

167-171 KING STREET WEST

WATERLOO, ONTARIO

PEDESTRIAN WIND TUNNEL STUDY REPORT

GNOBI #100025

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PREPARED BY

Kelly Baah, M.Eng., P.Eng.

Director | Principal Engineer

Kelly.baah@gnobiconsulting.com

D: 226-343-0728

PREPARED FOR

Jason Pucci

jason.pucci@vanmaron.com

VanMar Developments King Carol LP

145 Goddard Crescent

Cambridge, ON

Office: 519-740-6800 x134

Cell: 226-228-9608

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1. INTRODUCTION

This report presents the findings of the pedestrian wind tunnel assessment conducted by Gnobi Consulting Inc. for the proposed 167-171 King Street South development in Waterloo, ON. The report outlines the study objectives, methodology, results, and recommendations for wind mitigation measures where necessary.

1.1. Project Overview

The proposed development is a mixed-use project consisting of two towers rising 33 and 37 storeys, respectively, connected by a five-storey podium that includes outdoor amenity spaces (see **Image 2**). The surrounding area is predominantly composed of mid- and low-rise commercial and residential buildings in all directions, except in the southeast quadrant, where several mid- to high-rise buildings are present (see **Image 1**). Key pedestrian activity zones requiring careful consideration include building entrances, most notably the main entrances along King Street and Caroline Street South, the nearby Brewmeister Green Park, and the adjacent sidewalks.



Image 1: Aerial View of the Proposed Site, Source: Google Earth™



Image 2: 3D Rendering of the Proposed Project

1.2. Objectives

The primary objective of this study is to assess the wind conditions and their impact on pedestrians at various locations within and around the project site. The analysis focuses on identifying areas of concern and providing mitigation strategies to ensure optimal pedestrian comfort and safety.

1.3. Scope of the Study

The study considers both the existing conditions and the proposed design, taking into account potential future development scenarios in the surrounding area. The site configurations assessed included the following four scenarios:

- (1) **Existing Scheme:** Existing site and surrounding buildings within the study area (**Image 3A**).
- (2) **Proposed Scheme :** the proposed development plus existing surroundings (**Image 3B**).



Image 3A: Wind Tunnel Model of the Site and Existing Surrounding Buildings

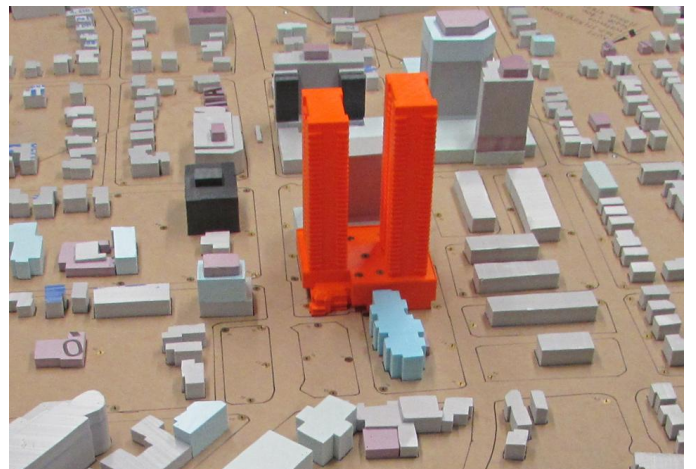


Image 3B: Wind Tunnel Model of the Proposed + Existing Surrounding Buildings

2. METHODOLOGY

2.1. Physical Modelling / Wind Tunnel Testing

The study methodology involved wind tunnel testing of a 1:400 scale model representing the existing and proposed scheme within a 480-meter radius study area. A total of 76 specially designed omnidirectional wind speed probes were placed at a height of approximately 1.5 meters above the local grade in pedestrian areas of interest on and around the project site.

The wind tunnel tests simulated mean speed and gust profiles within the atmospheric boundary layer beyond the modeled area. Wind speed ratios (measured at sensor probes relative to gradient height speeds) were combined with long-term data from a reference meteorological station to predict the magnitude and frequency of wind speeds at various locations across the study area. The tests covered 36 wind directions, assessed in 10-degree increments.

2.2. Meteorological Data Analysis

The local wind climate at the proposed site was evaluated using hourly wind data collected at Waterloo Wellington International Airport, situated at a height of 10 meters above ground level, as a point of reference. The wind roses in **Image 4** below presents the cumulative probability distribution of wind speeds for the summer (May to October) and winter (November to April) months.

Analysis of the data reveals that strong and potentially uncomfortable winds exceeding 20km/h occur more often in the winter than in the summer.

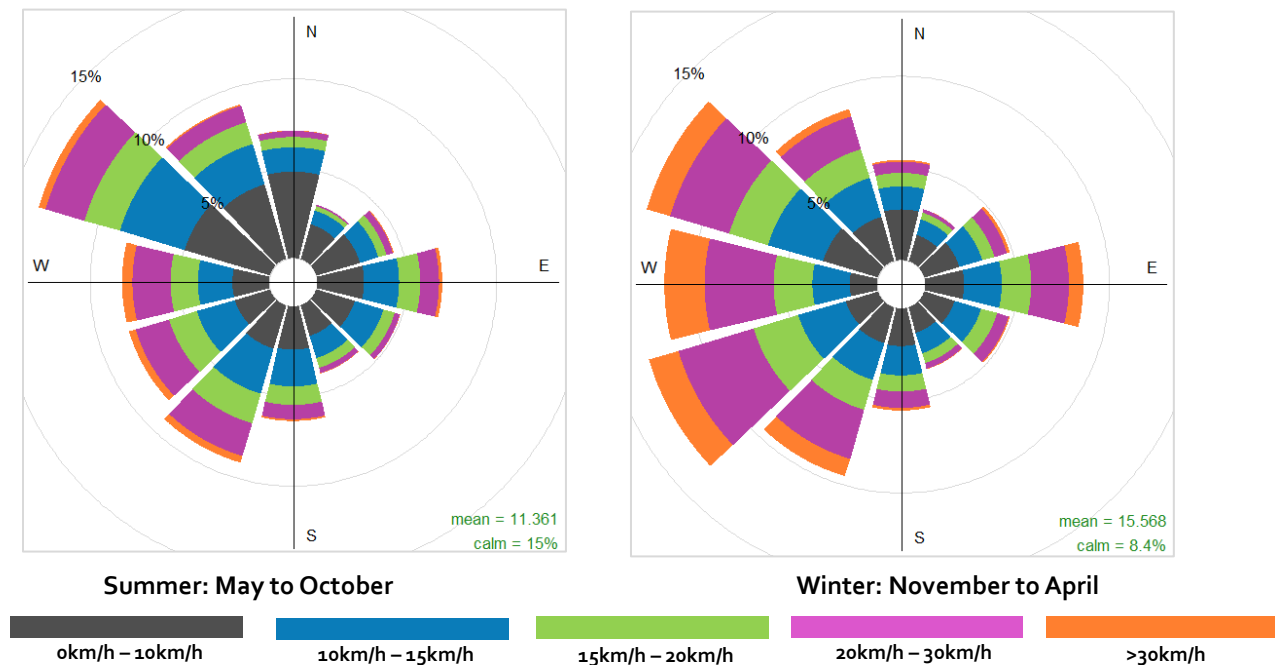


Image 4: Wind Data from Waterloo Wellington International Airport (1992 – 2022)

