

4898 KITCHENER STREET

NIAGARA FALLS, ON

PEDESTRIAN WIND STUDY

RWDI # 2510573

March 5, 2026

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the proposed development at 4898 Kitchener Street in Niagara Falls, ON (Image 1). Two variants of the proposed project were studied. The assessment was based on the wind-tunnel testing conducted for the proposed development under the Existing, Proposed 1 and Proposed 2 configurations of the site and existing surroundings (Image 2), in accordance with the requirements in the Pedestrian Level Wind Study Terms of Reference Guide for the Niagara Region and City of Niagara Falls (July 2022). The results were analyzed using wind records from Niagara Falls International Airport (Image 3) and evaluated against the Wind Criteria for Pedestrian Comfort and Safety specified in the Guide. The predicted wind conditions are presented in Figures 1A through 3C, and Table 1, and are summarized as follows:

Existing Configuration:

- All locations on and around the site are comfortable for pedestrian use throughout the year, with seasonally higher speeds in the winter.
- Wind speeds at all areas assessed are expected to meet the wind safety criterion.

Proposed 1 Configuration:

- With the addition of the Proposed 1 variant, elevated wind activity is expected in the vicinity of the eastern corners of the proposed tower and the surface parking to the east. The resultant wind speeds are mostly suitable for general pedestrian use in the summer; however, they can be uncomfortable in the winter.
- Wind conditions near most entrances are suitable for intended use except the church and hotel entrances from Kitchener Street, especially in the winter.
- Wind conditions within the above-grade amenity spaces are expected to be suitable for general passive use in the summer, with slightly higher-than-desired wind speeds at the northeast corner of the tower on Level 3. Elevated wind activity during the winter may be considered acceptable due to reduced usage of outdoor spaces during colder months.
- Wind conditions are expected to meet the wind safety criterion at most locations; exceptions are areas around the eastern corners of the proposed tower at grade.

Proposed 2 Configuration:

- The Proposed 2 variant was developed based on the findings from the study conducted for the Proposed 1 configuration. The building incorporates positive design features such as chamfered/rounded corners and stepped massing and overhead trellis above Level 1. The design team is also planning to include local wind-control measures in windier areas identified, such as wind-resistant landscaping and screens.
- Wind conditions during the summer are expected to be suitable for general pedestrian use. During the winter, uncomfortable conditions are still expected in the vicinity of the proposed tower, but with fewer locations and frequencies when compared to the Proposed 1 configuration.
- Wind conditions near most entrances are expected to be improved. Wind speeds near the north entrance to the church are expected to remain uncomfortable, however, they can likely be mitigated through the implementation of localized wind control elements.
- Wind speeds on Level 1 are expected to be reduced; however, conditions at Level 3 remain comparable to the Proposed 1 configuration.



- Wind conditions are anticipated to satisfy the wind safety criterion across the majority of the site. The only exception is a location within the surface parking area to the southeast of the proposed tower. Nevertheless, these conditions are expected to improve as the building design is further refined and localized wind mitigation features are incorporated in subsequent stages.
- In summary, the design team's collaboration with RWDI has already produced a more wind-responsive design, significantly reducing high gust issues, and remaining marginal discomfort can be further improved through targeted local interventions such as tall wind screens, planters, evergreen landscaping, and higher terrace railings, to be considered in later design stages.



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1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the proposed development at 4898 Kitchener Street in Niagara Falls, ON. This report outlines the project objectives, methodology, and key findings from RWDI's assessment. RWDI's Statement of Limitations, as it pertains to this study, is provided in Section 4 of this report.

1.1 Project Description

The proposed development site is located southeast of the intersection of Kitchener Street and Hunter Street (Image 1). The project consists of a 50-storey mixed-use tower connected to an existing church, with a 5-storey parking garage north of the site. The site plan identifies an outdoor patio at Level 1 and a roof terrace at Level 3. Two design variants were evaluated as part of this study. The Proposed 2 variant was developed based on insights gained from the original design (Proposed 1 variant). It also includes landscaping enhancements along Kitchener Street.

1.2 Objectives

The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas on and around the study site and provide recommendations to reduce adverse effects, if needed. This quantitative assessment was based on wind speed measurements on a scale model of the project and its surroundings in one of RWDI's boundary-layer wind tunnels. These measurements were combined with the local wind records and compared to the terms of reference guide for the Niagara Region (dated July 2022) for gauging wind comfort and safety in pedestrian areas. The assessment focused on critical pedestrian areas, including building entrances, public amenity areas, parking lots and public sidewalks.



Image 1: Aerial View of Site and Surroundings (Photo Credit: Google™ Earth)

2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

To assess the wind environment around the proposed project, a 1:300 scale model of the project site and surroundings was constructed for the wind tunnel tests of the following configurations:

- A - Existing: Existing site with existing surroundings (Image 2A),
- B - Proposed 1: Proposed 1 variant with existing surroundings (Image 2B), and
- C - Proposed 2: Proposed 2 variant with proposed landscaping and existing surroundings (Image 2C).

The wind tunnel model included all relevant surrounding buildings and topography within an approximate 365 m radius of the study site. The Proposed 2 configuration incorporated the proposed landscaping as well as select existing trees near the site. The landscaping plan featured both deciduous and marcescent tree species, with the deciduous trees modelled in their winter form (i.e., without leaves). Architectural screens at grade, as shown in the latest site plan, were also included in the model of the Proposed 2 configuration.

The wind and turbulence profiles in the atmospheric boundary layer beyond the modelled area were also simulated in RWDI's wind tunnel. The wind tunnel model was instrumented with 83 specially designed wind speed sensors to measure mean and gust speeds at a full-scale height of approximately 1.5 m above local grade in pedestrian areas throughout the study site. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site. Wind speeds were measured for 36 directions in 10-degree increments. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the mean wind speed at a reference height above the model.

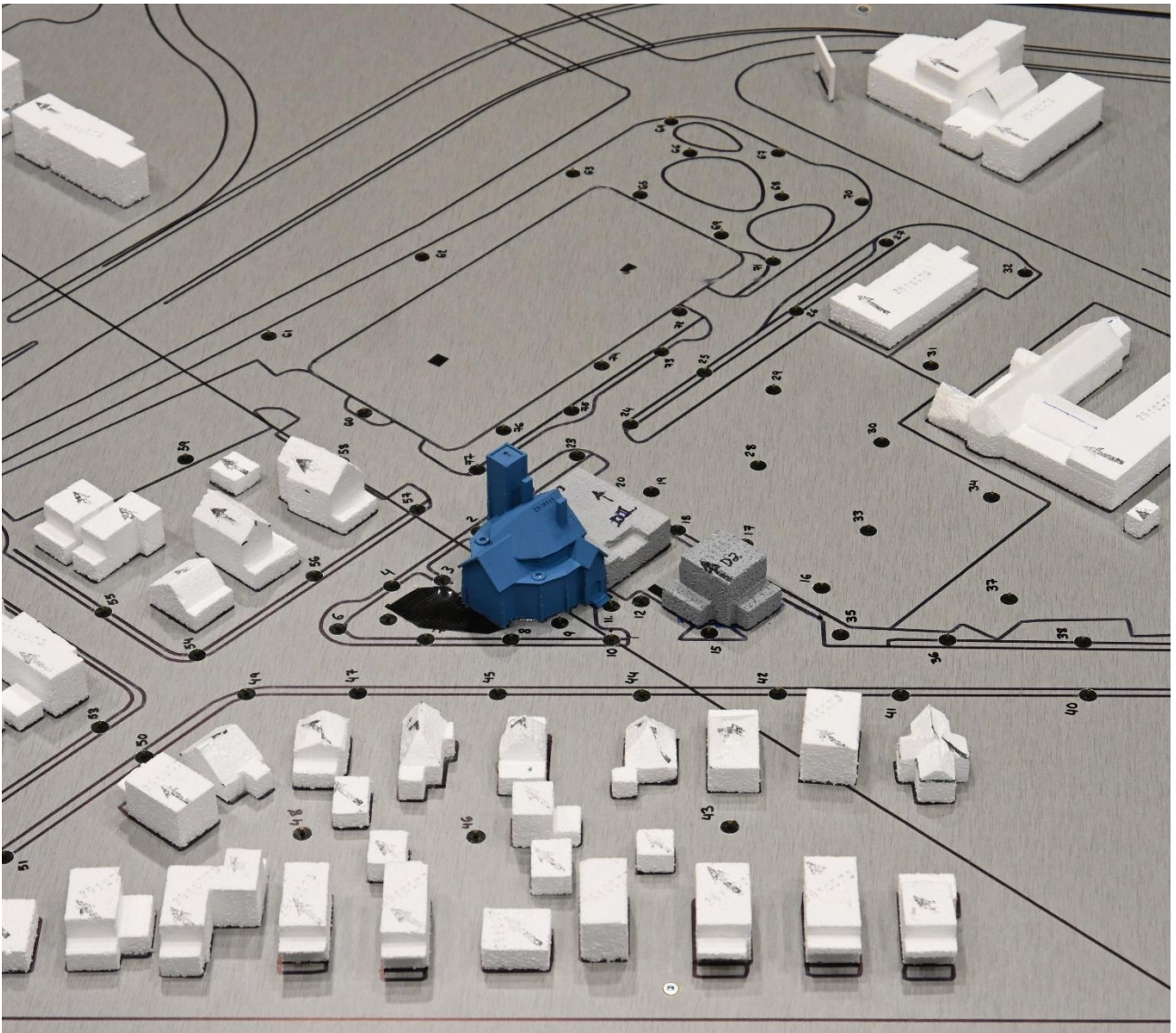


Image 2A: Wind Tunnel Study Model – Existing Configuration

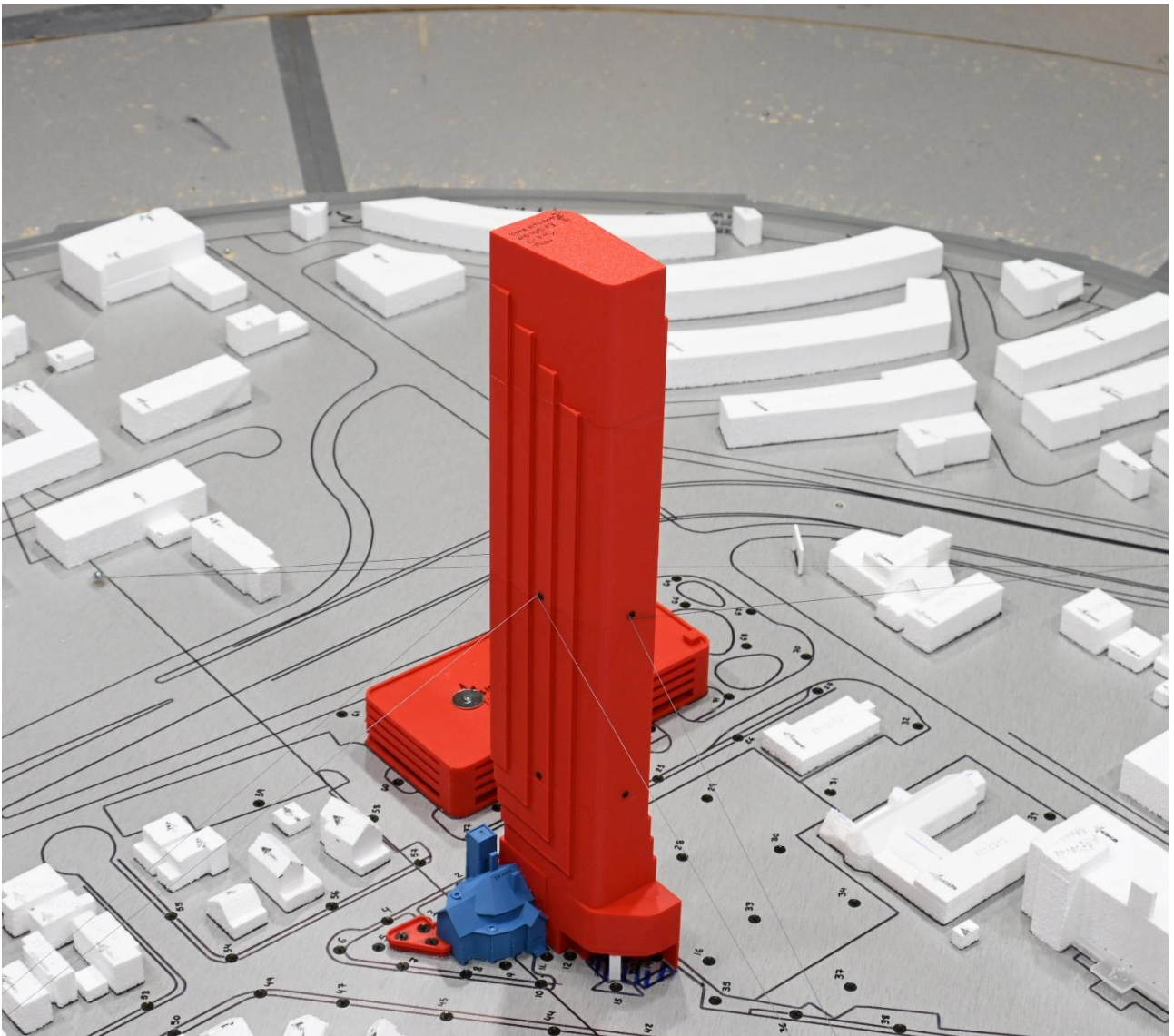
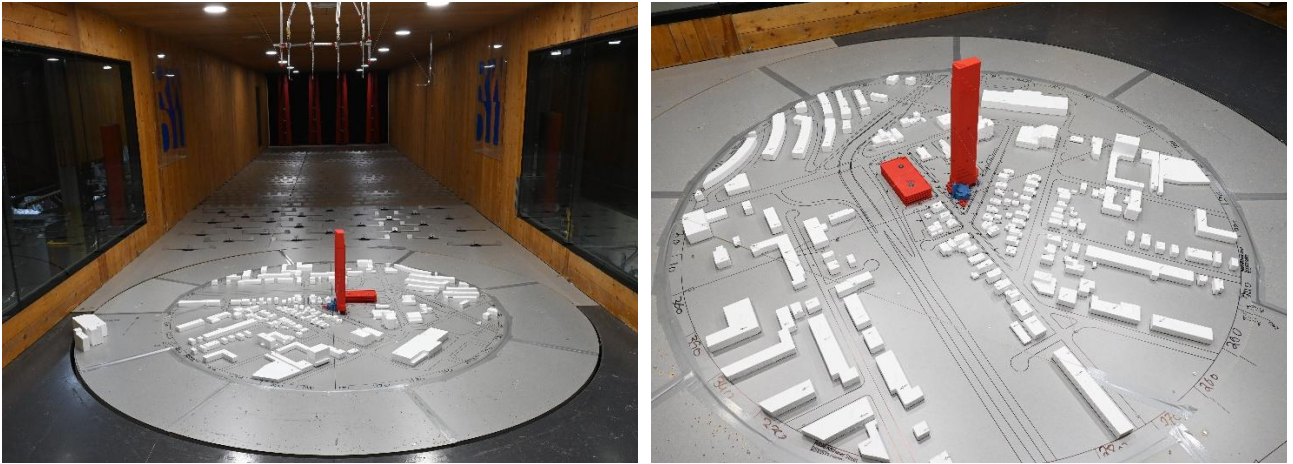


