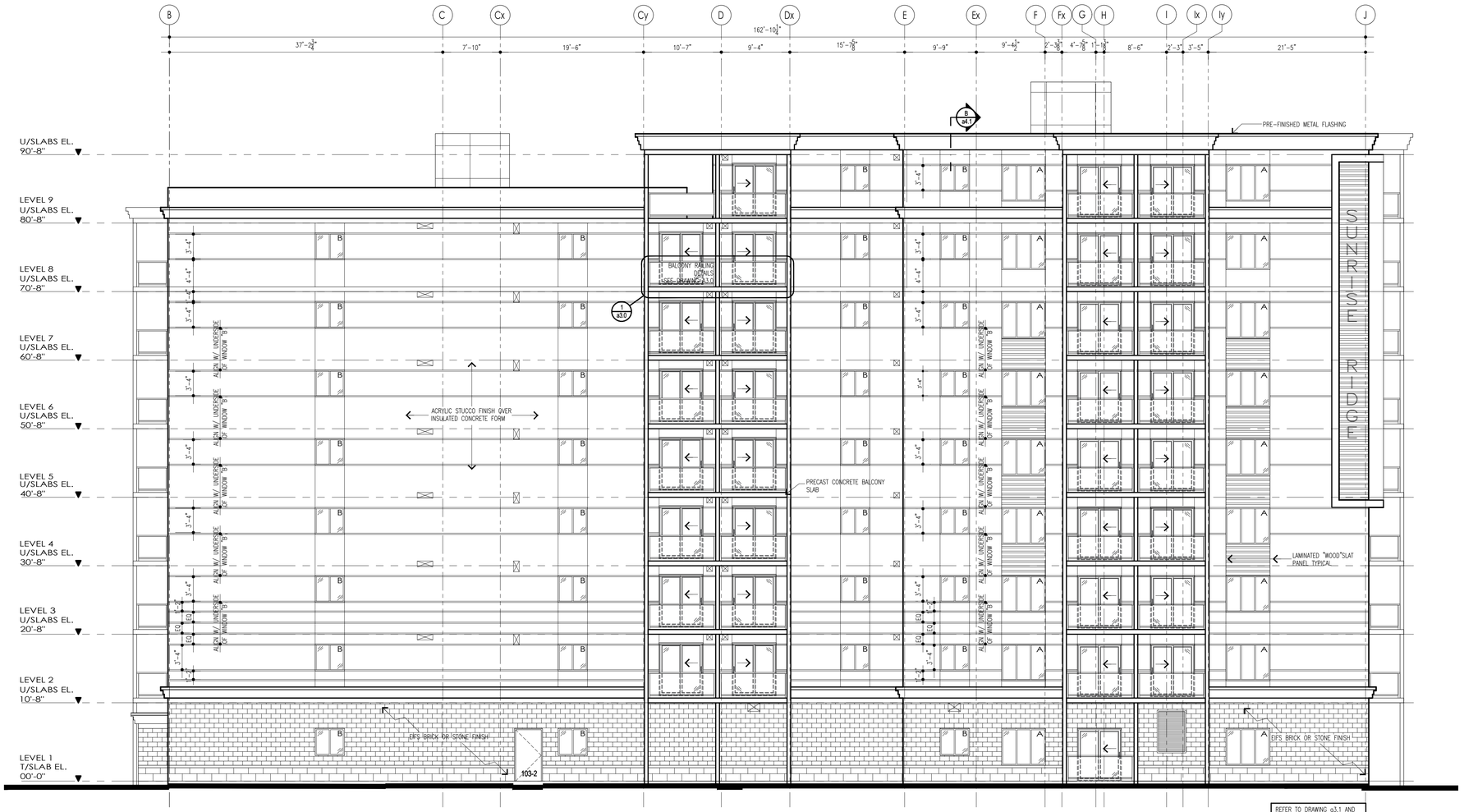
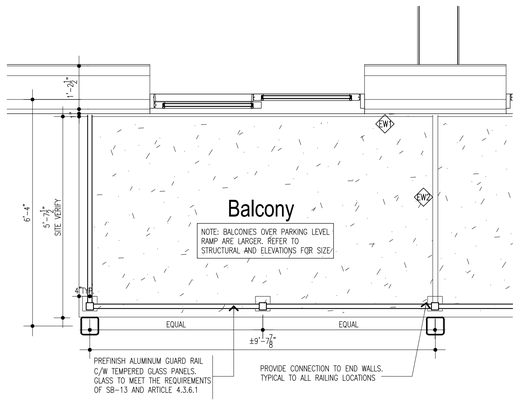
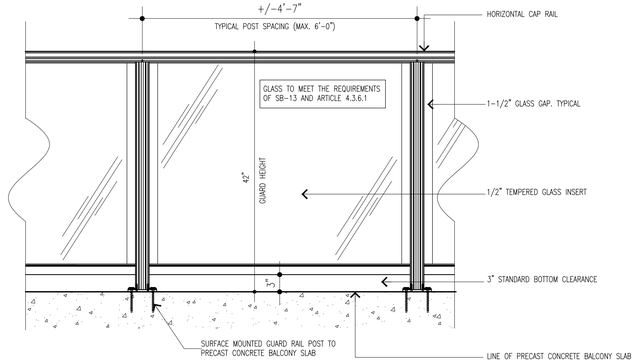


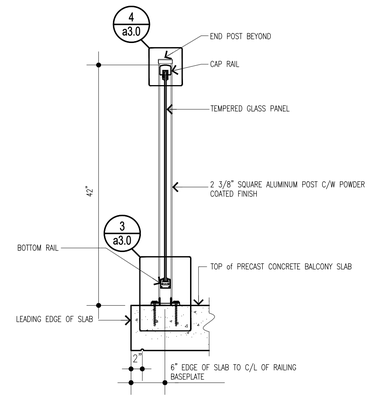
NORTH ELEVATION
SCALE 1/8"=1'-0"



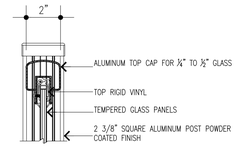
Typical Balcony Rail Layout



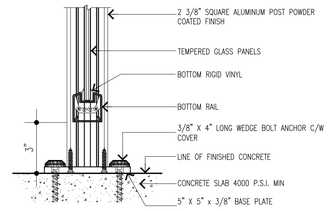
1/a3.0 Balcony Guard Rail Elevation
Tempered Glass Panels



2/a3.0 Typical Balcony Rail Section



4/a3.0 Guardrail Rail Cap Detail



3/a3.0 Guardrail Post
Surface Mounting Detail

seal

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project
Proposed Apartment Complex
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Sudbury, ON

david ELLIS architect inc.
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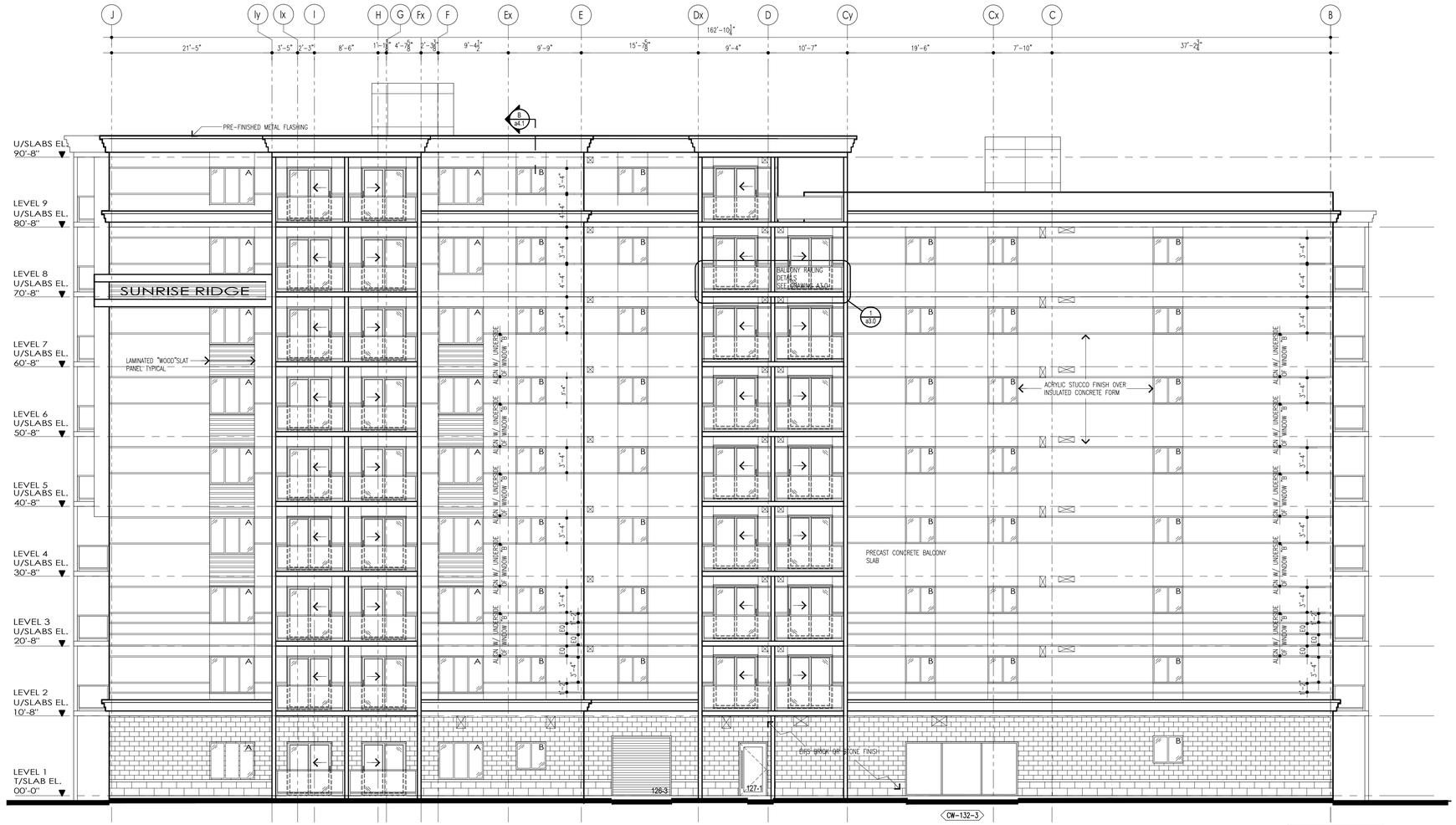
revisions

