

M District – Halifax, NS

Preliminary Design Guidance

SLR #241.031209.00001

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Legend

Red text = recommendations / concerns

Orange text = suggestions / concerns

Green text = No concerns

Approach

A qualitative experience-based assessment has been undertaken, based on our extensive experience in estimating wind flow patterns around buildings. This qualitative method provides a screening-level estimate of potential wind comfort conditions at the site and assists with the initial massing considerations.

This preliminary assessment is based on:

- A review of the architectural information received November 16, 2023.
- A review of the existing wind climate in the area, through examining historical climate data.
- SLR's experience on previous projects in the Halifax Region and across Canada.

We recommend a more detail qualitative and/or quantitative analysis be conducted for each phase as the planning application progresses, per the planning requirements.

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Wind Climate

Wind data from CFB Shearwater Airport, which is located on the east side of Halifax Harbour approximately 7 km southeast of the site, was obtained for the period between 1990 to 2020 and analyzed to create a wind climate model for the region. Annual and seasonal wind distribution diagrams (“wind roses”) are shown in **Figure 1**. These diagrams illustrate the percentage of time wind blows from the 16 main compass directions. Of main interest are the longest peaks that identify the most frequently occurring wind directions. The annual wind rose indicates that wind approaching from the northwest and southwest quadrants are most prevalent. The seasonal wind roses readily show how the prevalent winds shift throughout the year.

The directions from which stronger winds (e.g., > 30 km/h) approach are also of interest as they have the highest potential of creating problematic wind conditions, depending upon site exposure and the building configurations. The wind roses in Figure 4 also identify the directional frequency of these stronger winds, as indicated in the figure’s legend colour key. On an annual basis, strong winds occur from the northwest quadrant. All wind speeds and directions were included in the wind climate data.

