefited the air movement at these locations. Considering E wind being the most dominant wind throughout the year, the ventilation performance at pedestrian level within the Site will be significantly improved by the incorporation of the three design features.

5.12.6 The VR under S wind is also higher compared to overall SVR and LVR. The VR for test point S1 and S5 are particularly high, being 0.40 and 0.41 respectively. The S wind brought by the highway network diverges to the two sides of the Site and ventilates the east and west of the Site area. The increase of VR in S5 also leads to a relatively high VR for S6. This implies that the enlarged building separation between Block E and Block F is able to act as a local air path to facilitate air movement.

6 MITIGATION MEASURES

6.1.1 As presented in ***Table 5-3***, the Proposed Scheme shows a slight drop in VR under annual wind condition of 0.01 at Focus Group G0, G1 and G6; of 0.02 at G4; and of 0.04 at G9, when compared to the Base Scheme, but these differences are considered minimal. As presented in ***Table 5-4***, the Proposed Scheme also shows a slight drop in VR under summer wind condition of 0.01 at G1 and G6, when compared to the Base Scheme, but these differences are also considered minimal.

6.1.2 The greatest drop in VR of 0.04 is experienced at G9, which is therefore a key focus area of concern. Potential air ventilation impacts should be alleviated as far as possible through the following mitigation measures that shall be incorporated in the Detailed Design.

6.1.3 The landscape area south of Block D and E is on a podium above a car park at ground level and the CFD model shows all the prevailing winds will be blocked by the solid structure of the car park podium and forced to skim over it without reaching the ground. This means that air ventilation at downstream pedestrian level, including G9, may be affected.

6.1.4 In order the increase the wind penetration through the Site under Proposed Scheme, it is recommended to increase the permeability of the car park podium. The floors below the entrance are simulated as solid structure with façade in the CFD Model. In reality, however, the podium car park will be made permeable so as to improve the air ventilation performance at the pedestrian level.

6.1.5 The floor-to-ceiling height of the car park is approximately 4.5m, as indicated in the Sectional Plan in the Planning Statement. It is recommended that southern facade is designed as a semi-open floor, eliminating the solid façade, as shown in ***Figure 6-1***. A parapet of 1.5m would be provided at the bottom and the remaining vertical 3m above would be open for air infiltration, as illustrated in ***Figure 6-2***.

6.1.6 Since the southern part floor would be open without façade obstruction, it will provide an air path for wind from SE and SW to penetrate in and maintain the wind flow, thus improving the overall ventilation performance, including G9.

6.1.7 Focus Group G1 currently experiences low VR under the existing Base Scheme. The future Proposed Scheme will result in minimal drop of 0.01, based on assessment of the current preliminary design, and there are no obvious mitigation measures that can be recommended for the preliminary design. Nevertheless, during the detailed design stage, the Applicant commits to review the detailed design to see whether improvements can be made to improve the ventilation at G1.

Figure 6-1 Open Floor in the Carpark (Front View) – Mitigated (Indicative)

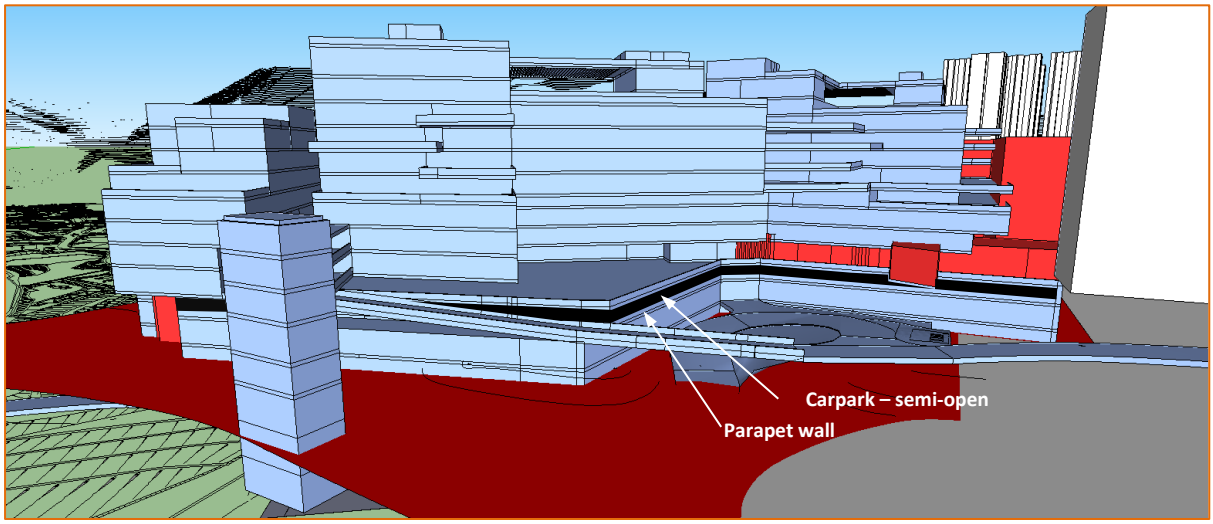
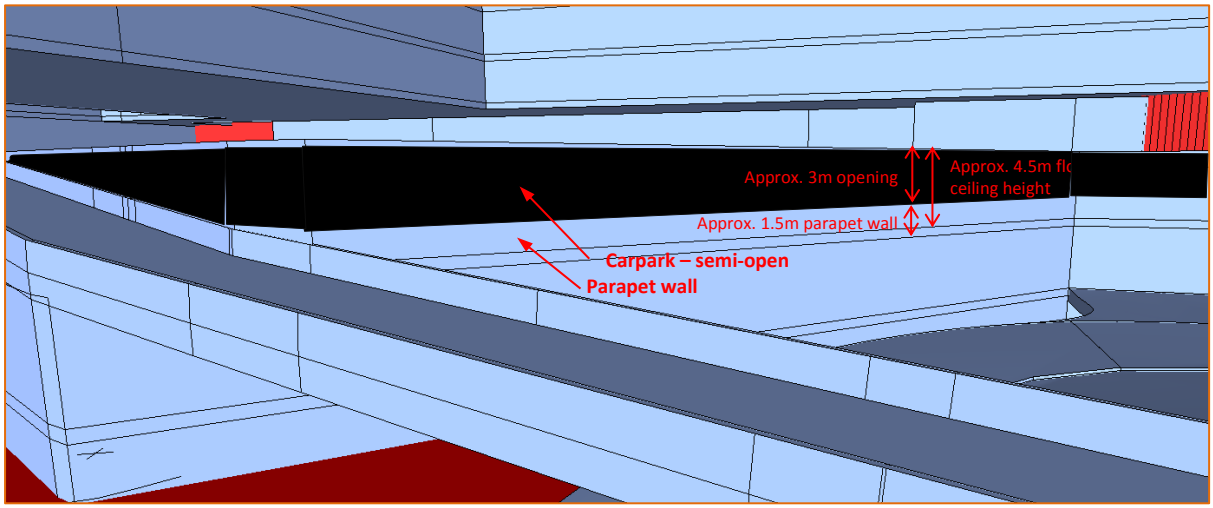


Figure 6-2 Open Floor in the Carpark (Zoom In) – Mitigated (Indicative)



7 CONCLUSION

7.1.1 The Proposed Redevelopment is within the 55,085m^2 Kwai Chung Hospital site, located on a hill in Kwai Chung. To the north of the Site is the Lai Chi Kok Fresh Water Service Reservoir; to the east is a cluster of residential developments; to the south is Princess Margaret Hospital; and to the west is PMH Nurses Training School and Quarters, with highways and container terminals further west. The building height restriction for developments in the area is not more than 110 mPD as stipulated in the OZP.

7.1.2 An Initial AVA Study has been conducted to assess the characteristics of wind availability at the Site. A series of CFD simulations have been conducted to quantitatively estimate and analyse different wind directions and investigate the effectiveness towards the implementation of two Schemes, the “Base Scheme” and the “Proposed Scheme”. Both annual and summer wind conditions were analysed under both Schemes.

7.1.3 The Base Scheme considers the ventilation performance at the Site with the existing hospital, whereas the Proposed Scheme considers the ventilation performance of the Proposed Redevelopment with a different layout and three major design improvements, namely only two building blocks in Phase 2 and an entire landscape area in Phase 3; a building separation distance of 13.2m between two blocks, and a 18.4m wide access road between Phase 1 and Phase 2. The Base Scheme is a semi-enclosed structure with five building blocks in the area of Phase 2 and Phase 3; a building separation distance of 2.9m between two blocks, and a 3.4m wide space between Phase 1 and Phase 2.

7.1.4 The Velocity Ratio (VR) as proposed by the Technical Circular was employed to assess the ventilation performance of the Proposed Redevelopment and surrounding environment. A total of 40 perimeter test points and 65 overall test points were selected to assess the air ventilation performance at the surrounding existing developments, while 10 special test points are positioned within the Site to assess the potential impact from the good design features. To further assess the impact of the Proposed Redevelopment on the wind environment of its immediate vicinity, 11 focus areas were identified. Results showed that improvement of the average velocity ratios is achieved in most focus areas for the Proposed Scheme.

7.1.5 The AVA study findings reveal that the three additional design parameters of the Proposed Redevelopment is unlikely to have any adverse ventilation performance impacts towards pedestrian areas at nearby areas and within the Site. At annual wind condition, the average SVRs under all 8 annual prevailing winds decrease by 0.01 under Proposed Scheme. The average LVRs under all 8 annual prevailing winds increase by 0.01 under Proposed Scheme. At summer wind condition, the average SVR remains at 0.21, while the average LVR remains at 0.19 in both Schemes. Directional analysis for the local air ventilation has been performed to understand the impact of the Proposed Redevelopment from the prevailing wind directions. Mitigation measures have been proposed to be incorporated in the Detailed Design to alleviate the potential air ventilation impacts on particular focus areas. Upon analysis, the Proposed Scheme would have no overall impact on the local environment, and the slight change in the SVR under annual condition is considered minimal and insignificant towards the site and surrounding environment.

7.1.6 As analysed in the previous sections, all its impacts upon ventilation performance of potential pedestrian areas and site perimeter areas with respect to impact from the

Proposed Redevelopment are deemed insignificant and thus are unlikely to affect the human activities. Therefore, it can be concluded that the three additional design parameters are unlikely to have a significant adverse wind impact on pedestrian level ventilation performance.

APPENDIX A

Annual and Summer Wind Speed (RAMS Data)

Annual Wind Data (Grid: 72, 48) – at 500m

e_01201	Wind_direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
V_infinity(m/s)	Sum	0.023	0.05	0.087	0.103	0.191	0.129	0.07	0.052	0.058	0.081	0.06	0.028	0.025	0.015	0.014	0.013
00_to_01	0.029	0.001	0.002	0.002	0.002	0.005	0.002	0.001	0.001	0.002	0.001	0.001	0.001	0.003	0.001	0.001	0.001
01_to_02	0.074	0.004	0.005	0.006	0.007	0.011	0.006	0.005	0.004	0.004	0.004	0.004	0.003	0.005	0.002	0.002	0.003
02_to_03	0.097	0.005	0.007	0.008	0.01	0.014	0.008	0.006	0.006	0.007	0.007	0.005	0.004	0.004	0.002	0.002	0.003
03_to_04	0.101	0.004	0.007	0.008	0.011	0.016	0.008	0.006	0.006	0.006	0.008	0.006	0.004	0.004	0.003	0.002	0.002
04_to_05	0.111	0.003	0.007	0.009	0.012	0.021	0.01	0.006	0.006	0.007	0.01	0.006	0.004	0.003	0.002	0.002	0.002
05_to_06	0.112	0.002	0.005	0.01	0.012	0.022	0.013	0.008	0.006	0.007	0.01	0.007	0.003	0.002	0.002	0.002	0.001
06_to_07	0.102	0.001	0.004	0.009	0.012	0.021	0.013	0.008	0.006	0.006	0.009	0.007	0.002	0.001	0.001	0.001	0.001
07_to_08	0.092	0.001	0.003	0.008	0.01	0.019	0.015	0.007	0.005	0.006	0.008	0.006	0.002	0.001	0.001	0.001	0
08_to_09	0.079	0	0.002	0.007	0.008	0.018	0.013	0.006	0.003	0.005	0.008	0.005	0.001	0.001	0	0	0
09_to_10	0.062	0	0.002	0.005	0.006	0.013	0.011	0.005	0.003	0.003	0.006	0.004	0.001	0	0	0	0
10_to_11	0.047	0	0.001	0.005	0.004	0.011	0.009	0.004	0.002	0.001	0.005	0.003	0.001	0	0	0	0
11_to_12	0.032	0	0.001	0.004	0.003	0.007	0.006	0.003	0.001	0.001	0.003	0.003	0	0	0	0	0
12_to_13	0.02	0	0.001	0.003	0.002	0.004	0.004	0.001	0.001	0	0.002	0.001	0	0	0	0	0
13_to_14	0.014	0	0.001	0.002	0.001	0.003	0.003	0.001	0.001	0	0.001	0.001	0	0	0	0	0
14_to_15	0.009	0	0	0.001	0.001	0.002	0.002	0.001	0	0	0.001	0.001	0	0	0	0	0
15_to_16	0.006	0	0.001	0.001	0.001	0.001	0.001	0	0	0	0	0	0	0	0	0	0
16_to_17	0.004	0	0	0	0	0.001	0.001	0	0	0	0	0	0	0	0	0	0
17_to_18	0.003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18_to_19	0.002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19_to_20	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20_to_21	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21_to_22	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22_to_23	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23_to_24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Summer Wind Data (Grid: 72, 48) – at 500m

e_01201	Wind_direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
V_infinity(m/s)	Sum	0.012	0.013	0.016	0.025	0.076	0.095	0.076	0.079	0.107	0.17	0.146	0.063	0.051	0.03	0.022	0.015
00_to_01	0.025	0.001	0.001	0.001	0.001	0.003	0.002	0.001	0.001	0.002	0.002	0.001	0.002	0.003	0.001	0.001	0.001
01_to_02	0.067	0.002	0.003	0.002	0.003	0.003	0.003	0.005	0.005	0.006	0.006	0.007	0.006	0.009	0.003	0.001	0.002
02_to_03	0.099	0.003	0.003	0.002	0.003	0.004	0.005	0.007	0.009	0.011	0.012	0.012	0.009	0.009	0.003	0.002	0.002
03_to_04	0.106	0.002	0.001	0.001	0.002	0.006	0.005	0.007	0.007	0.01	0.018	0.016	0.01	0.008	0.006	0.003	0.003
04_to_05	0.108	0.001	0.001	0.001	0.002	0.007	0.007	0.006	0.009	0.012	0.02	0.014	0.009	0.007	0.005	0.004	0.003
05_to_06	0.104	0.001	0	0.001	0.001	0.008	0.008	0.008	0.009	0.013	0.02	0.017	0.006	0.004	0.004	0.003	0.001
06_to_07	0.097	0.001	0	0.001	0.001	0.007	0.009	0.006	0.008	0.012	0.018	0.017	0.005	0.003	0.003	0.003	0.001
07_to_08	0.092	0	0	0.001	0.002	0.008	0.011	0.008	0.007	0.012	0.017	0.015	0.005	0.002	0.002	0.002	0.001
08_to_09	0.077	0	0	0.001	0.001	0.007	0.009	0.006	0.006	0.011	0.015	0.013	0.003	0.001	0.001	0.002	0.001
09_to_10	0.057	0	0	0	0.002	0.005	0.008	0.005	0.005	0.008	0.011	0.008	0.003	0.001	0	0.001	0
10_to_11	0.048	0	0.001	0	0.001	0.005	0.006	0.004	0.004	0.003	0.012	0.008	0.002	0.001	0	0	0
11_to_12	0.035	0	0	0.001	0.001	0.004	0.005	0.002	0.004	0.002	0.006	0.007	0.001	0.001	0	0	0
12_to_13	0.023	0	0	0	0.001	0.002	0.004	0.002	0.003	0.001	0.005	0.004	0	0.001	0	0	0
13_to_14	0.018	0	0	0	0.001	0.001	0.004	0.003	0.001	0.001	0.003	0.003	0	0	0	0	0
14_to_15	0.013	0	0	0	0.001	0.002	0.003	0.002	0	0.001	0.002	0.002	0.001	0	0	0	0
15_to_16	0.009	0	0	0	0	0.002	0.003	0.001	0	0.001	0.001	0.001	0	0	0	0	0
16_to_17	0.005	0	0	0	0	0.001	0.001	0	0	0.001	0	0	0	0	0	0	0
17_to_18	0.004	0	0	0	0	0	0.001	0.001	0	0.001	0	0	0	0	0	0	0
18_to_19	0.002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19_to_20	0.002	0	0	0	0	0	0	0	0	0.001	0	0	0	0	0	0	0
20_to_21	0.002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21_to_22	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22_to_23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23_to_24	0.001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX B

Velocity Ratio (VR) Results for Annual and Summer Prevailing Wind

Base Scheme – Perimeter Test Points Velocity Ratio (VR) under Annual Prevailing Wind

							E	ESE	ENE	NE	SSW	SE	SW	S	Weighted VR
						Velocity @ Infinite	6.432	6.988	6.000	6.575	6.611	6.214	6.383	5.043	
						Probability	0.191	0.129	0.103	0.087	0.081	0.070	0.060	0.058	
ID	Model ID	x	y	Z at 2m	X coordinates	Y coordinates									
P1	P1	31545.09	22741.23	37.44	831545.09	822741.23	0.27	0.05	0.31	0.09	0.29	0.12	0.28	0.44	0.22
P2	P2	31563.60	22765.22	46.38	831563.60	822765.22	0.48	0.23	0.19	0.09	0.30	0.13	0.27	0.30	0.28
P3	P3	31588.56	22761.92	50.09	831588.56	822761.92	0.35	0.23	0.20	0.11	0.35	0.14	0.33	0.22	0.25
P4	P4	31612.20	22749.02	52.69	831612.20	822749.02	0.31	0.19	0.23	0.23	0.37	0.15	0.36	0.17	0.26
P5	P5	31623.30	22725.49	46.23	831623.30	822725.49	0.21	0.08	0.09	0.35	0.35	0.12	0.34	0.11	0.20
P6	P6	31654.53	22724.58	54.95	831654.53	822724.58	0.15	0.06	0.10	0.46	0.36	0.11	0.42	0.15	0.20
P7	P7	31683.60	22734.00	67.35	831683.60	822734.00	0.25	0.11	0.16	0.51	0.36	0.13	0.48	0.18	0.26
P8	P8	31709.09	22749.27	79.88	831709.09	822749.27	0.77	0.31	0.42	0.49	0.40	0.17	0.56	0.29	0.47
P9	P9	31729.49	22762.30	87.06	831729.49	822762.30	0.84	0.36	0.50	0.54	0.42	0.21	0.54	0.37	0.52
P10	P10	31750.13	22744.42	85.47	831750.13	822744.42	0.75	0.32	0.41	0.46	0.37	0.16	0.52	0.34	0.46
P11	P11	31778.50	22735.71	85.40	831778.50	822735.71	0.73	0.34	0.34	0.38	0.14	0.14	0.21	0.27	0.39
P12	P12	31807.89	22745.02	87.42	831807.89	822745.02	0.79	0.37	0.65	0.54	0.14	0.20	0.25	0.25	0.47
P13	P13	31834.89	22751.11	85.23	831834.89	822751.11	0.81	0.40	0.73	0.60	0.16	0.31	0.15	0.21	0.50
P14	P14	31850.41	22736.70	78.65	831850.41	822736.70	0.72	0.36	0.72	0.52	0.14	0.29	0.21	0.22	0.46
P15	P15	31879.70	22720.90	70.31	831879.70	822720.90	0.56	0.29	0.57	0.47	0.11	0.27	0.07	0.32	0.38
P16	P16	31890.87	22690.83	67.81	831890.87	822690.83	0.67	0.24	0.68	0.53	0.28	0.17	0.28	0.41	0.45
P17	P17	31909.48	22670.02	66.82	831909.48	822670.02	0.59	0.13	0.50	0.36	0.08	0.35	0.14	0.13	0.33
P18	P18	31927.91	22648.47	67.11	831927.91	822648.47	0.53	0.10	0.42	0.22	0.13	0.41	0.13	0.31	0.31
P19	P19	31937.36	22619.21	69.94	831937.36	822619.21	0.42	0.41	0.50	0.34	0.13	0.42	0.12	0.34	0.36
P20	P20	31946.62	22595.22	71.56	831946.62	822595.22	0.30	0.51	0.52	0.38	0.17	0.45	0.11	0.33	0.36
P21	P21	31955.12	22571.84	71.76	831955.12	822571.84	0.58	0.54	0.42	0.28	0.22	0.44	0.18	0.38	0.42
P22	P22	31928.90	22564.30	74.82	831928.90	822564.30	0.19	0.15	0.40	0.43	0.17	0.07	0.10	0.20	0.22
P23	P23	31916.81	22591.99	76.23	831916.81	822591.99	0.38	0.25	0.59	0.36	0.14	0.12	0.06	0.14	0.29
P24	P24	31885.24	22578.39	74.21	831885.24	822578.39	0.23	0.06	0.09	0.11	0.07	0.07	0.06	0.09	0.12
P25	P25	31853.05	22564.53	75.07	831853.05	822564.53	0.26	0.08	0.10	0.14	0.12	0.06	0.13	0.07	0.14
P26	P26	31829.88	22547.76	75.50	831829.88	822547.76	0.17	0.10	0.16	0.22	0.12	0.03	0.10	0.15	0.14
P27	P27	31804.30	22536.70	71.92	831804.30	822536.70	0.07	0.08	0.04	0.03	0.37	0.10	0.38	0.24	0.13
P28	P28	31781.74	22562.14	64.76	831781.74	822562.14	0.24	0.19	0.17	0.18	0.20	0.08	0.23	0.14	0.19
P29	P29	31753.77	22560.40	54.73	831753.77	822560.40	0.20	0.16	0.17	0.20	0.20	0.07	0.21	0.24	0.18
P30	P30	31722.99	22562.25	47.37	831722.99	822562.25	0.09	0.14	0.11	0.13	0.17	0.05	0.28	0.16	0.13
P31	P31	31700.91	22550.54	41.99	831700.91	822550.54	0.09	0.17	0.06	0.08	0.14	0.09	0.27	0.10	0.12
P32	P32	31689.68	22572.97	41.57	831689.68	822572.97	0.07	0.17	0.13	0.10	0.15	0.06	0.16	0.06	0.11
P33	P33	31682.83	22595.82	41.85	831682.83	822595.82	0.12	0.17	0.06	0.19	0.12	0.02	0.16	0.07	0.12
P34	P34	31676.78	22618.13	41.10	831676.78	822618.13	0.18	0.15	0.14	0.13	0.12	0.03	0.07	0.09	0.13
P35	P35	31666.60	22642.24	38.06	831666.60	822642.24	0.23	0.10	0.17	0.11	0.07	0.02	0.14	0.06	0.13
P36	P36	31652.14	22664.24	37.75	831652.14	822664.24	0.28	0.02	0.15	0.20	0.12	0.01	0.29	0.08	0.16
P37	P37	31633.24	22684.83	36.64	831633.24	822684.83	0.27	0.02	0.14	0.45	0.27	0.03	0.29	0.05	0.19
P38	P38	31610.98	22701.08	36.30	831610.98	822701.08	0.24	0.08	0.07	0.37	0.33	0.07	0.31	0.10	0.20
P39	P39	31588.98	22713.40	35.93	831588.98	822713.40	0.20	0.10	0.13	0.27	0.34	0.10	0.30	0.22	0.20
P40	P40	31568.35	22728.76	36.06	831568.35	822728.76	0.16	0.07	0.25	0.15	0.31	0.11	0.28	0.31	0.19
						Average	0.37	0.20	0.29	0.30	0.22	0.15	0.24	0.21	**0.27**
						Min	0.07	0.02	0.04	0.03	0.07	0.01	0.05	0.05	**0.11**
						Max	0.84	0.54	0.73	0.60	0.42	0.45	0.56	0.44	**0.52**

Proposed Scheme – Perimeter Test Points Velocity Ratio (VR) under Annual Prevailing Wind

							E	ESE	ENE	NE	SSW	SE	SW	S	Weighted VR
						Velocity @ Infinite	6.432	6.988	6.000	6.575	6.611	6.214	6.383	5.043	
						Probability	0.191	0.129	0.103	0.087	0.081	0.070	0.060	0.058	
ID	Model ID	x	y	Z at 2m	X coordinates	Y coordinates									
P1	P1	31545.09	22741.24	37.44	831545.09	822741.24	0.21	0.08	0.27	0.21	0.31	0.15	0.30	0.42	0.22
P2	P2	31563.60	22765.22	46.38	831563.60	822765.22	0.49	0.19	0.33	0.10	0.32	0.16	0.28	0.32	0.30
P3	P3	31588.56	22761.92	50.09	831588.56	822761.92	0.31	0.14	0.24	0.19	0.36	0.16	0.32	0.22	0.24
P4	P4	31612.20	22749.02	52.69	831612.20	822749.02	0.23	0.11	0.15	0.35	0.37	0.16	0.35	0.16	0.23
P5	P5	31623.30	22725.49	46.23	831623.30	822725.49	0.13	0.10	0.08	0.44	0.35	0.15	0.32	0.17	0.19
P6	P6	31654.53	22724.59	54.95	831654.53	822724.59	0.06	0.09	0.14	0.30	0.34	0.07	0.40	0.32	0.18
P7	P7	31683.60	22734.00	67.35	831683.60	822734.00	0.38	0.15	0.22	0.40	0.36	0.12	0.48	0.41	0.31
P8	P8	31709.09	22749.26	79.88	831709.09	822749.26	0.70	0.33	0.49	0.50	0.31	0.16	0.41	0.45	0.46
P9	P9	31729.49	22762.30	87.06	831729.49	822762.30	0.78	0.38	0.43	0.49	0.29	0.20	0.46	0.45	0.48
P10	P10	31750.12	22744.42	85.47	831750.12	822744.42	0.68	0.36	0.41	0.43	0.17	0.17	0.24	0.17	0.39
P11	P11	31778.50	22735.70	85.40	831778.50	822735.70	0.68	0.35	0.42	0.49	0.14	0.18	0.07	0.17	0.38
P12	P12	31807.89	22745.02	87.42	831807.89	822745.02	0.74	0.39	0.62	0.56	0.17	0.33	0.12	0.25	0.46
P13	P13	31834.89	22751.11	85.23	831834.89	822751.11	0.77	0.41	0.64	0.60	0.20	0.39	0.11	0.16	0.49
P14	P14	31850.42	22736.71	78.65	831850.42	822736.71	0.75	0.39	0.63	0.56	0.22	0.39	0.13	0.23	0.48
P15	P15	31879.71	22720.91	70.31	831879.71	822720.91	0.68	0.32	0.60	0.48	0.23	0.39	0.15	0.24	0.44
P16	P16	31890.86	22690.83	67.81	831890.86	822690.83	0.48	0.20	0.40	0.30	0.18	0.40	0.16	0.20	0.32
P17	P17	31909.48	22670.02	66.82	831909.48	822670.02	0.49	0.10	0.15	0.33	0.20	0.40	0.14	0.27	0.28
P18	P18	31927.91	22648.47	67.11	831927.91	822648.47	0.50	0.15	0.30	0.38	0.23	0.41	0.12	0.44	0.33
P19	P19	31937.36	22619.21	69.94	831937.36	822619.21	0.43	0.41	0.49	0.39	0.19	0.44	0.09	0.28	0.37
P20	P20	31946.61	22595.21	71.56	831946.61	822595.21	0.28	0.50	0.54	0.33	0.26	0.47	0.13	0.15	0.35
P21	P21	31955.12	22571.84	71.76	831955.12	822571.84	0.49	0.50	0.46	0.19	0.29	0.45	0.14	0.17	0.38
P22	P22	31928.90	22564.30	74.82	831928.90	822564.30	0.27	0.10	0.42	0.34	0.19	0.08	0.08	0.15	0.22
P23	P23	31916.81	22591.98	76.23	831916.81	822591.98	0.54	0.12	0.63	0.55	0.22	0.08	0.11	0.26	0.35
P24	P24	31885.25	22578.39	74.21	831885.25	822578.39	0.28	0.10	0.61	0.34	0.15	0.09	0.23	0.15	0.26
P25	P25	31853.06	22564.53	75.07	831853.06	822564.53	0.14	0.17	0.43	0.13	0.13	0.04	0.23	0.08	0.17
P26	P26	31829.88	22547.76	75.50	831829.88	822547.76	0.22	0.18	0.42	0.19	0.16	0.07	0.06	0.28	0.21
P27	P27	31804.29	22536.69	71.92	831804.29	822536.69	0.12	0.25	0.19	0.16	0.19	0.08	0.34	0.32	0.19
P28	P28	31781.73	22562.14	64.76	831781.73	822562.14	0.09	0.09	0.19	0.11	0.15	0.08	0.11	0.34	0.13
P29	P29	31753.77	22560.41	54.73	831753.77	822560.41	0.11	0.15	0.20	0.29	0.24	0.06	0.21	0.31	0.18
P30	P30	31722.99	22562.26	47.37	831722.99	822562.26	0.13	0.15	0.23	0.29	0.17	0.05	0.28	0.13	0.17
P31	P31	31700.91	22550.54	41.99	831700.91	822550.54	0.17	0.16	0.22	0.28	0.17	0.11	0.30	0.09	0.18
P32	P32	31689.68	22572.96	41.57	831689.68	822572.96	0.16	0.15	0.22	0.23	0.16	0.07	0.31	0.16	0.18
P33	P33	31682.82	22595.81	41.85	831682.82	822595.81	0.12	0.13	0.11	0.20	0.16	0.05	0.20	0.23	0.14
P34	P34	31676.78	22618.13	41.10	831676.78	822618.13	0.02	0.02	0.02	0.03	0.02	0.01	0.03	0.02	0.02
P35	P35	31666.60	22642.24	38.06	831666.60	822642.24	0.12	0.08	0.12	0.12	0.07	0.05	0.10	0.25	0.11
P36	P36	31652.14	22664.23	37.75	831652.14	822664.23	0.11	0.02	0.13	0.13	0.09	0.04	0.13	0.32	0.11
P37	P37	31633.24	22684.83	36.64	831633.24	822684.83	0.07	0.05	0.11	0.23	0.15	0.03	0.23	0.25	0.12
P38	P38	31610.98	22701.08	36.30	831610.98	822701.08	0.12	0.12	0.05	0.41	0.33	0.13	0.29	0.16	0.18
P39	P39	31588.99	22713.41	35.93	831588.99	822713.41	0.12	0.11	0.10	0.31	0.36	0.12	0.30	0.23	0.18
P40	P40	31568.35	22728.76	36.06	831568.35	822728.76	0.08	0.08	0.17	0.23	0.34	0.13	0.29	0.34	0.17
						Average	0.33	0.20	0.31	0.31	0.22	0.18	0.22	0.24	**0.26**
						Min	0.02	0.02	0.02	0.03	0.02	0.01	0.03	0.02	**0.02**
						Max	0.78	0.50	0.64	0.60	0.37	0.47	0.48	0.45	**0.49**

Base Scheme – Overall Test Points Velocity Ratio (VR) under Annual Prevailing Wind