2.3. City of Waterloo's Wind Criteria

The City of Waterloo's pedestrian wind comfort and safety performance criteria form the basis of this assessment. These standards are a key component of building design in urban areas, providing guidelines on maximum allowable wind speeds and frequency thresholds that pedestrians can safely and comfortably tolerate during various activities, such as sitting, standing, or walking. The criteria are based on scientific data, engineering principles, and human experience, considering the intended use of pedestrian spaces within and around the project.

TABLE 1: WIND CRITERIA FOR PEDESTRIAN COMFORT AND SAFETY			
COMFORT CATEGORY	GEM* SPEED (km/h)	DESCRIPTION	AREA OF APPLICATION
Sitting 	≤ 10	Light breezes desired for outdoor seating areas where one can read a paper without having it blown away.	Park benches, restaurant seating, balconies, amenity terraces, etc. intended for relaxed, and usually seated activities.
Standing 	≤ 15	Gentle breezes suitable for passive pedestrian activities where a breeze may be tolerated	Main entrances, bus-stops, and other outdoor areas where seated activities can be avoided.
Walking 	≤ 20	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 infrequent.
Uncomfortable 	> 20	Strong winds, considered a nuisance for most activities.	May be accepted in areas not intended for pedestrian access
Notes	1) The required seasonal compliance is 80% of the time for the Sitting, Standing and Walking categories. The Uncomfortable categorization is applicable if the criteria for Walking are not met. 2) 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 <i>mean speed + (3 x RMS speed)</i>. 3) Comfort calculations are to be based on wind events recorded between 6:00 and 23:00 daily. 4) Threshold wind speeds are lower in the winter to account for wind-chill, to consider outdoor comfort in alignment with the Winter City Design Guidelines.		
SAFETY CRITERION / WIND HAZARD	GUST SPEED (km/h)	DESCRIPTION	AREA OF APPLICATION
Exceeded Y/N?	> 90	Excessive gust speeds can adversely affect a pedestrian's balance and footing. Wind mitigation is typically required.	All areas assessed
Yes -- 			
No -- 			
Notes	5) Wind safety assessment is to be based on wind events recorded for 24 hours a day.		

To determine suitable wind conditions for pedestrian activities such as sitting, standing, strolling or walking, it is recommended that the associated mean wind speeds be expected for at least 80% of the time (approximately five and half out of seven days). In areas where winds surpass the 20km/h limit for over 20% of the time or surpass the wind safety threshold, wind control measures are typically required to ensure the safety and comfort of individuals.

3. RESULTS AND DISCUSSION

The report's Appendix section includes **Table 1**, which provides data on wind speeds measured at various locations under different site configurations: **existing** and **proposed** scenarios. The analysis takes into account safety and comfort criteria, considering both annual (for wind safety) and seasonal periods (for wind comfort), as well as specific time frames throughout the day. Visual representations of the assessed conditions are presented in **Figures 1.1 through 3.2** in the **Appendix**.

3.1. Existing Wind Conditions

Overall, the existing wind conditions at all assessed locations are suitable for their intended uses. Comfort levels range from "standing or better" during the summer to "standing or walking" in the winter. Additionally, the annual wind safety criteria are met throughout the surrounding areas near the project site.

3.2. Proposed Wind Conditions

3.2.1. Wind Flow around the Proposed Project

Generally, wind flows smoothly over buildings of uniform height. However, taller buildings can disrupt this flow by intercepting and redirecting the wind, leading to effects such as downwashing and corner acceleration. When wind moves around the corners of tall buildings, it can cause localized increases in wind activity known as corner acceleration. Additionally, when two tall buildings are close together, the gap between them can act as a channel, accelerating the wind that passes through. Factors influencing this phenomenon include the height of the proposed buildings, the size of the gap and the alignment of the buildings with one or more prevailing wind directions at the project site. Narrower gaps tend to create stronger wind tunnel effects, while larger distances reduce the potential for channeling.

These wind flow mechanisms are often the main factors contributing to uncomfortable and potentially hazardous wind conditions around buildings. The current pedestrian wind tunnel assessment for the proposed project considers typical urban wind patterns, including wind tunneling/channeling, downwashing, and corner acceleration. The proposed buildings, ranging between 33 to 37 storeys, are taller than majority of the surrounding structures and are therefore expected to experience these wind effects. However, the design incorporates a 5-storey podium and tower setbacks which are expected to mitigate these impacts.

3.2.2. Proposed Scheme

Noteworthy Wind Responsive-Design Features

- The proposed development incorporates several design elements that contribute positively to managing wind conditions and should be retained in the final design. These include:
- **Vestibule at Main Entrances:** A sheltered vestibule will provide pedestrians protection from wind on particularly windy days.
- **Strategic Entrance Placement:** The main residential entrance along Caroline Street is located away from exposed building corners prone to accelerated wind speeds.
- **Recessed Design / Building Setback at Grade:** The proposed overhang and setbacks at grade help reduce the impact of downwashing and corner acceleration effects at pedestrian level.
- **Podium and Tower Setbacks:** The proposed Level 5 podium and tower setbacks will help mitigate the impact of downwashing at grade level by keeping the winds that are redirected by the towers above pedestrian height at grade.

Collectively, these features enhance the project's ability to manage wind speeds effectively and improve pedestrian comfort.

Proposed Summer and Winter Conditions

With the addition of the proposed development, wind conditions at all assessed grade-level areas are predicted to remain comfortable for their intended summer uses, such as standing at entrances and walking along sidewalks. At the nearby Brewmeister Green Park, conditions are expected to be comfortable for standing, which is appropriate for the space.