scale 1/8"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

drawing North Elevation
project number 23-05

a-1.0



SOUTH ELEVATION

SCALE 1/8"=1'-0"

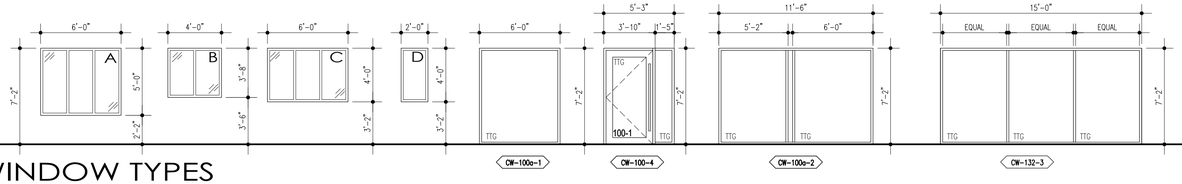
REFER TO DRAWING a3.1 AND DOOR SCHEDULE FOR SIZE OF EXTERIOR WINDOWS/DOORS AND CURTAIN WALLS.

Exterior Aluminum Curtain Wall

ALUMICOR - 2600 Series
or WINDSPEC - 5500 HTP Series
1-3/4" Triple Thermal Glazing
4" Deep Back Sections
Clear Anodized Finish
Extruded Aluminum Sills
Capped Joints

Exterior Aluminum Entry Doors

ALUMICOR - Thermaporte 7700 T600B
or WINDSPEC - 5500 Series Wide Stile
Refer to hardware schedule for door prep requirements



WINDOW TYPES

SCALE 3/16"=1'-0"

NOTE: ALL THE SUITE WINDOWS TO HAVE BRICK MOULDS

ABBREVIATION LEGEND

TTG – TEMPERED THERMAL GLAZING
TG – 1/4" TEMPERED GLAZING
FR – FIRE RATED GLAZING

ALL DIMENSIONS SHOWN ARE APPROXIMATE FOR ESTIMATING PURPOSES. CONTRACTOR IS RESPONSIBLE FOR SITE VERIFYING ALL MEASUREMENTS PRIOR TO ORDERING MATERIALS OR COMMENCING FABRICATION.

ALUMINUM NOTES:
ALL THERMAL GLAZING TO BE TEMPERED GLAZING TO BOTH INSIDE AND OUTSIDE LITES

ALL EXTERIOR FRAMES/GLAZING/DOORS, FLASHINGS, EXTRUDED SILLS BLOCKING, CAULKING ETC. ARE TO BE PROVIDED AND INSTALLED FOR A COMPLETE WEATHER TIGHT INSTALLATION, AND TO MEET ALL APPLICABLE O.B.C. REQUIREMENTS.

PROVIDE TOP AND BOTTOM FLASHING, TYPICAL

PROVIDE ROPE AND CAULKING TO VERTICAL JUNCTION OF WINDOW OPENINGS. IF GAP OVER 3/4", PROVIDE ALUMINUM FILLER AND CAULKING, TYPICAL

seal

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revisions

All measurements to be confirmed in field by Contractor. Errors and omissions to be reported to architect before commencement of work. Drawings not to be scaled. Responsibility for coordination of all work remains with the General Contractor.
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scale 1/8"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

drawing South Elevation
project number 23-05

a-1.1

WEST ELEVATION

SCALE 1/8"=1'-0"

REFER TO DRAWING a3.1 AND DOOR SCHEDULE FOR SIZE OF EXTERIOR WINDOWS/DOORS AND CURTAIN WALLS.

seal

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project

Proposed Apartment Complex for the Sunrise Ridge Drive Development Sudbury, ON

david ELLIS architect inc.

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revisions

All measurements to be confirmed in field by Contractor. Errors and omissions to be reported to Architect, Interior Designer, or Engineer prior to proceeding with work. Responsibility for coordination of all work remains with the General Contractor

scale 1/8"=1'-0"

date May, 2024

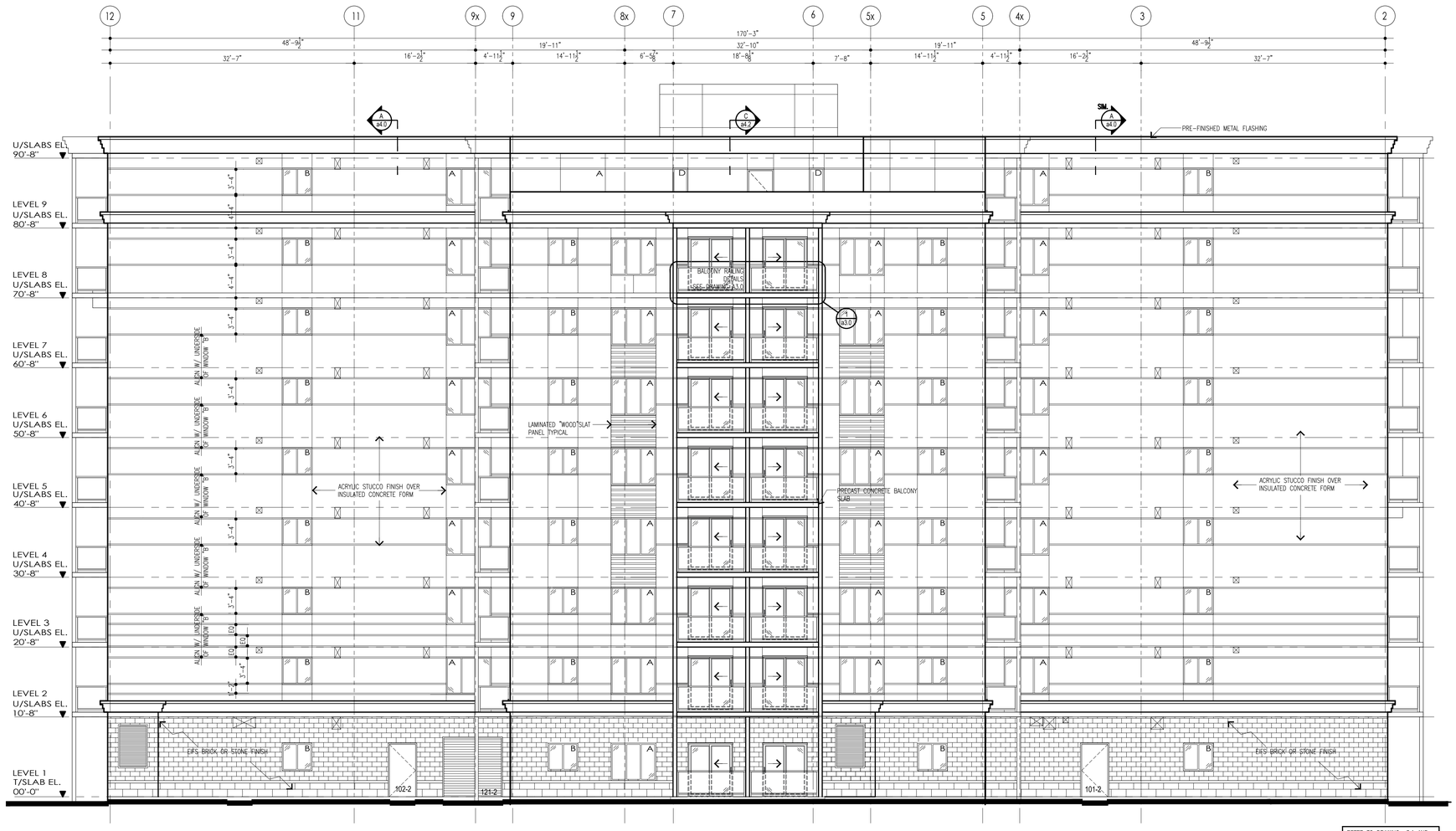
checked by d ellis

drawn by smackey

drawing West (Front) Elevation

project number 23-05

a-1.2



REFER TO DRAWING a3.1 AND DOOR SCHEDULE FOR SIZE OF EXTERIOR WINDOWS/DOORS AND CURTAIN WALLS.