							E	ESE	ENE	NE	SSW	SE	SW	S	
						Velocity @ Infinite	6.432	6.988	6.000	6.575	6.611	6.214	6.383	5.043	
						Probability	0.191	0.129	0.103	0.087	0.081	0.07	0.06	0.058	
ID	Model ID	x	y	Z at 2m	X coordinates	Y coordinates									Weighted VR
P1	P1	31545.09	22741.23	37.44	831545.09	822741.23	0.27	0.05	0.31	0.09	0.29	0.12	0.28	0.44	0.22
P2	P2	31563.60	22765.22	46.38	831563.60	822765.22	0.48	0.23	0.19	0.09	0.30	0.13	0.27	0.30	0.28
P3	P3	31588.56	22761.92	50.09	831588.56	822761.92	0.35	0.23	0.20	0.11	0.35	0.14	0.33	0.22	0.25
P4	P4	31612.20	22749.02	52.69	831612.20	822749.02	0.31	0.19	0.23	0.23	0.37	0.15	0.36	0.17	0.26
P5	P5	31623.30	22725.49	46.23	831623.30	822725.49	0.21	0.08	0.09	0.35	0.35	0.12	0.34	0.11	0.20
P6	P6	31654.53	22724.58	54.95	831654.53	822724.58	0.15	0.06	0.10	0.46	0.36	0.11	0.42	0.15	0.20
P7	P7	31683.60	22734.00	67.35	831683.60	822734.00	0.25	0.11	0.16	0.51	0.36	0.13	0.48	0.18	0.26
P8	P8	31709.09	22749.27	79.88	831709.09	822749.27	0.77	0.31	0.42	0.49	0.40	0.17	0.56	0.29	0.47
P9	P9	31729.49	22762.30	87.06	831729.49	822762.30	0.84	0.36	0.50	0.54	0.42	0.21	0.54	0.37	0.52
P10	P10	31750.13	22744.42	85.47	831750.13	822744.42	0.75	0.32	0.41	0.46	0.37	0.16	0.52	0.34	0.46
P11	P11	31778.50	22735.71	85.40	831778.50	822735.71	0.73	0.34	0.34	0.38	0.14	0.14	0.21	0.27	0.39
P12	P12	31807.89	22745.02	87.42	831807.89	822745.02	0.79	0.37	0.65	0.54	0.14	0.20	0.25	0.25	0.47
P13	P13	31834.89	22751.11	85.23	831834.89	822751.11	0.81	0.40	0.73	0.60	0.16	0.31	0.15	0.21	0.50
P14	P14	31850.41	22736.70	78.65	831850.41	822736.70	0.72	0.36	0.72	0.52	0.14	0.29	0.21	0.22	0.46
P15	P15	31879.70	22720.90	70.31	831879.70	822720.90	0.56	0.29	0.57	0.47	0.11	0.27	0.07	0.32	0.38
P16	P16	31890.87	22690.83	67.81	831890.87	822690.83	0.67	0.24	0.68	0.53	0.28	0.17	0.28	0.41	0.45
P17	P17	31909.48	22670.02	66.82	831909.48	822670.02	0.59	0.13	0.50	0.36	0.08	0.35	0.14	0.13	0.33
P18	P18	31927.91	22648.47	67.11	831927.91	822648.47	0.53	0.10	0.42	0.22	0.13	0.41	0.13	0.31	0.31
P19	P19	31937.36	22619.21	69.94	831937.36	822619.21	0.42	0.41	0.50	0.34	0.13	0.42	0.12	0.34	0.36
P20	P20	31946.62	22595.22	71.56	831946.62	822595.22	0.30	0.51	0.52	0.38	0.17	0.45	0.11	0.33	0.36
P21	P21	31955.12	22571.84	71.76	831955.12	822571.84	0.58	0.54	0.42	0.28	0.22	0.44	0.18	0.38	0.42
P22	P22	31928.90	22564.30	74.82	831928.90	822564.30	0.19	0.15	0.40	0.43	0.17	0.07	0.10	0.20	0.22
P23	P23	31916.81	22591.99	76.23	831916.81	822591.99	0.38	0.25	0.59	0.36	0.14	0.12	0.06	0.14	0.29
P24	P24	31885.24	22578.39	74.21	831885.24	822578.39	0.23	0.06	0.09	0.11	0.07	0.07	0.06	0.09	0.12
P25	P25	31853.05	22564.53	75.07	831853.05	822564.53	0.26	0.08	0.10	0.14	0.12	0.06	0.13	0.07	0.14
P26	P26	31829.88	22547.76	75.50	831829.88	822547.76	0.17	0.10	0.16	0.22	0.12	0.03	0.10	0.15	0.14
P27	P27	31804.30	22536.70	71.92	831804.30	822536.70	0.07	0.08	0.04	0.03	0.37	0.10	0.38	0.24	0.13
P28	P28	31781.74	22562.14	64.76	831781.74	822562.14	0.24	0.19	0.17	0.18	0.20	0.08	0.23	0.14	0.19
P29	P29	31753.77	22560.40	54.73	831753.77	822560.40	0.20	0.16	0.17	0.20	0.20	0.07	0.21	0.24	0.18
P30	P30	31722.99	22562.25	47.37	831722.99	822562.25	0.09	0.14	0.11	0.13	0.17	0.05	0.28	0.16	0.13
P31	P31	31700.91	22550.54	41.99	831700.91	822550.54	0.18	0.06	0.08	0.10	0.01	0.07	0.02	0.04	0.09
P32	P32	31689.68	22572.97	41.57	831689.68	822572.97	0.12	0.12	0.24	0.08	0.07	0.16	0.05	0.18	0.13
P33	P33	31682.83	22595.82	41.85	831682.83	822595.82	0.38	0.16	0.40	0.20	0.14	0.06	0.06	0.23	0.24
P34	P34	31676.78	22618.13	41.10	831676.78	822618.13	0.23	0.09	0.30	0.16	0.05	0.12	0.03	0.07	0.15
P35	P35	31666.60	22642.24	38.06	831666.60	822642.24	0.44	0.19	0.44	0.28	0.13	0.04	0.06	0.24	0.27
P36	P36	31652.14	22664.24	37.75	831652.14	822664.24	0.38	0.06	0.49	0.43	0.08	0.05	0.04	0.21	0.25
P37	P37	31633.24	22684.83	36.64	831633.24	822684.83	0.34	0.07	0.49	0.43	0.15	0.02	0.13	0.21	0.25
P38	P38	31610.98	22701.08	36.30	831610.98	822701.08	0.15	0.05	0.20	0.06	0.05	0.05	0.07	0.11	0.10
P39	P39	31588.98	22713.40	35.93	831588.98	822713.40	0.18	0.09	0.18	0.25	0.11	0.11	0.20	0.33	0.17
P40	P40	31568.35	22728.76	36.06	831568.35	822728.76	0.16	0.06	0.11	0.10	0.10	0.06	0.08	0.23	0.12
L1	P41	31981.92	22784.34	16.37	831981.92	822784.34	0.18	0.06	0.08	0.10	0.01	0.07	0.02	0.04	0.09
L2	P42	31973.42	22750.51	18.42	831973.42	822750.51	0.12	0.12	0.24	0.08	0.07	0.16	0.05	0.18	0.13
L3	P43	32014.21	22740.22	17.41	832014.21	822740.22	0.38	0.16	0.40	0.20	0.14	0.06	0.06	0.23	0.24
L4	P44	31988.23	22720.33	25.55	831988.23	822720.33	0.23	0.09	0.30	0.16	0.05	0.12	0.03	0.07	0.15
L5	P45	32033.88	22703.85	13.82	832033.88	822703.85	0.44	0.19	0.44	0.28	0.13	0.04	0.06	0.24	0.27
L6	P46	32029.31	22665.90	12.12	832029.31	822665.90	0.38	0.06	0.49	0.43	0.08	0.05	0.04	0.21	0.25
L7	P47	32018.20	22633.01	16.94	832018.20	822633.01	0.34	0.07	0.49	0.43	0.15	0.02	0.13	0.21	0.25
L8	P48	32037.02	22601.31	11.53	832037.02	822601.31	0.15	0.05	0.20	0.06	0.05	0.05	0.07	0.11	0.10
L9	P49	32036.85	22561.89	21.74	832036.85	822561.89	0.18	0.09	0.18	0.25	0.11	0.11	0.20	0.33	0.17
L10	P50	32056.23	22523.00	18.04	832056.23	822523.00	0.16	0.06	0.11	0.10	0.10	0.06	0.08	0.23	0.12
L11	P51	32051.83	22681.82	10.64	832051.83	822681.82	0.34	0.06	0.31	0.36	0.16	0.05	0.03	0.29	0.22
L12	P52	32064.21	22638.58	10.41	832064.21	822638.58	0.18	0.21	0.13	0.07	0.14	0.18	0.12	0.29	0.16
L13	P53	32077.65	22591.60	9.72	832077.65	822591.60	0.31	0.27	0.25	0.07	0.20	0.33	0.18	0.35	0.25
L14	P54	31907.00	22576.00	73.33	831907.00	822576.00	0.57	0.16	0.46	0.50	0.08	0.12	0.13	0.29	0.33
L15	P55	31844.46	22528.35	75.68	831844.46	822528.35	0.14	0.15	0.10	0.12	0.14	0.06	0.08	0.14	0.13
L16	P56	31935.95	22531.26	78.71	831935.95	822531.26	0.13	0.09	0.12	0.15	0.32	0.09	0.25	0.30	0.16
L17	P57	31897.30	22514.08	78.48	831897.30	822514.08	0.17	0.09	0.20	0.14	0.05	0.10	0.07	0.12	0.13
L18	P58	31857.02	22496.17	78.04	831857.02	822496.17	0.33	0.26	0.15	0.16	0.12	0.16	0.07	0.14	0.20
L19	P59	31970.33	22525.48	71.81	831970.33	822525.48	0.51	0.40	0.42	0.40	0.23	0.33	0.20	0.40	0.39
L20	P60	31952.31	22493.69	78.04	831952.31	822493.69	0.09	0.23	0.07	0.16	0.15	0.15	0.17	0.16	0.14
L21	P61	31916.66	22478.56	79.23	831916.66	822478.56	0.10	0.12	0.11	0.09	0.33	0.06	0.12	0.35	0.14
L22	P62	31880.26	22463.12	79.17	831880.26	822463.12	0.29	0.11	0.09	0.07	0.20	0.08	0.07	0.15	0.15
L23	P63	31844.94	22463.23	76.20	831844.94	822463.23	0.11	0.17	0.14	0.20	0.12	0.10	0.13	0.14	0.14
L24	P64	31963.47	22472.55	74.25	831963.47	822472.55	0.72	0.27	0.16	0.13	0.18	0.16	0.20	0.31	0.33
L25	P65	31943.45	22453.60	72.40	831943.45	822453.60	0.33	0.17	0.13	0.11	0.17	0.11	0.17	0.21	0.20
L26	P66	31912.40	22440.88	72.82	831912.40	822440.88	0.42	0.27	0.20	0.09	0.19	0.16	0.27	0.23	0.26
L27	P67	31869.80	22440.66	71.66	831869.80	822440.66	0.33	0.14	0.18	0.14	0.30	0.14	0.39	0.33	0.24
L28	P68	31824.33	22453.98	71.98	831824.33	822453.98	0.16	0.06	0.26	0.21	0.13	0.09	0.21	0.16	0.16
L29	P69	31818.23	22486.72	73.08	831818.23	822486.72	0.12	0.18	0.29	0.17	0.18	0.10	0.18	0.11	0.17
L30	P70	31801.62	22513.01	69.61	831801.62	822513.01	0.09	0.06	0.18	0.09	0.28	0.05	0.25	0.09	0.13

L31	P71	31790.74	22545.58	65.76	831790.74	822545.58	0.06	0.03	0.05	0.09	0.22	0.05	0.30	0.10	0.09
L32	P72	31982.10	22452.56	62.97	831982.10	822452.56	0.31	0.18	0.37	0.11	0.12	0.25	0.09	0.50	0.25
L33	P73	31972.08	22419.11	61.26	831972.08	822419.11	0.45	0.28	0.34	0.50	0.12	0.11	0.43	0.41	0.34
L34	P74	31924.15	22413.37	64.10	831924.15	822413.37	0.51	0.37	0.38	0.12	0.16	0.28	0.38	0.26	0.34
L35	P75	31901.22	22389.07	61.26	831901.22	822389.07	0.29	0.42	0.27	0.28	0.17	0.21	0.20	0.48	0.30
L36	P76	31867.90	22414.31	62.73	831867.90	822414.31	0.50	0.36	0.25	0.15	0.28	0.23	0.43	0.44	0.35
L37	P77	31841.25	22391.46	60.21	831841.25	822391.46	0.27	0.50	0.08	0.19	0.18	0.26	0.37	0.52	0.29
L38	P78	31803.71	22399.10	53.51	831803.71	822399.10	0.27	0.38	0.09	0.15	0.10	0.15	0.36	0.23	0.22
L39	P79	31799.02	22437.71	58.95	831799.02	822437.71	0.09	0.04	0.15	0.33	0.32	0.06	0.15	0.11	0.14
L40	P80	31756.94	22437.51	50.11	831756.94	822437.51	0.23	0.24	0.07	0.39	0.45	0.11	0.46	0.53	0.28
L41	P81	31761.07	22483.41	52.03	831761.07	822483.41	0.19	0.17	0.17	0.28	0.20	0.07	0.14	0.19	0.18
L42	P82	31724.08	22494.85	47.51	831724.08	822494.85	0.16	0.11	0.13	0.20	0.28	0.13	0.19	0.39	0.18
L43	P83	31751.09	22530.03	48.96	831751.09	822530.03	0.18	0.12	0.15	0.14	0.11	0.07	0.27	0.10	0.15
L44	P84	31722.98	22544.30	43.76	831722.98	822544.30	0.13	0.14	0.14	0.08	0.11	0.07	0.32	0.11	0.13
L45	P85	31701.02	22441.30	42.71	831701.02	822441.30	0.05	0.15	0.13	0.09	0.08	0.05	0.07	0.10	0.09
L46	P86	31668.84	22445.70	28.80	831668.84	822445.70	0.16	0.22	0.14	0.14	0.28	0.05	0.17	0.49	0.19
L47	P87	31666.76	22502.11	39.43	831666.76	822502.11	0.21	0.02	0.10	0.41	0.16	0.08	0.15	0.12	0.16
L48	P88	31631.63	22526.83	30.13	831631.63	822526.83	0.17	0.14	0.20	0.06	0.32	0.06	0.27	0.55	0.20
L49	P89	31652.98	22565.84	36.52	831652.98	822565.84	0.02	0.12	0.07	0.22	0.10	0.02	0.17	0.06	0.09
L50	P90	31615.08	22586.93	33.18	831615.08	822586.93	0.14	0.07	0.16	0.28	0.20	0.03	0.42	0.16	0.17
L51	P91	31637.61	22607.00	36.01	831637.61	822607.00	0.09	0.08	0.13	0.26	0.12	0.03	0.11	0.15	0.11
L52	P92	31733.56	22448.44	48.07	831733.56	822448.44	0.18	0.15	0.22	0.38	0.13	0.14	0.14	0.69	0.23
L53	P93	31705.87	22474.08	44.63	831705.87	822474.08	0.12	0.10	0.10	0.24	0.19	0.17	0.17	0.35	0.16
L54	P94	31707.62	22508.42	44.19	831707.62	822508.42	0.12	0.15	0.13	0.11	0.25	0.15	0.18	0.23	0.15
L55	P95	31686.35	22533.04	41.00	831686.35	822533.04	0.06	0.20	0.08	0.08	0.14	0.12	0.19	0.10	0.12
L56	P96	31677.66	22567.09	38.99	831677.66	822567.09	0.09	0.20	0.13	0.07	0.14	0.07	0.15	0.05	0.12
L57	P97	31665.28	22605.13	37.83	831665.28	822605.13	0.11	0.13	0.14	0.20	0.13	0.02	0.12	0.15	0.13
L58	P98	31646.17	22641.07	34.58	831646.17	822641.07	0.22	0.04	0.13	0.26	0.06	0.02	0.22	0.09	0.14
L59	P99	31615.10	22673.17	31.95	831615.10	822673.17	0.25	0.05	0.08	0.45	0.29	0.03	0.31	0.06	0.19
L60	P100	31587.76	22694.23	32.08	831587.76	822694.23	0.25	0.12	0.11	0.32	0.37	0.07	0.33	0.22	0.22
L61	P101	31557.18	22710.10	33.36	831557.18	822710.10	0.23	0.13	0.25	0.21	0.37	0.10	0.34	0.46	0.24
L62	P102	31523.30	22726.82	34.38	831523.30	822726.82	0.23	0.12	0.31	0.12	0.33	0.12	0.31	0.52	0.24
L63	P103	31500.00	22757.56	37.02	831500.00	822757.56	0.59	0.17	0.16	0.22	0.21	0.13	0.19	0.39	0.29
L64	P104	31459.45	22757.69	31.95	831459.45	822757.69	0.52	0.09	0.04	0.14	0.20	0.12	0.15	0.43	0.24
L65	P105	31436.09	22788.98	41.75	831436.09	822788.98	0.55	0.25	0.13	0.08	0.16	0.18	0.06	0.44	0.27
						Average	0.30	0.17	0.25	0.24	0.18	0.13	0.20	0.24	**0.23**
						Min	0.02	0.02	0.04	0.03	0.01	0.02	0.02	0.04	**0.09**
						Max	0.84	0.54	0.73	0.60	0.45	0.45	0.56	0.69	**0.52**

Proposed Scheme – Overall Test Points Velocity Ratio (VR) under Annual Prevailing Wind

							E	ESE	ENE	NE	SSW	SE	SW	S	
						Velocity @ Infinite	6.432	6.988	6.000	6.575	6.611	6.214	6.383	5.043	
						Probability	0.191	0.129	0.103	0.087	0.081	0.070	0.060	0.058	
ID	Model ID	x	y	Z at 2m	X coordinates	Y coordinates									Weighted VR
P1	P1	31545.09	22741.24	37.44	831545.09	822741.24	0.21	0.08	0.27	0.21	0.31	0.15	0.30	0.42	0.22
P2	P2	31563.60	22765.22	46.38	831563.60	822765.22	0.49	0.19	0.33	0.10	0.32	0.16	0.28	0.32	0.30
P3	P3	31588.56	22761.92	50.09	831588.56	822761.92	0.31	0.14	0.24	0.19	0.36	0.16	0.32	0.22	0.24
P4	P4	31612.20	22749.02	52.69	831612.20	822749.02	0.23	0.11	0.15	0.35	0.37	0.16	0.35	0.16	0.23
P5	P5	31623.30	22725.49	46.23	831623.30	822725.49	0.13	0.10	0.08	0.44	0.35	0.15	0.32	0.17	0.19
P6	P6	31654.53	22724.59	54.95	831654.53	822724.59	0.06	0.09	0.14	0.30	0.34	0.07	0.40	0.32	0.18
P7	P7	31683.60	22734.00	67.35	831683.60	822734.00	0.38	0.15	0.22	0.40	0.36	0.12	0.48	0.41	0.31
P8	P8	31709.09	22749.26	79.88	831709.09	822749.26	0.70	0.33	0.49	0.50	0.31	0.16	0.41	0.45	0.46
P9	P9	31729.49	22762.30	87.06	831729.49	822762.30	0.78	0.38	0.43	0.49	0.29	0.20	0.46	0.45	0.48
P10	P10	31750.12	22744.42	85.47	831750.12	822744.42	0.68	0.36	0.41	0.43	0.17	0.17	0.24	0.17	0.39
P11	P11	31778.50	22735.70	85.40	831778.50	822735.70	0.68	0.35	0.42	0.49	0.14	0.18	0.07	0.17	0.38
P12	P12	31807.89	22745.02	87.42	831807.89	822745.02	0.74	0.39	0.62	0.56	0.17	0.33	0.12	0.25	0.46
P13	P13	31834.89	22751.11	85.23	831834.89	822751.11	0.77	0.41	0.64	0.60	0.20	0.39	0.11	0.16	0.49
P14	P14	31850.42	22736.71	78.65	831850.42	822736.71	0.75	0.39	0.63	0.56	0.22	0.39	0.13	0.23	0.48
P15	P15	31879.71	22720.91	70.31	831879.71	822720.91	0.68	0.32	0.60	0.48	0.23	0.39	0.15	0.24	0.44
P16	P16	31890.86	22690.83	67.81	831890.86	822690.83	0.48	0.20	0.40	0.30	0.18	0.40	0.16	0.20	0.32
P17	P17	31909.48	22670.02	66.82	831909.48	822670.02	0.49	0.10	0.15	0.33	0.20	0.40	0.14	0.27	0.28
P18	P18	31927.91	22648.47	67.11	831927.91	822648.47	0.50	0.15	0.30	0.38	0.23	0.41	0.12	0.44	0.33
P19	P19	31937.36	22619.21	69.94	831937.36	822619.21	0.43	0.41	0.49	0.39	0.19	0.44	0.09	0.28	0.37
P20	P20	31946.61	22595.21	71.56	831946.61	822595.21	0.28	0.50	0.54	0.33	0.26	0.47	0.13	0.15	0.35
P21	P21	31955.12	22571.84	71.76	831955.12	822571.84	0.49	0.50	0.46	0.19	0.29	0.45	0.14	0.17	0.38
P22	P22	31928.90	22564.30	74.82	831928.90	822564.30	0.27	0.10	0.42	0.34	0.19	0.08	0.08	0.15	0.22
P23	P23	31916.81	22591.98	76.23	831916.81	822591.98	0.54	0.12	0.63	0.55	0.22	0.08	0.11	0.26	0.35
P24	P24	31885.25	22578.39	74.21	831885.25	822578.39	0.28	0.10	0.61	0.34	0.15	0.09	0.23	0.15	0.26
P25	P25	31853.06	22564.53	75.07	831853.06	822564.53	0.14	0.17	0.43	0.13	0.13	0.04	0.23	0.08	0.17
P26	P26	31829.88	22547.76	75.50	831829.88	822547.76	0.22	0.18	0.42	0.19	0.16	0.07	0.06	0.28	0.21
P27	P27	31804.29	22536.69	71.92	831804.29	822536.69	0.12	0.25	0.19	0.16	0.19	0.08	0.34	0.32	0.19
P28	P28	31781.73	22562.14	64.76	831781.73	822562.14	0.09	0.09	0.19	0.11	0.15	0.08	0.11	0.34	0.13
P29	P29	31753.77	22560.41	54.73	831753.77	822560.41	0.11	0.15	0.20	0.29	0.24	0.06	0.21	0.31	0.18
P30	P30	31722.99	22562.26	47.37	831722.99	822562.26	0.13	0.15	0.23	0.29	0.17	0.05	0.28	0.13	0.17
P31	P31	31700.91	22550.54	41.99	831700.91	822550.54	0.20	0.05	0.07	0.08	0.03	0.03	0.01	0.04	0.08
P32	P32	31689.68	22572.96	41.57	831689.68	822572.96	0.11	0.06	0.21	0.10	0.05	0.06	0.03	0.16	0.10
P33	P33	31682.82	22595.81	41.85	831682.82	822595.81	0.37	0.18	0.34	0.26	0.09	0.09	0.05	0.23	0.23
P34	P34	31676.78	22618.13	41.10	831676.78	822618.13	0.23	0.09	0.22	0.15	0.03	0.06	0.01	0.06	0.13
P35	P35	31666.60	22642.24	38.06	831666.60	822642.24	0.41	0.06	0.47	0.32	0.11	0.10	0.08	0.21	0.25
P36	P36	31652.14	22664.23	37.75	831652.14	822664.23	0.29	0.03	0.50	0.42	0.11	0.04	0.05	0.24	0.23
P37	P37	31633.24	22684.83	36.64	831633.24	822684.83	0.20	0.11	0.49	0.41	0.15	0.02	0.11	0.21	0.22
P38	P38	31610.98	22701.08	36.30	831610.98	822701.08	0.09	0.06	0.21	0.09	0.06	0.06	0.06	0.12	0.10
P39	P39	31588.99	22713.41	35.93	831588.99	822713.41	0.18	0.13	0.19	0.35	0.11	0.12	0.21	0.37	0.20
P40	P40	31568.35	22728.76	36.06	831568.35	822728.76	0.18	0.05	0.20	0.12	0.11	0.06	0.08	0.36	0.14
L1	P41	31981.92	22784.34	16.37	831981.92	822784.34	0.20	0.05	0.07	0.08	0.03	0.03	0.01	0.04	0.08
L2	P42	31973.42	22750.51	18.42	831973.42	822750.51	0.11	0.06	0.21	0.10	0.05	0.06	0.03	0.16	0.10
L3	P43	32014.21	22740.22	17.41	832014.21	822740.22	0.37	0.18	0.34	0.26	0.09	0.09	0.05	0.23	0.23
L4	P44	31988.23	22720.32	25.55	831988.23	822720.32	0.23	0.09	0.22	0.15	0.03	0.06	0.01	0.06	0.13
L5	P45	32033.88	22703.86	13.82	832033.88	822703.86	0.41	0.06	0.47	0.32	0.11	0.10	0.08	0.21	0.25
L6	P46	32029.31	22665.90	12.12	832029.31	822665.90	0.29	0.03	0.50	0.42	0.11	0.04	0.05	0.24	0.23
L7	P47	32018.21	22633.01	16.94	832018.21	822633.01	0.20	0.11	0.49	0.41	0.15	0.02	0.11	0.21	0.22
L8	P48	32037.03	22601.31	11.53	832037.03	822601.31	0.09	0.06	0.21	0.09	0.06	0.06	0.06	0.12	0.10
L9	P49	32036.85	22561.88	21.74	832036.85	822561.88	0.18	0.13	0.19	0.35	0.11	0.12	0.21	0.37	0.20
L10	P50	32056.23	22523.00	18.04	832056.23	822523.00	0.18	0.05	0.20	0.12	0.11	0.06	0.08	0.36	0.14
L11	P51	32051.83	22681.82	10.64	832051.83	822681.82	0.34	0.12	0.40	0.31	0.16	0.13	0.13	0.29	0.25
L12	P52	32064.21	22638.59	10.41	832064.21	822638.59	0.07	0.22	0.29	0.06	0.16	0.16	0.10	0.33	0.16
L13	P53	32077.66	22591.60	9.72	832077.66	822591.60	0.31	0.29	0.14	0.13	0.17	0.28	0.19	0.27	0.23
L14	P54	31907.00	22576.00	73.33	831907.00	822576.00	0.38	0.17	0.44	0.42	0.05	0.13	0.03	0.29	0.27
L15	P55	31844.46	22528.35	75.68	831844.46	822528.35	0.12	0.10	0.19	0.13	0.16	0.11	0.11	0.36	0.15
L16	P56	31935.95	22531.26	78.71	831935.95	822531.26	0.26	0.08	0.25	0.19	0.32	0.05	0.07	0.13	0.18
L17	P57	31897.31	22514.08	78.48	831897.31	822514.08	0.17	0.16	0.16	0.11	0.06	0.10	0.21	0.17	0.15
L18	P58	31857.01	22496.17	78.04	831857.01	822496.17	0.34	0.20	0.42	0.14	0.16	0.16	0.09	0.31	0.25
L19	P59	31970.33	22525.49	71.81	831970.33	822525.49	0.47	0.39	0.53	0.28	0.24	0.35	0.20	0.22	0.37
L20	P60	31952.30	22493.69	78.04	831952.30	822493.69	0.30	0.14	0.18	0.08	0.16	0.14	0.05	0.20	0.18
L21	P61	31916.66	22478.56	79.23	831916.66	822478.56	0.13	0.31	0.10	0.12	0.35	0.06	0.21	0.34	0.19
L22	P62	31880.27	22463.12	79.17	831880.27	822463.12	0.34	0.13	0.30	0.11	0.10	0.09	0.19	0.20	0.20
L23	P63	31844.94	22463.23	76.20	831844.94	822463.23	0.08	0.05	0.13	0.07	0.05	0.05	0.06	0.13	0.08
L24	P64	31963.47	22472.55	74.25	831963.47	822472.55	0.28	0.17	0.05	0.08	0.17	0.12	0.20	0.20	0.17
L25	P65	31943.45	22453.60	72.40	831943.45	822453.60	0.38	0.16	0.14	0.11	0.14	0.12	0.22	0.24	0.21
L26	P66	31912.40	22440.88	72.82	831912.40	822440.88	0.39	0.30	0.17	0.13	0.06	0.16	0.31	0.18	0.24
L27	P67	31869.80	22440.66	71.66	831869.80	822440.66	0.24	0.18	0.26	0.22	0.20	0.11	0.37	0.27	0.23
L28	P68	31824.33	22453.98	71.98	831824.33	822453.98	0.19	0.15	0.10	0.27	0.14	0.11	0.35	0.20	0.18
L29	P69	31818.23	22486.72	73.08	831818.23	822486.72	0.15	0.12	0.17	0.31	0.14	0.12	0.29	0.33	0.18
L30	P70	31801.61	22513.01	69.61	831801.61	822513.01	0.12	0.25	0.19	0.24	0.22	0.05	0.21	0.27	0.19

L31	P71	31790.74	22545.58	65.76	831790.74	822545.58	0.06	0.16	0.17	0.07	0.13	0.04	0.24	0.33	0.13
L32	P72	31982.10	22452.56	62.97	831982.10	822452.56	0.29	0.15	0.19	0.16	0.14	0.26	0.12	0.46	0.22
L33	P73	31972.08	22419.11	61.26	831972.08	822419.11	0.44	0.29	0.59	0.53	0.21	0.13	0.42	0.36	0.39
L34	P74	31924.15	22413.37	64.10	831924.15	822413.37	0.45	0.35	0.15	0.14	0.21	0.27	0.39	0.25	0.30
L35	P75	31901.22	22389.07	61.26	831901.22	822389.07	0.41	0.46	0.41	0.34	0.21	0.23	0.17	0.45	0.36
L36	P76	31867.90	22414.31	62.73	831867.90	822414.31	0.51	0.34	0.34	0.19	0.31	0.28	0.51	0.42	0.38
L37	P77	31841.25	22391.46	60.21	831841.25	822391.46	0.34	0.54	0.30	0.10	0.13	0.24	0.33	0.46	0.32
L38	P78	31803.71	22399.10	53.51	831803.71	822399.10	0.24	0.31	0.23	0.14	0.09	0.15	0.42	0.21	0.23
L39	P79	31799.03	22437.71	58.95	831799.03	822437.71	0.17	0.09	0.10	0.19	0.30	0.06	0.34	0.12	0.16
L40	P80	31756.94	22437.51	50.11	831756.94	822437.51	0.26	0.26	0.19	0.16	0.45	0.16	0.20	0.49	0.26
L41	P81	31761.07	22483.41	52.03	831761.07	822483.41	0.18	0.11	0.19	0.25	0.21	0.09	0.25	0.16	0.18
L42	P82	31724.09	22494.86	47.51	831724.09	822494.86	0.19	0.19	0.17	0.25	0.21	0.16	0.25	0.40	0.21
L43	P83	31751.09	22530.02	48.96	831751.09	822530.02	0.10	0.11	0.16	0.28	0.16	0.06	0.22	0.28	0.15
L44	P84	31722.98	22544.30	43.76	831722.98	822544.30	0.14	0.15	0.18	0.28	0.18	0.08	0.27	0.10	0.17
L45	P85	31701.01	22441.30	42.71	831701.01	822441.30	0.06	0.07	0.06	0.10	0.08	0.06	0.07	0.15	0.08
L46	P86	31668.84	22445.70	28.80	831668.84	822445.70	0.13	0.20	0.06	0.09	0.26	0.09	0.15	0.47	0.17
L47	P87	31666.76	22502.11	39.43	831666.76	822502.11	0.05	0.02	0.09	0.06	0.17	0.06	0.12	0.16	0.08
L48	P88	31631.64	22526.84	30.13	831631.64	822526.84	0.18	0.13	0.16	0.11	0.30	0.08	0.24	0.52	0.20
L49	P89	31652.98	22565.84	36.52	831652.98	822565.84	0.10	0.07	0.10	0.14	0.07	0.12	0.18	0.08	0.10
L50	P90	31615.08	22586.93	33.18	831615.08	822586.93	0.14	0.11	0.24	0.35	0.19	0.05	0.41	0.15	0.19
L51	P91	31637.61	22606.99	36.01	831637.61	822606.99	0.07	0.09	0.19	0.32	0.10	0.05	0.17	0.20	0.14
L52	P92	31733.56	22448.44	48.07	831733.56	822448.44	0.26	0.22	0.14	0.19	0.09	0.16	0.23	0.69	0.23
L53	P93	31705.87	22474.08	44.63	831705.87	822474.08	0.31	0.15	0.14	0.14	0.20	0.19	0.09	0.28	0.20
L54	P94	31707.62	22508.42	44.19	831707.62	822508.42	0.20	0.17	0.17	0.27	0.21	0.17	0.08	0.36	0.20
L55	P95	31686.35	22533.04	41.00	831686.35	822533.04	0.25	0.16	0.20	0.26	0.26	0.18	0.23	0.08	0.21
L56	P96	31677.66	22567.09	38.99	831677.66	822567.09	0.21	0.15	0.20	0.21	0.13	0.10	0.30	0.12	0.18
L57	P97	31665.28	22605.13	37.83	831665.28	822605.13	0.17	0.08	0.06	0.24	0.09	0.07	0.12	0.27	0.13
L58	P98	31646.17	22641.07	34.58	831646.17	822641.07	0.09	0.06	0.12	0.29	0.07	0.03	0.09	0.17	0.11
L59	P99	31615.10	22673.17	31.95	831615.10	822673.17	0.10	0.10	0.06	0.38	0.22	0.11	0.22	0.15	0.15
L60	P100	31587.75	22694.22	32.08	831587.75	822694.22	0.12	0.14	0.10	0.37	0.37	0.12	0.32	0.24	0.20
L61	P101	31557.18	22710.11	33.36	831557.18	822710.11	0.09	0.12	0.21	0.26	0.39	0.11	0.33	0.46	0.21
L62	P102	31523.30	22726.82	34.38	831523.30	822726.82	0.17	0.09	0.35	0.22	0.36	0.14	0.32	0.56	0.24
L63	P103	31500.00	22757.56	37.02	831500.00	822757.56	0.56	0.09	0.36	0.27	0.19	0.19	0.18	0.43	0.31
L64	P104	31459.44	22757.69	31.95	831459.44	822757.69	0.51	0.05	0.16	0.03	0.22	0.13	0.14	0.45	0.24
L65	P105	31436.09	22788.98	41.75	831436.09	822788.98	0.63	0.26	0.12	0.16	0.09	0.23	0.06	0.44	0.30
						Average	0.28	0.17	0.27	0.25	0.18	0.14	0.19	0.26	**0.23**
						Min	0.05	0.02	0.05	0.03	0.03	0.02	0.01	0.04	**0.08**
						Max	0.78	0.54	0.64	0.60	0.45	0.47	0.51	0.69	**0.49**

Proposed Scheme – Special Test Points Velocity Ratio (VR) under Annual Prevailing Wind

							E	ESE	ENE	NE	SSW	SE	SW	S	
						Velocity @ Infinite	6.432	6.988	6.000	6.575	6.611	6.214	6.383	5.043	
						Probability	0.191	0.129	0.103	0.087	0.081	0.070	0.060	0.058	
ID	**Model ID**	**x**	**y**	**Z at 2m**	**X coordinates**	**Y coordinates**									**Weighted VR**
S1	P106	31903.63	22645.79	70.38	861903.63	852645.79	0.42	0.35	0.23	0.37	0.24	0.38	0.17	0.40	0.33
S2	P107	31863.97	22584.86	73.35	861863.97	852584.86	0.18	0.34	0.31	0.24	0.03	0.05	0.26	0.13	0.20
S3	P108	31793.48	22587.49	66.50	861793.48	852587.49	0.03	0.08	0.15	0.18	0.08	0.07	0.13	0.30	0.11
S4	P109	31745.90	22627.50	73.11	861745.90	852627.50	0.04	0.06	0.11	0.09	0.09	0.07	0.09	0.20	0.08
S5	P110	31696.90	22655.30	73.11	861696.90	852655.30	0.27	0.13	0.33	0.13	0.16	0.12	0.34	0.41	0.23
S6	P111	31726.81	22700.56	72.89	861726.81	852700.56	0.40	0.08	0.42	0.39	0.19	0.08	0.22	0.35	0.28
S7	P112	31769.87	22678.18	73.11	861769.87	852678.18	0.13	0.11	0.29	0.17	0.07	0.10	0.05	0.13	0.14
S8	P113	31817.79	22659.89	72.80	861817.79	852659.89	0.28	0.15	0.41	0.27	0.08	0.08	0.10	0.12	0.21
S9	P114	31863.11	22679.99	72.51	861863.11	852679.99	0.24	0.12	0.27	0.12	0.09	0.07	0.09	0.11	0.16
S10	P115	31812.95	22699.44	73.98	861812.95	852699.44	0.60	0.13	0.25	0.38	0.04	0.11	0.20	0.19	0.29
						Average	0.26	0.15	0.28	0.23	0.11	0.11	0.17	0.23	**0.20**
						Min	0.03	0.06	0.11	0.09	0.03	0.05	0.05	0.11	**0.08**
						Max	0.60	0.35	0.42	0.39	0.24	0.38	0.34	0.41	**0.33**