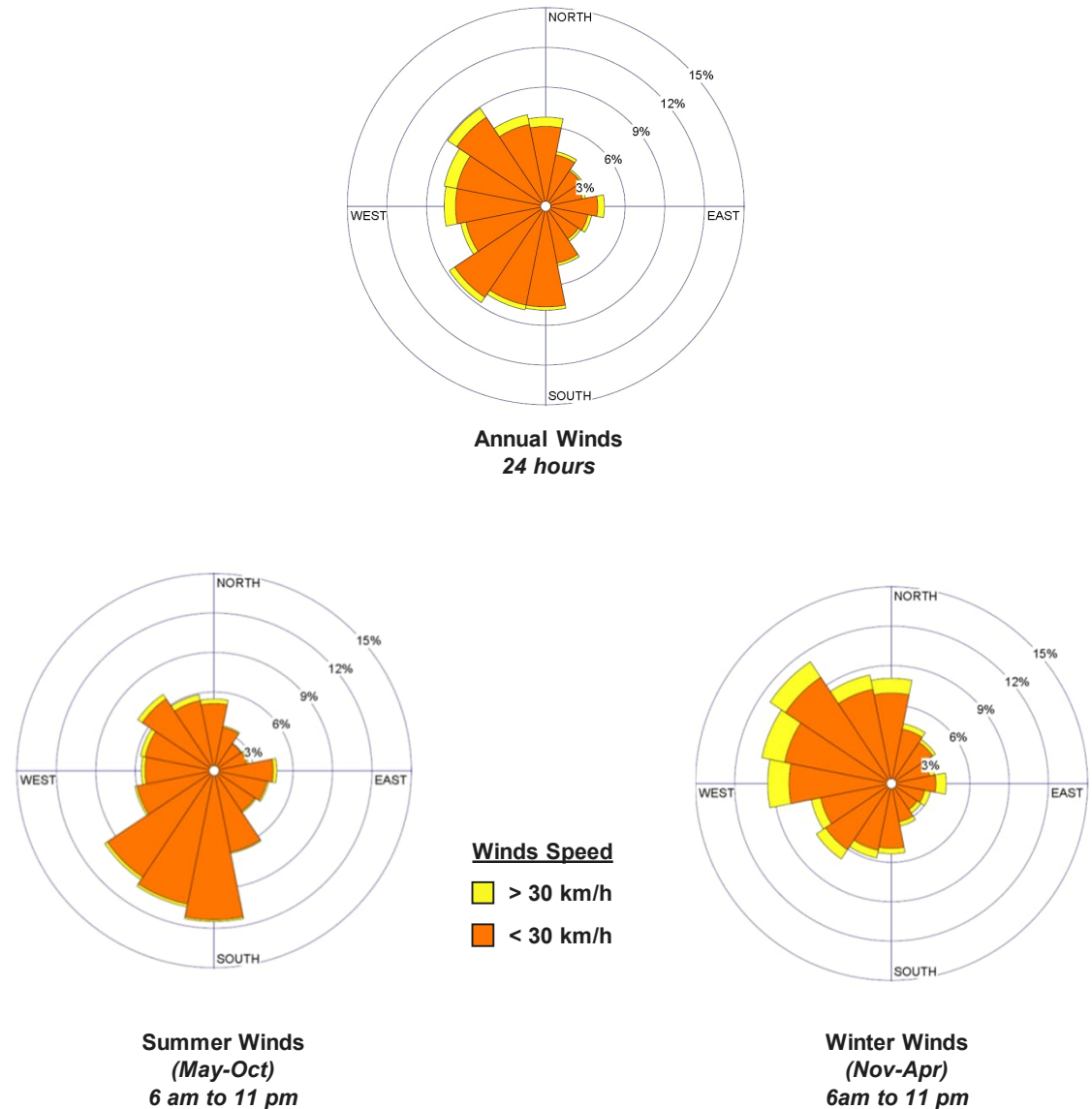


Figure 1: Wind Roses for CFB Shearwater Airport (1990-2020)