EAST ELEVATION
SCALE 1/8"=1'-0"

seal

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Sudbury, ON

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revisions

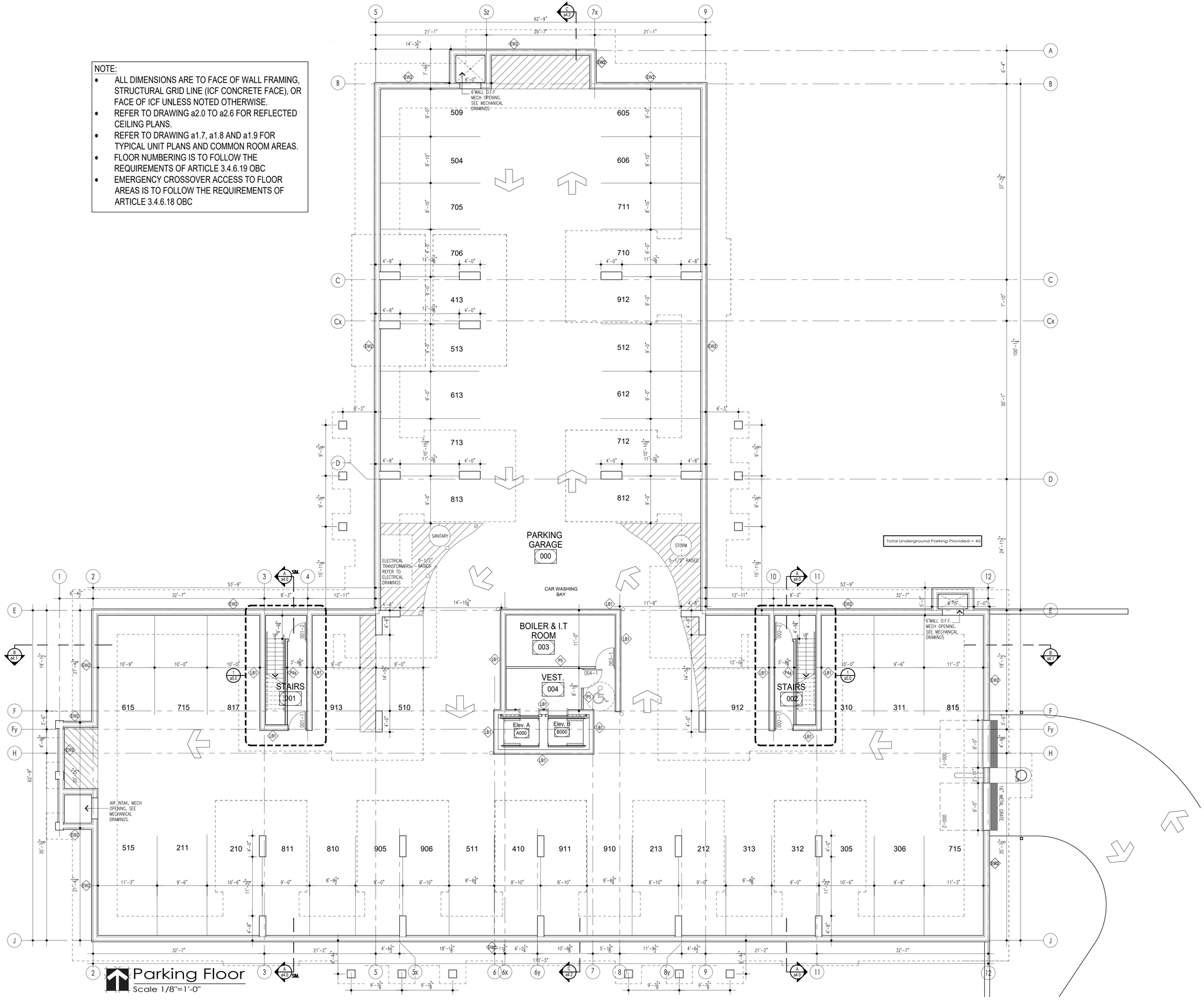
scale 1/8"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

drawing East Elevation
project number 23-05

a-1.3

NOTE:

- ALL DIMENSIONS ARE TO FACE OF WALL FRAMING, STRUCTURAL GRID LINE (ICF CONCRETE FACE), OR FACE OF ICF UNLESS NOTED OTHERWISE.
- REFER TO DRAWING a2.0 TO a2.6 FOR REFLECTED CEILING PLANS.
- REFER TO DRAWING a1.7, a1.8 AND a1.9 FOR TYPICAL UNIT PLANS AND COMMON ROOM AREAS.
- FLOOR NUMBERING IS TO FOLLOW THE REQUIREMENTS OF ARTICLE 3.4.6.19 OBC
- EMERGENCY CROSSOVER ACCESS TO FLOOR AREAS IS TO FOLLOW THE REQUIREMENTS OF ARTICLE 3.4.6.18 OBC



Parking Floor
Scale 1/8"=1'-0"

seal

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revisions

scale 1/8"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

drawing
Parking Level Plan

project number
23-05

a-1.0

NOTE:

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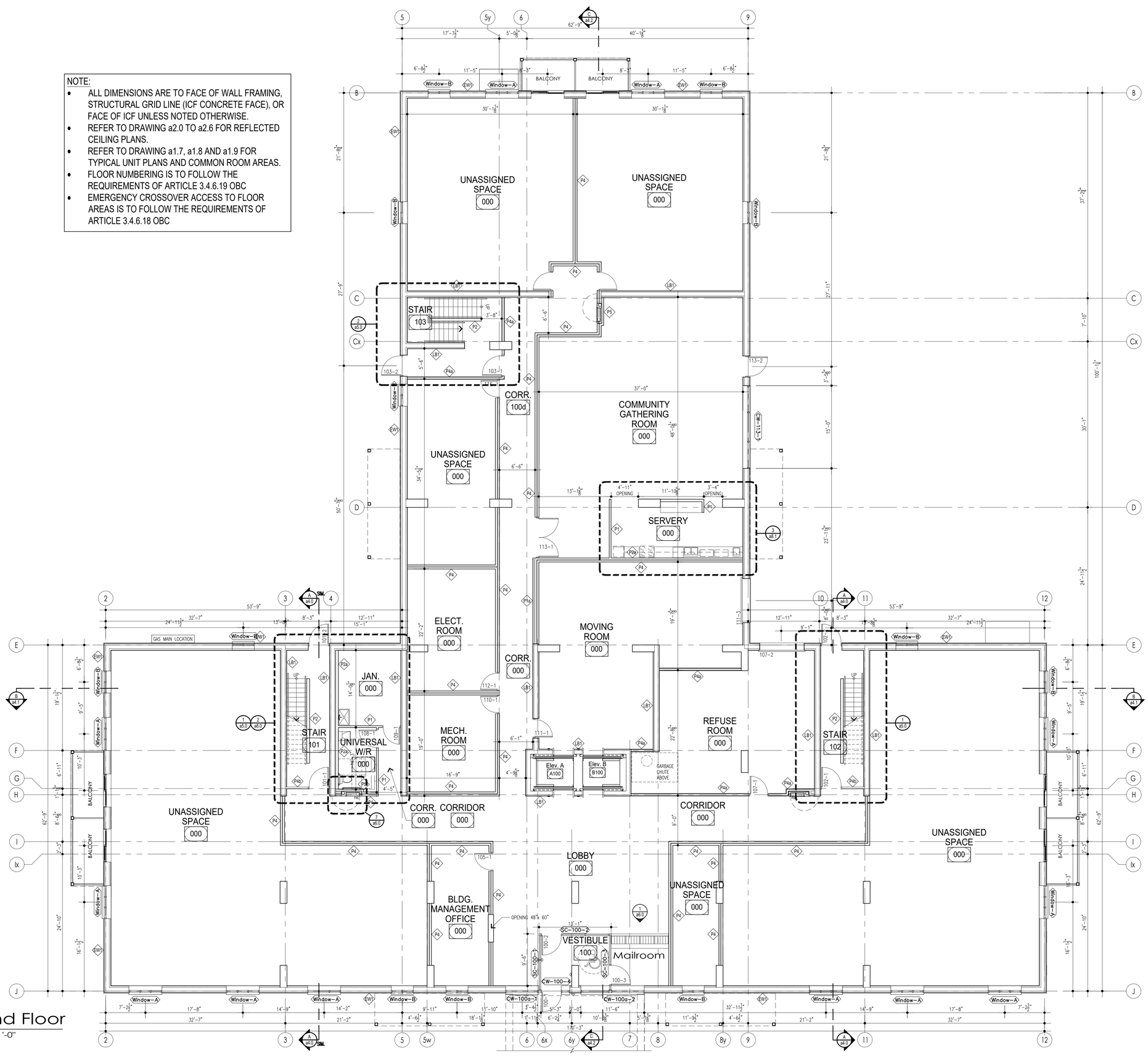
- EMERGENCY CROSSOVER ACCESS TO FLOOR AREAS IS TO FOLLOW THE REQUIREMENTS OF ARTICLE 3.4.6.18 OBC



