

December 18, 2019

Stay Inn Hospitality
650 Evans Avenue
Toronto, Ontario
M8W 2W6

Re: Qualitative Pedestrian Level Wind Assessment
2157 Lake Shore Boulevard West, Etobicoke
GWE File No.: 18-204-DTPLW

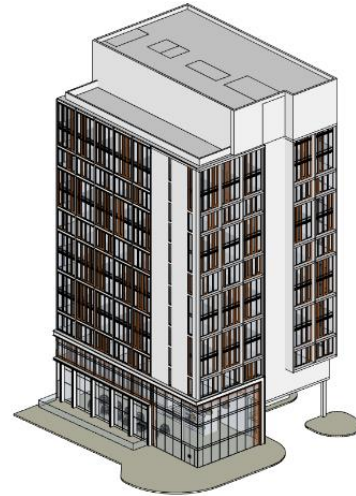
Gradient Wind Engineering Inc. (Gradient Wind) was retained by Stay Inn Hospitality to undertake a qualitative pedestrian level wind assessment for the boutique hotel located at 2157 Lake Shore Boulevard West in Etobicoke, Ontario. This report provides a qualitative assessment of pedestrian level wind comfort for the subject site based on drawings prepared by IBI Group received in November 2019, consideration of existing and approved future surrounding buildings, statistical knowledge of the Toronto wind climate, and experience with similar projects in Toronto.

In the early stages of design development, a qualitative wind assessment is useful to identify any significant massing features or design elements which may adversely impact pedestrian activities within the study area, and to provide initial recommendations for mitigation strategies, as may be required.

1. TERMS OF REFERENCE

The focus of this qualitative pedestrian wind assessment is the proposed boutique hotel at 2157 Lake Shore Boulevard West. The study site is located in the Humber Bay Shores area of Etobicoke and is situated on a parcel of land bounded by Lake Shore Boulevard West to the west, Silver Moon Drive to the south, Lane 'E' to the east, and an existing development to the north.

The development comprises a square-shaped 13-storey building with one level of underground parking. The ground floor features a lobby/lounge area at the southwest corner, a restaurant and associated kitchen at the north side, and building support functions in the remaining space. The southeast corner of the ground level is recessed, with a vehicular drop-off accessed from Silver Moon Drive and Lane 'E'. At Level 2, the floor plate steps out at the southeast corner and contains various amenity spaces and building support functions, and areas open to below. Levels 3 and above are reserved for hotel suites, and the building is topped by a mechanical penthouse and green roof.



Study Site, West Perspective

Regarding wind exposures, the near-field surroundings of the development (defined as an area falling within a 200-metre radius of the site) comprise numerous existing, under construction, and future approved medium- and high-rise buildings between Lake Shore Boulevard West and Marine Parade Drive, while areas to the west of Lake Shore Boulevard West are primarily open space. Specifically, the existing medium-rise development at 60 Annie Craig Drive (10 storeys) is located directly east of the site across Lane 'E', and the existing high-rise at 2167 Lake Shore Boulevard West (50 storeys) forming part of the multi-building "Lago at the Waterfront" development is located directly northeast. Building C (five storeys) and Building B (56 storeys) of the future approved development at 2143 Lake Shore Drive are respectively located west to east north of the site, north of the a planned three-storey commercial building directly north of the study site. The multi-building high-rise development site at 2161 Lake Shore Boulevard West is under construction south of the site along the full south extent of Silver Moon Drive; the development includes a four-storey commercial building directly south of the study building across Silver Moon Drive, as well as Tower A (53 storeys) and Tower B (14 storeys) located west to east, respectively, southeast of the study site. The far-field surroundings (defined as the area beyond the near field and within a two-kilometer radius) include Lake Ontario from the northeast rotating clockwise to the south-southwest, and primarily low-rise developments for the remaining directions in addition to high-rise developments along Park Lawn Road and Lakeshore Boulevard West.



The ground floor is illustrated in Figure 1 (following the main text), with letter tags identifying wind sensitive pedestrian locations considered in this assessment.