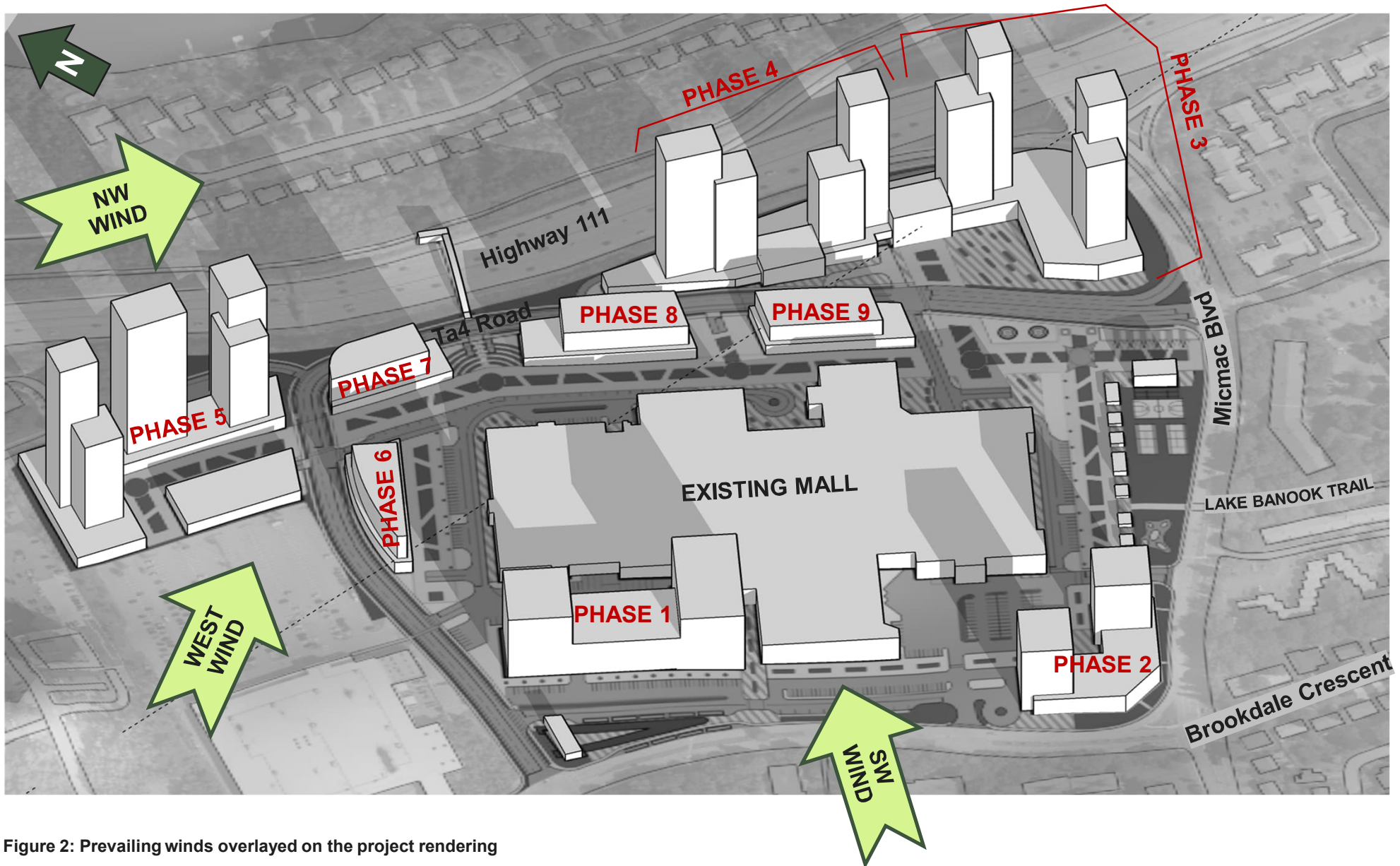
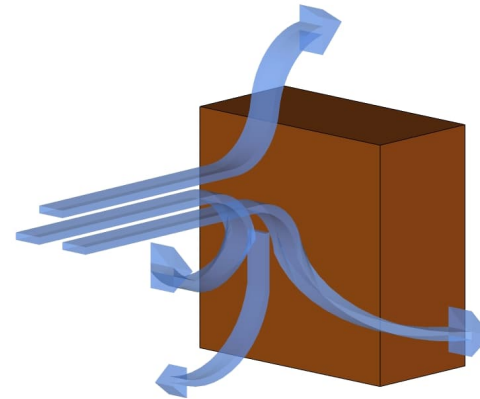