Ground Floor
Scale 1/8"=1'-0"

seal

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project
Proposed Apartment Complex
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Sudbury, ON

revisions

scale 1/8"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

drawing
Ground Floor Plan

project number
23-05

a-1.1

NOTE:

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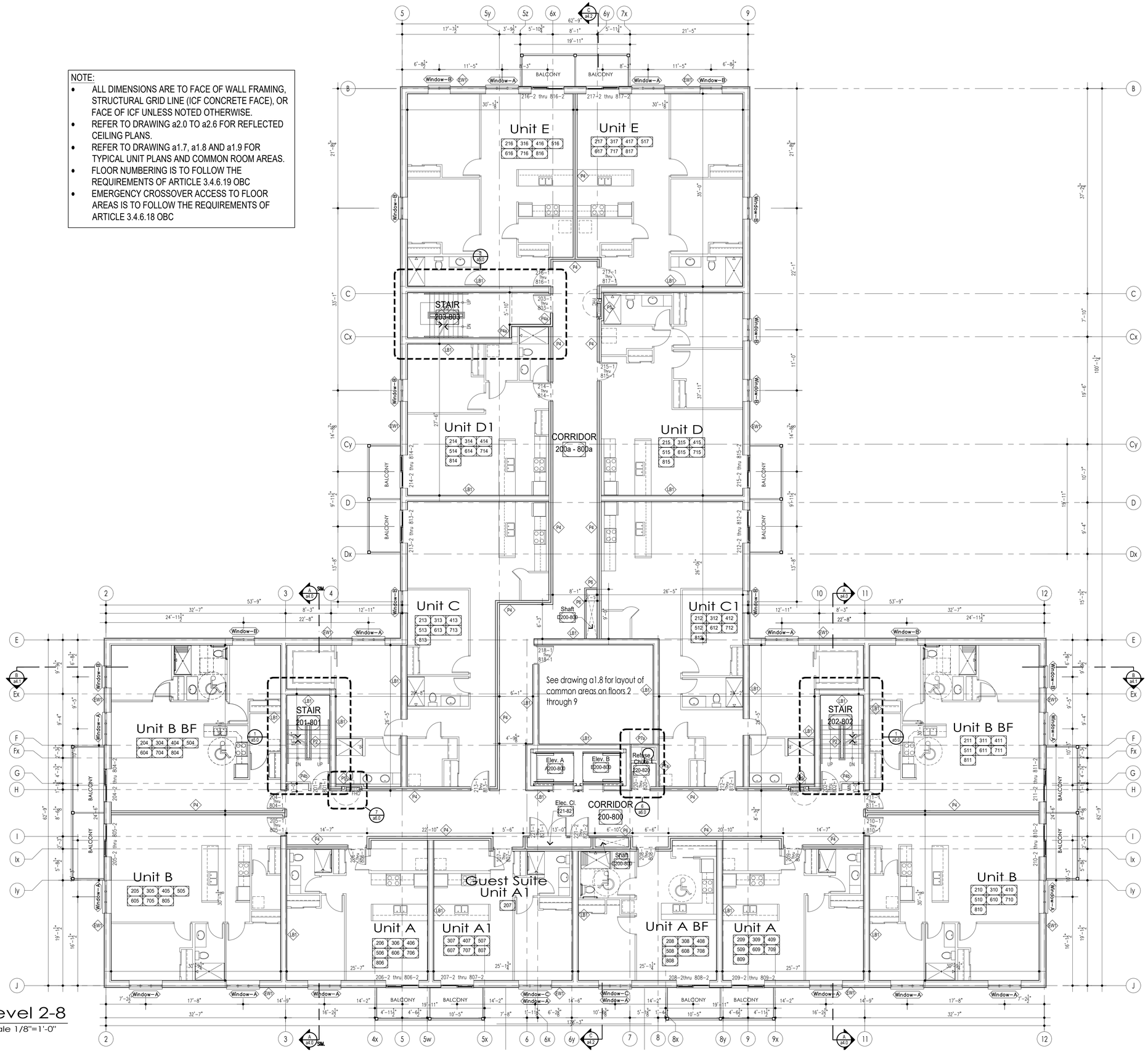

Level 2-8
Scale 1/8"=1'-0"

seal

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Proposed Apartment Complex
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Sudbury, ON

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revisions

scale 1/8"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

drawing
Level 2-8
Floor Plan

project number
23-05

a-1.2

NOTE:

- ALL DIMENSIONS ARE TO FACE OF WALL FRAMING, STRUCTURAL GRID LINE (ICF CONCRETE FACE), OR FACE OF ICF UNLESS NOTED OTHERWISE.
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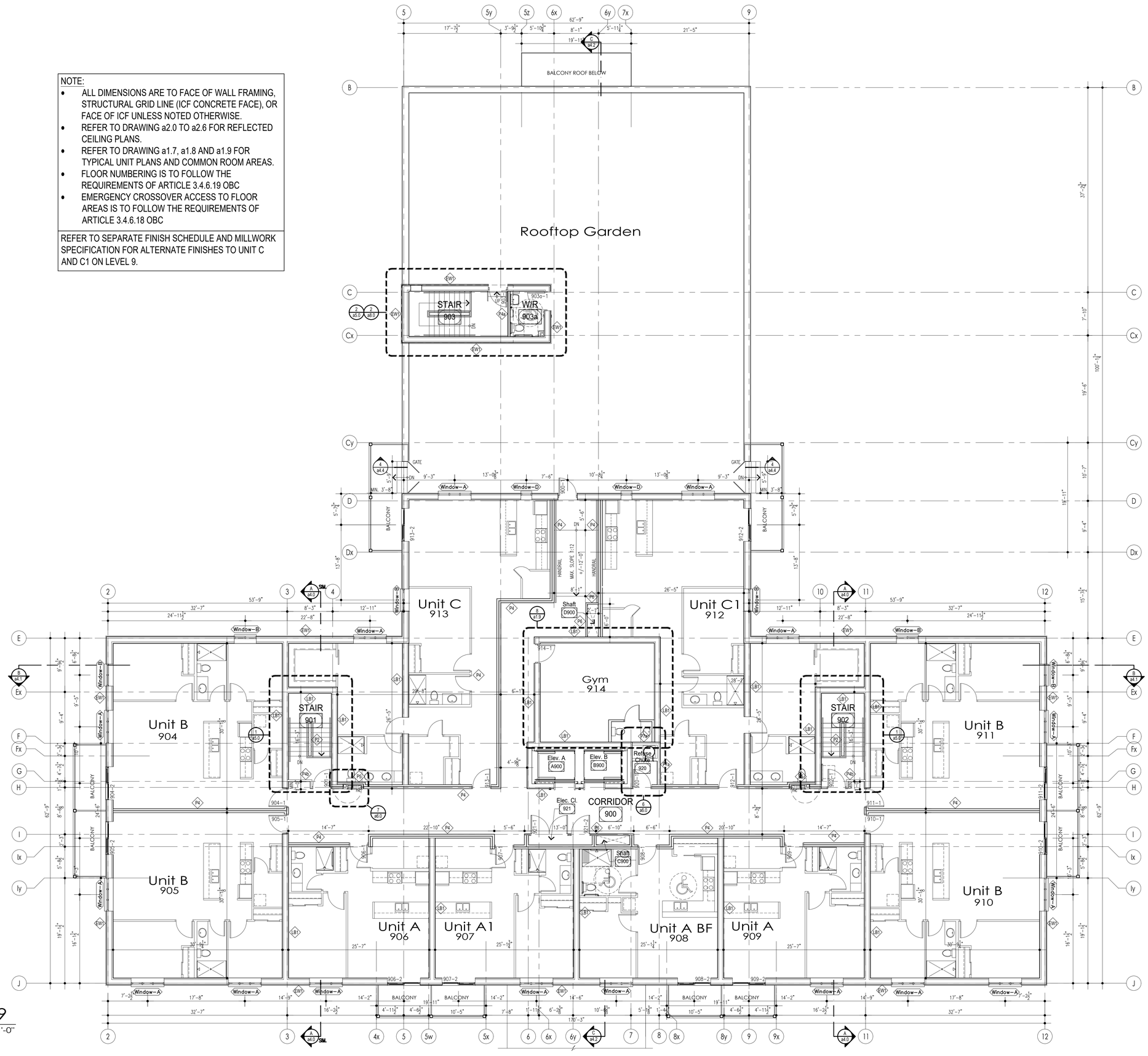
- EMERGENCY CROSSOVER ACCESS TO FLOOR AREAS IS TO FOLLOW THE REQUIREMENTS OF ARTICLE 3.4.6.18 OBC

REFER TO SEPARATE FINISH SCHEDULE AND MILLWORK SPECIFICATION FOR ALTERNATE FINISHES TO UNIT C AND C1 ON LEVEL 9.



