URBAN SOLUTIONS
PLANNING & LAND DEVELOPMENT

April 21, 2023

431-22

Via Email

Edward Winter, OAA
Planner 1 – Urban Design
City of Hamilton
71 Main Street West, 5th Floor
Hamilton, ON L8P 4Y5

Dear Mr. Winter,

RE: 175 John Street North, Hamilton
Design Review Panel Submission – UHOPA-23-012 | ZAC-23-027

UrbanSolutions Planning & Land Development Consultants Inc. has been retained as the authorized planning consultant acting on behalf of Darpel Investments (Owner). We are pleased to submit the enclosed Design Review Panel application on their behalf for the subject property.

In support of this application, please find enclosed the following:

- One (1) copy of the completed Applicant Project Summary Sheet;
- One (1) copy of the Context Plan prepared by UrbanSolutions;
- One (1) copy of the Urban Design Brief prepared by Whitehouse Urban Design;
- One (1) copy of the 3D Coloured Renderings prepared by SRM Architects;
- One (1) copy of the Perspective Drawings prepared by SRM Architects;
- One (1) copy of the Site Plan & Floor Plans prepared by SRM Architects;
- One (1) copy of the Building Elevations prepared by SRM Architects;
- One (1) copy of the Streetscape Cross-section prepared by Whitehouse Urban Design;
- One (1) copy of the Landscape Plan prepared by Whitehouse Urban Design;
- One (1) copy of the Sun/Shadow Study prepared by SRM Architects;
- One (1) copy of the Wind Study prepared by Gradient Wind.

We trust the enclosed is in order; however, please feel free to contact me with any questions.

Regards,
UrbanSolutions

Matt Johnston, MCIP, RPP
Principal

Stephen Erickson, BA (Hons), CPT
Planning Technician

CC: Mr. Philip Alaimo, Darpel Investments
Ms. Le'Ann Seely, Whitehouse Urban Design Inc. (via email)
Mr. Ed Thomas, SRM Architects (via email)

City of Hamilton – Design Review Panel
Applicant Project Summary Sheet

Applicant Name:	Darpel Investment Limited c/o UrbanSolutions Planning & Land Development Consultants Inc.
Panel Meeting Date:	May 11, 2023
Project Address:	175 John Street North, Hamilton
Date of Panel Pre-Consult [if applicable]:	March 16, 2022 (FC-22-034)

Project Data

Application Type [e.g. Site Plan, Re-zoning]:	Official Plan & Zoning By-law Amendment

Proposed Use, Description of Project and Brief description of adjacent uses: [e.g. Office, Residential]:

The proposed development entails one 19-storey multiple dwelling containing a total of 132 residential units. In addition, the proposed development is accommodated by 79 parking spaces contained in a second floor podium and underground garage, 65 long term bicycle parking spaces and 5 short term bicycle parking spaces. Abutting the site's northern boundary is an 18-storey multiple dwelling fronting John Street North. To the east of the site, opposite John Street North, is McLaren Park. Abutting the subject site's southern boundary is a +/- 1,113 m2 lot occupied by a Husky gas station. Directly west of the subject site is a +/- 2,789 m2 lot occupied by a Giant Tiger grocery store.

Policy and guideline documents examined in preparing proposal [please list specific guidelines examined]:

Planning Act, Provincial Policy Statement, Growth Plan for the Greater Golden Horseshoe, Urban Hamilton Official Plan, West Harbour Secondary Plan, Former City of Hamilton Zoning By-law No. 6593, City-Wide Corridor Planning Principles and Design Guidelines and Downtown Hamilton Tall Buildings Guidelines.

Existing zoning:	"H" (Community Shopping and Commercial, Etc.) District in the Former City of Hamilton Zoning By-law No. 6593

Zoning/Site Plan Details [complete relevant sections]

Permitted height and/or permitted density:

Permitted height: four storeys or 17.0 m

Proposed height and/or proposed density:

Proposed height: 60.0 m

Permitted Setbacks	**Front Yard**	2.7 m
	Side Yard	N/A
	Rear Yard	7.5 m

Proposed Setbacks	**Front Yard**	Please refer to Draft Zoning By-law
	Side Yard	
	Rear Yard	

Permitted Parking [please provide ratio and total e.g. 0.5/unit – 60 spaces]

1.0/unit = 132 spaces

Proposed Parking [please provide ratio and total e.g. 0.5/unit – 60 spaces]

0.6/unit = 79 spaces

If certain zoning provisions cannot be met, please explain why:

Amendments are required to accommodate the site-specific characteristics of the proposed development including setbacks, landscaping, height and parking. These are to be addressed through the amending Zoning By-law.

Disclosure of Information

Consent of Owner to the Disclosure of Application Information and Supporting Documentation

Application information is collected under the authority of the *Planning Act,* R.S.O. 1990, c. P.13. In accordance with that Act, it is the policy of the City of Hamilton to provide public access to all Design Review Panel applications and supporting documentation submitted to the City.

Darpel Investment Limited
c/o Philip Alaimo , the Owner, herby agree and acknowledge that the information
(Print Name of Owner)

contained in this application and any documentation, including reports, studies and drawings, provided in support of the application, by myself, my agents, consultants and solicitors, constitutes public information and will become part of the public record. As such, and in accordance with the provisions of the *Municipal Freedom of Information and Protection of Privacy Act,* R.S.O. 1990, c. M. 56, I hereby consent to the City of Hamilton making this application and its supporting documentation available to the general public, including copying and disclosing the application and its supporting documentation to any third party upon their request.

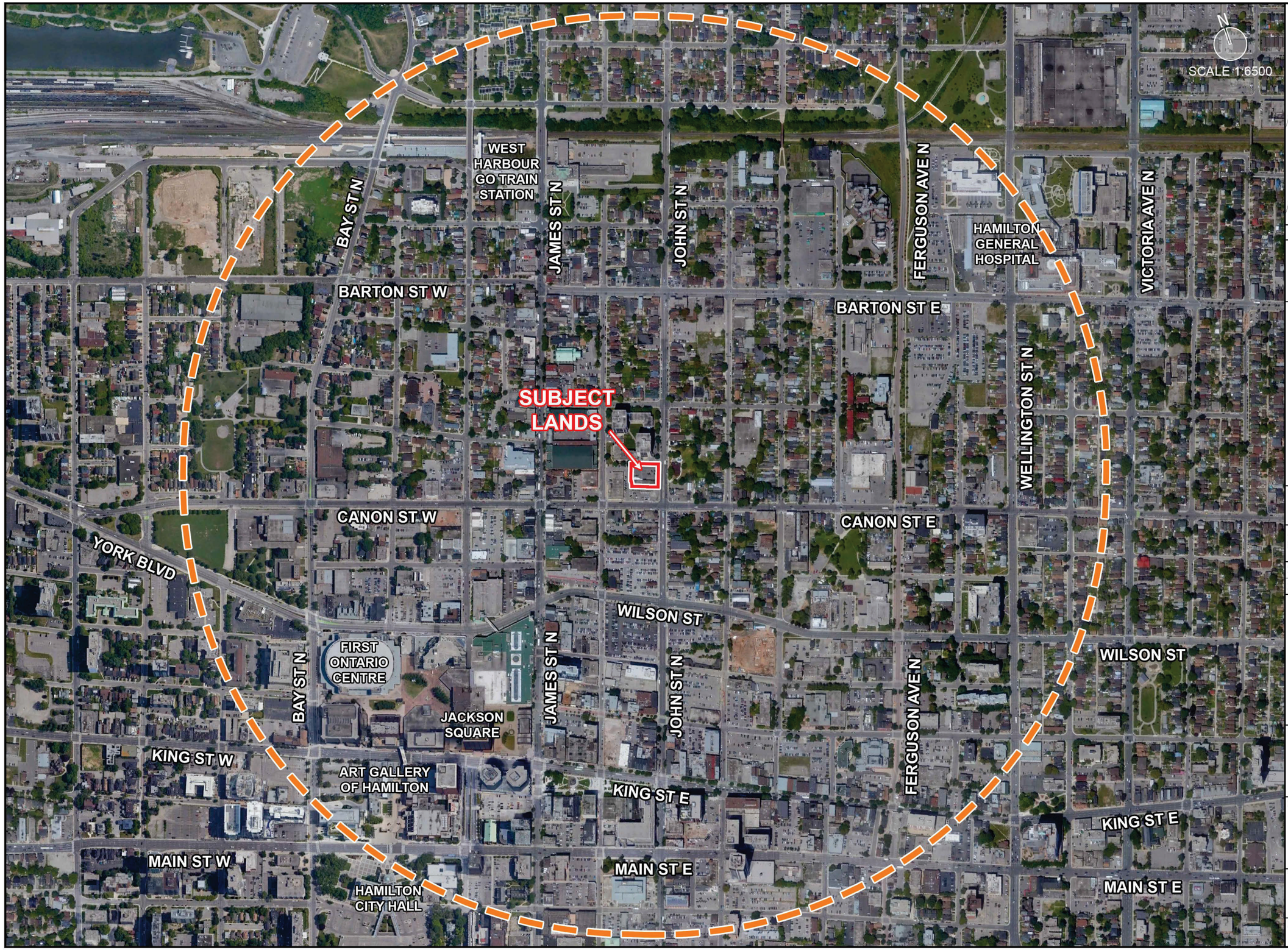
April 21st, 2023

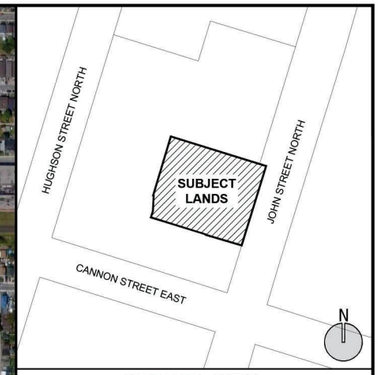
Date

Signature of Owner

NOTE 1: *Where owner or applicant is a corporation, the full name of the Corporation with name and title of signing officer must be set out.*

NOTE 2: *Design Review Panel meetings are public.*





KEY MAP - N.T.S.

SCALE 1:6500

METRES

0 50 100 200 300

LEGEND

SUBJECT LANDS

800m RADIUS

NOT FOR CONSTRUCTION
ISSUED FOR REVIEW & COMMENTS ONLY

NOTES:
ALL DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DESIGN BY: S. ERICKSON	CHECKED BY: M. JOHNSTON
DRAWN BY: S. ERICKSON	DATE: APRIL 18, 2023

URBAN SOLUTIONS
PLANNING & LAND DEVELOPMENT
3 STUDEBAKER PLACE, SUITE 1
HAMILTON, ON L8L 0C8
905-546-1087 - urbansolutions.info

PROJECT:

175 JOHN STREET NORTH
CITY OF HAMILTON

CLIENT:

DARPEL INVESTMENT LIMITED

TITLE:

CONTEXT PLAN

U/S FILE NUMBER:	SHEET NUMBER:
431-22	1

C:\Users\Stephen\Urban Solutions\Active Projects - Documents\431-22 - 175 John Street North\2 - Drawings\1 - UrbanSolutions\Context Plan\431-22 - Context Plan - 2023-04-18.dwg

Urban Design Brief:

175 John Street North

175 John Street North
Hamilton, Ontario

December, 2022

WHITEHOUSE URBAN DESIGN
LANDSCAPE ARCHITECTS & URBAN DESIGNERS

Prepared for:
Darpel Investments Limited

Prepared by:

WHITEHOUSE URBAN DESIGN
LANDSCAPE ARCHITECTS & URBAN DESIGNERS
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Hamilton, ON L8L 0C8
T (905) 546-1087

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SECTION 1

Introduction

1.1 Purpose of the Urban Design Brief

This Urban Design brief has been prepared in support of an application for an Official Plan and Zoning By-Law Amendment on behalf of Darpel Investments Limited., the registered owner of the lands municipally known as 175 John Street North in the City of Hamilton (referred to as "subject site").

The Subject Site is a 0.18-hectare parcel with street frontage on John Street North. The lands are currently occupied by a bakery. The subject site is proposed to include a new mid-high density residential development including a podium with parking available on 3 levels.

The proposed development features a 19-storey tower with 132 new residential units proposed on site. Both parking underground, at grade, and on the second level are proposed on site with a total of 79 parking spaces for residents. Along with vehicular parking spaces, the proposed development includes 70 bicycle parking spaces located underground and on the second floor of the building.

1.2 Site Context

The subject site is located within the central-west area of the Beasley neighborhood. As shown in Figure 1, the subject site is directly adjacent to the neighborhoods of North End East, Landsdale, Corktown, and Central.

The Beasley neighborhood is comprised of a range of uses and built forms. The southern boundary of Beasley runs along Main Street East and being in the downtown core, features many medium-to-high density developments, such as the tallest building in the City of Hamilton; Landmark Place. Main street East, which boarders Corktown neighborhood, is classified as the Urban growth Center of downtown Hamilton. The eastern edge of Beasley extends to wellington Street North and includes predominantly mixed-use low-to-medium density buildings, single detached dwellings and Institutional buildings, such as the Hamilton General Hospital. The northern edge of Beasley extends to the Canadian National Railway tracks and is primarily mixed-use low-to-medium density buildings and single detached dwellings. The western edge of Beasley abuts predominantly low-to-medium density buildings, with the highest densities typically found along James Street North consisting primarily of mixed-use medium density buildings.

The Beasley neighborhood is well serviced by bus routes given its location within the downtown core (see **Figure**

Figure 1 - Neighbourhoods Map

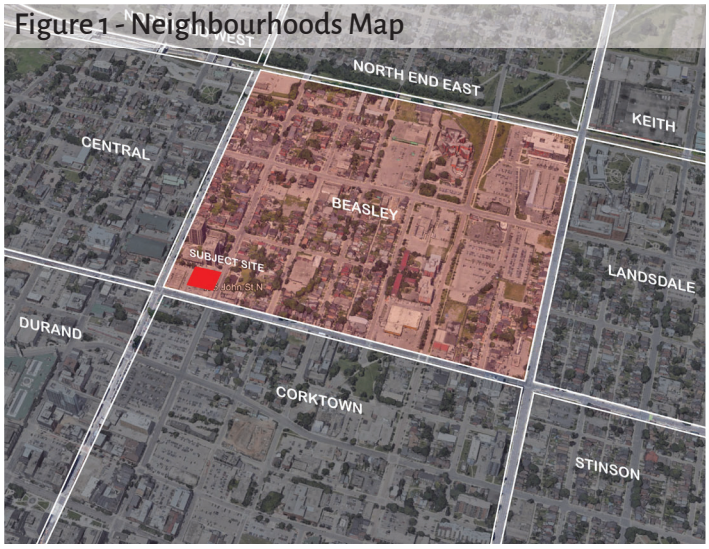


Figure 2 - HSR Route Map

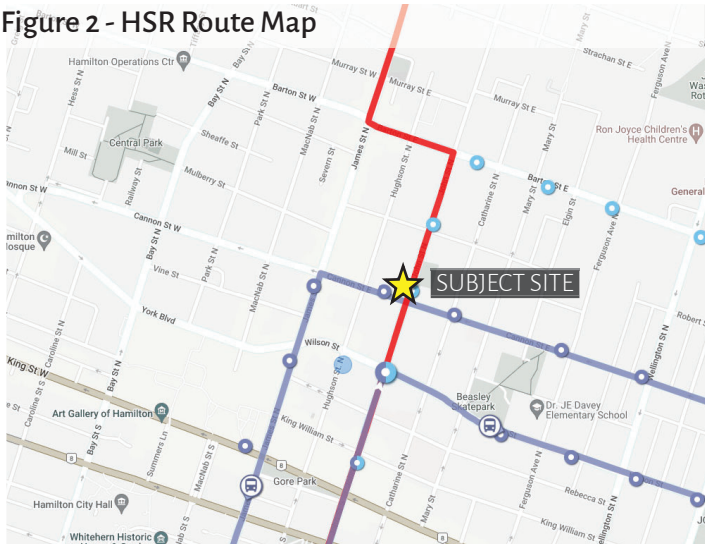
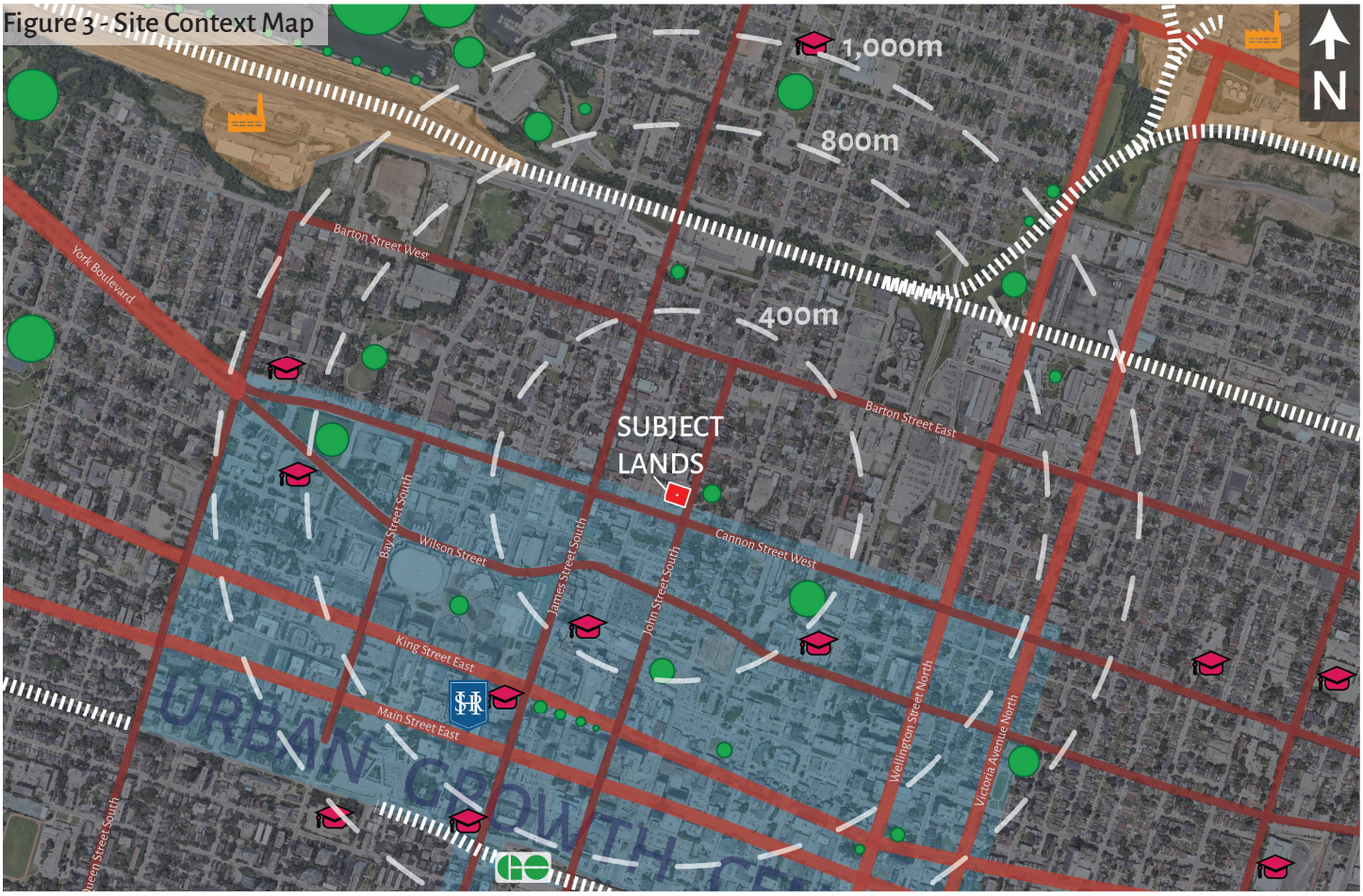


Figure 3 - Site Context Map



2). There are 4 bus stops conveniently located within 150 meters of the site. The 02 Barton Eastbound line has 2 stops within 150meters of the site and runs along John Street North and then extends east on Barton Street East. The 03 Cannon westbound has 2 stops within 150 meters and extends west on James Street North. The 20-A Line Express north and southbound has 4 bus stops within 200 meters of the site and services John Street North and James Street North.

A notable landmark within 1km of the Subject Site is the Hamilton GO Centre. The GO Centre fronts onto Hunter Street East and provides connection to both regional rail and regional busses. It is south of the subject site and is approximately a 15-minute walk, or a 5-minute bike ride. Due to the site's proximity to the Downtown Urban Growth Centre, servies and amenities are very accessible by means of public transit and active transportation.

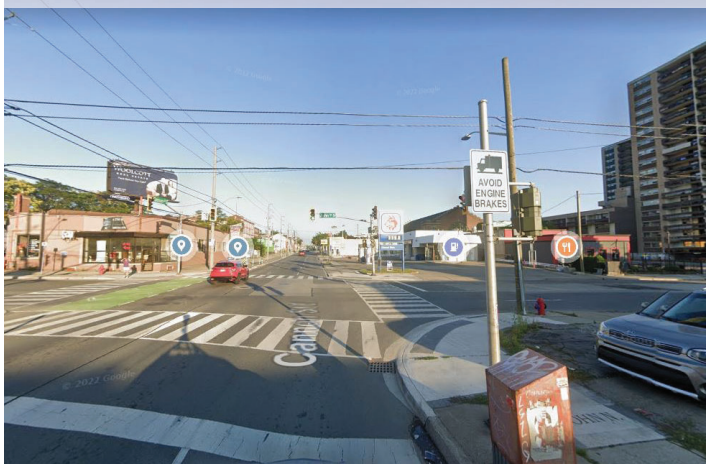
There are eight educational institutions and many green spaces within a 1km radius of the subject site. Directly across John Street North from the site is McLaren Park, featuring a playground for children which includes a slide, spring rider, trampoline, and swings. In the summer months, a splash pad, soccer field and a small paved ball hockey area are available. The park also includes water fountains and picnic tables to promote leisure activity.

Three of these green spaces are within an approximate 5-minute walk from the subject site and nine are within an approximate 10 to 12-minute walk, resulting in ample open space for future residents of the proposed development. Five educational institutions are within an approximate 10-minute walk from the subject site.

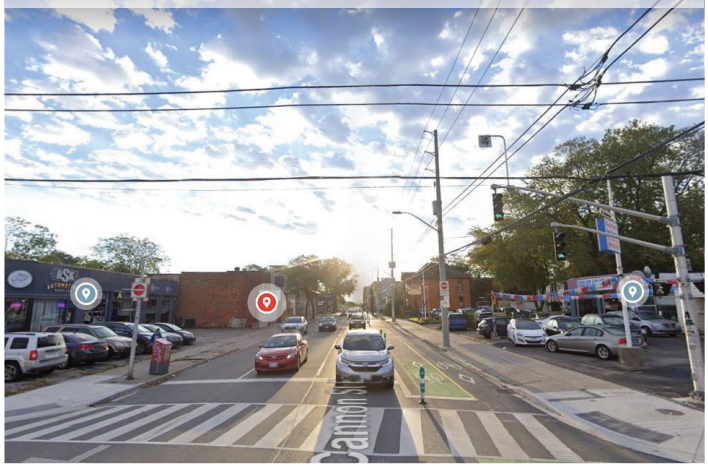
1.3 Streetscape Context

Cannon Street East: Cannon Street East runs parallel to the southern boundary of the site and is a one-way, minor arterial road which runs east-west, and provides on-street parking opportunities along the north side of the street. Cannon Street East is primarily mixed-use with low-medium density buildings of commercial and residential uses and single detached dwellings. Some institutional and commercial uses front onto Cannon Street with greater densities closer to James Street North. The pedestrian realm is made up of concrete sidewalks, sodded boulevards, and street trees.

View towards the west on Cannon Street East



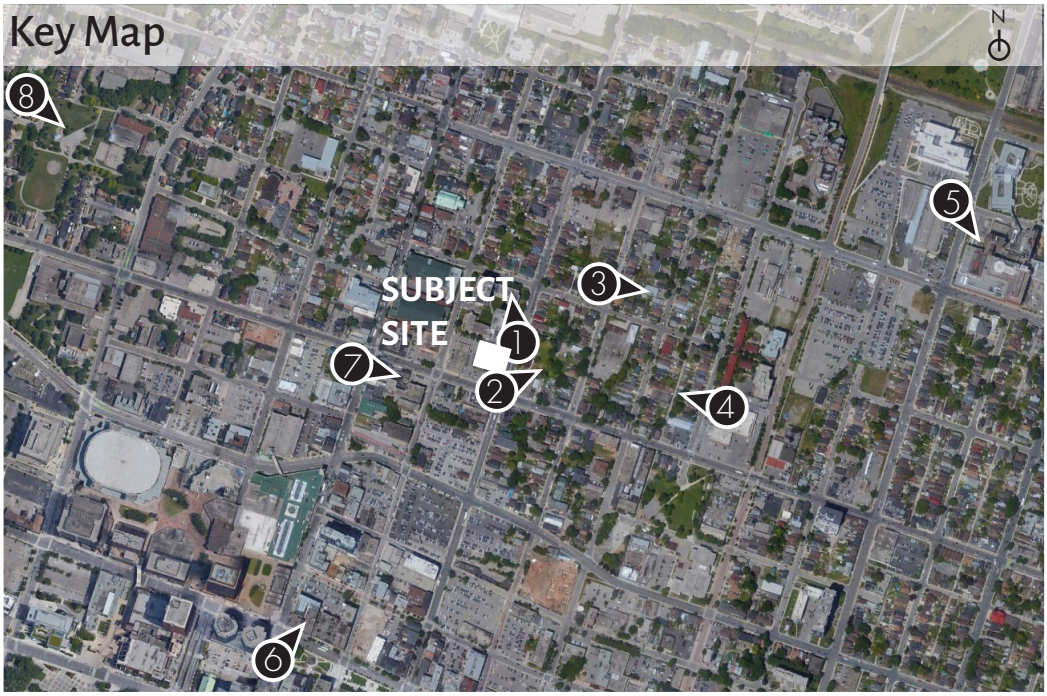
View towards the east on Cannon Street East



John Street North: John Street North borders the eastern side of the site and is a two-way, minor arterial road running north-south, with two lanes of traffic on either side and one lane on each side solely dedicated to parking. John street North is composed of various building types such as mixed use low-medium residential and commercial density buildings and single-detached dwellings. The pedestrian realm is made up of concrete sidewalks, sodded boulevards, and street trees.

View towards the north on John Street North

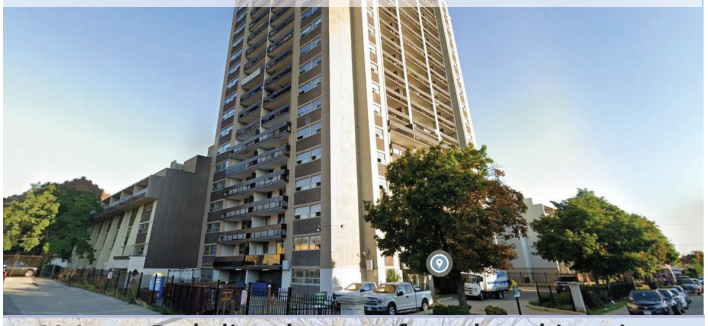
View towards the south on John Street North



North: The area north of the subject site is made up of a variety of uses and built-forms such as low-rise and mid-rise mixed-use residential and commercial buildings and single detached dwellings. Abutting the site's northern boundary are two 18-storey residential multiple-dwelling with underground parking entrances on both John Street North and Hughson Street North.

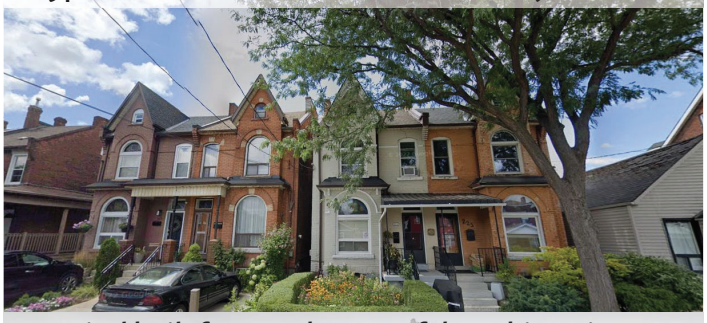
East: The area east of the subject site has a range of housing types including single-detached dwellings, townhouses, and mixed-use commercial and residential properties. However, the predominant built form of the lands east of the site are townhouses, semi-detached dwellings, and single detached dwellings. Two public parks are located east of the site, including McLaren Park and Beasley skate park. The Hamilton General and Ron Joyce Children's hospital are both located in the north-east area of the Beasley neighborhood.

1. High rise building abutting the site to the north

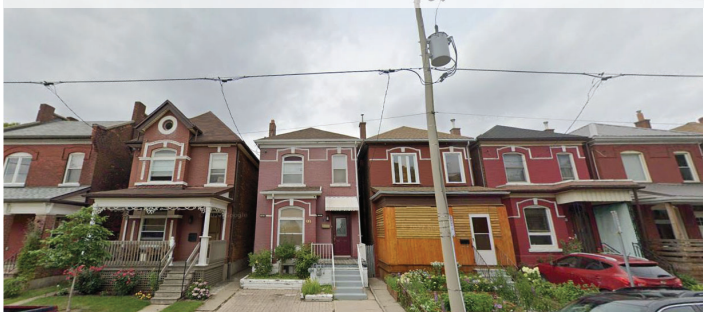


2. McLaren Park directly across from the subject site

3. Typical built form to the north of the subject site



4. Typical built form to the east of the subject site

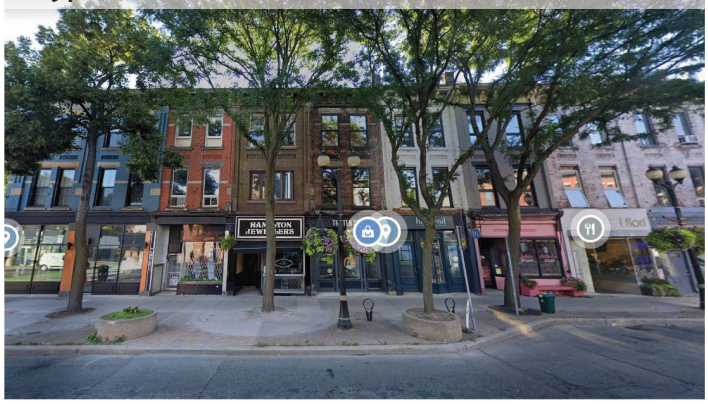


South: The lands south of the subject site are fully developed and are a part of the downtown Hamilton Urban Growth Centre. A variety of uses and built-forms exist to the south of the site, including the most notable building in Hamilton's skyline, Landmark Place, which fronts onto Catharine Street and Main Street. The downtown Urban Growth Centre provides many amenities for residents within the area.