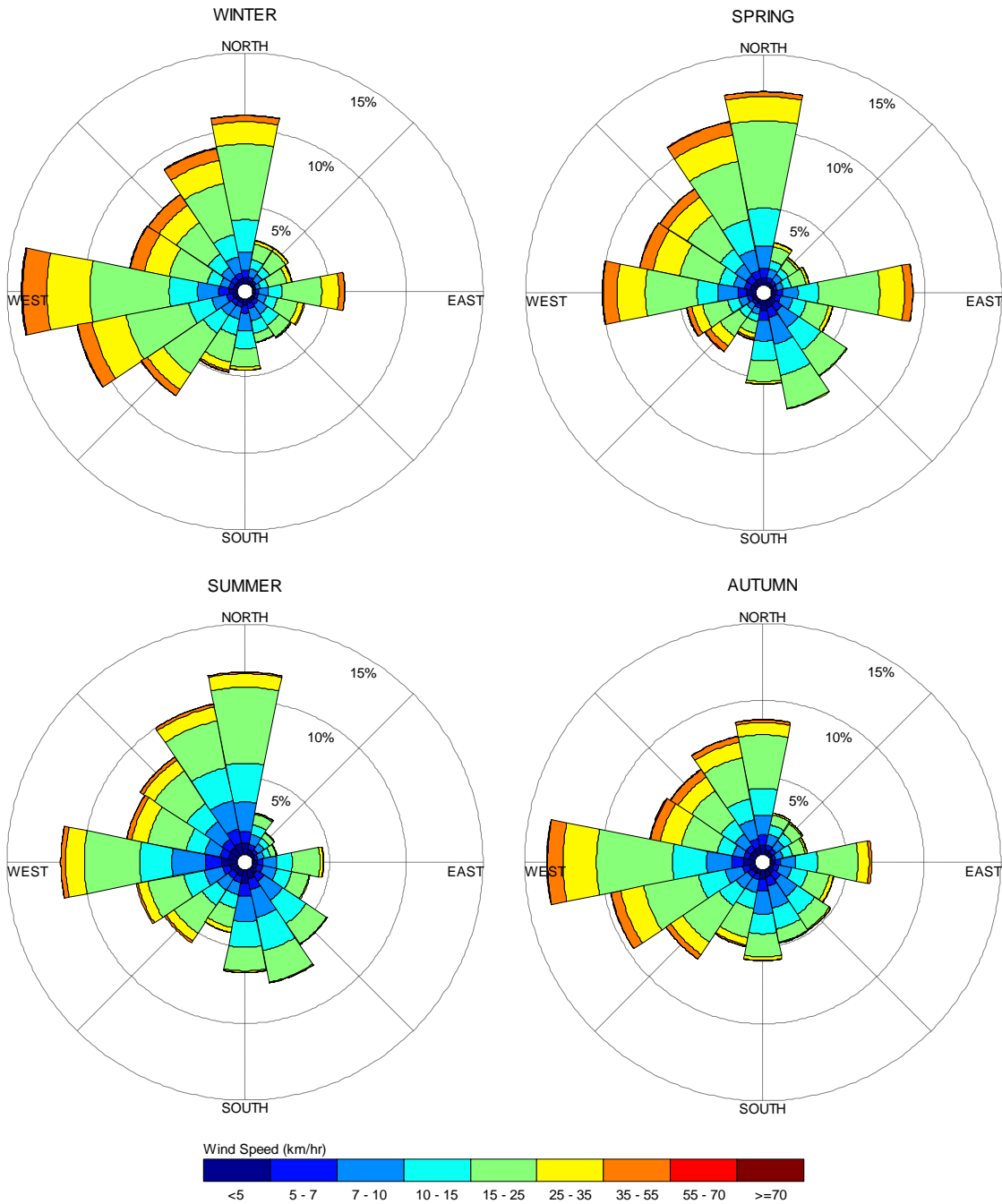
2. METHODOLOGY

The main aspects of a qualitative pedestrian level wind assessment include (i) consideration of the statistical properties of the local wind climate; (ii) knowledge of wind flow behaviour in typical urban and suburban environments; and (iii) an understanding of how common wind conditions relate to typical pedestrian activity types.