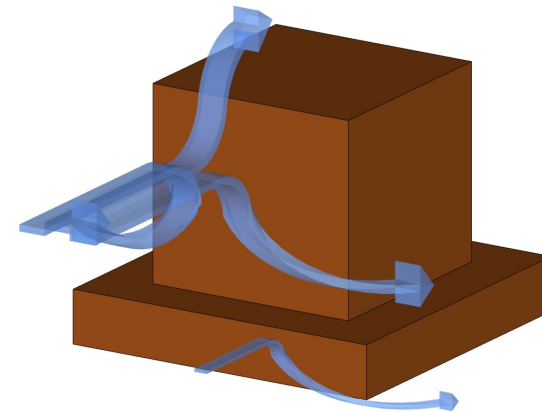
Figure 2: Prevailing winds overlayed on the project rendering

General Comments

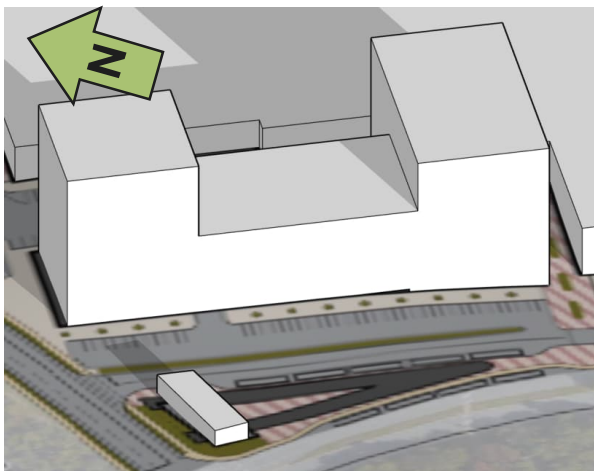
- The proposed development is generally surrounded by low-rise residential and/or commercial buildings, except to the northwest where there are two high-rise buildings on Horizon Court. Hence, the site is exposed to the predominant winds from the northwest and southwest quadrants.
- We recommend including significant step-backs on the north and west sides of the proposed towers. For instance, we recommend placing towers a minimum of 5 m from the edge of podiums. As per the images to the right, the inclusion of podiums (or canopies) disrupts and deflects the strong downwashing wind flows that are intercepted and redirected downwards by the towers. The interception of the wind flows by the podium promotes calmer wind conditions at grade, within the public realm.
- It is a positive design feature to align the long axis of buildings with the prevailing winds (Phases 4, 5, 7, 8 and 9). This may be difficult at the majority of the prevailing winds range from southwest to west to northwest. But it is something for the design team to consider, as this reduces the size of the façade presented to the wind, and hence the “volume” of wind that is redirected downwards to grade and minimizes the local wind accelerations at building corners.
- The windiest areas on a site tend to be at the building corners, due to the local wind accelerations from downwashing flows. If calmer wind conditions are desired at corners due to entrances or outdoor amenity spaces, massing changes can be included to mitigate (i.e., chamfered corners, rounded corners, recessed corners, and/or stepped facades).
- To remove entrances from the windy areas at building corners, we suggest keeping main entrances at least 5 m away from building corners.
- It is a positive design feature to place taller buildings (Phase 5) upwind of the site, to partially shelter the site from the prevailing northwesterly winds.



Downwashing flows redirected to grade

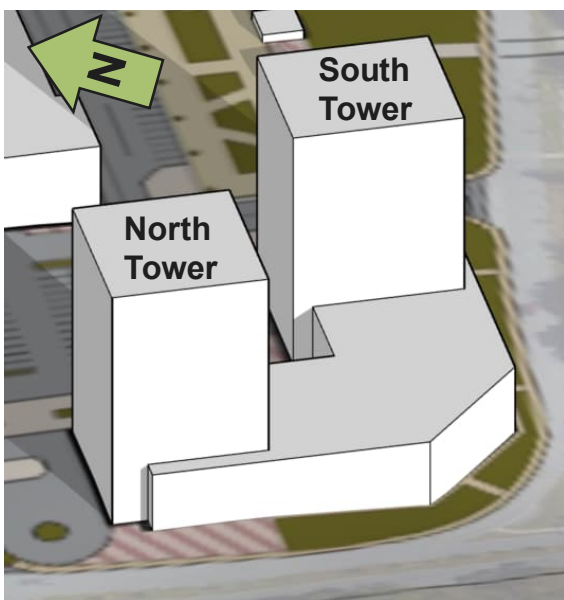


Low-rise podium helps reduce downwashing flow influence at grade



Phase 1

The Phase 1 buildings (11-storeys on the north side and 13-storeys on the south side) will be surrounded by low-rise buildings or parking lots in all directions. As a result, Phase 1 development will be exposed to the predominant winds. Strong winds are anticipated near the northeast, northwest and southwest corners of the building. We suggest incorporating step-backs (i.e., a podium) along the north and west sides of the building, to minimize the impact of the downwashing wind flows at grade.



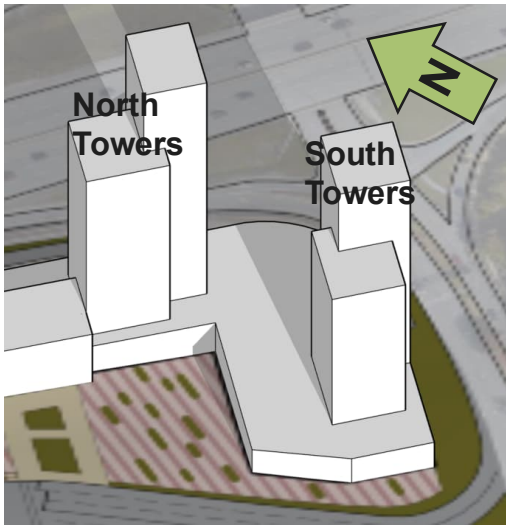
Phase 2

Both the North and South towers of Phase 2 are 16-storeys in height. As the North Tower is fully exposed to the prevailing winds, strong wind flows are expected along the north side of the tower. Similar wind flows are predicted along the north side of the South Tower. To provide calmer wind conditions at grade in these areas, we suggest extending the podium to the north sides of both towers.

