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DIALOG
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T: 780.429.1580
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Re: Pedestrian Wind Impact Statement
Wexford Ice District Tower
10420 – 103 Avenue NW – Edmonton, AB
RWDI Project # 1900339

Dear Mr. Rivest,

RWDI has prepared this Pedestrian Wind Impact Statement that summarizes our opinion on the pedestrian wind conditions around the proposed Wexford Ice District Tower to be located at 10420 – 103 Avenue in Edmonton, AB. This Wind Impact Statement is required by the City of Edmonton, as per Bylaw 16733 - Section 14.2, in support of the Re-Zoning Application for this project. A Wind Impact Study involving scale model wind-tunnel tests will be required later in the design in support of the Development Permit application to quantify the pedestrian wind conditions presented herein, and refine wind mitigation measures, if needed.

Our opinions presented herein are based on a qualitative assessment of the wind conditions in the context of the local wind climate, current design drawings (received on February 26, 2019), our expert understanding of wind flows around buildings, and our experience with wind tunnel studies of many projects in Edmonton including several studies in the Edmonton Ice District.

BUILDING AND SITE INFORMATION

The project is a 28-storey (90 m tall) residential tower that includes a three-storey podium with retail spaces on the ground floor (see Image 1). The main entrance is located on 103 Ave NW, and roof patios are proposed on Levels 4 and 28.

The proposed project will be located at the northwest corner of 103 Ave NW and 104 St NW, in the block southwest of Rogers Centre Arena (see Image 2). The site is immediately surrounded by a mix of low-rise buildings and high-rise towers in the neighbouring blocks. The Edmonton Ice District development, which includes several blocks currently under construction, is to the east and northeast of the site and the downtown core is to the southeast. Surroundings farther away comprise primarily

low-rise buildings in the northerly directions, a mix of low-rise and mid-rises to the west and mainly high-rises to the southeast and south.

Image 1: Project Renderings; Views from South(left) and Southeast (right)

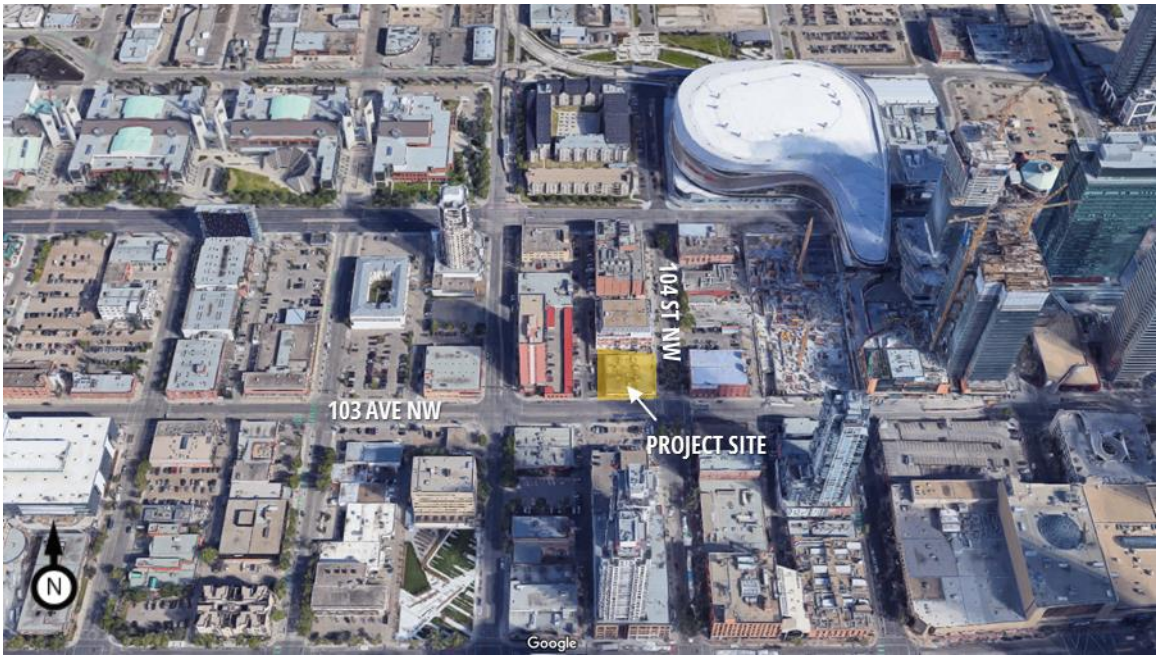

Image 2: Aerial View of the Existing Site and Surroundings (Image Credit: Google Map)

WIND DATA

Wind data from the previously operational Edmonton City Centre Airport were used as a reference for the current project (refer to the wind roses in Image 3). This is the nearest station with long-term hourly wind data.