2.1 Toronto Wind Climate

The statistical model of the Toronto wind climate, which indicates the directional character of local winds on a seasonal basis, is illustrated on the following page. The plots illustrate seasonal distribution of measured wind speeds and directions in kilometers per hour (km/h). Probabilities of occurrence of different wind speeds are represented as stacked polar bars in sixteen azimuth divisions. The radial direction represents the percentage of time for various wind speed ranges per wind direction during a 40-year measurement period. The preferred wind speeds and directions can be identified by the longer length of the bars. For Toronto, the most common winds concerning pedestrian comfort occur from the southwest clockwise to the north, as well as those from the east. The directional preference and relative magnitude of the wind speed varies somewhat from season to season, with the summer months displaying the calmest winds relative to the remaining seasonal periods.

SEASONAL DISTRIBUTION OF WINDS FOR VARIOUS PROBABILITIES PEARSON INTERNATIONAL AIRPORT, TORONTO, ONTARIO



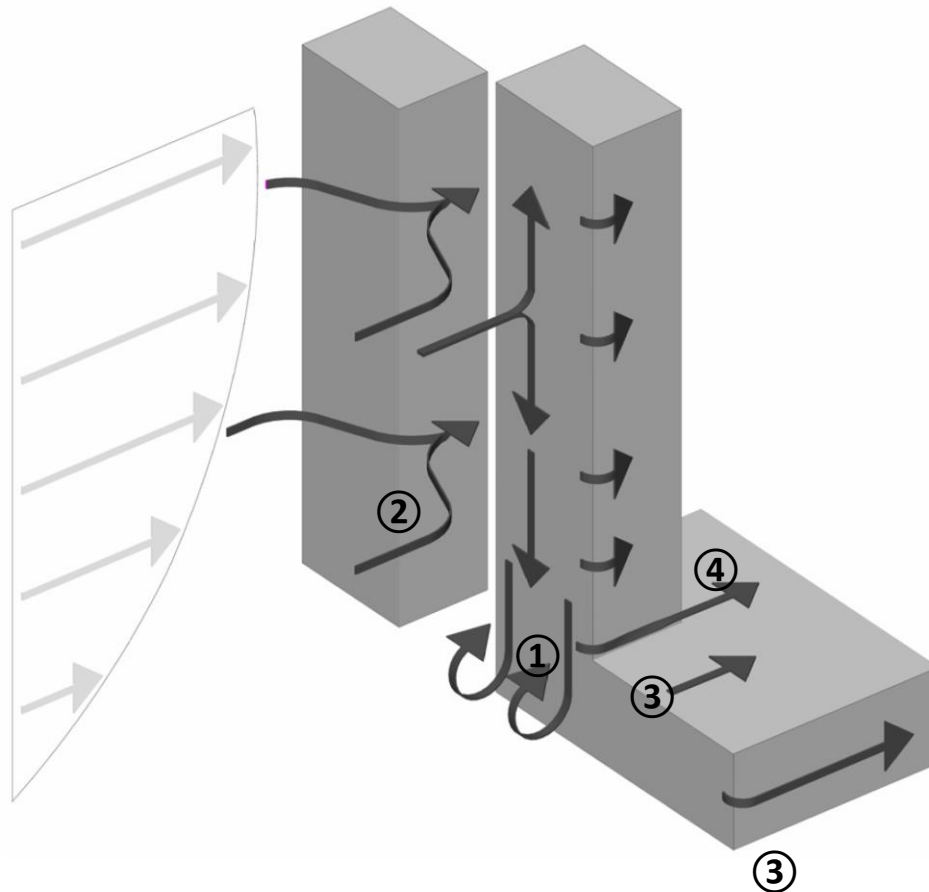
Notes:

1. Radial distances indicate percentage of time of wind events.
2. Wind speeds are mean hourly in km/h, measured at 10 m above the ground.