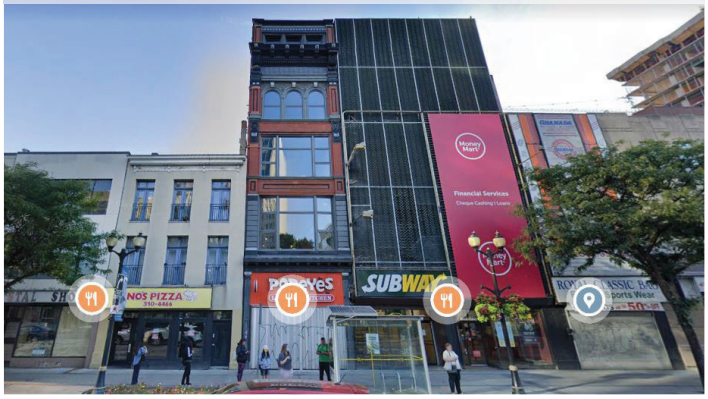
West: Continuing to the area west of the site is James Street North which includes high density mixed-use and commercial buildings within the downtown Hamilton Area. There are two public parks to the west of the site such as central park, which includes a newly updated playground and soccer field.

5. Hamilton General Hospital

7. Typical built form on James Street North



6. Typical built form to the south of the subject site



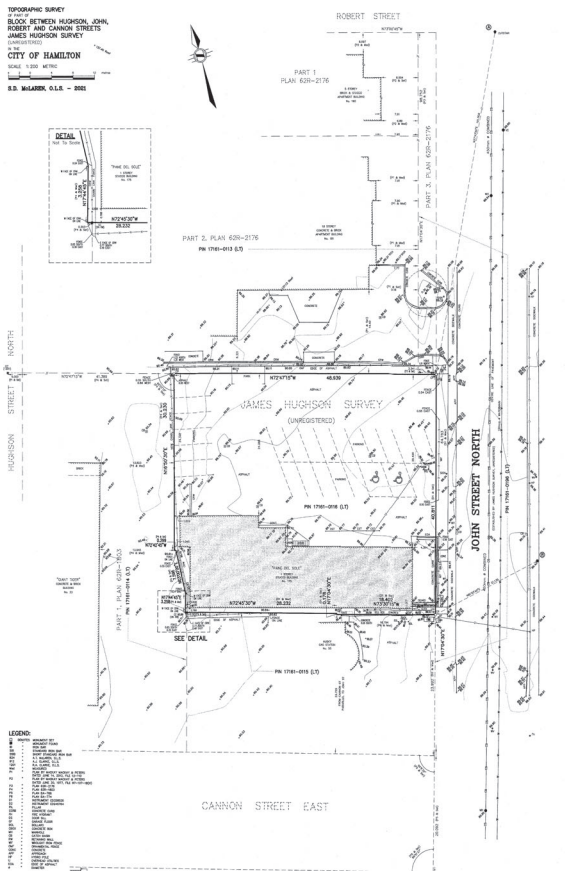
8. Central Park

1.4 Site Attributes & Limitations

Site Description and Location:
The site is in the Beasley neighbourhood, in the central-western area of lower Hamilton. Beasley is bordered by James Street North to the west, the Canadian National Railways to the north, Wellington Street North to the east, and Main Street East to the south. The Subject Site is a generally square shaped, 0.18 ha parcel with 40 m of frontage on John Street North.

Existing Topography and Vegetation:
The site contains a gradual slope from the streetline to the rear property line gradually increasing in elevation near the most south-western point on site. The difference in elevation from the streetline to the highest point on site is approximately 1.4m. The only vegetation on site is within a fenced-in outdoor patio of the Bakery, fronting John Street North and includes mostly low-to-medium deciduous shrubs.

Topographic Survey by A.T. McLaren Limited



Existing Buildings and Structures:
The southern portion of the +/- 0.49-acre (+/- 2,001 m2) site is currently developed with a two-storey commercial building occupied by Pane Del Sole Bakery. The buildings footprint is rectangular in shape with its main entrance to the Bakery off John Street North and a parking lot entrance facing John Street North.

The land slated to house the proposed development is currently occupied by the existing bakery and surface parking. The vacant land is also being partially used as a waste storage area for the existing building. A rusted chain link fence in poor condition runs along the west side of the site and a wrought iron fence surrounds the perimeter of the vacant property and the outdoor patio located in the front of the Bakery along John Street North.

There is also an existing sign for the Bakery on site, that includes a concrete base and Bollards located within the central-east area of the site.

Limited Developable Area: At an area of roughly 0.18 hectares, the small size of the parcel restricts the developability of the lands. However, this is combated through a design which makes the most efficient use of the parcel's shape and size.

Limited Parking: With limited area to develop on the site, parking has been accommodated both underground and in the 2-storey podium of the development concept. A reduction in required parking spaces is to be facilitated through the Zoning By-Law Amendment.

SECTION 2

Municipal Policy Review

2.1 The Urban Hamilton Official Plan (UHOP) Section B.3.3 - Urban Design Policies & Principles

The Urban Design principles for the proposed development are based on the applicable policies in B.3.3.2.3 through B.3.3.2.10 inclusive, which apply to all development and redevelopment. These principles include:

- fostering a sense of community pride and identity;
- visually connecting the public and private realms;
- making places safe, accessible, connected, and easy to navigate;
- creating communities that are transit supportive and promote active transportation;
- creating places that are adaptable to future demographic and environmental changes;
- encouraging innovative community design and technology;
- enhancing the character of the existing environment; and
- promoting compatible intensification that makes appropriate and innovative use of buildings and sites.

Urban Design Policies for Circulation, Site Organization, and Compatibility with Surrounding Context:

Urban design policies in Section B.3.3 applicable to **circulation** accomplish the above principles through:

- connecting buildings and spaces through an efficient, intuitive, and safe network of streets, roads, alleys, sidewalks, and pathways;
- providing connections and access to all buildings and places for all users, regardless of age and physical ability;
- integrating conveniently located public transit and cycling infrastructure with existing and new development;
- encouraging design that accommodates the changing physical needs of people and their lifestyles through all stages of their lives;
- connecting sidewalks to transit stops and shelters;
- locating transit stops and principal building entrances in close proximity to each other, where appropriate;
- locating service and storage areas away from streets so as to minimize disruption or conflicts with adjacent land uses and pedestrian routes, and screened as necessary from views from the public right-of-way;

Urban design policies in Section B.3.3 applicable to **site organization** accomplish the above principles through:

- organizing space in a logical manner through the design, placement, and construction of new buildings, streets, structures, and landscaping;
- creating places and spaces which are publicly visible and safe;
- locating surface parking to the sides or rear of sites or buildings, where appropriate; and
- service and loading areas shall be located away from streets so as to minimize disruption or conflicts with adjacent land uses and pedestrian routes and shall be screened as necessary from views from the public right-of-way;
- to create and enhance safe, attractive pedestrian oriented streetscapes, surface parking shall be discouraged, and parking located below grade or in parking structures shall be encouraged.

Urban design policies in Section B.3.3 applicable to **compatibility with surrounding context** accomplish the above principles through:

- respecting existing character, development patterns, built form and landscape;
- promoting quality design consistent with the locale and surrounding environment;
- conserving and respecting the existing built heritage

features of the City and its communities;
- demonstrating sensitivity toward community identity through an understanding of the character of a place, context and setting in both the public and private realm;
- recognizing that every new building or structure is part of a greater whole that contributed to the overall appearance and visual cohesiveness of the urban fabric;
- respecting the existing cultural and natural heritage features of the existing environment by re-using, adapting, and incorporating existing characteristics; and,
- encouraging development of complete and compact communities or neighbourhoods that contain a variety of land uses, transportation, recreational, and open space uses.

Urban design policies in Section B.3.3 applicable to **landscape design** accomplish the above principles through:

- contributing to the character and ambiance of the community through appropriate design of streetscapes and amenity areas;
- including transitional areas between the public and private spaces where possible through use of features such as landscaping, planters, porches, canopies, and/or stairs;
- adequate and accessible space for pedestrians, bicycles, as well as transit, other vehicles, and utilities;
- landscaping such as street trees and landscaped boulevards;
- service and loading areas shall be buffered to reduce visual and noise impacts, particularly when located adjacent to residential areas. Buffering methods should include berms, tree and shrub plantings, noise walls, fences, and/or the use of quality construction materials and methods;
- including a quality landscape edge along frontages where buildings are set back from the street;
- ensuring pedestrian walkways shall differ in material and appearance from driving surfaces, promoting safety and emphasizing pedestrian priority over vehicular traffic; and,
- providing landscaped walkways along buildings, particularly in areas with high levels of pedestrian traffic, and connecting walkways to other pedestrian routes on the site and links to pedestrian entry points at the street, and where appropriate to adjacent developments.

Urban design policies in Section B.3.3 applicable to **architectural design** accomplish the above principles through:

- ensuring building entrances are visible from the street and promoting shelter at entrance ways;
- creating transitions in scale to neighbouring buildings;
- including ample glazing on ground floors to create visibility to and from the public sidewalk;
- using design techniques, such as building step-backs, to maximize sunlight to pedestrian areas;
- achieving compact development and resulting built forms;
- using materials that are consistent and compatible with the existing surrounding context in the design of new buildings;
- encouraging innovative design of built forms and public spaces;

2.2 The Urban Hamilton Official Plan (UHOP) Section E.3 - Neighbourhoods Designation

The Site is designated "Neighbourhoods" in the Urban Hamilton Official Plan's Urban Structure and Urban Land Use Plan (See **Figures 4 & 5**). According to Section E.3.2.1, areas designated Neighbourhoods shall function as complete communities, including the full range of residential dwelling types and densities, as well as supporting uses intended to serve the local residents. E.3.1 The following goals apply to the Neighbourhoods land use designation:

E.3.1 The following goals apply to the Neighbourhoods land use designation.

E.3.1.1 Develop compact, mixed use, transit supportive, and active transportation friendly neighbourhoods;

E.3.1.4 Promote and support design which enhances and respects the character of existing neighbourhoods while at the same time allowing their ongoing evolution; and,

E.3.1.5 Promote and support residential intensification of appropriate scale and in appropriate locations throughout the neighbourhoods.

E.3.2.4 Residential intensification shall enhance and be compatible with the scale and character of the existing neighbourhood;

E.3.2.7 The City shall require quality urban and architectural design. Development of lands within the Neighbourhoods designation shall be designed to be safe, efficient, pedestrian oriented, and attractive, and shall comply with the following criteria:

a) New development on large sites shall support a grid system of streets of pedestrian scale, short blocks, street oriented structures, and a safe and attractive public realm.

b) Garages, parking areas, and driveways along the public street shall not be dominant. Surface parking between a building and a public street (excluding a public alley) shall be minimized.

c) Adequate and direct pedestrian access and linkages to community facilities/services and local commercial uses shall be provided.

d) Development shall improve existing landscape features and overall landscape character of the surrounding area.

e) Development shall comply with Section B.3.3 – Urban Design Policies and all other applicable policies.

E.3.2.8 Proposals for supporting uses, except local commercial uses, within the Neighbourhoods designation shall be evaluated on the following criteria:

a) compatibility with the surrounding area in terms of scale, massing, height, siting, orientation, setbacks, parking, and landscaping.

b) access to a collector or major or minor arterial road shall be preferred.

c) provision of adequate off-street parking with appropriate buffering and landscaping from residential uses.

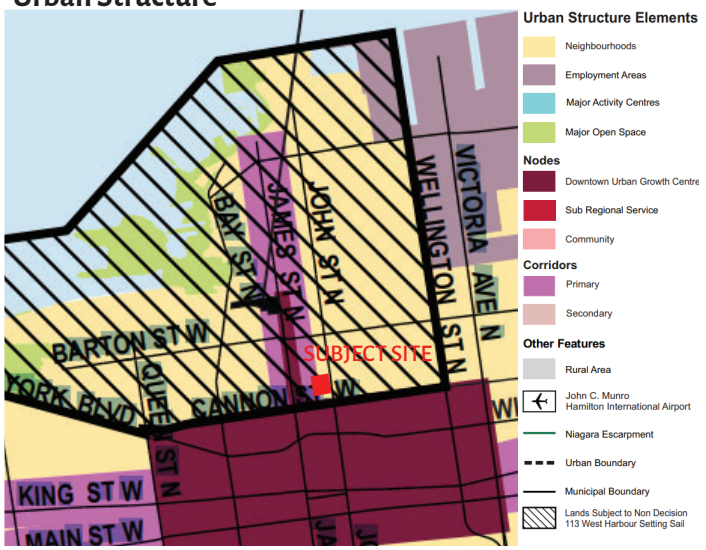
d) compliance with Section B.3.3 – Urban Design Policies and B.3.5 – Community Facilities/Services Policies.

e) adjacency and integration with parks to provide an attractive extension of parks and maximize the use of parkland facilities.

E.3.6.1 High density residential areas are characterized by multiple dwelling forms on the periphery of neighbourhoods in proximity to major or minor arterial roads.

E.3.6.4 High density residential uses shall be located

Figure 4 - Urban Hamilton Official Plan Schedule E Urban Structure



within safe and convenient walking distance of existing or planned community facilities/services, including public transit, schools, and active or passive recreational facilities.

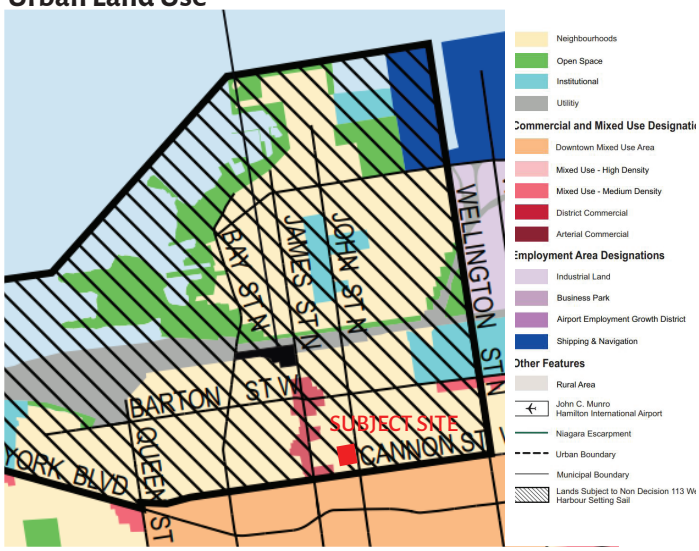
E.3.6.5 Proximity to the Downtown Urban Growth Centre, Sub-Regional Nodes or Community Nodes, and designated Employment Areas shall be considered desirable for high density residential uses.

E.3.6.7 High density residential areas are characterized by multiple dwelling forms in proximity to major or minor arterial roads. Development within the high density residential category shall be evaluated on the basis of the following criteria:

a) Developments should have direct access to a collector or major or minor arterial road.

b) High profile multiple dwellings shall not generally be permitted immediately adjacent to low profile residential uses. A separation distance shall generally be required and may be in the form of a suitable intervening land use, such as a medium density residential use. Where such separations cannot be achieved, transitional features such as effective screening and/or design features shall be incorporated into the design of the high density development to mitigate adverse impact on adjacent low profile residential uses.

Figure 5 - Urban Hamilton Official Plan Schedule E Urban Land Use



c) High profile development may be considered appropriate, subject to the other policies of this plan, where it would result in the preservation of natural heritage system features or public view corridors which may otherwise be compromised by more dispersed, lower profile development.

d) Development shall:

- provide adequate landscaping, amenity features, on site parking, and buffering where required;
- be compatible with existing and future uses in the surrounding area in terms of heights, massing, and an arrangement of buildings and structures; and
- provide adequate access to the property, designed to minimize conflicts between traffic and pedestrians both on-site and on surrounding streets.

e) In accordance with the policies of Section B.3.3 - Urban Design Policies, development shall contribute to an attractive public realm by minimizing the view of the following elements from the abutting public streets (excluding public alleys):

- surface parking areas;
- parking structures;
- utility and service structures such as garbage enclosures; and
- expanses of blank walls.

f) The City may require studies, in accordance with Chapter F - Implementation Policies, completed to the satisfaction of the City, to demonstrate that the height, orientation, design and massing of a building or structure shall not unduly overshadow, block light, or result in the loss of privacy of adjacent residential uses.

g) The orientation, design, and massing of a building or structure higher than six storeys shall take into account the impact on public view corridors and general public views of the area of the Niagara Escarpment, waterfront, and other parts of the City as identified through secondary plans or other studies.

2.3 The West Harbour "Setting Sail" Secondary Plan - Medium Density Residential Designation

The Site is designated "Medium Density Residential 1" in the Setting Sail Secondary Plan's General Land Use Plan (See **Figure 6**). According to the Secondary Plan Section A.6.3.3.1.13, the following policies apply to areas designated Medium Density Residential 1:

i) multiple dwellings are permitted;

ii) the density of development shall be in the range of 60 – 150 units per gross hectare;

iii) the height of buildings shall range from 3 to 5 storeys;

iv) existing grid patterns of streets, blocks and open spaces, and/or those proposed by this plan, shall be respected;

v) front yard setbacks shall be generally consistent with the setbacks of adjacent buildings;

vi) for streets where a road allowance widening is required, the setback under the zoning by-law must be taken from the widened road allowance;

vii) parking areas generally shall be provided at the rear of sites or underground, with access from public streets or laneways;

viii) direct driveway access to individual units, garages fronting public streets and front yard parking shall not be permitted;

ix) the main entrances to buildings shall face public streets;

x) private amenity space shall be provided on balconies and terraces, at the front or rear of individual ground-floor units, and/or within internal courtyards outdoors and indoors;

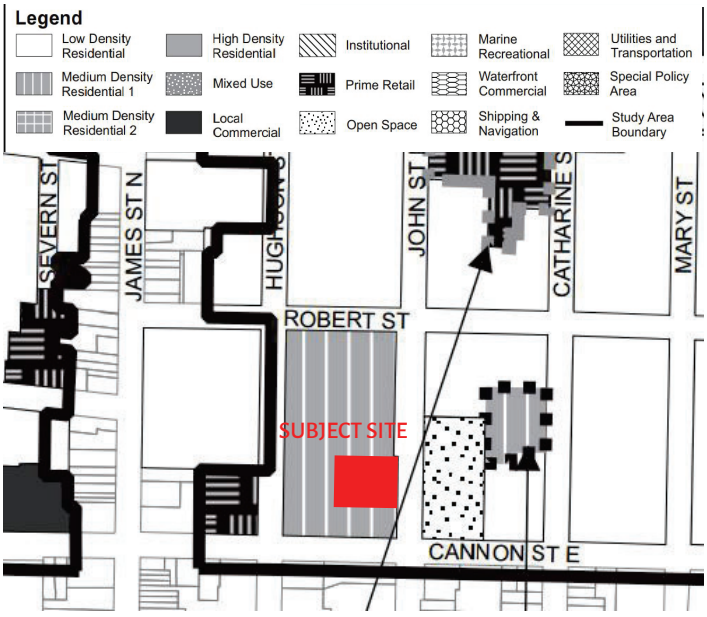
xi) common amenity space shall be consolidated on the site to create useable spaces;

xii) the design and massing of buildings shall minimize shadow and wind impacts on the public realm;

xiii) the design of new developments shall have respect for the light, views and privacy enjoyed by residents in adjacent buildings and areas; and,

xiv) approval of rezonings for new residential development within the Zone of Noise Influence, as delineated on Schedule "M-3", shall be contingent on submission of a "Noise and Vibration Study" to the satisfaction of City staff and the Ministry of the Environment and agreement by the proponent to implement the recommendations of the study.

Figure 6 - West Harbour Secondary Plan Schedule M-2 General Land Use



SECTION 3

Design Proposal

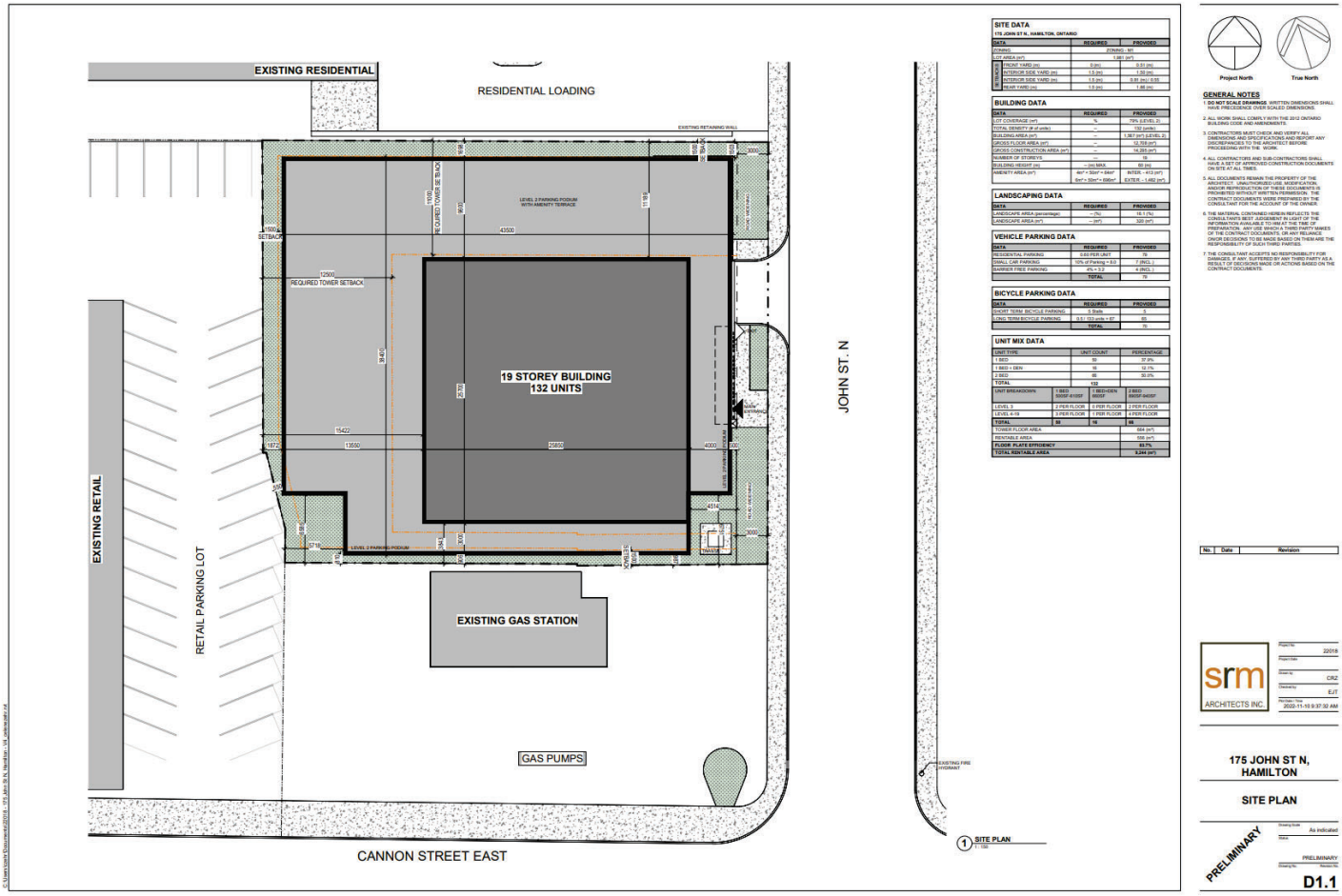
3.1 Site Organization and Circulation

3.1.1 Site Organization

The Urban Hamilton Official Plan encourages new developments to organize space in a way that animates its surroundings, visually connects the public and private realms, and promotes active transportation. The proposed development accomplishes these objectives and more through intuitive site organization that seeks to accommodate both pedestrian and automobile circulation. The proposed development consists of a 19-storey tower with a 2-storey podium containing above-ground parking opportunities, and a generally square-shaped footprint.

The 19-storey tower sits atop a 2-storey podium and is positioned centrally in the site. The footprint of the overall structure maximizes the buildable area within the parcel and contains aboveground and underground parking proposed for the site. Specifically, 2-storeys of aboveground parking and 1 level of underground parking is to be provided for a total count of 79. The proposal primarily consists of residential condominium units and features amenity space at-grade within the southeastern portion of the tower.

Site Plan - SRM Architects Inc.



3.1.2 Pedestrian Circulation

As a result of the design making efficient use of the parcel and maximizing the use of the building envelope, pedestrian circulation is straightforward and sensible. Access into the parking lot at-grade is facilitated by a sidewalk connecting to the public realm along John Street and is also facilitated at the rear of the base of the tower which keeps pedestrians away from the busier driving aisle entry. As illustrated below, the majority of pedestrian traffic has direct access into the first floor lobby of the tower through two front doors, with the route clearly demarcated through use of distinct pavers.

3.1.3 Vehicular Circulation

The majority of vehicular traffic entering the site is to be directed along a central driving aisle which will provide access to each proposed level of parking. The greatest volumes of vehicles are to be directed to the upper and lower levels, and a small portion of the traffic is to be directed into the parking spaces at-grade. A loading area is accessible at-grade from the central drive aisle and is located to facilitate easier entry and exit for loading vehicles, providing them with ample maneuvering and parking space. Two barrier-free parking spaces are provided at-grade and nearby the rear exit of the tower's first floor.

Figure 7 - Pedestrian

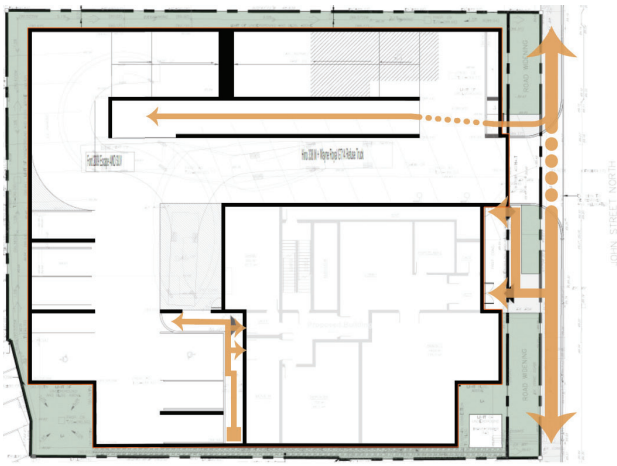
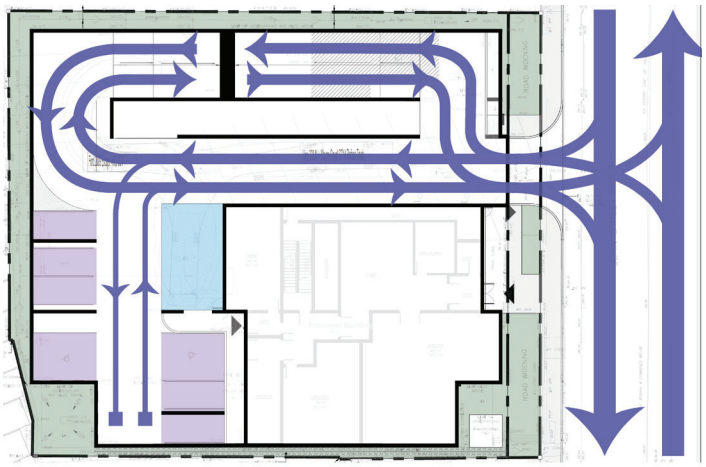


Figure 8 - Vehicular Circulation



3.2 Massing and Relationship to Context

3.2.1 Massing

The massing of the proposed development has been designed in a way to address the intersection of two important Minor Arterial roads of Cannon Street and John Street North, while providing step-backs on upper stories to convey lighter massing and a visual transition to surrounding uses. The scale of the proposal is in keeping with the surrounding context, as two 19-story buildings currently exist on the abutting lot to the north of the subject lands. Additionally, the subject lands straddle the Urban Growth Boundary to the south which is the City's primary location of growth, infill, and intensification, and as such, features the largest proportion of mid and high-rise buildings of any other area in the City.

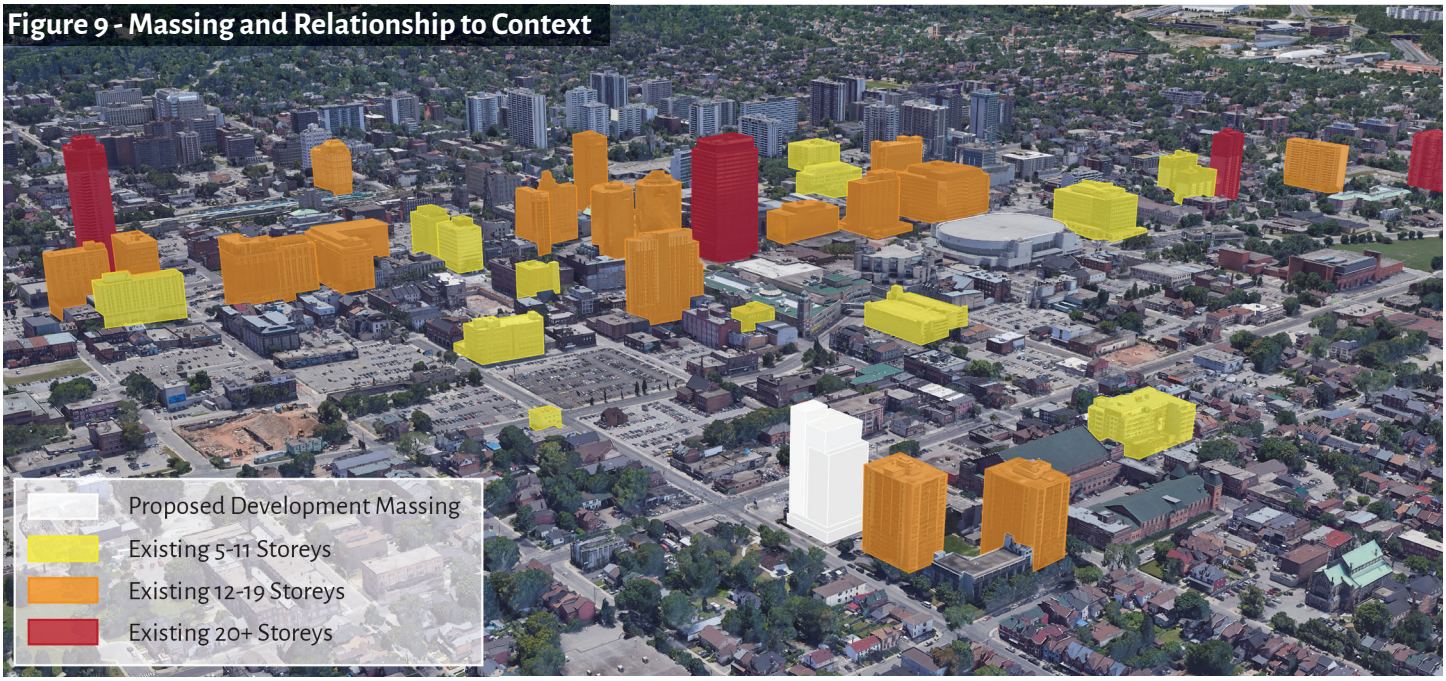
The proposal reaches a maximum floor height of 19 storeys (60 metres) at the tower's southeasternmost extent, and gently steps back at the 15th and 2nd storey. The step backs aid in ensuring that the proposal has a minimal impact on sunlight reaching the pedestrian realm. The implementation of different colours and materials within the architecture also help break up the massing and seamlessly integrate the entirety of the proposal into the surrounding area.