Image 2B: Wind Tunnel Study Model – Proposed 1 Configuration

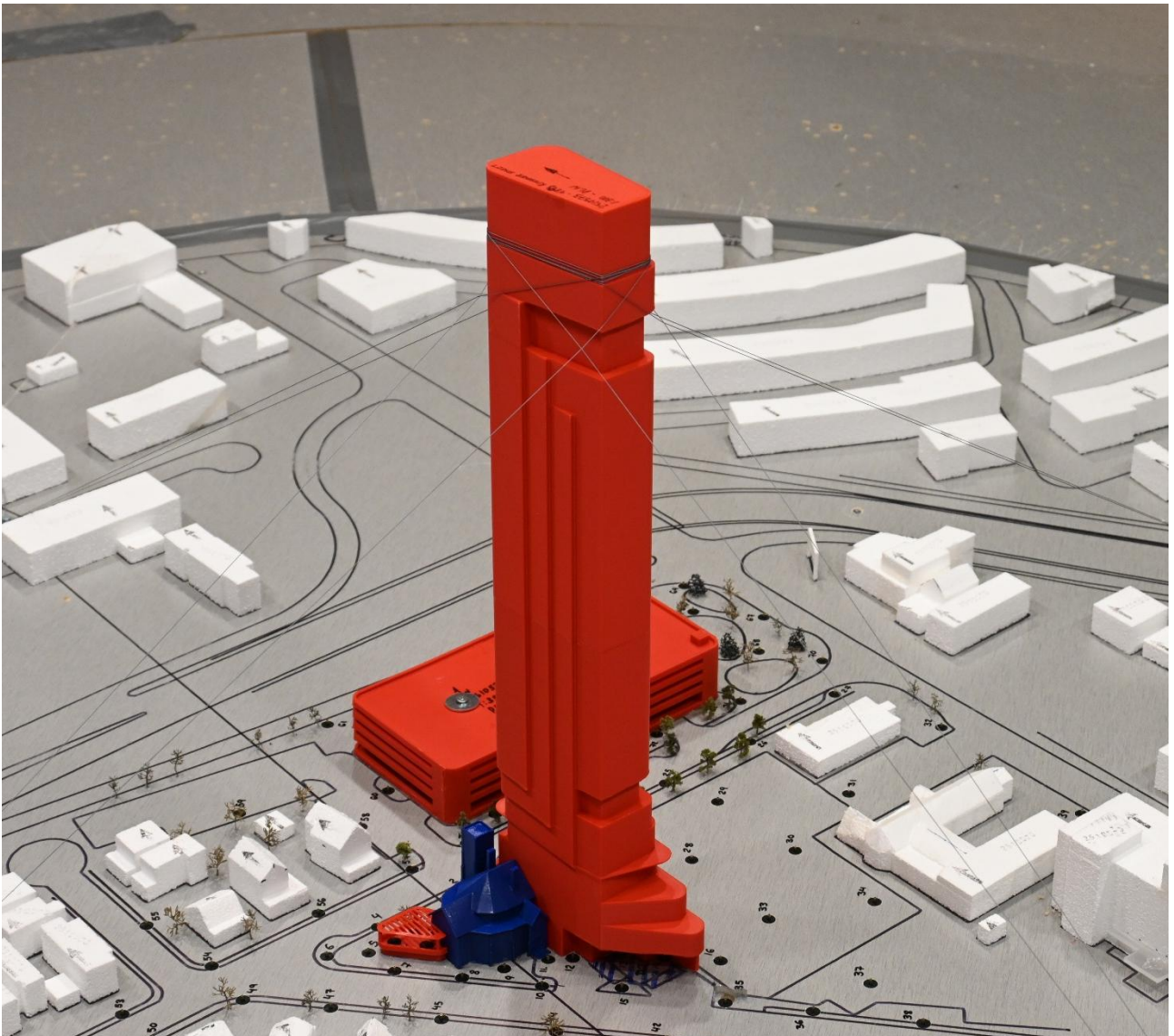
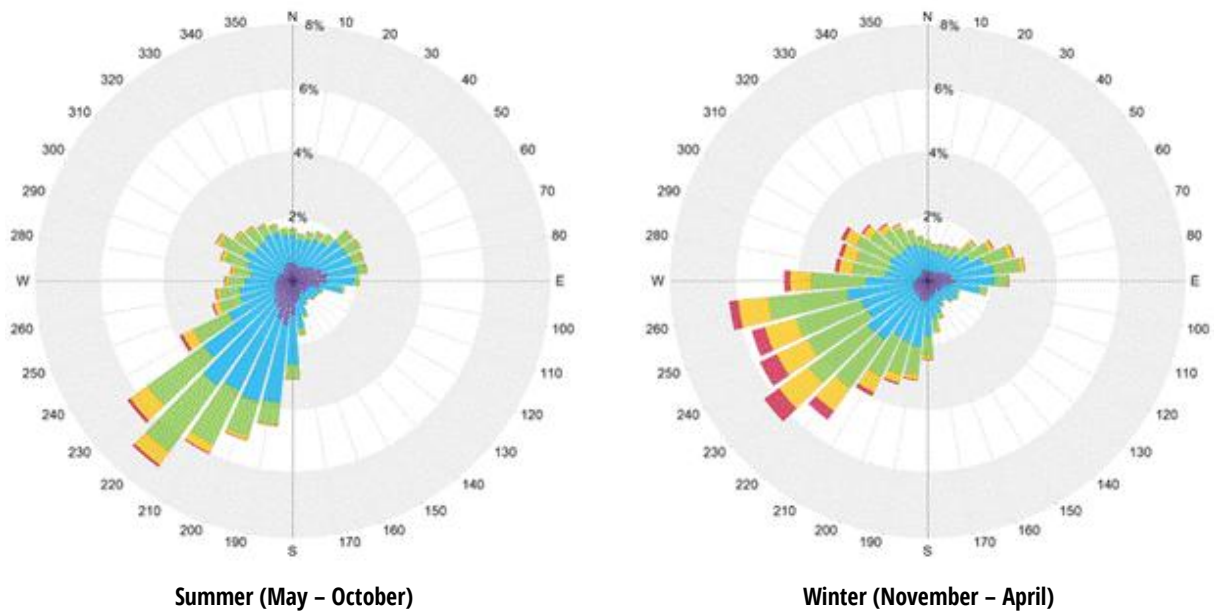


Image 2C: Wind Tunnel Study Model – Proposed 2 Configuration

2.2 Wind Climate Data

Wind statistics recorded at the Niagara Falls International Airport between 1994 and 2024, inclusive, were analyzed for the Summer (May through October) and Winter (November through April) seasons. Image 3 graphically depicts the directional distributions of wind frequencies and speeds for these two seasons. Winds from the southwest quadrant are predominant in both seasons, as indicated by the wind roses. Strong winds of a mean speed greater than 30 km/h measured at the airport (at an anemometer height of 10 m) are substantially more frequent in the winter (12.8%) than in the summer (3.8%). These strong winds can be the source of uncomfortable and severe wind conditions, depending on site exposure and massing.

Wind statistics were combined with the wind tunnel data to predict the frequency of occurrence of full-scale wind speeds. The full-scale wind predictions were then compared with the wind criteria for pedestrian comfort and safety.









	Wind Speed (km/h)	Probability (%)	
		Summer	Winter
	Calm	11.2	6.3
	1-10	23.6	16.6
	11-20	41.9	35.9
	21-30	19.4	28.5
	31-40	3.3	9.7
	>40	0.5	3.1

Image 3: Directional Distribution of Winds Approaching Niagara Falls International Airport between 1994 and 2024

2.3 Pedestrian Wind Criteria for Niagara Region

The Pedestrian Level Wind Study Terms of Reference Guide for the Niagara Region and City of Niagara Falls (dated July 2022), prepared by Urban Design and Landscape Architecture Planning and Development Services, requires that the public realm, streetscapes and public/private outdoor open spaces related to the existing and proposed buildings are to be comfortable for their intended use. The table below describes the minimum wind criteria for specific locations. The criteria deal with the comfort and safety of pedestrians:

Comfort: Commonly experienced wind speeds have been categorized into ranges based on the activity level of a person that the winds would be conducive to. Lower wind speeds are desirable for passive activities, and active pedestrians would be tolerant of higher wind speeds.

Safety: It is important to assess wind conditions in the pedestrian realm from a safety perspective as strong wind gusts can deter safe pedestrian use of outdoor spaces. Wind speeds associated with wind gusts are infrequent but deserve special attention due to their potential impact on pedestrian safety.

Comfort Category	GEM Speed (km/h)	Minimum Occurrence (% of Time)	Description	Area of Application
Sitting	≤ 10	80	Light breezes desired for outdoor seating areas where one can read a paper without having it blown away.	Park benches, restaurant and café seating, balconies, amenity terraces, children's areas, etc. intended for relaxed, and usually seated activities.
Standing	≤ 15	80	Gentle breezes suitable for passive pedestrian activities where a breeze may be tolerated.	Main entrances, bus-stops, dog areas, and other outdoor areas where seated activities are not expected.
Walking	≤ 20	80	Relatively high speeds that can be tolerated during intentional walking, running and other active movements.	Sidewalks, parking lots, alleyways, and areas where pedestrian activity is primarily for walking.
Uncomfortable	> 20	20	Strong winds, considered a nuisance for most activities.	Not acceptable in areas with pedestrian access

NOTES:

- 1) Gust Equivalent Mean (GEM) speed = maximum of either mean speed or gust speed/1.85. The gust speed can be measured directly from wind tunnel or estimated as mean speed + (3 x RMS speed).
- 2) Comfort calculations are to be based on wind events recorded between 6:00 and 23:00 daily.