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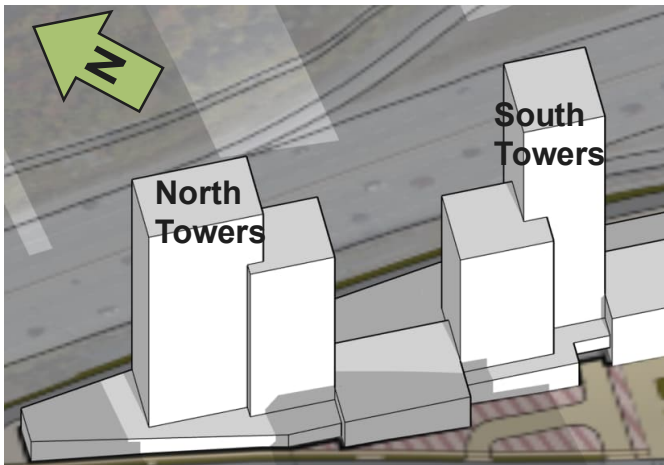
Green text = No concerns



Phase 3

The inclusion of a podium around the edges of the North (30 and 40 storey tall) and South Towers (25 and 35 storey tall) of Phase 3 is a positive design feature, as the podium deflects and disrupts the downwashing flows from the prevailing winds.

This design feature, of a significant podium width to the west and north of tall towers should be maintained as the design progresses.



Phase 4

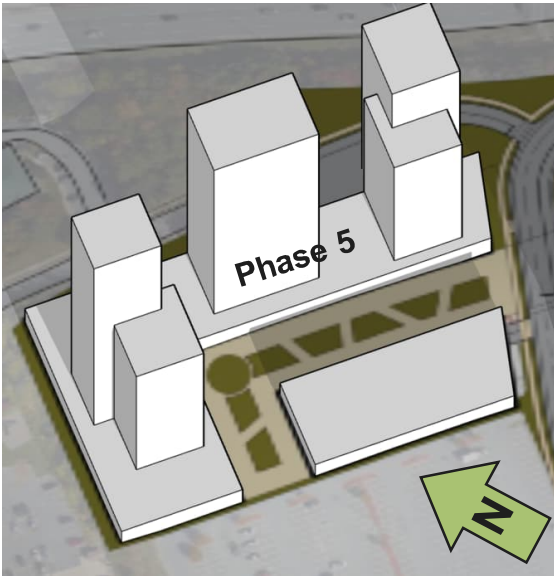
The massing of Phase 4 also includes a significant podium step back on the north and west sides of the tall North Towers (27 and 35 storeys tall) as well as the South Towers (22 and 37 storeys tall).

This is a positive design feature that should be maintained as the design progresses.

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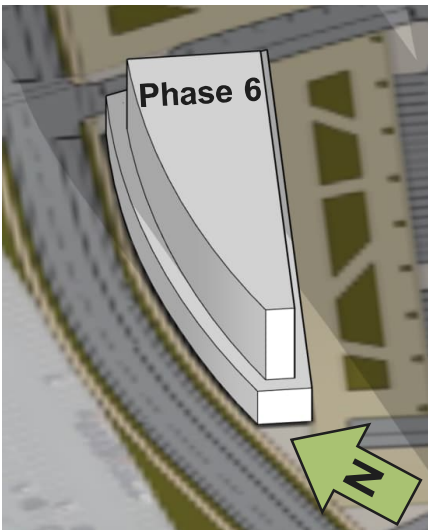
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Phase 5

Phase 5 includes five towers ranging in height from 25 to 40 storeys. The inclusion of a podium around the towers is a positive design feature with regards to downwashing wind flows.