3.2.2 Compatibility with Surrounding Land Uses

In keeping with the character of the surrounding land uses, the proposed development seeks to introduce a mid-to-high rise building in a location within close proximity to the downtown Hamilton Urban Growth Boundary and adjacent to various high-rise towers. As shown in **figure 3,** the site is less than 400 metres from the downtown Hamilton Urban Growth Boundary.

The development is both consistent and compatible with the existing neighbourhood through the organization of site components and architectural treatments such as building stepbacks which mitigate negative impacts to the pedestrian realm. It provides additional density in a suitable area of the city, facilitated through the draft Official Plan and Zoning By-law Amendments prepared by UrbanSolutions. The site is very close to a wide variety of commercial and institutional services, and makes efficient use of vacant land in an existing high-density node within the City of Hamilton.

Figure 9 - Massing and Relationship to Context



3.3 Architectural Design

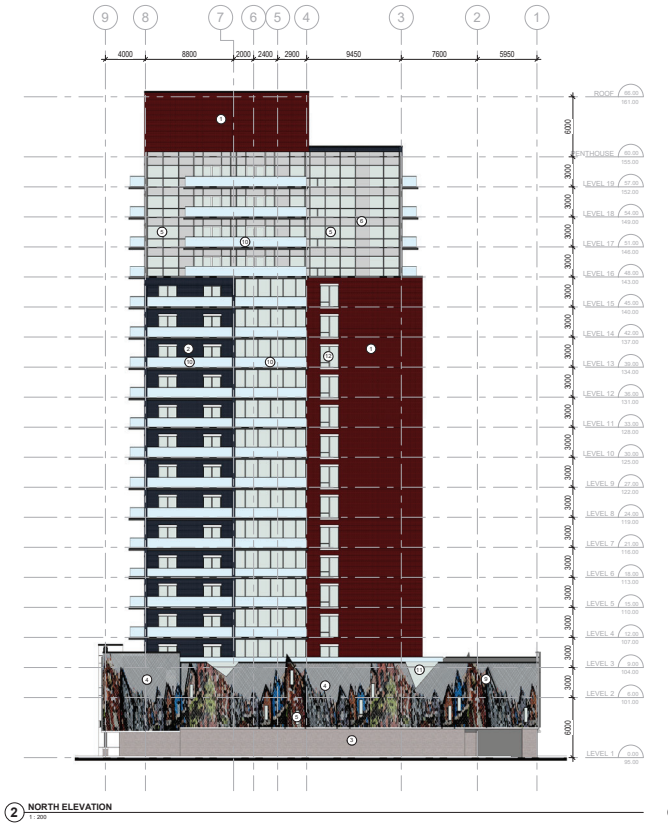
The proposed building is designed in a contemporary style that incorporates materiality found in neighbouring architecture. It is visually articulated with high quality materials such as brick, stone, metal, and glass along the building facade, creating variation in the design.

The building's perceived massing is reduced through the allocation of colours and cladding materials along the façade. The lower 2 storeys are comprised of a kinetic façade that is prevalent along all faces of the building and incorporates colours found within the existing architecture of the neighbourhood (see **Figure 10**).

The distribution of colours within the kinetic facade draws the eyes towards the lower storeys of the building and creates a more comfortable and inviting pedestrian experience along the building's frontage. Glazing is prevalent throughout all 4 sides of the building, and glazing at grade creates a visual emphasis around the buildings primary pedestrian entrance.

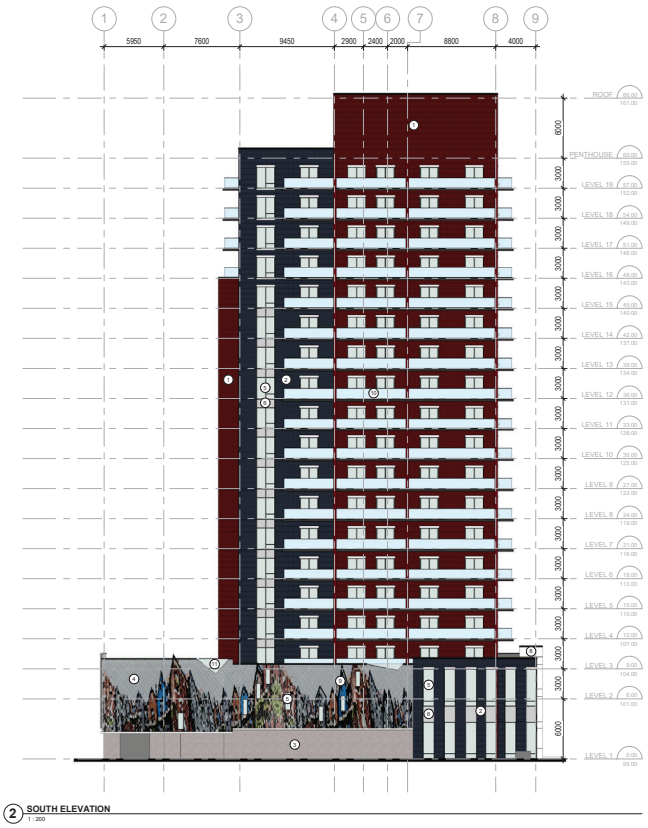
Upper storeys use red and grey brick to incorporate the architectural design of existing buildings into a modern look that promotes innovative design of built forms. The building facade prioritizes architectural interest while still ensuring the residential units are provided with ample sunlight and outdoor space.

Northern Elevation



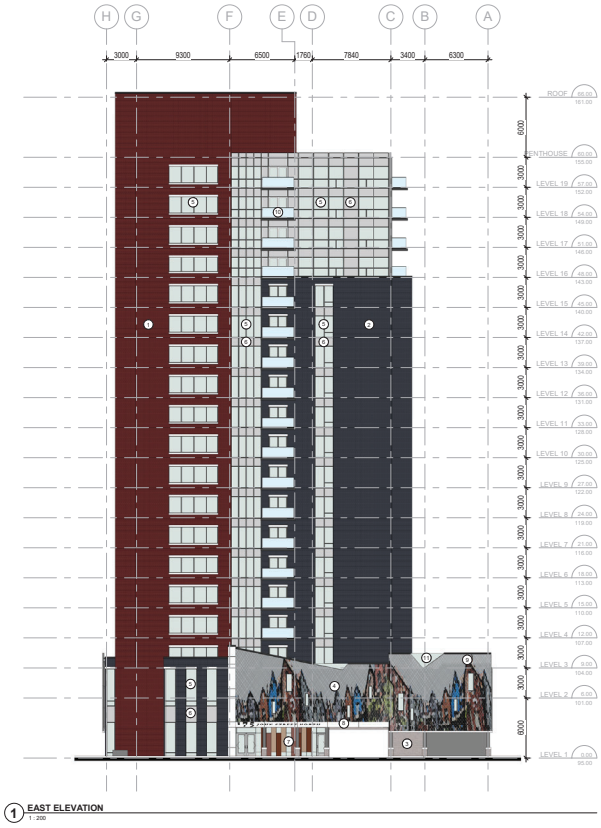
2 NORTH ELEVATION
1 : 200

Southern Elevation

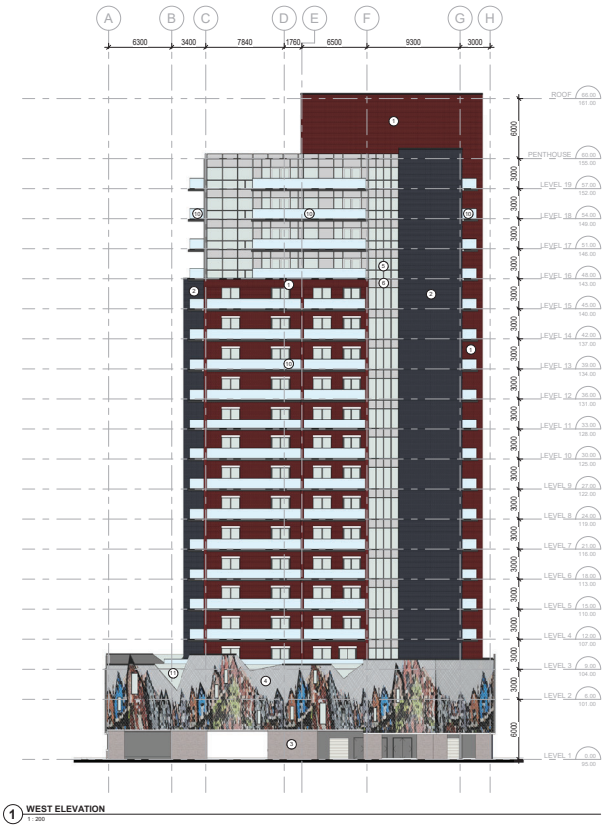


2 SOUTH ELEVATION
1 : 200

Eastern Elevation



Western Elevation



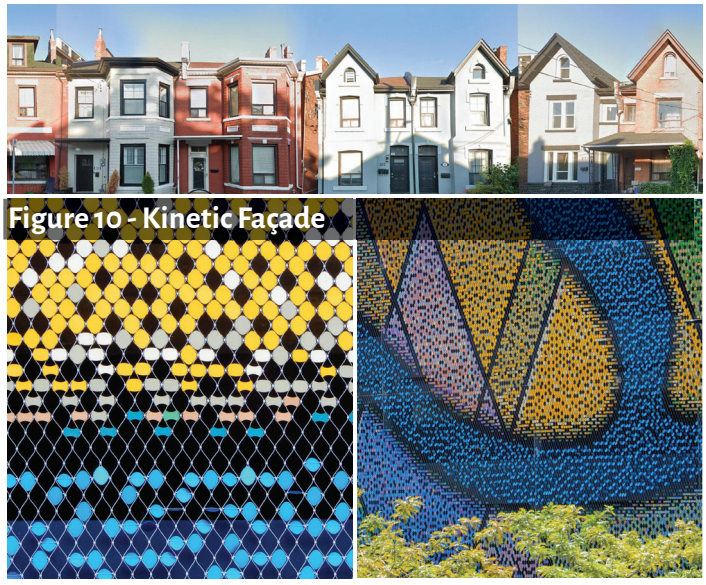


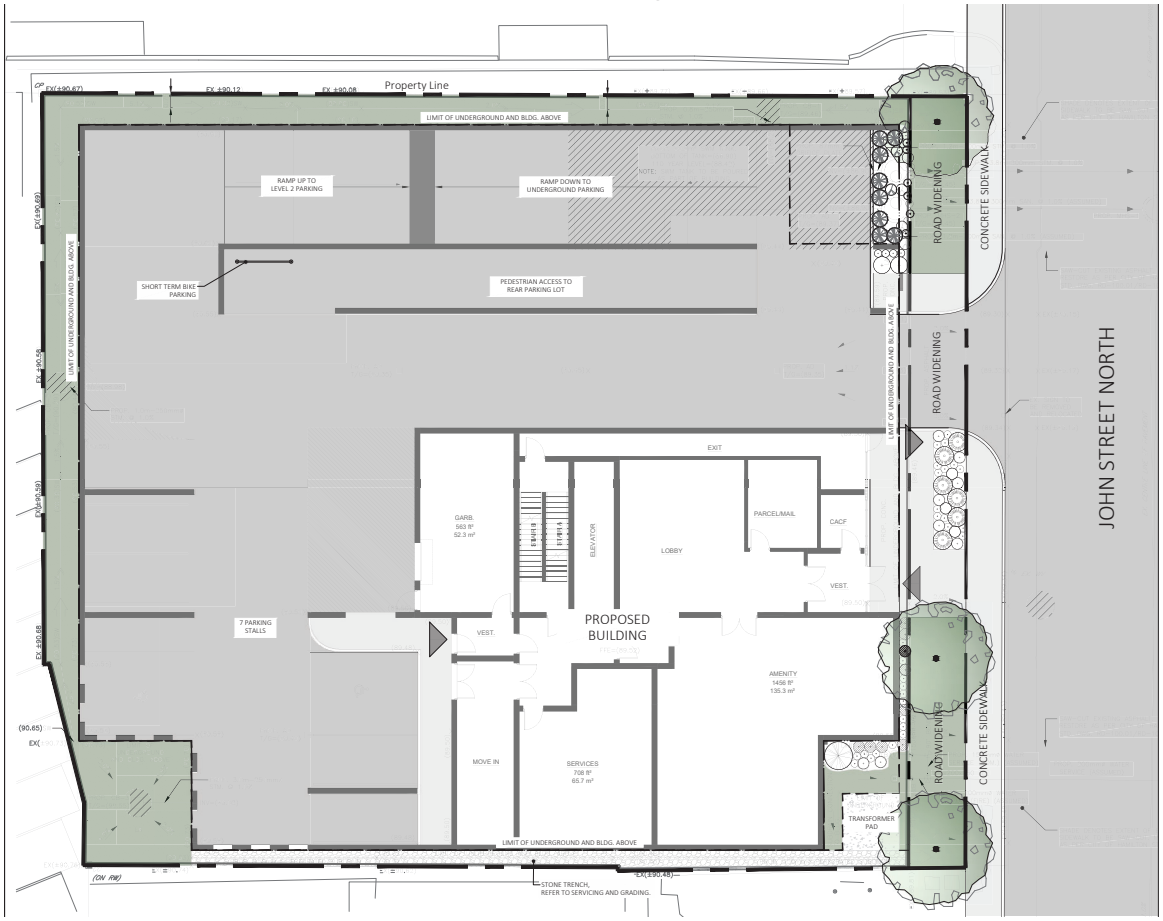
Figure 10 - Kinetic Façade

3.4 Landscape Design

The landscape of the proposed development is designed to encourage pedestrian connectivity at the public realm, promote accessibility, and direct pedestrians to and from the site safely. The proposed planting introduces a variety of coniferous and deciduous perennials, shrubs, and grasses which create diverse and colorful textures year-round. The street trees provide shade in the summertime.

The streetscape planting along the north-east side of the building utilizes tall coniferous shrubs to limit wind flow directly into the ground floor parking level. Perennials are planted along both the north-east and south-east side of the building to add colour and variety within the planting palette for all seasons. Small-to-Medium shrubs and ornamental grasses are planted against the building at the south-east side to maximize sun exposure into the building where there is proposed floor-to-ceiling glazing.

Conceptual Landscape Plan - Whitehouse Urban Design Inc.



SECTION 4

Analysis and Conclusion

4.1 Analysis of Proposal: Policy Reference and Design Response

4.1.1 Design Theme: Circulation

UHOP B.3.3.2.5 Places that are safe, accessible, connected and easy to navigate shall be created by connecting buildings and spaces through an efficient, intuitive, and safe network of streets, roads, alleys, sidewalks, and pathways;

The main pedestrian entrance to the building directly connects to an existing sidewalk that abuts the east side of the property on John Street North and extends south to Cannon Street East. The main pedestrian entrance is located on the eastern side of the building where the sidewalk is located to provide a sense of organization and safety across the pedestrian realm and create strong connections between the public and private areas.

UHOP B.3.3.2.5 Places that are safe, accessible, connected and easy to navigate shall be created by providing connections and access to all buildings and places for all users, regardless of age and physical ability;

All visitors and residents can access the site regardless of age and physical ability. Ramps on site are to be AODA compliant to provide barrier-free access, and 2 accessible parking spaces are provided at-grade, nearest to the ground floor lobby.

UHOP B.3.3.9.6 Transit access shall be enhanced by connecting sidewalks to transit stops and shelters;

The subject site directly connects to an existing sidewalk that runs along the frontage of the building where the main entrance is and extends along cannon street to bus stops servicing the Hamilton area. Bus stops and bike share terminals are located within 100 meters of the site.

UHOP B.3.3.7.1 Service and loading areas shall be located away from streets so as to minimize disruption or conflicts with adjacent land uses and pedestrian routes and shall be screened as necessary from views from the public right-of-way.

Service areas are located directly behind the building to minimize interference of public roads and pedestrian routes. Service and garbage areas are also hidden from the street-front to minimize disruption of the public realm. The loading area is located directly off of the main drive aisle and easily accessible for service vehicles.

4.1.2 Design Theme: Site Organization

UHOP B.3.3.2.4 Quality spaces physically and visually connect the public and private realms. Public and private development and redevelopment should create quality spaces by organizing space in a logical manner through the design, placement, and construction of new buildings, streets, structures, and landscaping;

The proposed development organizes the space in a way that integrates site elements such as pedestrian and vehicular circulation, limited surface parking, and landscaped open space. These elements come together harmoniously to provide a sense of organization and safety across the pedestrian realm and create strong connections between the public and private realms.

UHOP B.3.3.2.5 Places that are safe, accessible, connected and easy to navigate shall be created by creating places and spaces which are publicly visible and safe;

The proposed site design provides clear and unobstructed views into and out of the building and where the main building entrance is open and fully visible to the street, as encouraged by the principles of Crime Prevention Through Environmental Design (CPTED).

UHOP B.3.3.3.5 Built form shall create comfortable pedestrian environments by locating surface parking to the sides or rear of sites or buildings, where appropriate; and

7 parking spaces are to be located at-grade at the rear of the building and majority of the parking is to be located underground or on the second level to minimize disruption of pedestrian circulation at ground level.

UHOP B.3.3.10.1 To create and enhance safe, attractive pedestrian oriented streetscapes, surface parking shall be discouraged, and parking located below grade or in parking structures shall be encouraged.

Surface parking is limited for the proposed building providing 7 parking stalls to the rear of the parking garage and contained only at the rear of the site. Surface parking is screened from view of the street by the proposed parking garage and limited parking is provided behind the building at grade and away from the street front. Street parking is provided along John Street North and will remain after the site has been developed. The majority of the parking for the site is to be accommodated underground and on the second level.

4.1.3 Design Theme: Compatibility with Surrounding Context

UHOP B.3.3.2.3 respecting existing character, development patterns, built form and landscape;

The overall design of the building incorporates characteristics of the surrounding environment to maintain built form and unity within the neighbourhood by using similar materials, planting styles and colours.

UHOP B.3.3.2.3 Urban design should foster a sense of community pride and identity by promoting quality design consistent with the locale and surrounding environment;

The buildings, landscape, and overall layout of the proposed development are designed to high standards with quality materials and techniques, which complement and elevate the surrounding community. The site will be a modern node of the community and notably contribute to the community's identity city-wide.

UHOP B.3.3.2.4 Quality spaces physically and visually connect the public and private realms. Public and private development and redevelopment should create quality spaces by recognizing that every new building or structure is part of a greater whole that contributed to the overall appearance and visual cohesiveness of the urban fabric;

The buildings, landscape, and overall layout of the proposed development are consistent with the surrounding built form which consists primarly of mid and high-rise residential towers of various shapes and heights. The design's understanding of the community's character allows for it to be seamlessly integrated with minimal shortcomings.

UHOP B.3.3.2.6 Where it has been determined through the policies of this Plan that compatibility with the surrounding areas is desirable, new development and redevelopment should enhance the character of the existing environment by respecting the existing cultural and natural heritage features of the existing environment by re-using, adapting, and incorporating existing characteristics; and,

The proposed building respects existing characteristics of the surrounding environment by incorporating materials and colours within the neighbourhood, with the goal of creating a visually appealing design that incorporates both modern and existing features.

UHOP B.3.3.2.9 Urban design plays a significant role in the physical and mental health of our citizens. Community health and well-being shall be enhanced and supported through the following actions, by encouraging development of complete and compact communities or neighbourhoods that contain a variety of land uses, transportation, recreational, and open space uses.

Although the site is not particularly large in area, the space is used efficiently with a high-degree of organization and quality. The site facilitates active transportation through its provision of bike parking, a bike share node, and linkages to surrounding public transit and active transportation infrastructure. Through its facilitation of various methods of transportation and a focus on the use of its limited outdoor space, the site will help ensure negative mental health triggers are mitigated and promote healthier lifestyles for residents and visitors alike.

4.1.4 Design Theme: Architectural Design

UHOP B.3.3.2.4 Public and private development and redevelopment should create quality spac
UHOP B.3.3.2.5 Places that are safe, accessible, connected and easy to navigate shall be created by ensuring building entrances are visible from the street and promoting shelter at entrance ways;

Through the use pathways extending from the internal and external sidewalks, building entrances fronting onto the public Right-of-Way will be clearly visible. Entryways feature upgraded landscape treatment and architectural overhangs on upper storeys to promote shelter at entrance ways.

UHOP B.3.3.3.5 Built form shall create comfortable pedestrian environments by including ample glazing on ground floors to create visibility to and from the public sidewalk

The proposed architectural design provides ample glazing on the ground floors, creating visibility to and from the public sidewalk.

UHOP B.3.3.3.5 Built form shall create comfortable pedestrian environments by using design techniques, such as building step-backs, to maximize sunlight to pedestrian areas;

The built form of this proposal promotes pedestrian comfort through the implementation of many design techniques, notably building stepbacks, access to sunlight and shade, and careful consideration of the organization of the site, especially in high-traffic pedestrian areas.

UHOP B.3.3.2.4 Quality spaces physically and visually connect the public and private realms. Public and private development and redevelopment should create quality spaces by using materials that are consistent and compatible with the existing surrounding context in the design of new buildings;

The lower 2 storeys are comprised of a kinetic mesh that is prevalent along all faces of the building and incorporates colours found within the existing architecture of the neighbourhood.

4.1.5 Design Theme: Landscape Design

UHOP B.3.3.7.2 Service and loading areas shall be buffered to reduce visual and noise impacts, particularly when located adjacent to residential areas. Buffering methods should include berms, tree and shrub plantings, noise walls, fences, and/or the use of quality construction materials and methods.

Landscape areas along the street front are designed to contain and minimize noise to and from the parking garage through visual buffers such as dense coniferous shrubs. The landscape buffer will provide more greenery to the site as well as visually buffering the inside of the parking garage, thus creating a semi-private open space between the public and private realms, while not limiting views.

UHOP B.3.3.3.5 Built form shall create comfortable pedestrian environments by including a quality landscape edge along frontages where buildings are set back from the street;

The design proposes a consistent landscaped edge along the frontage of John Street North. Planting has been selected in specific areas to minimize direct wind flow into the site and front of the building, while also maintaining views out to the street front. Building setbacks from the public Right-of-Ways also remain relatively consistent along the frontage of the proposal.

UHOP B.3.3.9.3 To ensure safety and promote their priority over vehicular traffic, pedestrian walkways shall differ in material and appearance from driving surfaces.

The proposed development features different types of paving to clearly demarcate pedestrian pathways from vehicular driveways. Sidewalks are continuous across the entrances to the underground garage to prioritize pedestrians where there are vehicles entering the site.

UHOP B.3.3.9.4 Landscaped walkways shall be provided along buildings, particularly in areas with high levels of pedestrian traffic. Walkways shall be connected to other pedestrian routes on the site and linked to pedestrian entry points at the street, and where appropriate to adjacent developments.

The main pedestrian entrance directly connects to an existing sidewalk that extends south to cannon street east and north to Robert Street. The main entrance is also directly adjacent to McLaren park on John Street North.

4.2 Conclusion

From an urban design perspective, the proposed development complies with policies in the Urban Hamilton Official Plan. The project relates to its role in the urban context by locating a beautiful mid-to-high-rise building within a community that provides access to a variety of amenities to support future residents. The architecture enhances the public realm through elegant design that picks up on building materials used in the surrounding neighbourhood.

Through the full Site Plan Review process, the details of the project design will be finalized, ensuring the implementation of the urban design policies in the Urban Hamilton Official Plan. Please also refer to the Planning Justification Report prepared by Urban Solutions Planning and Land Development Consultants.

GENERAL NOTES

1. **DO NOT SCALE DRAWINGS**. WRITTEN DIMENSIONS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS.
2. ALL WORK SHALL COMPLY WITH THE 2012 ONTARIO BUILDING CODE AND AMENDMENTS.
3. CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND SPECIFICATIONS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.
4. ALL CONTRACTORS AND SUB-CONTRACTORS SHALL HAVE A SET OF APPROVED CONSTRUCTION DOCUMENTS ON SITE AT ALL TIMES.
5. ALL DOCUMENTS REMAIN THE PROPERTY OF THE ARCHITECT. UNAUTHORIZED USE, MODIFICATION, AND/OR REPRODUCTION OF THESE DOCUMENTS IS PROHIBITED WITHOUT WRITTEN PERMISSION. THE CONTRACT DOCUMENTS WERE PREPARED BY THE CONSULTANT FOR THE ACCOUNT OF THE OWNER.
6. THE MATERIAL CONTAINED HEREIN REFLECTS THE CONSULTANTS BEST JUDGEMENT IN LIGHT OF THE INFORMATION AVAILABLE TO HIM AT THE TIME OF PREPARATION. ANY USE WHICH A THIRD PARTY MAKES OF THE CONTRACT DOCUMENTS, OR ANY RELIANCE ON/OR DECISIONS TO BE MADE BASED ON THEM ARE THE RESPONSIBILITY OF SUCH THIRD PARTIES.
7. THE CONSULTANT ACCEPTS NO RESPONSIBILITY FOR DAMAGES, IF ANY, SUFFERED BY ANY THIRD PARTY AS A RESULT OF DECISIONS MADE OR ACTIONS BASED ON THE CONTRACT DOCUMENTS.

No.	Date	Revision

srm ARCHITECTS INC.

Project No 22018
Project Date 2022-11-18
Drawn by CRZ
Checked by EJT
Plot Date / Time 2022-11-18 12:35:17 PM

175 JOHN ST N, HAMILTON

RENDERINGS

PRELIMINARY

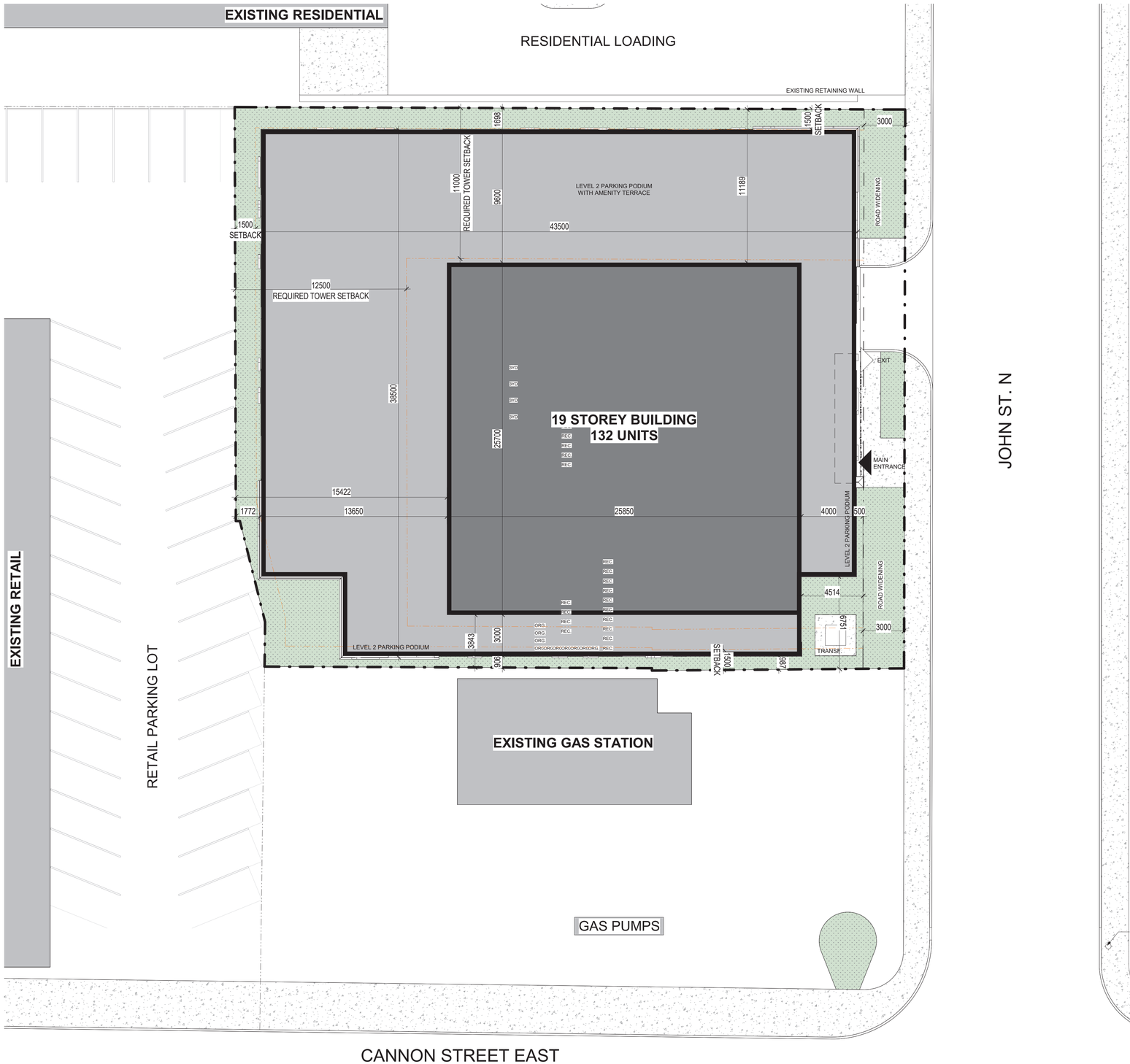
Drawing Scale
Status PRELIMINARY
Drawing No. D3.3
Revision No.

C:\Users\czeln\Documents\22018 - 175 John St N, Hamilton - V4_celenezehr.rvt

PERSPECTIVE DRAWINGS - PREPARED BY SRM ARCHITECTS

LOOKING SOUTHWEST AT 175 JOHN STREET NORTH

LOOKING NORTHWEST AT 175 JOHN STREET NORTH



1 SITE PLAN
1 : 150

SITE DATA

175 JOHN ST N., HAMILTON, ONTARIO

DATA		REQUIRED	PROVIDED
ZONING		ZONING - M1	
LOT AREA (m²)		1,981 (m²)	
SETBACKS	FRONT YARD (m)	0 (m)	0.51 (m)
	INTERIOR SIDE YARD (m)	1.5 (m)	1.50 (m)
	INTERIOR SIDE YARD (m)	1.5 (m)	0.81 (m) / 0.55
	REAR YARD (m)	1.5 (m)	1.86 (m)

BUILDING DATA

DATA	REQUIRED	PROVIDED
LOT COVERAGE (m²)	%	79% (LEVEL 2)
TOTAL DENSITY (# of units)	--	132 (units)
BUILDING AREA (m²)	--	1,567 (m²) (LEVEL 2)
GROSS FLOOR AREA (m²)	--	12,708 (m²)
GROSS CONSTRUCTION AREA (m²)	--	14,322 (m²)
NUMBER OF STOREYS	---	19
BUILDING HEIGHT (m)	-- (m) MAX.	60 (m)
AMENITY AREA (m²)	4m² < 50m² = 64m² 6m² > 50m² = 696m²	INTER. - 413 (m²) EXTER. - 1,482 (m²)

LANDSCAPING DATA

DATA	REQUIRED	PROVIDED
LANDSCAPE AREA (percentage)	-- (%)	16.1 (%)
LANDSCAPE AREA (m²)	-- (m²)	320 (m²)

VEHICLE PARKING DATA

DATA	REQUIRED	PROVIDED
RESIDENTIAL PARKING	0.60 PER UNIT	79
SMALL CAR PARKING	10% of Parking = 8.0	7 (INCL.)
BARRIER FREE PARKING	4% = 3.2	4 (INCL.)
	TOTAL	79

BICYCLE PARKING DATA

DATA	REQUIRED	PROVIDED
SHORT TERM BICYCLE PARKING	5 Stalls	5
LONG TERM BICYCLE PARKING	0.5 / 133 units = 67	65
	TOTAL	70

UNIT MIX DATA

UNIT TYPE	UNIT COUNT	PERCENTAGE
1 BED	50	37.9%
1 BED + DEN	16	12.1%
2 BED	66	50.0%
TOTAL	**132**	

UNIT BREAKDOWN	1 BED 500SF-610SF	1 BED+DEN 660SF	2 BED 890SF-940SF
LEVEL 3	2 PER FLOOR	0 PER FLOOR	2 PER FLOOR
LEVEL 4-19	3 PER FLOOR	1 PER FLOOR	4 PER FLOOR
TOTAL	**50**	**16**	**66**

TOWER FLOOR AREA	664 (m²)
RENTABLE AREA	556 (m²)
FLOOR PLATE EFFICIENCY	**83.7%**
TOTAL RENTABLE AREA	**9,244 (m²)**

Project North

True North

GENERAL NOTES

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No.	Date	Revision

srm ARCHITECTS INC.