Level 9
Scale 1/8"=1'-0"

seal

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project
Proposed Apartment Complex
for the Sunrise Ridge Drive Development
Sudbury, ON

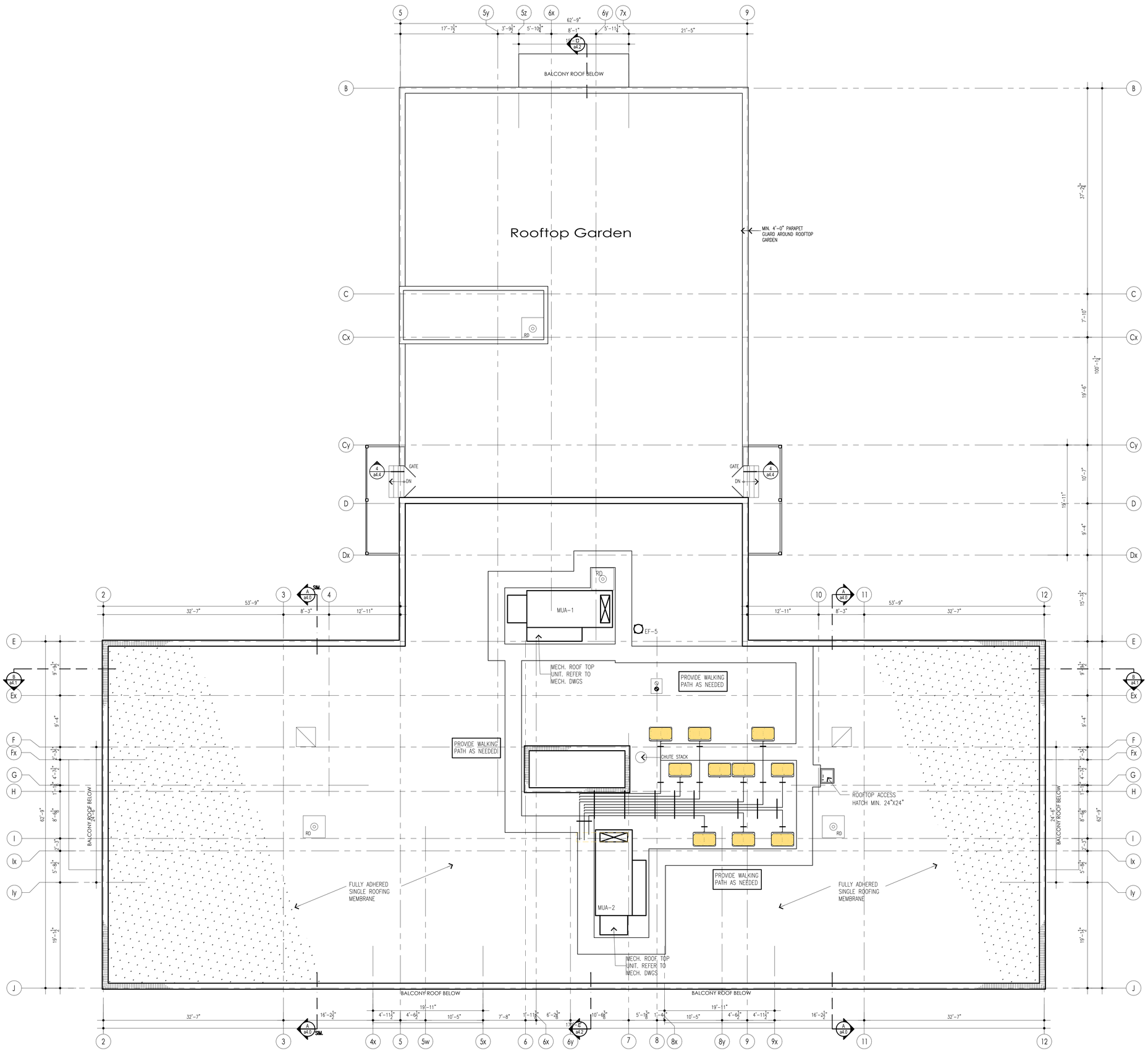
revisions

scale 1/8"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

drawing
Level 9
Floor Plan

project number
23-05

a-1.3



Roof Plan
Scale 1/8"=1'-0"

seal

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Proposed Apartment Complex
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Sudbury, ON

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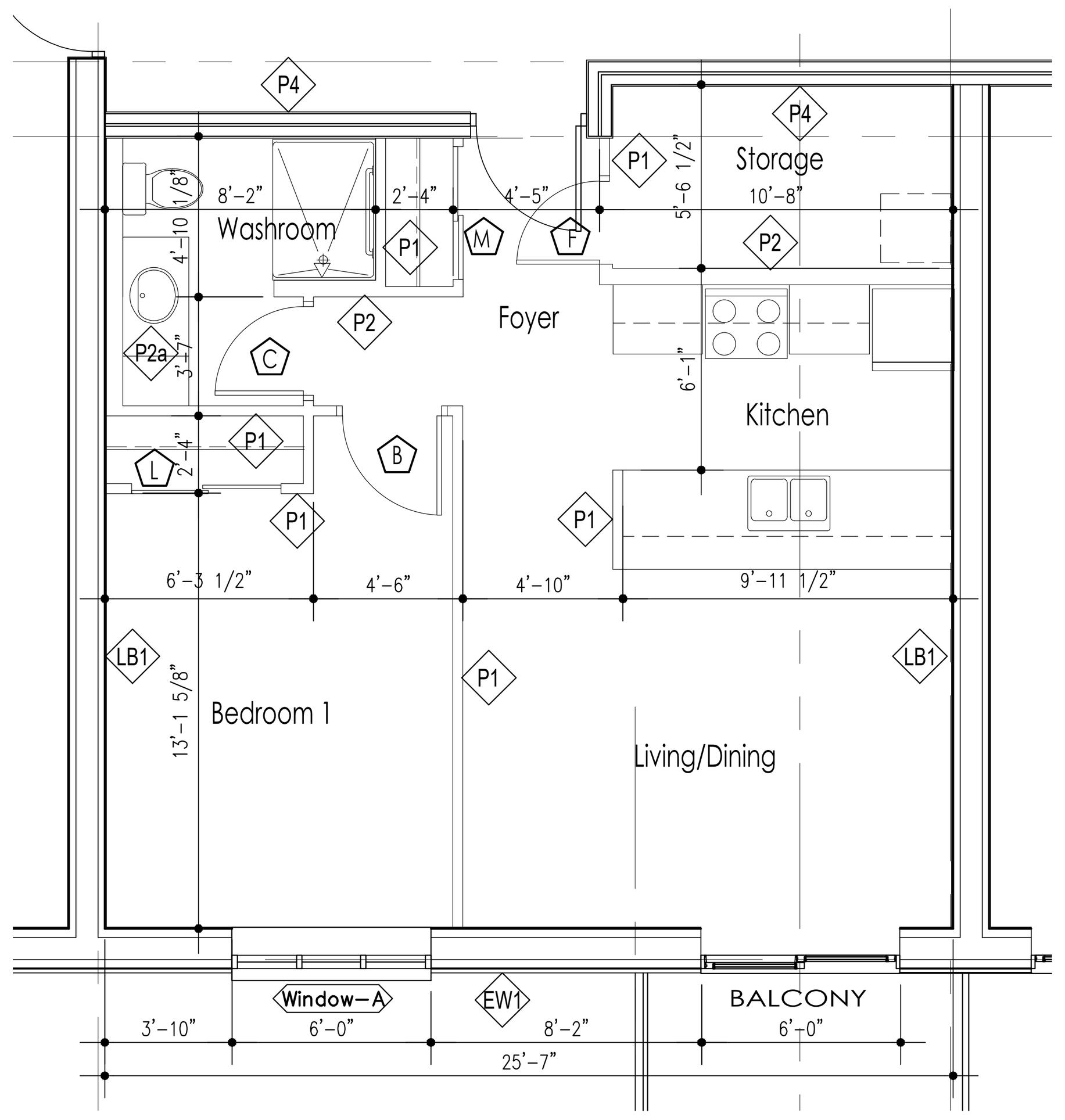
revisions