Wind speeds on the proposed Level 5 amenity podium are expected to range between comfortable for standing and walking. However, in some areas, wind speeds may exceed the target criterion for passive use spaces, which requires conditions comfortable for sitting or standing. These elevated wind speeds could reduce comfort for passive activities such as seating. These conditions can be improved through localized wind control measures—such as tall planters, landscaping, wind screens, trellises, or canopies—to create pockets of calm suitable for passive activities.

During winter months, wind speeds at grade-level areas on and around the development are predicted to remain comfortable for their intended uses (standing at entrances and Brewmeister Green Park, walking on sidewalks). The annual wind safety criterion is predicted to be met at all assessed grade-level locations.

However, wind speeds on the Level 5 amenity are expected to increase in winter due to stronger prevailing winds. Conditions in this area are generally predicted to be comfortable for walking, which may be undesirable for passive use areas. The annual wind safety criterion is met at all above-grade locations assessed, except for a localized area near the northeast corner of Tower A, where channeling and corner acceleration from prevailing winter winds result in an exceedance (Location 72 in Figure 3.2). This hazardous condition is anticipated to occur primarily during the winter months, when the Level 5 amenity space is typically unoccupied.

The risk can be effectively mitigated through thoughtful design interventions, such as incorporating a canopy and/or landscape features into the design strategy near the northeast corner of Tower A at the podium level. Further wind tunnel testing will be conducted as the design advances, and prior to site plan approval, to confirm the effectiveness of the proposed mitigation measures and implement any necessary refinements.

4. CONCLUSION

Gnobi Consulting Inc. was retained to complete a quantitative pedestrian-level wind tunnel assessment for the proposed development at 167-171 King Street South in Waterloo, ON. This assessment was conducted to support the Zoning By-law Amendment / Site Plan Approval application for the site's redevelopment. The study included wind tunnel modeling and testing of both existing and proposed schemes, combined with historical meteorological wind data from Waterloo Wellington International Airport.

The proposed development, comprising towers ranging from 33 to 37 storeys with a 5-storey podium, is anticipated to introduce typical urban wind effects such as downwashing, corner acceleration, and wind channeling due to building height and configuration. However, the inclusion of podium and tower setbacks, along with other design features, effectively mitigates adverse wind impacts at pedestrian level.

Wind conditions at all assessed grade-level locations are predicted to remain comfortable for their intended summer uses, including standing at entrances and walking along sidewalks. The adjacent Brewmeister Green Park is also expected to experience suitable conditions for standing and passive use.

At the proposed Level 5 amenity podium, wind speeds are generally comfortable for standing and walking, but in some areas the target criterion for passive spaces (comfortable for sitting or standing) is exceeded. These elevated wind speeds may reduce comfort for passive activities but can be mitigated through localized wind control measures such as landscaping, wind screens, and canopies.

During the winter months, grade-level wind conditions are expected to remain within the comfort and safety criteria for pedestrian use. Although the Level 5 amenity is expected to experience increased wind speeds during this period—resulting in a localized wind safety exceedance near the northeast corner of Tower A—this is not anticipated to pose a significant concern, as the space is typically unoccupied in colder weather.

If necessary, targeted wind control measures can be implemented to enhance safety in this area. Specifically, the exceedance identified near Location 72 on the Level 5 podium can be effectively mitigated through thoughtful design interventions, such as incorporating a canopy and/or landscape features into the design strategy at the northeast corner of Tower A. Further wind tunnel testing will be conducted as the design progresses, and prior to site plan approval, to verify the effectiveness of the proposed mitigation measures and implement any required refinements.

Overall, the proposed development is consistent with the existing wind environment, and the annual pedestrian wind safety criterion is met at all locations assessed except for the identified localized winter safety exceedance on the podium. No new significant adverse wind conditions are anticipated as a result of the project.