When all winds are considered, wind from southeast through south and west through north-northwest directions are predominant in both summer and winter (see Image 3). Strong winds occur slightly more often in the summer (left wind rose in Image 3) than in the winter (right wind rose in Image 3), and they are typically from the west-northwest and northwest directions.

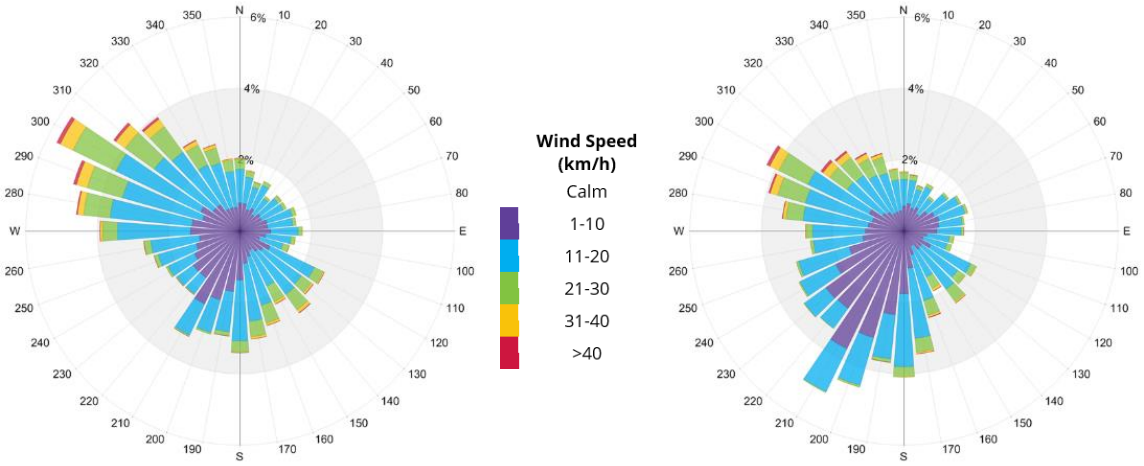

Image 3: Direction Distribution of Winds Recorded at Edmonton City Centre Airport from 1985 to 2014

PEDESTRIAN WIND ASSESSMENT

To provide an opinion on the overall pedestrian level wind conditions expected on and around the proposed project, RWDI reviewed the long-term meteorological data for the area, drawings of the proposed development received from Dialog on January 22, 2019, and information regarding the surroundings available through online resources, and assessed them in conjunction with our recent experience in the area and our engineering judgment. Our statement is presented in the following pages.

Predicted Wind Flow Patterns

The proposed site is surrounded by dense high-rise structures to the east, northeast, southeast and south, including several proposed buildings that are under construction. These built-up areas create lower wind speeds downwind due the aerodynamic drag they provide. Thus, the proposed site would be sheltered from prevailing winds from southeast through south.

The tall buildings that exist on nearby lots to the west and in the distance to the northwest are expected to provide a moderate level of sheltering for winds approaching from the northwest quadrant. However, due to the height of the proposed tower, and partial exposure to the northwest winds, the tower is expected to intercept winds and direct them downward in a phenomenon called *Downwashing* (see Image 4a). These winds would subsequently accelerate around the northeast and southwest corners of the tower and create high wind speeds there. Image 4b illustrates these flow patterns as expected around the proposed project.