Project No	22018
Project Date	2022-11-18
Drawn by	CRZ
Checked by	EJT
Plot Date / Time	2022-12-12 12:54:17 PM

175 JOHN ST N, HAMILTON

SITE PLAN

PRELIMINARY

Drawing Scale	As indicated
Status	PRELIMINARY
Drawing No.	Revision No.
	D1.1

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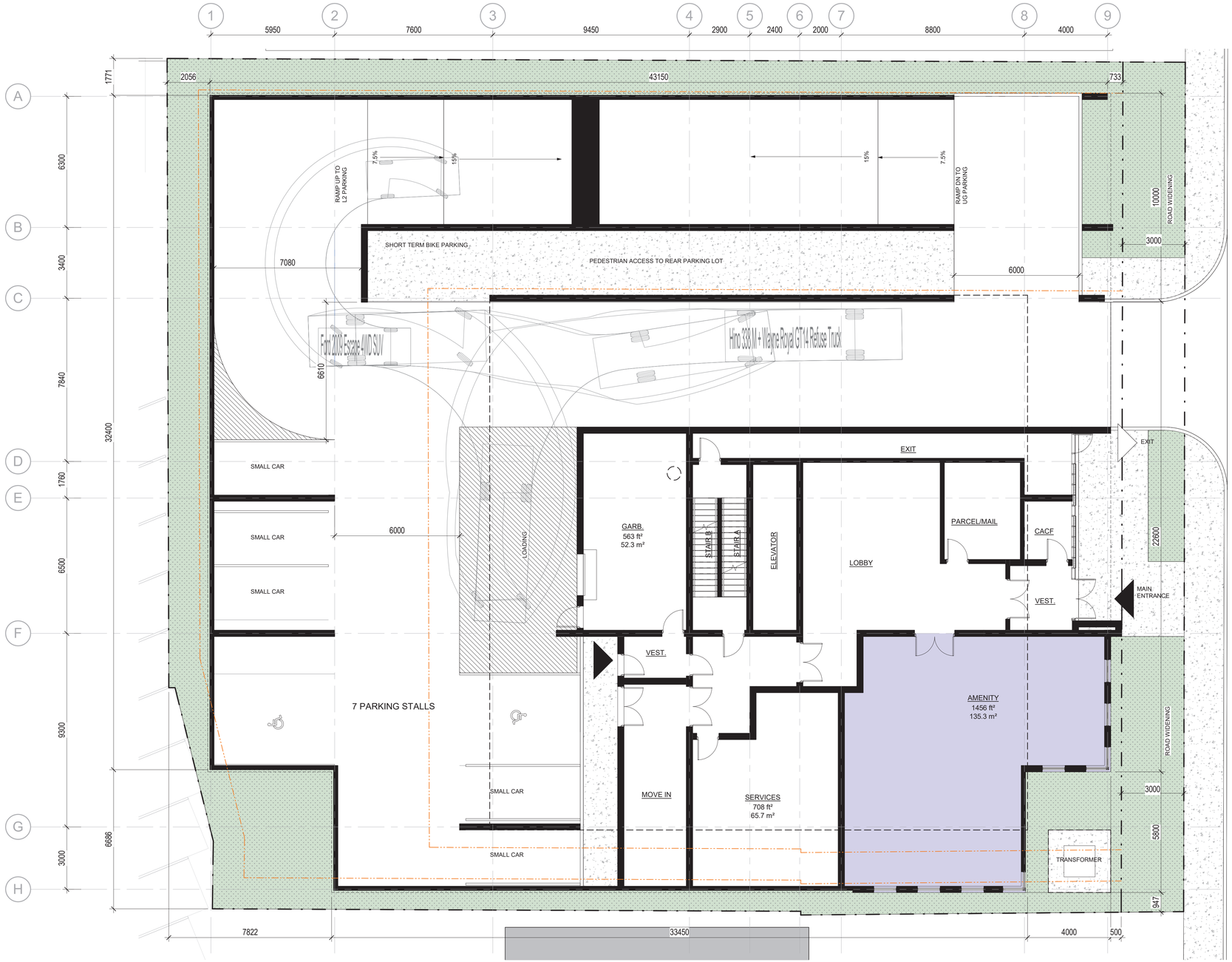
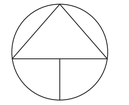


1 **LEVEL 1 / SITE PLAN**
1 : 100



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No.	Date	Revision

srm ARCHITECTS INC.

Project No	22018
Project Date	
Drawn by	CRZ
Checked by	EJT
Plot Date / Time	2022-11-10 9:37:33 AM

175 JOHN ST N, HAMILTON

LEVEL 1 / SITE PLAN

PRELIMINARY

Drawing Scale	1 : 100
Status	PRELIMINARY
Drawing No.	Revision No.

D2.1

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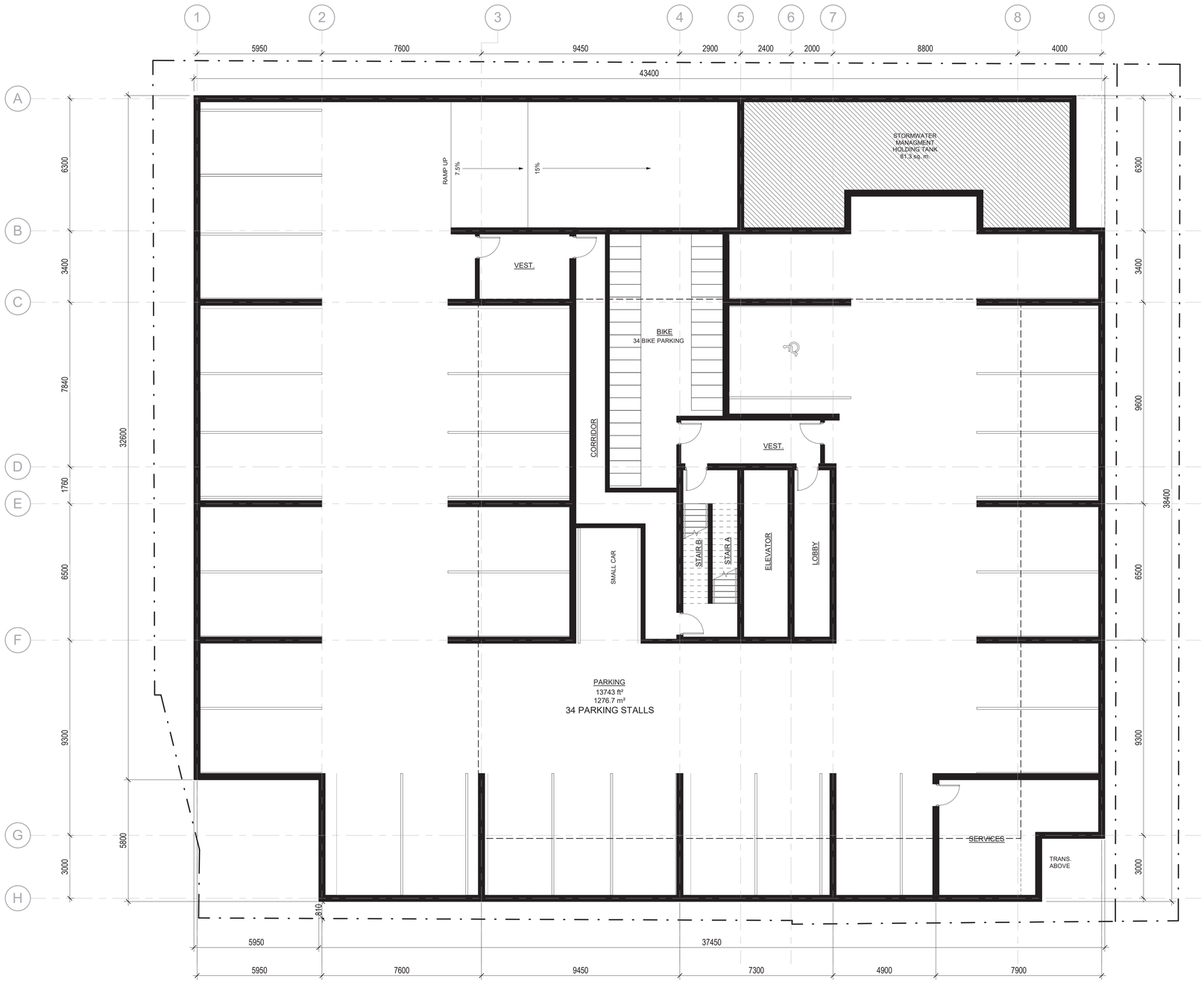

1 **UNDERGROUND**
1 : 100

Project North

True North

GENERAL NOTES

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srm ARCHITECTS INC.

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Checked by	EJT
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175 JOHN ST N, HAMILTON

UG PARKING LEVEL

PRELIMINARY

Drawing Scale	1 : 100
Status	PRELIMINARY
Drawing No.	Revision No.
	D2.2

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1 **LEVEL 2**
1 : 100

Project North

True North

GENERAL NOTES

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No.	Date	Revision

srm ARCHITECTS INC.

Project No: 22018
Project Date:
Drawn by: CRZ
Checked by: EJT
Plot Date / Time: 2022-11-10 9:37:34 AM

175 JOHN ST N, HAMILTON

LEVEL 2 PARKING

PRELIMINARY

Drawing Scale: 1 : 100
Status: PRELIMINARY
Drawing No.: D2.3
Revision No.:

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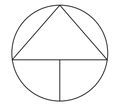
1 **LEVEL 3**
1 : 100



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No.	Date	Revision

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Project No 22018
Project Date
Drawn by CRZ
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Plot Date / Time 2022-10-31 4:31:22 PM

175 JOHN ST N, HAMILTON

LEVEL 3

PRELIMINARY

Drawing Scale 1 : 100
Status PRELIMINARY
Drawing No. D2.4
Revision No.

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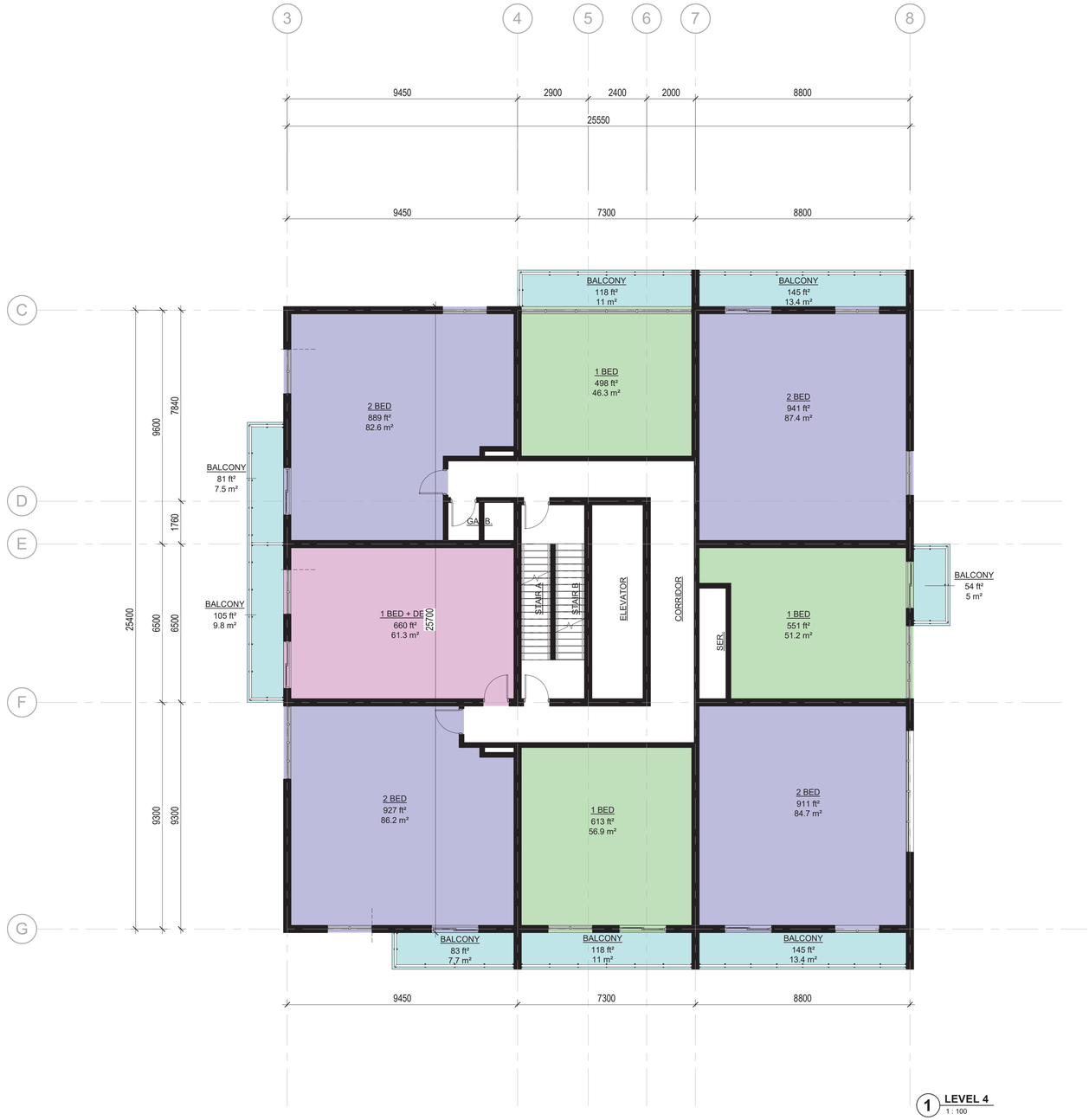

1 LEVEL 4
1 : 100

Project North

True North

GENERAL NOTES

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srm ARCHITECTS INC.

Project No 22018
Project Date
Drawn by CRZ
Checked by EJT
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175 JOHN ST N, HAMILTON

LEVEL 4-19

PRELIMINARY

Drawing Scale 1 : 100
Status PRELIMINARY
Drawing No. D2.5
Revision No.

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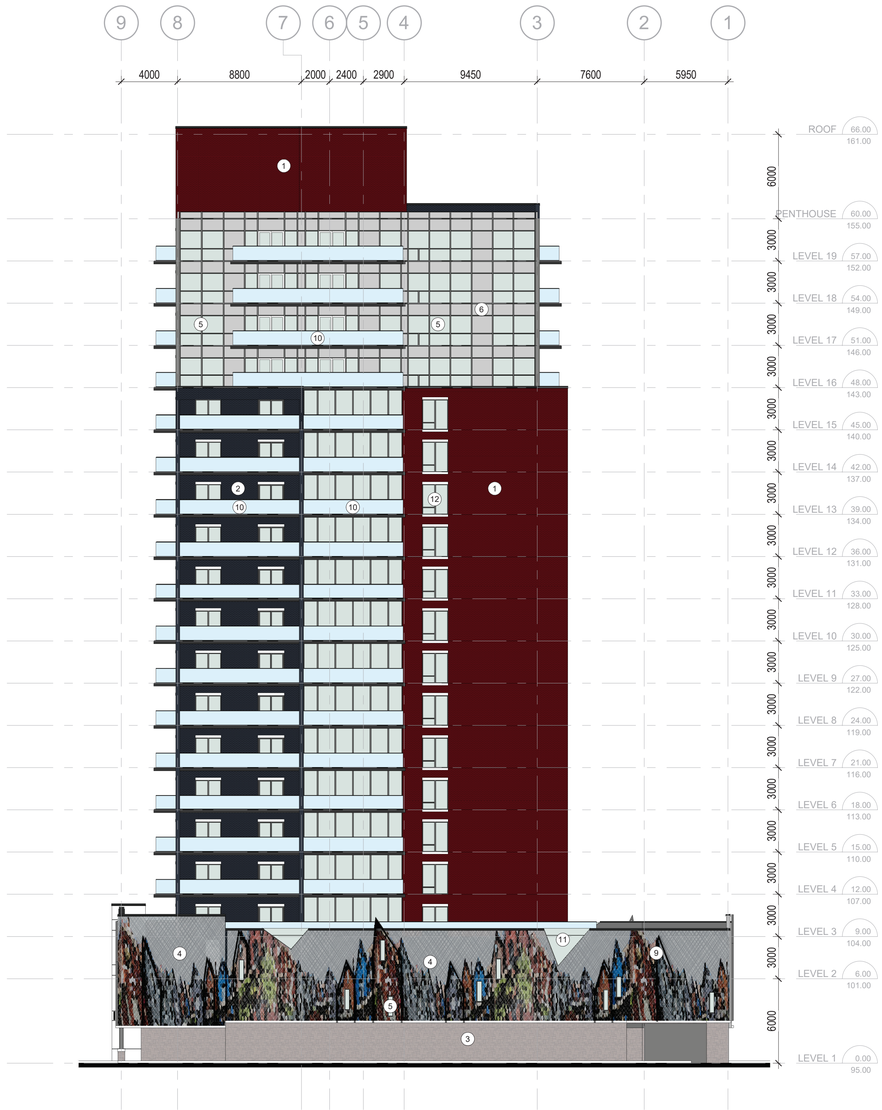
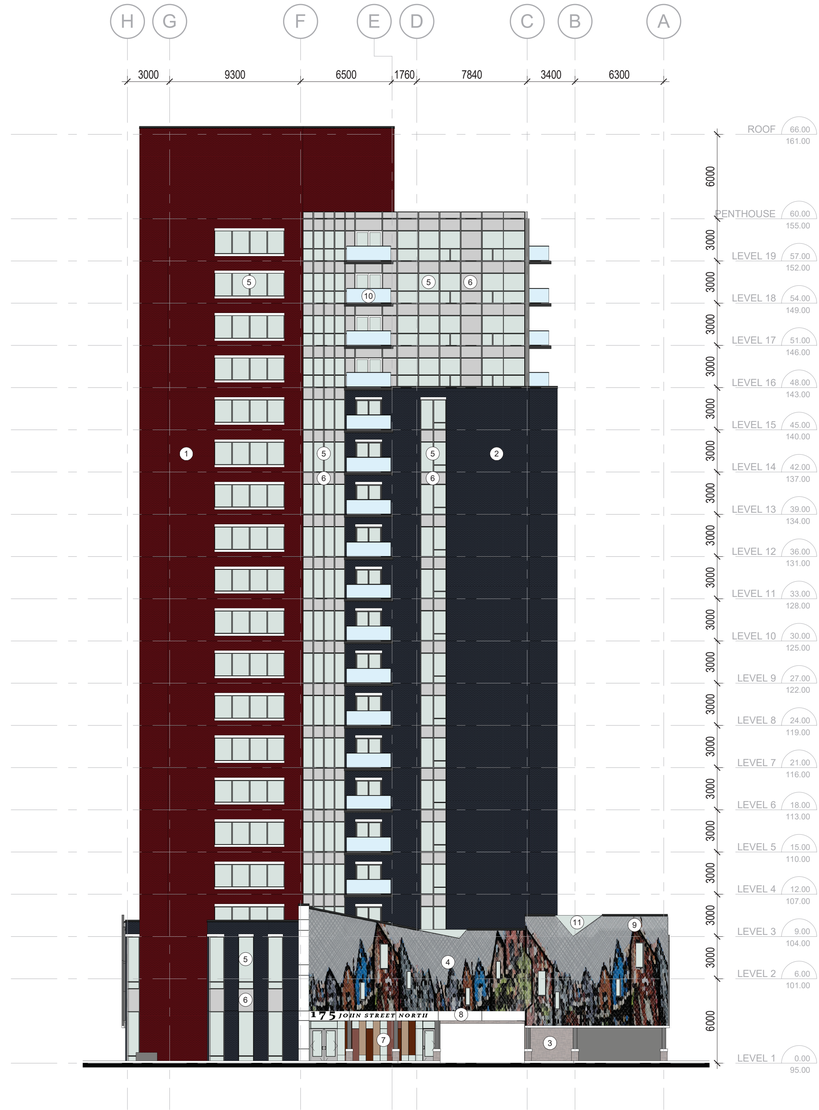


2 NORTH ELEVATION
1 : 200



1 EAST ELEVATION
1 : 200

MATERIAL LEGEND

	1	MASONRY - RED BRICK
	2	MASONRY - CHARCOAL BRICK
	3	MASONRY - LARGE LIGHT BLOCK
	4	KINETIC METAL SCREEN
	5	WINDOW WALL
	6	SPANDRAL - COLOUR 1
	7	SPANDRAL - FEATURE COLOURS
	8	CANOPY
	9	FEATURE FRAMES
	10	RAILING
	11	FEATURE RAILING
	12	WINDOW, WITH HEADER & SILL

GENERAL NOTES

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Drawn by CRZ
Checked by EJT
Plot Date / Time 2022-11-18 12:35:14 PM

175 JOHN ST N, HAMILTON

ELEVATIONS

PRELIMINARY

Drawing Scale As indicated
Status PRELIMINARY
Drawing No. D3.1
Revision No.

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MATERIAL LEGEND

	1	MASONRY - RED BRICK
	2	MASONRY - CHARCOAL BRICK
	3	MASONRY - LARGE LIGHT BLOCK
	4	KINETIC METAL SCREEN
	5	WINDOW WALL
	6	SPANDRAL - COLOUR 1
	7	SPANDRAL - FEATURE COLOURS
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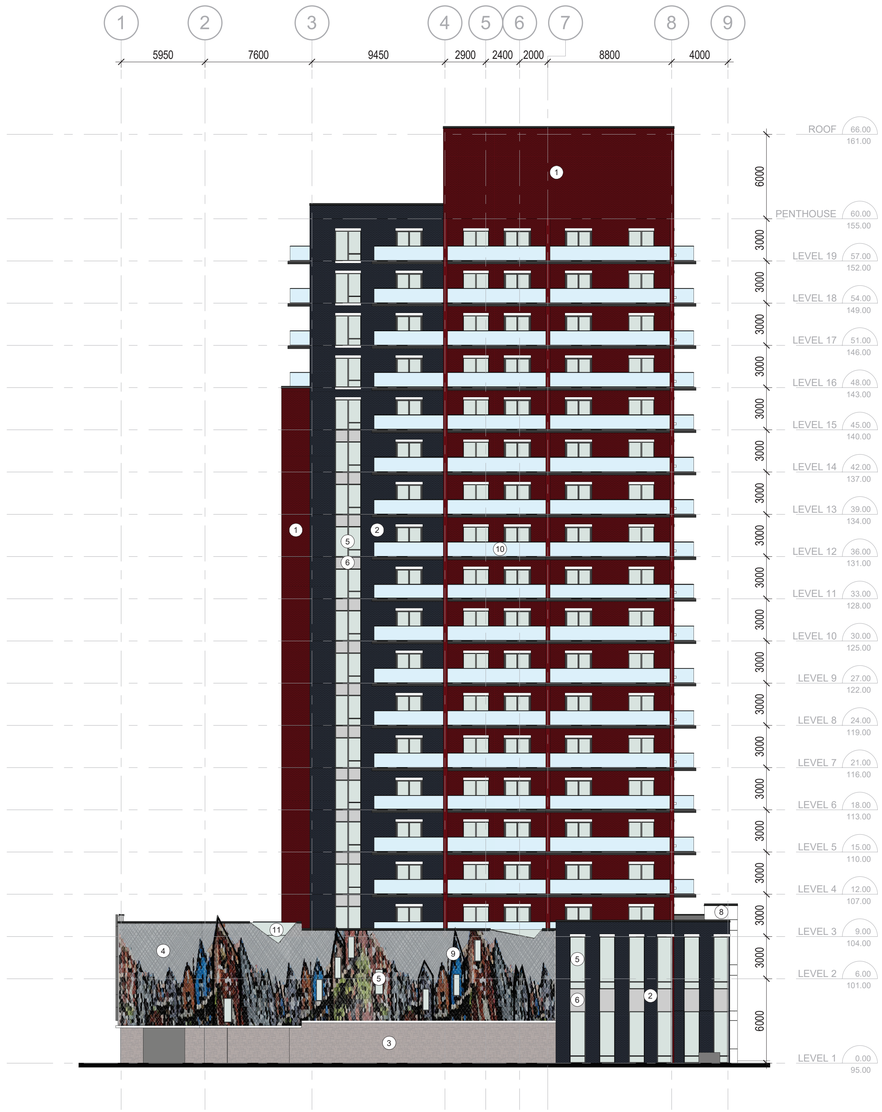
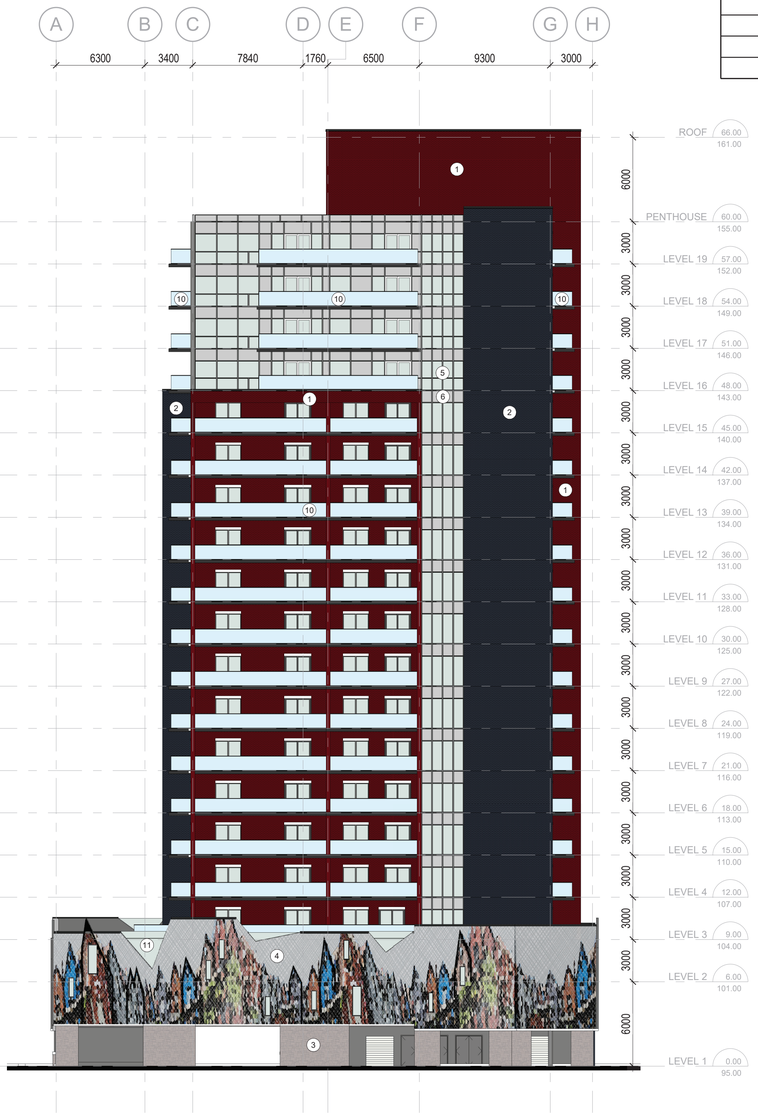


2 **SOUTH ELEVATION**
1 : 200



1 **WEST ELEVATION**
1 : 200

No.	Date	Revision

srm ARCHITECTS INC.

Project No 22018
Project Date 2022-11-18
Drawn by CRZ
Checked by EJT
Plot Date / Time 2022-11-18 12:35:17 PM

175 JOHN ST N, HAMILTON

ELEVATIONS

PRELIMINARY

Drawing Scale As indicated
Status PRELIMINARY
Drawing No. D3.2
Revision No.