Base Scheme – Perimeter Test Points Velocity Ratio (VR) under Summer Prevailing Wind

							SSW	SW	S	ESE	SSE	SE	E	WSW	Weighted VR
						Velocity @ Infinite	6.600	6.592	6.573	7.926	6.165	6.724	7.086	4.952	
						Probability	0.170	0.146	0.107	0.095	0.079	0.076	0.076	0.063	
ID	Model ID	x	y	Z at 2m	X coordinates	Y coordinates									
P1	P1	31545.09	22741.23	37.44	831545.09	822741.23	0.29	0.27	0.33	0.05	0.05	0.11	0.25	0.32	0.22
P2	P2	31563.60	22765.22	46.38	831563.60	822765.22	0.30	0.26	0.23	0.20	0.05	0.12	0.44	0.35	0.25
P3	P3	31588.56	22761.92	50.09	831588.56	822761.92	0.35	0.32	0.17	0.20	0.09	0.13	0.32	0.36	0.25
P4	P4	31612.20	22749.02	52.69	831612.20	822749.02	0.37	0.35	0.13	0.17	0.11	0.14	0.28	0.39	0.26
P5	P5	31623.30	22725.49	46.23	831623.30	822725.49	0.35	0.33	0.08	0.07	0.11	0.11	0.19	0.36	0.22
P6	P6	31654.53	22724.58	54.95	831654.53	822724.58	0.36	0.40	0.11	0.05	0.09	0.10	0.13	0.39	0.23
P7	P7	31683.60	22734.00	67.35	831683.60	822734.00	0.36	0.47	0.14	0.10	0.08	0.12	0.22	0.46	0.26
P8	P8	31709.09	22749.27	79.88	831709.09	822749.27	0.40	0.54	0.22	0.28	0.07	0.16	0.70	0.56	0.37
P9	P9	31729.49	22762.30	87.06	831729.49	822762.30	0.42	0.53	0.28	0.31	0.10	0.19	0.77	0.62	0.40
P10	P10	31750.13	22744.42	85.47	831750.13	822744.42	0.38	0.50	0.26	0.28	0.11	0.15	0.68	0.50	0.36
P11	P11	31778.50	22735.71	85.40	831778.50	822735.71	0.14	0.20	0.21	0.30	0.11	0.13	0.66	0.49	0.25
P12	P12	31807.89	22745.02	87.42	831807.89	822745.02	0.14	0.24	0.20	0.33	0.12	0.18	0.71	0.25	0.25
P13	P13	31834.89	22751.11	85.23	831834.89	822751.11	0.16	0.14	0.16	0.35	0.21	0.29	0.74	0.17	0.25
P14	P14	31850.41	22736.70	78.65	831850.41	822736.70	0.15	0.21	0.17	0.31	0.23	0.27	0.65	0.16	0.25
P15	P15	31879.70	22720.90	70.31	831879.70	822720.90	0.11	0.06	0.25	0.26	0.27	0.25	0.51	0.04	0.20
P16	P16	31890.87	22690.83	67.81	831890.87	822690.83	0.28	0.27	0.31	0.21	0.18	0.16	0.61	0.17	0.28
P17	P17	31909.48	22670.02	66.82	831909.48	822670.02	0.08	0.14	0.10	0.11	0.32	0.32	0.54	0.13	0.19
P18	P18	31927.91	22648.47	67.11	831927.91	822648.47	0.13	0.13	0.24	0.09	0.39	0.37	0.48	0.14	0.22
P19	P19	31937.36	22619.21	69.94	831937.36	822619.21	0.13	0.11	0.26	0.36	0.42	0.39	0.38	0.14	0.25
P20	P20	31946.62	22595.22	71.56	831946.62	822595.22	0.17	0.11	0.25	0.45	0.42	0.41	0.27	0.13	0.26
P21	P21	31955.12	22571.84	71.76	831955.12	822571.84	0.22	0.17	0.29	0.47	0.42	0.41	0.52	0.11	0.31
P22	P22	31928.90	22564.30	74.82	831928.90	822564.30	0.17	0.10	0.15	0.13	0.09	0.06	0.17	0.13	0.13
P23	P23	31916.81	22591.99	76.23	831916.81	822591.99	0.14	0.06	0.11	0.22	0.11	0.11	0.35	0.15	0.14
P24	P24	31885.24	22578.39	74.21	831885.24	822578.39	0.07	0.06	0.07	0.05	0.07	0.07	0.21	0.06	0.08
P25	P25	31853.05	22564.53	75.07	831853.05	822564.53	0.12	0.12	0.05	0.07	0.08	0.05	0.24	0.12	0.11
P26	P26	31829.88	22547.76	75.50	831829.88	822547.76	0.12	0.10	0.11	0.09	0.16	0.03	0.15	0.14	0.11
P27	P27	31804.30	22536.70	71.92	831804.30	822536.70	0.38	0.37	0.18	0.07	0.09	0.09	0.06	0.33	0.23
P28	P28	31781.74	22562.14	64.76	831781.74	822562.14	0.20	0.22	0.10	0.17	0.10	0.07	0.22	0.29	0.17
P29	P29	31753.77	22560.40	54.73	831753.77	822560.40	0.20	0.20	0.18	0.14	0.11	0.07	0.18	0.36	0.18
P30	P30	31722.99	22562.25	47.37	831722.99	822562.25	0.17	0.27	0.12	0.12	0.04	0.05	0.08	0.40	0.16
P31	P31	31700.91	22550.54	41.99	831700.91	822550.54	0.14	0.26	0.08	0.15	0.08	0.08	0.08	0.42	0.16
P32	P32	31689.68	22572.97	41.57	831689.68	822572.97	0.15	0.16	0.04	0.15	0.04	0.05	0.06	0.21	0.11
P33	P33	31682.83	22595.82	41.85	831682.83	822595.82	0.12	0.15	0.05	0.15	0.04	0.02	0.11	0.24	0.11
P34	P34	31676.78	22618.13	41.10	831676.78	822618.13	0.12	0.07	0.07	0.13	0.07	0.02	0.16	0.25	0.11
P35	P35	31666.60	22642.24	38.06	831666.60	822642.24	0.07	0.14	0.05	0.09	0.07	0.02	0.20	0.26	0.10
P36	P36	31652.14	22664.24	37.75	831652.14	822664.24	0.12	0.28	0.06	0.02	0.09	0.01	0.25	0.31	0.14
P37	P37	31633.24	22684.83	36.64	831633.24	822684.83	0.27	0.28	0.03	0.01	0.10	0.02	0.24	0.31	0.17
P38	P38	31610.98	22701.08	36.30	831610.98	822701.08	0.33	0.30	0.08	0.07	0.09	0.07	0.22	0.32	0.20
P39	P39	31588.98	22713.40	35.93	831588.98	822713.40	0.34	0.29	0.17	0.09	0.08	0.09	0.18	0.30	0.21
P40	P40	31568.35	22728.76	36.06	831568.35	822728.76	0.31	0.27	0.24	0.07	0.04	0.10	0.15	0.29	0.20
						Average	0.22	0.24	0.16	0.17	0.14	0.14	0.33	0.28	**0.21**
						Min	0.07	0.06	0.03	0.01	0.04	0.01	0.06	0.04	**0.08**
						Max	0.42	0.54	0.33	0.47	0.42	0.41	0.77	0.62	**0.40**

Proposed Scheme – Perimeter Test Points Velocity Ratio (VR) under Summer Prevailing Wind

							SSW	SW	S	ESE	SSE	SE	E	WSW	Weighted VR
						Velocity @ Infinite	6.600	6.592	6.573	7.926	6.165	6.724	7.086	4.952	
						Probability	0.17	0.146	0.107	0.095	0.079	0.076	0.076	0.063	
ID	Model ID	x	y	Z at 2m	X coordinates	Y coordinates									
P1	P1	31545.09	22741.24	37.44	831545.09	822741.24	0.31	0.29	0.33	0.07	0.11	0.14	0.19	0.30	0.23
P2	P2	31563.60	22765.22	46.38	831563.60	822765.22	0.32	0.28	0.25	0.16	0.06	0.15	0.44	0.31	0.25
P3	P3	31588.56	22761.92	50.09	831588.56	822761.92	0.36	0.31	0.17	0.12	0.10	0.15	0.28	0.32	0.24
P4	P4	31612.20	22749.02	52.69	831612.20	822749.02	0.37	0.34	0.12	0.10	0.10	0.15	0.21	0.34	0.24
P5	P5	31623.30	22725.49	46.23	831623.30	822725.49	0.35	0.31	0.13	0.09	0.08	0.14	0.12	0.31	0.21
P6	P6	31654.53	22724.59	54.95	831654.53	822724.59	0.34	0.39	0.24	0.08	0.06	0.07	0.05	0.33	0.22
P7	P7	31683.60	22734.00	67.35	831683.60	822734.00	0.36	0.47	0.31	0.13	0.06	0.11	0.34	0.44	0.30
P8	P8	31709.09	22749.26	79.88	831709.09	822749.26	0.31	0.40	0.34	0.30	0.22	0.15	0.64	0.50	0.35
P9	P9	31729.49	22762.30	87.06	831729.49	822762.30	0.29	0.44	0.35	0.33	0.24	0.18	0.70	0.52	0.37
P10	P10	31750.12	22744.42	85.47	831750.12	822744.42	0.17	0.23	0.13	0.32	0.23	0.15	0.61	0.32	0.25
P11	P11	31778.50	22735.70	85.40	831778.50	822735.70	0.14	0.07	0.13	0.31	0.24	0.16	0.62	0.22	0.21
P12	P12	31807.89	22745.02	87.42	831807.89	822745.02	0.17	0.11	0.19	0.34	0.25	0.31	0.67	0.14	0.25
P13	P13	31834.89	22751.11	85.23	831834.89	822751.11	0.21	0.11	0.12	0.36	0.27	0.36	0.70	0.08	0.25
P14	P14	31850.42	22736.71	78.65	831850.42	822736.71	0.22	0.12	0.18	0.34	0.26	0.36	0.68	0.13	0.26
P15	P15	31879.71	22720.91	70.31	831879.71	822720.91	0.23	0.15	0.18	0.28	0.27	0.36	0.62	0.18	0.26
P16	P16	31890.86	22690.83	67.81	831890.86	822690.83	0.18	0.16	0.15	0.17	0.17	0.37	0.43	0.17	0.21
P17	P17	31909.48	22670.02	66.82	831909.48	822670.02	0.20	0.14	0.21	0.09	0.19	0.37	0.44	0.17	0.21
P18	P18	31927.91	22648.47	67.11	831927.91	822648.47	0.23	0.12	0.33	0.13	0.34	0.38	0.45	0.22	0.26
P19	P19	31937.36	22619.21	69.94	831937.36	822619.21	0.19	0.09	0.21	0.36	0.30	0.40	0.39	0.24	0.25
P20	P20	31946.61	22595.21	71.56	831946.61	822595.21	0.26	0.12	0.11	0.44	0.31	0.43	0.26	0.20	0.25
P21	P21	31955.12	22571.84	71.76	831955.12	822571.84	0.29	0.14	0.13	0.44	0.30	0.42	0.45	0.08	0.27
P22	P22	31928.90	22564.30	74.82	831928.90	822564.30	0.19	0.08	0.12	0.09	0.12	0.07	0.24	0.18	0.14
P23	P23	31916.81	22591.98	76.23	831916.81	822591.98	0.22	0.11	0.20	0.11	0.12	0.07	0.49	0.21	0.18
P24	P24	31885.25	22578.39	74.21	831885.25	822578.39	0.15	0.23	0.11	0.09	0.05	0.08	0.25	0.30	0.16
P25	P25	31853.06	22564.53	75.07	831853.06	822564.53	0.13	0.22	0.06	0.15	0.08	0.03	0.13	0.52	0.16
P26	P26	31829.88	22547.76	75.50	831829.88	822547.76	0.16	0.06	0.22	0.16	0.13	0.06	0.20	0.43	0.16
P27	P27	31804.29	22536.69	71.92	831804.29	822536.69	0.19	0.33	0.25	0.22	0.20	0.08	0.11	0.15	0.21
P28	P28	31781.73	22562.14	64.76	831781.73	822562.14	0.15	0.11	0.26	0.08	0.21	0.07	0.08	0.37	0.16
P29	P29	31753.77	22560.41	54.73	831753.77	822560.41	0.24	0.20	0.24	0.13	0.16	0.05	0.10	0.29	0.18
P30	P30	31722.99	22562.26	47.37	831722.99	822562.26	0.17	0.27	0.10	0.13	0.10	0.04	0.12	0.31	0.16
P31	P31	31700.91	22550.54	41.99	831700.91	822550.54	0.17	0.29	0.07	0.14	0.07	0.10	0.15	0.34	0.17
P32	P32	31689.68	22572.96	41.57	831689.68	822572.96	0.16	0.30	0.12	0.13	0.13	0.07	0.15	0.22	0.17
P33	P33	31682.82	22595.81	41.85	831682.82	822595.81	0.16	0.20	0.17	0.12	0.14	0.04	0.11	0.22	0.15
P34	P34	31676.78	22618.13	41.10	831676.78	822618.13	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0.01	0.02
P35	P35	31666.60	22642.24	38.06	831666.60	822642.24	0.07	0.10	0.19	0.07	0.18	0.05	0.11	0.13	0.11
P36	P36	31652.14	22664.23	37.75	831652.14	822664.23	0.09	0.12	0.25	0.02	0.17	0.04	0.10	0.18	0.12
P37	P37	31633.24	22684.83	36.64	831633.24	822684.83	0.15	0.23	0.19	0.04	0.13	0.03	0.07	0.22	0.14
P38	P38	31610.98	22701.08	36.30	831610.98	822701.08	0.33	0.28	0.12	0.10	0.08	0.12	0.10	0.26	0.20
P39	P39	31588.99	22713.41	35.93	831588.99	822713.41	0.36	0.29	0.18	0.10	0.07	0.11	0.11	0.26	0.21
P40	P40	31568.35	22728.76	36.06	831568.35	822728.76	0.34	0.28	0.26	0.07	0.06	0.12	0.07	0.28	0.21
						Average	0.22	0.21	0.19	0.17	0.16	0.16	0.30	0.26	**0.21**
						Min	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0.01	**0.02**
						Max	0.37	0.47	0.35	0.44	0.34	0.43	0.70	0.52	**0.37**

Base Scheme – Overall Test Points Velocity Ratio (VR) under Summer Prevailing Wind

							SSW	SW	S	ESE	SSE	SE	E	WSW	
						Velocity @ Infinite	6.60	6.59	6.57	7.93	6.17	6.72	7.09	4.95	
						Probability	0.17	0.148	0.107	0.095	0.079	0.076	0.076	0.063	
ID	Model ID	x	y	Z at 2m	X coordinates	Y coordinates									Weighted VR
P1	P1	31545.09	22741.23	37.44	831545.09	822741.23	0.29	0.27	0.33	0.05	0.05	0.11	0.25	0.32	0.22
P2	P2	31563.60	22765.22	46.38	831563.60	822765.22	0.30	0.26	0.23	0.20	0.05	0.12	0.44	0.35	0.25
P3	P3	31588.36	22761.92	50.09	831588.36	822761.92	0.35	0.32	0.17	0.20	0.09	0.13	0.32	0.36	0.25
P4	P4	31612.20	22749.02	52.69	831612.20	822749.02	0.37	0.35	0.13	0.17	0.11	0.14	0.28	0.39	0.26
P5	P5	31623.30	22725.49	46.23	831623.30	822725.49	0.35	0.33	0.08	0.07	0.11	0.11	0.19	0.36	0.22
P6	P6	31654.53	22724.58	54.95	831654.53	822724.58	0.36	0.40	0.11	0.05	0.09	0.10	0.13	0.39	0.23
P7	P7	31683.60	22734.00	67.35	831683.60	822734.00	0.36	0.47	0.14	0.10	0.08	0.12	0.22	0.46	0.26
P8	P8	31709.09	22749.27	79.88	831709.09	822749.27	0.40	0.54	0.22	0.28	0.07	0.16	0.70	0.56	0.37
P9	P9	31729.49	22762.30	87.06	831729.49	822762.30	0.42	0.53	0.28	0.31	0.10	0.19	0.77	0.62	0.40
P10	P10	31750.13	22744.42	85.47	831750.13	822744.42	0.38	0.50	0.26	0.28	0.11	0.15	0.68	0.50	0.36
P11	P11	31778.50	22735.71	85.40	831778.50	822735.71	0.14	0.20	0.21	0.30	0.11	0.13	0.66	0.49	0.25
P12	P12	31807.89	22745.02	87.42	831807.89	822745.02	0.14	0.24	0.20	0.33	0.12	0.18	0.71	0.25	0.25
P13	P13	31834.89	22751.11	85.23	831834.89	822751.11	0.16	0.14	0.16	0.35	0.21	0.29	0.74	0.17	0.25
P14	P14	31850.41	22736.70	78.65	831850.41	822736.70	0.15	0.21	0.17	0.31	0.23	0.27	0.65	0.16	0.25
P15	P15	31879.70	22720.90	70.31	831879.70	822720.90	0.11	0.06	0.25	0.26	0.27	0.25	0.51	0.04	0.20
P16	P16	31890.87	22690.83	67.81	831890.87	822690.83	0.28	0.27	0.31	0.21	0.18	0.16	0.61	0.17	0.28
P17	P17	31909.48	22670.02	66.82	831909.48	822670.02	0.08	0.14	0.10	0.11	0.32	0.32	0.54	0.13	0.19
P18	P18	31927.91	22648.47	67.11	831927.91	822648.47	0.13	0.13	0.24	0.09	0.39	0.37	0.48	0.14	0.22
P19	P19	31937.36	22619.21	69.94	831937.36	822619.21	0.13	0.11	0.26	0.36	0.42	0.39	0.38	0.14	0.25
P20	P20	31946.62	22595.22	71.56	831946.62	822595.22	0.17	0.11	0.25	0.45	0.42	0.41	0.27	0.13	0.26
P21	P21	31955.12	22571.84	71.76	831955.12	822571.84	0.22	0.17	0.29	0.47	0.42	0.41	0.32	0.11	0.31
P22	P22	31928.90	22564.30	74.82	831928.90	822564.30	0.17	0.10	0.15	0.13	0.09	0.06	0.17	0.13	0.13
P23	P23	31916.81	22591.99	76.23	831916.81	822591.99	0.14	0.06	0.11	0.22	0.11	0.11	0.35	0.15	0.14
P24	P24	31885.24	22578.39	74.21	831885.24	822578.39	0.07	0.06	0.07	0.05	0.07	0.07	0.21	0.06	0.08
P25	P25	31853.05	22564.53	75.07	831853.05	822564.53	0.12	0.12	0.05	0.07	0.08	0.05	0.24	0.12	0.11
P26	P26	31829.88	22547.76	75.50	831829.88	822547.76	0.12	0.10	0.11	0.09	0.16	0.03	0.15	0.14	0.11
P27	P27	31804.30	22536.70	71.92	831804.30	822536.70	0.38	0.37	0.18	0.07	0.09	0.09	0.06	0.33	0.23
P28	P28	31781.74	22562.14	64.76	831781.74	822562.14	0.20	0.22	0.10	0.17	0.10	0.07	0.22	0.29	0.17
P29	P29	31753.77	22560.40	54.73	831753.77	822560.40	0.20	0.20	0.18	0.14	0.11	0.07	0.18	0.36	0.18
P30	P30	31722.99	22562.25	47.37	831722.99	822562.25	0.17	0.27	0.12	0.12	0.04	0.05	0.08	0.40	0.16
P31	P31	31700.91	22550.54	41.99	831700.91	822550.54	0.01	0.02	0.03	0.05	0.02	0.07	0.16	0.05	0.04
P32	P32	31689.68	22572.97	41.57	831689.68	822572.97	0.07	0.05	0.14	0.11	0.08	0.15	0.11	0.05	0.09
P33	P33	31682.83	22595.82	41.85	831682.83	822595.82	0.14	0.06	0.18	0.14	0.14	0.06	0.34	0.06	0.13
P34	P34	31676.78	22618.13	41.10	831676.78	822618.13	0.05	0.03	0.06	0.08	0.05	0.11	0.21	0.05	0.07
P35	P35	31666.60	22642.24	38.06	831666.60	822642.24	0.13	0.06	0.18	0.17	0.09	0.04	0.40	0.05	0.13
P36	P36	31652.14	22664.24	37.75	831652.14	822664.24	0.08	0.04	0.16	0.05	0.10	0.04	0.34	0.06	0.10
P37	P37	31633.24	22684.83	36.64	831633.24	822684.83	0.15	0.12	0.16	0.06	0.29	0.02	0.31	0.11	0.15
P38	P38	31610.98	22701.08	36.30	831610.98	822701.08	0.05	0.07	0.09	0.04	0.20	0.05	0.13	0.03	0.08
P39	P39	31588.98	22713.40	35.93	831588.98	822713.40	0.11	0.19	0.25	0.08	0.31	0.10	0.16	0.11	0.16
P40	P40	31568.35	22728.76	36.06	831568.35	822728.76	0.10	0.08	0.18	0.06	0.31	0.06	0.14	0.09	0.12
L1	P41	31981.92	22784.34	16.37	831981.92	822784.34	0.01	0.02	0.03	0.05	0.02	0.07	0.16	0.05	0.04
L2	P42	31973.42	22750.51	18.42	831973.42	822750.51	0.07	0.05	0.14	0.11	0.08	0.15	0.11	0.05	0.09
L3	P43	32014.21	22740.22	17.41	832014.21	822740.22	0.14	0.06	0.18	0.14	0.14	0.06	0.34	0.06	0.13
L4	P44	31988.23	22720.33	25.55	831988.23	822720.33	0.05	0.03	0.06	0.08	0.05	0.11	0.21	0.05	0.07
L5	P45	32033.88	22703.85	13.82	832033.88	822703.85	0.13	0.06	0.18	0.17	0.09	0.04	0.40	0.05	0.13
L6	P46	32029.31	22665.90	12.12	832029.31	822665.90	0.08	0.04	0.16	0.05	0.10	0.04	0.34	0.06	0.10
L7	P47	32018.20	22633.01	16.94	832018.20	822633.01	0.15	0.12	0.16	0.06	0.29	0.02	0.31	0.11	0.15
L8	P48	32037.02	22601.31	11.53	832037.02	822601.31	0.05	0.07	0.09	0.04	0.20	0.05	0.13	0.03	0.08
L9	P49	32036.85	22561.89	21.74	832036.85	822561.89	0.11	0.19	0.25	0.08	0.31	0.10	0.16	0.11	0.16
L10	P50	32056.23	22523.00	18.04	832056.23	822523.00	0.10	0.08	0.18	0.06	0.31	0.06	0.14	0.09	0.12
L11	P51	32051.83	22681.82	10.64	832051.83	822681.82	0.16	0.03	0.22	0.05	0.13	0.05	0.31	0.08	0.13
L12	P52	32064.21	22638.58	10.41	832064.21	822638.58	0.14	0.11	0.23	0.19	0.11	0.16	0.16	0.09	0.15
L13	P53	32077.65	22591.60	9.72	832077.65	822591.60	0.20	0.18	0.26	0.24	0.12	0.30	0.28	0.18	0.22
L14	P54	31907.00	22576.00	73.33	831907.00	822576.00	0.08	0.12	0.22	0.15	0.13	0.11	0.52	0.05	0.16
L15	P55	31844.46	22528.35	75.68	831844.46	822528.35	0.14	0.08	0.11	0.14	0.19	0.05	0.13	0.15	0.12
L16	P56	31935.95	22531.26	78.71	831935.95	822531.26	0.33	0.24	0.23	0.08	0.16	0.08	0.12	0.22	0.20
L17	P57	31897.30	22514.08	78.48	831897.30	822514.08	0.05	0.07	0.09	0.08	0.06	0.09	0.15	0.11	0.08
L18	P58	31857.02	22496.17	78.04	831857.02	822496.17	0.12	0.07	0.10	0.23	0.22	0.15	0.30	0.14	0.15
L19	P59	31970.33	22525.48	71.81	831970.33	822525.48	0.23	0.20	0.31	0.35	0.37	0.31	0.46	0.18	0.29
L20	P60	31952.31	22493.69	78.04	831952.31	822493.69	0.15	0.17	0.13	0.20	0.13	0.14	0.08	0.19	0.15
L21	P61	31916.66	22478.56	79.23	831916.66	822478.56	0.33	0.12	0.27	0.11	0.10	0.06	0.09	0.24	0.18
L22	P62	31880.26	22463.12	79.17	831880.26	822463.12	0.20	0.06	0.11	0.10	0.11	0.08	0.26	0.16	0.13
L23	P63	31844.94	22463.23	76.20	831844.94	822463.23	0.12	0.12	0.10	0.15	0.25	0.10	0.10	0.16	0.13
L24	P64	31963.47	22472.55	74.25	831963.47	822472.55	0.18	0.20	0.23	0.23	0.22	0.15	0.66	0.28	0.25
L25	P65	31943.45	22453.60	72.40	831943.45	822453.60	0.17	0.17	0.16	0.15	0.28	0.10	0.30	0.29	0.19
L26	P66	31912.40	22440.88	72.82	831912.40	822440.88	0.19	0.26	0.18	0.24	0.23	0.15	0.38	0.44	0.24
L27	P67	31869.80	22440.66	71.66	831869.80	822440.66	0.30	0.37	0.25	0.12	0.19	0.13	0.30	0.52	0.28
L28	P68	31824.33	22453.98	71.98	831824.33	822453.98	0.13	0.20	0.12	0.05	0.18	0.09	0.15	0.29	0.15
L29	P69	31818.23	22486.72	73.08	831818.23	822486.72	0.18	0.18	0.08	0.16	0.15	0.09	0.11	0.29	0.15
L30	P70	31801.62	22513.01	69.61	831801.62	822513.01	0.28	0.24	0.07	0.05	0.08	0.05	0.08	0.26	0.16

L31	P71	31790.74	22545.58	65.76	831790.74	822545.58	0.22	0.29	0.08	0.02	0.06	0.04	0.06	0.23	0.14
L32	P72	31982.10	22452.56	62.97	831982.10	822452.56	0.12	0.09	0.38	0.16	0.32	0.23	0.28	0.17	0.20
L33	P73	31972.08	22419.11	61.26	831972.08	822419.11	0.13	0.42	0.31	0.25	0.31	0.10	0.41	0.41	0.28
L34	P74	31924.15	22413.37	64.10	831924.15	822413.37	0.16	0.36	0.20	0.33	0.20	0.26	0.46	0.55	0.29
L35	P75	31901.22	22389.07	61.26	831901.22	822389.07	0.18	0.20	0.37	0.37	0.38	0.19	0.26	0.29	0.27
L36	P76	31867.90	22414.31	62.73	831867.90	822414.31	0.28	0.41	0.33	0.31	0.39	0.21	0.46	0.58	0.36
L37	P77	31841.25	22391.46	60.21	831841.25	822391.46	0.18	0.36	0.40	0.44	0.53	0.24	0.25	0.55	0.35
L38	P78	31803.71	22399.10	53.51	831803.71	822399.10	0.10	0.35	0.17	0.33	0.19	0.14	0.24	0.56	0.24
L39	P79	31799.02	22437.71	58.95	831799.02	822437.71	0.32	0.15	0.08	0.04	0.09	0.05	0.08	0.27	0.15
L40	P80	31756.94	22437.51	50.11	831756.94	822437.51	0.45	0.45	0.41	0.21	0.24	0.10	0.21	0.36	0.33
L41	P81	31761.07	22483.41	52.03	831761.07	822483.41	0.20	0.13	0.15	0.15	0.04	0.06	0.17	0.29	0.15
L42	P82	31724.08	22494.85	47.51	831724.08	822494.85	0.28	0.18	0.30	0.10	0.16	0.12	0.15	0.27	0.20
L43	P83	31751.09	22530.03	48.96	831751.09	822530.03	0.11	0.26	0.08	0.10	0.07	0.07	0.17	0.31	0.14
L44	P84	31722.98	22544.30	43.76	831722.98	822544.30	0.11	0.31	0.08	0.12	0.04	0.07	0.12	0.41	0.16
L45	P85	31701.02	22441.30	42.71	831701.02	822441.30	0.08	0.07	0.08	0.13	0.06	0.05	0.04	0.13	0.08
L46	P86	31668.84	22445.70	28.80	831668.84	822445.70	0.28	0.16	0.37	0.19	0.14	0.04	0.14	0.12	0.20
L47	P87	31666.76	22502.11	39.43	831666.76	822502.11	0.16	0.14	0.09	0.02	0.08	0.07	0.19	0.17	0.12
L48	P88	31631.63	22526.83	30.13	831631.63	822526.83	0.32	0.26	0.42	0.13	0.08	0.05	0.16	0.35	0.24
L49	P89	31652.98	22565.84	36.52	831652.98	822565.84	0.10	0.17	0.05	0.10	0.04	0.02	0.02	0.15	0.09
L50	P90	31615.08	22586.93	33.18	831615.08	822586.93	0.20	0.40	0.12	0.06	0.09	0.02	0.12	0.34	0.19
L51	P91	31637.61	22607.00	36.01	831637.61	822607.00	0.12	0.10	0.11	0.07	0.09	0.03	0.08	0.30	0.11
L52	P92	31733.56	22448.44	48.07	831733.56	822448.44	0.13	0.14	0.53	0.13	0.27	0.13	0.16	0.18	0.21
L53	P93	31705.87	22474.08	44.63	831705.87	822474.08	0.19	0.16	0.27	0.09	0.24	0.16	0.10	0.09	0.17
L54	P94	31707.62	22508.42	44.19	831707.62	822508.42	0.25	0.17	0.18	0.13	0.19	0.14	0.11	0.16	0.18
L55	P95	31686.35	22533.04	41.00	831686.35	822533.04	0.14	0.19	0.08	0.18	0.21	0.11	0.06	0.43	0.16
L56	P96	31677.66	22567.09	38.99	831677.66	822567.09	0.14	0.15	0.04	0.17	0.10	0.07	0.08	0.20	0.12
L57	P97	31665.28	22605.13	37.83	831665.28	822605.13	0.13	0.11	0.11	0.11	0.07	0.02	0.10	0.28	0.11
L58	P98	31646.17	22641.07	34.58	831646.17	822641.07	0.06	0.22	0.07	0.03	0.03	0.02	0.20	0.28	0.11
L59	P99	31615.10	22673.17	31.95	831615.10	822673.17	0.29	0.30	0.05	0.04	0.07	0.03	0.23	0.32	0.18
L60	P100	31587.76	22694.23	32.08	831587.76	822694.23	0.37	0.32	0.17	0.11	0.10	0.07	0.23	0.30	0.23
L61	P101	31557.18	22710.10	33.36	831557.18	822710.10	0.37	0.33	0.35	0.11	0.07	0.09	0.21	0.29	0.25
L62	P102	31523.30	22726.82	34.38	831523.30	822726.82	0.33	0.30	0.40	0.11	0.18	0.11	0.21	0.31	0.26
L63	P103	31500.00	22757.56	37.02	831500.00	822757.56	0.21	0.18	0.30	0.15	0.20	0.12	0.53	0.35	0.24
L64	P104	31459.45	22757.69	31.95	831459.45	822757.69	0.20	0.14	0.33	0.08	0.19	0.11	0.47	0.23	0.21
L65	P105	31436.09	22788.98	41.75	831436.09	822788.98	0.16	0.06	0.34	0.22	0.27	0.16	0.50	0.37	0.23
						Average	0.18	0.19	0.19	0.15	0.16	0.12	0.27	0.23	0.19
						Min	0.01	0.02	0.03	0.02	0.02	0.02	0.02	0.03	0.04
						Max	0.45	0.54	0.53	0.47	0.53	0.41	0.77	0.62	0.40

Proposed Scheme – Overall Test Points Velocity Ratio (VR) under Summer Prevailing Wind