To promote calmer wind conditions on the north and west sides of the development at grade, we recommend enlarging the podium step back along the north and west sides.



Phase 6

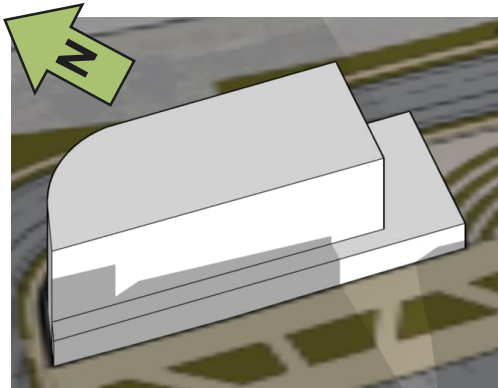
Given the height of the Phase 6 building (eight-storeys) and the adjacent low-rise surroundings, strong wind flows are not anticipated in the vicinity.

However, to promote a calm wind climate at grade, we suggest enlarging the step back on the north side.

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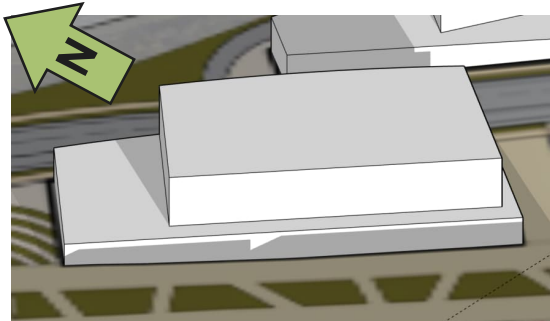
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Phase 7

Phase 7 is partially sheltered by the Phase 5 massing from the prevailing northwesterly winds. In addition, the rounded north corner of the building is a positive feature, as it promotes wind flows to continue horizontal, rather than directing flows downwards.

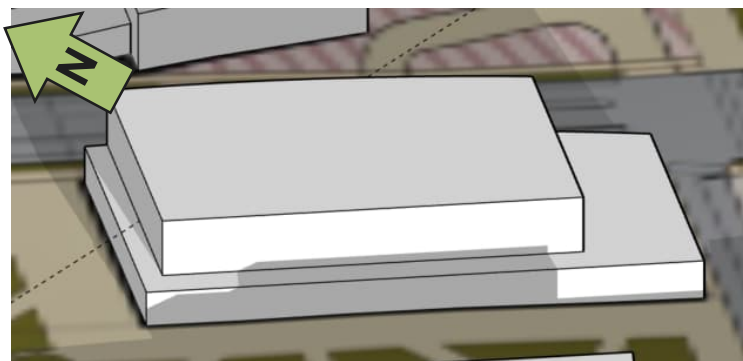
To promote a calmer wind climate around the Phase 7 building, we suggest enlarging the podium step back on the north and west sides.



Phase 8

The Phase 8 building includes a large step back on the north side of the mid-rise element, which is a positive design feature.

We suggest including podium step back around the perimeter of the mid-rise mass, in order to provide a disruption to downwashing wind flows from the southwest through northwest. This will provide a calmer wind climate for the surrounding pedestrian walkways.