2.2 Massing vs. Climate – Geometric Effects

The physical features of a development site that are most influential to the local wind conditions include the massing and relative spacing of surrounding buildings, the geometry and orientation of the study building, and the alignment of the study building with respect to statistically prominent wind directions.

Wind flow characteristics which combine to determine how conditions will develop include phenomena known as downwash, channelling coupled with acceleration, and shielding, as illustrated in the image below. Downwash ① relates to the effect of winds against a tall building, whereby much of the impinging flow on the windward side of the building, nominally below two-thirds of the total height, is directed to lower levels. Taller buildings with smooth façades and no podiums produce the strongest downwash effects at grade, while the presence of protruding balconies and a tower setback from the podium edge mitigates downwash effects at the ground level. Channelling ② refers to acceleration of wind through gaps between buildings, while acceleration of wind ③ occurs around building corners. Shielding ④ relates to calm zones on the leeward side of buildings, protected from prevailing winds.



2.3 Pedestrian Comfort and Safety Guidelines

The pedestrian wind comfort guidelines used by Gradient Wind, which correspond to industry-accepted standards, are based on the correlation between a variety of pedestrian activity types and acceptable wind speed ranges for those activities. More specifically:

- Wind conditions are comfortable for *sitting* when gust wind speeds no greater than 16 km/h occur at least 80% of the time;
- Wind conditions are comfortable for *standing* when gust wind speeds no greater than 22 km/h occur at least 80% of the time; and
- Wind conditions are comfortable for *walking* when gust wind speeds no greater than 30 km/h occur at least 80% of the time.

These guidelines are based on gust wind speeds, since people are most sensitive to wind gusts rather than to constant wind speeds. The guidelines are applied to the intended use of an outdoor area. For example, an entrance to a building should be suitable for standing, but need not be suitable for sitting, while a public sidewalk need only be suitable for walking in most circumstances.

3. ANTICIPATED PEDESTRIAN COMFORT

Based on consideration of the proposed development located at 2157 Lake Shore Boulevard West, surrounding building massing, and the relationship to the local wind climate, the following statements summarize our assessment of wind comfort at key pedestrian areas.

Sidewalk along Lake Shore Boulevard West, inclusive of Building Entrance (Tags A and B): The sidewalk along Lake Shore Boulevard West will be exposed to prominent winds from the southwest clockwise to the north with little upwind resistance. Modest downwash of these wind directions is expected, however the relatively low-height of the building will limit this effect. Although prominent west-quadrant winds may accelerate around west building corners, these winds are expected to accelerate on the side of the corner opposite to the building entrances, away from Lake Shore Boulevard West. Channelling of easterly winds between the medium and high-rise massing east of Lakeshore Boulevard West will likely be limited due to the orientation of the buildings, which instead opens the corridors to less prominent southeasterly winds.

Overall, the Lake Shore Boulevard West sidewalk is expected to be comfortable for a mix of sitting and standing during the summer and autumn, and may transition to include walking conditions towards the intersection of Silver Moon Drive and Lake Shore Boulevard West during the spring and winter. The adjacent entrances will experience somewhat calmer conditions due to proximity to the building façade and are expected to be suitable for standing or better throughout the year. These conditions are acceptable for the intended uses, including for the existing transit stop northwest of the study building.

Sidewalk along Silver Moon Drive (Tag C): Silver Moon Drive is aligned with prominent northwest and less frequent southeasterly wind directions, which are expected to be further exacerbated by channeling effects within the corridor, especially between high-rise buildings to the east towards Marine Parade Drive. However, the relatively low height of the study building, the infrequency of southeasterly winds for the Toronto wind climate, the low overall height of the developments nearest to the site (the adjacent 10 storey building at 60 Annie Craig Drive to the east, and the four-storey building under construction at 2161 Lake Shore Boulevard West to the south) will limit this channelling effect in proximity to the study site.