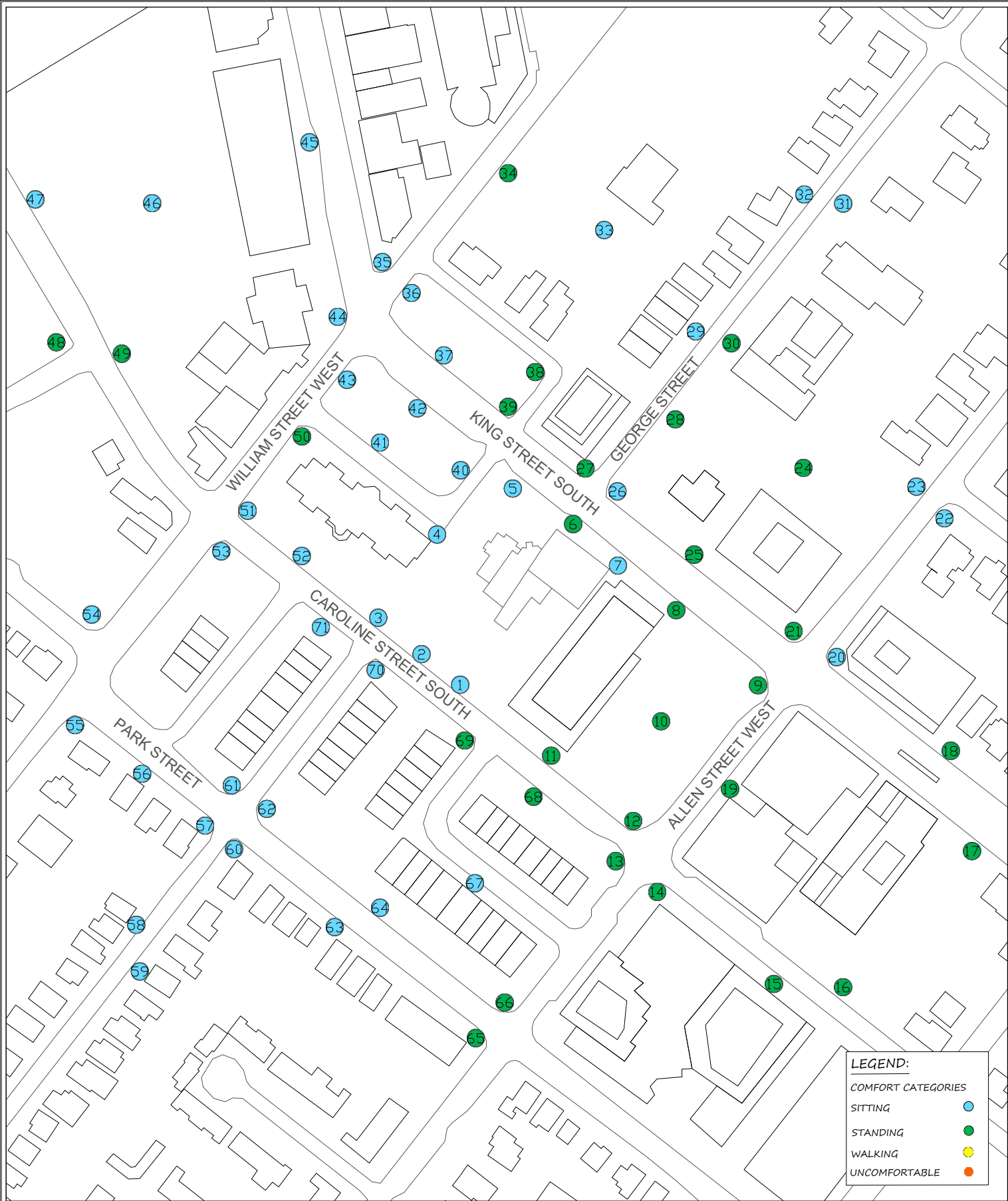
5. STUDY APPLICABILITY

The assessment presented in this report pertains to the proposed 167-171 King Street South in Waterloo, ON and is predicated on the 3D massing model provided by Kirkor Architects and Planners received May 20, 2025. **Should there be any substantial modifications to the design, Gnobi Consulting Inc. is available to evaluate their potential impact on the pedestrian wind conditions discussed in this report. It is incumbent upon others to initiate this process by contacting Gnobi Consulting Inc.**

6. REFERENCES

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FIGURES



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contact@gnobiconsulting.com
(226)-343-0728

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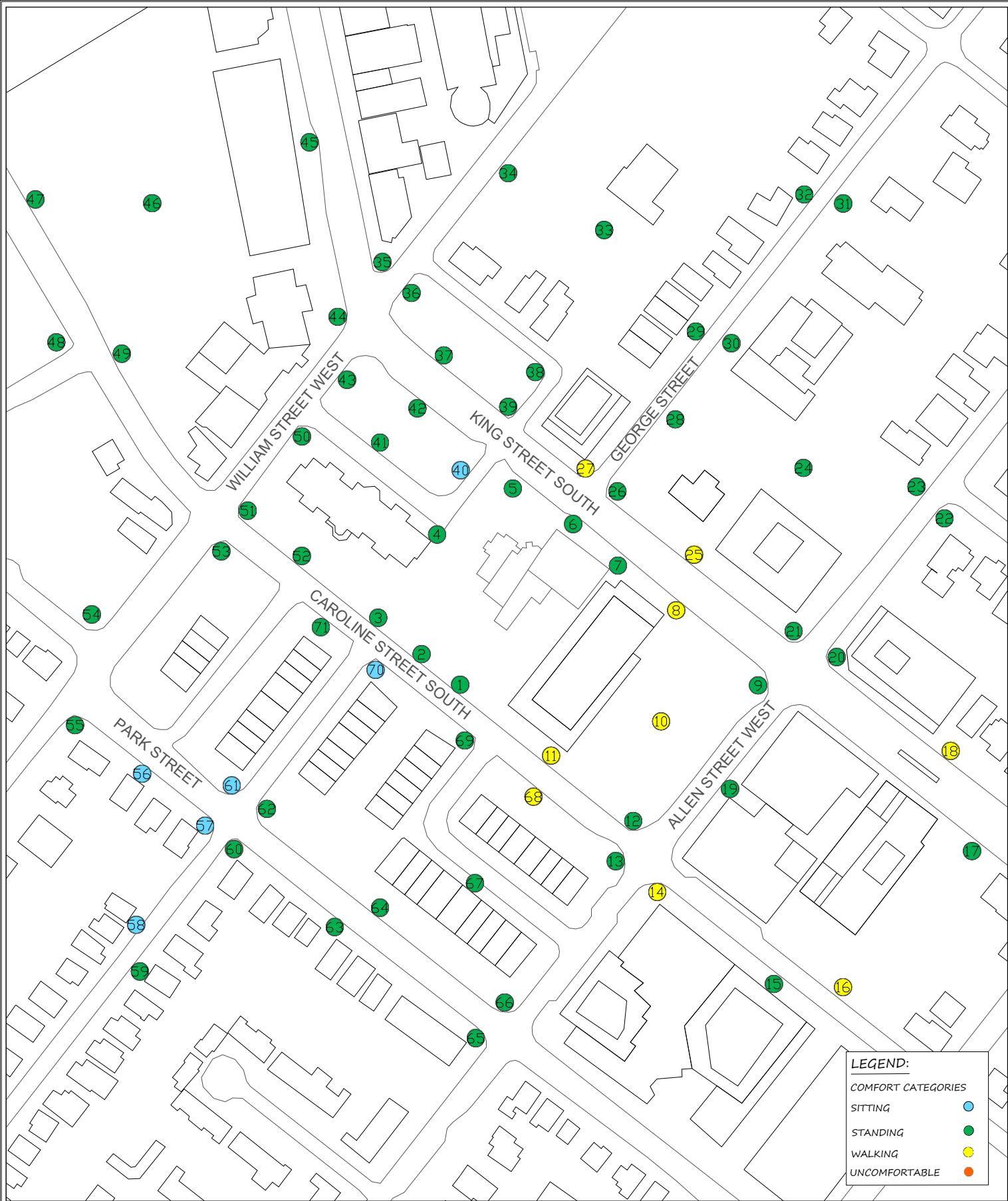
1.1 - EXISTING SCHEME (SUMMER)

GNobi PROJECT #:100025

DATE: JUNE 6, 2025



Scale:1:55



LEGEND:

COMFORT CATEGORIES

SITTING ●

STANDING ●

WALKING ●

UNCOMFORTABLE ●



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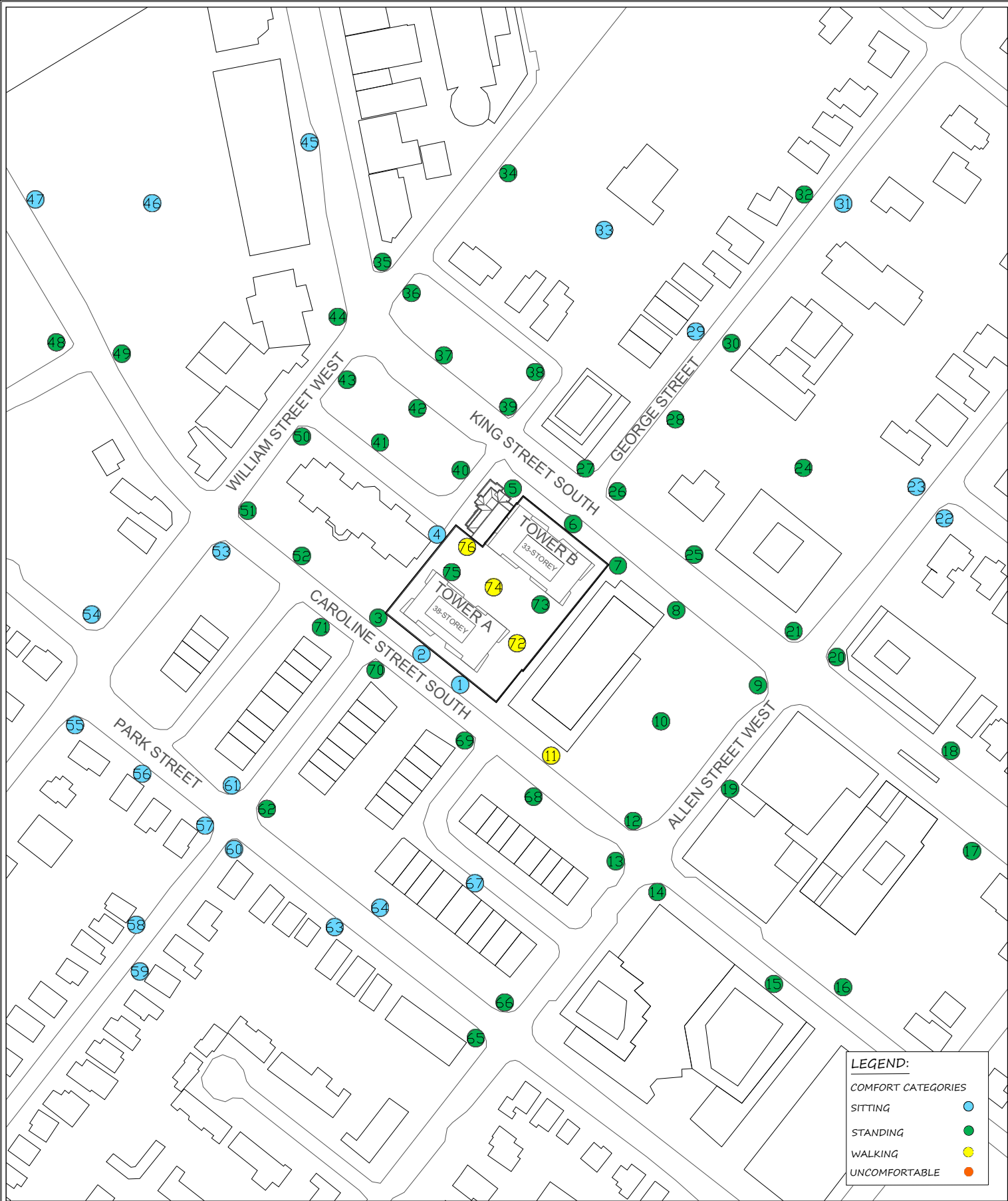
2.1 - EXISTING SCHEME (WINTER)

GNOBI PROJECT #:100025

DATE: JUNE 6, 2025



Scale: 1:55



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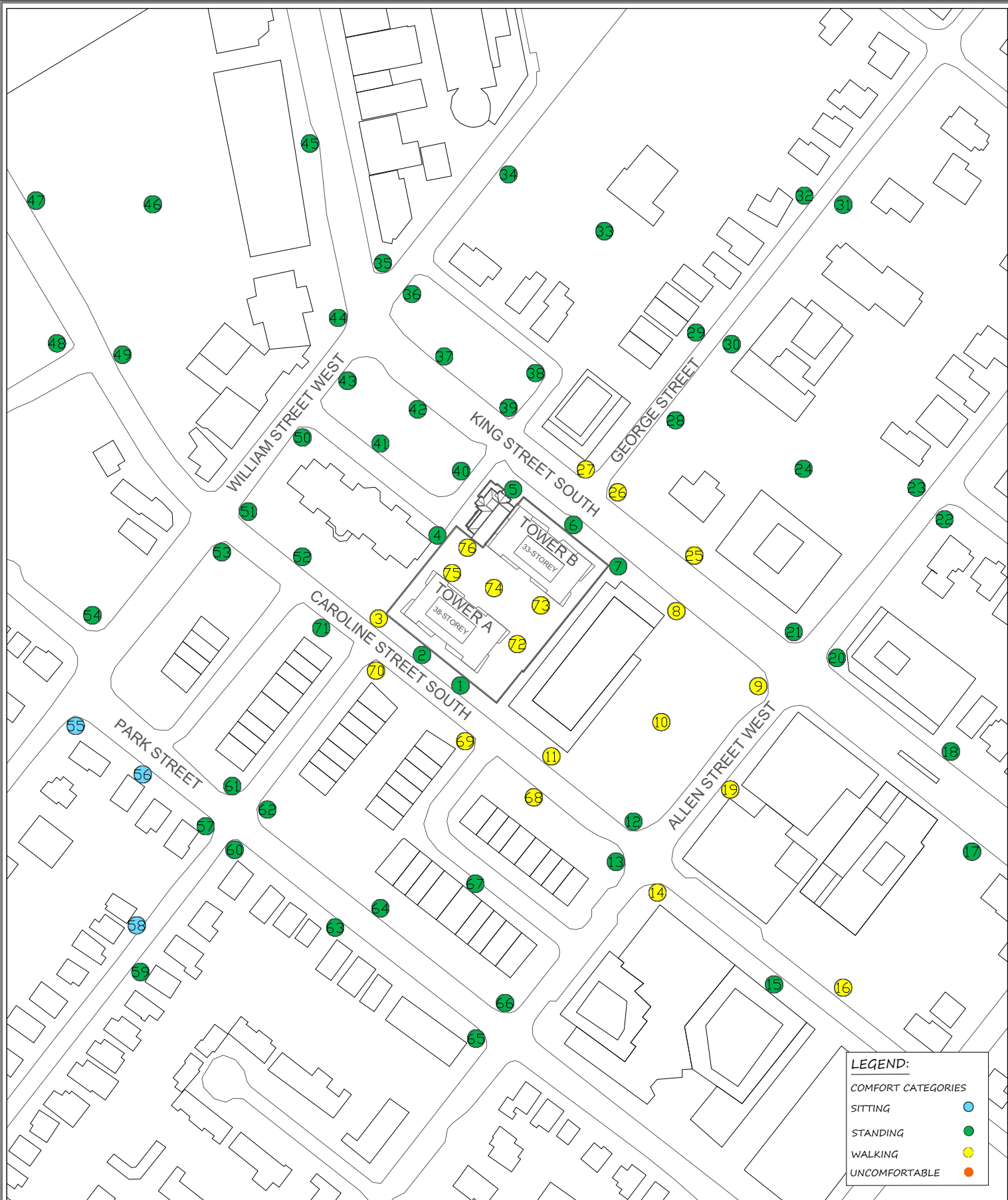
1.2 - PROPOSED SCHEME (SUMMER)