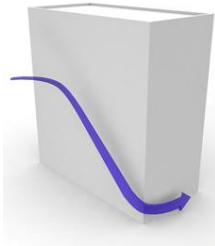
Safety Criterion	Gust Speed (km/h)	Minimum Occurrence Annual	Description	Area of Application
Exceeded	> 90	0.1% (9 hours in a year)	Excessive gust speeds that can adversely affect a pedestrian's balance and footing. Wind mitigation is typically required.	Not acceptable in any area of interest

NOTES:

- 3) Safety calculations are to be based on wind events recorded for 24 hours a day

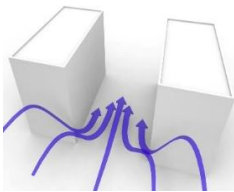
2.4 General Wind Flow Mechanisms

In the discussion of wind conditions, reference is made to the following wind flow mechanisms (Image 4):



CORNER ACCELERATION

When wind moves around the buildings, a localized increase in the wind activity or corner acceleration can be expected around the exposed building corners at pedestrian level. The effect is intensified when the wind approaches at an oblique angle to a tall façade and is deflected down and around the exposed corners.



CHANNELLING EFFECT

Wind flow tends to accelerate through the space between buildings, under bridges or in passages through buildings due to the channelling effect caused by the narrow gap. The effect is intensified if the channel is aligned with the predominant wind direction.

Image 4: General Wind Flow Mechanisms

If these building/wind combinations occur for prevailing winds, there is a greater potential for increased wind activity. Design details such as setting back a tall tower from the edges of a podium, deep canopies close to ground level, wind screens, tall trees with dense landscaping, etc. (Image 5) can help reduce wind speeds. The choice and effectiveness of these measures would depend on the exposure and orientation of the site with respect to the prevailing wind directions and the size and massing of the proposed buildings.

Podium/tower setback, canopy, landscaping and wind screens (left to right)

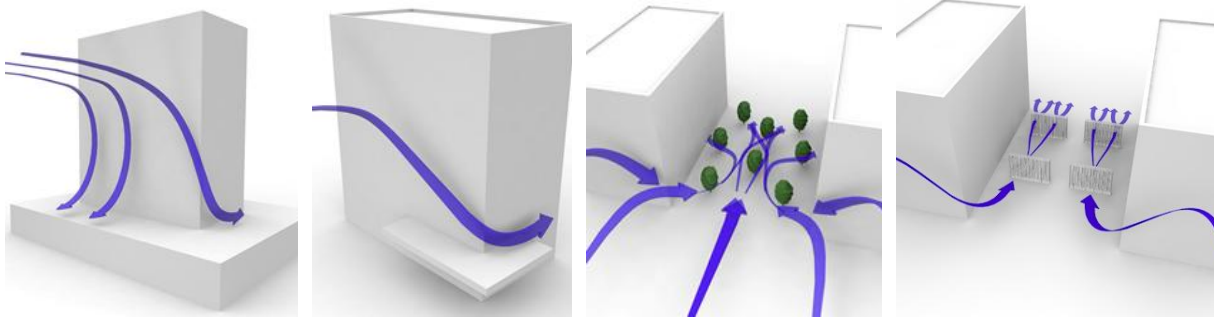


Image 5: Common Wind Control Measures

3 RESULTS AND DISCUSSION

The predicted wind conditions are shown on site plans in Figures 1A through 3C, located in the “Figures” section of this report, and the associated wind speeds are presented in Table 1, located in the “Tables” section of this report.

Wind conditions comfortable for walking are appropriate for sidewalks and walkways, as pedestrians will be active and less likely to remain in one area for prolonged periods of time. Lower wind speeds conducive to standing or sitting are preferred at main entrances where pedestrians are apt to linger. Wind speeds comfortable for sitting are preferred for areas intended for prolonged passive activities, such as outdoor dining/lounging, particularly during the summer.

The following is a detailed discussion of the suitability of the predicted wind conditions for the anticipated pedestrian use of each area of interest.

3.1 Grade-Level (Locations 1 through 77)

3.1.1 Existing Configuration

The wind speeds on and around the site are currently comfortable for sitting or standing in the summer, and mostly standing during the winter, which is suitable for pedestrian use (Figures 1A and 2A).

Wind conditions meet the wind safety criterion for all assessed areas in the existing configuration (Figure 3A).

3.1.2 Proposed 1 Configuration

The proposed tower is significantly taller than the surroundings. With the proposed building in place, due to the increased wind-building interactions (see Section 2.4), elevated wind activity is expected around the project site.

Wind speeds on the walkways on-site are anticipated to be comfortable for standing or walking in the summer, which is suitable for pedestrian use (Figure 1B). Slightly higher wind speeds to the south and north of the proposed tower, along the sidewalks of Kitchener Street and Hunter Street, can be occasionally uncomfortable (Locations 2 and 35 in Figure 1B). Due to seasonally stronger winds during the winter, additional locations with uncomfortable wind conditions are expected in the vicinity of the proposed tower, including sidewalks along Kitchener Street and Hunter Street, as well as on the surface parking to the east (Figure 2B).

The main hotel entrance is recessed and designed with a large canopy, with wind conditions comfortable for standing in the summer and for walking in the winter (Location 1 in Figures 1B and 2B). Church and staff entrances are situated near Locations 2, 11 and 12 in the Figures. Most of these entrances are situated within regions with low wind speeds and suitable conditions. However, wind speeds near the northern entrance of the church along Kitchener Street are expected to be uncomfortable (Location 2 in Figures 1B and 2B).

Wind conditions are expected to exceed the wind safety criterion in the vicinity of the eastern corners of the proposed tower (Locations 16, 21, 23, 24, 35, and 75 in Figure 3B).

3.1.3 Proposed 2 Configuration

The Proposed 2 variant was developed based on the findings of the study carried out on the original design (Proposed 1 configuration) in order to reduce the potential wind impact at grade. This design variant includes additional stepping at the south, rounded tower corners at the northwest and southeast, as well as local wind control features on and around the project site.

During the summer, wind conditions on and around the site are expected to be comfortable for walking or better (Figure 1C). In the winter, uncomfortable wind conditions are still anticipated to occur north, east and south of the proposed tower (Figure 2C); however, these conditions are expected to occur less frequently and at lower wind speeds compared to the Proposed 1 configuration. Most of the uncomfortable locations in the vicinity of the project site are expected to only marginally exceed the 20 km/h threshold during the winter season (Table 1).

Similar to the Proposed 1 configuration, wind conditions near most of the main entrances to the buildings are expected to be suitable for intended use throughout the year, including the hotel entrance (Location 1 in Figures 1C and 2C). Wind conditions near the northern church entrance are expected to be slightly improved. However, it remains higher-than-desired and seasonally uncomfortable (Location 2 in Figures 1C and 2C).

Most of the high wind gust issues that were measured in the Proposed 1 configuration are predicted to be eliminated. However, wind conditions may still exceed the wind safety threshold near the southeast corner of the proposed tower within the surface parking (Location 16 in Figure 3C).

3.2 Above-grade Terraces (Locations 78 through 83)

It is generally desirable for wind conditions in areas intended for passive activities to be comfortable for sitting or standing more than 80% of the time in the summer. Conditions comfortable for sitting are ideal for areas intended for seating/dining/lounging, and other similar relaxed uses. During the winter, the area would not be used frequently, and increased wind activity would be considered acceptable.

3.2.1 Proposed 1 Configuration

Wind conditions at the proposed patio at Level 1 are expected to be comfortable for standing in summer, which are suitable for general passive use. During the winter, wind conditions are expected to be comfortable for standing or walking (Figures 1B and 2B).

Wind speeds at Level 3 are expected to be comfortable for sitting or standing at the western portion of the terrace, with higher wind speeds comfortable for walking at the eastern portion (Figure 1B). During the winter, higher wind speeds throughout the terrace are comfortable for standing or walking (Figure 2B). These speeds are higher than desired for passive use, but may be considered acceptable.

Wind conditions are expected to meet the wind safety criterion (Figure 3B).

3.2.2 Proposed 2 Configuration

In this project variant, the patio at Level 1 is designed with an overhead trellis that provides partial protection from redirected winds off the tower (Image 2C). The resultant wind speeds within Level 1 are measured to be reduced, with conditions comfortable for sitting or standing in the summer (Figure 1C) and comfortable for standing during the winter (Figure 2C).

Wind conditions at Level 3 are expected to remain comparable to the Proposed 1 configuration (Figures 1C and 2C).

Wind conditions are expected to meet the wind safety criterion at all above-grade locations (Figure 3C).

3.3 Wind Control Recommendation

As mentioned earlier, the design team has already engaged with RWDI proactively to develop a more wind-responsive design, and the Proposed 2 variant has shown a significant improvement compared to the original proposal and has eliminated most of the high wind gust issues near the proposed tower. Most of the remaining uncomfortable conditions in the vicinity of the project site are only marginally exceeding the comfort criteria during the colder months.

Local interventions have proved to be an effective method of wind control. If feasible, the design team may consider additional tall wind screens, planters and evergreen landscaping near the building corners, near the church entrance and along the sidewalks where high wind activity is predicted, similar to the strategies that have already been implemented. Such local interventions should be further considered at later stages. Some examples are illustrated in Image 6.



Image 6: Example of Wind Control Strategies Applicable to Grade-Level

Wind conditions at the Level 3 terrace can be improved by tall railings (at least 1.8 m tall). Some examples are shown in Image 7.



Image 7: Example of Wind Control Strategies Applicable to Level 3 Terrace

4 STATEMENT OF LIMITATIONS

Limitations

This report was prepared by Rowan Williams Davies & Irwin, Inc. (“RWDI”) for 1000052392 Ontario Inc. (Niagara) Ltd (“Client”). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein (“Project”). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

Design Assumptions

RWDI confirms that the pedestrian wind assessment (the “**Assessment**”) discussed herein was performed by RWDI in accordance with generally accepted professional standards at the time when the Assessment was performed and in the location of the Project. No other representations, warranties, or guarantees are made with respect to the accuracy or completeness of the information, findings, recommendations, or conclusions contained in this Report. This report is not a legal opinion regarding compliance with applicable laws. The findings and recommendations set out in this report are based on the following information disclosed to RWDI. Drawings and information listed below were received from Matthew Schmid Architecture and used to construct the scale model of the proposed development at 4898 Kitchener Street (“**Project Data**”).



File Name	File Type	Date Received (dd/mm/yyyy)
251215 Kitchener Street Site Plans	PDF	16/12/2025
251208 Kitchener Model	Rhino	08/12/2025
260202 Kitchener Model 2	Rhino	02/02/2026
260206 Kitchener St Context Site Plan Tree Markup	PDF	06/02/2026

The recommendations and conclusions are based on the assumption that the Project Data and Climate Data are accurate and complete. RWDI assumes no responsibility for any inaccuracy or deficiency in information it has received from others. In addition, the recommendations and conclusions in this report are partially based on historical data and can be affected by a number of external factors, including but not limited to Project design, quality of materials and construction, site conditions, meteorological events, and climate change. As such, the conclusions and recommendations contained in this report do not list every possible outcome.

The opinions in this report can only be relied upon to the extent that the Project Data and Project Specific Conditions have not changed. Any change in the Project Data or Project Specific Conditions not reflected in this report can impact and/or alter the recommendations and conclusions in this report. Therefore, it is incumbent upon the Client and/or any other third party reviewing the recommendations and conclusions in this report to contact RWDI in the event of any change in the Project Data and Project Specific Conditions in order to determine whether any such change(s) may impact the assumptions upon which the recommendations and conclusions were made.