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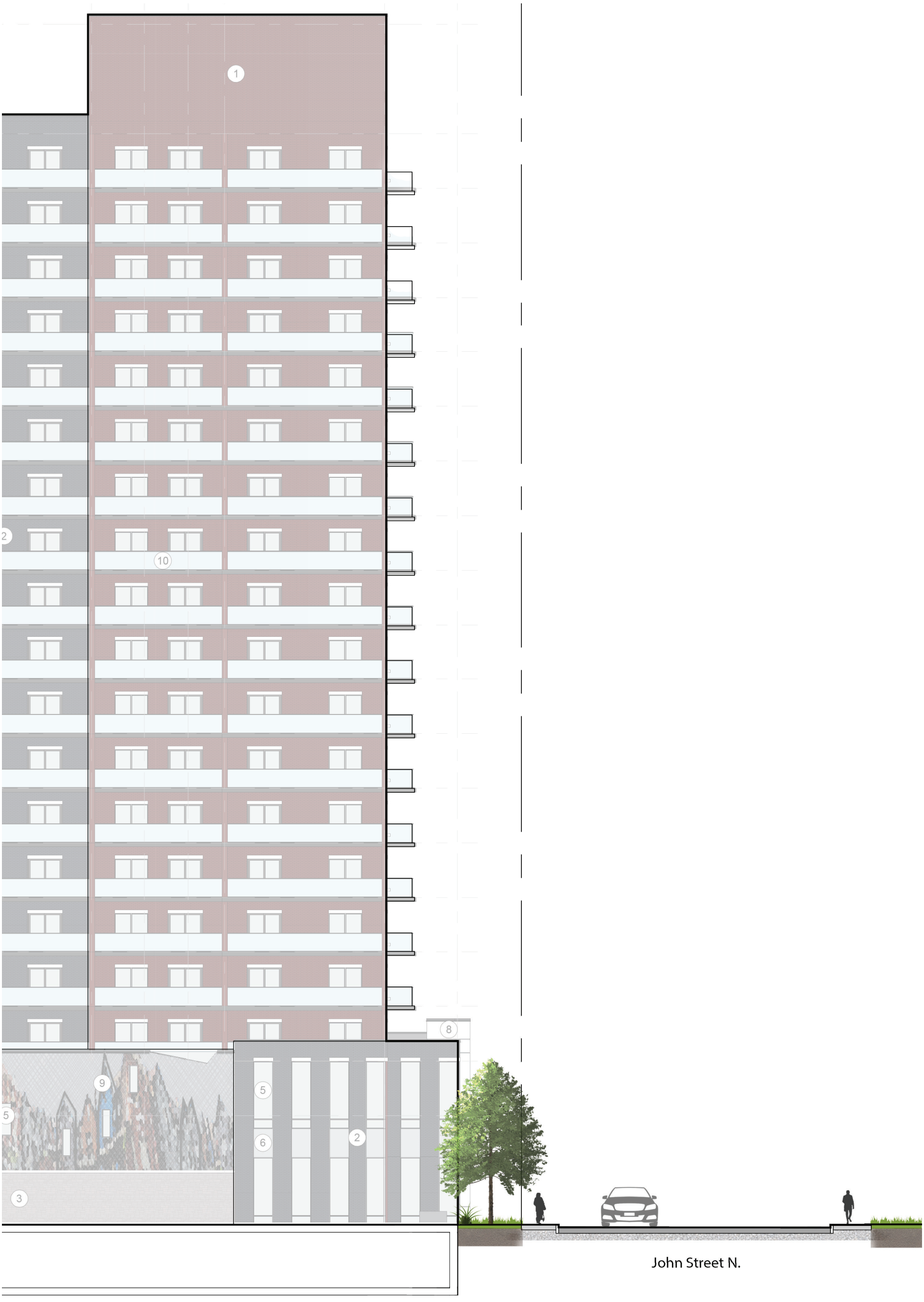
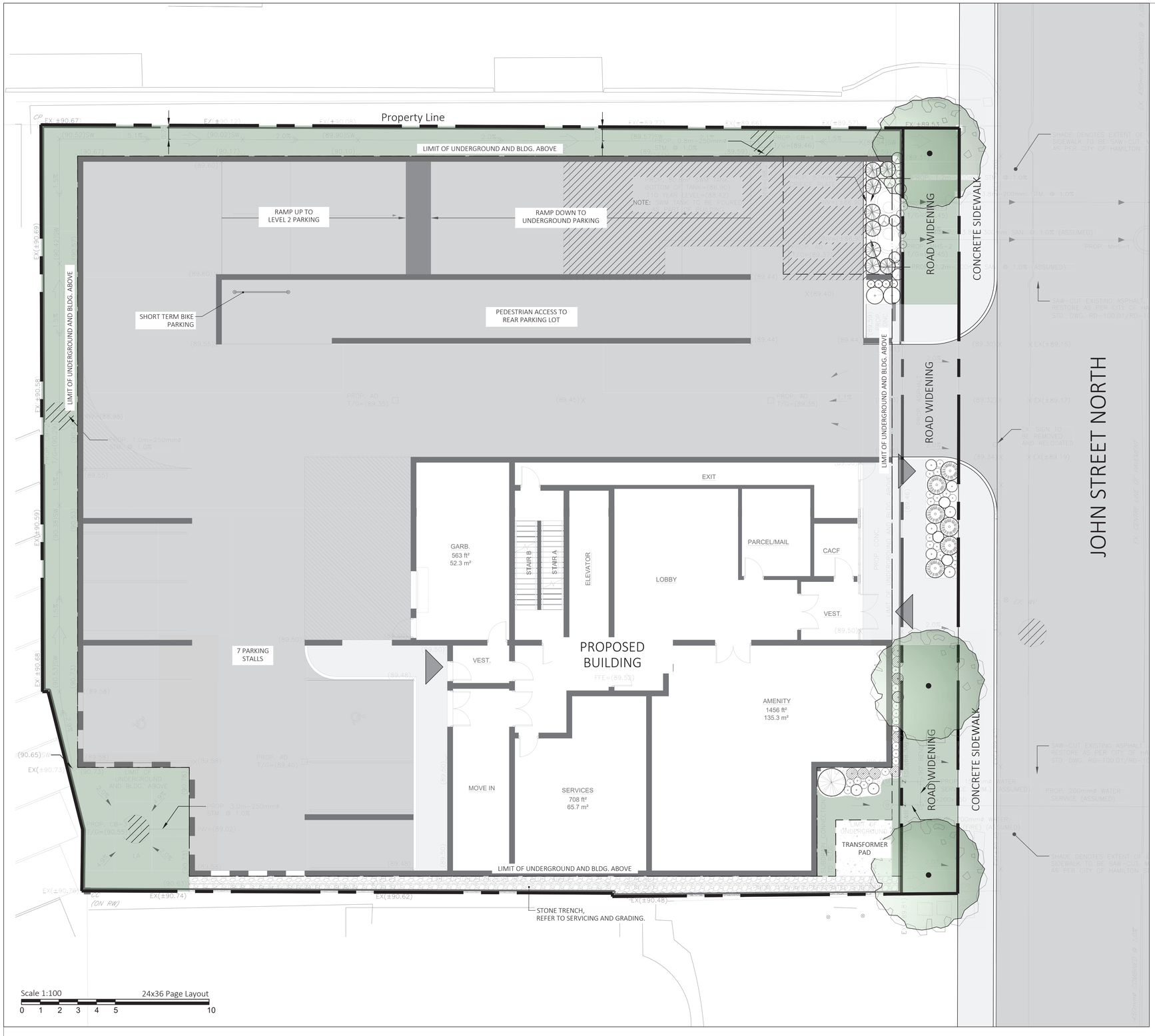


175 John Street North - Section

23-04-21

1:200

WHITEHOUSE URBAN DESIGN
LANDSCAPE ARCHITECTS & URBAN DESIGNERS



KEY MAP:

LEGEND:

- Concrete
- Asphalt
- Sod
- (116.90) Proposed Elevation
- 116.80 Existing Elevation
- Existing Tree
- Proposed Vegetation
- Limit of Underground
- Limit of Building Above

Landscape Notes

1. Dimensions are shown in meters unless noted otherwise. Do not scale drawings.
2. Contractor to review layout on site with Landscape Architect prior to commencing work.
3. Contractor to verify grades and identify discrepancies prior to initiating work. Report any changes, discrepancies, or substitutions to the Landscape Architect for review prior to work.
4. It is the contractor's responsibility to locate and verify all existing utilities and services prior to construction.
5. Plant material support systems must be removed by the contractor at time of final acceptance. No extras will be paid to complete this work.
6. Contractor to provide minimum one (1) year warranty from date accepted on all work unless otherwise specified.
7. Grading and servicing shown is for information purposes. For grading and servicing information refer to engineering drawings.
8. For lighting information and power distribution refer to the electrical drawings.
9. Drawings are for construction only if Landscape Architects stamp is signed and dated by the Landscape Architect, and plans are approved by the Municipality.
10. Tree planting within the municipal right-of-way to be undertaken by the Municipality unless noted otherwise.
11. Unless otherwise specified all landscaped areas are to be sodded.
12. Unless otherwise specified, all undeveloped areas shall be undisturbed and kept free and clear of debris.
13. The Owner is to be aware of the Migratory Birds Convention Act, 1994. This Act is implemented by Environment Canada and the Owner is to make every effort to avoid removal of vegetation from the period of March 31st to August 31st

STAMP:

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
Debra Ann Whitehouse
CSLA MEMBER
2022-12-12

NOT FOR CONSTRUCTION

WHITEHOUSE URBAN DESIGN
LANDSCAPE ARCHITECTS & URBAN DESIGNERS

REVISIONS / SUBMISSIONS

NO.	DESCRIPTION	DATE:
1	For Zoning By-law Amendment	2022-12-12

CLIENT:
Darpel Investments Limited

PROJECT TITLE:
175 John St N

SHEET TITLE:
Preliminary Landscape Plan

DWG No. L1	**DRAWN BY:** JJ
SHEET No. 1 of 1	**DESIGN BY:** LWS and JJ
PROJECT No: 075-22	**CHECKED BY:** LWS
SCALE: 1:100	**NORTH ARROW:**

Whitehouse Urban Design Inc.
3 Studebaker Place, Unit 1, Hamilton, ON L8L 0C8
905-546-1087

Shadow Studies

The following shadow studies demonstrates the shadow impacts of the proposed development during the Spring / Fall Equinox. The proposed site currently has a one-storey building.

The proposed building is a 19 Storey residential building consisting of 132 units.

Lot Area: 1,981 m²
Building Area: 1,567 m²
Gross Floor Area: 12,708 m²
Building Height: 60m + Mechanical Penthouse
March 21st Sunrise: ±7:20am
March 21st Sunset: ±7:33pm
The shadow impact study takes place from 8:50am until 6:03pm at hourly intervals, and is located at:
Latitude: N43 degrees:15' 38.412"
Longitude: W79 degrees:51' 53.49"

The as of right massing model is based off of a 17m high building for a H zone.

Mitigation measures include:
• 11 meter step at levels 3-16 along Robert St. and John St.
• 15.5 meter step at levels 3-16 along Robert St. and John St.

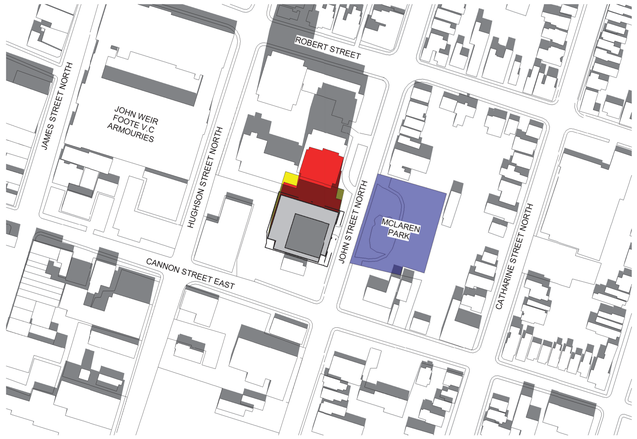
March 21st (Spring Equinox)

The proposed development has the following:
• No impact on the residential buildings across from the development on the North Side and John St N.
• Minor impact on the Parkland across from the development on John St. N between 3:03pm and 5:03pm.
• After 4:03pm, the proposed development will add new shadows as the existing Residential on the North end of John St N. adjacent from the proposed development is already casting large shadows; no new shadows will be cast at 5:47pm.
• No new shadows will impact Mclaren Park

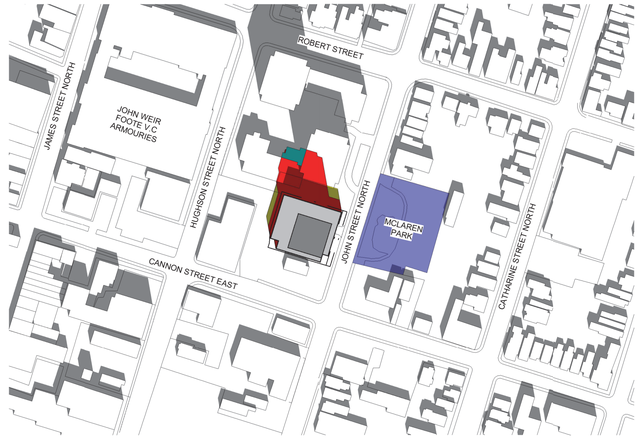
Legend

- PROPOSED DEVELOPMENT SHADOWS
- PARKLAND & HAMILTON GENERAL HOSPITAL
- EXISTING SHADOWS
- BY RIGHT SHADOWS
- PROPOSED BUILDING FOOTPRINT
- PROPERTY LINE

0 50m 100m 200m

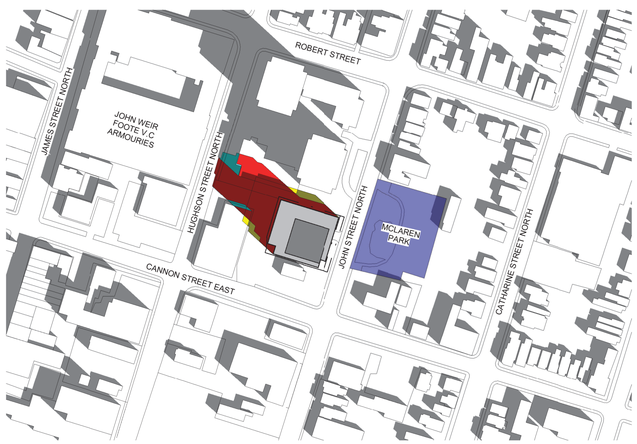


6 SHADOW STUDY BASE MARCH 21 1PM
1 : 2000



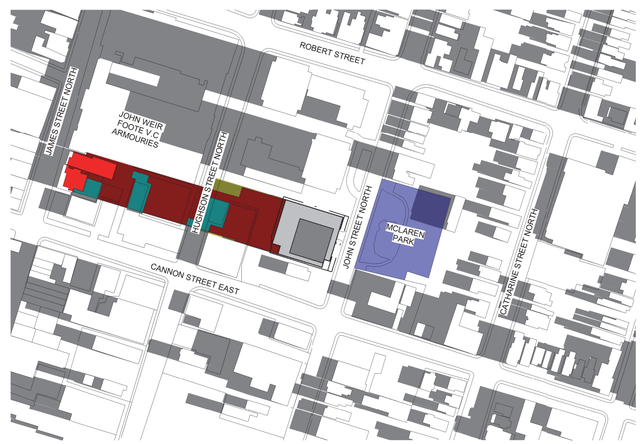
5 SHADOW STUDY BASE MARCH 21 12 NOON
1 : 2000

4 SHADOW STUDY BASE MARCH 21 11AM
1 : 2000



3 SHADOW STUDY BASE MARCH 21 10AM
1 : 2000

2 SHADOW STUDY BASE MARCH 21 9AM (90+ MINUTES AFTER SUNRISE)
1 : 2000



1 SHADOW STUDY BASE MARCH 21 8AM (45 MINUTES AFTER SUNRISE)
1 : 2000

Project North True North

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175 JOHN ST N, HAMILTON

SHADOW STUDIES - MARCH 21st (1/2)

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D4.1

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Legend

- PROPOSED DEVELOPMENT SHADOWS
- PARKLAND & HAMILTON GENERAL HOSPITAL
- EXISTING SHADOWS
- BY RIGHT SHADOWS
- PROPOSED BUILDING FOOTPRINT
- PROPERTY LINE

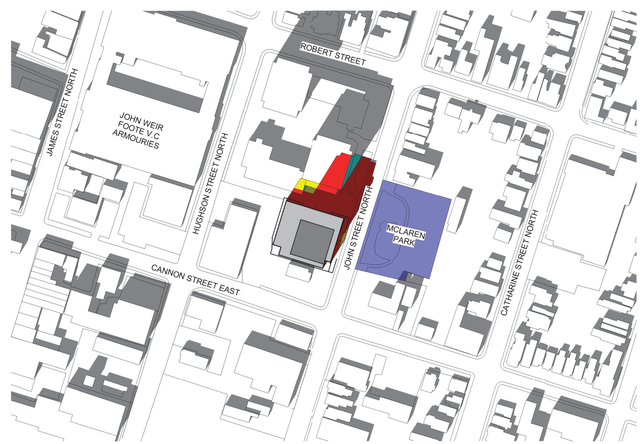
0 50m 100m 200m

5 **SHADOW STUDY BASE MARCH 21 6 PM (90 MINUTES BEFORE SUNSET)**
1 : 2000

4 **SHADOW STUDY BASE MARCH 21 5 PM**
1 : 2000

3 **SHADOW STUDY BASE MARCH 21 4 PM**
1 : 2000

2 **SHADOW STUDY BASE MARCH 21 3PM**
1 : 2000



1 **SHADOW STUDY BASE MARCH 21 2PM**
1 : 2000

Project North

True North

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175 JOHN ST N, HAMILTON

SHADOW STUDIES - MARCH 21st (2/2)

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Revision No.

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Shadow Studies

The following shadow studies demonstrates the shadow impacts of the proposed development during the Spring / Fall Equinox. The proposed site currently has a one-storey building.

The proposed building is a 19 Storey residential building consisting of 132 units.

Lot Area: 1,981 m²
Building Area: 1,567 m²
Gross Floor Area: 12,708 m²
Building Height: 60m + Mechanical Penthouse
March 21st Sunrise: ±7:20am
March 21st Sunset: ±7:33pm
The shadow impact study takes place from 8:50am until 6:03pm at hourly intervals, and is located at:
Latitude: N43 degrees:15' 38.412"
Longitude: W79 degrees:51' 53.49"

The as of right massing model is based off of a 17m high building for a H zone.

Mitigation measures include:
• 11 meter step at levels 3-16 along Robert St. and John St.
• 15.5 meter step at levels 3-16 along Robert St. and John St.

September 21st (Fall Equinox)

The proposed development has the following:
• No impact on the residential buildings across from the development on the North Side and John St N.
• Minor impact on the Parkland across from the development on John St. N between 3:03pm and 5:03pm.
• After 4:03pm, the proposed development will add new shadows as the existing Residential on the North end of John St N. adjacent from the proposed development is already casting large shadows; no new shadows will be cast at 5:47pm.
• No new shadows will impact Mclaren Park

Legend

- PROPOSED DEVELOPMENT SHADOWS
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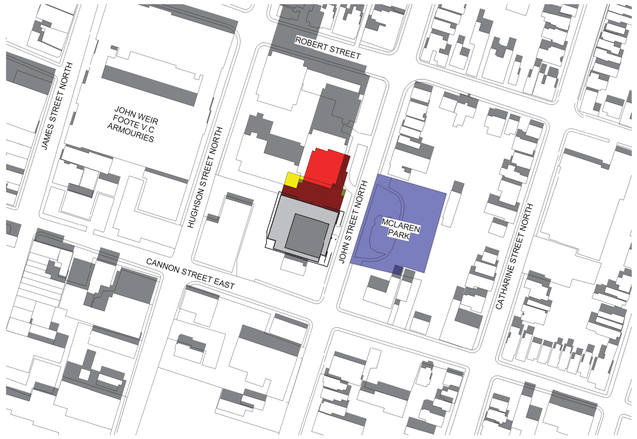
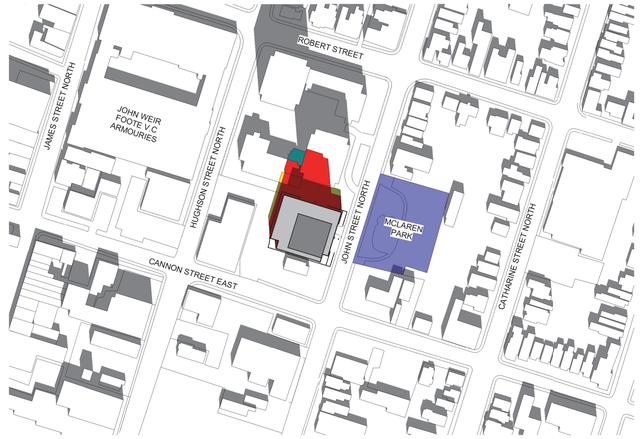
- PROPERTY LINE

0 50m 100m 200m



6 SHADOW STUDY BASE SEPTEMBER 21 1PM
1 : 2000



5 SHADOW STUDY BASE SEPTEMBER 21 12 NOON
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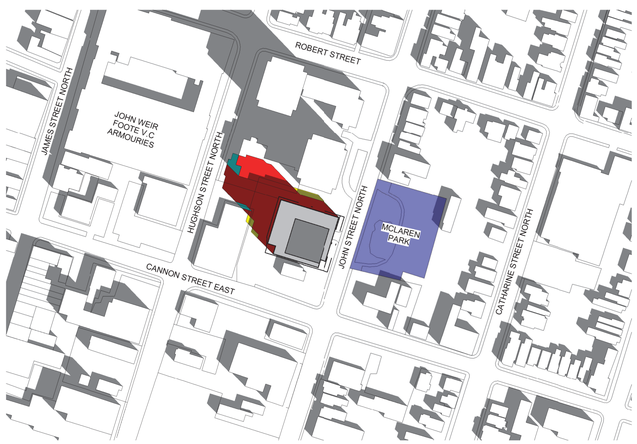
4 SHADOW STUDY BASE SEPTEMBER 21 11AM
1 : 2000



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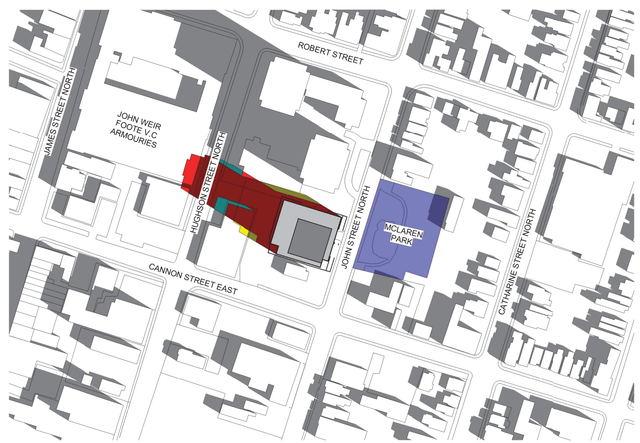
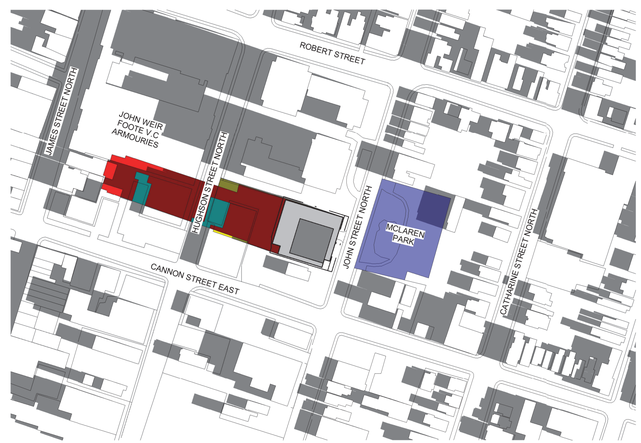


2 SHADOW STUDY BASE SEPTEMBER 21 9AM 90+ MINUTES AFTER SUNRISE)
1 : 2000



1 SHADOW STUDY BASE SEPTEMBER 21 8 AM (45 MINUTES AFTER SUNRISE)
1 : 2000

Project North True North

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175 JOHN ST N, HAMILTON

SHADOW STUDY - SEPTEMBER 21st (1/2)

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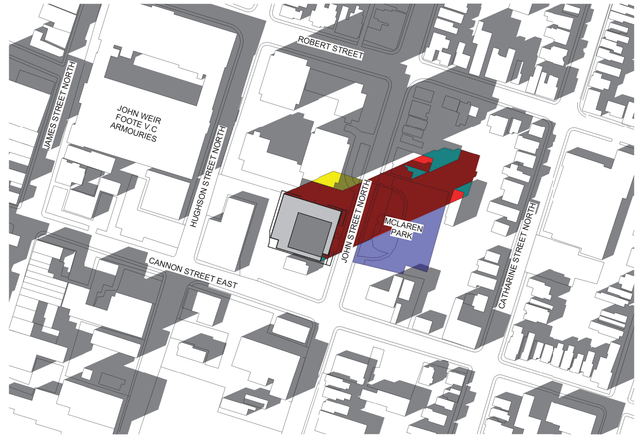

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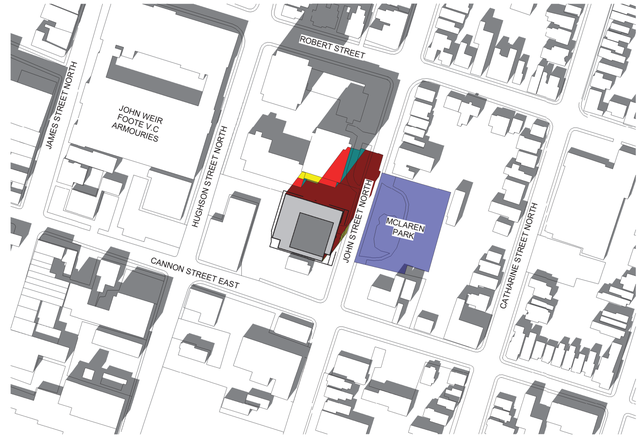

1 **SHADOW STUDY BASE SEPTEMBER 21 2PM**
1 : 2000

Project North

True North

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175 JOHN ST N, HAMILTON

SHADOW STUDY - SEPTEMBER 21st (2/2)

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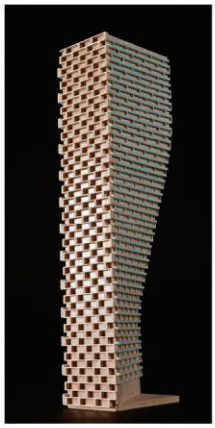
GRADIENTWIND
ENGINEERS & SCIENTISTS

PEDESTRIAN LEVEL WIND STUDY

175 John Street North
Hamilton, Ontario

REPORT: GW22-275-WTPLW



December 1st, 2022

PREPARED FOR

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3 Studebaker Place, Unit 1
Hamilton, Ontario
L8L 0C8

PREPARED BY

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GRADIENTWIND.COM

EXECUTIVE SUMMARY

This report describes a pedestrian level wind study undertaken to assess wind conditions for a proposed residential development located at 175 John Street North in Hamilton, Ontario. The study involves wind tunnel measurements of pedestrian wind speeds using a physical scale model, combined with meteorological data integration, to assess pedestrian comfort at key areas within and surrounding the study site. Grade-level areas investigated include sidewalks, surface parking, laneways, landscaped areas, transit stops, parks, and building access points. Wind comfort is also evaluated over the Level 3 outdoor amenity terrace. To evaluate the influence of the proposed development on the existing wind conditions surrounding the site, two massing configurations were studied: (i) existing conditions without the proposed development, and (ii) conditions with the proposed development in place. The results and recommendations derived from these considerations are summarized in the following paragraphs and detailed in the subsequent report.

Our work is based on industry standard wind tunnel testing and data analysis procedures, City of Hamilton wind criteria, architectural drawings provided by SRM Architects Inc. in October 2022, surrounding street layouts, as well as existing and approved future building massing information and recent site imagery.

A complete summary of the predicted wind conditions is provided in Section 5.2 of this report, and is also illustrated in Figures 2A-4B, as well as Tables A1-A2 and B1-B2 in the appendices. Based on wind tunnel test results, meteorological data analysis, and experience with similar developments in the area, we conclude that conditions over all grade level pedestrian-sensitive areas within and surrounding the development site will be acceptable for the intended pedestrian uses on an annual and seasonal basis.

Regarding the Level 3 outdoor amenity, if calm conditions comfortable for sitting or more sedentary activities are desired throughout the full space during the warmer months, mitigation is recommended, as described in Section 5.2.

Within the context of typical weather patterns, which exclude anomalous localized storm events such as tornadoes and downbursts, no areas over the study site were found to experience conditions that could be considered unsafe.

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FIGURES
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Appendix A – Pedestrian Comfort Suitability (Future Conditions)
Appendix B – Pedestrian Comfort Suitability (Existing vs Future Conditions)
Appendix C – Wind Tunnel Simulation of the Natural Wind
Appendix D – Pedestrian Level Wind Measurement Methodology

1. INTRODUCTION

This report describes a pedestrian level wind study undertaken to assess wind conditions for a proposed residential development located at 175 John Street North in Hamilton, Ontario. Two conditions were studied: (i) existing conditions, including all approved, surrounding developments and without the proposed development, and (ii) conditions with the proposed development in place. The study was performed in accordance with industry standard wind tunnel testing techniques, City of Hamilton wind criteria, architectural drawings provided by SRM Architects inc. in October 2022, surrounding street layouts and existing and approved future building massing information, as well as recent site imagery.

2. TERMS OF REFERENCE

The focus of this pedestrian wind study is the proposed development located at 175 John Street North in Hamilton, Ontario. The study site is situated on a rectangular parcel of land, bounded by Cannon Street East to the south, John Street North to the east, Robert Street to the north, and Hughson Street North to the west.

The study building comprises a 19-storey building with a 2-storey parking podium. One level of below-grade parking and one level of above-grade parking are accessible from the east elevation. The ground floor comprises parking spaces, an amenity area, and a residential lobby fronting John Street North. At Level 3, the building sets back from all elevations to the typical tower floorplate, with indoor and outdoor amenity space provided along the north façade of the tower. Above Level 3, the building comprises exclusively of residential occupancy and rises to full height, where a mechanical penthouse completes the development.

Regarding wind exposures, the near- and far-field surroundings of the development (defined as an area falling within a 200-metre radius of the site, and as the area beyond the near field and within a two-kilometer radius, respectively) are characterized by low-rise suburban exposure in all directions, with Lake Ontario located approximately 1.2 kilometres to the north.

Grade-level areas investigated include sidewalks, surface parking, laneways, landscaped areas, transit stops, parks, and building access points. Wind comfort is also evaluated over the Level 3 balcony terrace amenity area. Figures 1A and 1B illustrate the study site and surrounding context for the existing and

future test scenarios, respectively, and Photographs 1 through 6 depict the wind tunnel model used to conduct the study.

3. OBJECTIVES

The principal objectives of this study are to (i) determine pedestrian level wind comfort and safety conditions at key areas within and surrounding the development site; (ii) identify areas where wind conditions may interfere with the intended uses of outdoor spaces; (iii) recommend suitable mitigation measures, where required; and (iv) evaluate the influence of the proposed development on the existing wind conditions surrounding the site.

4. METHODOLOGY

The approach followed to quantify pedestrian wind conditions over the site is based on wind tunnel measurements of wind speeds at selected locations on a reduced-scale physical model, meteorological analysis of the Hamilton area wind climate and synthesis of wind tunnel data with industry-accepted guidelines. The following sections describe the analysis procedures, including a discussion of the pedestrian comfort and safety guidelines.

4.1 Wind Tunnel Context Modelling

A detailed PLW study is performed to determine the influence of local winds at the pedestrian level for a proposed development. The physical model of the proposed development and relevant surroundings, illustrated in Photographs 1 through 6 following the main text, was constructed at a scale of 1:400. The wind tunnel model includes all existing buildings and approved future developments within a full-scale diameter of approximately 840 metres. The general concept and approach to wind tunnel modelling is to provide building and topographic detail in the immediate vicinity of the study site on the surrounding model, and to rely on a length of wind tunnel upwind of the model to develop wind properties consistent with known turbulent intensity profiles that represent the surrounding terrain.

An industry standard practice is to omit trees, vegetation, and other existing and planned landscape elements from the wind tunnel model due to the difficulty of providing accurate seasonal representation of vegetation. The omission of trees and other landscaping elements produces slightly more conservative wind speed values.

4.2 Wind Speed Measurements

The PLW study was performed by testing a total of 45 sensor locations on the scale model in Gradient Wind's wind tunnel. Of these 45 sensors, 43 were located at grade and the remaining two sensors were located over the Level 3 amenity balcony terrace. Wind speed measurements were performed for each of the 45 sensors for 36 wind directions at 10° intervals. Figures 1A and 1B illustrate a plan of the site and relevant surrounding context for the existing and future test scenarios, respectively, while sensor locations used to investigate wind conditions are illustrated in Figures 2A through 4B.