							SSW	SW	S	ESE	SSE	SE	E	WSW	
						Velocity @ Infinite	6.60	6.59	6.57	7.93	6.17	6.72	7.09	4.95	
						Probability	0.17	0.146	0.107	0.095	0.079	0.076	0.076	0.063	
ID	Model ID	x	y	Z at 2m	X coordinates	Y coordinates									Weighted VR
P1	P1	31545.09	22741.24	37.44	831545.09	822741.24	0.31	0.29	0.33	0.07	0.11	0.14	0.19	0.30	0.23
P2	P2	31563.60	22765.22	46.38	831563.60	822765.22	0.32	0.28	0.25	0.16	0.06	0.15	0.44	0.31	0.25
P3	P3	31588.56	22761.92	50.09	831588.56	822761.92	0.36	0.31	0.17	0.12	0.10	0.15	0.28	0.32	0.24
P4	P4	31612.20	22749.02	52.69	831612.20	822749.02	0.37	0.34	0.12	0.10	0.10	0.15	0.21	0.34	0.24
P5	P5	31623.30	22725.49	46.23	831623.30	822725.49	0.35	0.31	0.13	0.09	0.08	0.14	0.12	0.31	0.21
P6	P6	31654.53	22724.59	54.95	831654.53	822724.59	0.34	0.39	0.24	0.08	0.06	0.07	0.05	0.33	0.22
P7	P7	31683.60	22734.00	67.35	831683.60	822734.00	0.36	0.47	0.31	0.13	0.06	0.11	0.34	0.44	0.30
P8	P8	31709.09	22749.26	79.88	831709.09	822749.26	0.31	0.40	0.34	0.30	0.22	0.15	0.64	0.50	0.35
P9	P9	31729.49	22762.30	87.06	831729.49	822762.30	0.29	0.44	0.35	0.33	0.24	0.18	0.70	0.52	0.37
P10	P10	31750.12	22744.42	85.47	831750.12	822744.42	0.17	0.23	0.13	0.32	0.23	0.15	0.61	0.32	0.25
P11	P11	31778.50	22735.70	85.40	831778.50	822735.70	0.14	0.07	0.13	0.31	0.24	0.16	0.62	0.22	0.21
P12	P12	31807.89	22745.02	87.42	831807.89	822745.02	0.17	0.11	0.19	0.34	0.25	0.31	0.67	0.14	0.25
P13	P13	31834.89	22751.11	85.23	831834.89	822751.11	0.21	0.11	0.12	0.36	0.27	0.36	0.70	0.08	0.25
P14	P14	31850.42	22736.71	78.65	831850.42	822736.71	0.22	0.12	0.18	0.34	0.26	0.36	0.68	0.13	0.26
P15	P15	31879.71	22720.91	70.31	831879.71	822720.91	0.23	0.15	0.18	0.28	0.27	0.36	0.62	0.18	0.26
P16	P16	31890.86	22690.83	67.81	831890.86	822690.83	0.18	0.16	0.15	0.17	0.17	0.37	0.43	0.17	0.21
P17	P17	31909.48	22670.02	66.82	831909.48	822670.02	0.20	0.14	0.21	0.09	0.19	0.37	0.44	0.17	0.21
P18	P18	31927.91	22648.47	67.11	831927.91	822648.47	0.23	0.12	0.33	0.13	0.34	0.38	0.45	0.22	0.26
P19	P19	31937.36	22619.21	69.94	831937.36	822619.21	0.19	0.09	0.21	0.36	0.30	0.40	0.39	0.24	0.25
P20	P20	31946.61	22595.21	71.56	831946.61	822595.21	0.26	0.12	0.11	0.44	0.31	0.43	0.26	0.20	0.25
P21	P21	31955.12	22571.84	71.76	831955.12	822571.84	0.29	0.14	0.13	0.44	0.30	0.42	0.45	0.08	0.27
P22	P22	31928.90	22564.30	74.82	831928.90	822564.30	0.19	0.08	0.12	0.09	0.12	0.07	0.24	0.18	0.14
P23	P23	31916.81	22591.98	76.23	831916.81	822591.98	0.22	0.11	0.20	0.11	0.12	0.07	0.49	0.21	0.18
P24	P24	31885.23	22578.39	74.21	831885.23	822578.39	0.15	0.23	0.11	0.09	0.05	0.08	0.25	0.30	0.16
P25	P25	31853.06	22564.53	75.07	831853.06	822564.53	0.13	0.22	0.06	0.15	0.08	0.03	0.13	0.52	0.16
P26	P26	31829.88	22547.76	75.50	831829.88	822547.76	0.16	0.06	0.22	0.16	0.13	0.06	0.20	0.43	0.16
P27	P27	31804.29	22536.69	71.92	831804.29	822536.69	0.19	0.33	0.25	0.22	0.20	0.08	0.11	0.15	0.21
P28	P28	31781.73	22562.14	64.76	831781.73	822562.14	0.15	0.11	0.26	0.08	0.21	0.07	0.08	0.37	0.16
P29	P29	31753.77	22560.41	54.73	831753.77	822560.41	0.24	0.20	0.24	0.13	0.16	0.05	0.10	0.29	0.18
P30	P30	31722.99	22562.26	47.37	831722.99	822562.26	0.17	0.27	0.10	0.13	0.10	0.04	0.12	0.31	0.16
P31	P31	31700.91	22550.54	41.99	831700.91	822550.54	0.03	0.01	0.03	0.04	0.01	0.02	0.18	0.05	0.04
P32	P32	31689.68	22572.96	41.57	831689.68	822572.96	0.05	0.02	0.12	0.05	0.09	0.06	0.10	0.08	0.07
P33	P33	31682.82	22595.81	41.85	831682.82	822595.81	0.09	0.05	0.17	0.16	0.15	0.08	0.33	0.16	0.13
P34	P34	31676.78	22618.13	41.10	831676.78	822618.13	0.03	0.01	0.05	0.08	0.04	0.06	0.21	0.03	0.05
P35	P35	31666.60	22642.24	38.06	831666.60	822642.24	0.11	0.07	0.16	0.06	0.08	0.09	0.37	0.06	0.12
P36	P36	31652.14	22664.23	37.75	831652.14	822664.23	0.11	0.05	0.18	0.03	0.09	0.04	0.27	0.03	0.10
P37	P37	31633.24	22684.83	36.64	831633.24	822684.83	0.15	0.10	0.16	0.09	0.26	0.02	0.18	0.05	0.13
P38	P38	31610.98	22701.08	36.30	831610.98	822701.08	0.06	0.06	0.09	0.05	0.05	0.06	0.08	0.06	0.06
P39	P39	31588.99	22713.41	35.93	831588.99	822713.41	0.11	0.20	0.28	0.11	0.33	0.12	0.16	0.09	0.17
P40	P40	31568.35	22728.76	36.06	831568.35	822728.76	0.11	0.08	0.28	0.05	0.33	0.05	0.16	0.02	0.13
L1	P41	31981.92	22784.34	16.37	831981.92	822784.34	0.03	0.01	0.03	0.04	0.01	0.02	0.18	0.05	0.04
L2	P42	31973.42	22750.51	18.42	831973.42	822750.51	0.05	0.02	0.12	0.05	0.09	0.06	0.10	0.08	0.07
L3	P43	32014.21	22740.22	17.41	832014.21	822740.22	0.09	0.05	0.17	0.16	0.15	0.08	0.33	0.16	0.13
L4	P44	31988.23	22720.32	25.55	831988.23	822720.32	0.03	0.01	0.05	0.08	0.04	0.06	0.21	0.03	0.05
L5	P45	32033.88	22703.86	13.82	832033.88	822703.86	0.11	0.07	0.16	0.06	0.08	0.09	0.37	0.06	0.12
L6	P46	32029.31	22665.90	12.12	832029.31	822665.90	0.11	0.05	0.18	0.03	0.09	0.04	0.27	0.03	0.10
L7	P47	32018.21	22633.01	16.94	832018.21	822633.01	0.15	0.10	0.16	0.09	0.26	0.02	0.18	0.05	0.13
L8	P48	32037.03	22601.31	11.53	832037.03	822601.31	0.06	0.06	0.09	0.05	0.05	0.06	0.08	0.06	0.06
L9	P49	32036.85	22561.88	21.74	832036.85	822561.88	0.11	0.20	0.28	0.11	0.33	0.12	0.16	0.09	0.17
L10	P50	32056.23	22523.00	18.04	832056.23	822523.00	0.11	0.08	0.28	0.05	0.33	0.05	0.16	0.02	0.13
L11	P51	32051.83	22681.82	10.64	832051.83	822681.82	0.16	0.12	0.22	0.10	0.07	0.12	0.31	0.09	0.15
L12	P52	32064.21	22638.59	10.41	832064.21	822638.59	0.16	0.10	0.26	0.19	0.09	0.15	0.07	0.16	0.15
L13	P53	32077.66	22591.60	9.72	832077.66	822591.60	0.17	0.18	0.21	0.25	0.12	0.26	0.28	0.17	0.20
L14	P54	31907.00	22576.00	73.33	831907.00	822576.00	0.05	0.03	0.22	0.15	0.22	0.12	0.34	0.19	0.14
L15	P55	31844.46	22528.35	75.68	831844.46	822528.35	0.16	0.11	0.27	0.09	0.14	0.10	0.11	0.38	0.16
L16	P56	31935.95	22531.26	78.71	831935.95	822531.26	0.32	0.07	0.10	0.07	0.17	0.05	0.23	0.20	0.16
L17	P57	31897.31	22514.08	78.48	831897.31	822514.08	0.06	0.20	0.13	0.14	0.09	0.09	0.15	0.34	0.14
L18	P58	31857.01	22496.17	78.04	831857.01	822496.17	0.16	0.09	0.24	0.18	0.17	0.15	0.31	0.18	0.17
L19	P59	31970.33	22525.49	71.81	831970.33	822525.49	0.24	0.19	0.17	0.34	0.29	0.32	0.43	0.18	0.26
L20	P60	31952.30	22493.69	78.04	831952.30	822493.69	0.16	0.05	0.15	0.12	0.11	0.13	0.28	0.25	0.15
L21	P61	31916.66	22478.56	79.23	831916.66	822478.56	0.35	0.20	0.26	0.27	0.12	0.05	0.11	0.14	0.21
L22	P62	31880.27	22463.12	79.17	831880.27	822463.12	0.10	0.19	0.15	0.12	0.18	0.08	0.31	0.04	0.14
L23	P63	31844.94	22463.23	76.20	831844.94	822463.23	0.05	0.06	0.10	0.04	0.20	0.05	0.07	0.22	0.09
L24	P64	31963.47	22472.55	74.25	831963.47	822472.55	0.17	0.20	0.15	0.15	0.26	0.11	0.25	0.31	0.19
L25	P65	31943.45	22453.60	72.40	831943.45	822453.60	0.14	0.21	0.18	0.14	0.28	0.11	0.35	0.27	0.20
L26	P66	31912.40	22440.88	72.82	831912.40	822440.88	0.06	0.30	0.14	0.27	0.24	0.15	0.35	0.34	0.21
L27	P67	31869.80	22440.66	71.66	831869.80	822440.66	0.20	0.36	0.21	0.16	0.16	0.10	0.22	0.43	0.23
L28	P68	31824.33	22453.98	71.98	831824.33	822453.98	0.14	0.34	0.15	0.13	0.18	0.10	0.17	0.47	0.20
L29	P69	31818.23	22486.72	73.08	831818.23	822486.72	0.14	0.28	0.25	0.11	0.17	0.11	0.13	0.24	0.18
L30	P70	31801.61	22513.01	69.61	831801.61	822513.01	0.22	0.20	0.21	0.22	0.11	0.04	0.11	0.19	0.17

L31	P71	31790.74	22545.58	65.76	831790.74	822545.58	0.13	0.23	0.25	0.14	0.20	0.03	0.05	0.11	0.16
L32	P72	31982.10	22452.56	62.97	831982.10	822452.56	0.14	0.12	0.35	0.14	0.32	0.24	0.26	0.23	0.21
L33	P73	31972.08	22419.11	61.26	831972.08	822419.11	0.21	0.41	0.28	0.26	0.29	0.12	0.40	0.49	0.30
L34	P74	31924.15	22413.37	64.10	831924.15	822413.37	0.21	0.38	0.20	0.31	0.20	0.25	0.41	0.58	0.30
L35	P75	31901.22	22389.07	61.26	831901.22	822389.07	0.21	0.16	0.34	0.41	0.37	0.21	0.38	0.30	0.28
L36	P76	31867.90	22414.31	62.73	831867.90	822414.31	0.31	0.49	0.32	0.30	0.42	0.26	0.46	0.63	0.39
L37	P77	31841.25	22391.46	60.21	831841.25	822391.46	0.13	0.32	0.35	0.48	0.50	0.22	0.31	0.58	0.33
L38	P78	31803.71	22399.10	58.51	831803.71	822399.10	0.09	0.41	0.16	0.27	0.23	0.14	0.21	0.56	0.24
L39	P79	31799.03	22437.71	58.95	831799.03	822437.71	0.30	0.33	0.09	0.08	0.17	0.05	0.16	0.43	0.21
L40	P80	31756.94	22437.51	50.11	831756.94	822437.51	0.45	0.19	0.38	0.23	0.23	0.15	0.24	0.18	0.28
L41	P81	31761.07	22483.41	52.03	831761.07	822483.41	0.21	0.25	0.12	0.10	0.08	0.08	0.16	0.33	0.17
L42	P82	31724.09	22494.86	47.51	831724.09	822494.86	0.21	0.24	0.31	0.17	0.13	0.14	0.17	0.11	0.20
L43	P83	31751.09	22530.02	48.96	831751.09	822530.02	0.16	0.21	0.21	0.10	0.08	0.06	0.09	0.35	0.16
L44	P84	31722.98	22544.30	43.76	831722.98	822544.30	0.18	0.26	0.08	0.13	0.06	0.07	0.12	0.41	0.17
L45	P85	31701.01	22441.30	42.71	831701.01	822441.30	0.08	0.07	0.11	0.06	0.10	0.05	0.05	0.06	0.08
L46	P86	31668.84	22445.70	28.80	831668.84	822445.70	0.27	0.15	0.36	0.17	0.09	0.08	0.12	0.12	0.19
L47	P87	31666.76	22502.11	39.43	831666.76	822502.11	0.17	0.12	0.12	0.02	0.10	0.05	0.04	0.25	0.11
L48	P88	31631.64	22526.84	30.13	831631.64	822526.84	0.30	0.24	0.40	0.12	0.13	0.08	0.17	0.33	0.23
L49	P89	31652.98	22565.84	36.52	831652.98	822565.84	0.07	0.17	0.07	0.06	0.05	0.11	0.09	0.16	0.10
L50	P90	31615.08	22586.93	33.18	831615.08	822586.93	0.19	0.39	0.11	0.09	0.04	0.05	0.13	0.31	0.18
L51	P91	31637.61	22606.99	36.01	831637.61	822606.99	0.11	0.16	0.15	0.08	0.10	0.05	0.07	0.22	0.12
L52	P92	31733.56	22448.44	48.07	831733.56	822448.44	0.09	0.22	0.53	0.19	0.27	0.15	0.24	0.23	0.23
L53	P93	31705.87	22474.08	44.63	831705.87	822474.08	0.20	0.09	0.21	0.13	0.25	0.17	0.28	0.12	0.18
L54	P94	31707.62	22508.42	44.19	831707.62	822508.42	0.21	0.07	0.28	0.15	0.15	0.16	0.19	0.13	0.17
L55	P95	31686.35	22533.04	41.00	831686.35	822533.04	0.26	0.23	0.06	0.14	0.16	0.16	0.23	0.48	0.21
L56	P96	31677.66	22567.09	38.99	831677.66	822567.09	0.13	0.29	0.09	0.13	0.13	0.09	0.19	0.17	0.16
L57	P97	31665.28	22605.13	37.83	831665.28	822605.13	0.09	0.11	0.21	0.07	0.12	0.06	0.15	0.17	0.12
L58	P98	31646.17	22641.07	34.58	831646.17	822641.07	0.07	0.08	0.13	0.05	0.10	0.03	0.08	0.15	0.09
L59	P99	31615.10	22673.17	31.95	831615.10	822673.17	0.22	0.21	0.12	0.09	0.10	0.10	0.09	0.24	0.16
L60	P100	31587.75	22694.22	32.08	831587.75	822694.22	0.37	0.31	0.18	0.13	0.06	0.11	0.11	0.25	0.22
L61	P101	31557.18	22710.11	33.36	831557.18	822710.11	0.39	0.32	0.35	0.11	0.08	0.11	0.08	0.26	0.24
L62	P102	31523.30	22726.82	34.38	831523.30	822726.82	0.36	0.31	0.43	0.08	0.22	0.13	0.15	0.28	0.27
L63	P103	31500.00	22757.56	37.02	831500.00	822757.56	0.19	0.17	0.33	0.08	0.17	0.18	0.51	0.33	0.23
L64	P104	31459.44	22757.69	31.95	831459.44	822757.69	0.22	0.14	0.35	0.05	0.18	0.12	0.46	0.21	0.21
L65	P105	31436.09	22788.98	41.75	831436.09	822788.98	0.09	0.05	0.34	0.23	0.29	0.21	0.57	0.34	0.23
						Average	0.18	0.18	0.20	0.15	0.17	0.13	0.26	0.23	0.19
						Min	0.03	0.01	0.03	0.02	0.01	0.02	0.04	0.02	0.04
						Max	0.45	0.49	0.53	0.48	0.50	0.43	0.70	0.63	0.39

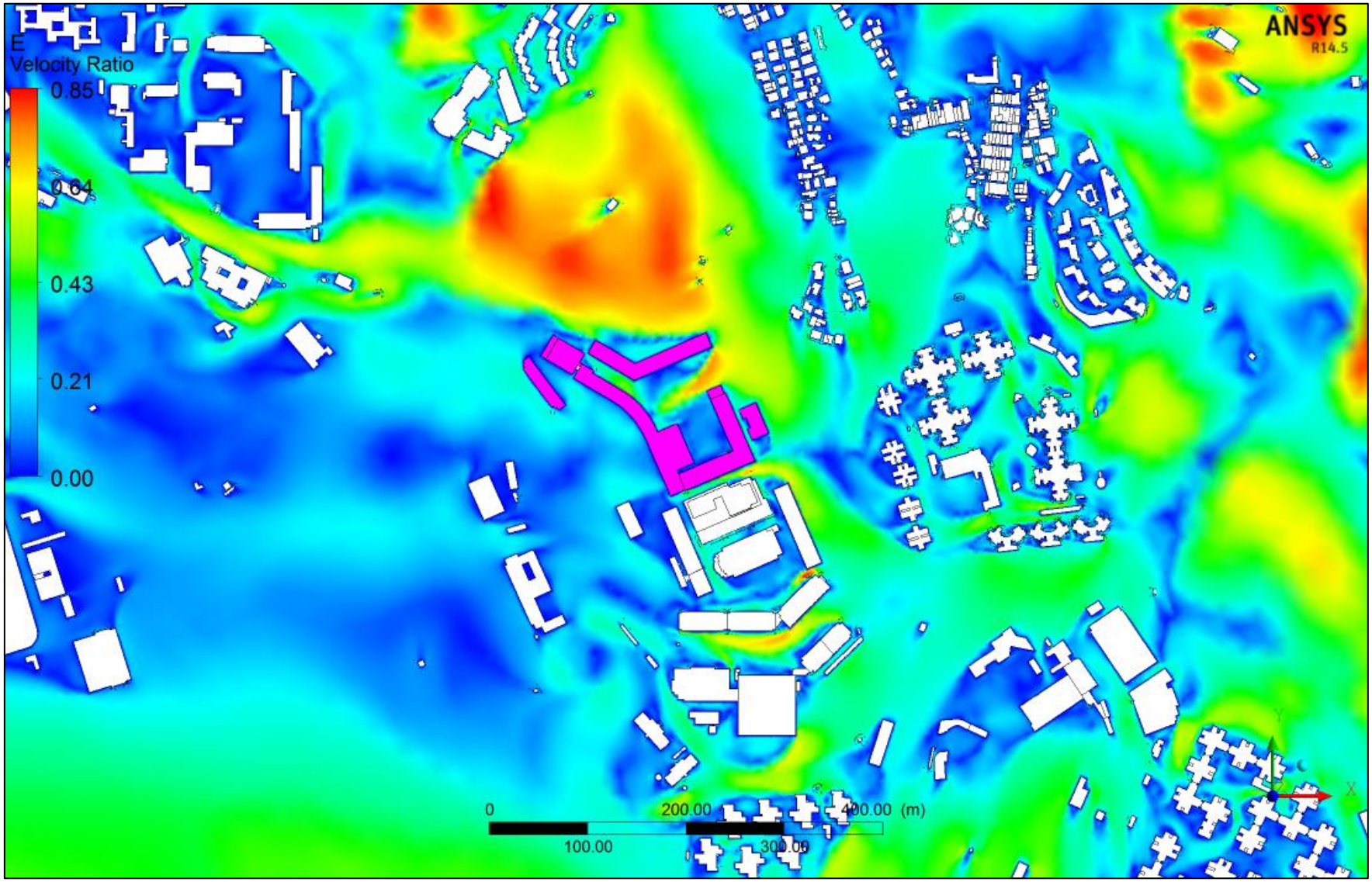
Proposed Scheme – Special Test Points Velocity Ratio (VR) under Summer Prevailing Wind

							SSW	SW	S	ESE	SSE	SE	E	WSW	
						Velocity @ Infinite	6.60	6.59	6.57	7.93	6.17	6.72	7.09	4.95	
						Probability	0.17	0.146	0.107	0.095	0.079	0.076	0.076	0.063	
ID	**Model ID**	**x**	**y**	**Z at 2m**	**X coordinates**	**Y coordinates**									**Weighted VR**
S1	P106	31903.63	22645.79	70.38	861903.63	852645.79	0.24	0.16	0.31	0.31	0.07	0.35	0.38	0.10	0.24
S2	P107	31863.97	22584.86	73.35	861863.97	852584.86	0.03	0.25	0.10	0.30	0.08	0.05	0.16	0.11	0.14
S3	P108	31793.48	22587.49	66.50	861793.48	852587.49	0.08	0.13	0.23	0.07	0.23	0.06	0.02	0.17	0.12
S4	P109	31745.90	22627.50	73.11	861745.90	852627.50	0.09	0.09	0.15	0.05	0.13	0.07	0.04	0.10	0.09
S5	P110	31696.90	22655.30	73.11	861696.90	852655.30	0.16	0.33	0.31	0.11	0.24	0.11	0.25	0.31	0.23
S6	P111	31726.81	22700.56	72.89	861726.81	852700.56	0.19	0.22	0.26	0.07	0.07	0.07	0.36	0.24	0.19
S7	P112	31769.87	22678.18	73.11	861769.87	852678.18	0.07	0.05	0.10	0.10	0.08	0.09	0.12	0.09	0.08
S8	P113	31817.79	22659.89	72.80	861817.79	852659.89	0.08	0.10	0.10	0.13	0.05	0.08	0.25	0.02	0.10
S9	P114	31863.11	22679.99	72.51	861863.11	852679.99	0.09	0.09	0.09	0.10	0.06	0.06	0.21	0.05	0.09
S10	P115	31812.95	22699.44	73.98	861812.95	852699.44	0.04	0.19	0.15	0.12	0.16	0.10	0.54	0.10	0.16
						Average	0.11	0.16	0.18	0.14	0.12	0.10	0.23	0.13	**0.14**
						Min	0.03	0.05	0.09	0.05	0.05	0.05	0.02	0.02	**0.08**
						Max	0.24	0.33	0.31	0.31	0.24	0.35	0.54	0.31	**0.24**