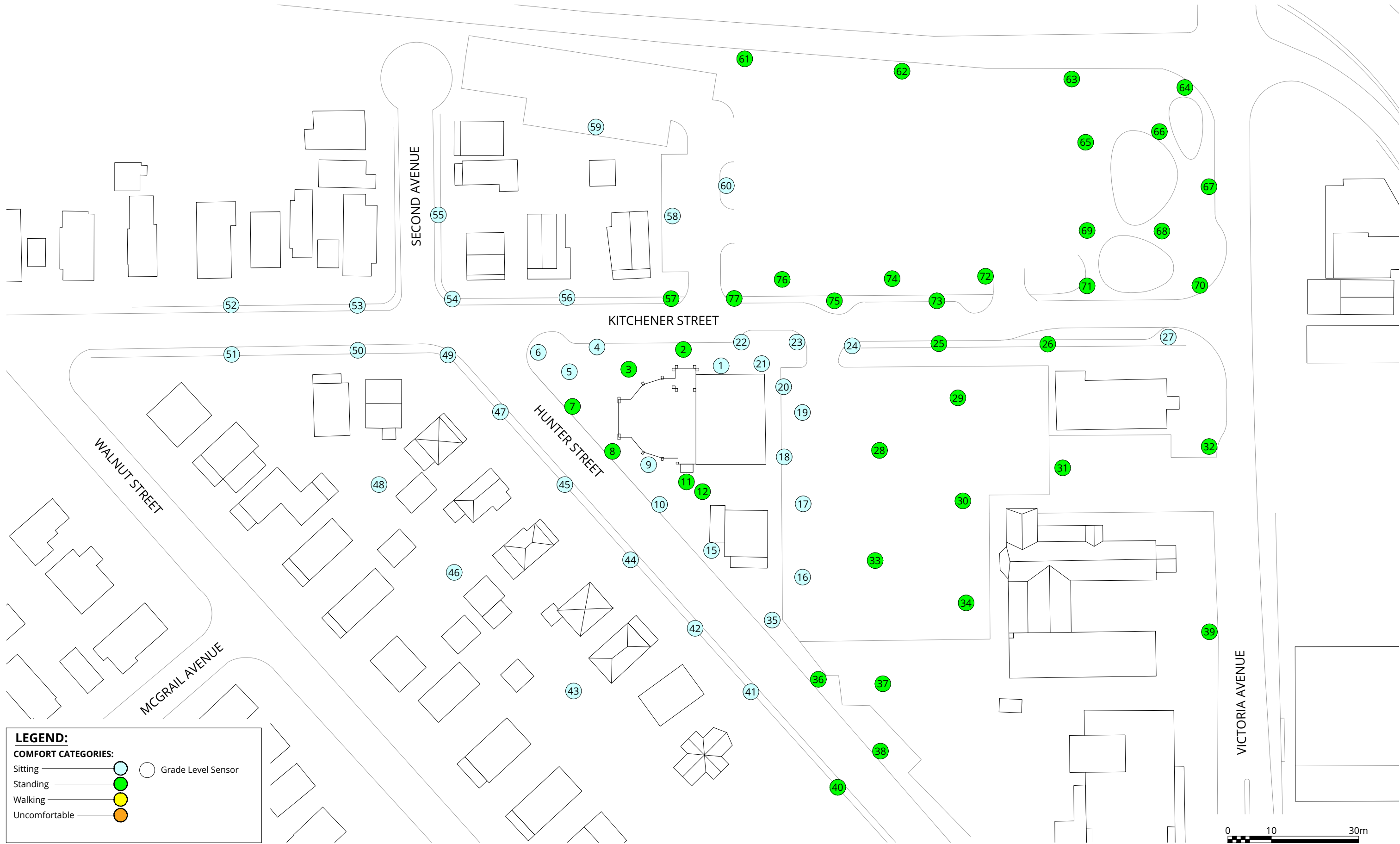


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FIGURES



Pedestrian Wind Comfort Conditions

Existing Configuration
 Summer (May to October, 6:00 to 23:00)

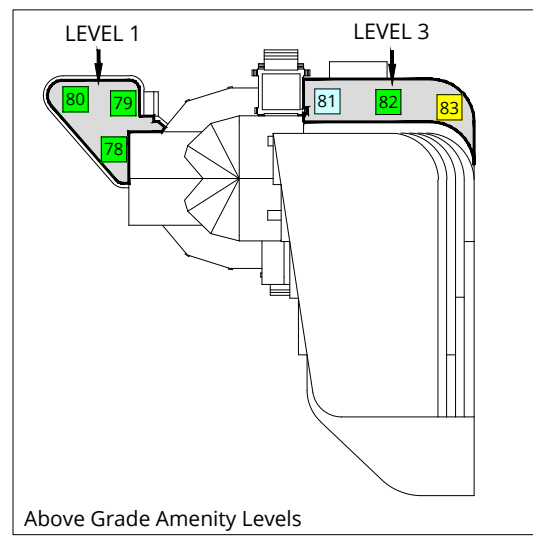
4898 Kitchener Street - Niagara Falls, ON



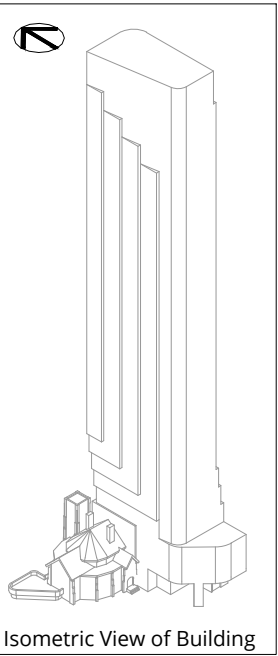
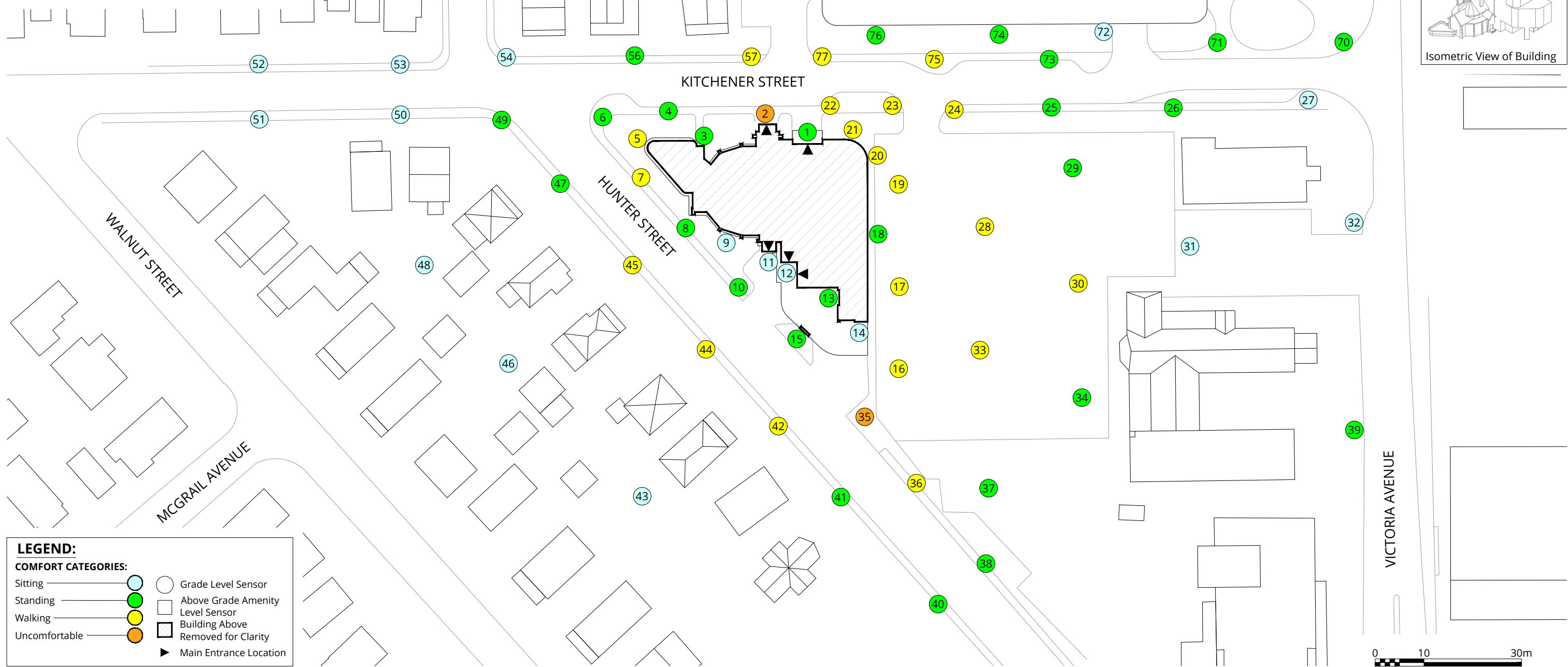
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Approx. Scale: 1:800	
Date Revised: Jan. 16, 2026	



Project #2510573



Above Grade Amenity Levels



LEGEND:

COMFORT CATEGORIES:

- Sitting (Blue circle)
- Standing (Green circle)
- Walking (Yellow circle)
- Uncomfortable (Orange circle)

SENSOR TYPES:

- Grade Level Sensor (White circle)
- Above Grade Amenity Level Sensor (White square)
- Building Above Removed for Clarity (White square with diagonal lines)
- Main Entrance Location (Black triangle)



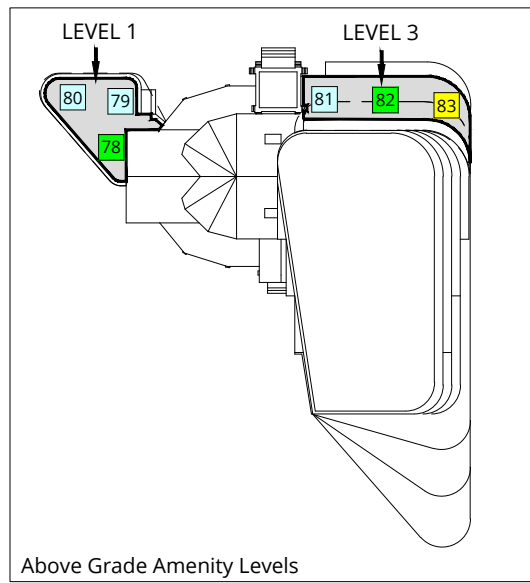
Pedestrian Wind Comfort Conditions
 Proposed 1 Configuration
 Summer (May to October, 6:00 to 23:00)
 4898 Kitchener Street - Niagara Falls, ON

True North (North arrow icon)

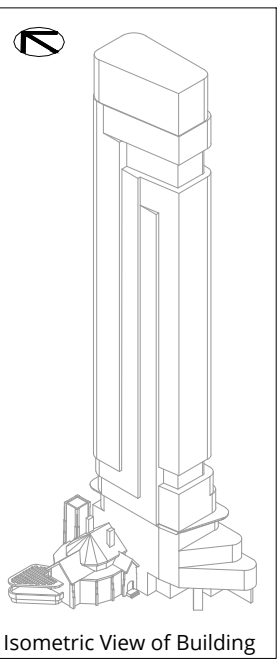
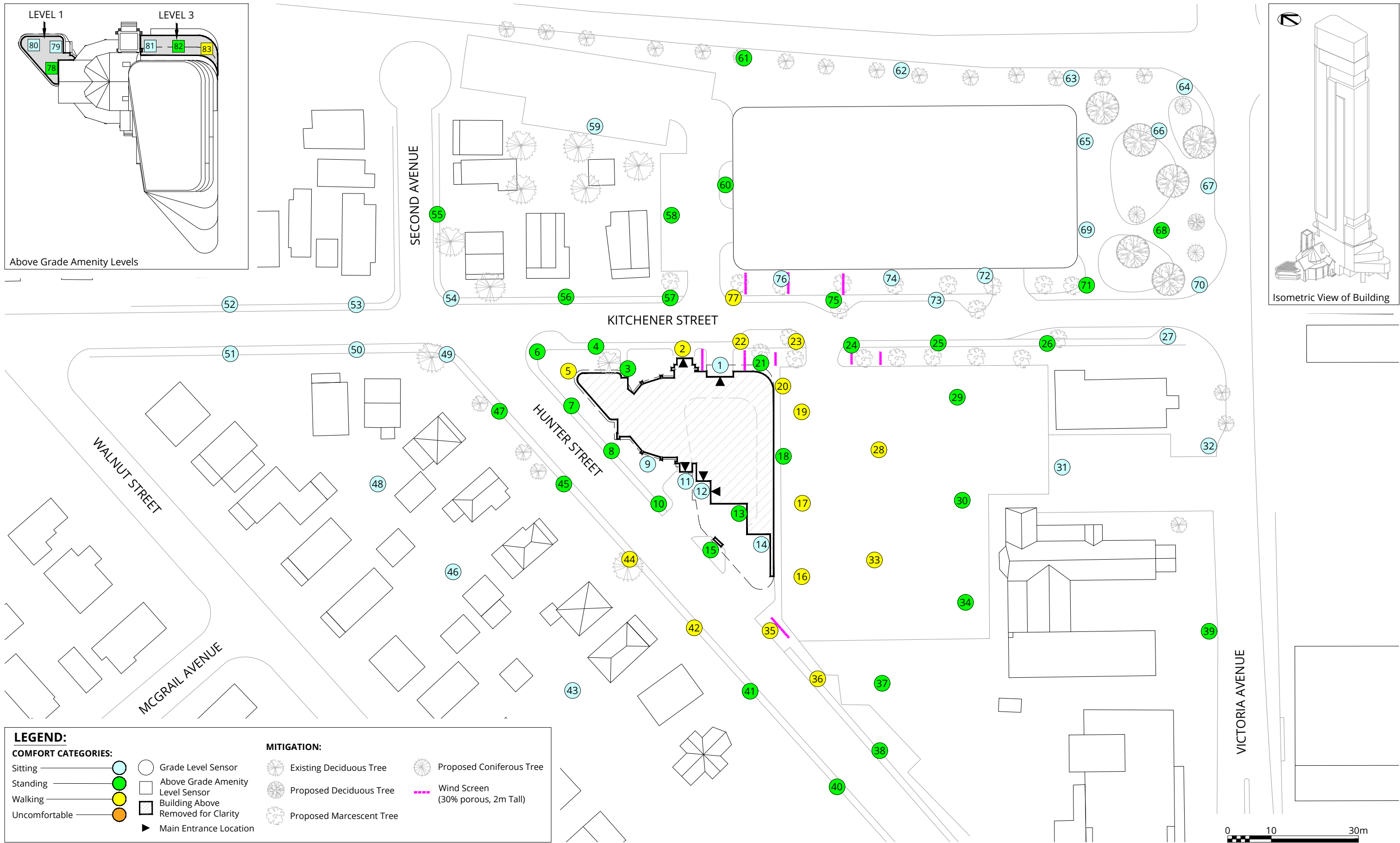
Drawn by: NRA Figure: 1B

