Kassner Goodspeed Architects Ltd.

29 & State Street Developments Ltd.
The Promenade at Robie South

Case 20761: Application for Development Agreement

Wind Impact Statement

The project by 29 & State Developments Ltd. for their land assembly at College, Robie and Carlton Streets in central Halifax incorporates two residential tower on top of a low rise streetwall structure. This statement outlines the measures that have been incorporated into the project design to mitigate adverse wind effects caused by the new building.

The primary concern is the impact of winds on the pedestrian environment. Wind speeds at ground level (boundary layer) are much lower than those in the unobstructed air flow several hundred feet higher. In general the rougher or more built up the area, the lower the wind speed near the ground. However, tall slab like buildings tend to deflect wind down into previously sheltered areas. This can create effects that can make walking difficult, affect snow and rain deposition patterns and make a place chillier than it would otherwise be.

Winds vary in direction, strength and turbulence, while buildings vary in plan form, height and arrangement. Generally, only those buildings that are at least twice the height of upstream obstructions are likely to create significant problems. Determination of wind effects is complex and difficult to predict in any detail. The effects that occur individually around buildings cannot be applied directly to groups of buildings. The cumulative effect of many clustered tall buildings, like in this situation, can create a wide range of different wind scenarios that must be modelled as a group to understand the cumulative impacts.

Although it can be complex to assess the wind patterns, there are design strategies that can work to mitigate the anticipated impact on local wind patterns. Several of these measures have been incorporated in the design of the proposed structure.

Downwashing occurs when pressure differential forces the faster winds at the top of a tower down the windward face, dramatically increasing pedestrian wind speeds. The taller the exposed face, the higher the wind speed will be at the base. The tower stepbacks above the streetwall will receive the bulk of this downwash, effectively protecting the pedestrian sidewalks below.

At the windward corners of buildings, there can be unexpected increases in wind speeds as winds force around the around the winward corners from high bpressure on the windward face to low pressure on the lee side, An effective strategy to mitigate this impact is too increase the complexity of the form at the coners. The open balcony treatment at the corners of the towers dissipates wind energy as it rushes around the windward corners.

Suite **200-5663** Cornwallis Street, Halifax, NS, B3K 1B6 ■ **tel:** (902) 422-1557 ■ **fax:** (902) 422-8685 ■ **email:** kgarch@kgarch.ns.ca

Richard M Kassner FRAIC MNSAA MAAPEI MAANB MCSC
Daniel B Goodspeed FRAIC MNSAA MAAPEI MAANB

The wake effect is generally caused by both the downwash and the corner effect causing turbulent flows on the lee side of the building. The area of impact is directly proportional to the lee side area of the tower. Stepbacks creating a projected base are key to blocking these turbulent flows from impacting pedestrian areas.

Wind patterns vary seasonally. In the winter, the northwest prevailing winds are the dominant occurance. Approximately half the winds come from the northwest. Winter winds are also stronger than those in the summer, with about fifteen percent of all winds reaching speeds above 29 kph. The variations in building heights in the upwind zone and the mature street trees to the north and east will provide mitigation, buffering impacts on and around the site. Winter winds will impact the Robie frontage, as the wind is channeled by the streetwall. In contrast, the College frontage will be on the lee side in winter, with excellent sun exposure

During the summer approximately half the winds come from the southwest quadrant, with the remaining spread amongst the other three quadrants. Overall the winds are mild, with just over 2 percent of the winds reaching speeds over 29 kph. Summer winds may mildly impact the intersection of Robie and College Streets, as the wind builds over the predominantly low rise university district to the southwest.

Based upon the urban context, the local wind environment and the wind mitigation features described above, the impact of the building is expected to be minimal on the adjacent streets and minimal to negligible on adjacent private and public lands.

Daniel B Goodspeed, Architect FRAIC, NSAA