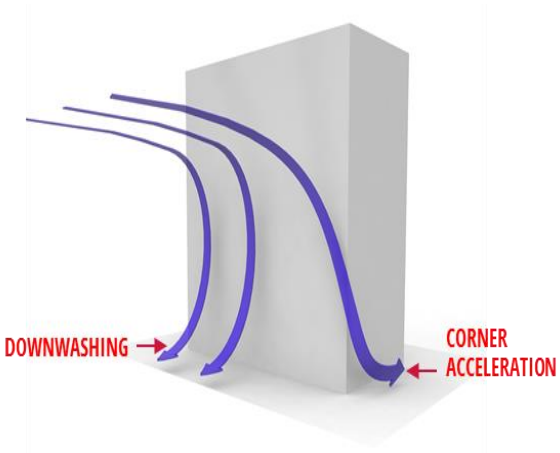

Image 4a: Downwashing and Corner Acceleration

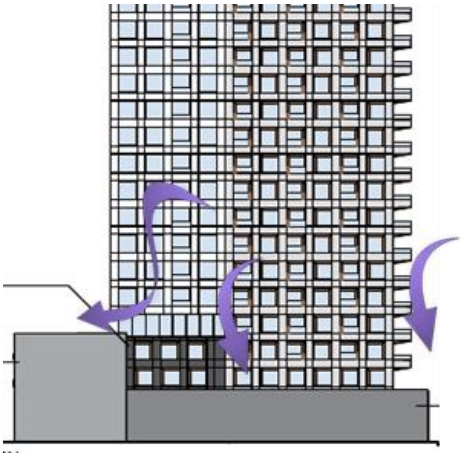

Image 4b: Predicted Flow of Northwest Winds on the North Elevation

The proposed tower is designed with a three-storey podium and the tower is setback from the edges of this podium on the west, north and east. The podium acts as a horizontal break for downwashing flows; the larger setback on the east side is expected to intercept downwashing and corner acceleration flows and reduce potential wind impacts on 104 St NW. The setbacks on the north and west sides would also function as horizontal breaks for the redirected flows. However, due to their smaller depths, the disrupted flow is still expected to create a minor increase in wind speeds along the north and west elevations, especially near the southwest corner of the building.

Predicted Wind Conditions

Ground Level

The proposed podium, as described previously, reduces downwashing impacts and therefore, is a positive feature from a wind perspective. An additional positive feature is the location and design of the main entrance. The main entrance is located on the south façade, partially recessed from the main facade and designed with a large overhead canopy (see Image 5). Commercial/retail entrances are proposed on the east façade. We understand that the design team is proposing seating areas along the south side of the building and large street trees on both 104 St NW and 103 Ave NW.

The sidewalks and entrances along 104 St NW and most areas on 103 Ave NW, including the main entrance and seating area, are sheltered from the prevailing northwesterly winds by the proposed development itself. Therefore, suitable wind conditions are expected in both the summer and winter seasons. During the summer, the proposed trees would provide additional protection from winds and thereby enhance wind conditions for passive activities. Although we predict increased wind speeds at the southwest corner and to the north and west of the site, these wind speeds are expected to be appropriate for pedestrians walking in the area. We understand that areas bordering the site to the north and west are alleys and vehicular accesses; therefore, increased wind speeds should not be a concern in those areas.

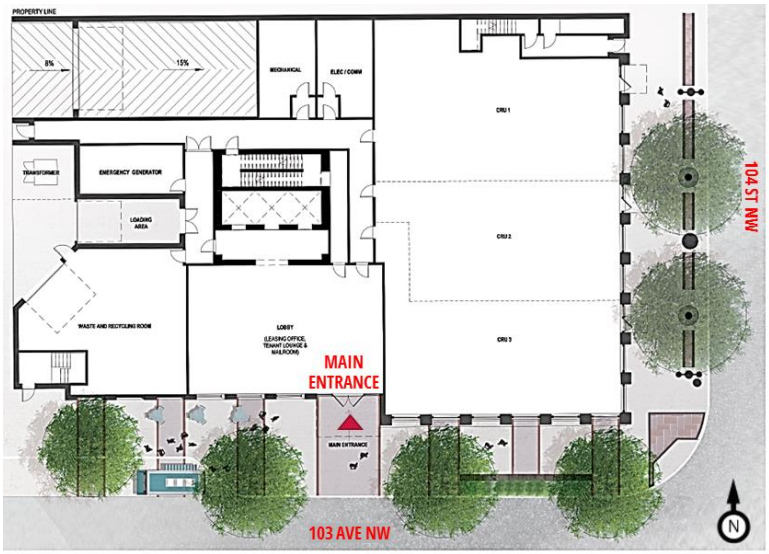

Image 5: Ground Floor Plan

Roof Patios

Roof patios are proposed on the east side of the tower on Level 4, and on the west side of Level 28 (see Image 6). Wind speeds increase with elevation and therefore, if terraces are exposed to these winds, conditions on the terraces are likely to be windier than desired for passive activities.