Approx. Scale: 1:800

Date Revised: Jan. 16, 2026



Above Grade Amenity Levels



Isometric View of Building

LEGEND:

COMFORT CATEGORIES:

- Sitting — Light Blue Circle
- Standing — Green Circle
- Walking — Yellow Circle
- Uncomfortable — Orange Circle

MITIGATION:

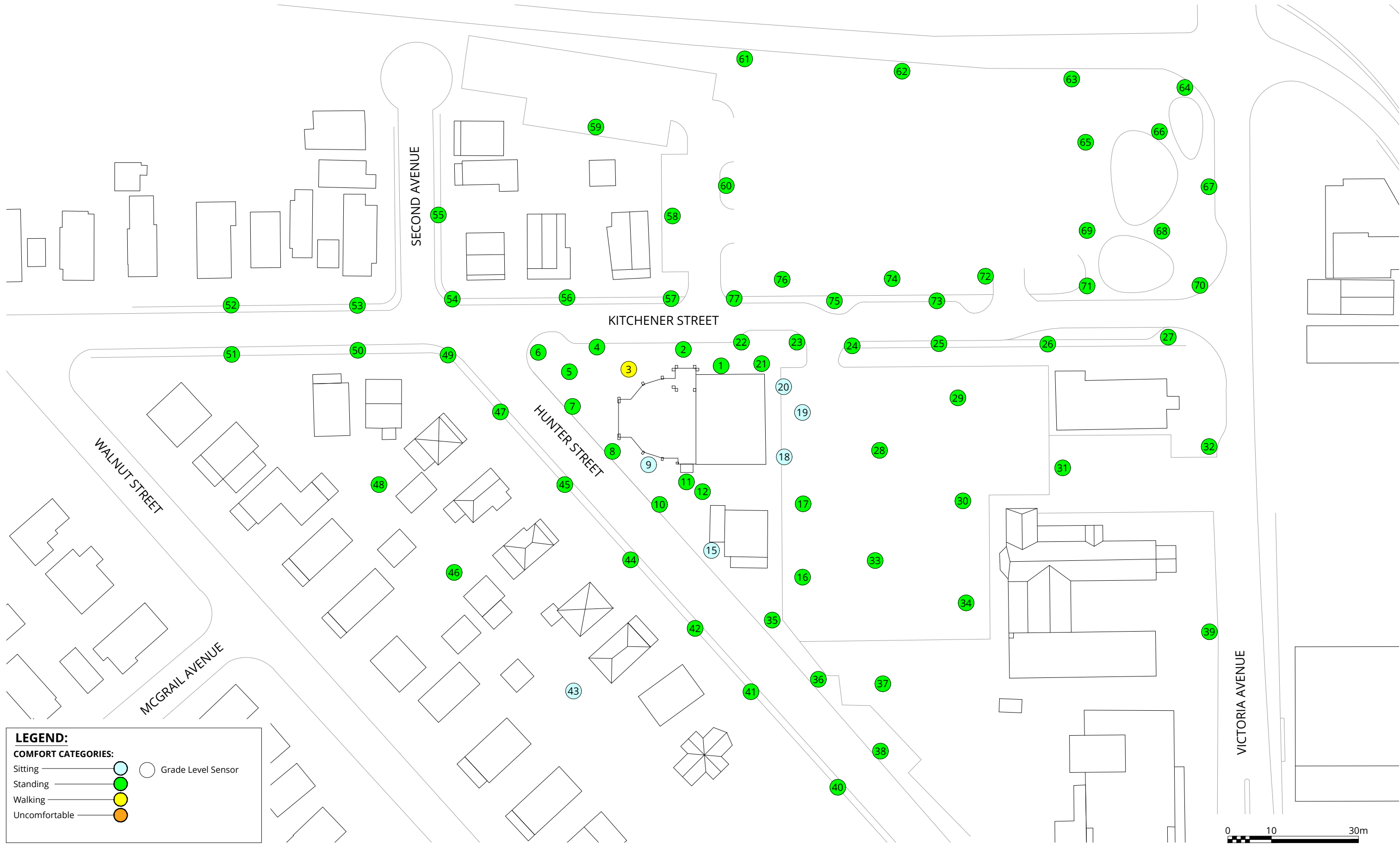
- Existing Deciduous Tree — Tree Icon
- Proposed Deciduous Tree — Tree Icon
- Proposed Coniferous Tree — Tree Icon
- Proposed Marcescent Tree — Tree Icon
- Grade Level Sensor — Circle with Center Dot
- Above Grade Amenity Level Sensor — Square with Center Dot
- Building Above Removed for Clarity — Hatched Area
- Main Entrance Location — Black Triangle
- Wind Screen (30% porous, 2m Tall) — Pink Dashed Line

Pedestrian Wind Comfort Conditions
 Proposed 2 Configuration
 Summer (May to October, 6:00 to 23:00)
 4898 Kitchener Street - Niagara Falls, ON

True North

Drawn by: NRA Figure: 1C
 Approx. Scale: 1:800
 Date Revised: Feb. 25, 2026

Project #2510573



Pedestrian Wind Comfort Conditions

Existing Configuration
 Winter (November to April, 6:00 to 23:00)

4898 Kitchener Street - Niagara Falls, ON



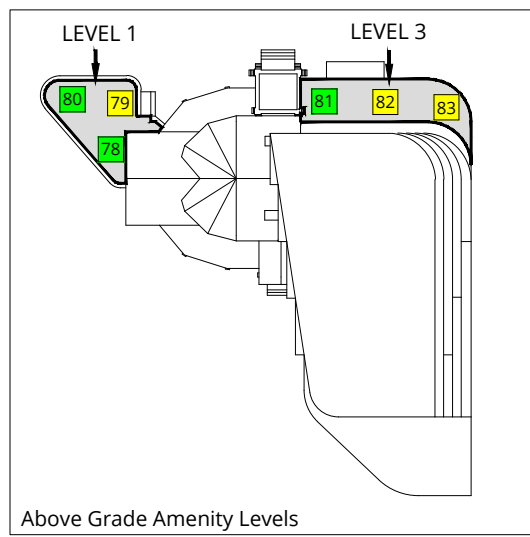
Drawn by: NRA Figure: 2A

Approx. Scale: 1:800

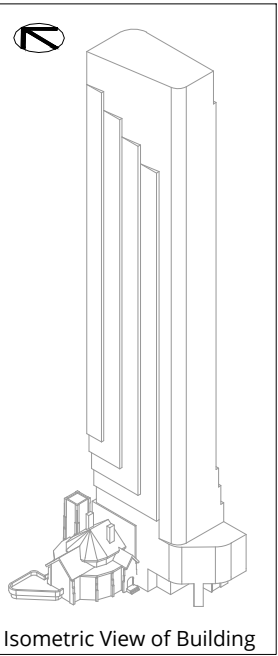
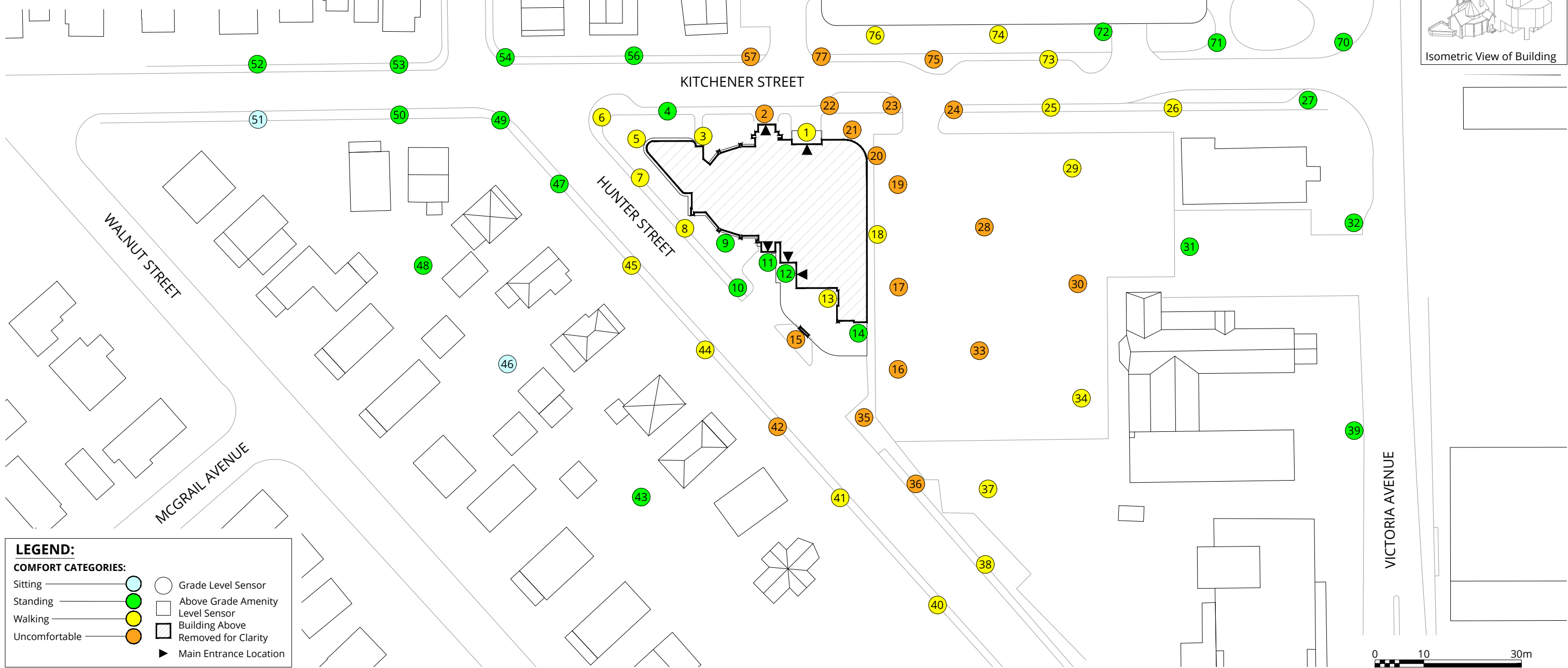
Project #2510573

Date Revised: Jan. 16, 2026





Above Grade Amenity Levels



LEGEND:

COMFORT CATEGORIES:

- Sitting — Light Blue Circle
- Standing — Green Circle
- Walking — Yellow Circle
- Uncomfortable — Orange Circle

SENSOR TYPES:

- Grade Level Sensor — White Circle
- Above Grade Amenity Level Sensor — Grey Square
- Building Above Removed for Clarity — Black Square
- Main Entrance Location — Black Arrow

Pedestrian Wind Comfort Conditions
 Proposed 1 Configuration
 Winter (November to April, 6:00 to 23:00)
 4898 Kitchener Street - Niagara Falls, ON