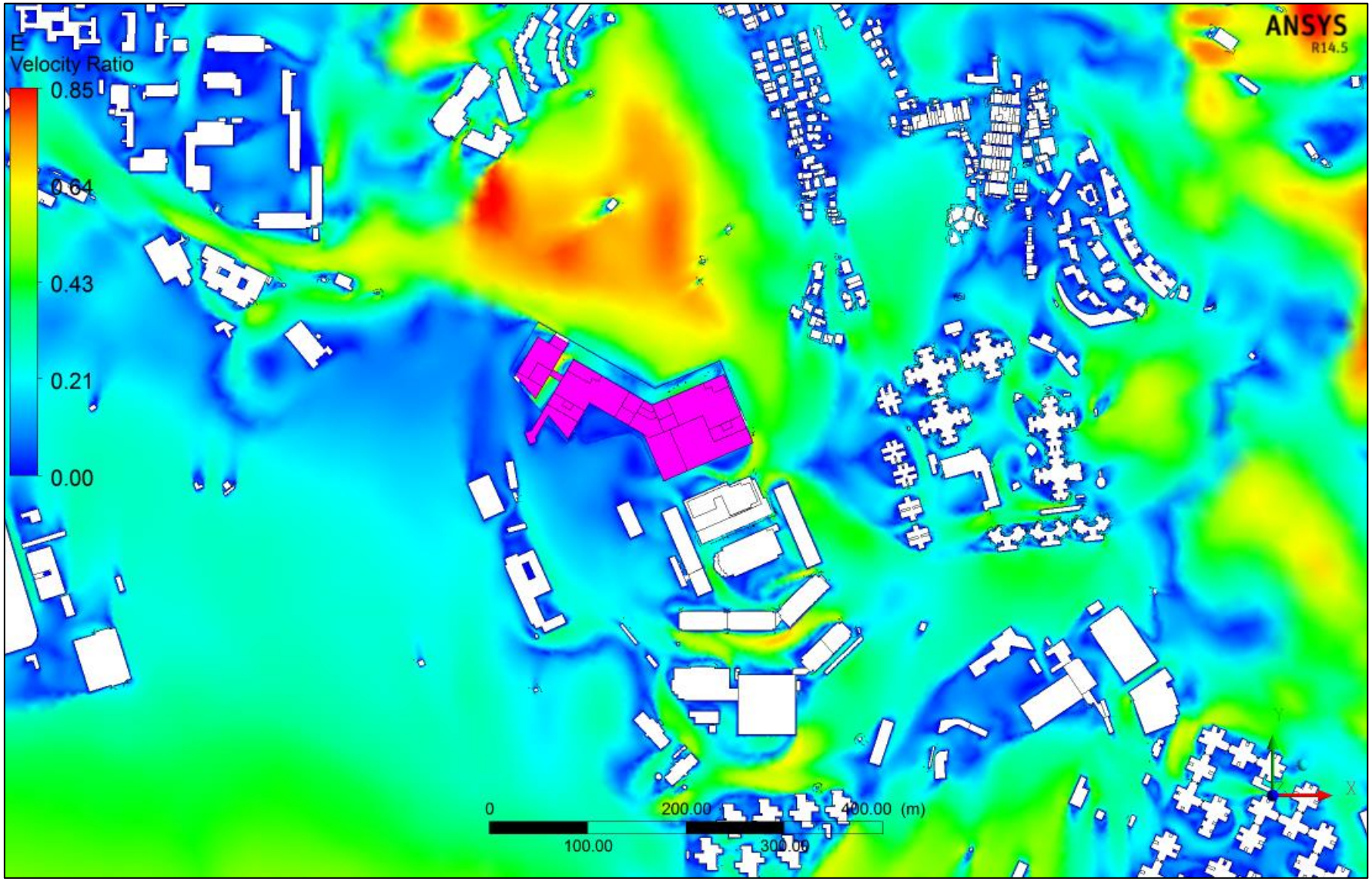
APPENDIX C

Overall Weighted VR Contour Plots for Annual and Summer Prevailing Wind

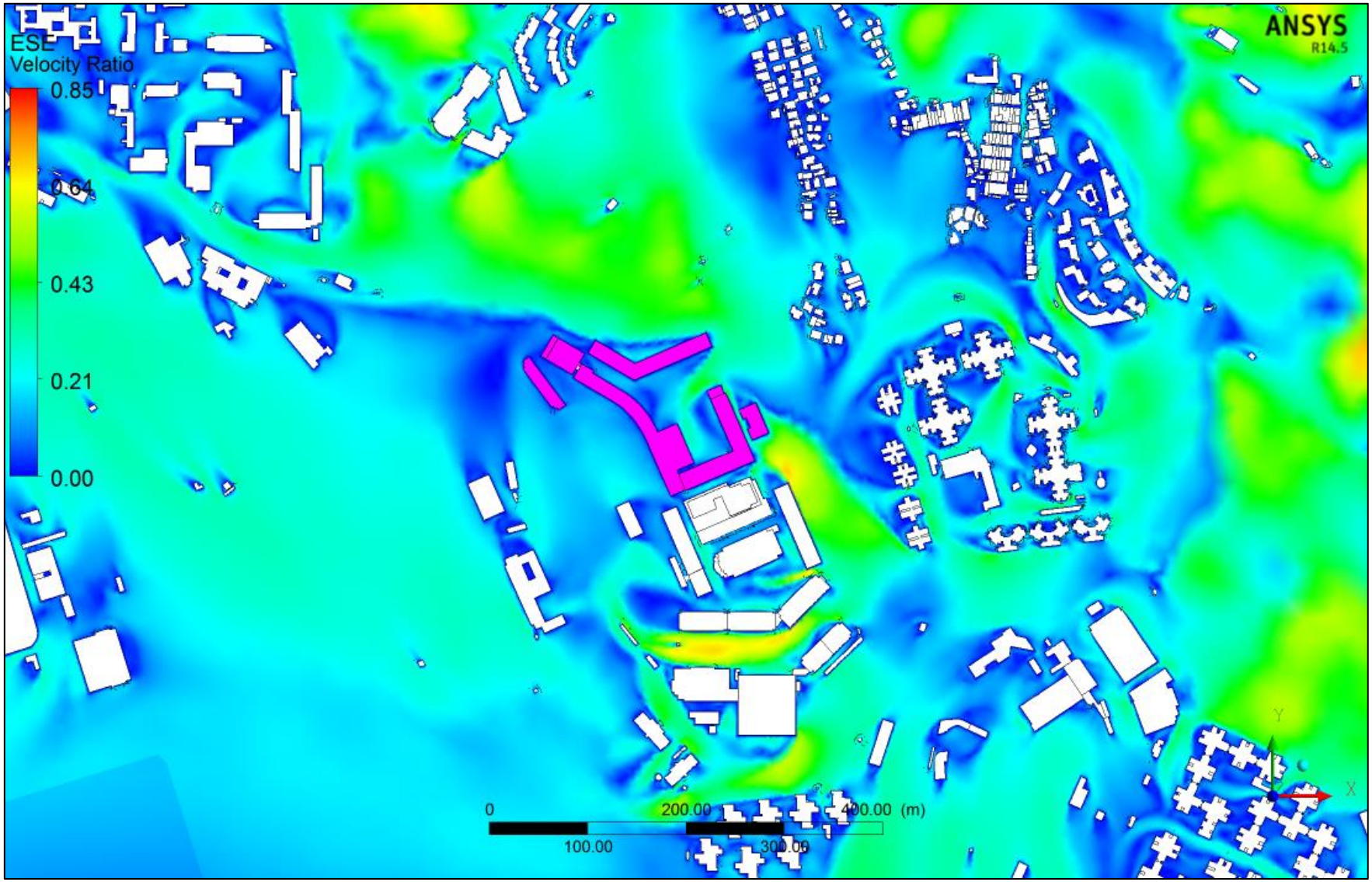
Base Scheme – E at 2mAG



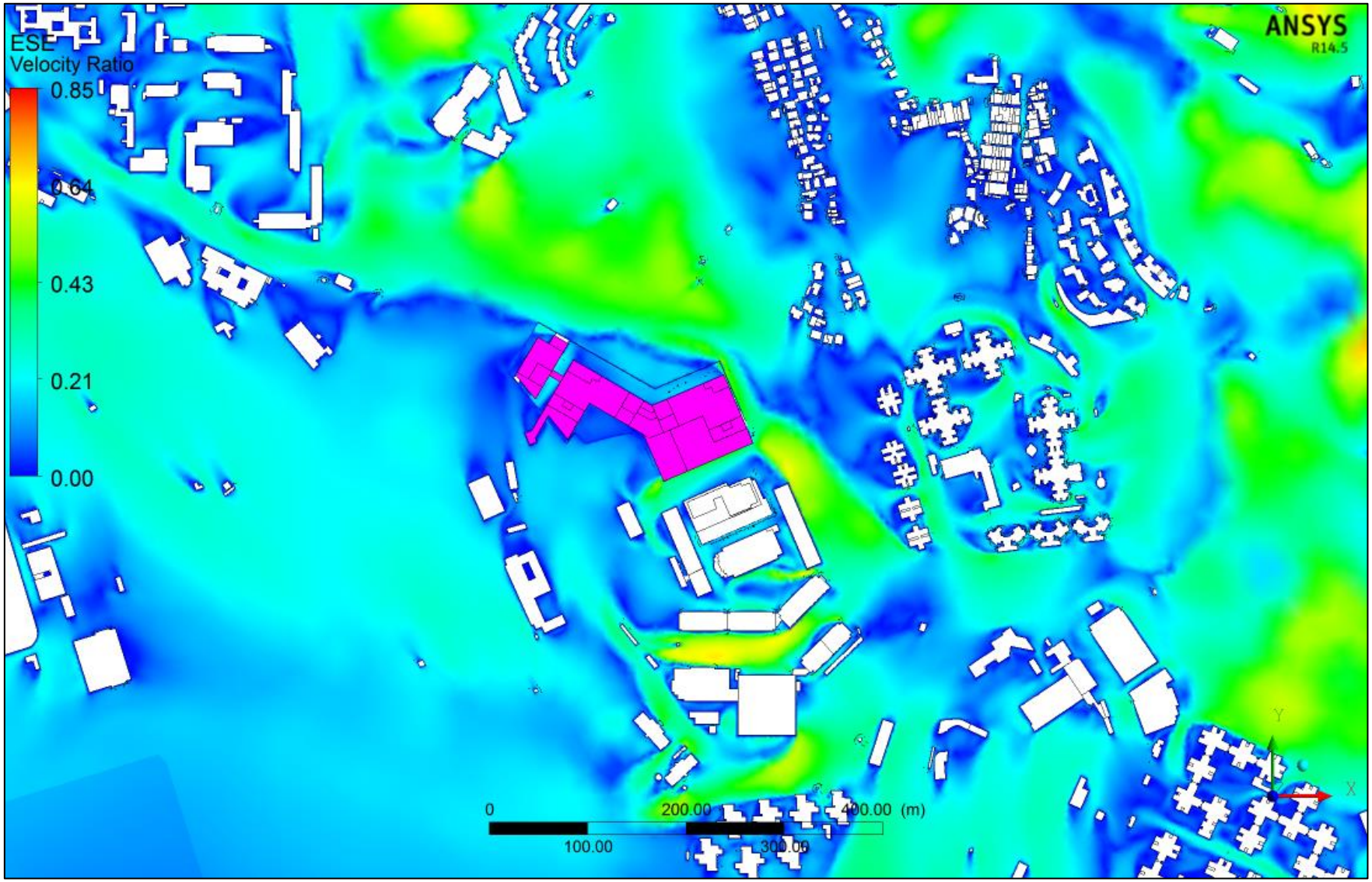
Proposed Scheme – E at 2mAG



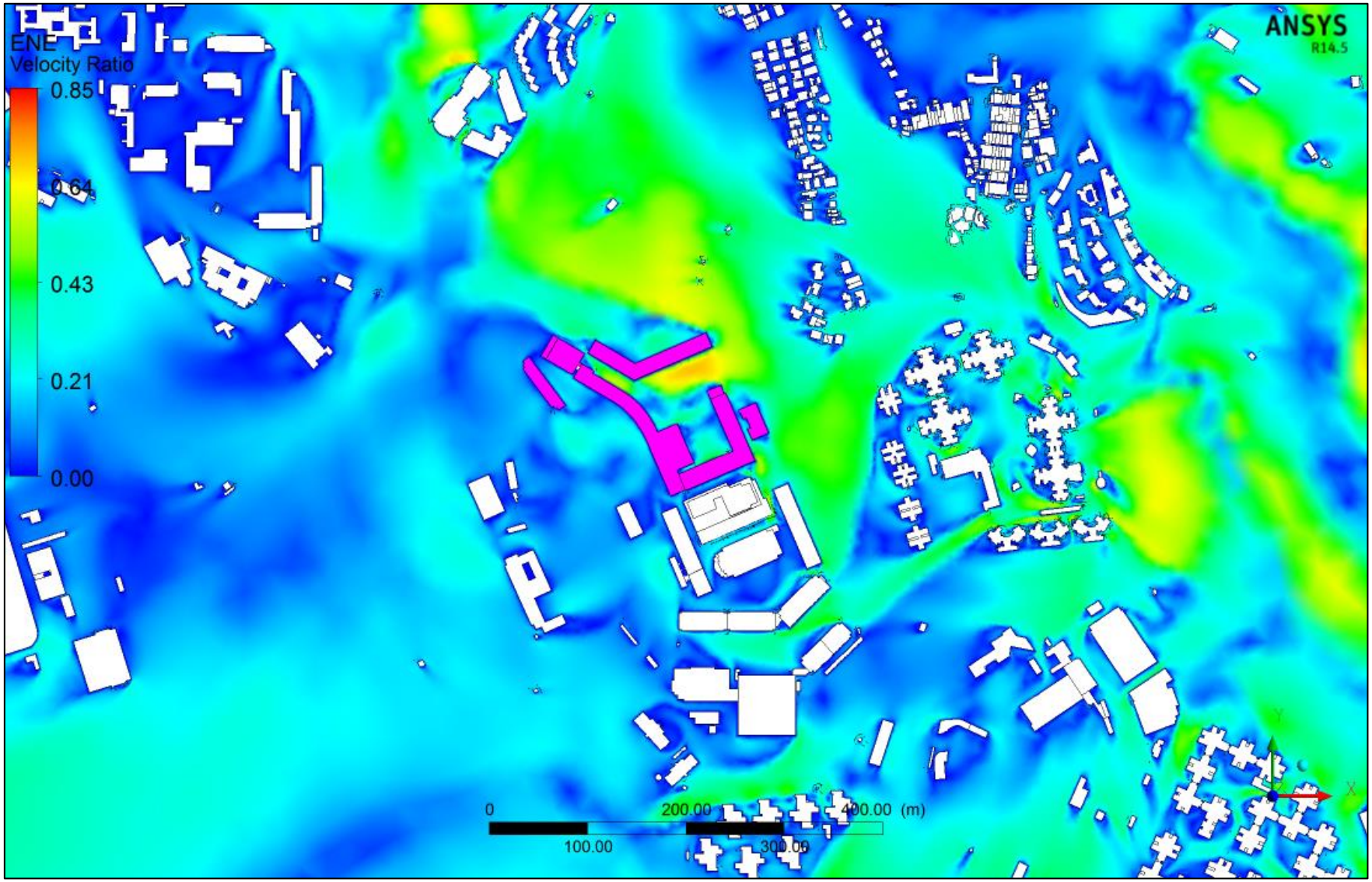
Base Scheme – ESE at 2mAG



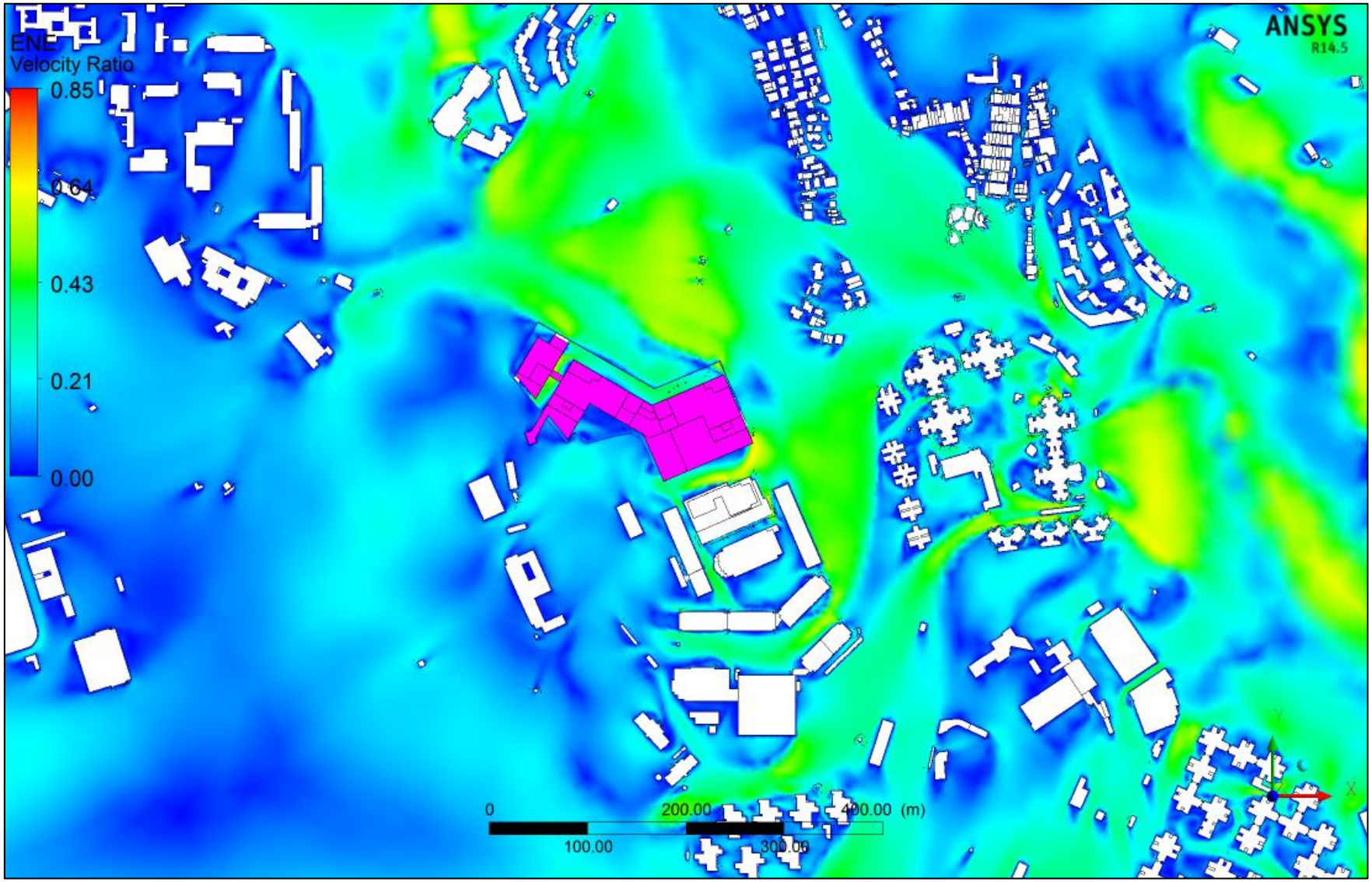
Proposed Scheme – ESE at 2mAG



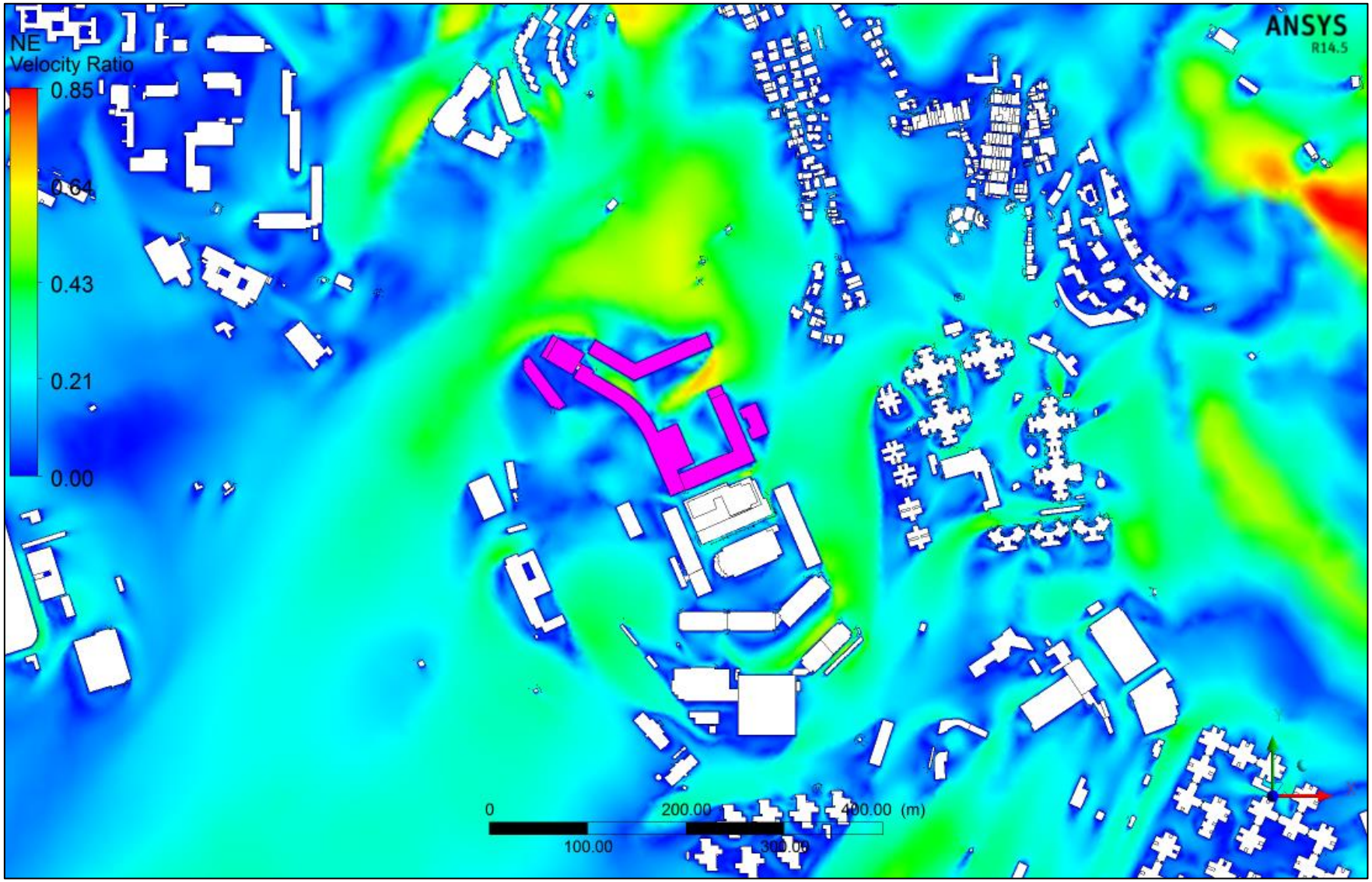
Base Scheme – ENE at 2mAG



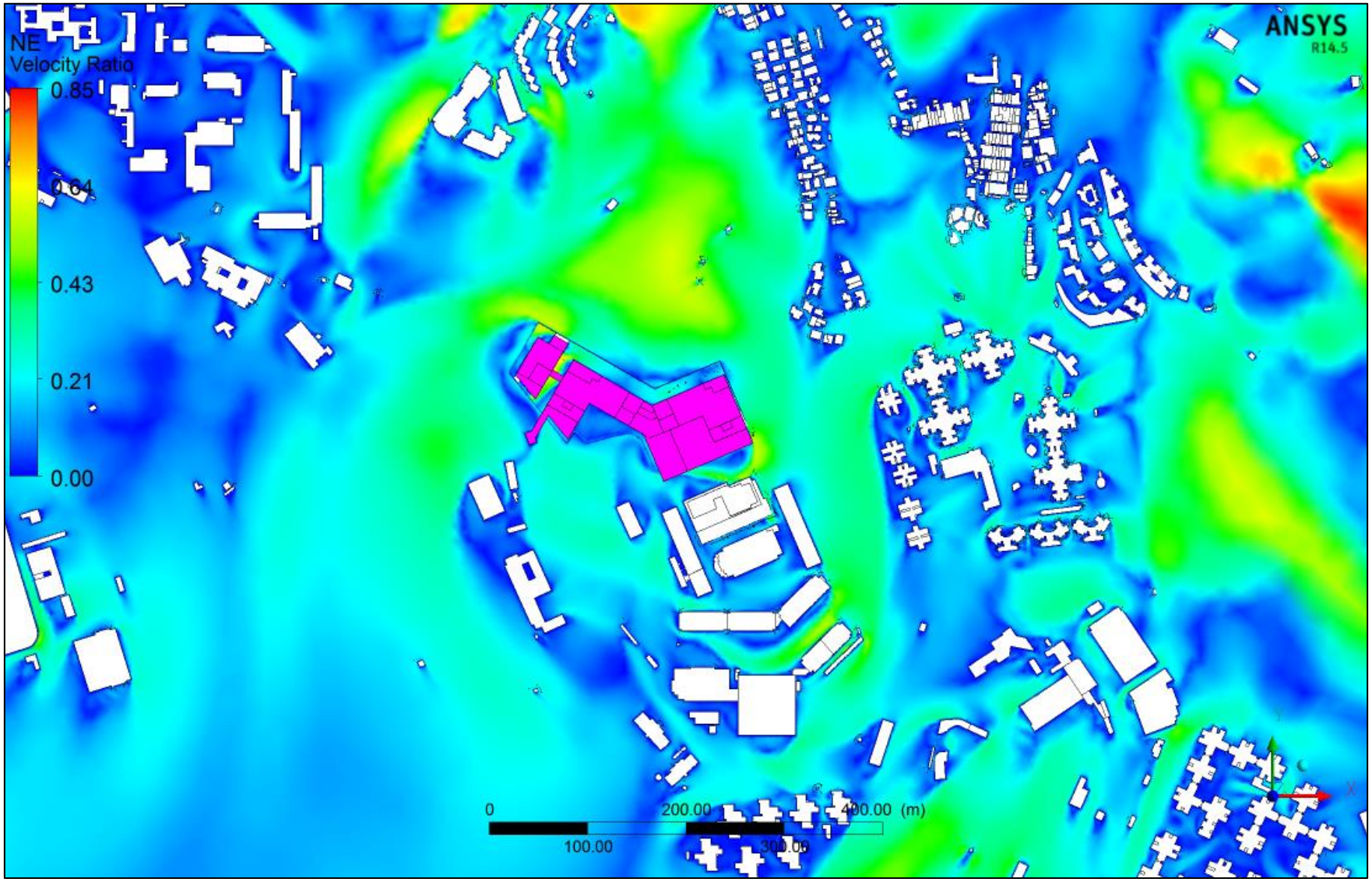
Proposed Scheme – ENE at 2mAG



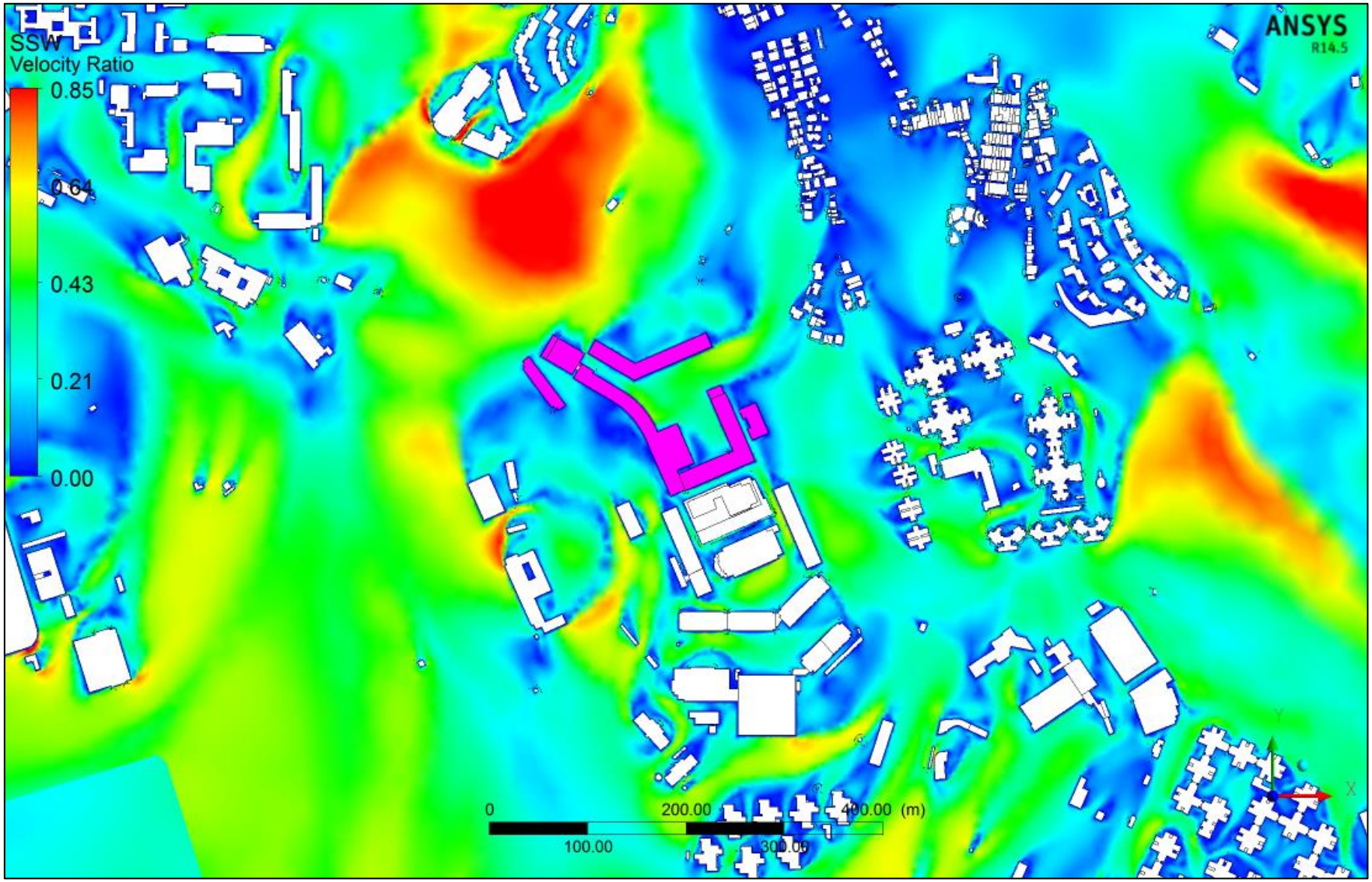
Base Scheme – NE at 2mAG



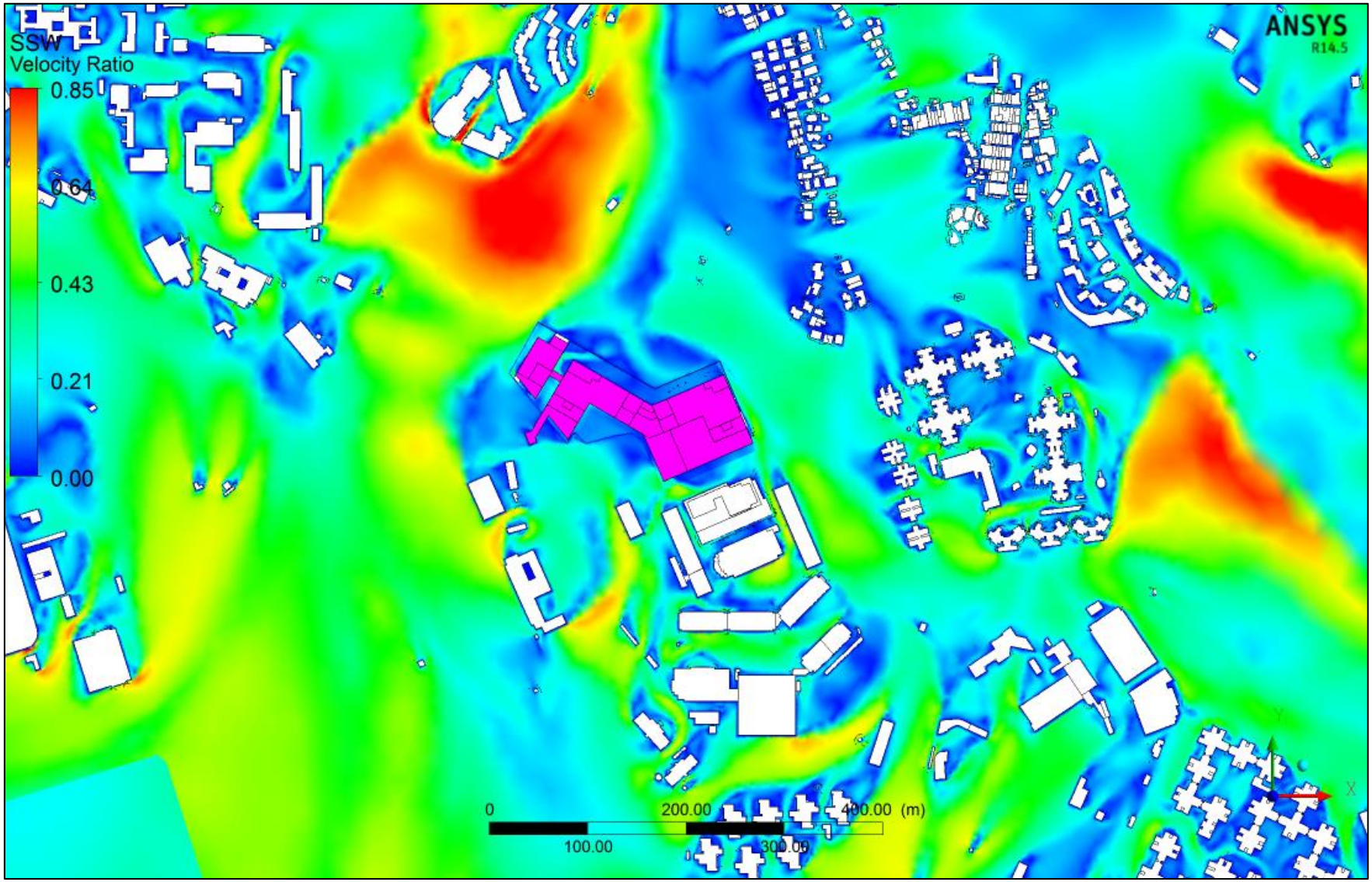
Proposed Scheme – NE at 2mAG



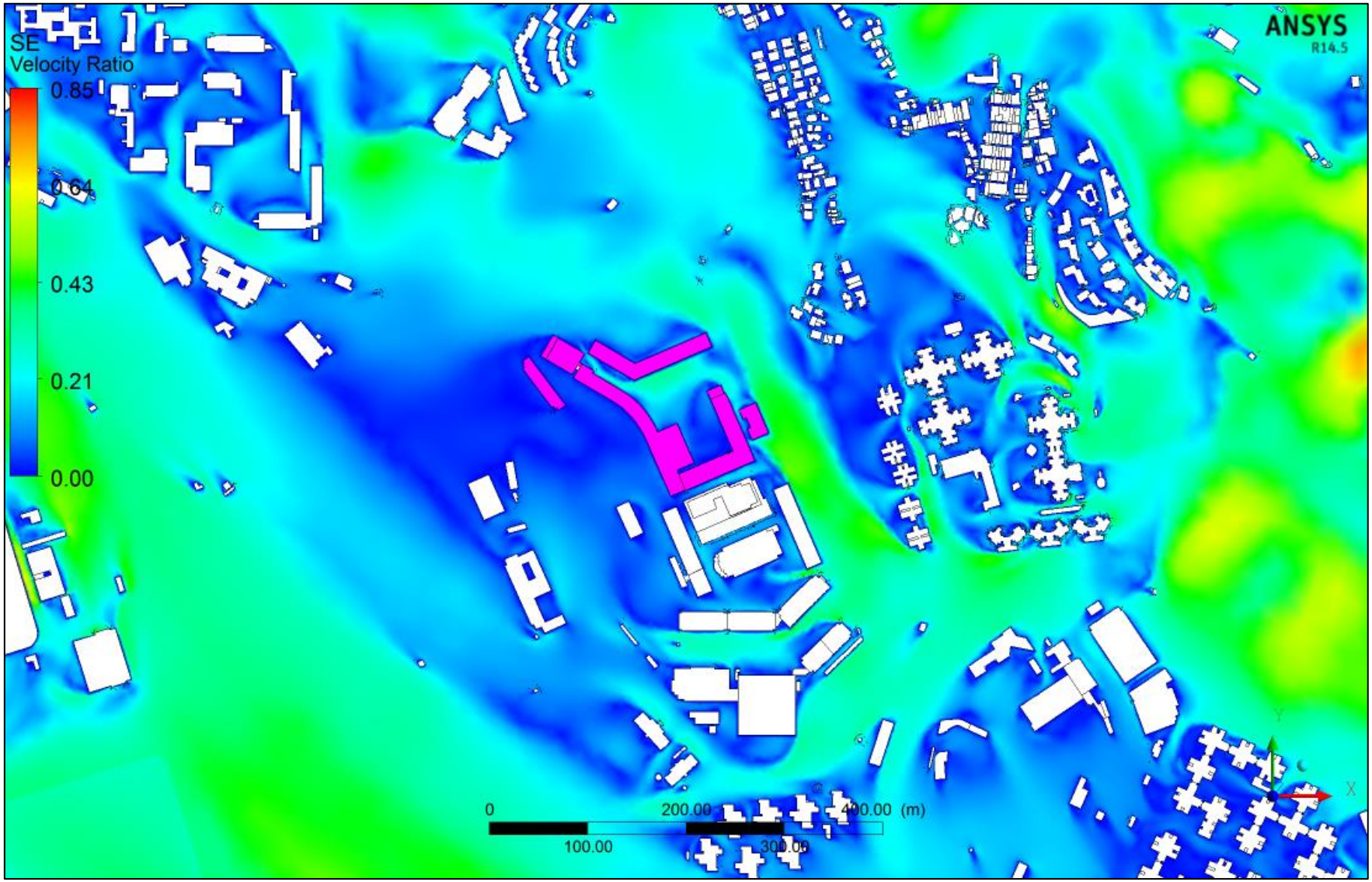