scale 3/16"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

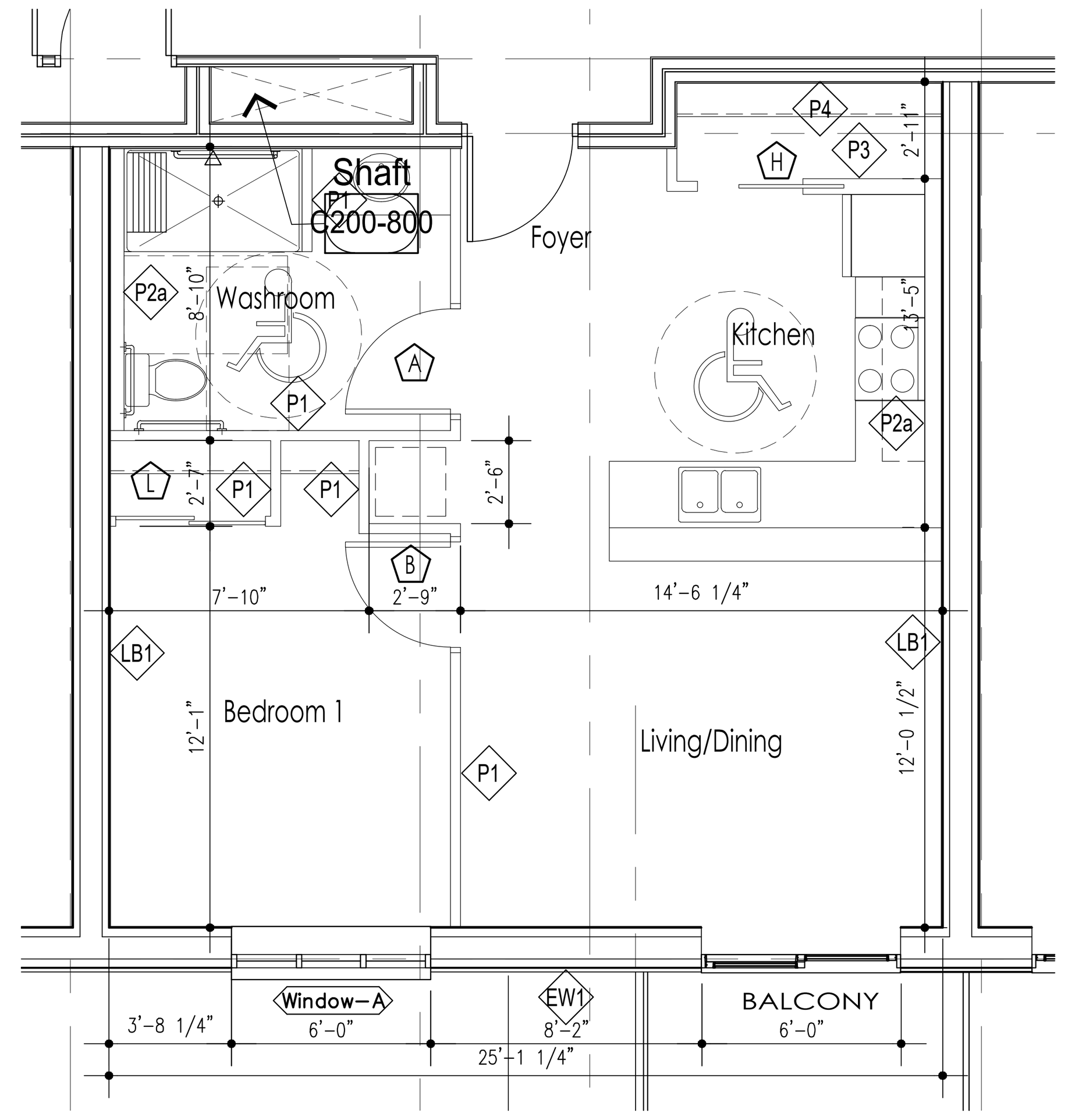
drawing
Roof Plan

project number
23-05

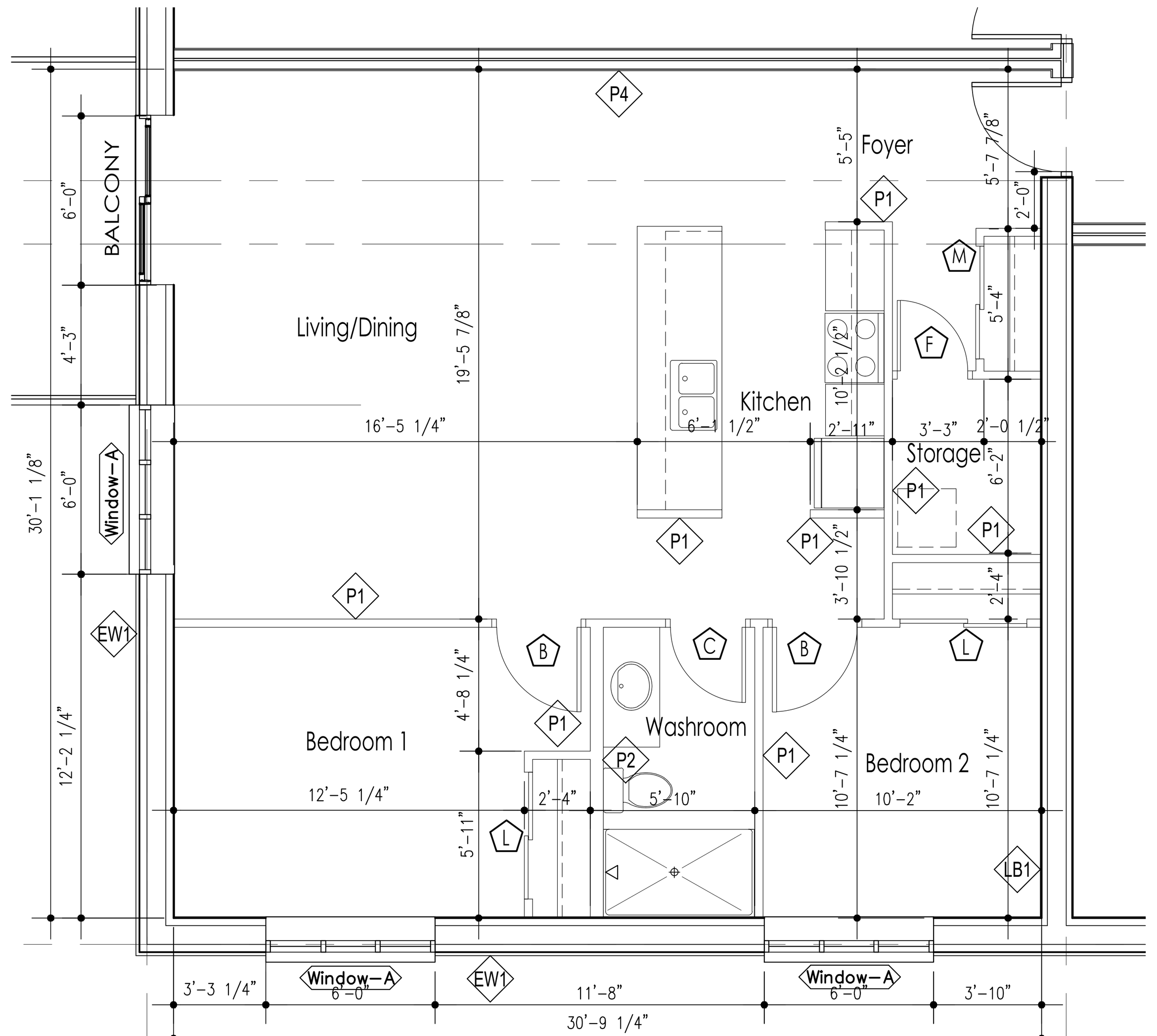
a-1.4



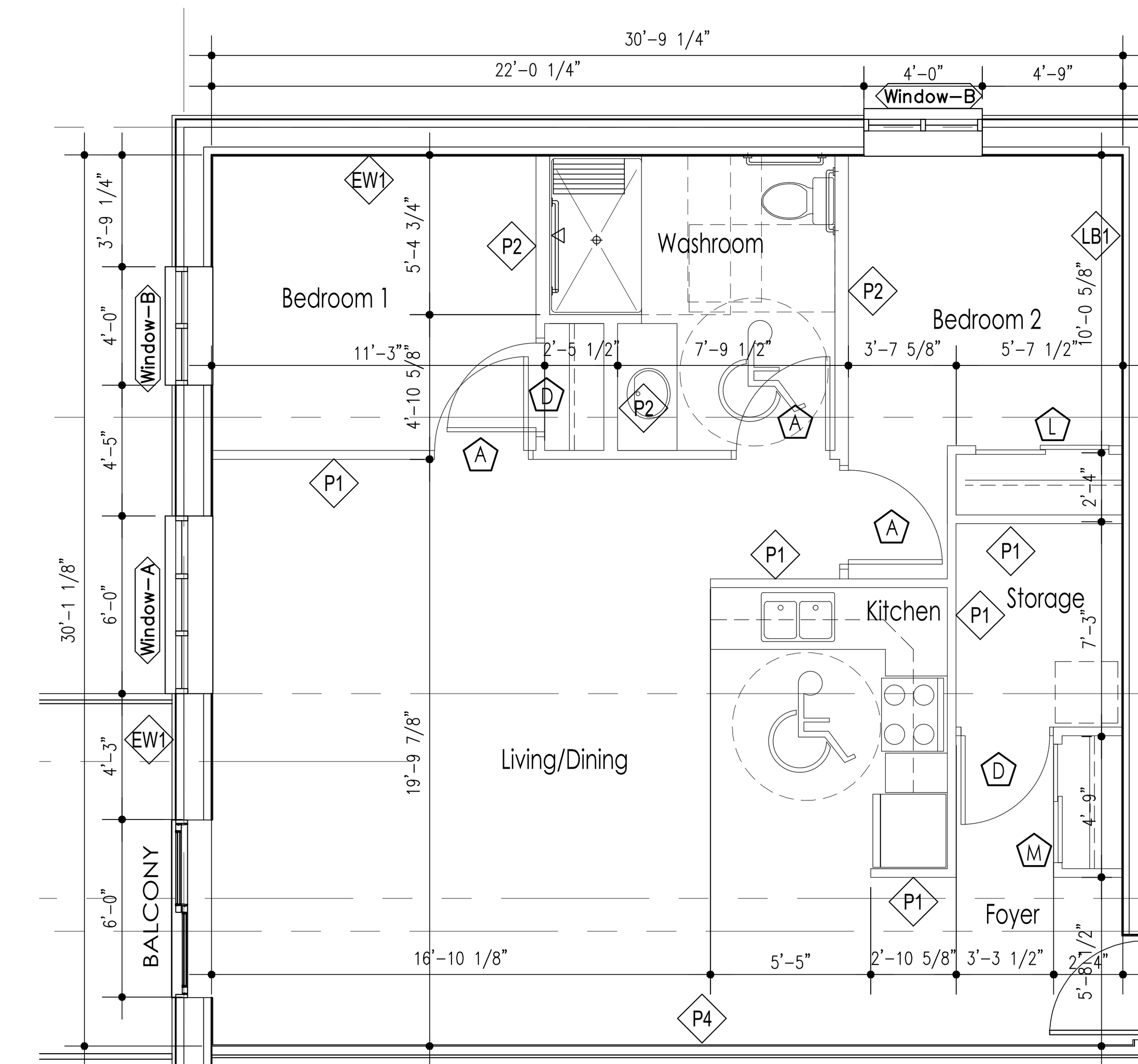