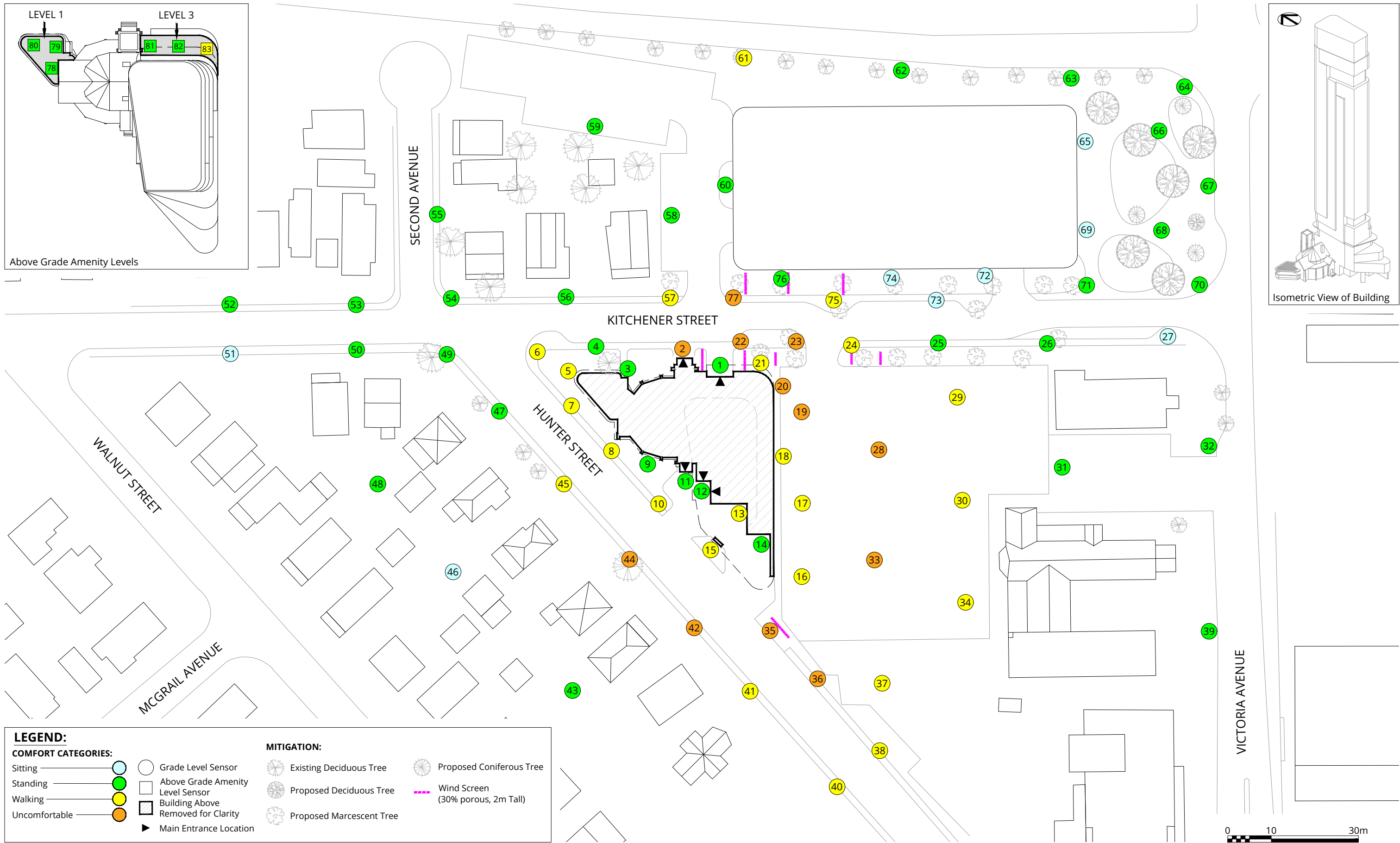
True North

Drawn by: NRA Figure: 2B

Approx. Scale: 1:800

Date Revised: Jan. 16, 2026

Project #2510573



LEGEND:

COMFORT CATEGORIES:

- Sitting ○
- Standing ○
- Walking ○
- Uncomfortable ○

MITIGATION:

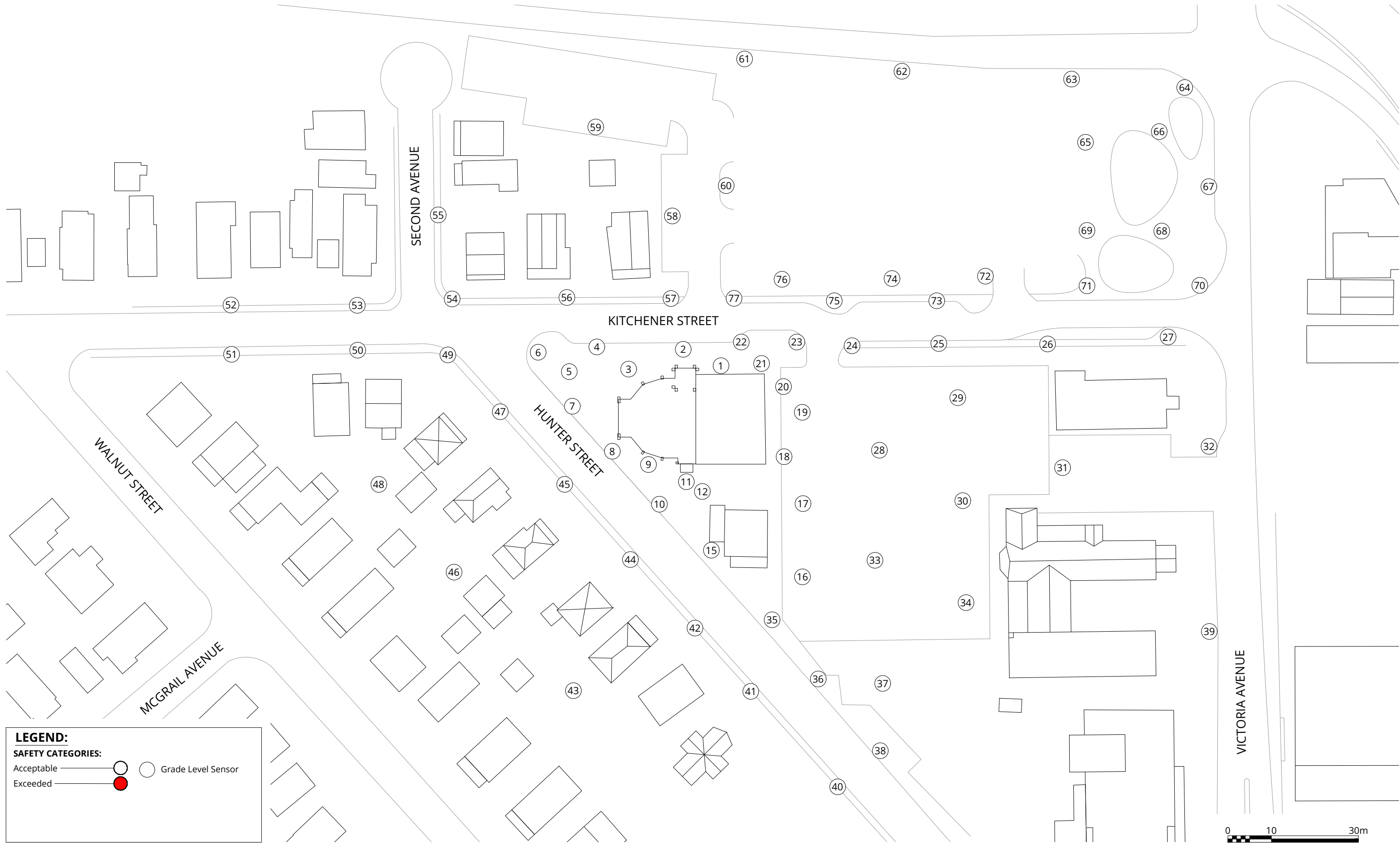
- Grade Level Sensor
- Above Grade Amenity Level Sensor
- Building Above Removed for Clarity
- ▶ Main Entrance Location
- Existing Deciduous Tree
- Proposed Deciduous Tree
- Proposed Marcescent Tree
- Proposed Coniferous Tree
- Wind Screen (30% porous, 2m Tall)

Pedestrian Wind Comfort Conditions
 Proposed 2 Configuration
 Winter (November to April, 6:00 to 23:00)
 4898 Kitchener Street - Niagara Falls, ON

True North

Drawn by: NRA Figure: 2C
 Approx. Scale: 1:800
 Date Revised: Feb. 25, 2026





LEGEND:

SAFETY CATEGORIES:

Acceptable — ○ Grade Level Sensor

Exceeded — ●

Pedestrian Wind Safety Conditions
 Existing Configuration
 Annual (January to December, 0:00 to 23:00)

4898 Kitchener Street - Niagara Falls, ON



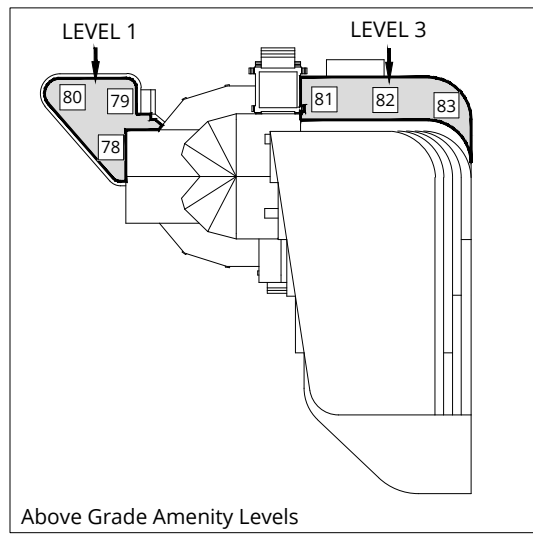
Drawn by: NRA Figure: 3A

Approx. Scale: 1:800

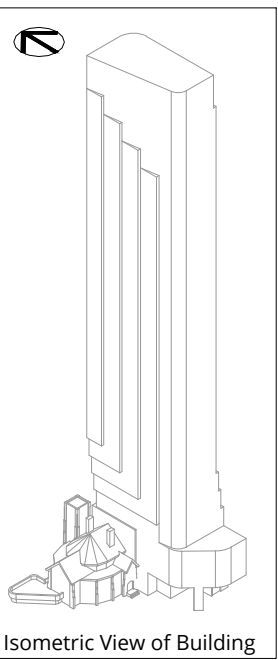
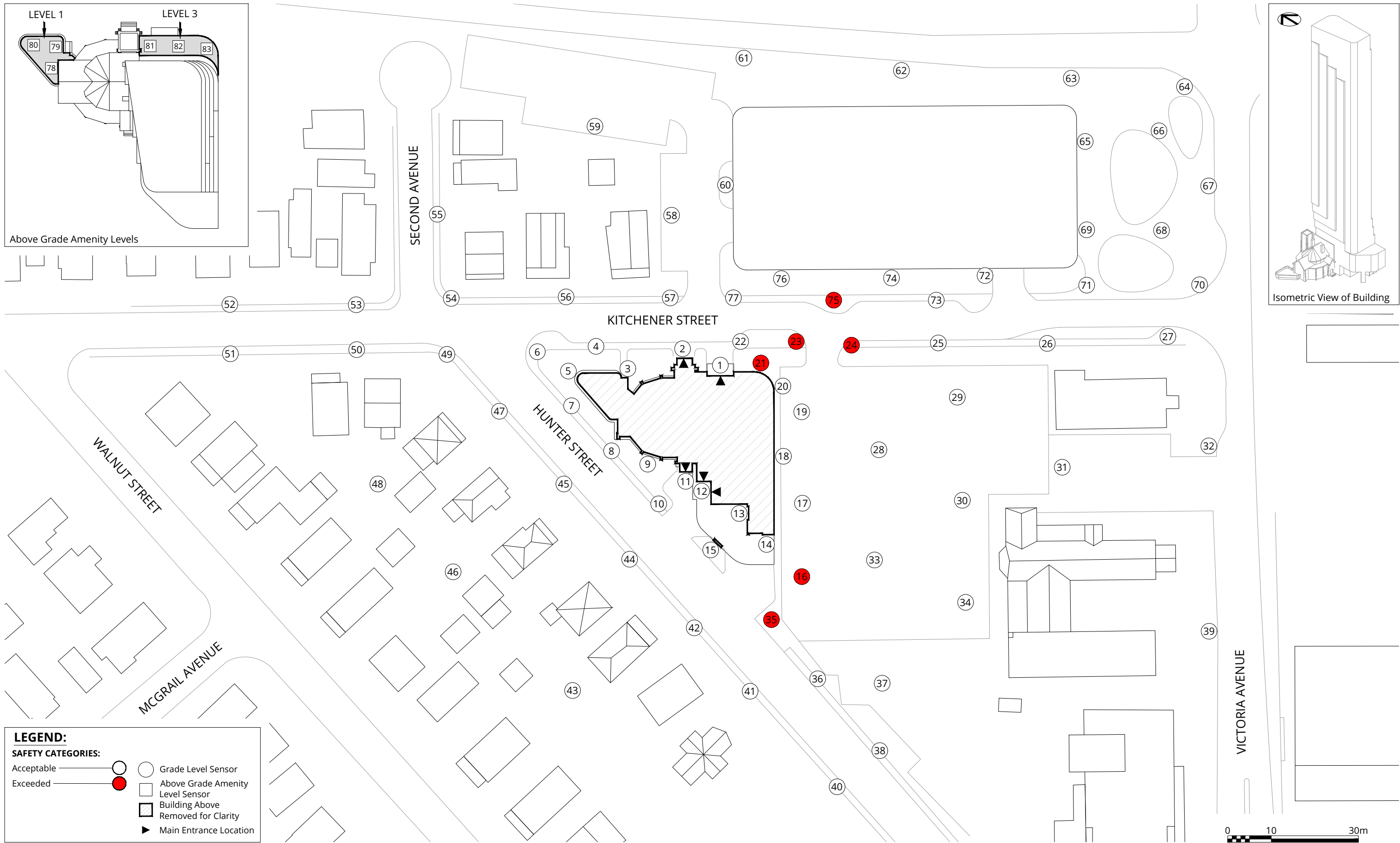
Date Revised: Jan. 16, 2026