Base Scheme – SSW at 2mAG



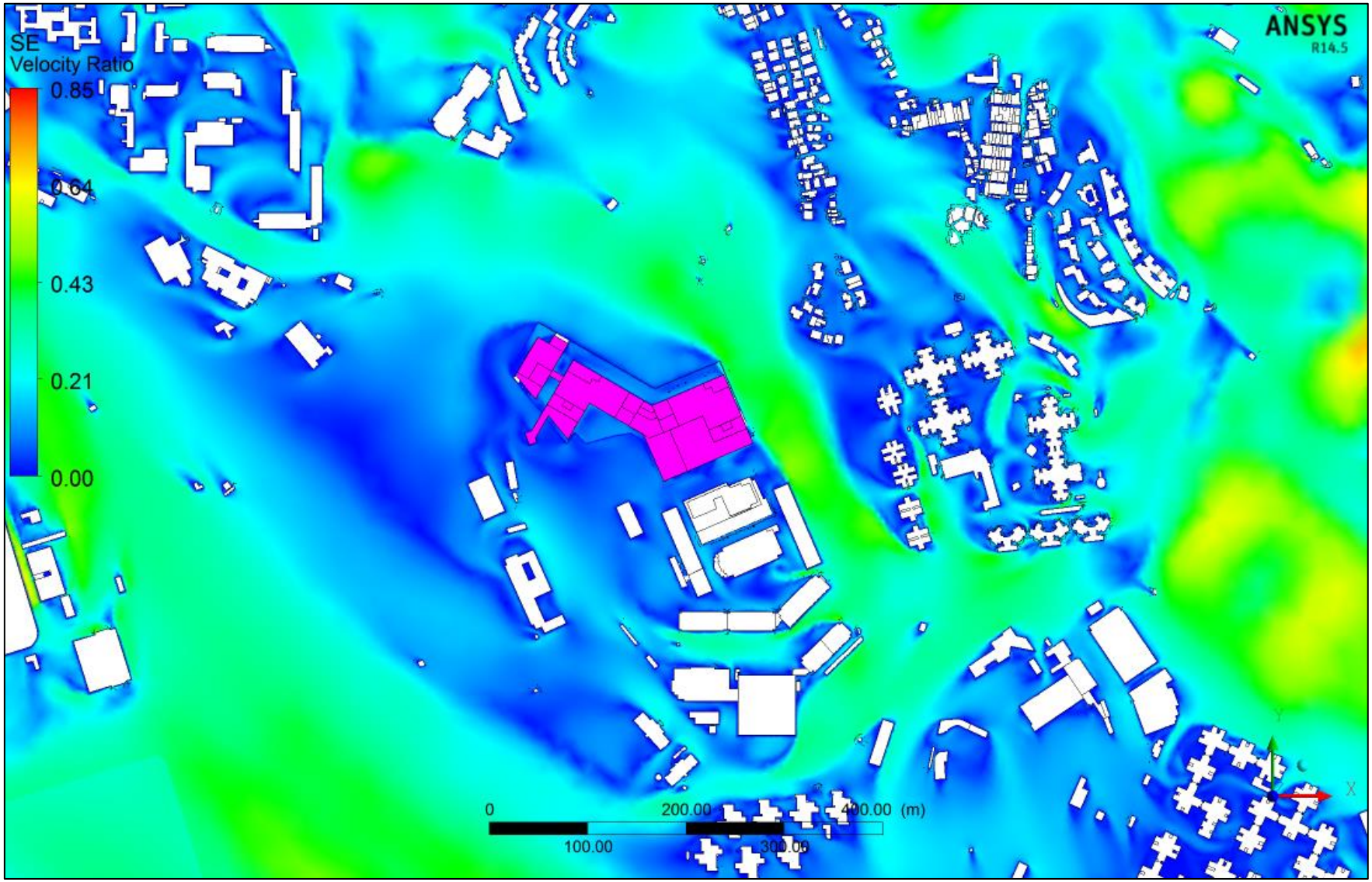
Proposed Scheme – SSW at 2mAG



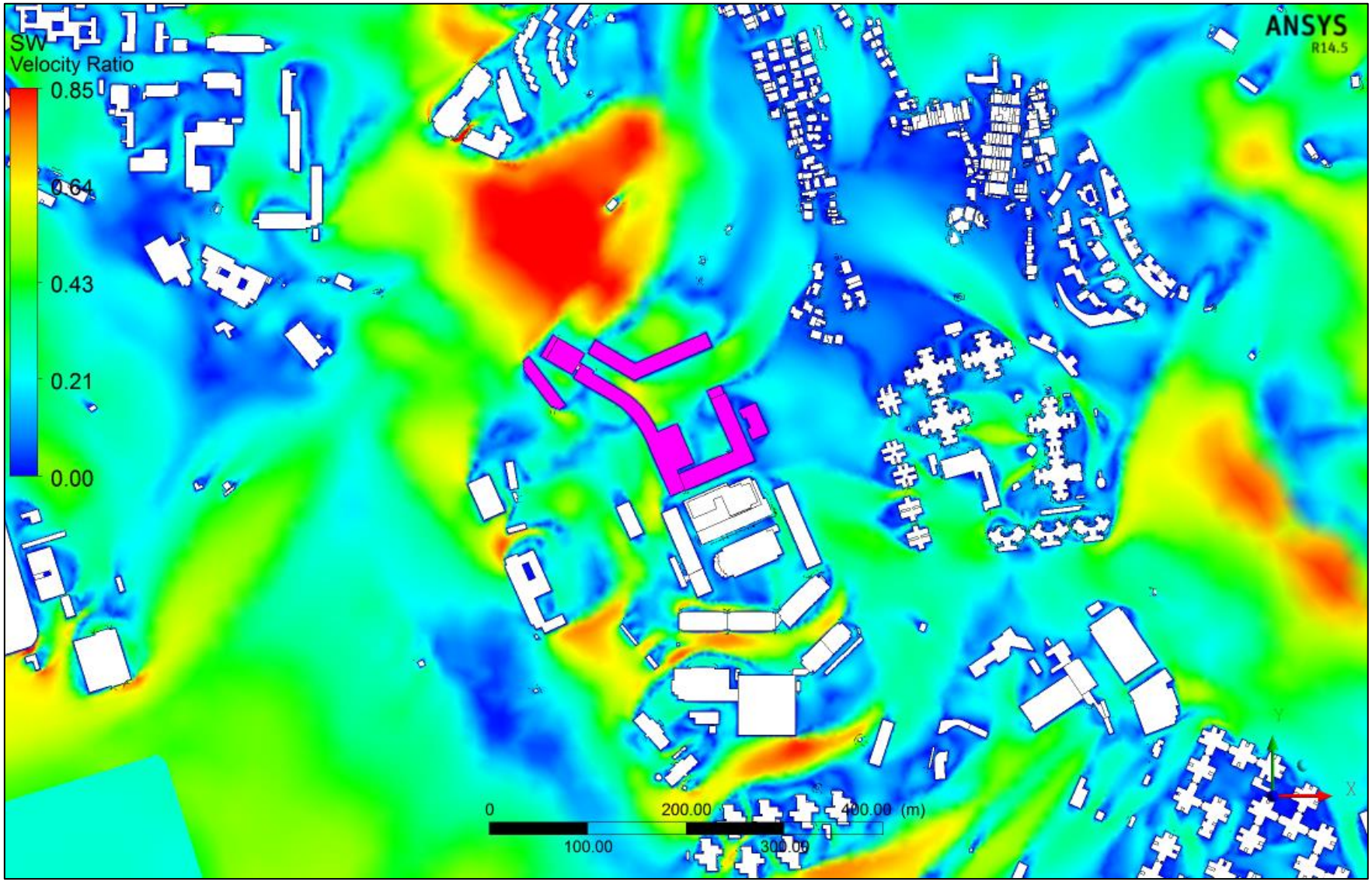
Base Scheme – SE at 2mAG



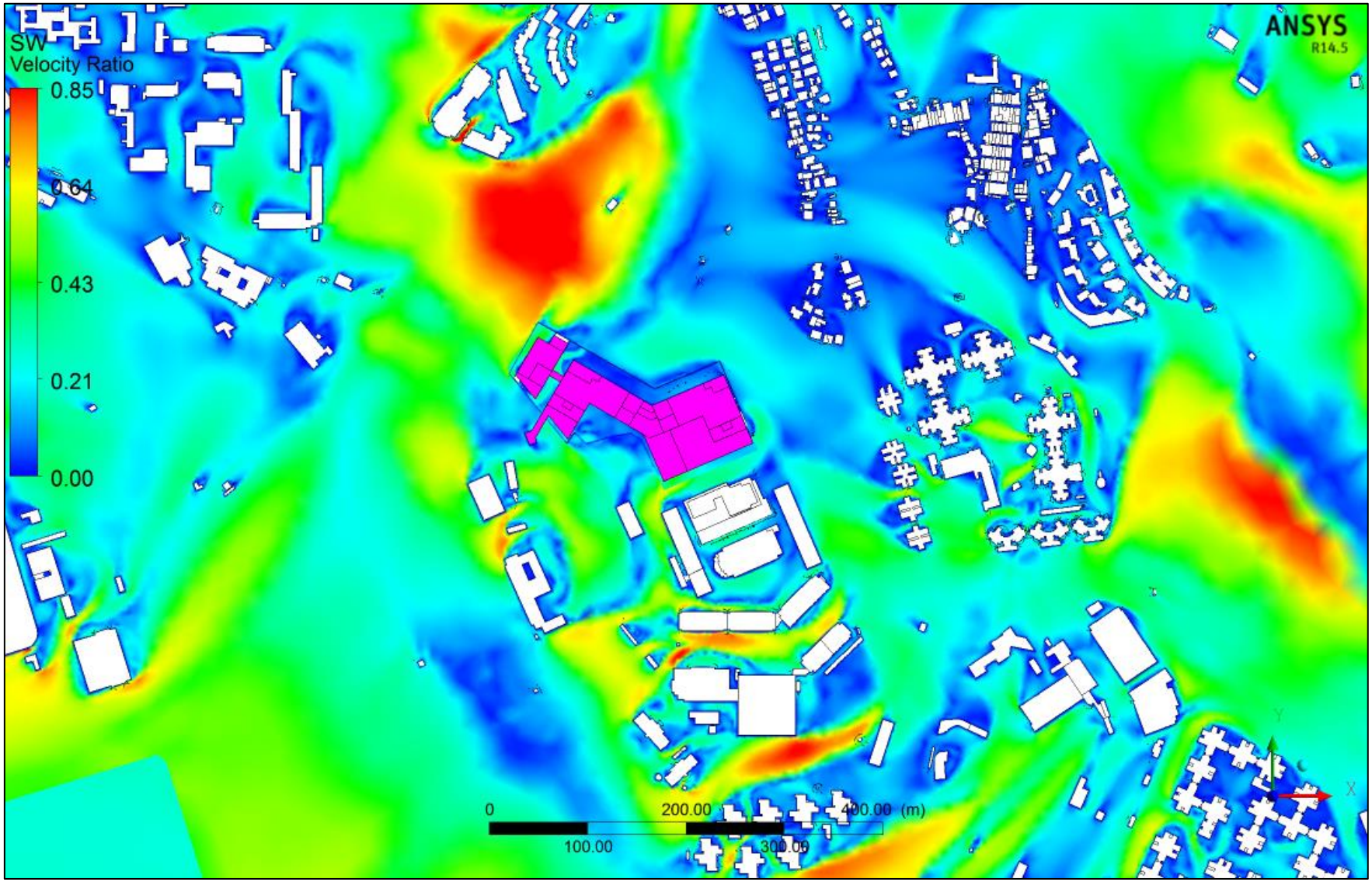
Proposed Scheme – SE at 2mAG



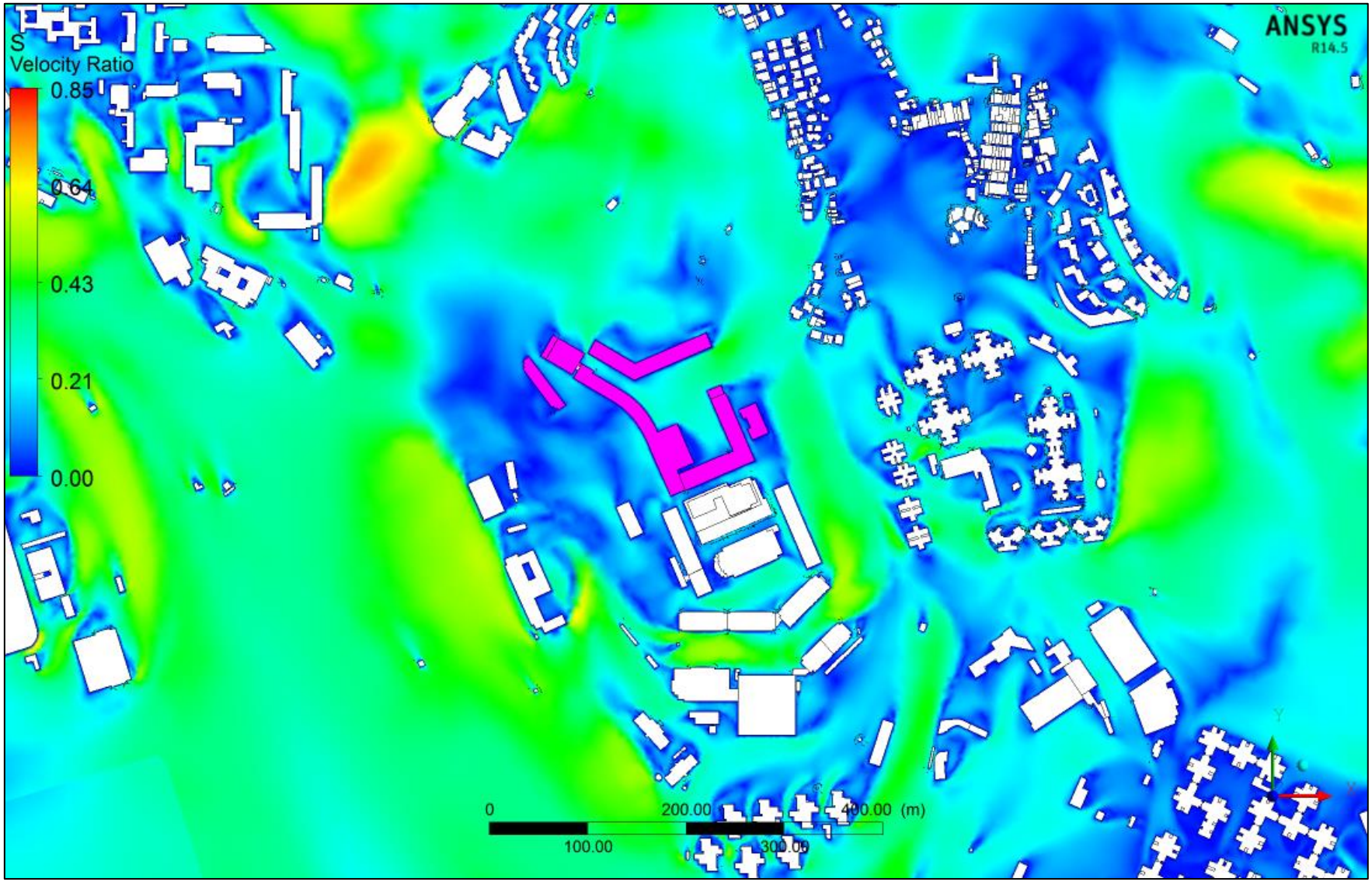
Base Scheme – SW at 2mAG



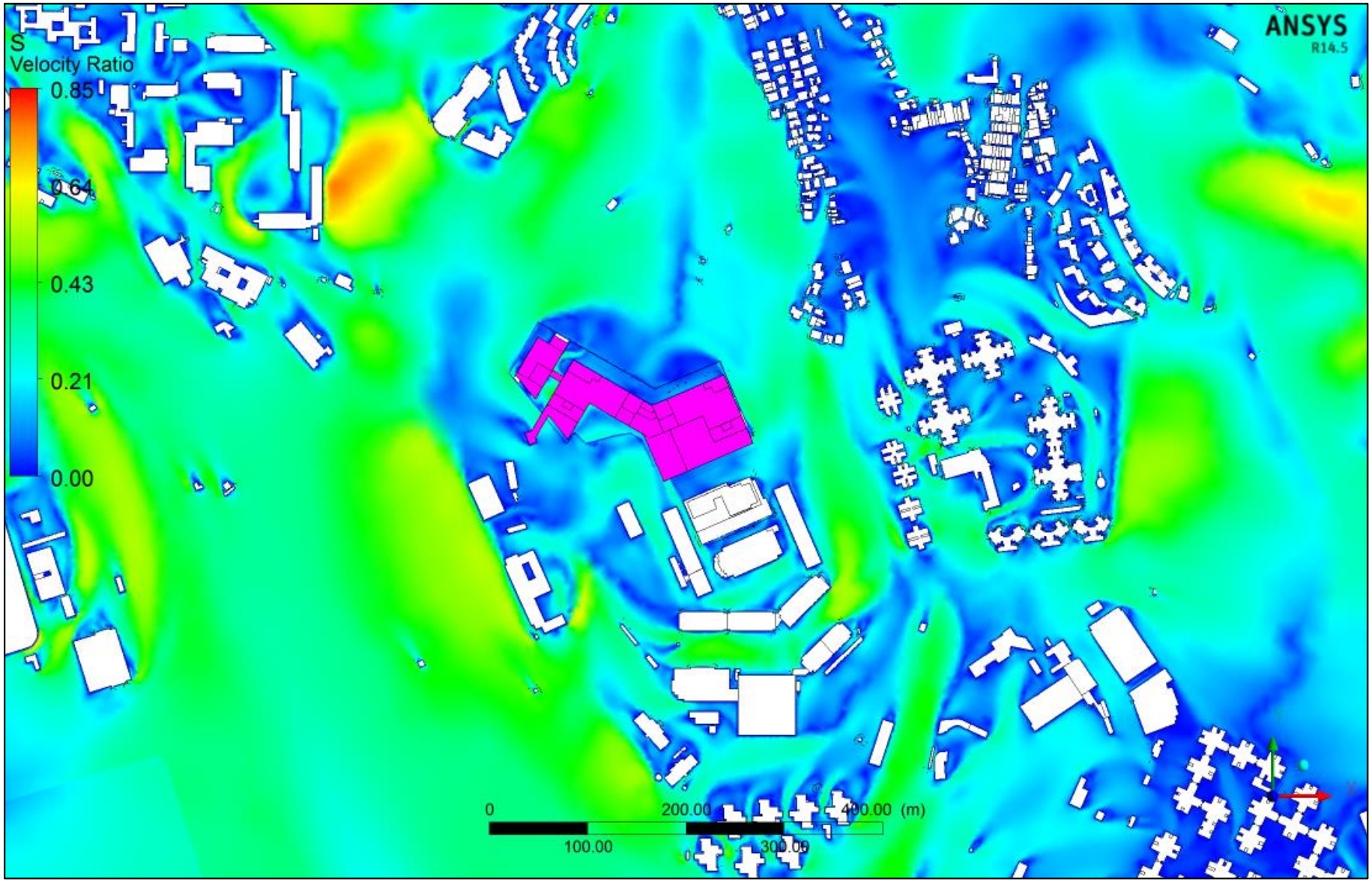
Proposed Scheme – SW at 2mAG



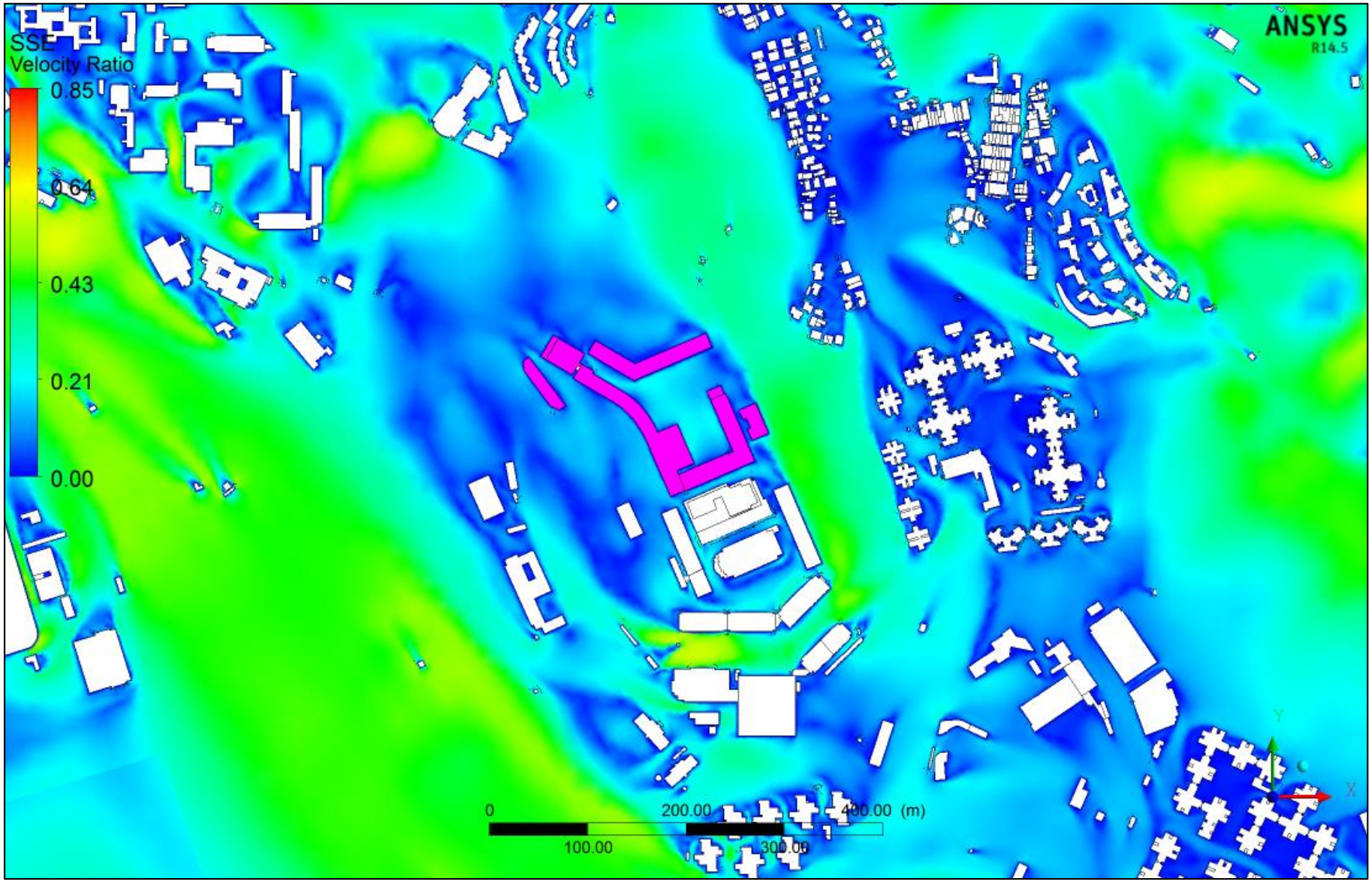
Base Scheme – S at 2mAG



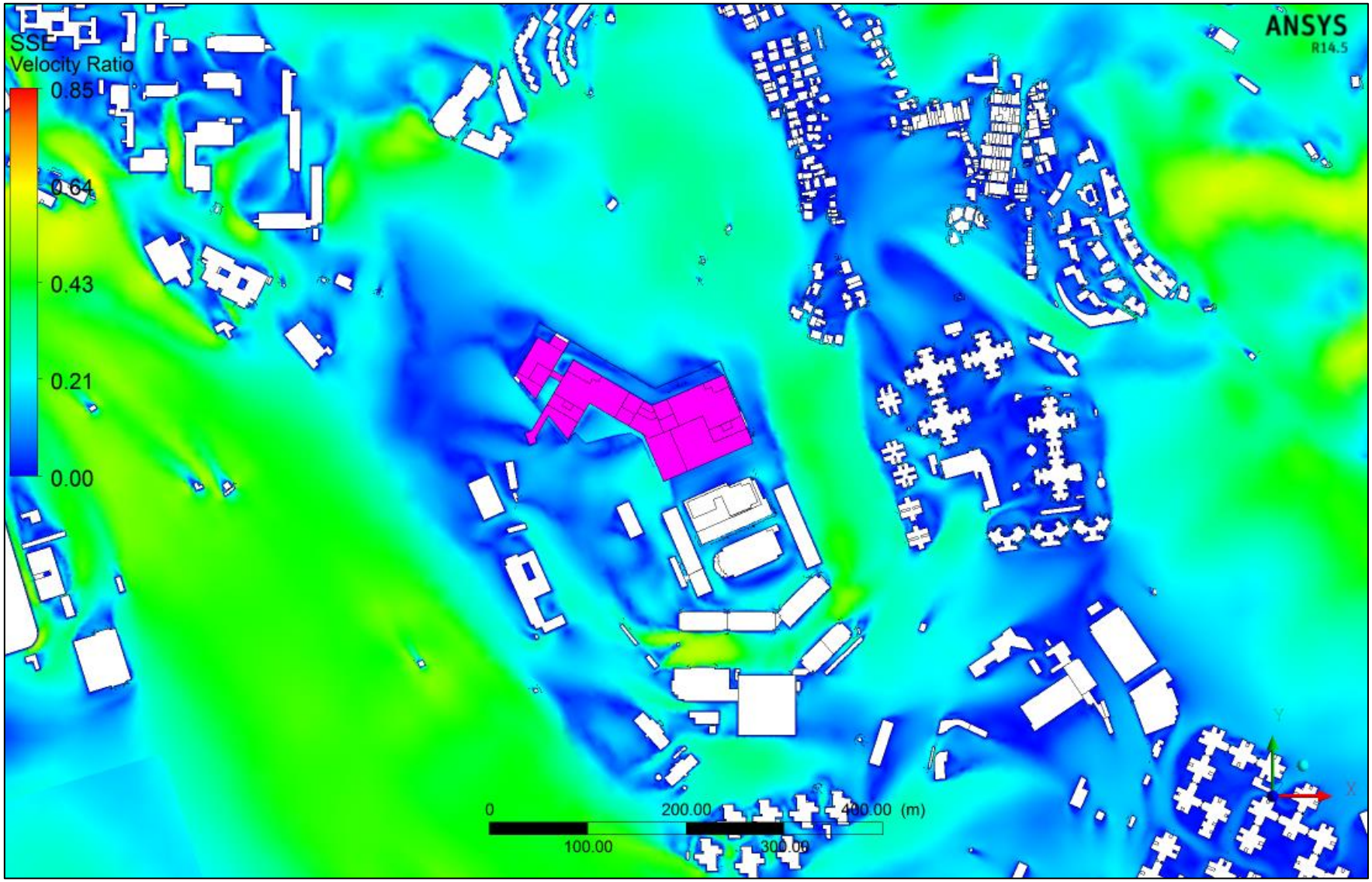
Proposed Scheme – S at 2mAG



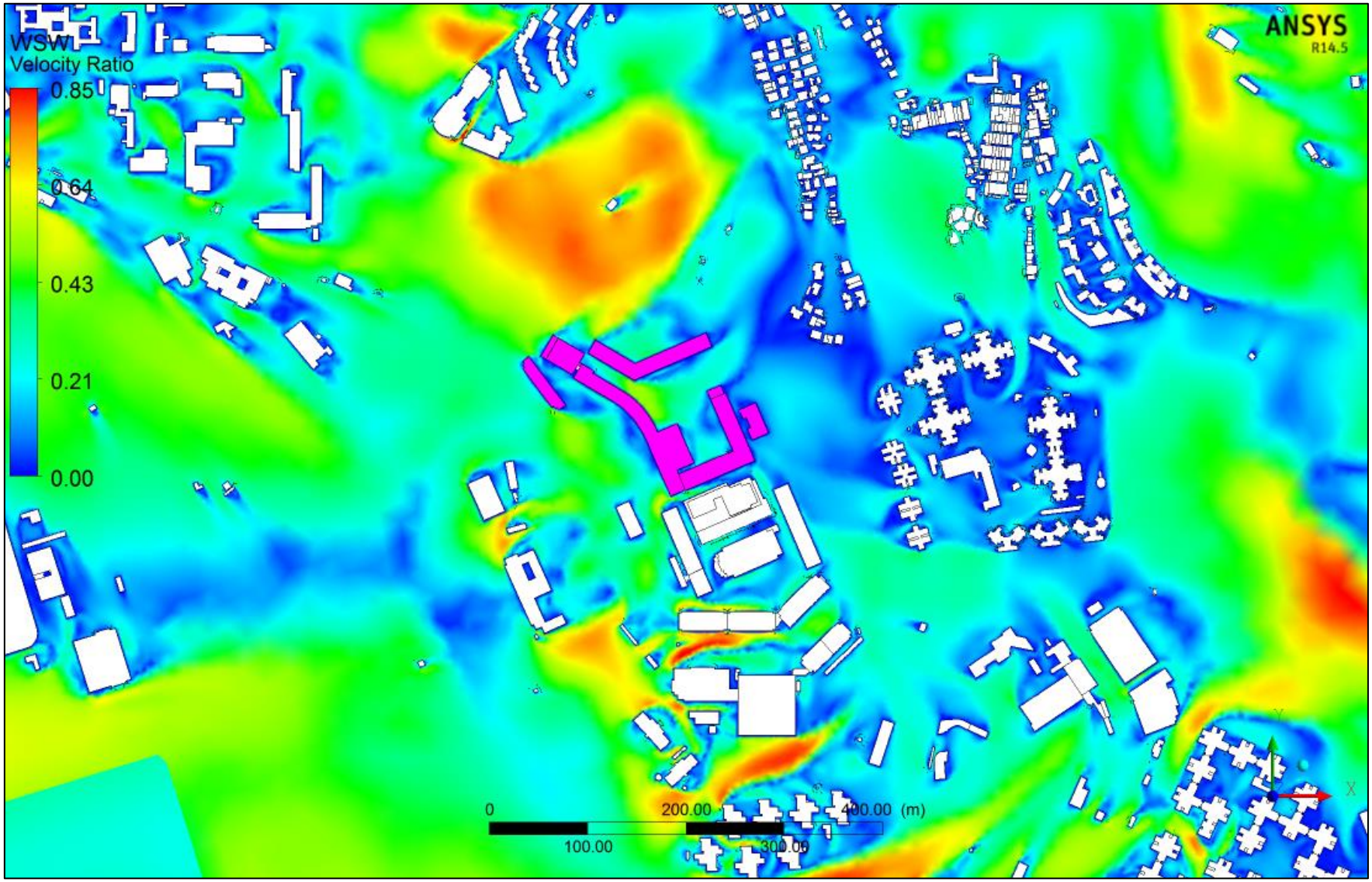
Base Scheme – SSE at 2mAG



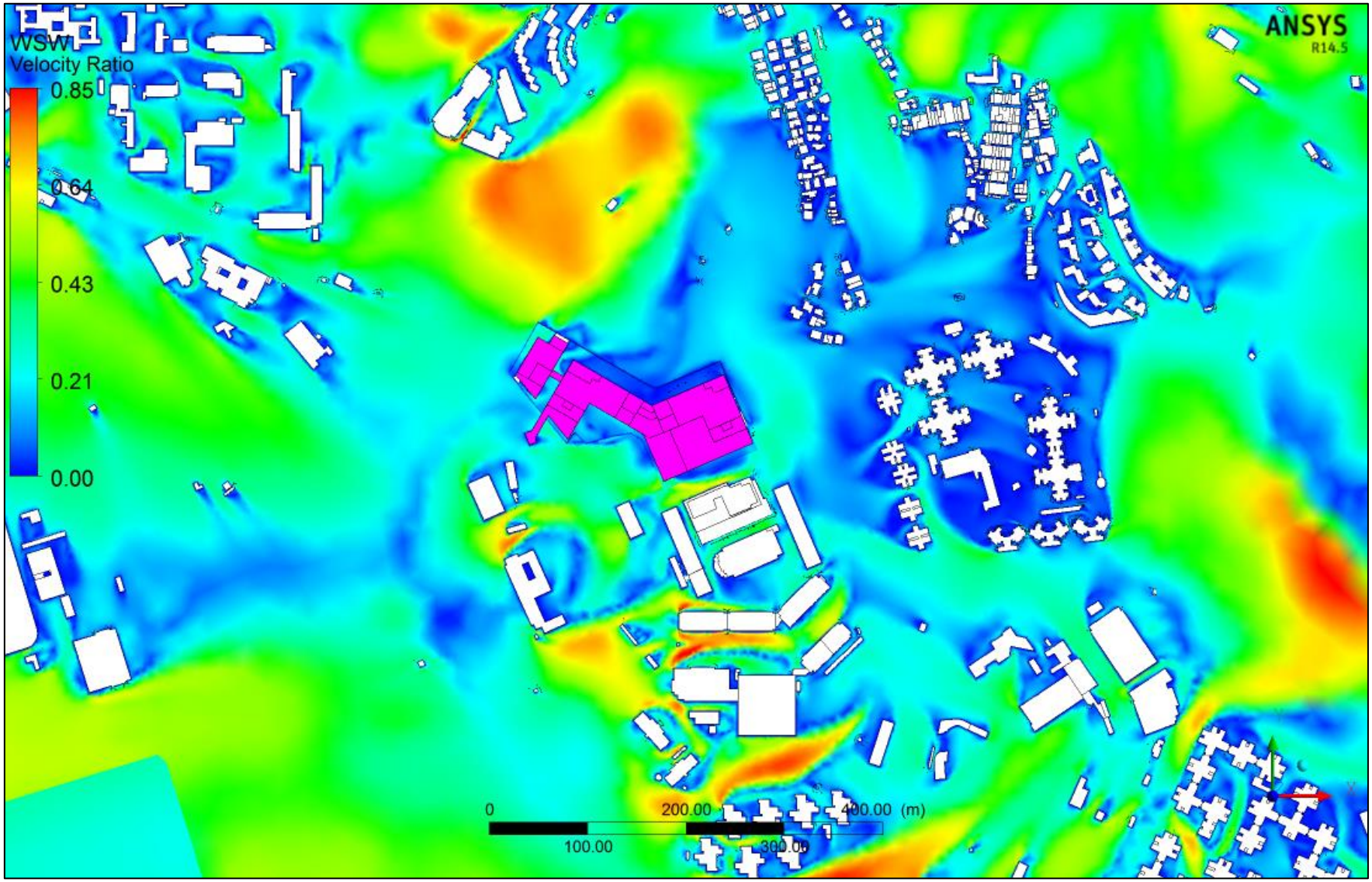
Proposed Scheme – SSE at 2mAG



Base Scheme – WSW at 2mAG



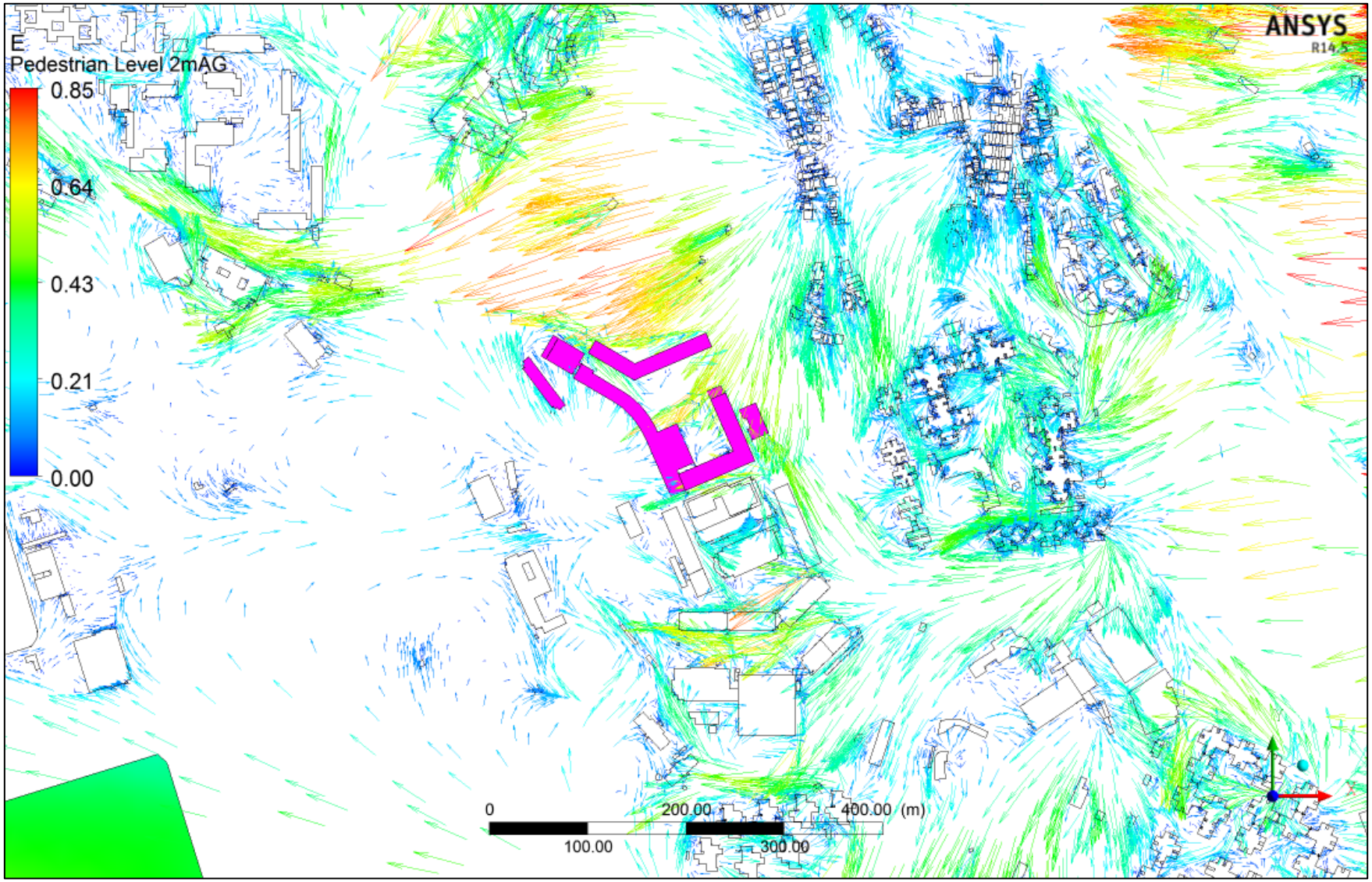