We understand that the Level 28 patio is designed with a wall with windows for viewing around it (Image 6). The wall appears to be about 3 m tall, which is appropriate for providing the necessary wind protection and resulting in comfortable wind conditions for passive activities on the patio.

The Level 4 patio would be subject to corner acceleration of the northwest winds as described previously and illustrated in Image 4b. Without wind control measures, the north end of this patio would be windier than the south end. It is our understanding the patio will be surrounded by a glass wall that appears to be at least 2 m tall (Image 6, perspective view). If the glass screen is not 2 m tall at the north end, it is recommended that a screen of that height be established using plants or hedges, to protect the patio from wind exposure. Additionally, it is recommended to add a trellis that is at least 70% solid, over the dining area at the north end, to protect the area from downwashing flows. Any

additional landscaping within the patio area that is at least 2 m tall would enhance wind conditions. Examples are provided in Image 7.

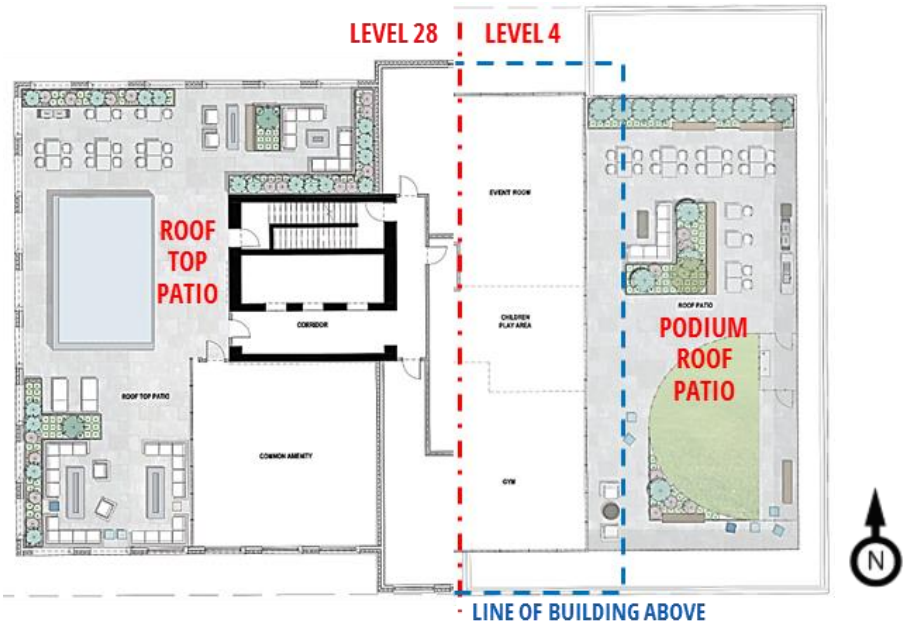

Image 6: Partial Plans (top) and Perspective Views (bottom) of Roof Patios on Levels 4 and 28

Image 7: Examples of Wind Control Measures for the Level 4 Patio

CONCLUSIONS

Based on a combination of the wind-responsive design features of the proposed building and the dense high-rise surroundings, appropriate wind conditions are predicted at the main entrance, along public sidewalks and on the patios, throughout the year. Options for alternative measures have been provided to improve wind conditions on the Level 4 patio.

A Wind Impact Study involving scale model wind-tunnel tests will be conducted later in the design stage in support of the Development Application. The wind tunnel tests will be able to quantify and confirm the level of wind speed reduction required, and better develop appropriate wind control measures.

CLOSING

We trust the enclosed meets your present requirements. Should you have any questions or require additional information, please do not hesitate to contact us.

Yours truly,
RWDI

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NV/RWS/JJA/smd