Project #2510573



Above Grade Amenity Levels



Isometric View of Building

LEGEND:

SAFETY CATEGORIES:

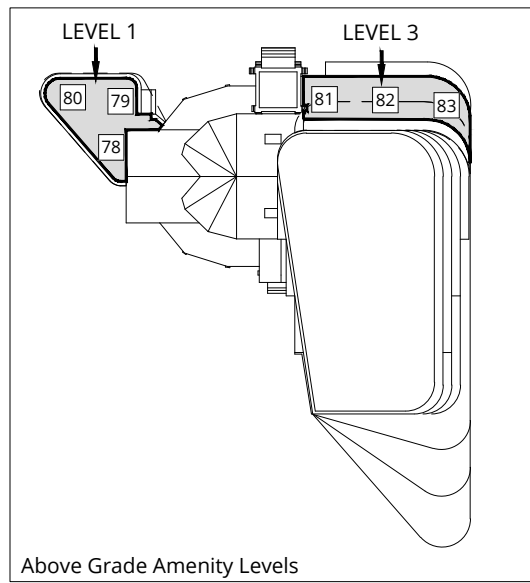
- Acceptable
- Exceeded
- Grade Level Sensor
- Above Grade Amenity Level Sensor
- Building Above Removed for Clarity
- Main Entrance Location

Pedestrian Wind Safety Conditions
 Proposed 1 Configuration
 Annual (January to December, 0:00 to 23:00)
 4898 Kitchener Street - Niagara Falls, ON

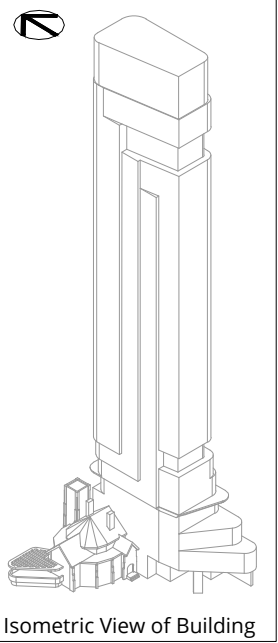
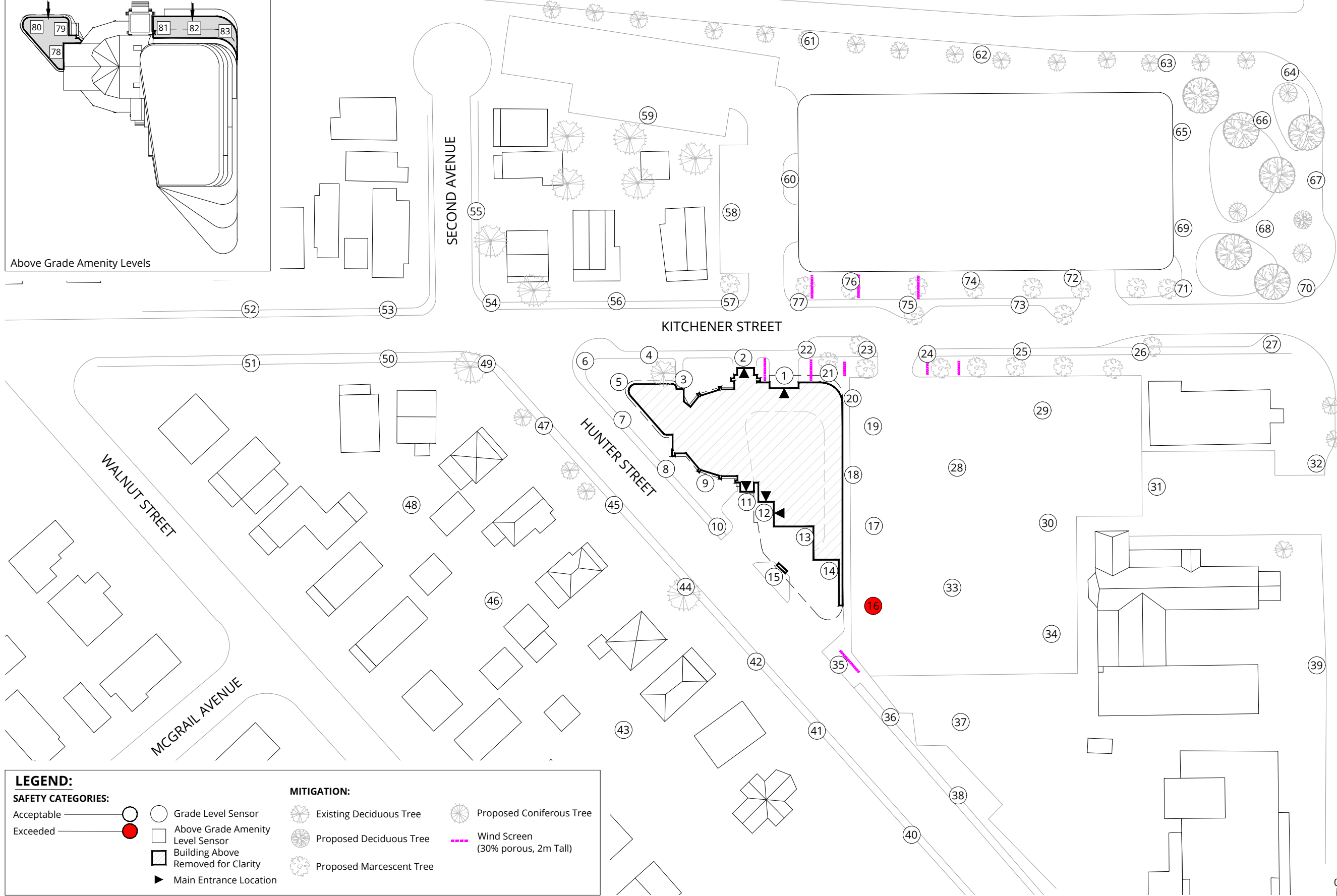
True North

Drawn by: NRA	Figure: 3B
Approx. Scale: 1:800	
Date Revised: Jan. 16, 2026	

Project #2510573



Above Grade Amenity Levels



LEGEND:

SAFETY CATEGORIES:

- Acceptable (white circle)
- Exceeded (red circle)

MITIGATION:

- Grade Level Sensor (white circle)
- Above Grade Amenity Level Sensor (grey square)
- Building Above Removed for Clarity (hatched square)
- Main Entrance Location (black triangle)
- Existing Deciduous Tree (dotted circle)
- Proposed Deciduous Tree (dotted circle with outline)
- Proposed Marcescent Tree (dotted circle with cross-hatch)
- Proposed Coniferous Tree (solid circle with cross-hatch)
- Wind Screen (30% porous, 2m Tall) (pink dashed line)



Pedestrian Wind Safety Conditions
 Proposed 2 Configuration
 Annual (January to December, 0:00 to 23:00)
 4898 Kitchener Street - Niagara Falls, ON

True North

Drawn by: NRA Figure: 3C
 Approx. Scale: 1:800
 Date Revised: Feb. 25, 2026

Project #2510573

A large decorative graphic on the left side of the page, featuring a blue triangle in the top-left corner and a large, light-grey semi-circle that curves from the top-left towards the bottom-right. The word 'TABLES' is centered within the grey area.