Proposed Scheme – WSW at 2mAG



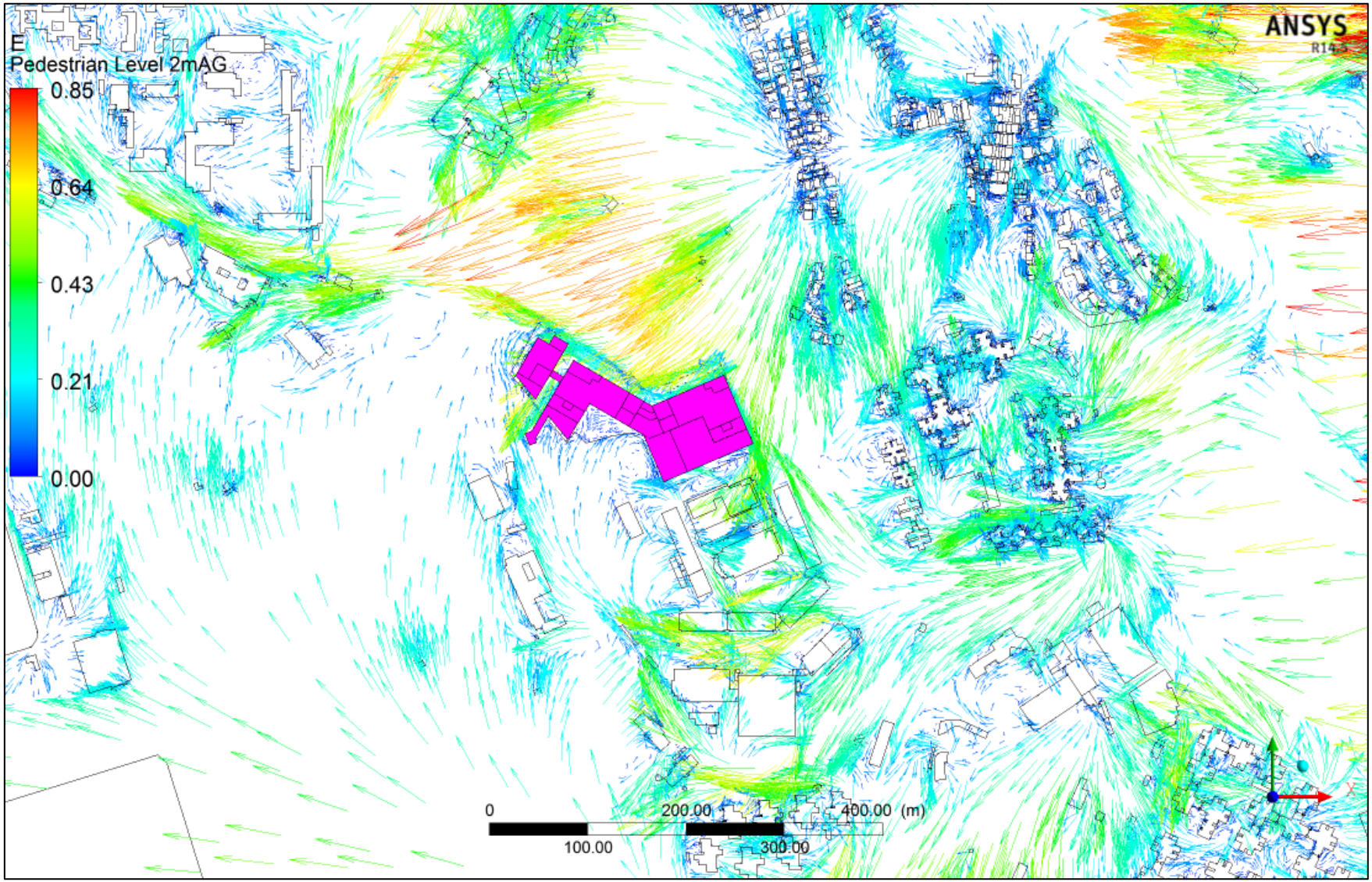
APPENDIX D

Overall Weighted VR Vector Plots for Annual and Summer Prevailing Wind

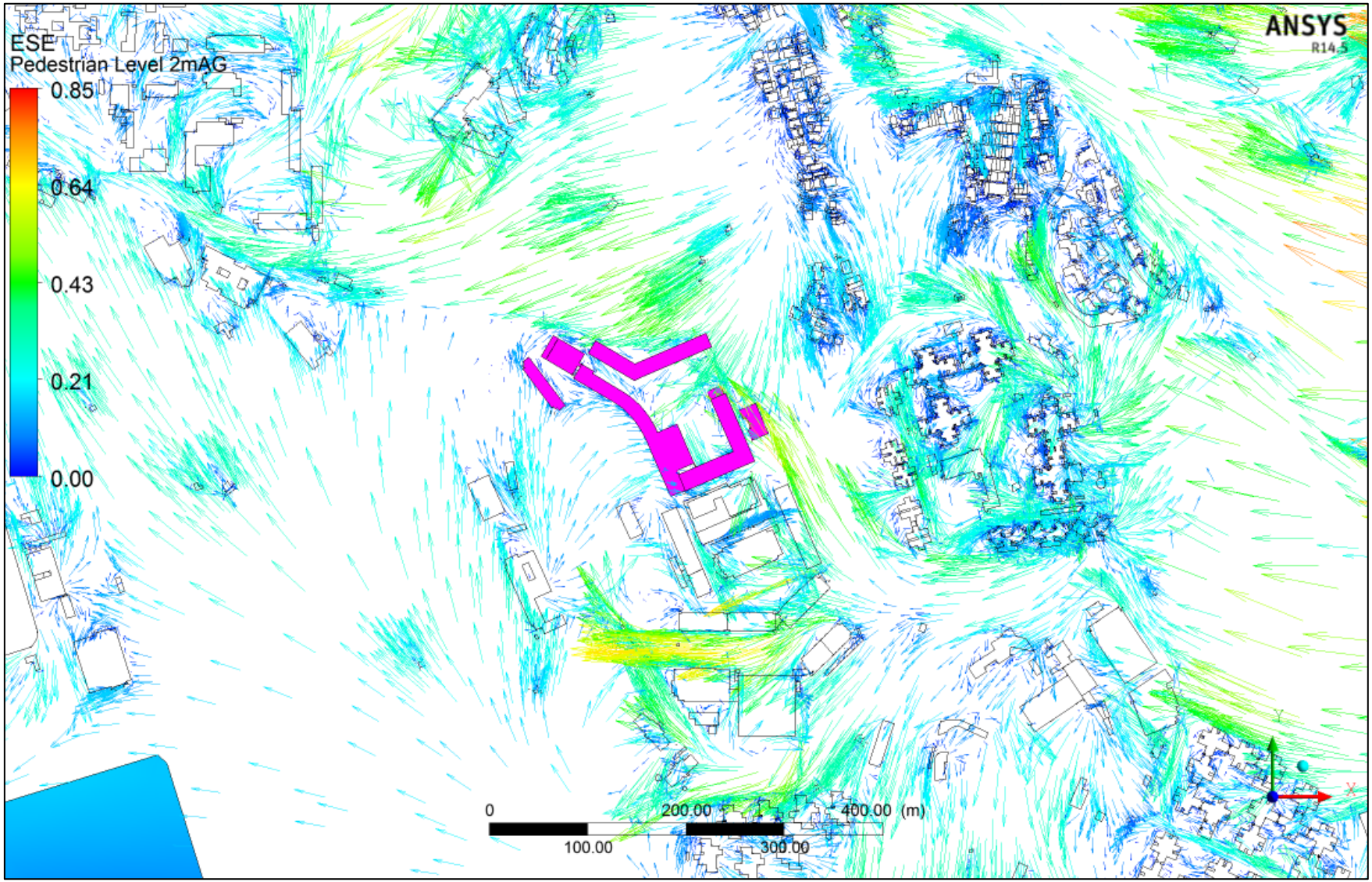
Base Scheme – E at 2mAG



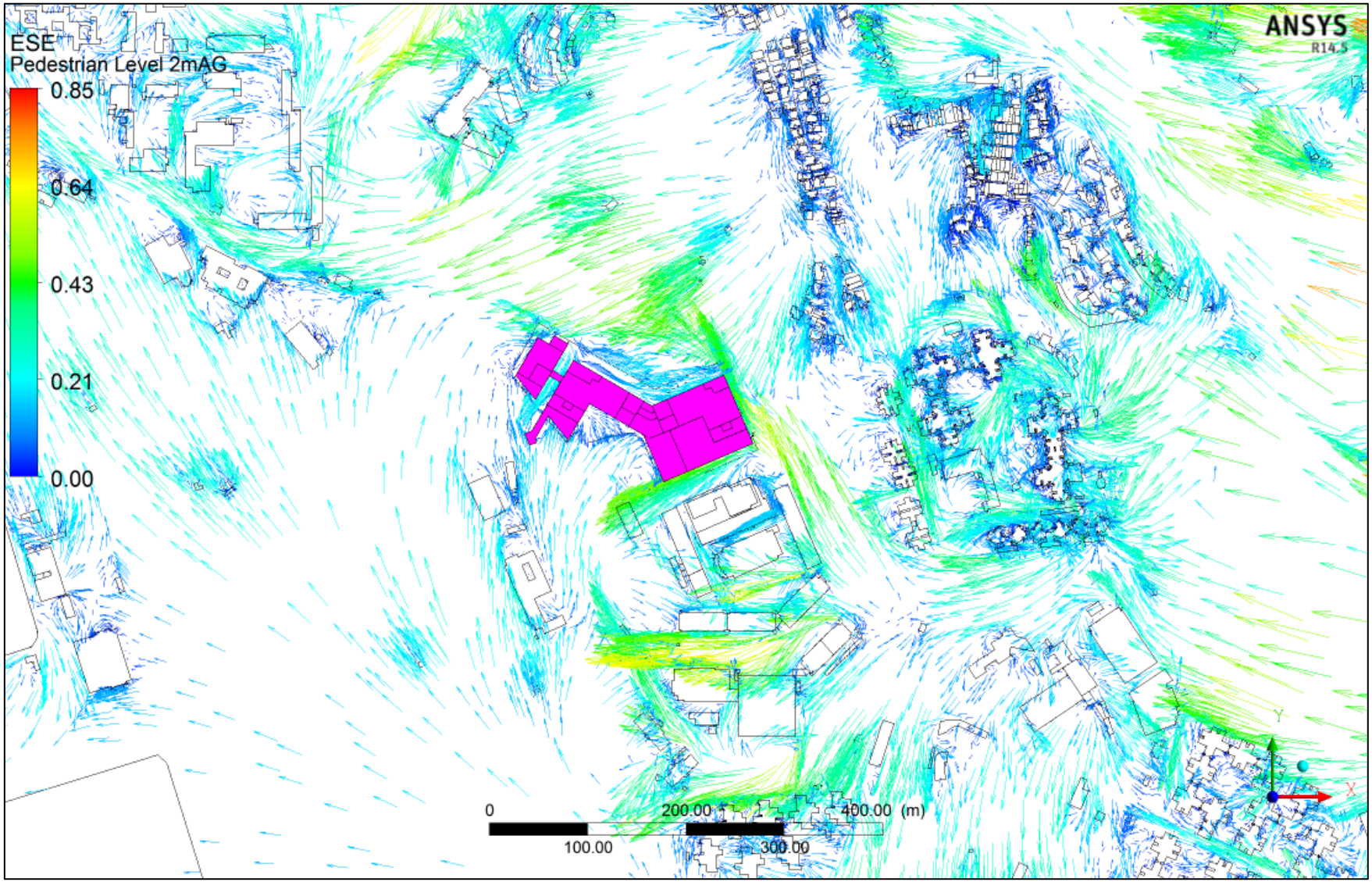
Proposed Scheme – E at 2mAG



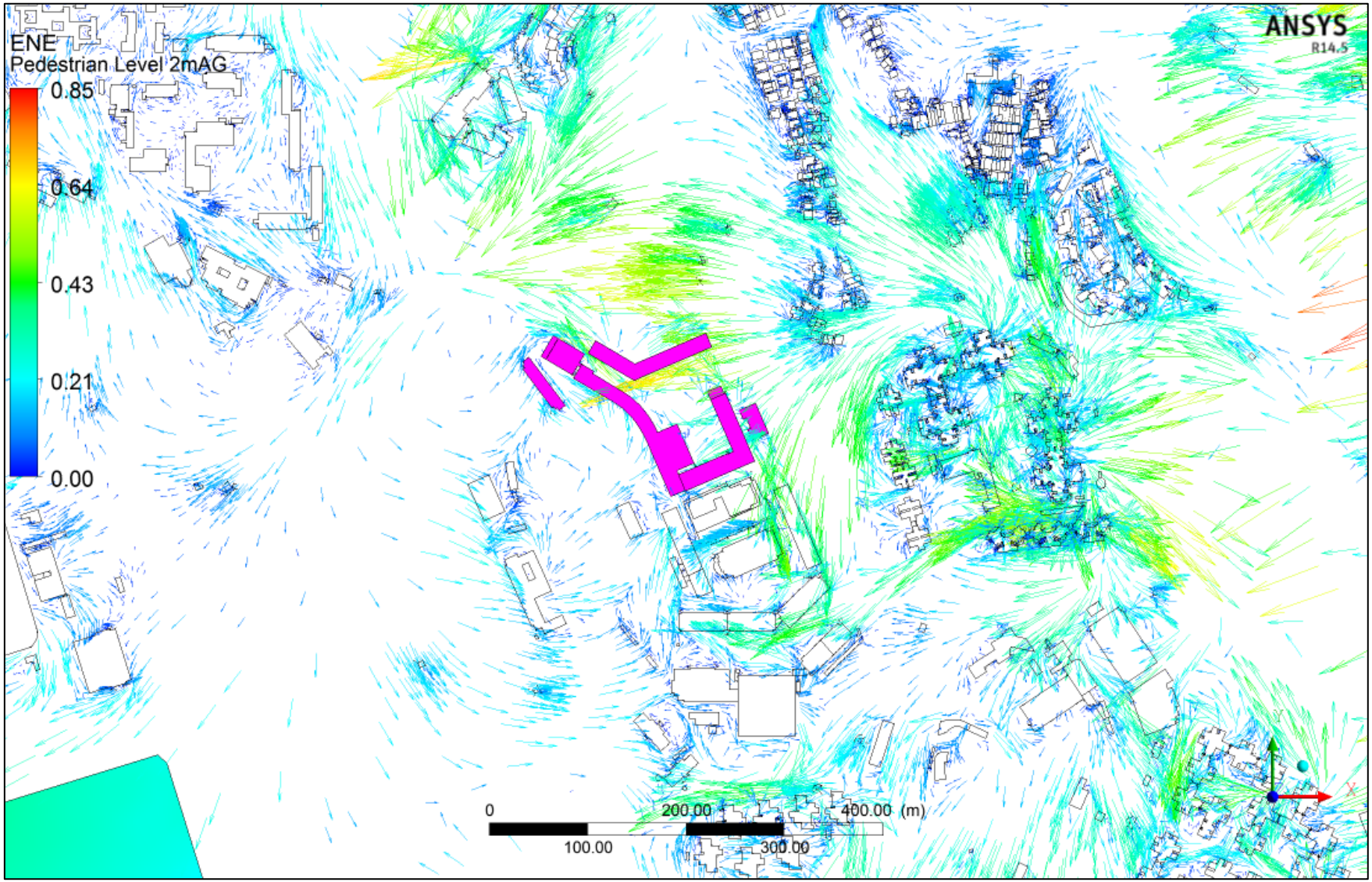
Base Scheme – ESE at 2mAG



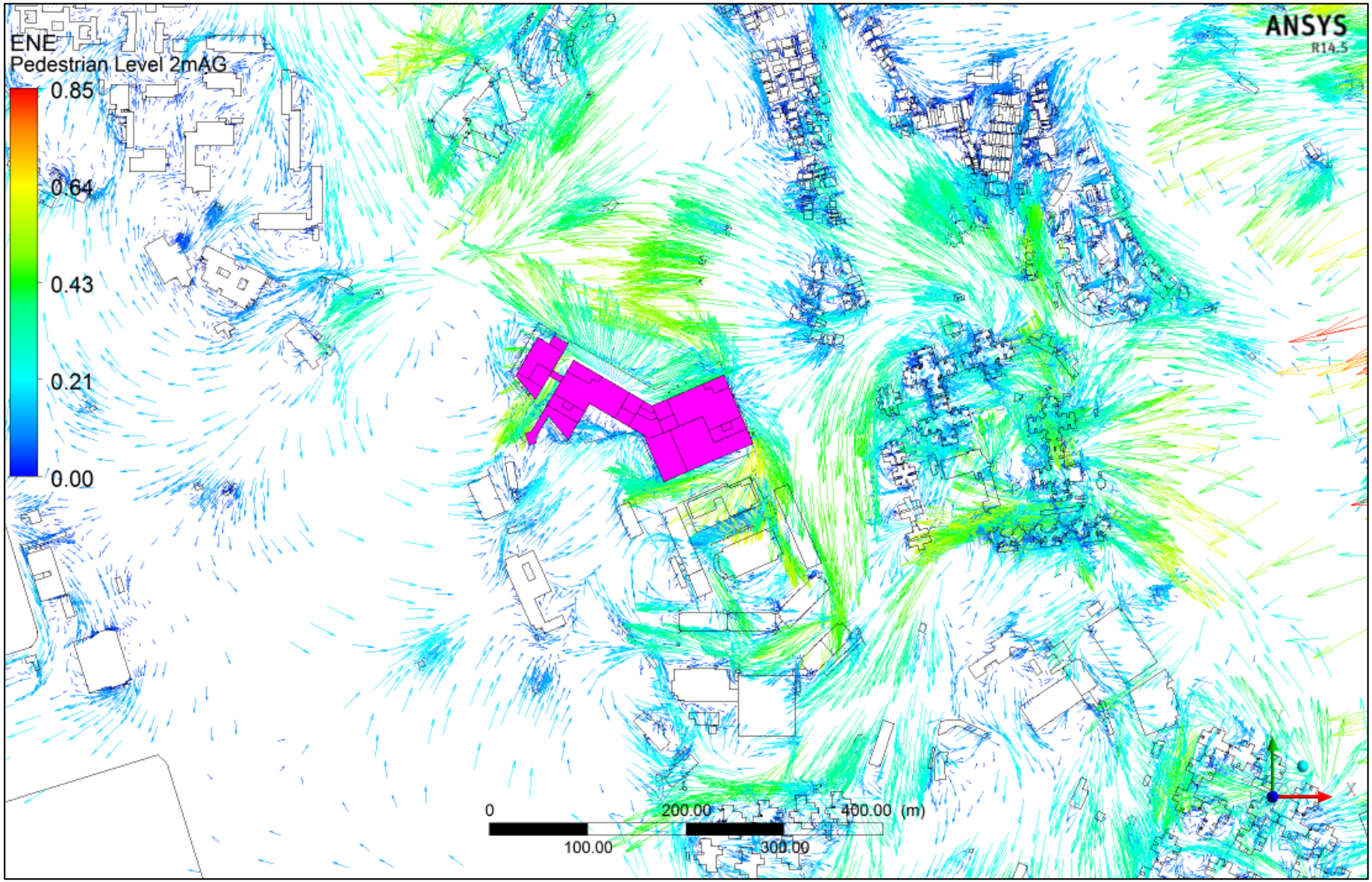
Proposed Scheme – ESE at 2mAG



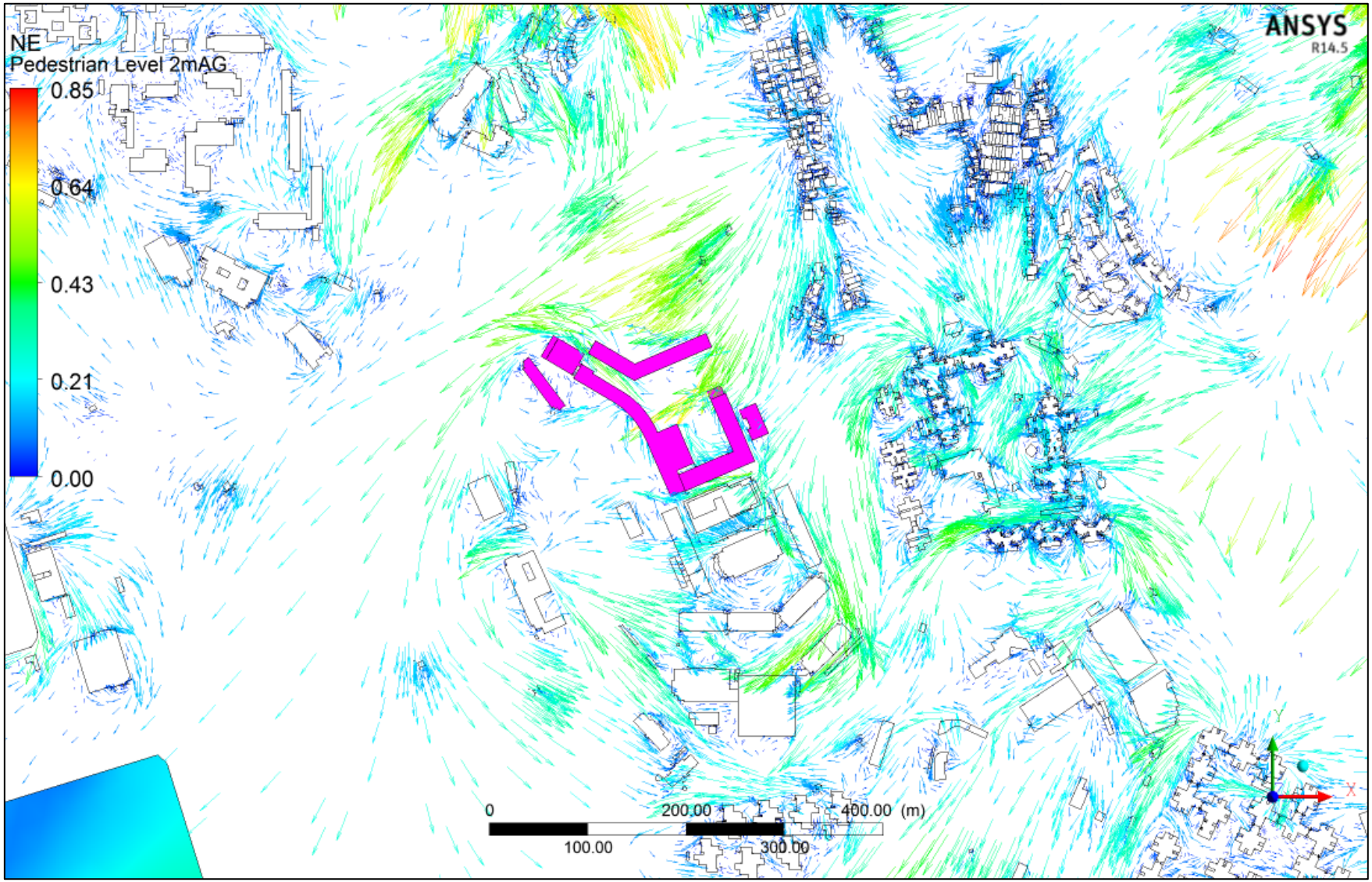
Base Scheme – ENE at 2mAG



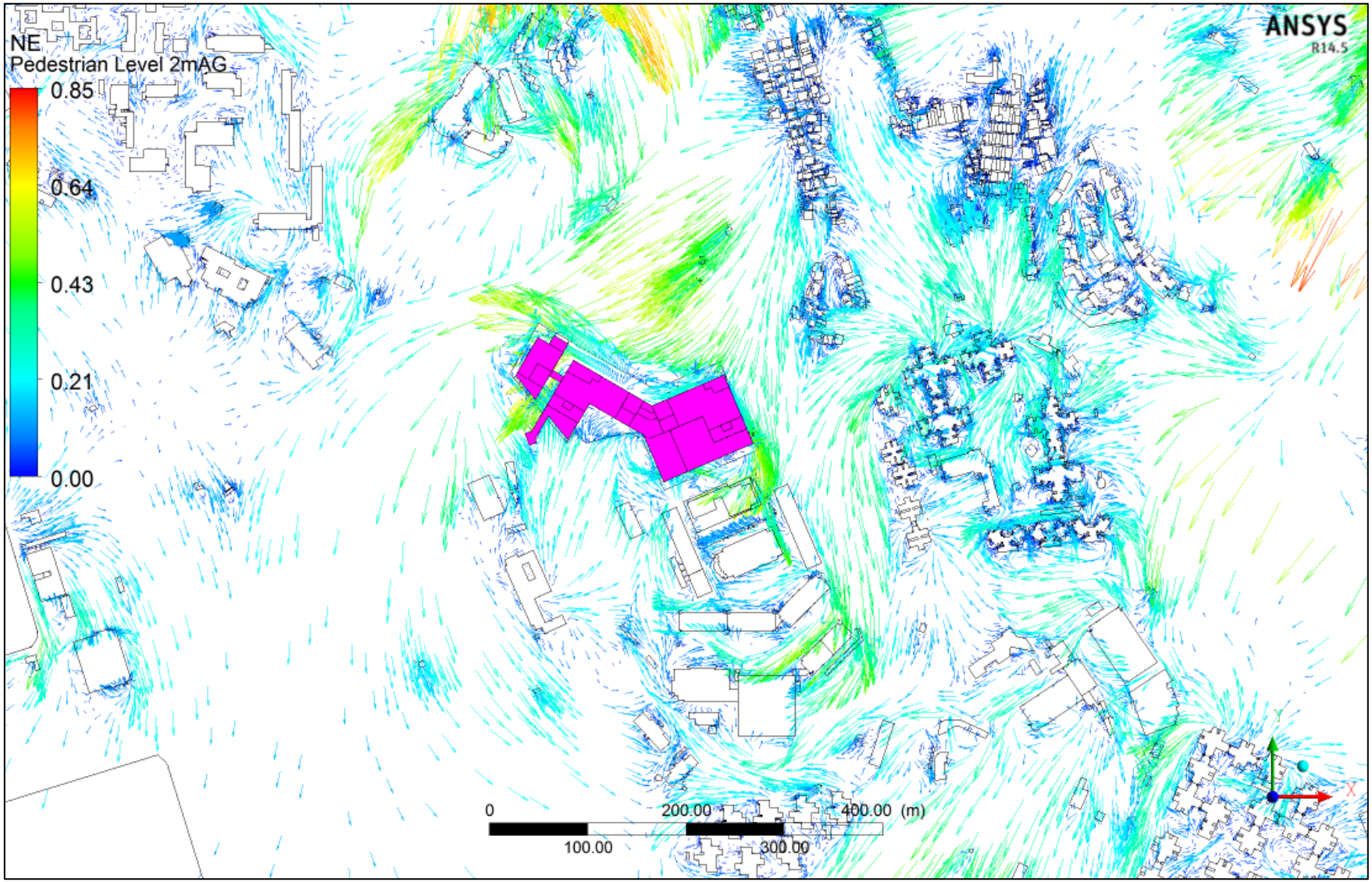
Proposed Scheme – ENE at 2mAG



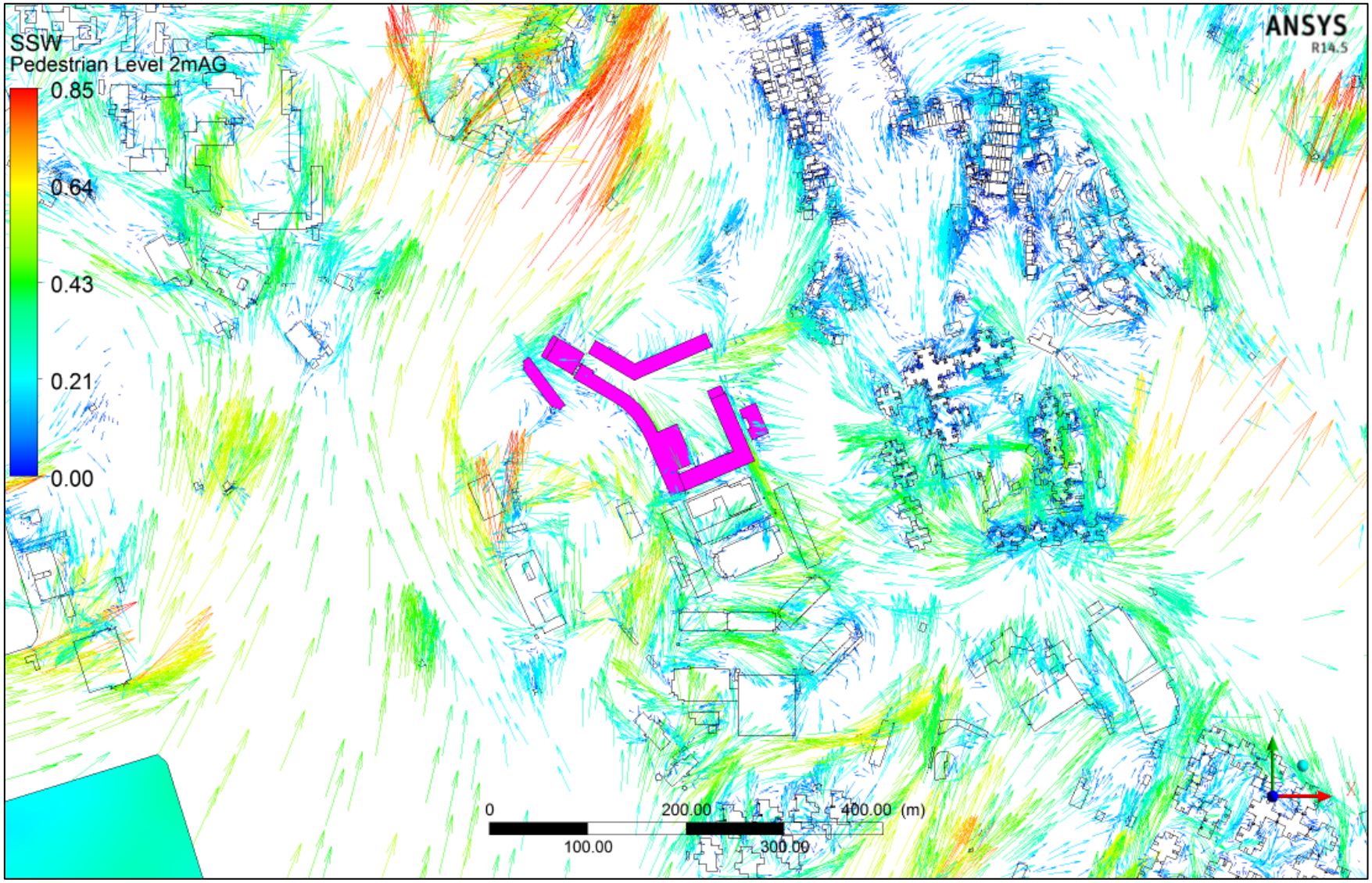
Base Scheme – NE at 2mAG



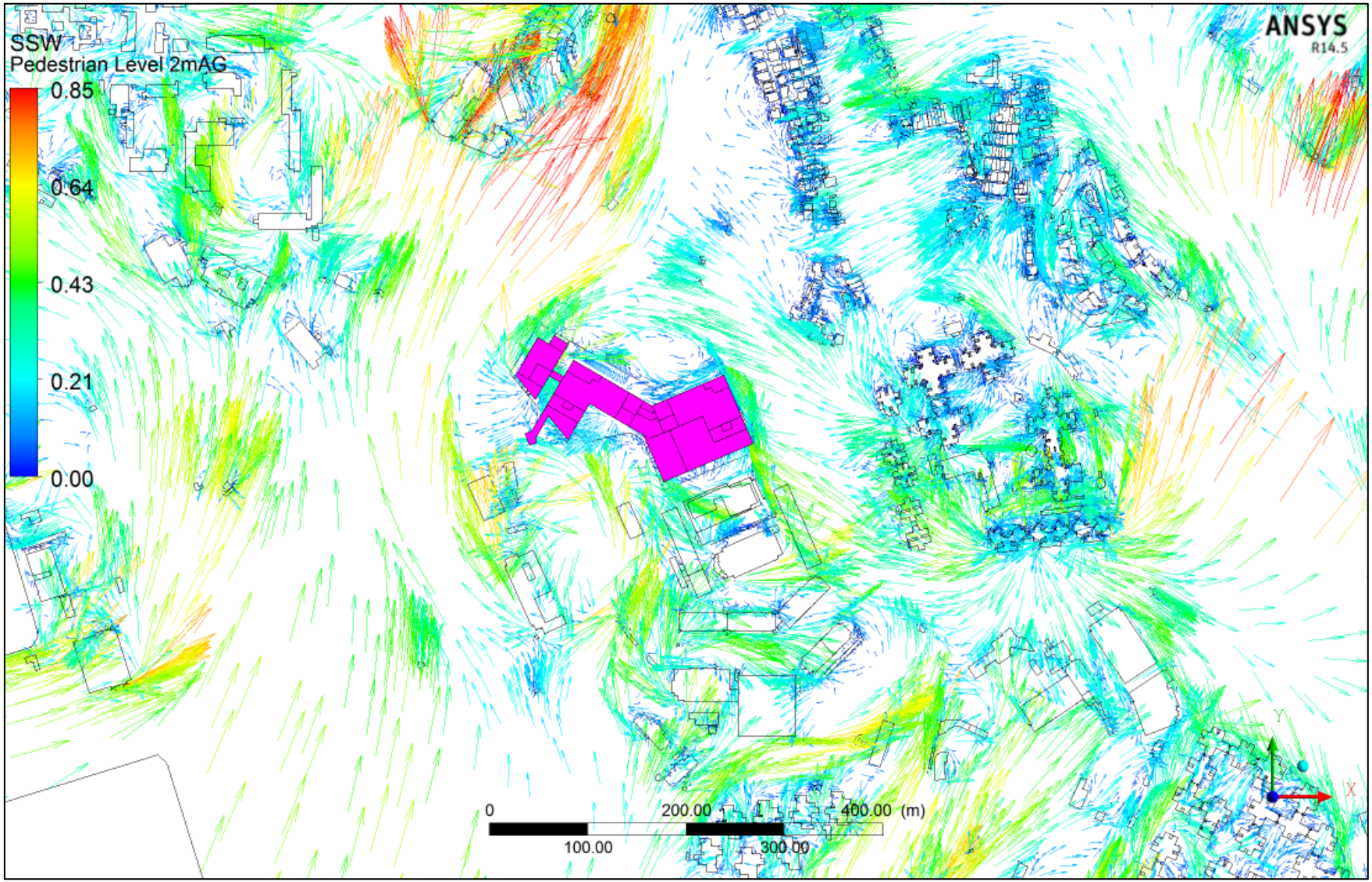
Proposed Scheme – NE at 2mAG