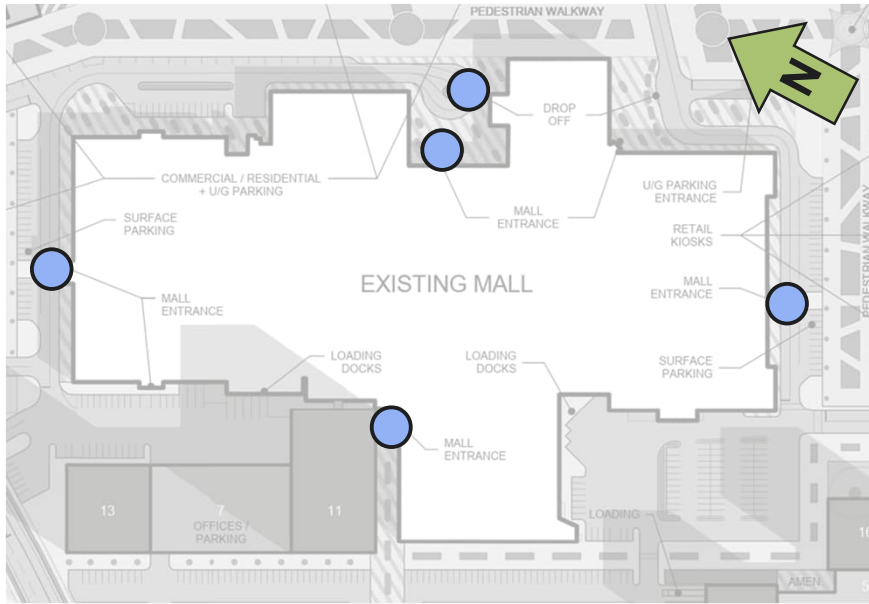
Phase 9

To reduce the potential for local wind accelerations due to downwashing flows along the north side of the Phase 9 building, we suggest including large step back on the west, north and east sides of the mid-rise element. This will provide a calmer wind climate at grade.

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Existing Mall

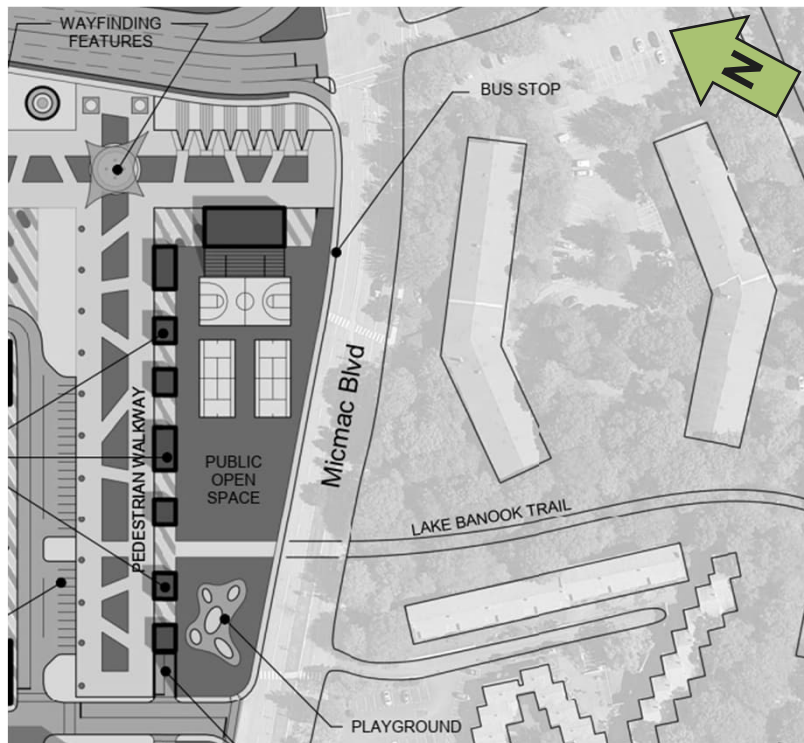
Wind conditions around the existing mall are generally predicted to be suitable for the intended use year-round. Most of the entrances and drop-off areas are sheltered by the mall itself or the proposed surroundings. Hence, we expect the entrances to have wind comfort conditions suitable for the intended use.