Overall, the sidewalk south of the site is expected to be largely comfortable for standing during the summer and autumn, and a mix of walking or standing for the remainder of the year, which is acceptable.

Covered Drop-off Area and Adjacent Lobby Entrance (Tag D): The covered drop-off area is well-protected from most wind directions by the massing of the surrounding buildings and the study building itself. Although prominent southwesterly winds may accelerate around the southeast corner of the lobby/lounge, conditions within the covered drop-off area are expected to be calm and largely suitable for sitting throughout the year, which is acceptable.

Sidewalk along Lane 'E' (Tag E): Lane 'E' is well-shielded from oncoming winds by the surrounding massing. Although windier conditions are expected to occur over sections of the laneway to the northwest and southwest of the site, this is due largely to the downwash of prominent westerly winds along the west elevation of surrounding high-rise developments, as well as limited channeling of winds within intersecting laneways and Silver Moon Drive.

Wind conditions over the sidewalk along Lane 'E' are largely expected to be comfortable for standing during the summer and autumn, transitioning to include walking conditions over sidewalk areas in

proximity to neighboring building corners during the winter. These conditions are acceptable for the intended uses.

Influence of the Proposed Development on Existing Wind Conditions near the Study Site: The introduction of the proposed development is not expected to significantly influence pedestrian wind comfort over neighbouring areas. Nearby building entrances, sidewalks, laneways, parking areas, and other pedestrian-sensitive areas beyond the development site are expected to experience wind conditions similar to those that exist prior to development of the subject site.

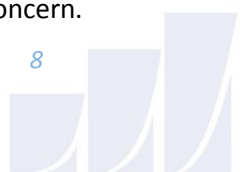
Applicability of Predictions: The forgoing statements and conclusions apply to common weather systems, during which no dangerous or consistently strong wind conditions are expected anywhere over the study site. During such extreme weather events, (e.g. thunderstorms, tornadoes, and downbursts), pedestrian safety is the main concern. However, these events are generally short-lived and infrequent and there is often sufficient warning for pedestrians to take appropriate cover.

4. SUMMARY AND RECOMMENDATIONS

Based on a qualitative analysis of architectural drawings, surrounding building massing, and the Toronto wind climate, the following general statements summarize our prediction of future wind conditions for the proposed mixed-use development at 2157 Lake shore Boulevard West in Etobicoke, Ontario.

1. Wind comfort at all grade-level pedestrian-sensitive locations across the full study site is expected to be suitable for the anticipated uses without mitigation. These grade-level areas include nearby sidewalks, the covered drop-off area, and building access points.
2. The introduction of the proposed building is not expected to significantly influence pedestrian wind comfort at neighbouring areas beyond the development site. In particular, nearby building entrances, sidewalks, laneways, parking areas, and other pedestrian-sensitive areas beyond the development site are expected to continue to experience wind conditions similar to those that presently exist without the proposed building in place.

The forgoing statements and conclusions apply to common weather systems, during which no dangerous or consistently strong wind conditions are expected anywhere over the study site. During such extreme weather events, (e.g. thunderstorms, tornadoes, and downbursts), pedestrian safety is the main concern.



However, these events are generally short-lived and infrequent and there is often sufficient warning for pedestrians to take appropriate cover.

This concludes our qualitative assessment of pedestrian wind comfort. Please advise the undersigned of any questions or comments.

Sincerely,

Gradient Wind Engineering Inc.