GNobi PROJECT #:100025

DATE: JUNE 6, 2025



Scale:1:55



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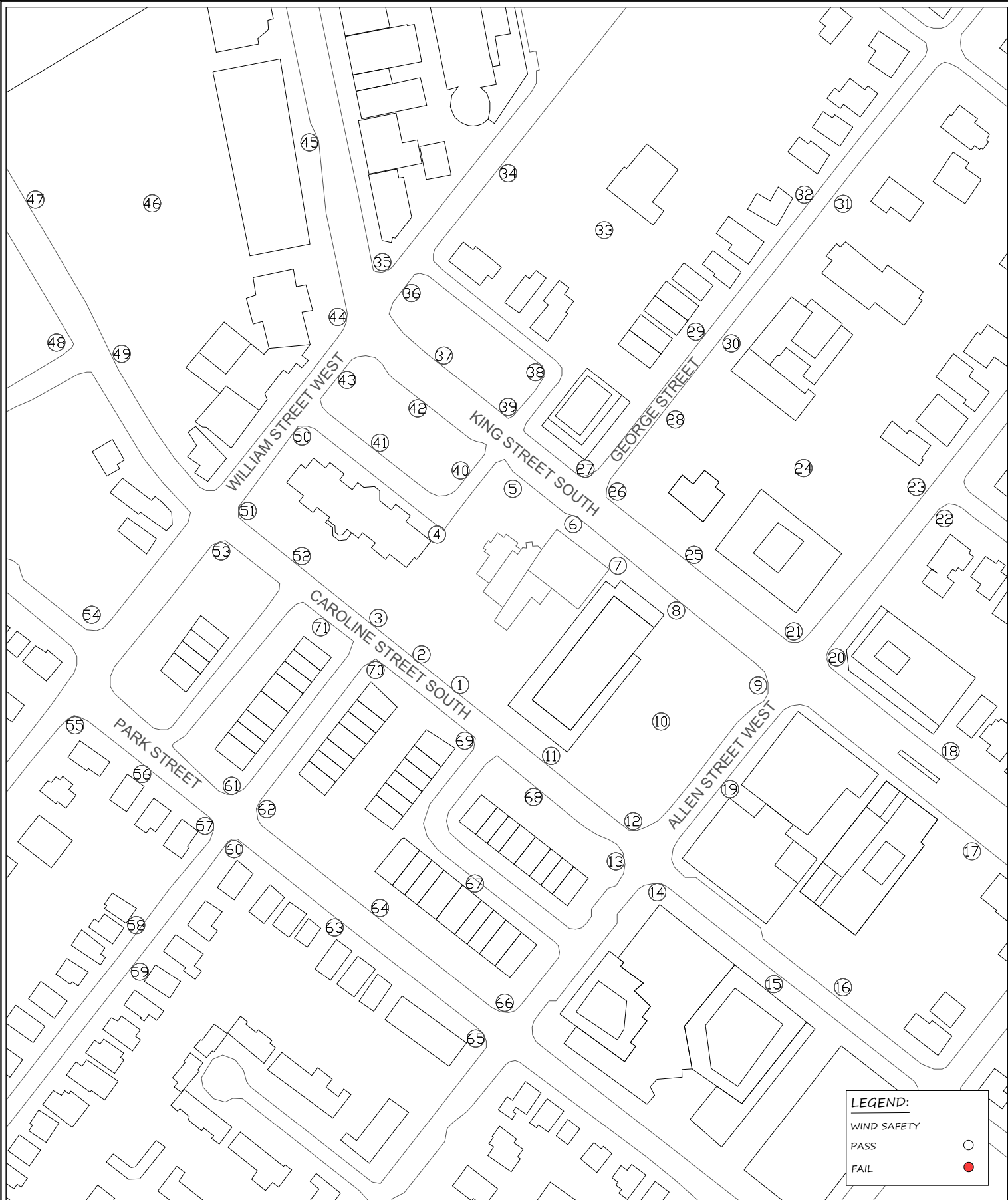
2.2 - PROPOSED SCHEME (WINTER)