 Mall Entrance/ Drop-off Area

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Outdoor Amenity Spaces

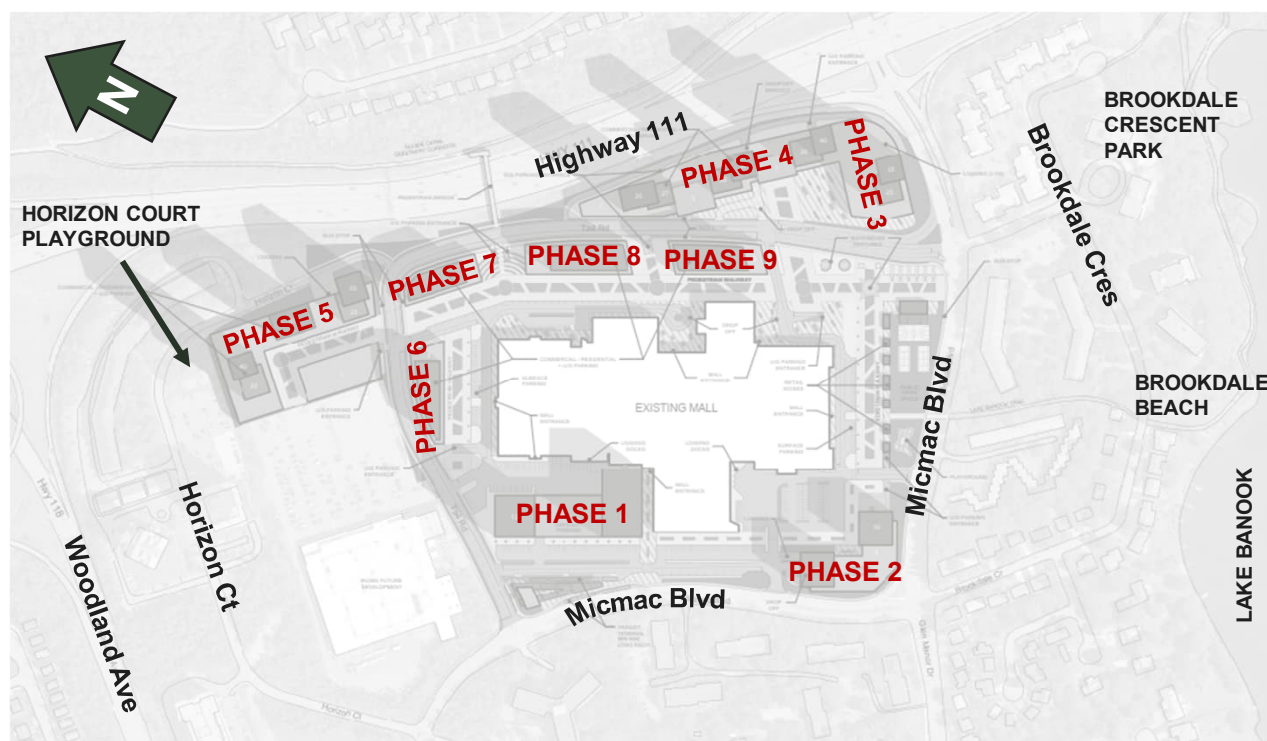
Outdoor amenity spaces associated with the proposed development include a public open space, a playground, and playing fields, all of which are located on the south edge of the property. These spaces connect with the nearby Lake Banook Trail and are partially sheltered by low-rise buildings to the north and south, with mid-rise proposed buildings to the west (Phase 2) and high-rise buildings to the east (Phase 3).

Depending on how calm these spaces should be, the design team could consider providing more adjacent shelter through the inclusion of tall landscaping along the west, north and east edges of the space.

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Surrounding Off-site Areas

On the southeast side of Phase 3, the residential areas and Brookdale Crescent Park will generally be sheltered from the prevailing winds by the mass of the development. Wind conditions in these areas are expected to be suitable for the intended use. Similarly, wind conditions on Lake Banook are expected to remain similar to existing conditions.

Brookdale Beach, which is located approximately 300 m southeast of the development, is immediately surrounded by low and mid-rise buildings. As this is a significant distance away from the development, wind conditions in the area are expected to remain similar to existing conditions year-round.

Surrounding Off-site Areas

With the addition of the proposed development, wind conditions along the upwind sidewalks of Woodland Ave, Micmac Boulevard and Horizon Court are generally expected to be similar to the existing wind conditions, with slightly stronger wind flows near the taller buildings (i.e. Phases 1, 2 and 5). The resultant wind conditions should still be comfortable for the intended use of sidewalks throughout the year.

Stronger wind flows are expected in Horizon Court playground, immediately northwest of Phase 5 buildings, with the development in place. The previously recommended large step-back on the north and west sides of the Phase 5 podium will be beneficial to improve wind conditions in the playground.

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