ONE BEDROOM - UNIT A
SCALE: 3/16"-1'-0"



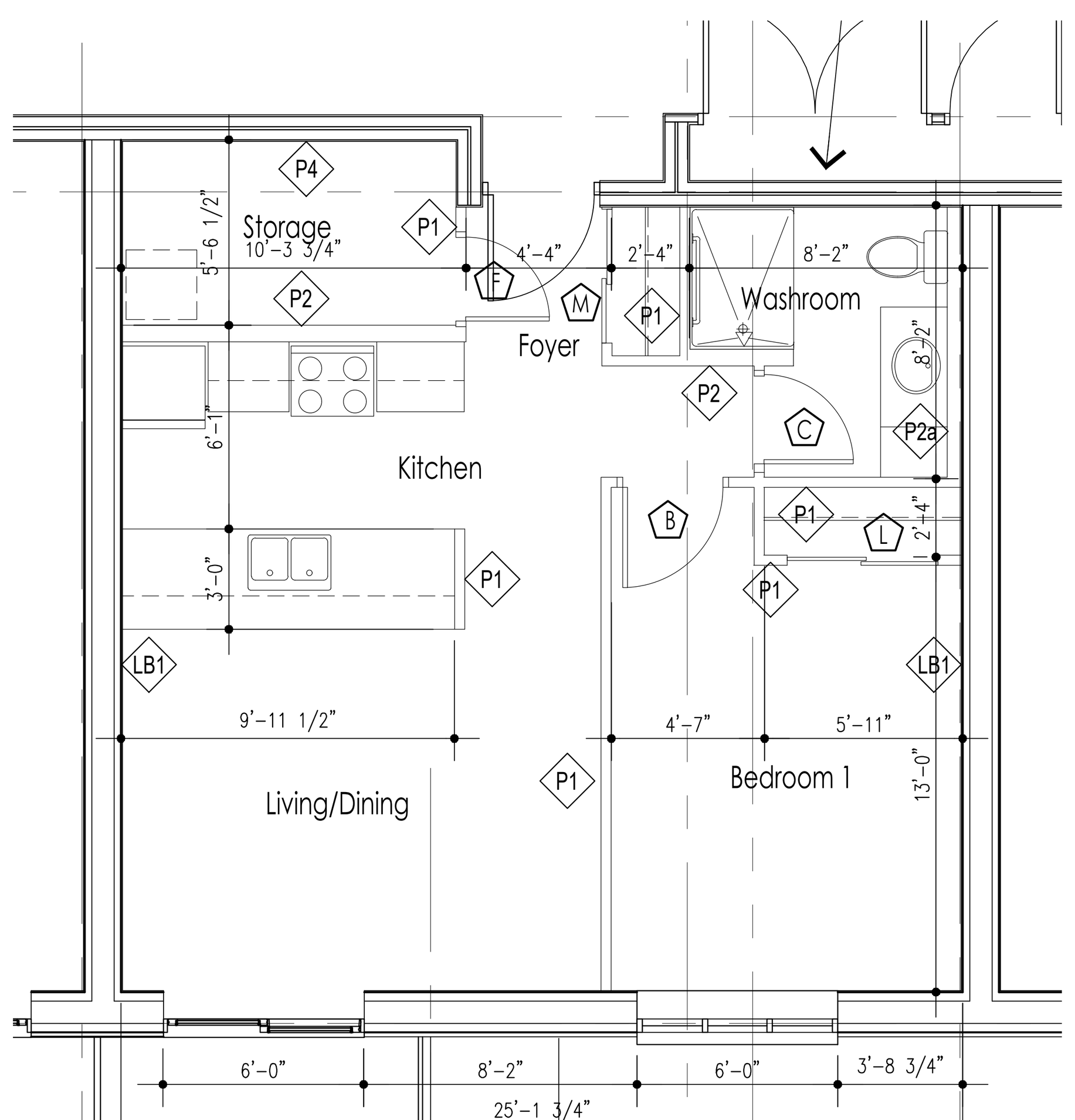
BARRIER FREE ONE BEDROOM - UNIT A
SCALE: 3/16"-1'-0"



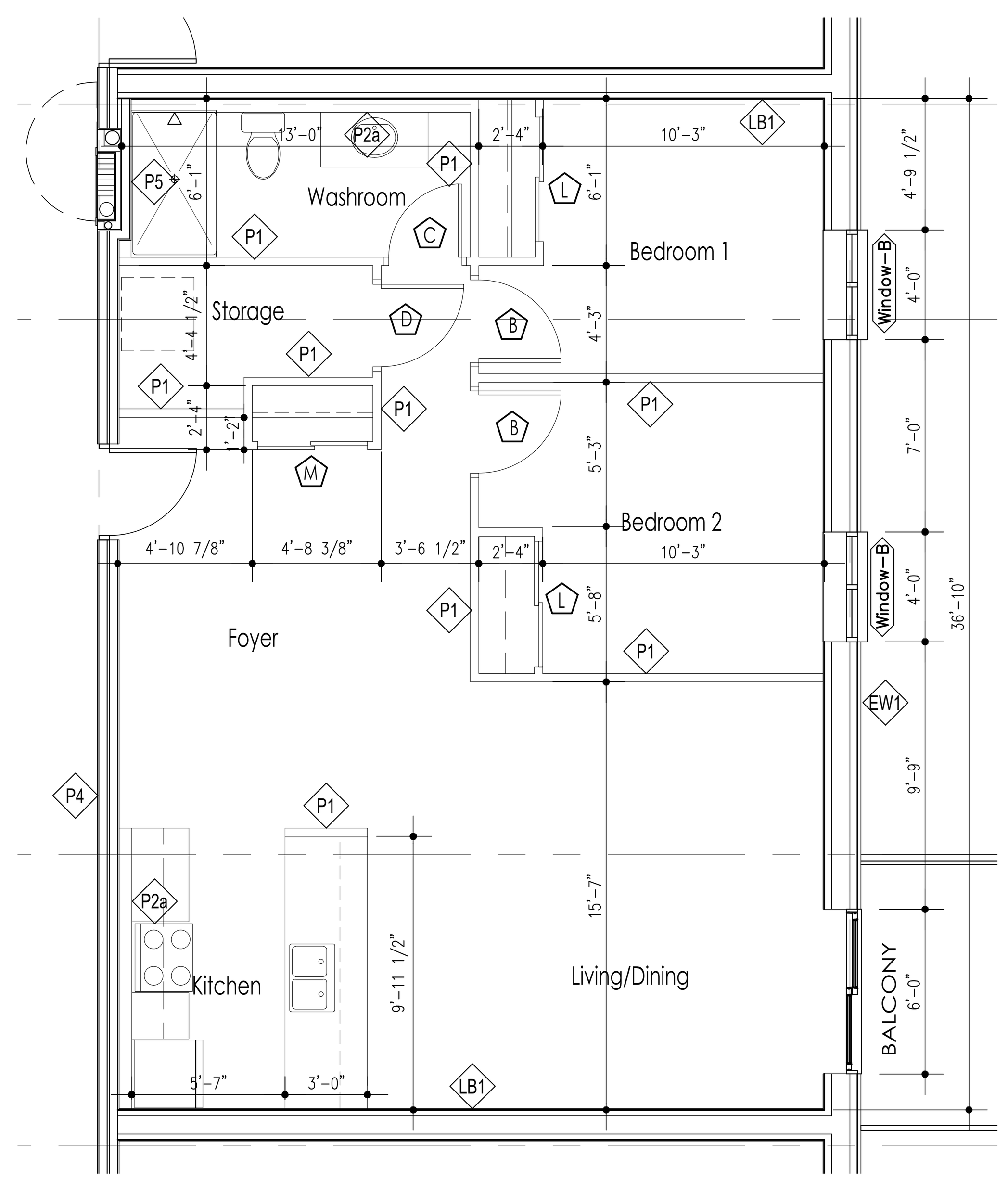
TWO BEDROOM - UNIT B
SCALE: 3/16"-1'-0"