TABLES

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
1	Existing	8	Sitting	11	Standing	42	Pass
	Proposed 1	13	Standing	17	Walking	60	Pass
	Proposed 2	10	Sitting	12	Standing	48	Pass
2	Existing	11	Standing	14	Standing	54	Pass
	Proposed 1	21	Uncomfortable	26	Uncomfortable	88	Pass
	Proposed 2	18	Walking	24	Uncomfortable	87	Pass
3	Existing	13	Standing	16	Walking	59	Pass
	Proposed 1	15	Standing	17	Walking	76	Pass
	Proposed 2	13	Standing	15	Standing	62	Pass
4	Existing	10	Sitting	13	Standing	46	Pass
	Proposed 1	12	Standing	14	Standing	60	Pass
	Proposed 2	11	Standing	14	Standing	55	Pass
5	Existing	10	Sitting	12	Standing	45	Pass
	Proposed 1	17	Walking	20	Walking	73	Pass
	Proposed 2	16	Walking	20	Walking	73	Pass
6	Existing	9	Sitting	12	Standing	43	Pass
	Proposed 1	15	Standing	17	Walking	67	Pass
	Proposed 2	14	Standing	17	Walking	68	Pass
7	Existing	11	Standing	12	Standing	46	Pass
	Proposed 1	16	Walking	18	Walking	72	Pass
	Proposed 2	15	Standing	18	Walking	74	Pass
8	Existing	11	Standing	14	Standing	55	Pass
	Proposed 1	15	Standing	17	Walking	66	Pass
	Proposed 2	15	Standing	17	Walking	65	Pass
9	Existing	8	Sitting	10	Sitting	41	Pass
	Proposed 1	10	Sitting	13	Standing	50	Pass
	Proposed 2	10	Sitting	13	Standing	48	Pass
10	Existing	10	Sitting	13	Standing	47	Pass
	Proposed 1	13	Standing	15	Standing	56	Pass
	Proposed 2	13	Standing	16	Walking	60	Pass
11	Existing	11	Standing	13	Standing	49	Pass
	Proposed 1	9	Sitting	13	Standing	57	Pass
	Proposed 2	9	Sitting	12	Standing	47	Pass
12	Existing	12	Standing	15	Standing	54	Pass
	Proposed 1	9	Sitting	14	Standing	66	Pass
	Proposed 2	10	Sitting	14	Standing	66	Pass
13	Existing	-	-	-	-	-	-
	Proposed 1	11	Standing	16	Walking	66	Pass
	Proposed 2	11	Standing	16	Walking	63	Pass
14	Existing	-	-	-	-	-	-
	Proposed 1	9	Sitting	11	Standing	42	Pass
	Proposed 2	10	Sitting	12	Standing	48	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
15	Existing	8	Sitting	10	Sitting	39	Pass
	Proposed 1	14	Standing	21	Uncomfortable	83	Pass
	Proposed 2	13	Standing	18	Walking	72	Pass
16	Existing	10	Sitting	13	Standing	45	Pass
	Proposed 1	20	Walking	24	Uncomfortable	99	Exceeded
	Proposed 2	18	Walking	19	Walking	93	Exceeded
17	Existing	9	Sitting	11	Standing	42	Pass
	Proposed 1	17	Walking	21	Uncomfortable	75	Pass
	Proposed 2	16	Walking	19	Walking	77	Pass
18	Existing	8	Sitting	10	Sitting	39	Pass
	Proposed 1	15	Standing	19	Walking	75	Pass
	Proposed 2	15	Standing	19	Walking	75	Pass
19	Existing	8	Sitting	10	Sitting	41	Pass
	Proposed 1	18	Walking	22	Uncomfortable	87	Pass
	Proposed 2	16	Walking	21	Uncomfortable	80	Pass
20	Existing	8	Sitting	9	Sitting	40	Pass
	Proposed 1	18	Walking	22	Uncomfortable	81	Pass
	Proposed 2	17	Walking	22	Uncomfortable	81	Pass
21	Existing	9	Sitting	11	Standing	45	Pass
	Proposed 1	19	Walking	26	Uncomfortable	99	Exceeded
	Proposed 2	14	Standing	19	Walking	77	Pass
22	Existing	10	Sitting	13	Standing	51	Pass
	Proposed 1	20	Walking	27	Uncomfortable	90	Pass
	Proposed 2	19	Walking	25	Uncomfortable	85	Pass
23	Existing	10	Sitting	13	Standing	47	Pass
	Proposed 1	20	Walking	27	Uncomfortable	101	Exceeded
	Proposed 2	18	Walking	24	Uncomfortable	83	Pass
24	Existing	10	Sitting	13	Standing	45	Pass
	Proposed 1	17	Walking	24	Uncomfortable	98	Exceeded
	Proposed 2	14	Standing	19	Walking	82	Pass
25	Existing	11	Standing	14	Standing	47	Pass
	Proposed 1	14	Standing	19	Walking	80	Pass
	Proposed 2	11	Standing	15	Standing	65	Pass
26	Existing	11	Standing	14	Standing	53	Pass
	Proposed 1	12	Standing	17	Walking	78	Pass
	Proposed 2	11	Standing	15	Standing	76	Pass
27	Existing	9	Sitting	12	Standing	45	Pass
	Proposed 1	9	Sitting	11	Standing	44	Pass
	Proposed 2	8	Sitting	10	Sitting	41	Pass
28	Existing	11	Standing	12	Standing	45	Pass
	Proposed 1	19	Walking	23	Uncomfortable	88	Pass
	Proposed 2	17	Walking	21	Uncomfortable	83	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
29	Existing	12	Standing	14	Standing	49	Pass
	Proposed 1	15	Standing	18	Walking	78	Pass
	Proposed 2	12	Standing	16	Walking	77	Pass
30	Existing	12	Standing	15	Standing	53	Pass
	Proposed 1	16	Walking	21	Uncomfortable	79	Pass
	Proposed 2	15	Standing	19	Walking	77	Pass
31	Existing	11	Standing	14	Standing	51	Pass
	Proposed 1	10	Sitting	14	Standing	58	Pass
	Proposed 2	9	Sitting	12	Standing	51	Pass
32	Existing	11	Standing	13	Standing	53	Pass
	Proposed 1	10	Sitting	14	Standing	59	Pass
	Proposed 2	10	Sitting	13	Standing	59	Pass
33	Existing	11	Standing	14	Standing	49	Pass
	Proposed 1	19	Walking	23	Uncomfortable	85	Pass
	Proposed 2	18	Walking	21	Uncomfortable	83	Pass
34	Existing	11	Standing	13	Standing	48	Pass
	Proposed 1	13	Standing	16	Walking	60	Pass
	Proposed 2	13	Standing	16	Walking	61	Pass
35	Existing	10	Sitting	12	Standing	45	Pass
	Proposed 1	21	Uncomfortable	28	Uncomfortable	93	Exceeded
	Proposed 2	20	Walking	27	Uncomfortable	90	Pass
36	Existing	11	Standing	14	Standing	50	Pass
	Proposed 1	16	Walking	21	Uncomfortable	80	Pass
	Proposed 2	16	Walking	22	Uncomfortable	88	Pass
37	Existing	12	Standing	14	Standing	53	Pass
	Proposed 1	14	Standing	19	Walking	71	Pass
	Proposed 2	15	Standing	20	Walking	76	Pass
38	Existing	11	Standing	14	Standing	53	Pass
	Proposed 1	13	Standing	16	Walking	57	Pass
	Proposed 2	13	Standing	17	Walking	64	Pass
39	Existing	11	Standing	15	Standing	59	Pass
	Proposed 1	11	Standing	14	Standing	56	Pass
	Proposed 2	11	Standing	14	Standing	57	Pass
40	Existing	11	Standing	14	Standing	54	Pass
	Proposed 1	13	Standing	16	Walking	56	Pass
	Proposed 2	13	Standing	16	Walking	58	Pass
41	Existing	9	Sitting	11	Standing	40	Pass
	Proposed 1	13	Standing	17	Walking	64	Pass
	Proposed 2	14	Standing	19	Walking	77	Pass
42	Existing	9	Sitting	11	Standing	41	Pass
	Proposed 1	17	Walking	22	Uncomfortable	82	Pass
	Proposed 2	17	Walking	22	Uncomfortable	83	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
43	Existing	8	Sitting	10	Sitting	36	Pass
	Proposed 1	9	Sitting	11	Standing	42	Pass
	Proposed 2	8	Sitting	11	Standing	42	Pass
44	Existing	9	Sitting	11	Standing	41	Pass
	Proposed 1	16	Walking	20	Walking	75	Pass
	Proposed 2	16	Walking	21	Uncomfortable	77	Pass
45	Existing	9	Sitting	11	Standing	42	Pass
	Proposed 1	16	Walking	19	Walking	76	Pass
	Proposed 2	15	Standing	19	Walking	79	Pass
46	Existing	9	Sitting	11	Standing	40	Pass
	Proposed 1	9	Sitting	10	Sitting	38	Pass
	Proposed 2	8	Sitting	10	Sitting	38	Pass
47	Existing	9	Sitting	11	Standing	40	Pass
	Proposed 1	13	Standing	15	Standing	59	Pass
	Proposed 2	12	Standing	14	Standing	58	Pass
48	Existing	8	Sitting	11	Standing	42	Pass
	Proposed 1	9	Sitting	11	Standing	39	Pass
	Proposed 2	9	Sitting	11	Standing	40	Pass
49	Existing	9	Sitting	11	Standing	40	Pass
	Proposed 1	11	Standing	13	Standing	51	Pass
	Proposed 2	10	Sitting	12	Standing	46	Pass
50	Existing	9	Sitting	12	Standing	47	Pass
	Proposed 1	9	Sitting	11	Standing	43	Pass
	Proposed 2	9	Sitting	11	Standing	40	Pass
51	Existing	8	Sitting	11	Standing	42	Pass
	Proposed 1	8	Sitting	10	Sitting	39	Pass
	Proposed 2	8	Sitting	10	Sitting	41	Pass
52	Existing	9	Sitting	12	Standing	45	Pass
	Proposed 1	9	Sitting	11	Standing	43	Pass
	Proposed 2	9	Sitting	11	Standing	45	Pass
53	Existing	9	Sitting	12	Standing	48	Pass
	Proposed 1	9	Sitting	11	Standing	45	Pass
	Proposed 2	9	Sitting	11	Standing	48	Pass
54	Existing	10	Sitting	12	Standing	47	Pass
	Proposed 1	10	Sitting	13	Standing	46	Pass
	Proposed 2	10	Sitting	12	Standing	45	Pass
55	Existing	10	Sitting	12	Standing	45	Pass
	Proposed 1	11	Standing	14	Standing	49	Pass
	Proposed 2	11	Standing	14	Standing	47	Pass
56	Existing	10	Sitting	13	Standing	49	Pass
	Proposed 1	12	Standing	15	Standing	55	Pass
	Proposed 2	11	Standing	14	Standing	52	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
57	Existing	12	Standing	15	Standing	54	Pass
	Proposed 1	17	Walking	21	Uncomfortable	70	Pass
	Proposed 2	15	Standing	19	Walking	62	Pass
58	Existing	10	Sitting	12	Standing	48	Pass
	Proposed 1	12	Standing	14	Standing	51	Pass
	Proposed 2	11	Standing	13	Standing	51	Pass
59	Existing	10	Sitting	13	Standing	47	Pass
	Proposed 1	10	Sitting	13	Standing	46	Pass
	Proposed 2	9	Sitting	11	Standing	44	Pass
60	Existing	10	Sitting	12	Standing	45	Pass
	Proposed 1	14	Standing	17	Walking	78	Pass
	Proposed 2	13	Standing	15	Standing	80	Pass
61	Existing	12	Standing	15	Standing	55	Pass
	Proposed 1	15	Standing	19	Walking	72	Pass
	Proposed 2	14	Standing	17	Walking	73	Pass
62	Existing	12	Standing	15	Standing	53	Pass
	Proposed 1	9	Sitting	13	Standing	51	Pass
	Proposed 2	7	Sitting	11	Standing	45	Pass
63	Existing	12	Standing	15	Standing	53	Pass
	Proposed 1	10	Sitting	14	Standing	56	Pass
	Proposed 2	9	Sitting	12	Standing	48	Pass
64	Existing	11	Standing	14	Standing	51	Pass
	Proposed 1	11	Standing	14	Standing	51	Pass
	Proposed 2	8	Sitting	11	Standing	42	Pass
65	Existing	12	Standing	15	Standing	53	Pass
	Proposed 1	7	Sitting	9	Sitting	35	Pass
	Proposed 2	7	Sitting	9	Sitting	33	Pass
66	Existing	12	Standing	15	Standing	52	Pass
	Proposed 1	12	Standing	15	Standing	55	Pass
	Proposed 2	10	Sitting	13	Standing	47	Pass
67	Existing	12	Standing	14	Standing	50	Pass
	Proposed 1	12	Standing	14	Standing	55	Pass
	Proposed 2	10	Sitting	13	Standing	46	Pass
68	Existing	11	Standing	14	Standing	50	Pass
	Proposed 1	12	Standing	14	Standing	57	Pass
	Proposed 2	11	Standing	13	Standing	48	Pass
69	Existing	11	Standing	14	Standing	51	Pass
	Proposed 1	9	Sitting	10	Sitting	41	Pass
	Proposed 2	8	Sitting	9	Sitting	41	Pass
70	Existing	11	Standing	13	Standing	46	Pass
	Proposed 1	11	Standing	13	Standing	51	Pass
	Proposed 2	10	Sitting	12	Standing	49	Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
71	Existing	11	Standing	14	Standing	50	Pass
	Proposed 1	13	Standing	15	Standing	66	Pass
	Proposed 2	11	Standing	13	Standing	58	Pass
72	Existing	11	Standing	13	Standing	46	Pass
	Proposed 1	8	Sitting	11	Standing	57	Pass
	Proposed 2	7	Sitting	9	Sitting	43	Pass
73	Existing	12	Standing	14	Standing	49	Pass
	Proposed 1	11	Standing	16	Walking	73	Pass
	Proposed 2	8	Sitting	10	Sitting	51	Pass
74	Existing	11	Standing	14	Standing	49	Pass
	Proposed 1	12	Standing	16	Walking	75	Pass
	Proposed 2	9	Sitting	10	Sitting	64	Pass
75	Existing	11	Standing	14	Standing	48	Pass
	Proposed 1	16	Walking	22	Uncomfortable	99	Exceeded
	Proposed 2	12	Standing	16	Walking	67	Pass
76	Existing	11	Standing	14	Standing	50	Pass
	Proposed 1	15	Standing	20	Walking	90	Pass
	Proposed 2	10	Sitting	14	Standing	60	Pass
77	Existing	11	Standing	14	Standing	54	Pass
	Proposed 1	20	Walking	25	Uncomfortable	84	Pass
	Proposed 2	17	Walking	22	Uncomfortable	73	Pass
78	Existing	-	-	-	-	-	-
	Proposed 1	12	Standing	14	Standing	56	Pass
	Proposed 2	11	Standing	14	Standing	54	Pass
79	Existing	-	-	-	-	-	-
	Proposed 1	13	Standing	16	Walking	60	Pass
	Proposed 2	10	Sitting	13	Standing	53	Pass
80	Existing	-	-	-	-	-	-
	Proposed 1	12	Standing	14	Standing	53	Pass
	Proposed 2	10	Sitting	12	Standing	49	Pass
81	Existing	-	-	-	-	-	-
	Proposed 1	10	Sitting	12	Standing	45	Pass
	Proposed 2	9	Sitting	13	Standing	48	Pass
82	Existing	-	-	-	-	-	-
	Proposed 1	13	Standing	16	Walking	66	Pass
	Proposed 2	13	Standing	15	Standing	61	Pass
83	Existing	-	-	-	-	-	-
	Proposed 1	16	Walking	20	Walking	77	Pass
	Proposed 2	16	Walking	20	Walking	84	Pass

Season	Months	Hours	Comfort Speed (km/h)	Safety Speed (km/h)
Summer	May - October	6:00 - 23:00 for comfort	(20% Seasonal Exceedance)	(0.1% Annual Exceedance)
Winter	November - April	6:00 - 23:00 for comfort	≤ 10 Sitting	≤ 90 Pass

Table 1: Pedestrian Wind Comfort and Safety Conditions

Location	Configuration	Wind Comfort				Wind Safety	
		Summer		Winter		Annual	
		Speed (km/h)	Rating	Speed (km/h)	Rating	Speed (km/h)	Rating
Annual	January - December	0:00 - 23:00 for safety		11 - 15	Standing	> 90	Exceeded
Configurations							
Existing	Existing site and surroundings			16 - 20	Walking		
Proposed 1	Project Proposed 1 with existing surroundings			> 20	Uncomfortable		
Proposed 2	Project Proposed 2 with existing surroundings						