GNOBI PROJECT #:100025

DATE: JUNE 6, 2025



Scale:1:55

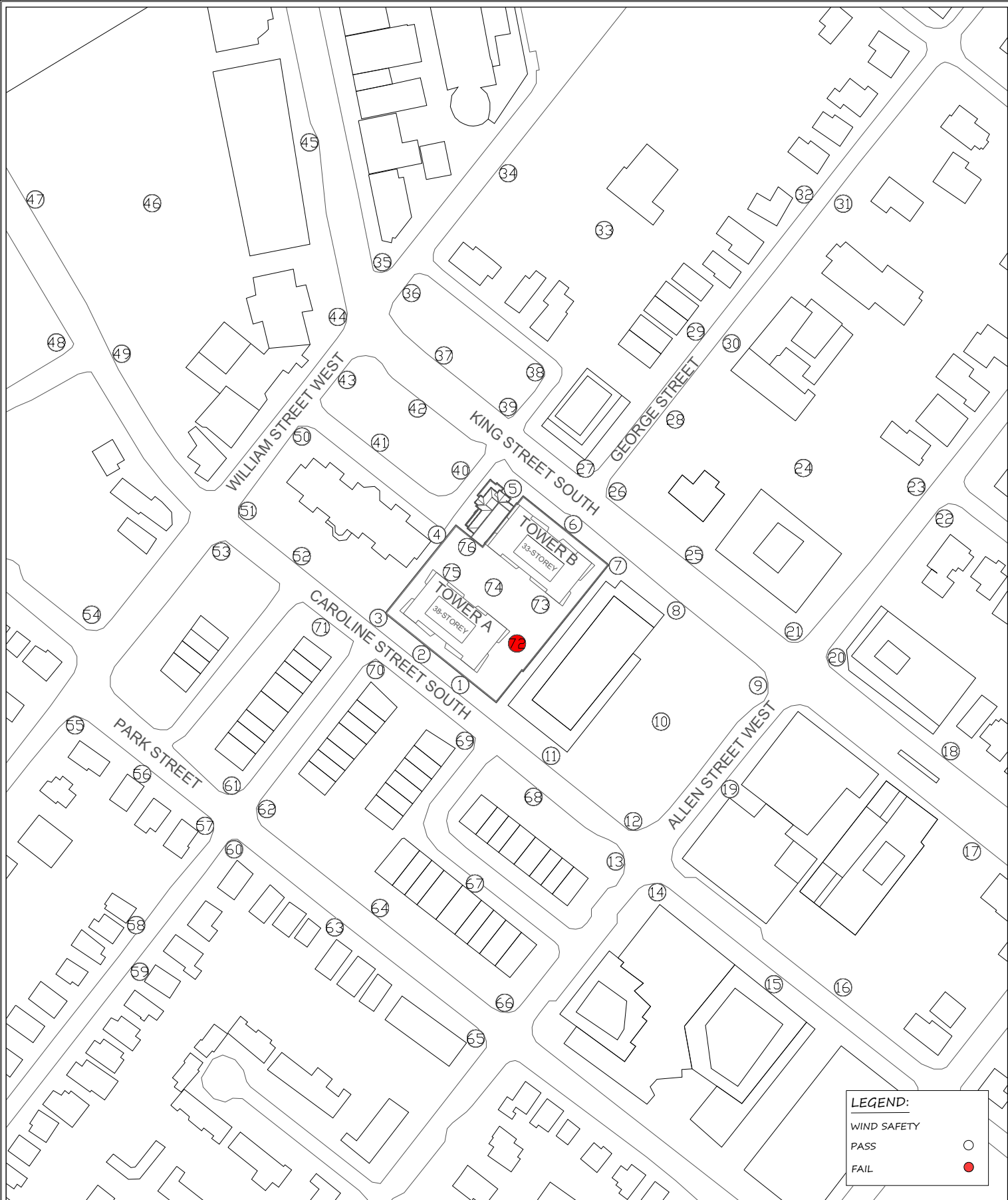


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3.1 - EXISTING SCHEME (SAFETY)

	
GNOBI PROJECT #:100025	
DATE: JUNE 6, 2025	Scale:1:55



LEGEND:

WIND SAFETY

PASS ○

FAIL ●



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3.2 - PROPOSED SCHEME (SAFETY)

GNOBI PROJECT #:100025		
DATE: JUNE 6, 2025		Scale:1:55

TABLES

Table 1: Assessment of Pedestrian Wind Comfort and Safety

Wind Probe	Assessed Scheme	Hazard Criterion		Comfort Criteria			
		Annual: January - December		Summer May - October		Winter: November - April	
		Hours: 0:00 - 23:00		Hours: 6:00 - 23:00		Hours: 6:00 - 23:00	
		Gust (km/h)	Exceeded Yes/No?	Mean (km/h)	Comfort Category	Mean (km/h)	Comfort Category
Loc. 1	Existing	51	No	10	Sitting	12	Standing
	Proposed	51	No	9	Sitting	11	Standing
Loc. 2	Existing	44	No	9	Sitting	11	Standing
	Proposed	46	No	10	Sitting	11	Standing
Loc. 3	Existing	50	No	10	Sitting	12	Standing
	Proposed	71	No	14	Standing	16	Walking
Loc. 4	Existing	42	No	9	Sitting	11	Standing
	Proposed	54	No	10	Sitting	13	Standing
Loc. 5	Existing	53	No	10	Sitting	13	Standing
	Proposed	65	No	12	Standing	15	Standing
Loc. 6	Existing	59	No	11	Standing	13	Standing
	Proposed	73	No	12	Standing	15	Standing
Loc. 7	Existing	61	No	10	Sitting	12	Standing
	Proposed	55	No	11	Standing	13	Standing
Loc. 8	Existing	76	No	13	Standing	16	Walking
	Proposed	69	No	14	Standing	16	Walking
Loc. 9	Existing	62	No	12	Standing	15	Standing
	Proposed	71	No	13	Standing	16	Walking
Loc. 10	Existing	80	No	14	Standing	17	Walking
	Proposed	88	No	14	Standing	18	Walking
Loc. 11	Existing	75	No	15	Standing	18	Walking
	Proposed	87	No	16	Walking	20	Walking
Loc. 12	Existing	56	No	11	Standing	13	Standing
	Proposed	63	No	12	Standing	15	Standing
Loc. 13	Existing	61	No	12	Standing	14	Standing
	Proposed	59	No	12	Standing	14	Standing
Loc. 14	Existing	73	No	13	Standing	16	Walking
	Proposed	72	No	13	Standing	17	Walking
Loc. 15	Existing	60	No	12	Standing	14	Standing
	Proposed	60	No	12	Standing	14	Standing
Loc. 16	Existing	66	No	13	Standing	16	Walking
	Proposed	66	No	13	Standing	16	Walking
Loc. 17	Existing	51	No	11	Standing	13	Standing
	Proposed	50	No	11	Standing	13	Standing
Loc. 18	Existing	74	No	13	Standing	16	Walking
	Proposed	71	No	12	Standing	15	Standing
Loc. 19	Existing	69	No	12	Standing	15	Standing
	Proposed	72	No	13	Standing	16	Walking
Loc. 20	Existing	57	No	10	Sitting	13	Standing
	Proposed	63	No	11	Standing	13	Standing
Loc. 21	Existing	64	No	12	Standing	15	Standing
	Proposed	62	No	12	Standing	15	Standing
Loc. 22	Existing	53	No	10	Sitting	12	Standing
	Proposed	51	No	10	Sitting	12	Standing
Loc. 23	Existing	49	No	10	Sitting	12	Standing
	Proposed	48	No	10	Sitting	12	Standing
Loc. 24	Existing	70	No	12	Standing	14	Standing
	Proposed	64	No	12	Standing	14	Standing
Loc. 25	Existing	72	No	13	Standing	16	Walking
	Proposed	76	No	14	Standing	17	Walking
Loc. 26	Existing	59	No	10	Sitting	13	Standing
	Proposed	77	No	13	Standing	17	Walking
Loc. 27	Existing	73	No	13	Standing	16	Walking
	Proposed	85	No	14	Standing	18	Walking