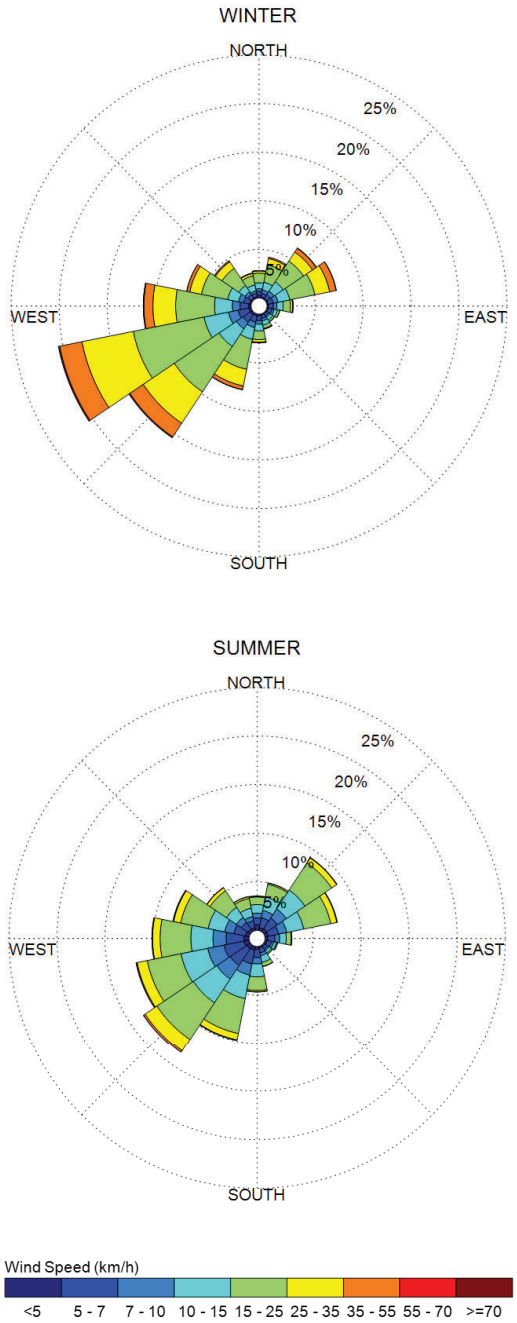
Mean and peak wind speed values for each location and wind direction were calculated from real-time pressure measurements, recorded at a sample rate of 500 samples per second, and taken over a 60-second time period. This period at model-scale corresponds approximately to one hour in full-scale, which matches the time frame of full-scale meteorological observations. Measured mean and gust wind speeds at grade were referenced to the wind speed measured near the ceiling of the wind tunnel to generate mean and peak wind speed ratios. Ceiling height in the wind tunnel represents the depth of the boundary layer of wind flowing over the earth's surface, referred to as the gradient height. Within this boundary layer, mean wind speed increases up to the gradient height and remains constant thereafter. Appendices C and D provide greater detail of the theory behind wind speed measurements. Wind tunnel measurements for this project, conducted in Gradient Wind's wind tunnel facility, meet or exceed guidelines found in the National Building Code of Canada 2015 and of 'Wind Tunnel Studies of Buildings and Structures', ASCE Manual 7 Reports on Engineering Practice No 67.

4.3 Meteorological Data Analysis

A statistical model for winds in Hamilton was developed from approximately 40-years of hourly meteorological wind data recorded at John C. Munro Hamilton International Airport, and obtained from the local branch of Atmospheric Environment Services of Environment Canada. Wind speed and direction data were analyzed for each month of the year in order to determine the statistically prominent wind directions and corresponding speeds, and to characterize similarities between monthly weather patterns. Following the Terms of Reference: Pedestrian Level Wind Study for Downtown Hamilton, the year is represented by a two-season model, and not according to the traditional calendar method.

The statistical model of the Hamilton area 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 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 the measurement period. The preferred wind speeds and directions can be identified by the longer length of the bars. For Hamilton, the most common winds concerning pedestrian comfort occur from the southwest, followed by those from the northeast. The directional preference and relative magnitude of the wind speed varies somewhat from season to season, with the summer months displaying calmer winds relative to the winter.

SEASONAL DISTRIBUTION OF WINDS FOR VARIOUS PROBABILITIES
JOHN C. MUNRO HAMILTON INTERNATIONAL AIRPORT, HAMILTON, 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.

4.4 Pedestrian Comfort and Safety Guidelines

Pedestrian comfort and safety guidelines are based on the mechanical effects of wind without consideration of other meteorological conditions (i.e. temperature, relative humidity). The comfort guidelines assume that pedestrians are appropriately dressed for a specified outdoor activity during any given season. Four pedestrian comfort classes are based on 80% non-exceedance Guest Equivalent Mean (GEM) wind speed ranges, which include (i) Sitting; (ii) Standing; (iii) Walking; and (iv) Uncomfortable. More specifically, the comfort classes and associated GEM wind speed ranges are summarized as follows:

(i) **Sitting** – A wind speed below 10 km/h (i.e. 0 – 10 km/h) would be considered acceptable for sedentary activities, including sitting.

(ii) **Standing** – A wind speed below 15 km/h (i.e. 10 km/h – 15 km/h) is acceptable for activities such as standing or leisurely strolling.

(iii) **Walking** – A wind speed below 20 km/h (i.e. 15 km/h – 20 km/h) is acceptable for walking or more vigorous activities.

(iv) **Uncomfortable** – A wind speed over 20 km/h is classified as uncomfortable from a pedestrian comfort standpoint. Brisk walking and exercise, such as jogging, would be acceptable for moderate excesses of this criterion.

The pedestrian safety wind speed guideline is based on the approximate threshold that would cause a vulnerable member of the population to fall. A 0.1% exceedance gust wind speed of greater than 90 km/h is classified as dangerous.

Experience and research on people's perception of mechanical wind effects has shown that if the wind speed levels are exceeded for more than 20% of the time, the activity level would be judged to be uncomfortable by most people. For instance, if wind speeds of 10 km/h were exceeded for more than 20% of the time most pedestrians would judge that location to be too windy for sitting or more sedentary activities. Similarly, if 20 km/h at a location were exceeded for more than 20% of the time, walking or less vigorous activities would be considered uncomfortable. As most of these criteria are based on subjective reactions of a population to wind forces, their application is partly based on experience and judgment.

Once the pedestrian wind speed predictions have been established at tested locations, the assessment of pedestrian comfort involves determining the suitability of the predicted wind conditions for their

associated spaces. This step involves comparing the predicted comfort class to the desired comfort class, which is dictated by the location type represented by the sensor (i.e. a sidewalk, building entrance, amenity space, or other). An overview of common pedestrian location types and their desired comfort classes are summarized below.

DESIRED PEDESTRIAN COMFORT CLASSES FOR VARIOUS LOCATION TYPES

Location Types	Desired Comfort Classes
Primary Building Entrance	Standing
Secondary Building Access Point	Walking
Public Sidewalks / Pedestrian Walkways	Walking
Outdoor Amenity Spaces	Sitting / Standing
Cafés / Patios / Benches / Gardens	Sitting / Standing
Plazas	Standing / Walking
Transit Stops	Standing
Public Parks	Sitting / Walking
Garage / Service Entrances	Walking
Vehicular Drop-Off Zones	Walking
Laneways / Loading Zones	Walking

5. RESULTS AND DISCUSSION

Tables A1 through A2 in Appendix A provide a summary of seasonal comfort predictions for each sensor location under the *existing* massing scenario. Similarly, Tables B1 through B2 in Appendix B provide the seasonal comfort predictions for under the *proposed* massing scenario. The tables indicate the 80% non-exceedance GEM wind speeds and corresponding comfort classifications as defined in Section 4.4. In other words, a wind speed threshold of 19.1 for the summer season indicates that 80% of the measured data falls at or below 19.1 km/h during the summer months and conditions are therefore suitable for walking, as the 80% threshold value falls within the exceedance range of 15-20 km/h for walking. The tables include the predicted threshold values for each sensor location during each season, accompanied by the corresponding predicted comfort class (i.e. sitting, standing, walking, etc.).

The most significant findings of the PLW study are summarized in Sections 5.1 and 5.2. To assist with understanding and interpretation, predicted conditions for the proposed development are also illustrated in colour-coded format in Figures 2A through 4B. Conditions suitable for sitting are represented by the colour blue, while standing is represented by green, and walking by yellow. Conditions considered uncomfortable for walking are represented by the colour orange.

5.1 Pedestrian Comfort Suitability – *Existing Scenario*

Based on the analysis of the measured data, consideration of local climate data, and the suitability descriptors provided in Tables A1-A2 in Appendix A and illustrated in Figures 2A through 2B, this section summarizes the significant findings of the PLW study with respect to the *existing scenario*, as follows:

1. All public sidewalks, surface parking, laneways, and landscaped areas within and surrounding the proposed development currently experience wind conditions suitable for walking or better during each seasonal period.
2. The transit stops located to the east along John Street North (Sensor 19), and south along Cannon Street East (Sensor 11), currently both experience wind conditions suitable for standing or better throughout the warmer months, with the transit stop to the south intermittently experiencing wind conditions suitable for walking in the winter.
3. McLaren Park to the east (Sensors 20, 21, 23, and 24) is currently comfortable for standing or better during the summer and walking or better during the winter.
4. Within the context of typical weather patterns, which exclude anomalous localized storm events such as tornadoes and downbursts, no areas over the study site were found to experience wind conditions that are considered unsafe.

5.2 Pedestrian Comfort Suitability – *Proposed Scenario*

Based on the analysis of the measured data, consideration of local climate data, and the suitability descriptors provided in Tables B1-B2 in Appendix B and illustrated in Figures 3A through 4D, this section summarizes the significant findings of the PLW study with respect to the *proposed scenario*, as follows:

1. Most public sidewalks, driveways, surface parking, and landscaped areas within and surrounding the proposed development will experience wind conditions suitable for walking or better during

each seasonal period, which is acceptable for the intended uses of the spaces. An exception occurs in a strip of landscaping along the west side of the north elevation (Sensors 30 and 31), where wind conditions will marginally exceed the walking criterion intermittently during the winter months. However, considering the marginality and limited basis of the exceedances, and the minimal pedestrian traffic expected in this area, mitigation is not considered necessary.

2. The transit stops located to the east along John Street North (Sensor 19), and south along Cannon Street East (Sensor 11), will both experience wind conditions suitable for standing or better during the warmer months, and walking or better during the winter. It is notable that the conditions at the stop along Connon Street East are pre-existing. If calmer conditions are desired, providing three-walled transit shelters would provide adequate protection during the winter months.
3. McLaren Park to the east (Sensors 20, 21, 23, and 24) will generally be comfortable for sitting during the summer and standing during the winter, which is an improvement from the existing conditions.
4. All primary and secondary building entrances (Including stairwell exits and vehicle access points) will experience wind conditions suitable for standing or better throughout the year, which is appropriate.
5. The Level 3 outdoor amenity balcony terrace (Sensors 44 and 45) will experience wind conditions during the warmer months suitable for sitting or more sedentary activities on the eastern portion of the terrace (Sensor 45), and standing or better on the western portion. It is notable that the exceedance of the sitting criterion during the summer months is marginal, and unless designated seating areas will be provided along the western portion, mitigation is not considered to be a requirement. If calmer conditions are desired, or if the noted west section will contain designated seating, it is recommended to provide 1.6-metre-tall targeted wind barriers, comprising high-solidity windscreens, raised planters with dense coniferous plantings, or a combination thereof, to the immediate northeast. Alternatively, such barriers could be placed along the north perimeter guard of the space or be substituted with targeted overhead canopy or pergola structures instead.

6. Within the context of typical weather patterns, which exclude anomalous localized storm events such as tornadoes and downbursts, no areas over the study site were found to experience wind conditions that are considered unsafe.

6. CONCLUSIONS AND RECOMMENDATIONS

This report summarizes the methodology, results, and recommendations related to a pedestrian level wind study for a proposed mixed-use development located at 175 John Street North in Hamilton, Ontario. The study was performed in accordance with industry standard wind tunnel testing and data analysis procedures.

A complete summary of the predicted wind conditions is provided in Section 5.2 of this report, and is also illustrated in Figures 2A-4B, as well as Tables A1-A2 and B1-B2 in the appendices. Based on wind tunnel test results, meteorological data analysis, and experience with similar developments in the area, we conclude that conditions over all grade level pedestrian-sensitive areas within and surrounding the development site will be acceptable for the intended pedestrian uses on an annual and seasonal basis.

Regarding the Level 3 outdoor amenity, if calm conditions comfortable for sitting or more sedentary activities are desired throughout the full space during the warmer months, mitigation is recommended, as described in Section 5.2.

Within the context of typical weather patterns, which exclude anomalous localized storm events such as tornadoes and downbursts, no areas over the study site were found to experience conditions that could be considered unsafe.

This concludes our pedestrian level wind study and report. Please advise the undersigned of any questions or comments.

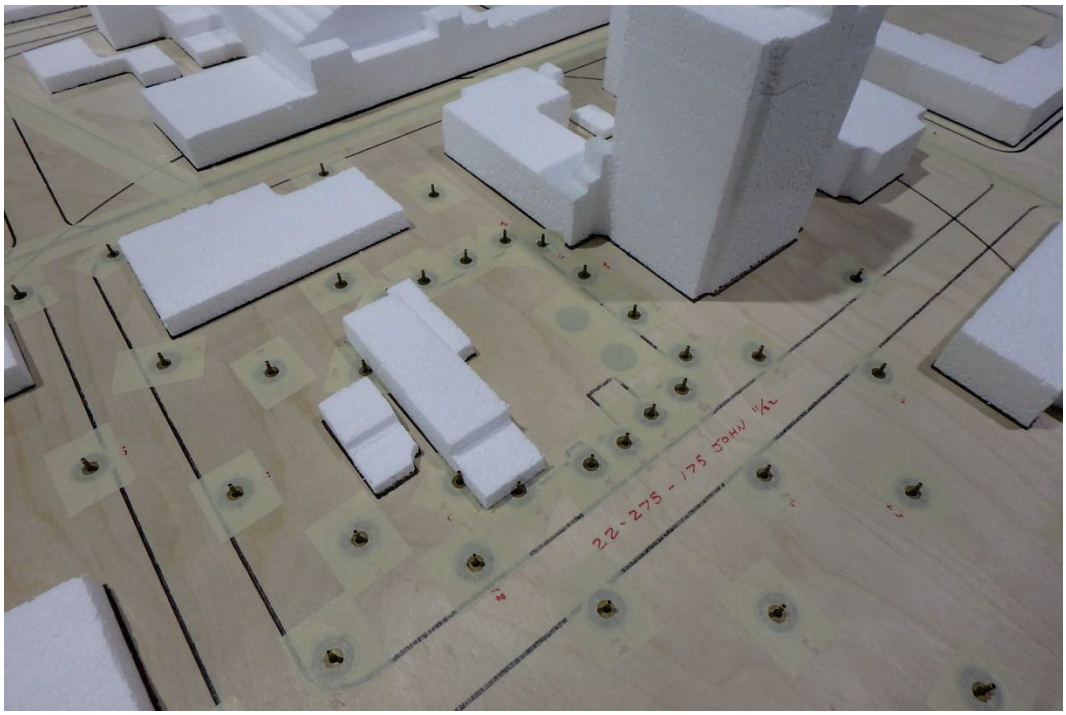
Sincerely,

Gradient Wind Engineering Inc.

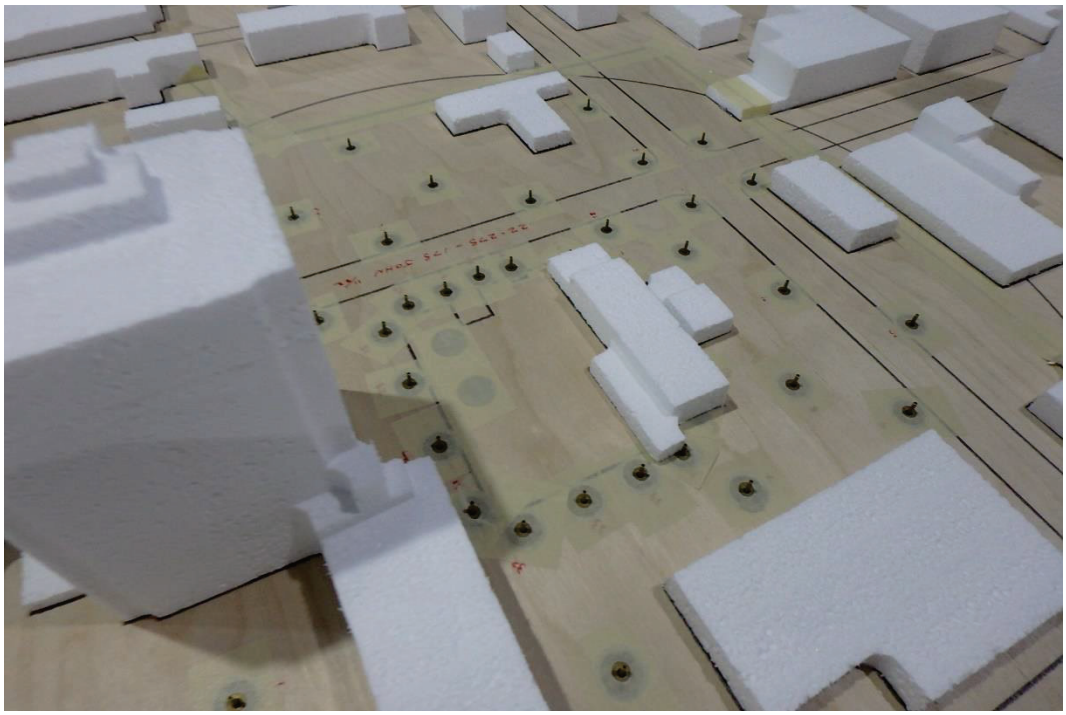
Logan McFadden, B.Eng.,
Junior Wind Scientist

Nick Petersen, P.Eng.,
Wind Engineer

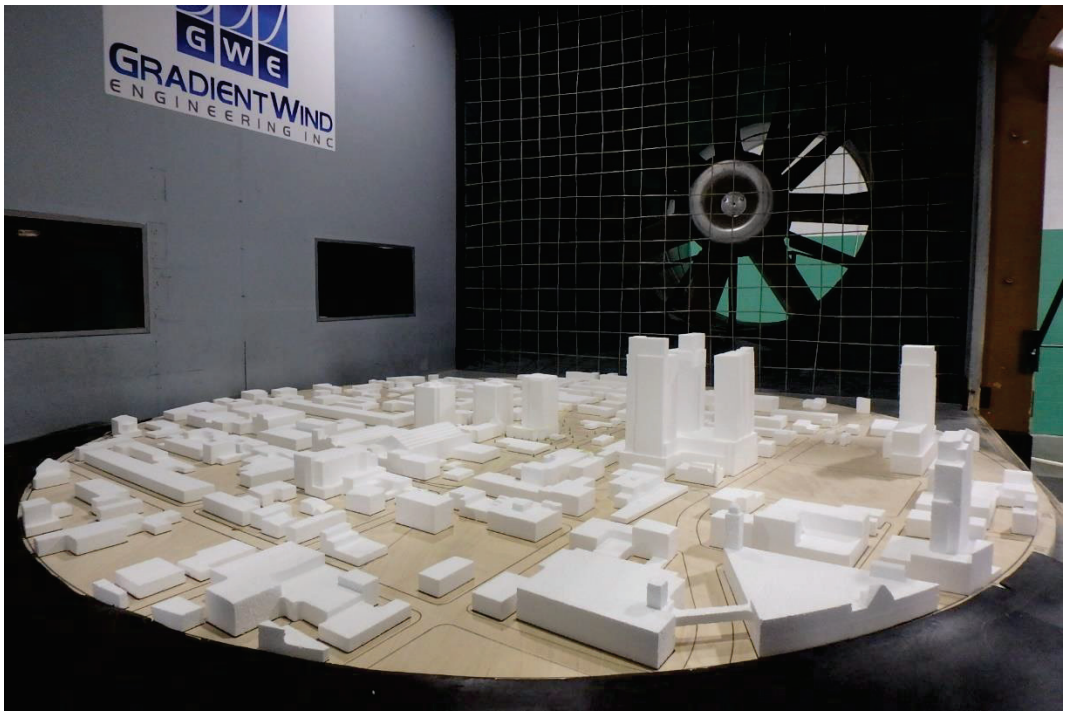
GW22-275-WTPLW



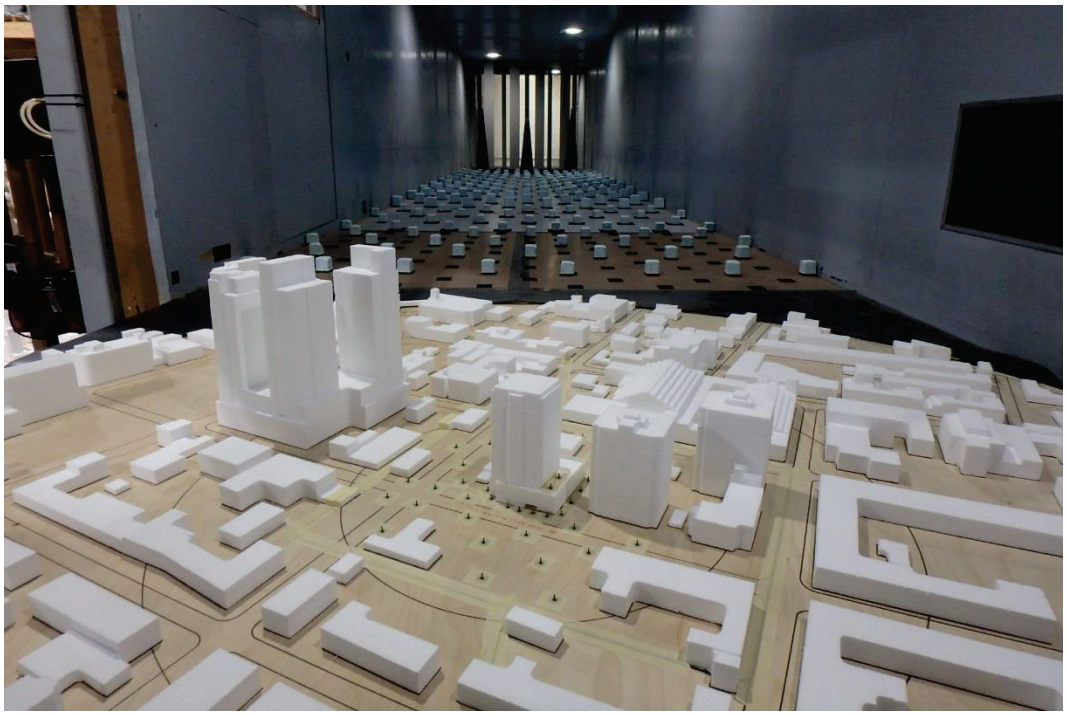
PHOTOGRAPH 1: CLOSE-UP VIEW OF EXISTING CONTEXT MODEL LOOKING NORTHWEST



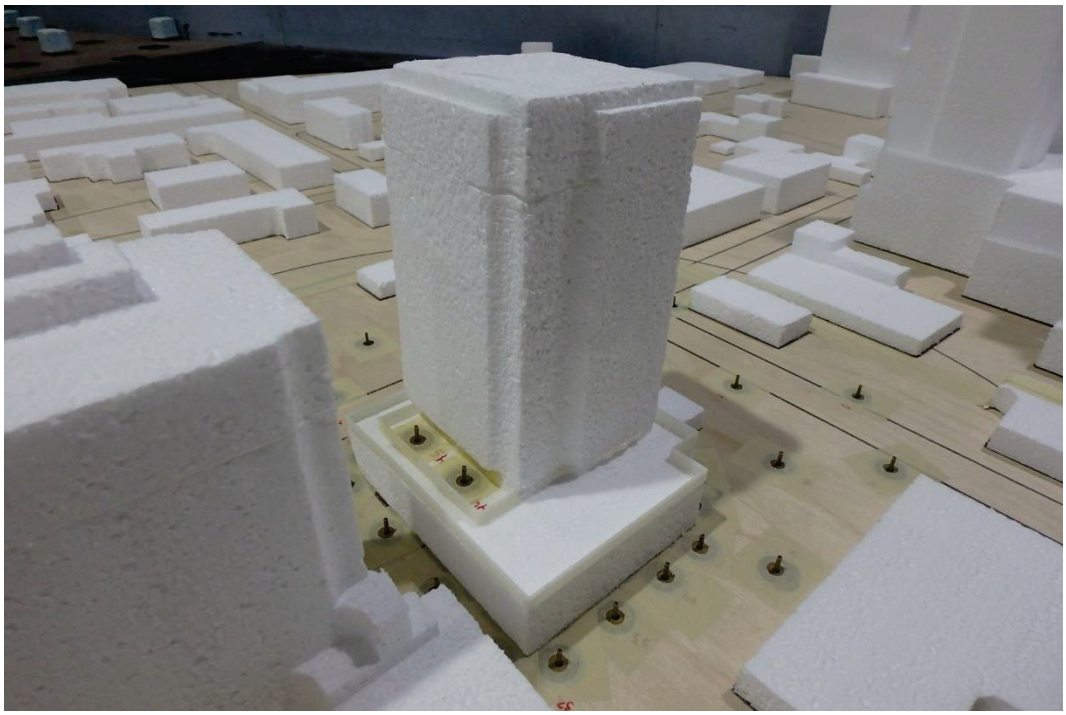
PHOTOGRAPH 2: CLOSE-UP VIEW OF EXISTING CONTEXT MODEL LOOKING SOUTHEAST



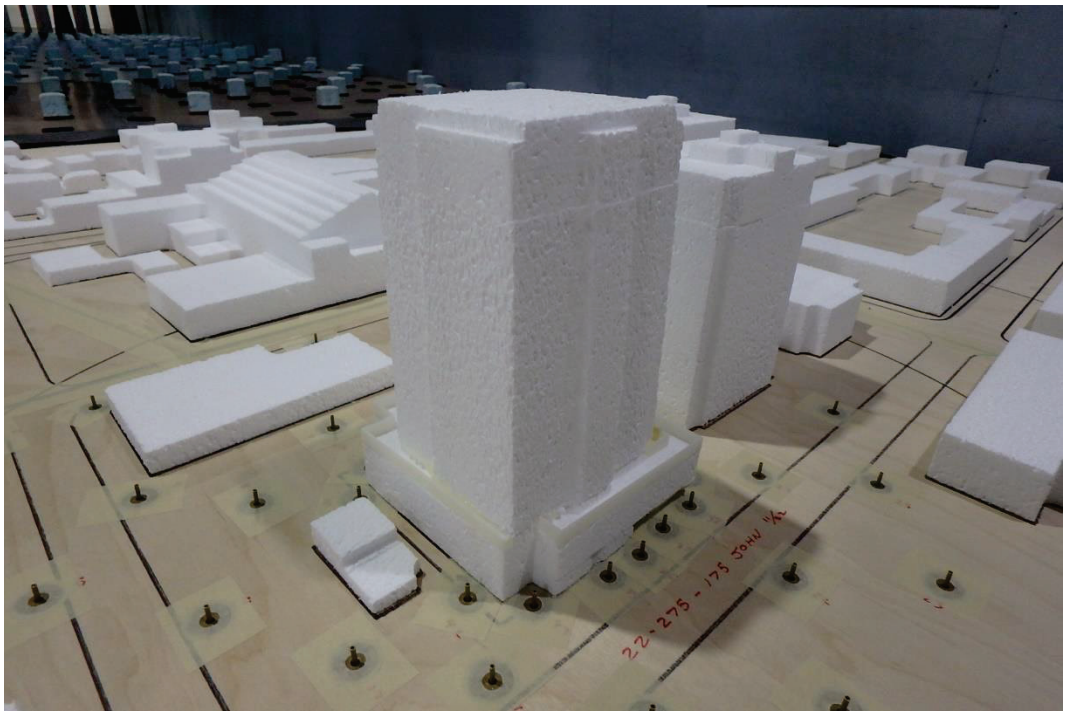
PHOTOGRAPH 3: STUDY MODEL INSIDE THE GWE WIND TUNNEL LOOKING DOWNWIND



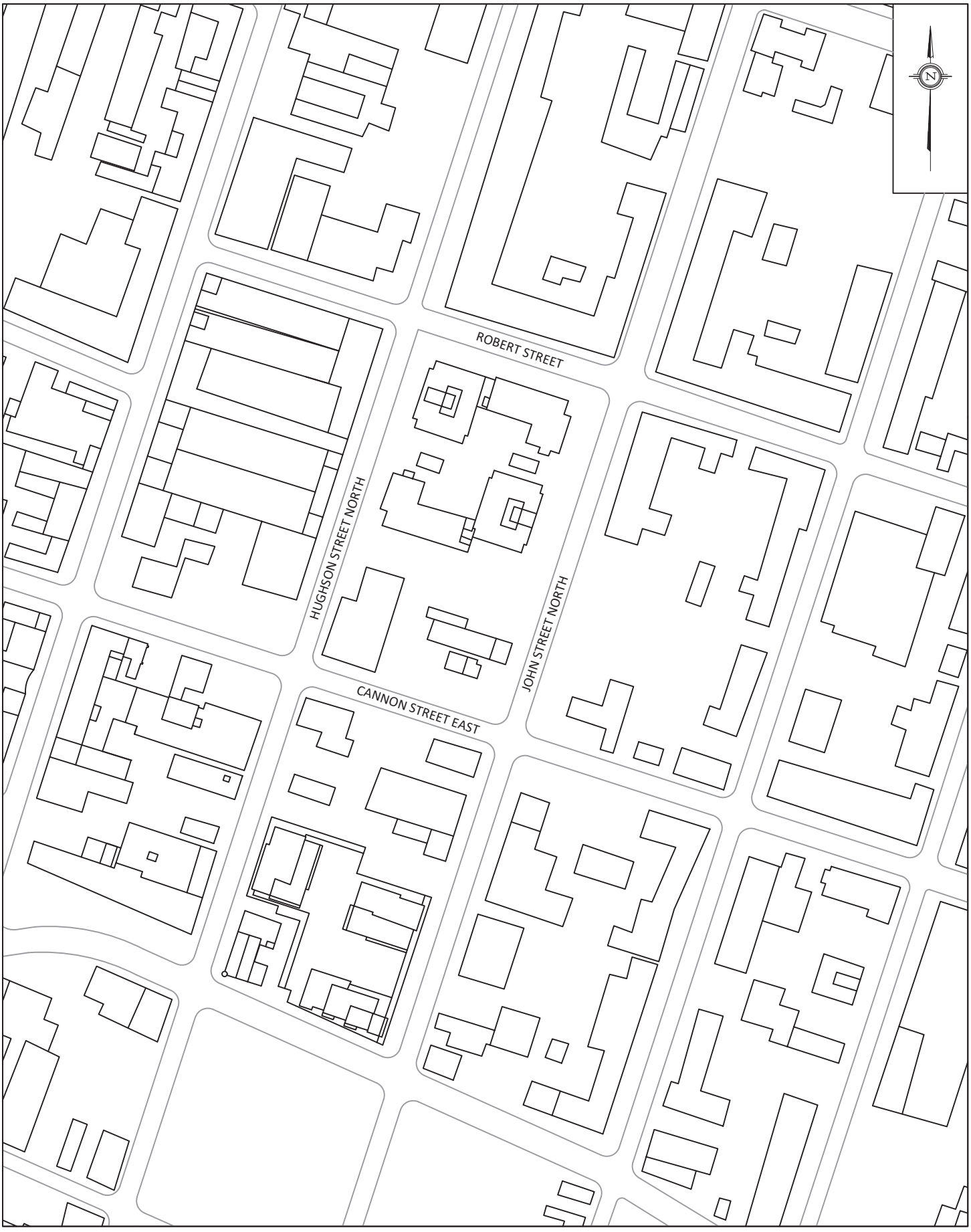
PHOTOGRAPH 4: STUDY MODEL INSIDE THE GWE WIND TUNNEL LOOKING UPWIND



PHOTOGRAPH 5: CLOSE-UP VIEW OF STUDY MODEL LOOKING SOUTHEAST



PHOTOGRAPH 6: CLOSE-UP VIEW OF STUDY MODEL LOOKING NORTHWEST



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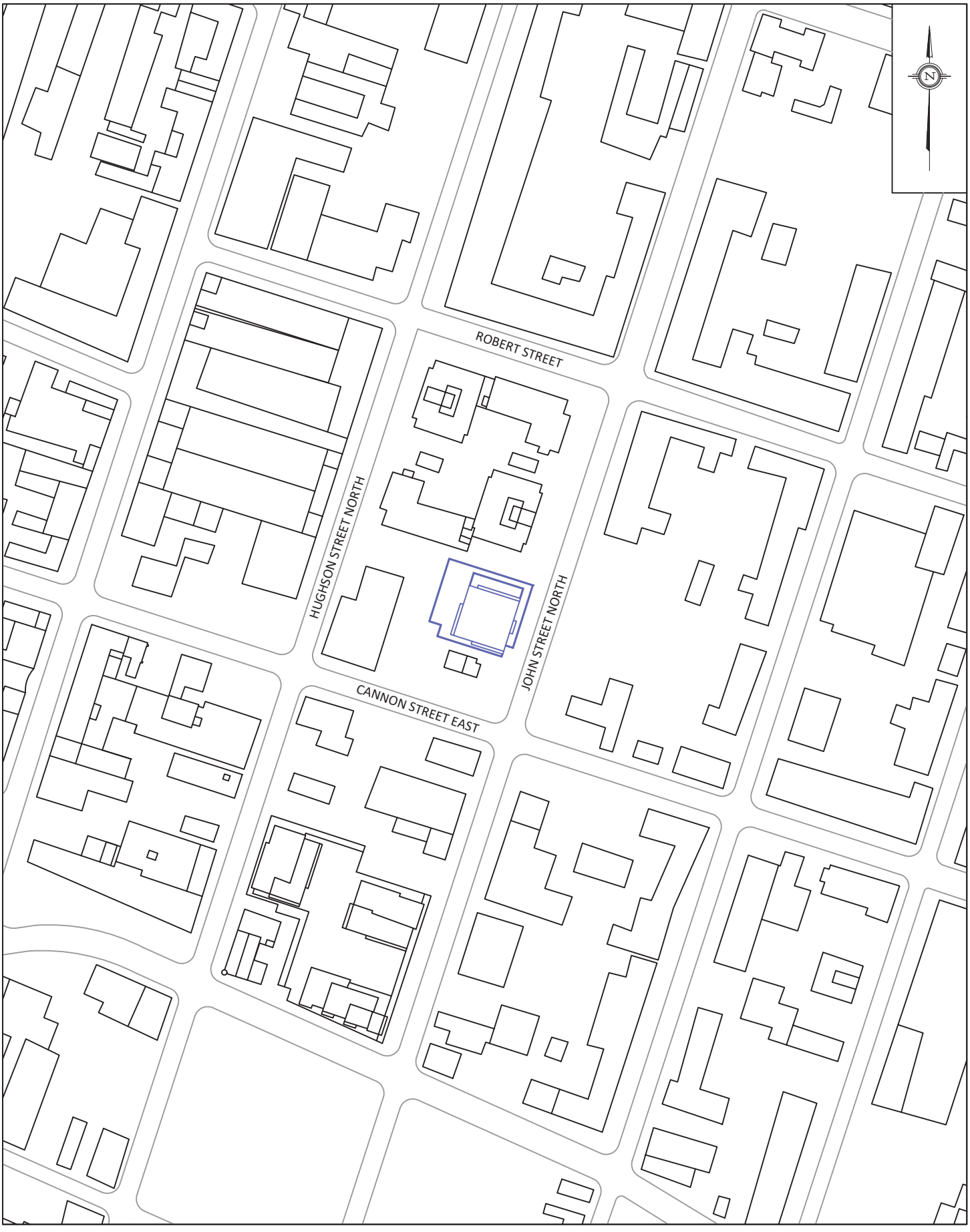
PROJECT	175 JOHN STREET N, HAMILTON PEDESTRIAN LEVEL WIND STUDY
SCALE	1:2500 (APPROX.)
DRAWING NO.	GW22-275-PLW-1A
DATE	DECEMBER 1, 2022
DRAWN BY	C.E.