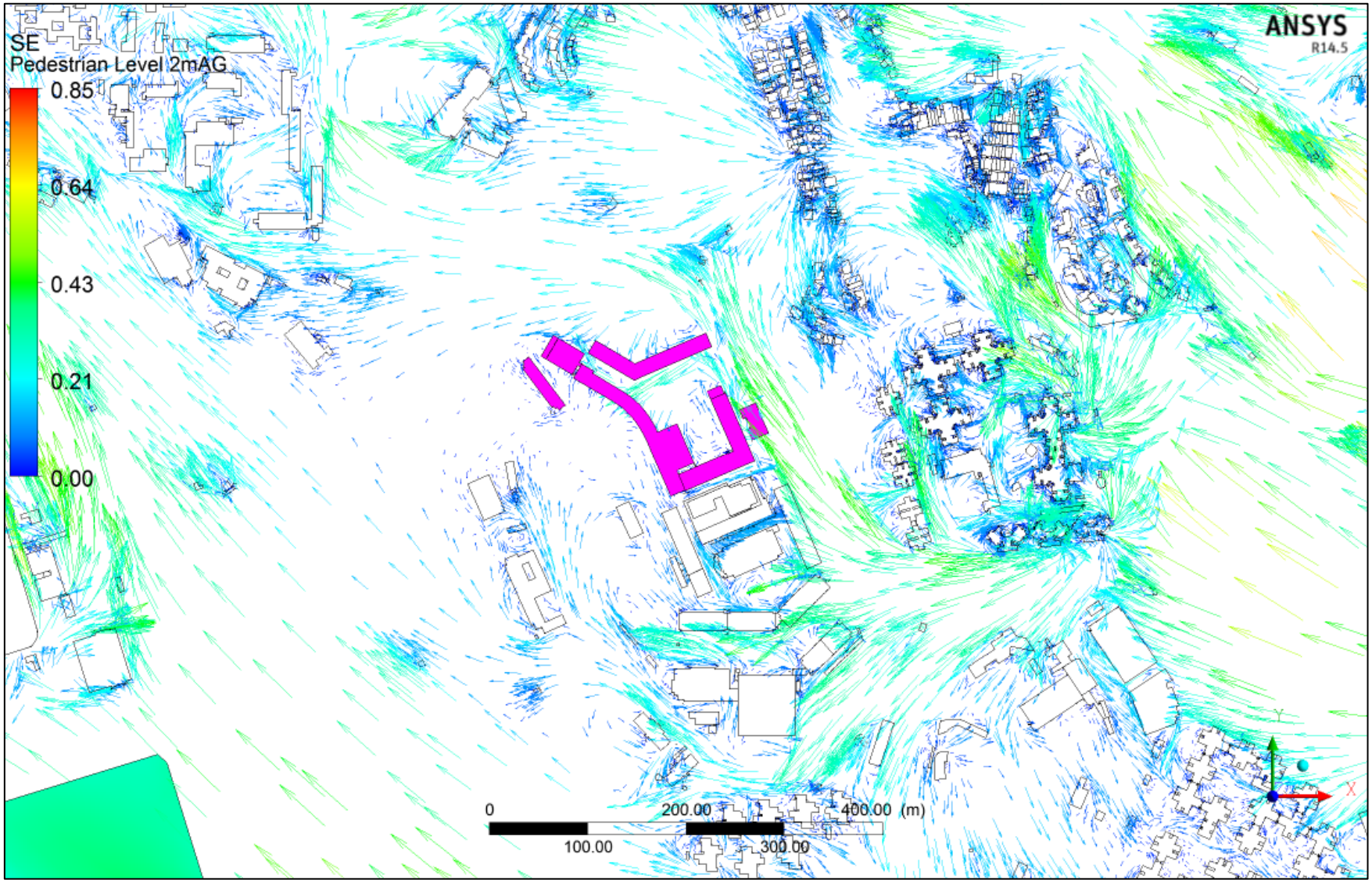
Base Scheme – SSW at 2mAG



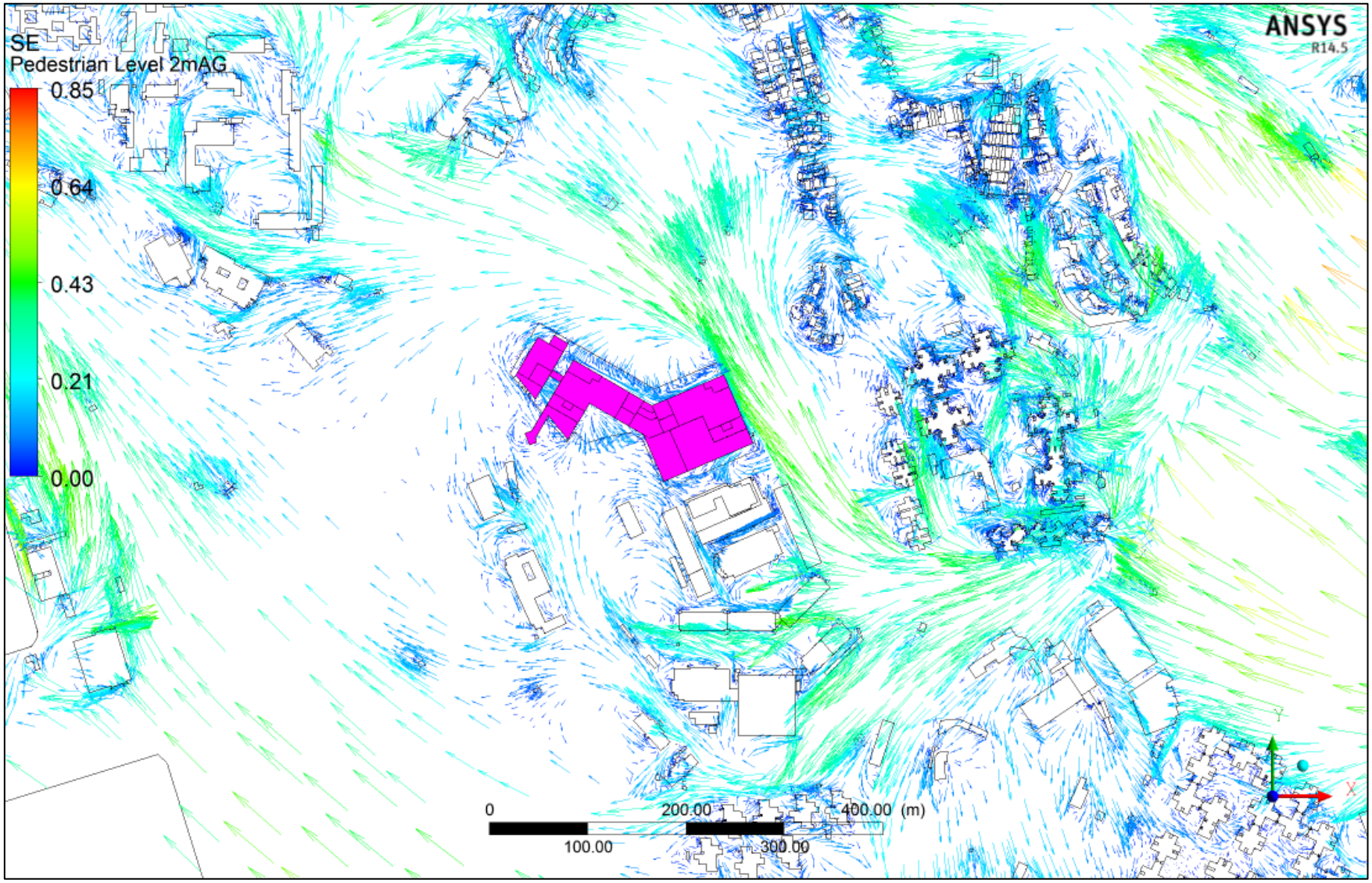
Proposed Scheme – SSW at 2mAG



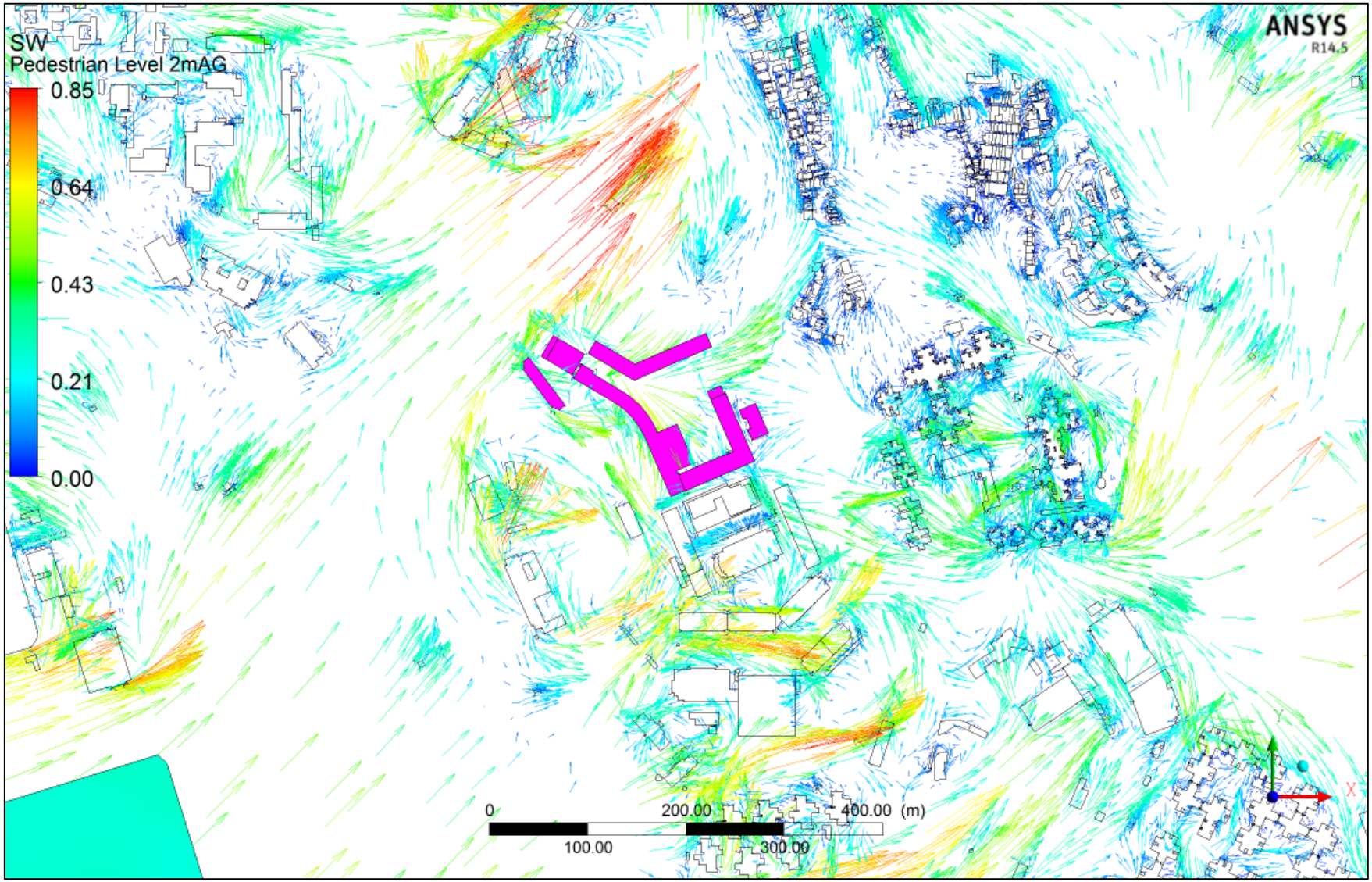
Base Scheme – SE at 2mAG



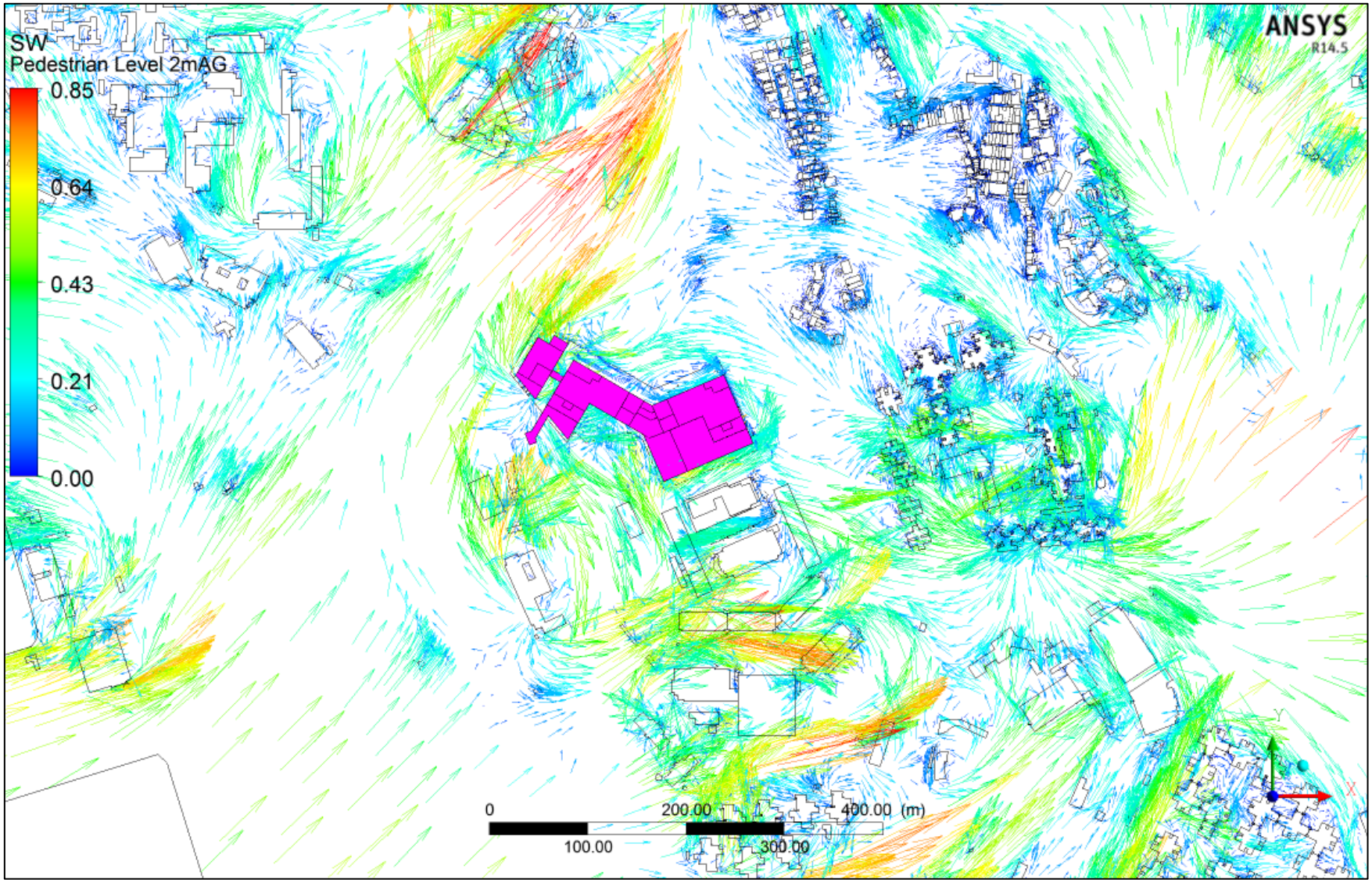
Proposed Scheme – SE at 2mAG



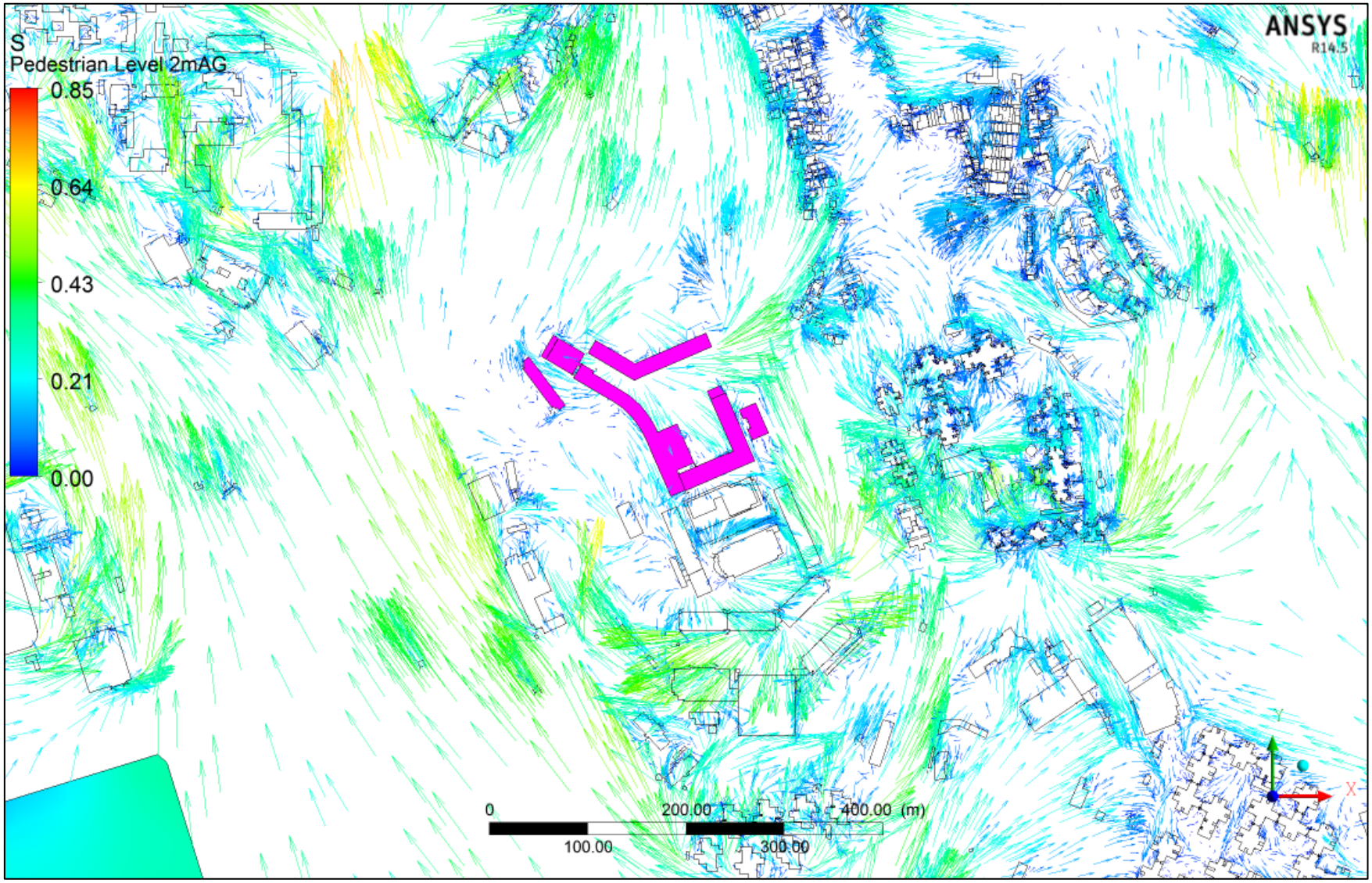
Base Scheme – SW at 2mAG



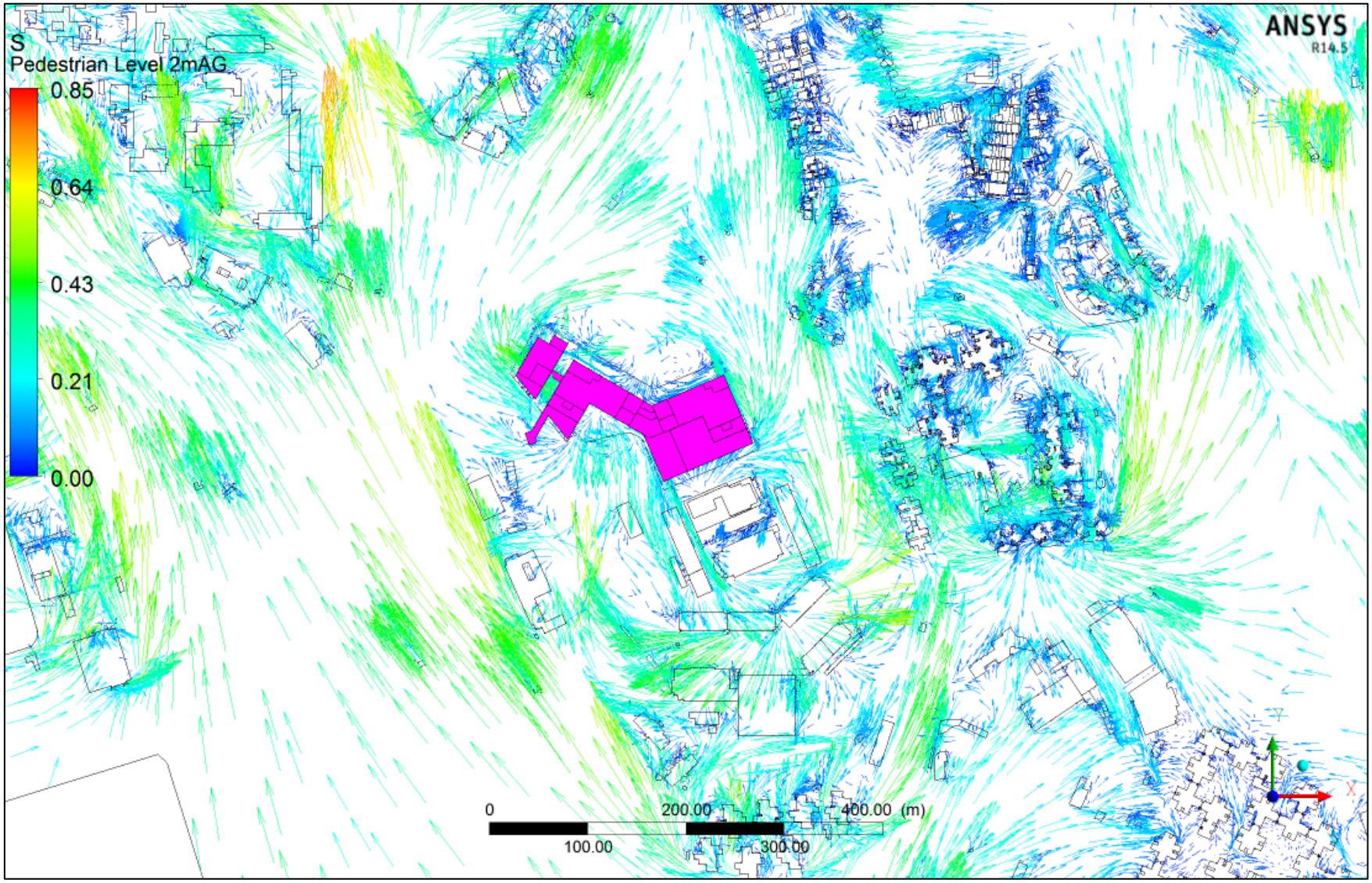
Proposed Scheme – SW at 2mAG



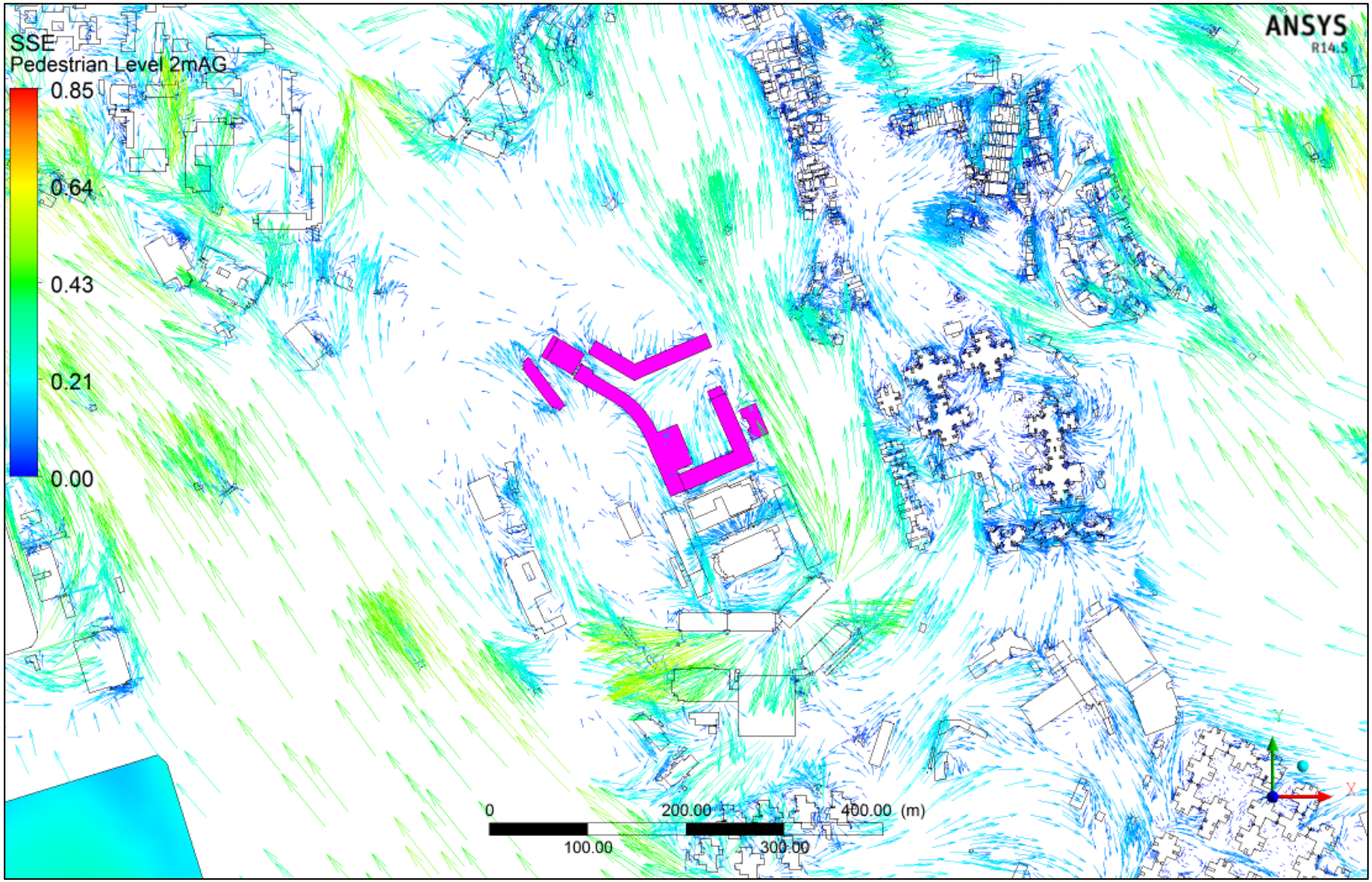
Base Scheme – S at 2mAG



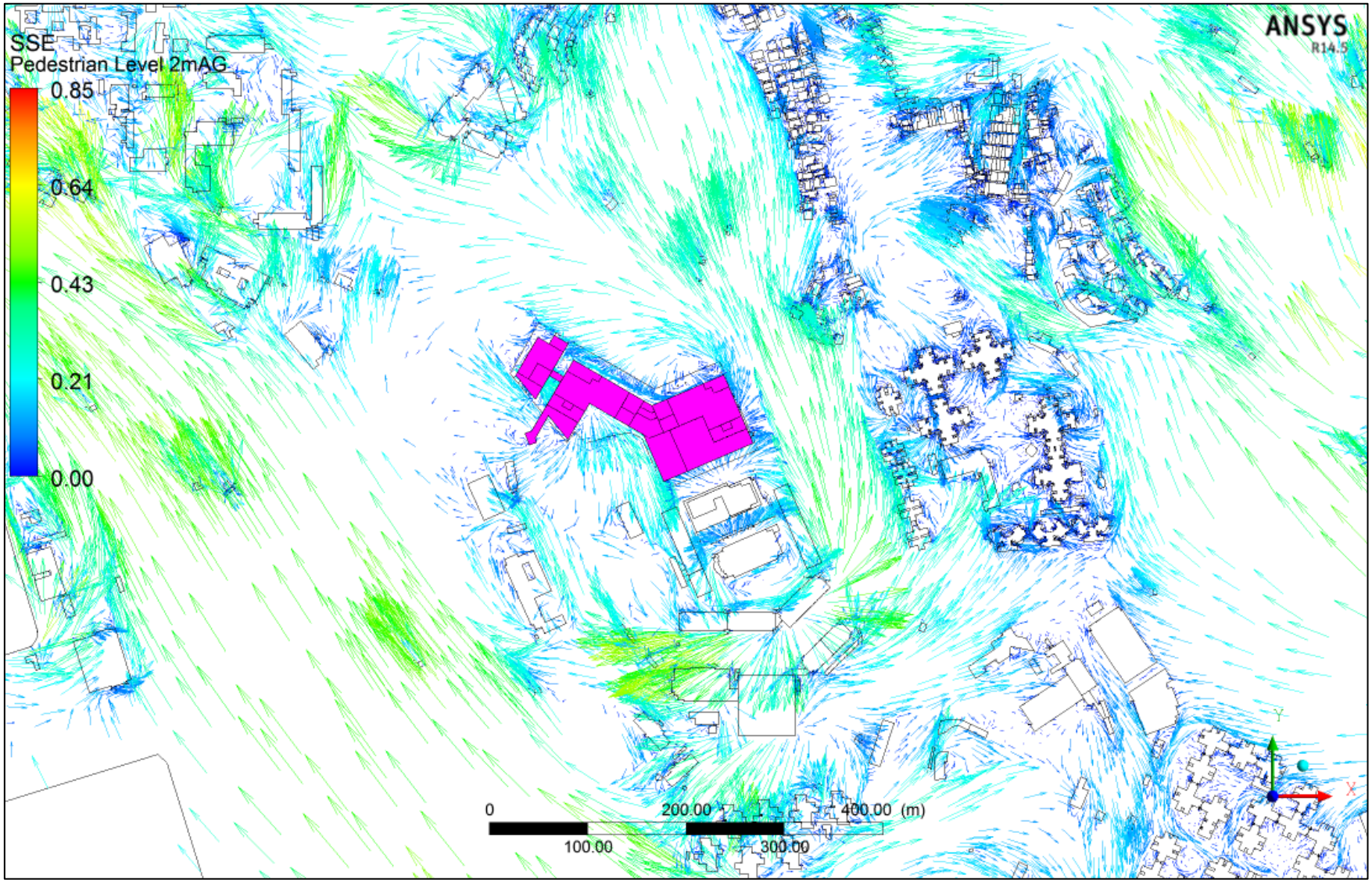
Proposed Scheme – S at 2mAG



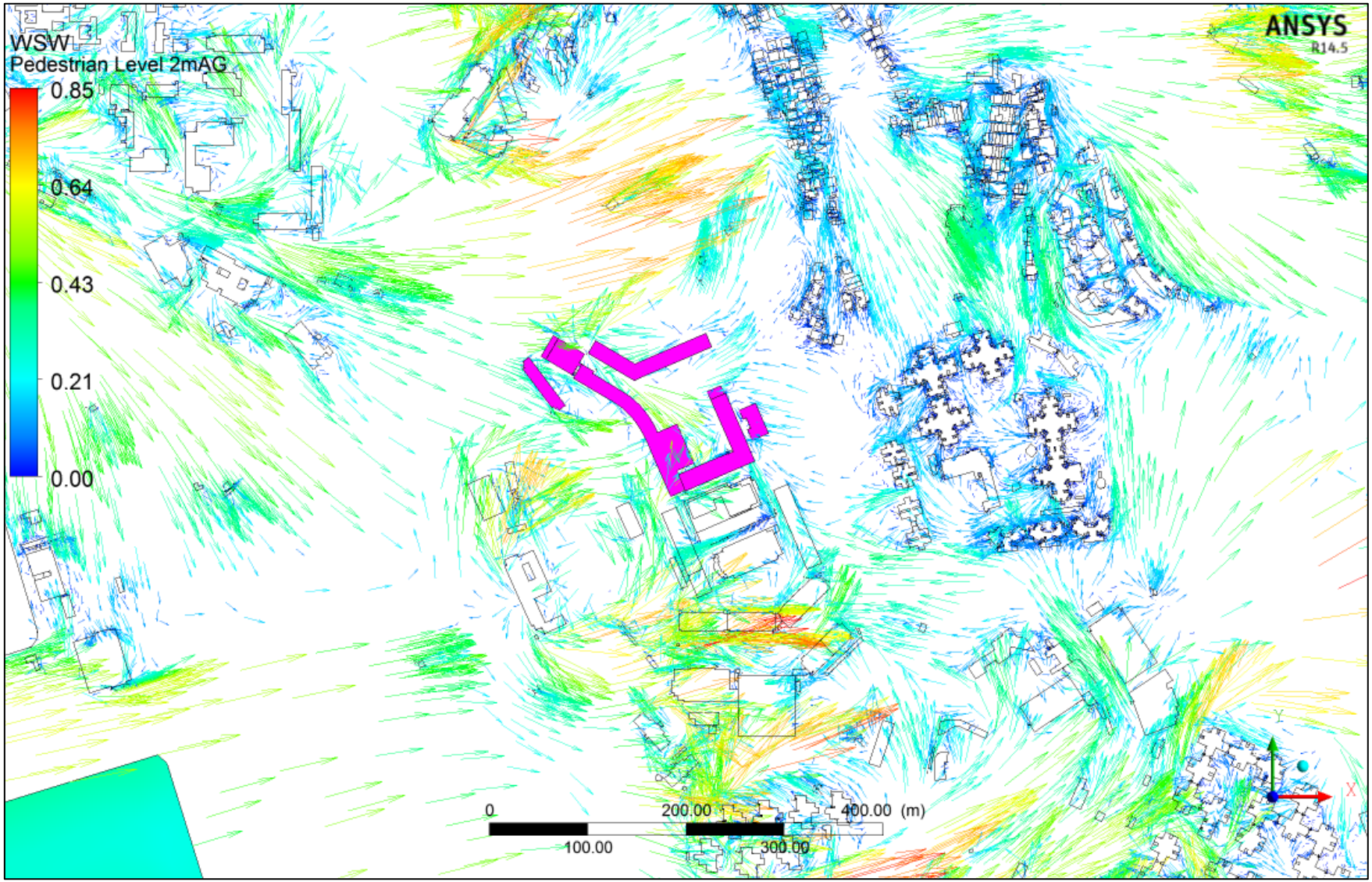
Base Scheme – SSE at 2mAG



Proposed Scheme – SSE at 2mAG



Base Scheme – WSW at 2mAG



Proposed Scheme – WSW at 2mAG