Wind Probe	Assessed Scheme	Hazard Criterion		Comfort Criteria			
		Annual: January - December		Summer May - October		Winter: November - April	
		Hours: 0:00 - 23:00		Hours: 6:00 - 23:00		Hours: 6:00 - 23:00	
		Gust (km/h)	Exceeded Yes/No?	Mean (km/h)	Comfort Category	Mean (km/h)	Comfort Category
Loc. 28	Existing	58	No	11	Standing	14	Standing
	Proposed	63	No	11	Standing	14	Standing
Loc. 29	Existing	47	No	9	Sitting	11	Standing
	Proposed	46	No	9	Sitting	11	Standing
Loc. 30	Existing	61	No	11	Standing	14	Standing
	Proposed	65	No	11	Standing	13	Standing
Loc. 31	Existing	50	No	10	Sitting	12	Standing
	Proposed	52	No	10	Sitting	12	Standing
Loc. 32	Existing	52	No	10	Sitting	12	Standing
	Proposed	55	No	11	Standing	13	Standing
Loc. 33	Existing	47	No	9	Sitting	11	Standing
	Proposed	49	No	9	Sitting	11	Standing
Loc. 34	Existing	62	No	11	Standing	14	Standing
	Proposed	65	No	12	Standing	15	Standing
Loc. 35	Existing	53	No	10	Sitting	12	Standing
	Proposed	52	No	11	Standing	13	Standing
Loc. 36	Existing	46	No	9	Sitting	11	Standing
	Proposed	57	No	11	Standing	13	Standing
Loc. 37	Existing	52	No	10	Sitting	12	Standing
	Proposed	62	No	11	Standing	14	Standing
Loc. 38	Existing	59	No	12	Standing	15	Standing
	Proposed	60	No	12	Standing	14	Standing
Loc. 39	Existing	51	No	11	Standing	13	Standing
	Proposed	59	No	11	Standing	14	Standing
Loc. 40	Existing	48	No	8	Sitting	10	Sitting
	Proposed	66	No	12	Standing	15	Standing
Loc. 41	Existing	57	No	10	Sitting	12	Standing
	Proposed	67	No	12	Standing	15	Standing
Loc. 42	Existing	56	No	10	Sitting	13	Standing
	Proposed	62	No	12	Standing	15	Standing
Loc. 43	Existing	59	No	10	Sitting	13	Standing
	Proposed	63	No	12	Standing	15	Standing
Loc. 44	Existing	46	No	10	Sitting	12	Standing
	Proposed	55	No	11	Standing	13	Standing
Loc. 45	Existing	48	No	10	Sitting	12	Standing
	Proposed	51	No	10	Sitting	12	Standing
Loc. 46	Existing	48	No	9	Sitting	12	Standing
	Proposed	48	No	10	Sitting	12	Standing
Loc. 47	Existing	47	No	10	Sitting	11	Standing
	Proposed	52	No	10	Sitting	12	Standing
Loc. 48	Existing	57	No	11	Standing	14	Standing
	Proposed	56	No	11	Standing	14	Standing
Loc. 49	Existing	53	No	11	Standing	13	Standing
	Proposed	53	No	11	Standing	13	Standing
Loc. 50	Existing	64	No	11	Standing	14	Standing
	Proposed	65	No	13	Standing	15	Standing
Loc. 51	Existing	47	No	10	Sitting	12	Standing
	Proposed	54	No	11	Standing	13	Standing
Loc. 52	Existing	51	No	10	Sitting	12	Standing
	Proposed	56	No	11	Standing	13	Standing
Loc. 53	Existing	45	No	9	Sitting	11	Standing
	Proposed	47	No	10	Sitting	12	Standing
Loc. 54	Existing	46	No	9	Sitting	11	Standing
	Proposed	46	No	10	Sitting	12	Standing

Wind Probe	Assessed Scheme	Hazard Criterion		Comfort Criteria			
		Annual: January - December		Summer May - October		Winter: November - April	
		Hours: 0:00 - 23:00		Hours: 6:00 - 23:00		Hours: 6:00 - 23:00	
		Gust (km/h)	Exceeded Yes/No?	Mean (km/h)	Comfort Category	Mean (km/h)	Comfort Category
Loc. 55	Existing	45	No	9	Sitting	11	Standing
	Proposed	45	No	9	Sitting	10	Sitting
Loc. 56	Existing	39	No	8	Sitting	9	Sitting
	Proposed	46	No	8	Sitting	10	Sitting
Loc. 57	Existing	39	No	8	Sitting	10	Sitting
	Proposed	45	No	9	Sitting	11	Standing
Loc. 58	Existing	42	No	8	Sitting	10	Sitting
	Proposed	42	No	8	Sitting	10	Sitting
Loc. 59	Existing	49	No	9	Sitting	11	Standing
	Proposed	47	No	9	Sitting	11	Standing
Loc. 60	Existing	49	No	9	Sitting	12	Standing
	Proposed	47	No	10	Sitting	12	Standing
Loc. 61	Existing	46	No	8	Sitting	10	Sitting
	Proposed	61	No	9	Sitting	11	Standing
Loc. 62	Existing	48	No	10	Sitting	12	Standing
	Proposed	54	No	11	Standing	13	Standing
Loc. 63	Existing	51	No	10	Sitting	12	Standing
	Proposed	52	No	10	Sitting	12	Standing
Loc. 64	Existing	50	No	10	Sitting	12	Standing
	Proposed	51	No	10	Sitting	13	Standing
Loc. 65	Existing	51	No	11	Standing	13	Standing
	Proposed	51	No	11	Standing	13	Standing
Loc. 66	Existing	54	No	11	Standing	13	Standing
	Proposed	55	No	11	Standing	14	Standing
Loc. 67	Existing	50	No	9	Sitting	11	Standing
	Proposed	52	No	10	Sitting	12	Standing
Loc. 68	Existing	63	No	13	Standing	16	Walking
	Proposed	71	No	13	Standing	17	Walking
Loc. 69	Existing	58	No	12	Standing	14	Standing
	Proposed	70	No	14	Standing	17	Walking
Loc. 70	Existing	41	No	8	Sitting	10	Sitting
	Proposed	68	No	14	Standing	16	Walking
Loc. 71	Existing	50	No	9	Sitting	11	Standing
	Proposed	57	No	11	Standing	13	Standing
Loc. 72	Existing	--	--	--	--	--	--
	Proposed	95	Yes	16	Walking	20	Walking
Loc. 73	Existing	--	--	--	--	--	--
	Proposed	88	No	15	Standing	19	Walking
Loc. 74	Existing	--	--	--	--	--	--
	Proposed	90	No	17	Walking	20	Walking
Loc. 75	Existing	--	--	--	--	--	--
	Proposed	87	No	15	Standing	18	Walking
Loc. 76	Existing	--	--	--	--	--	--
	Proposed	87	No	17	Walking	20	Walking

Notes:

Annual wind Hazard probability of exceedance = 0.1%

Seasonal Wind Comfort Probability of Exceedance = 20%

Abbreviations:

Loc. = Location

of Configurations Assessed: Two (2)

Existing: Existing Surrounding Buildings

Proposed: Proposed + Existing Surrounding Buildings



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