DESCRIPTION

FIGURE 1A:
EXISTING SITE PLAN
AND SURROUNDING CONTEXT



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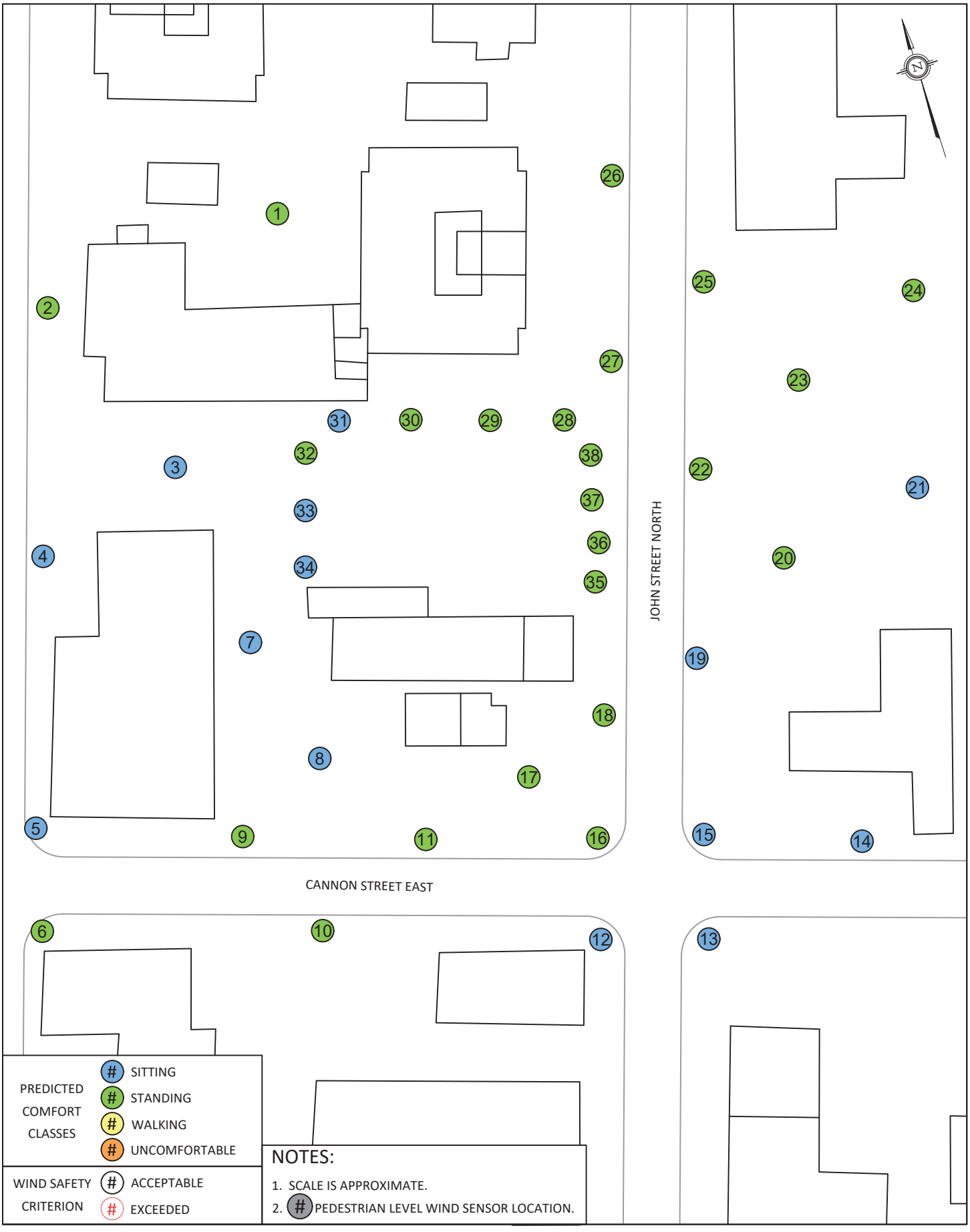
SCALE	1:2500 (APPROX.)
DRAWING NO.	GW22-275-PLW-1B
DATE	DECEMBER 1, 2022
DRAWN BY	C.E.

DESCRIPTION

FIGURE 1B:
PROPOSED SITE PLAN
AND SURROUNDING CONTEXT



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SCALE	1:850 (APPROX.)
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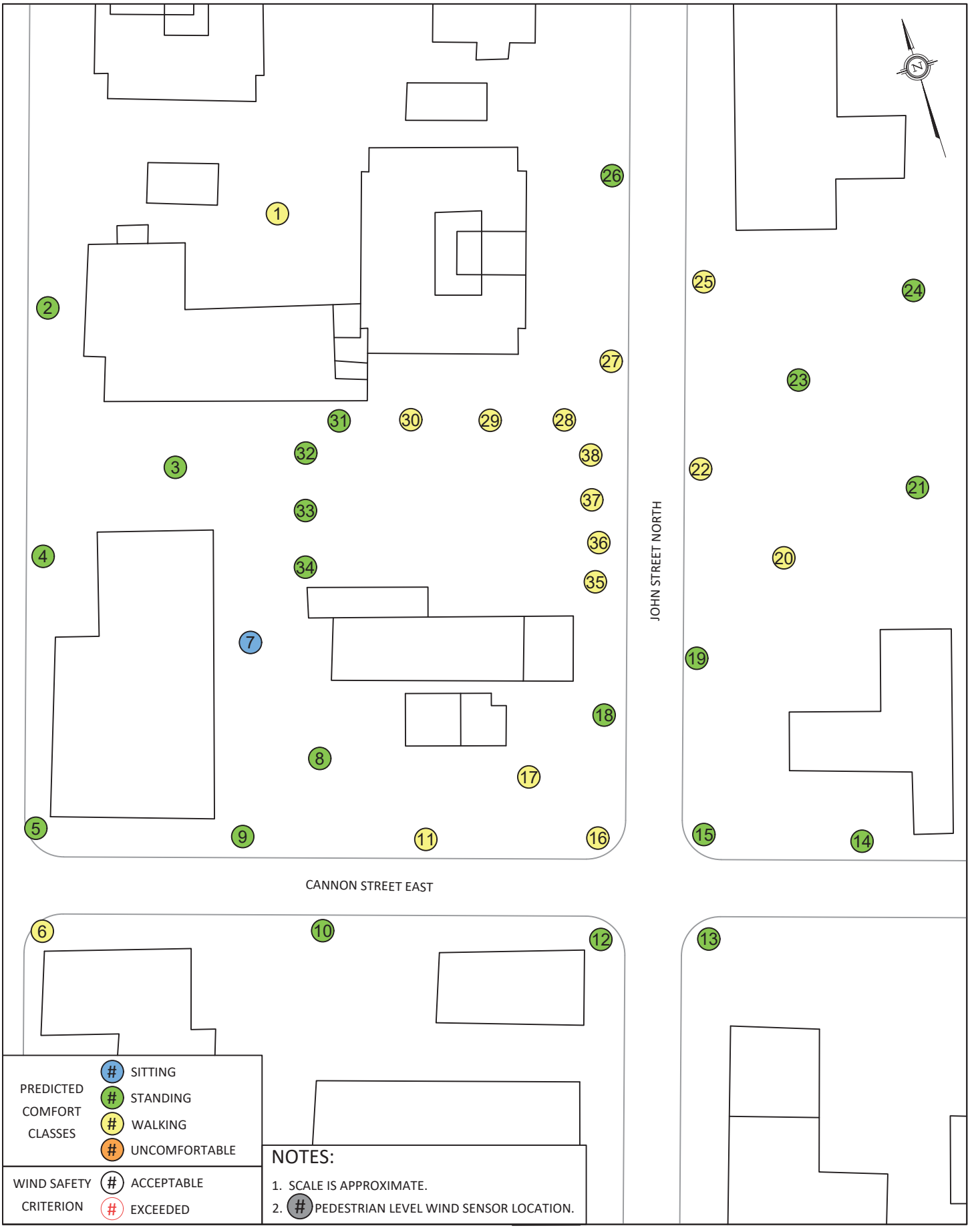
DATE	DECEMBER 1, 2022
DRAWN BY	C.E.

DESCRIPTION

FIGURE 2A: SUMMER
EXISTING GROUND FLOOR PLAN
PEDESTRIAN COMFORT PREDICTIONS



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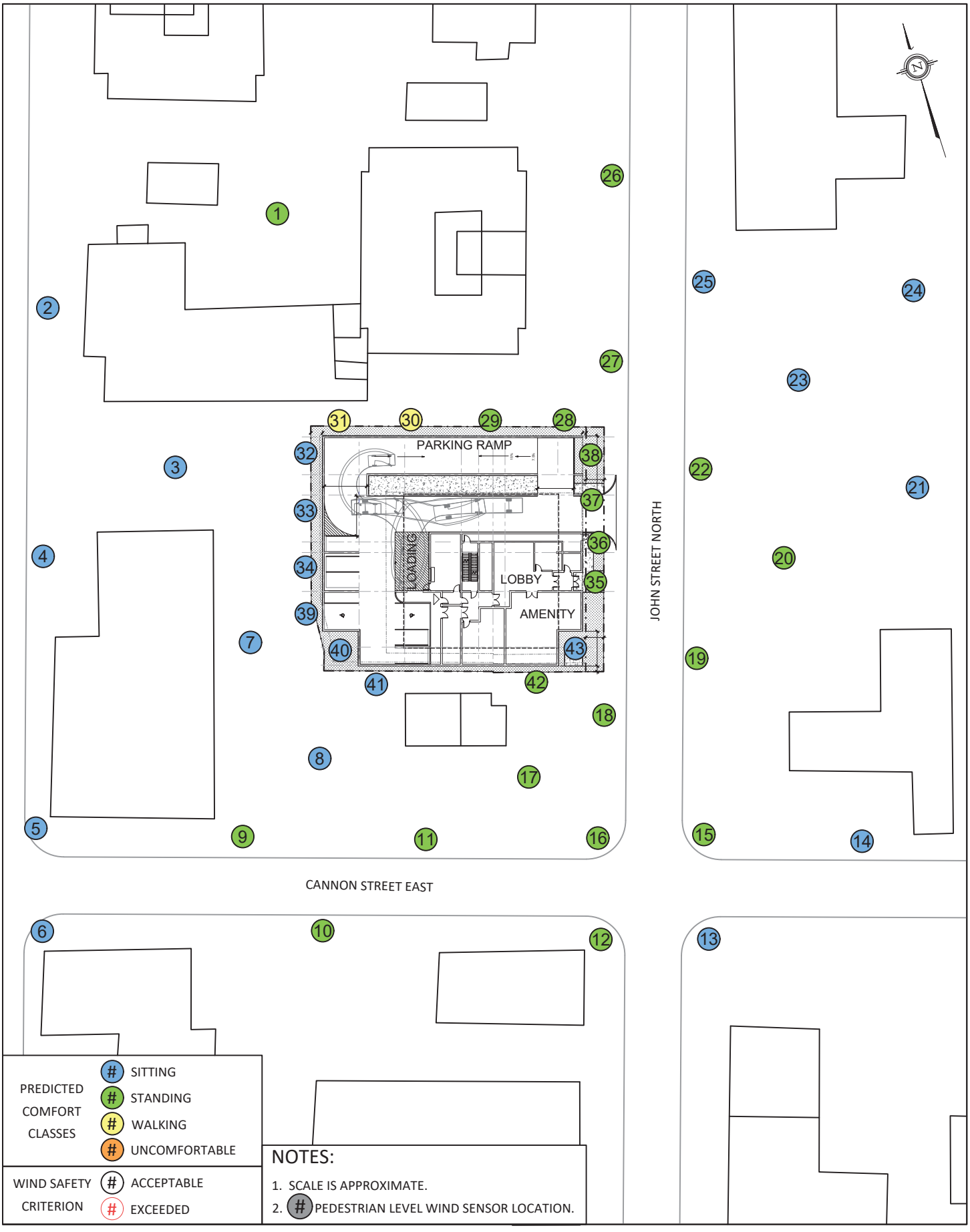
SCALE	1:850 (APPROX.)
DRAWING NO.	GW22-275-PLW-2B
DATE	DECEMBER 1, 2022
DRAWN BY	C.E.

DESCRIPTION

FIGURE 2B: WINTER
EXISTING GROUND FLOOR PLAN
PEDESTRIAN COMFORT PREDICTIONS



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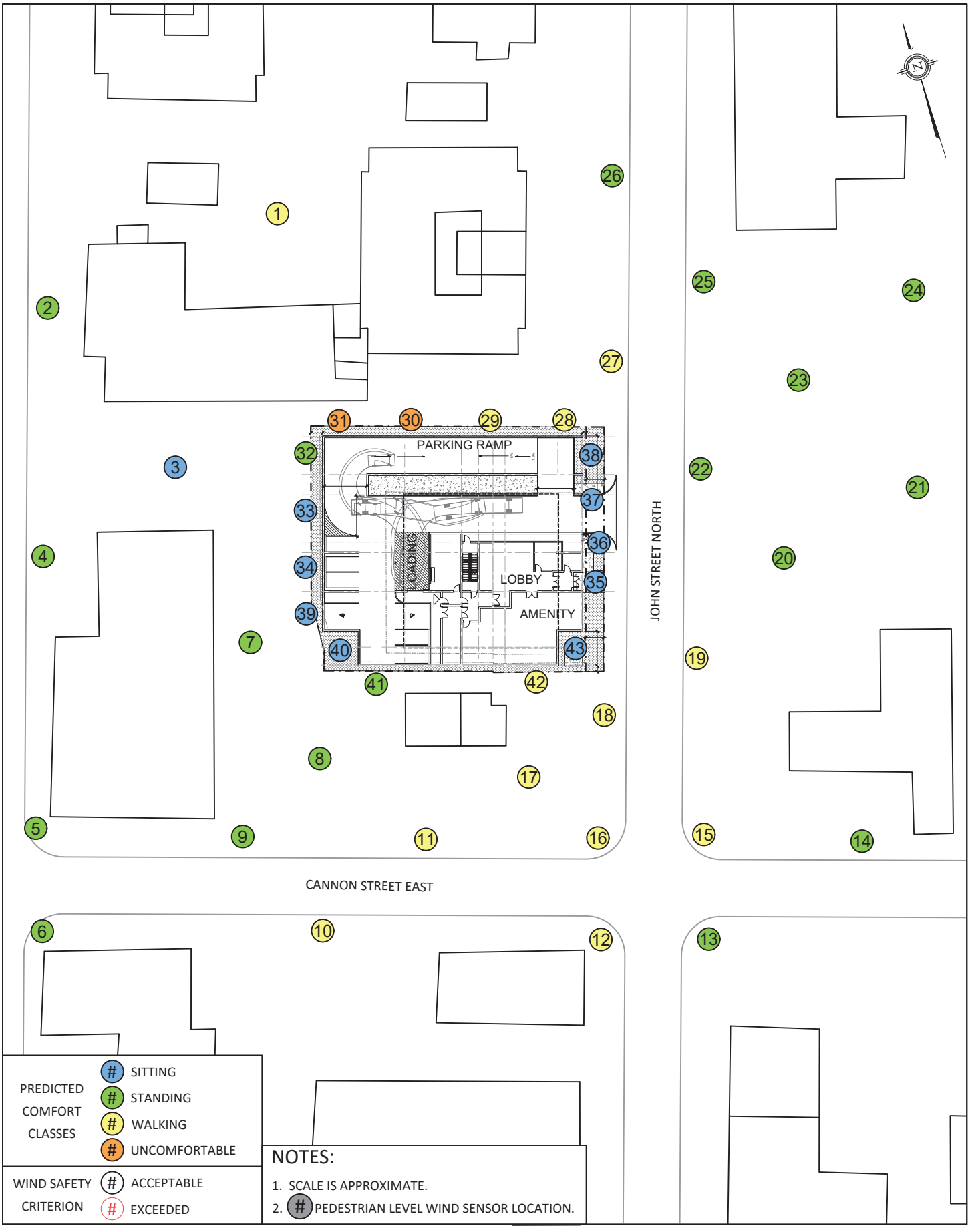
SCALE	1:850 (APPROX.)
DRAWING NO.	GW22-275-PLW-3A
DATE	DECEMBER 1, 2022
DRAWN BY	C.E.

DESCRIPTION

FIGURE 3A: SUMMER
PROPOSED GROUND FLOOR PLAN
PEDESTRIAN COMFORT PREDICTIONS



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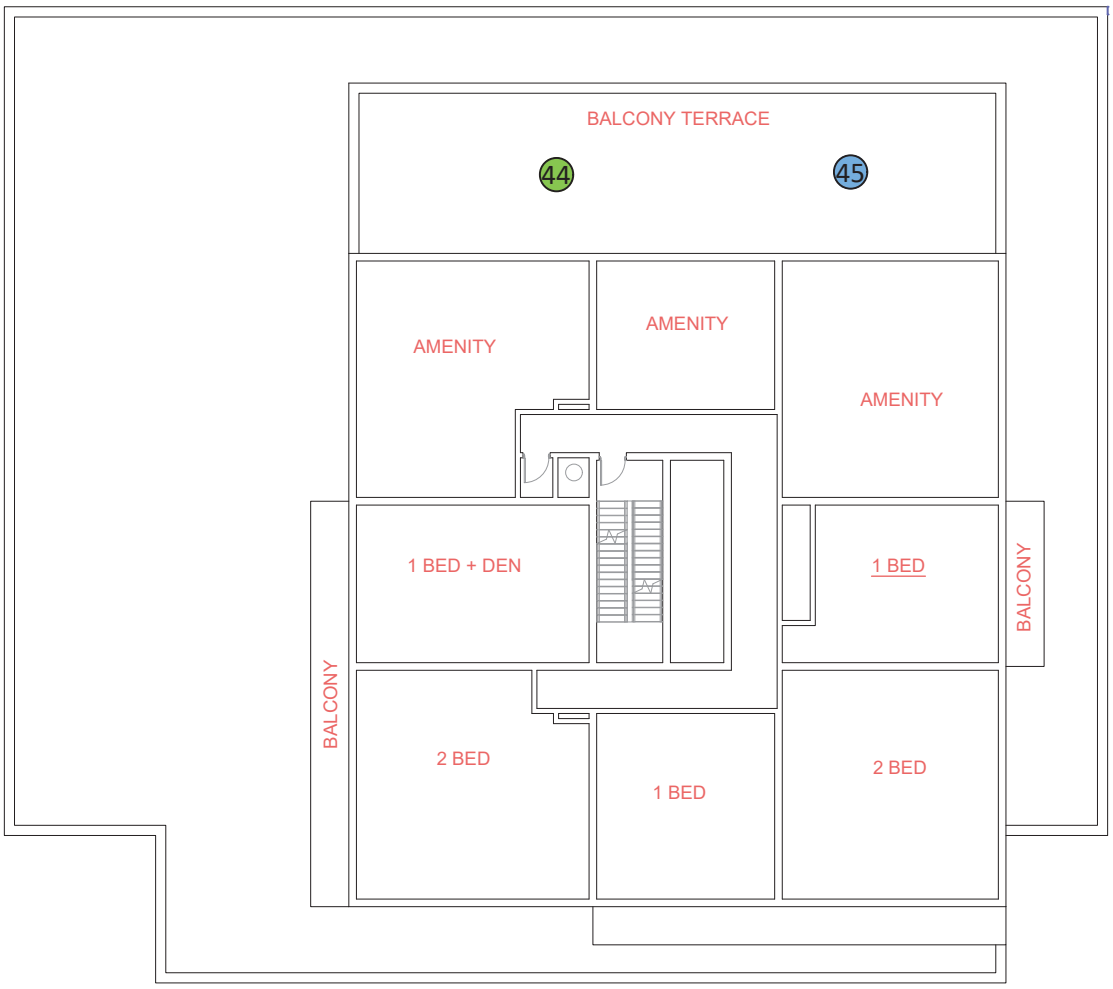
DRAWING NO.	GW22-275-PLW-3B
DATE	DECEMBER 1, 2022
DRAWN BY	C.E.

DESCRIPTION

FIGURE 3B: WINTER
PROPOSED GROUND FLOOR PLAN
PEDESTRIAN COMFORT PREDICTIONS



PREDICTED COMFORT CLASSES	#	SITTING
	#	STANDING
	#	WALKING
	#	UNCOMFORTABLE
WIND SAFETY CRITERION	#	ACCEPTABLE
	#	EXCEEDED

NOTES:

1. SCALE IS APPROXIMATE.
2. # PEDESTRIAN LEVEL WIND SENSOR LOCATION.

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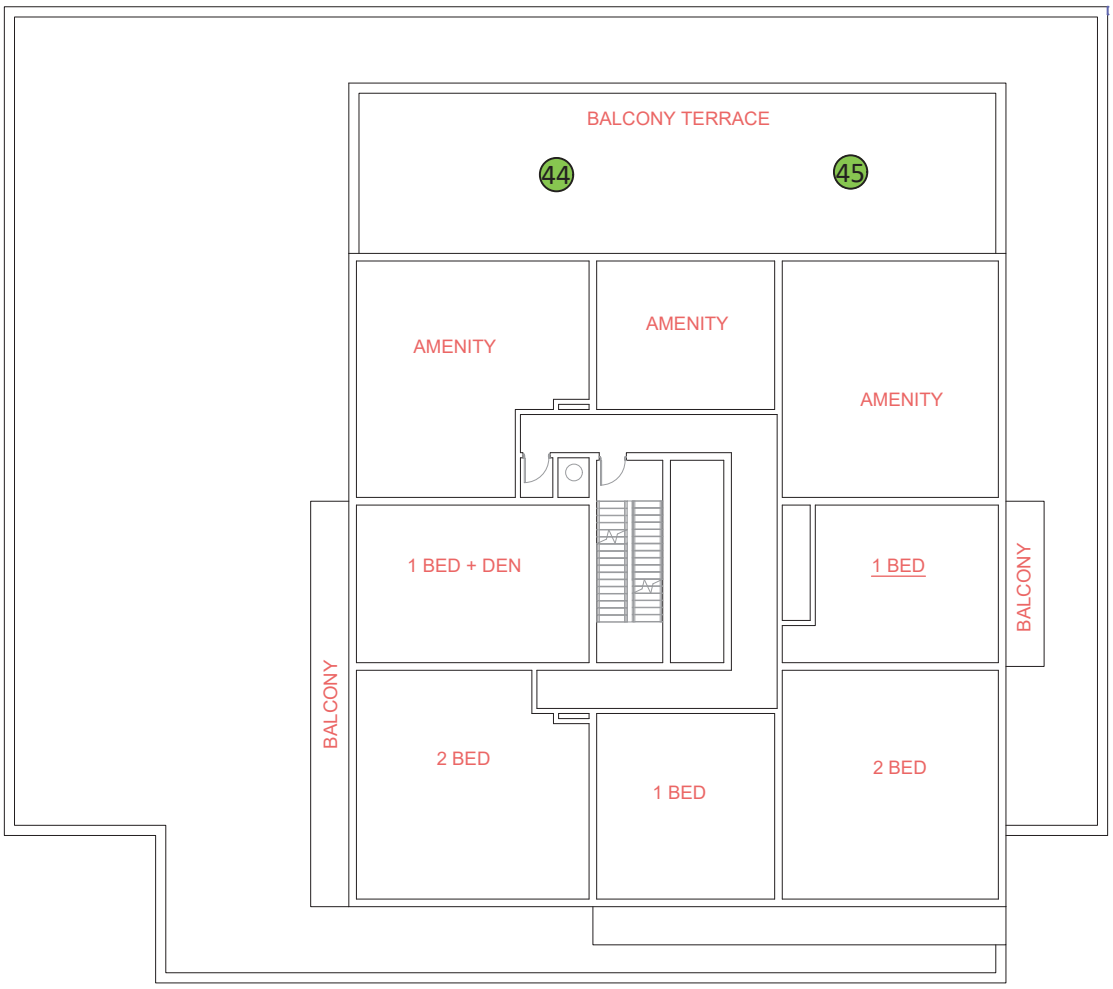
SCALE	1:300 (APPROX.)	DRAWING NO.	GW22-275-PLW-4A
DATE	DECEMBER 1, 2022	DRAWN BY	C.E.