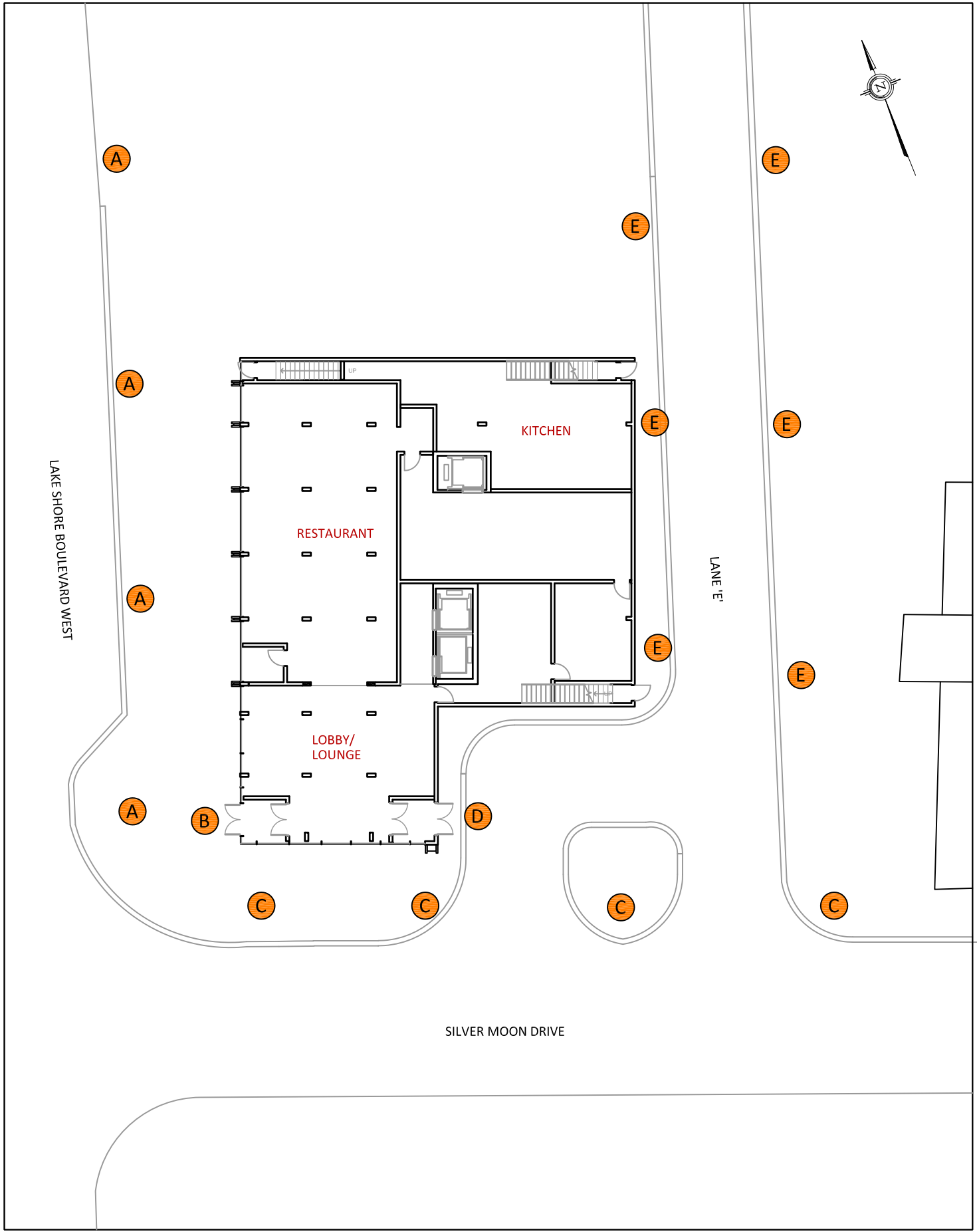


Megan Jee, MEng.,
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GW18-204-DTPLW



Andrew Sliwas, M.A.Sc., P.Eng.,
Principal



PROJECT	2157 LAKE SHORE BOULEVARD, ETOBICOKE QUALITATIVE PEDESTRIAN LEVEL WIND ASSESSMENT	
SCALE	1:300 (APPROX.)	DRAWING NO. GWE18-204-DTPLW-1
DATE	DECEMBER 18, 2019	DRAWN BY C.E.

DESCRIPTION	FIGURE 1: GROUND FLOOR PLAN WITH REFERENCE MARKERS
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