FIGURE 4A: SUMMER
LEVEL 3 AMENITY PLAN
PEDESTRIAN COMFORT PREDICTIONS



PREDICTED COMFORT CLASSES	#	SITTING
	#	STANDING
	#	WALKING
	#	UNCOMFORTABLE
WIND SAFETY CRITERION	#	ACCEPTABLE
	#	EXCEEDED

NOTES:

1. SCALE IS APPROXIMATE.
2. # PEDESTRIAN LEVEL WIND SENSOR LOCATION.

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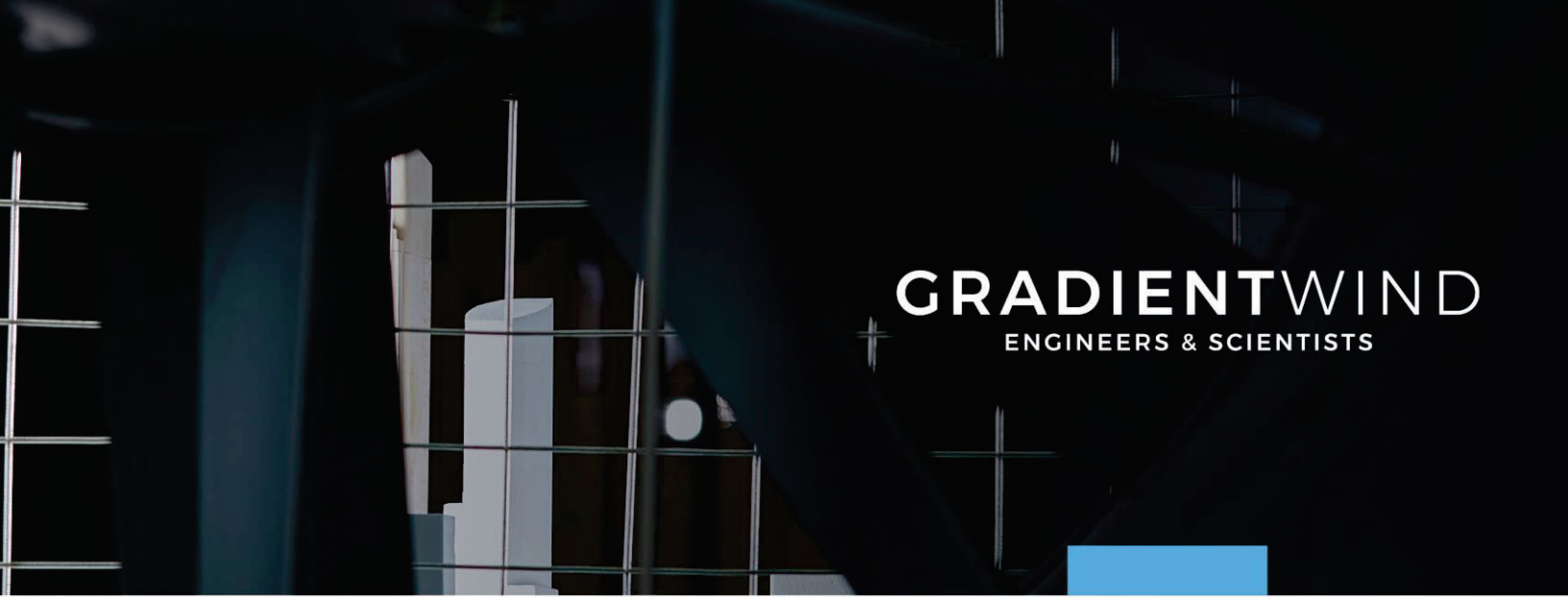
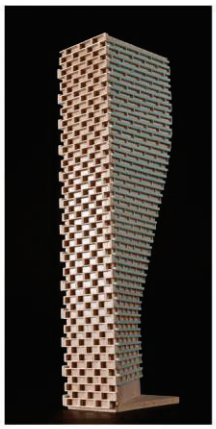
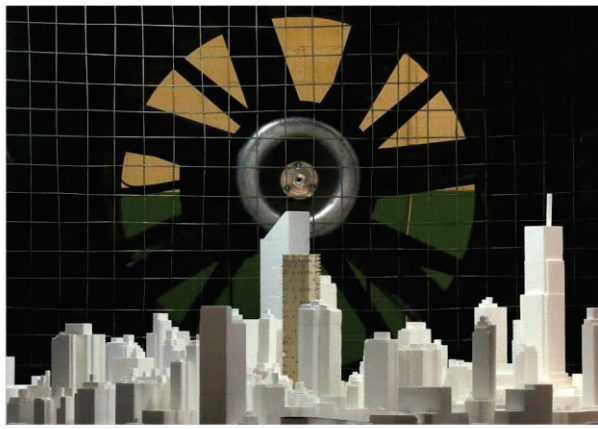
PROJECT	175 JOHN STREET N, HAMILTON PEDESTRIAN LEVEL WIND STUDY		DESCRIPTION
SCALE	1:300 (APPROX.)	DRAWING NO.	GW22-275-PLW-4B
DATE	DECEMBER 1, 2022	DRAWN BY	C.E.

FIGURE 4B: WINTER
LEVEL 3 AMENITY PLAN
PEDESTRIAN COMFORT PREDICTIONS







APPENDIX A

PEDESTRIAN COMFORT SUITABILITY, TABLES A1-A2 (EXISTING CONDITIONS)

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Guidelines	
Pedestrian Comfort	**20% exceedance wind speed** 0-10 km/h = Sitting, 10-15 km/h = Standing, 15-20 km/h = Walking, >20 km/h = Uncomfortable
Pedestrian Safety	**0.1% exceedance wind speed** 0-90 km/h = Safe

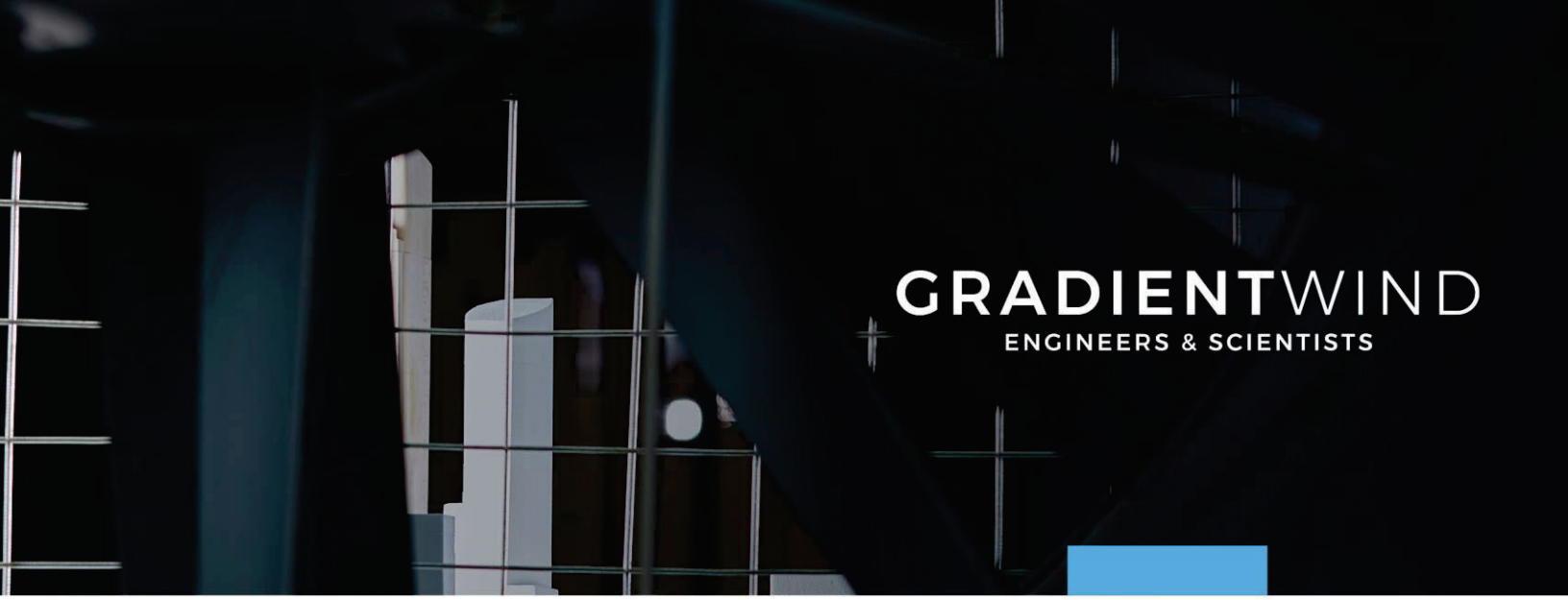
TABLE A1: SUMMARY OF PEDESTRIAN COMFORT (EXISTING CONDITIONS)

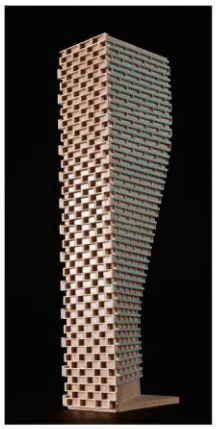
Sensor	Pedestrian Comfort				Pedestrian Safety	
	Summer		Winter		Annual	
	Wind Speed	Comfort Class	Wind Speed	Comfort Class	Wind Speed	Safety Class
1	14.5	Standing	18.5	Walking	69.2	Safe
2	10.8	Standing	14.3	Standing	51.4	Safe
3	9.6	Sitting	12.3	Standing	49.2	Safe
4	8.9	Sitting	11.7	Standing	42.1	Safe
5	9.9	Sitting	13.4	Standing	46.4	Safe
6	11.3	Standing	15.8	Walking	52.1	Safe
7	6.9	Sitting	9.1	Sitting	36.0	Safe
8	7.9	Sitting	10.6	Standing	42.9	Safe
9	10.9	Standing	15.0	Standing	52.4	Safe
10	10.2	Standing	14.0	Standing	52.2	Safe
11	11.1	Standing	15.7	Walking	60.0	Safe
12	9.6	Sitting	13.9	Standing	58.0	Safe
13	8.5	Sitting	12.2	Standing	53.6	Safe
14	8.7	Sitting	12.1	Standing	50.0	Safe
15	9.0	Sitting	13.2	Standing	57.1	Safe
16	10.8	Standing	15.6	Walking	60.8	Safe
17	11.2	Standing	16.1	Walking	62.0	Safe
18	10.1	Standing	13.9	Standing	51.7	Safe
19	9.4	Sitting	12.6	Standing	47.9	Safe
20	11.9	Standing	16.4	Walking	54.6	Safe
21	8.8	Sitting	12.3	Standing	49.5	Safe
22	12.3	Standing	16.9	Walking	59.4	Safe
23	10.1	Standing	14.2	Standing	56.6	Safe
24	10.6	Standing	14.4	Standing	54.8	Safe
25	11.4	Standing	15.6	Walking	63.2	Safe
26	11.0	Standing	14.5	Standing	49.7	Safe
27	13.7	Standing	18.7	Walking	65.1	Safe
28	14.1	Standing	18.8	Walking	65.2	Safe
29	13.6	Standing	18.1	Walking	72.2	Safe
30	11.5	Standing	15.9	Walking	61.9	Safe
31	9.7	Sitting	13.4	Standing	51.0	Safe
32	10.4	Standing	13.9	Standing	55.7	Safe
33	9.8	Sitting	12.9	Standing	57.9	Safe
34	10.0	Sitting	13.2	Standing	62.0	Safe
35	10.8	Standing	15.1	Walking	52.7	Safe

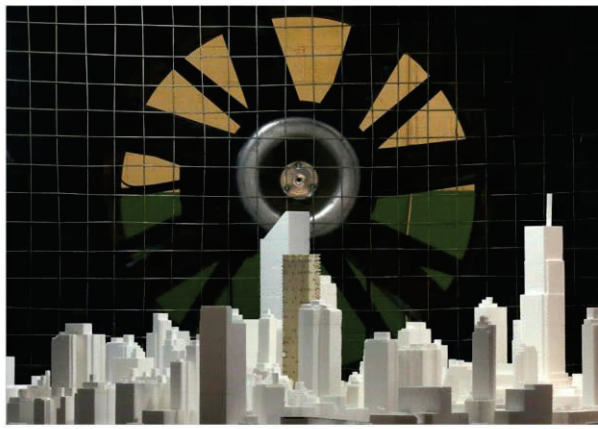
Guidelines	
Pedestrian Comfort	**20% exceedance wind speed** 0-10 km/h = Sitting, 10-15 km/h = Standing, 15-20 km/h = Walking, >20 km/h = Uncomfortable
Pedestrian Safety	**0.1% exceedance wind speed** 0-90 km/h = Safe

TABLE A2: SUMMARY OF PEDESTRIAN COMFORT (EXISTING CONDITONS)

Sensor	Pedestrian Comfort				Pedestrian Safety	
	Summer		Winter		Annual	
	Wind Speed	Comfort Class	Wind Speed	Comfort Class	Wind Speed	Safety Class
36	12.1	Standing	16.6	Walking	55.8	Safe
37	14.2	Standing	19.6	Walking	63.7	Safe
38	14.3	Standing	19.6	Walking	64.8	Safe







APPENDIX B

PEDESTRIAN COMFORT SUITABILITY, TABLES B1-B2 (PROPOSED SCENARIO)

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Guidelines	
Pedestrian Comfort	**20% exceedance wind speed** 0-10 km/h = Sitting, 10-15 km/h = Standing, 15-20 km/h = Walking, >20 km/h = Uncomfortable
Pedestrian Safety	**0.1% exceedance wind speed** 0-90 km/h = Safe

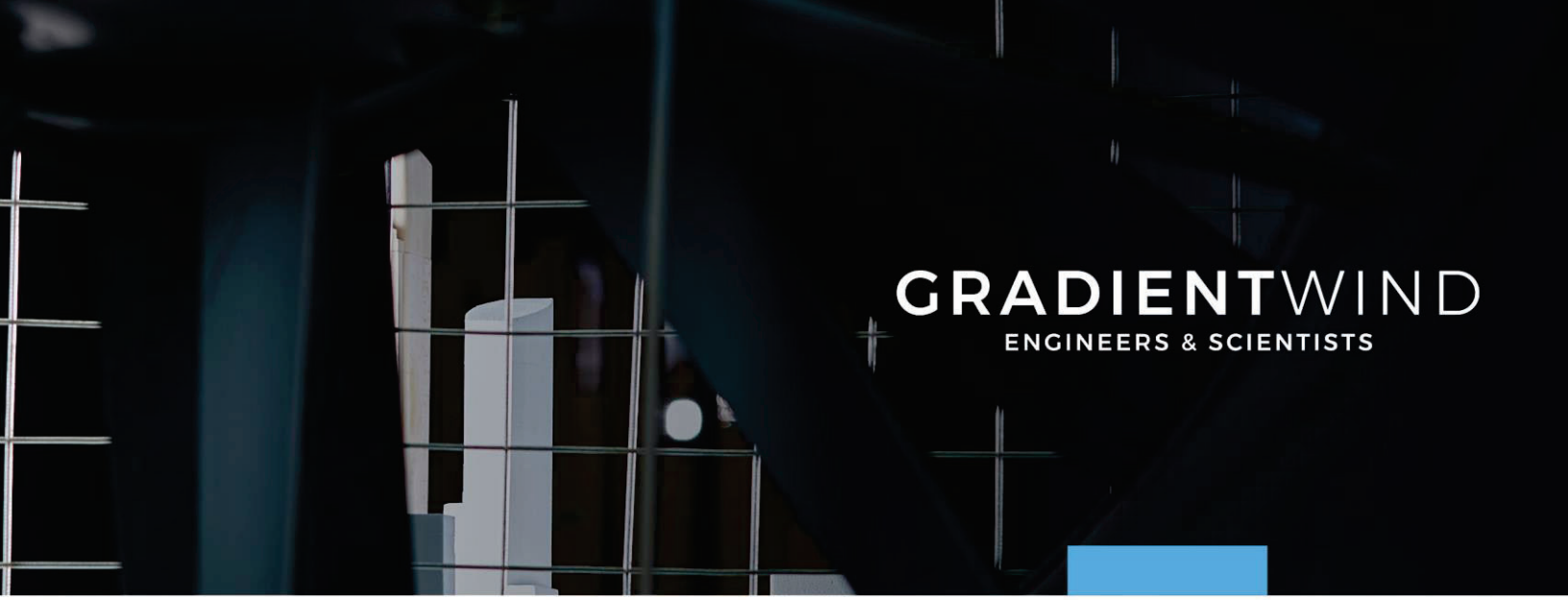
TABLE B1: SUMMARY OF PEDESTRIAN COMFORT (PROPOSED CONDITIONS)

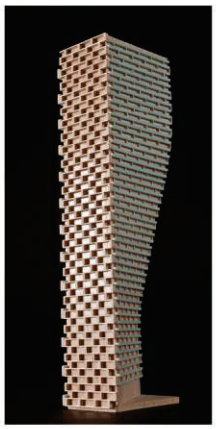
Sensor	Pedestrian Comfort				Pedestrian Safety	
	Summer		Winter		Annual	
	Wind Speed	Comfort Class	Wind Speed	Comfort Class	Wind Speed	Safety Class
1	13.9	Standing	17.3	Walking	67.1	Safe
2	9.8	Sitting	12.7	Standing	47.7	Safe
3	7.7	Sitting	9.9	Sitting	38.1	Safe
4	8.9	Sitting	11.8	Standing	42.3	Safe
5	8.5	Sitting	11.4	Standing	42.3	Safe
6	9.6	Sitting	13.2	Standing	46.6	Safe
7	8.7	Sitting	11.7	Standing	42.2	Safe
8	8.8	Sitting	11.7	Standing	46.9	Safe
9	10.1	Standing	13.3	Standing	54.3	Safe
10	11.4	Standing	15.3	Walking	57.0	Safe
11	13.7	Standing	18.8	Walking	71.0	Safe
12	11.8	Standing	16.6	Walking	60.0	Safe
13	10.0	Sitting	14.3	Standing	56.5	Safe
14	8.9	Sitting	13.4	Standing	54.3	Safe
15	11.3	Standing	16.0	Walking	58.6	Safe
16	13.8	Standing	19.1	Walking	63.6	Safe
17	14.7	Standing	20.0	Walking	68.8	Safe
18	14.6	Standing	19.9	Walking	68.0	Safe
19	12.8	Standing	18.2	Walking	68.1	Safe
20	10.3	Standing	13.6	Standing	53.6	Safe
21	7.5	Sitting	10.3	Standing	45.2	Safe
22	11.1	Standing	14.9	Standing	58.0	Safe
23	8.0	Sitting	11.0	Standing	47.4	Safe
24	8.0	Sitting	10.4	Standing	42.4	Safe
25	9.3	Sitting	12.1	Standing	46.9	Safe
26	10.4	Standing	13.5	Standing	47.2	Safe
27	11.5	Standing	16.0	Walking	59.1	Safe
28	11.2	Standing	16.4	Walking	63.1	Safe
29	14.5	Standing	19.8	Walking	67.7	Safe
30	15.8	Walking	21.6	Uncomfortable	73.2	Safe
31	16.1	Walking	22.2	Uncomfortable	76.1	Safe
32	7.9	Sitting	11.1	Standing	44.1	Safe
33	7.0	Sitting	9.5	Sitting	39.5	Safe
34	7.1	Sitting	9.1	Sitting	35.4	Safe
35	6.9	Sitting	8.8	Sitting	40.0	Safe

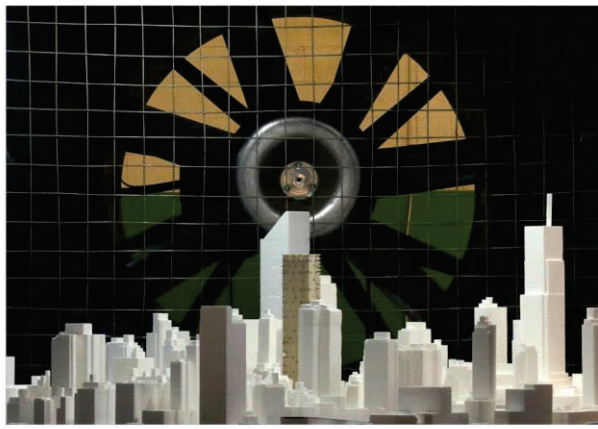
Guidelines	
Pedestrian Comfort	**20% exceedance wind speed** 0-10 km/h = Sitting, 10-14 km/h = Standing, 14-17 km/h = Strolling, 17-20 km/h = Walking, >20 km/h = Uncomfortable
Pedestrian Safety	**0.1% exceedance wind speed** 0-90 km/h = Safe

TABLE B2: SUMMARY OF PEDESTRIAN COMFORT (PROPOSED CONDITONS)

Sensor	Pedestrian Comfort				Pedestrian Safety	
	Summer		Winter		Annual	
	Wind Speed	Comfort Class	Wind Speed	Comfort Class	Wind Speed	Safety Class
36	6.7	Sitting	8.5	Sitting	34.3	Safe
37	6.4	Sitting	8.5	Sitting	31.3	Safe
38	8.1	Sitting	9.9	Sitting	46.3	Safe
39	7.5	Sitting	9.6	Sitting	39.4	Safe
40	7.4	Sitting	9.6	Sitting	37.0	Safe
41	9.7	Sitting	13.4	Standing	53.4	Safe
42	11.6	Standing	16.8	Walking	64.6	Safe
43	7.3	Sitting	9.1	Sitting	62.1	Safe
44	11.4	Standing	14.9	Standing	61.7	Safe
45	8.0	Sitting	10.9	Standing	43.0	Safe







APPENDIX C

WIND TUNNEL SIMULATION OF THE NATURAL WIND

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WIND TUNNEL SIMULATION OF THE NATURAL WIND

Wind flowing over the surface of the earth develops a boundary layer due to the drag produced by surface features such as vegetation and man-made structures. Within this boundary layer, the mean wind speed varies from zero at the surface to the gradient wind speed at the top of the layer. The height of the top of the boundary layer is referred to as the gradient height, above which the velocity remains more-or-less constant for a given synoptic weather system. The mean wind speed is taken to be the average value over one hour. Superimposed on the mean wind speed are fluctuating (or turbulent) components in the longitudinal (i.e. along wind), vertical and lateral directions. Although turbulence varies according to the roughness of the surface, the turbulence level generally increases from nearly zero (smooth flow) at gradient height to maximum values near the ground. While for a calm ocean the maximum could be 20%, the maximum for a very rough surface such as the center of a city could be 100%, or equal to the local mean wind speed. The height of the boundary layer varies in time and over different terrain roughness within the range of 400 metres (m) to 600 m.

Simulating real wind behaviour in a wind tunnel requires simulating the variation of mean wind speed with height, simulating the turbulence intensity, and matching the typical length scales of turbulence. It is the ratio between wind tunnel turbulence length scales and turbulence scales in the atmosphere that determines the geometric scales that models can assume in a wind tunnel. Hence, when a 1:200 scale model is quoted, this implies that the turbulence scales in the wind tunnel and the atmosphere have the same ratios. Some flexibility in this requirement has been shown to produce reasonable wind tunnel predictions compared to full scale. In model scale the mean and turbulence characteristics of the wind are obtained with the use of spires at one end of the tunnel and roughness elements along the floor of the tunnel. The fan is located at the model end and wind is pulled over the spires, roughness elements and model. It has been found that, to a good approximation, the mean wind profile can be represented by a power law relation, shown below, giving height above ground versus wind speed.

$$U = U_g \left(\frac{Z}{Z_g} \right)^{\alpha}$$

Where; U = mean wind speed, U_g = gradient wind speed, Z = height above ground, Z_g = depth of the boundary layer (gradient height) and α is the power law exponent.

Figure B1 on the following page plots three velocity profiles for open country, and suburban and urban exposures.

The exponent α varies according to the type of upwind terrain; α ranges from 0.14 for open country to 0.33 for an urban exposure. Figure C2 illustrates the theoretical variation of turbulence for open country, suburban and urban exposures.

The integral length scale of turbulence can be thought of as an average size of gust in the atmosphere. Although it varies with height and ground roughness, it has been found to generally be in the range of 100 m to 200 m in the upper half of the boundary layer. Thus, for a 1:300 scale, the model value should be between 1/3 and 2/3 of a metre. Integral length scales are derived from power spectra, which describe the energy content of wind as a function of frequency. There are several ways of determining integral length scales of turbulence. One way is by comparison of a measured power spectrum in model scale to a non-dimensional theoretical spectrum such as the Davenport spectrum of longitudinal turbulence. Using the Davenport spectrum, which agrees well with full-scale spectra, one can estimate the integral scale by plotting the theoretical spectrum with varying L until it matches as closely as possible the measured spectrum:

$$f \times S(f) = \frac{\frac{4(Lf)^2}{U_{10}{}^2}}{\left[1 + \frac{4(Lf)^2}{U_{10}{}^2}\right]^{\frac{4}{3}}}$$

Where, f is frequency, S(f) is the spectrum value at frequency f, U10 is the wind speed 10 m above ground level, and L is the characteristic length of turbulence.

Once the wind simulation is correct, the model, constructed to a suitable scale, is installed at the center of the working section of the wind tunnel. Different wind directions are represented by rotating the model to align with the wind tunnel center-line axis.

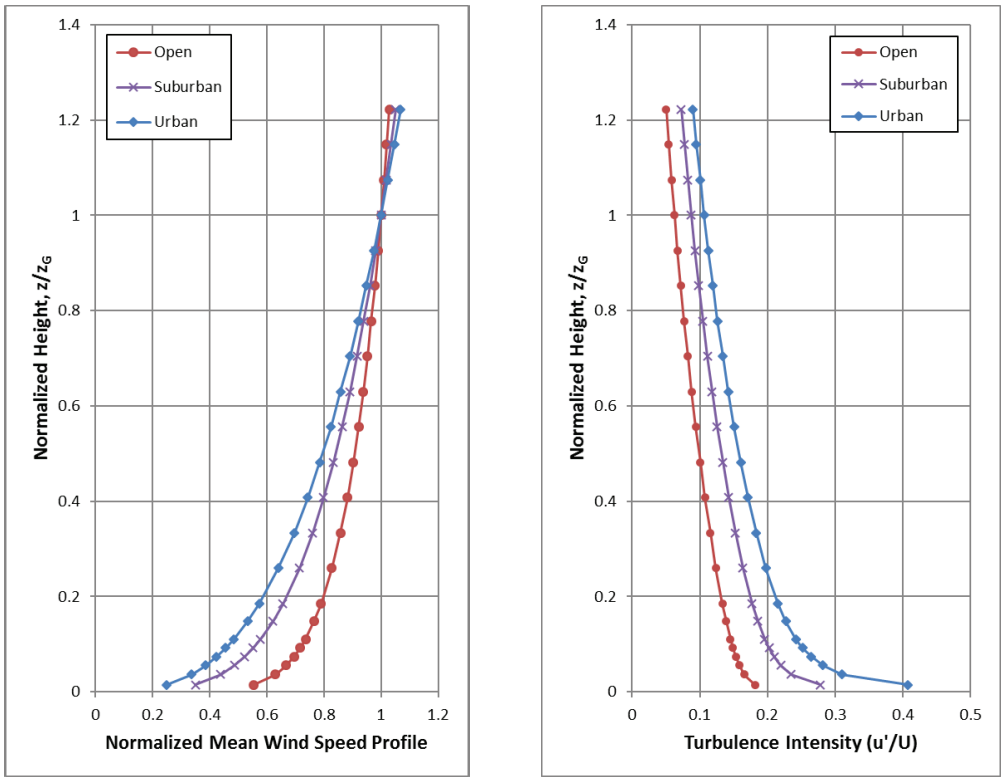

FIGURE C1 (LEFT): MEAN WIND SPEED PROFILES;
FIGURE C2 (RIGHT): TURBULENCE INTENSITY PROFILES

REFERENCES

1. Teunissen, H.W., 'Characteristics of The Mean Wind And Turbulence In The Planetary Boundary Layer', Institute For Aerospace Studies, University Of Toronto, UTIAS # 32, Oct. 1970

2. Flay, R.G., Stevenson, D.C., 'Integral Length Scales in an Atmospheric Boundary Layer Near The Ground', 9th Australian Fluid Mechanics Conference, Auckland, Dec. 1966

3. ESDU, 'Characteristics of Atmospheric Turbulence Near the Ground', 74030

4. Bradley, E.F., Coppin, P.A., Katen, P.C., '*Turbulent Wind Structure Above Very Rugged Terrain*', 9th Australian Fluid Mechanics Conference, Auckland, Dec. 1966

APPENDIX D

PEDESTRIAN LEVEL WIND MEASUREMENT METHODOLOGY

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PEDESTRIAN LEVEL WIND MEASUREMENT METHODOLOGY

Pedestrian level wind studies are performed in a wind tunnel on a physical model of the study buildings at a suitable scale. Instantaneous wind speed measurements are recorded at a model height corresponding to 1.5 m full scale using either a hot wire anemometer or a pressure-based transducer. Measurements are performed at any number of locations on the model and usually for 36 wind directions. For each wind direction, the roughness of the upwind terrain is matched in the wind tunnel to generate the correct mean and turbulent wind profiles approaching the model.

The hot wire anemometer is an instrument consisting of a thin metallic wire conducting an electric current. It is an omni-directional device equally sensitive to wind approaching from any direction in the horizontal plane. By compensating for the cooling effect of wind flowing over the wire, the associated electronics produce an analog voltage signal that can be calibrated against velocity of the air stream. For all measurements, the wire is oriented vertically so as to be sensitive to wind approaching from all directions in a horizontal plane.

The pressure sensor is a small cylindrical device that measures instantaneous pressure differences over a small area. The sensor is connected via tubing to a transducer that translates the pressure to a voltage signal that is recorded by computer. With appropriately designed tubing, the sensor is sensitive to a suitable range of fluctuating velocities.

For a given wind direction and location on the model, a time history of the wind speed is recorded for a period of time equal to one hour in full-scale. The analog signal produced by the hot wire or pressure sensor is digitized at a rate of 400 samples per second. A sample recording for several seconds is illustrated in Figure D1. This data is analyzed to extract the mean, root-mean-square (rms) and the peak of the signal. The peak value, or gust wind speed, is formed by averaging a number of peaks obtained from sub-intervals of the sampling period. The mean and gust speeds are then normalized by the wind tunnel gradient wind speed, which is the speed at the top of the model boundary layer, to obtain mean and gust ratios. At each location, the measurements are repeated for 36 wind directions to produce normalized polar plots, which will be provided upon request.

In order to determine the duration of various wind speeds at full scale for a given measurement location the gust ratios are combined with a statistical (mathematical) model of the wind climate for the project site. This mathematical model is based on hourly wind data obtained from one or more meteorological stations (usually airports) close to the project location. The probability model used to represent the data is the Weibull distribution expressed as:

$$P\left(>U_g\right) = A_\theta \bullet \exp\left[\left(-\frac{Ug}{C\theta}\right)^{K\theta}\right]$$

Where,

P (> U_g) is the probability, fraction of time, that the gradient wind speed ***U_g*** is exceeded; ***θ*** is the wind direction measured clockwise from true north, ***A***, ***C***, ***K*** are the Weibull coefficients, (Units: A - dimensionless, C - wind speed units [km/h] for instance, K - dimensionless). ***A_θ*** is the fraction of time wind blows from a 10° sector centered on ***θ***.

Analysis of the hourly wind data recorded for a length of time, on the order of 10 to 30 years, yields the ***A_θ***, ***C_θ*** and ***K_θ*** values. The probability of exceeding a chosen wind speed level, say 20 km/h, at sensor *N* is given by the following expression:

$$P_N(>20) = \Sigma_\theta P\left[\frac{(>20)}{\left(\frac{U_N}{U_g}\right)}\right]$$

P_N (> 20) = Σ_θ P { > 20/(U_N/Ug) }

Where, ***U_N/U_g*** is the gust velocity ratios, where the summation is taken over all 36 wind directions at 10° intervals.

If there are significant seasonal variations in the weather data, as determined by inspection of the C_θ and K_θ values, then the analysis is performed separately for two or more times corresponding to the groupings of seasonal wind data. Wind speed levels of interest for predicting pedestrian comfort are based on the comfort guidelines chosen to represent various pedestrian activity levels as discussed in the main text.

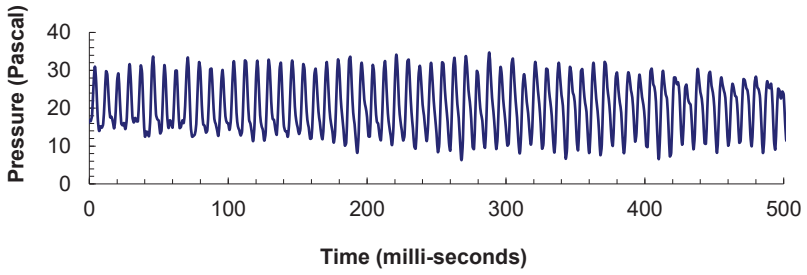

FIGURE D1: TIME VERSUS VELOCITY TRACE FOR A TYPICAL WIND SENSOR

REFERENCES

1. Davenport, A.G., '*The Dependence of Wind Loading on Meteorological Parameters*', Proc. of Int. Res. Seminar, Wind Effects on Buildings & Structures, NRC, Ottawa, 1967, University of Toronto Press.

2. Wu, S., Bose, N., 'An *Extended Power Law Model for the Calibration of Hot-wire/Hot-film Constant Temperature Probes*', Int. J. of Heat Mass Transfer, Vol.17, No.3, pp.437-442, Pergamon Press.