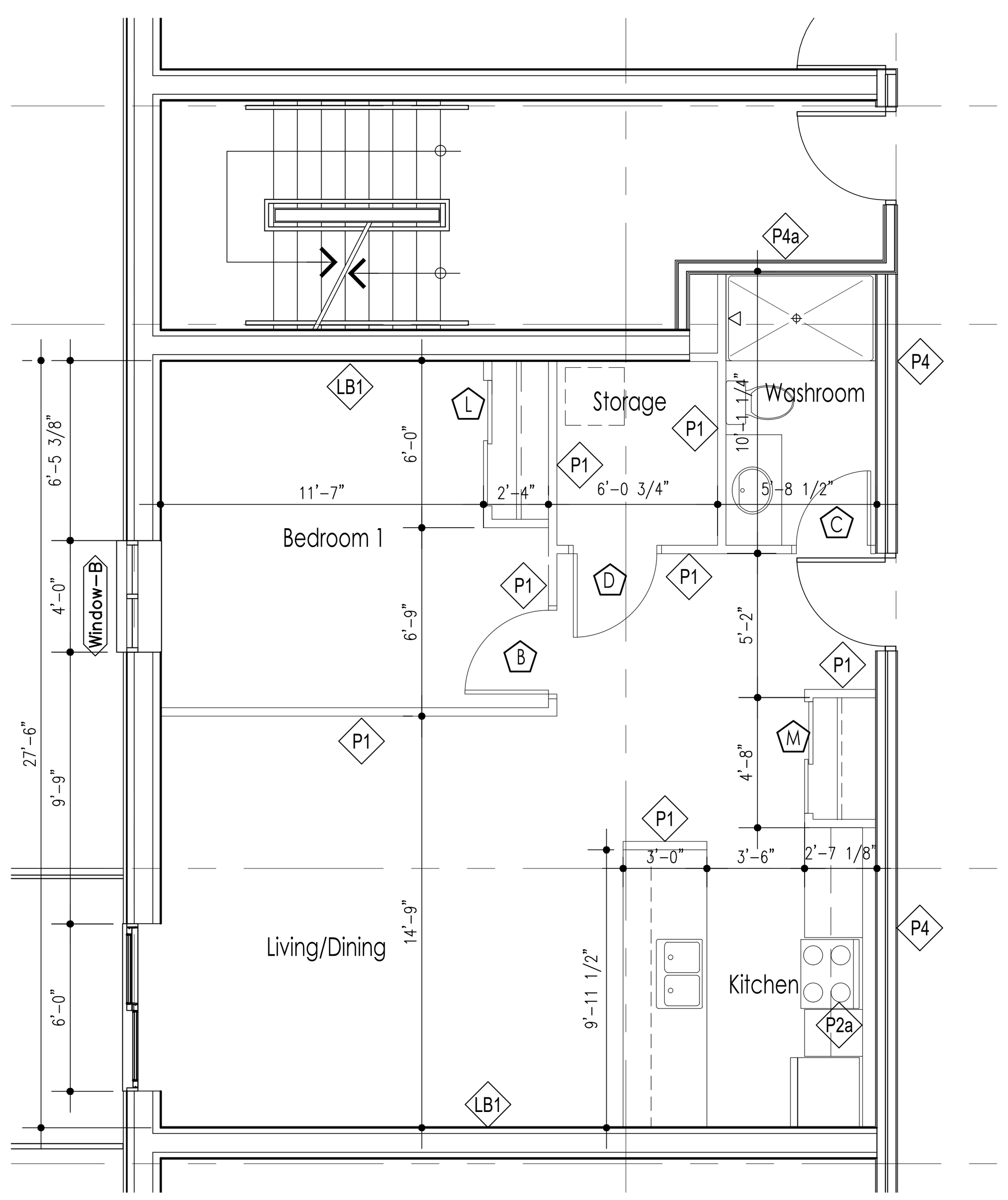
BARRIER FREE TWO BEDROOM - UNIT B
SCALE: 3/16"-1'-0"



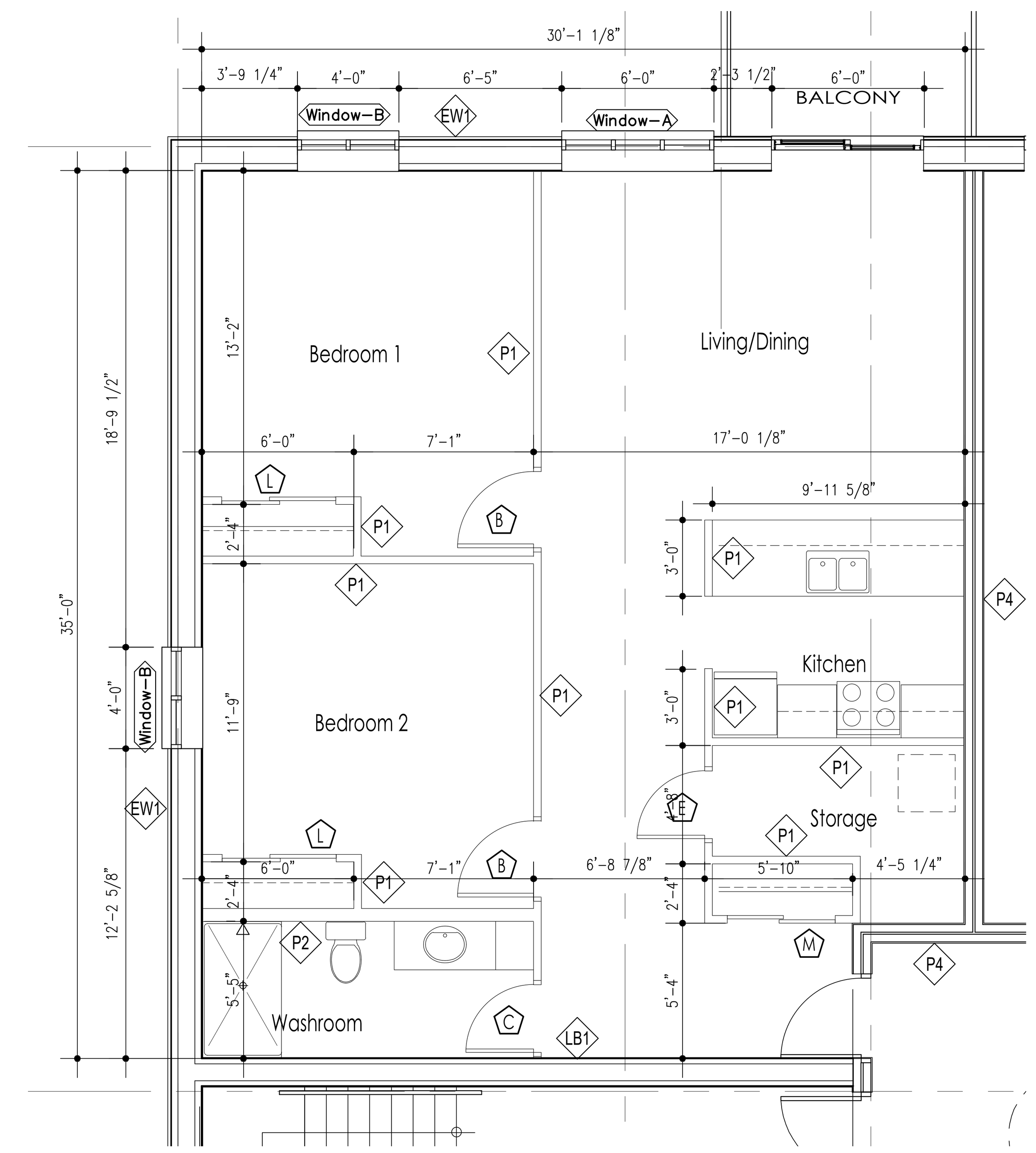
ONE BEDROOM - UNIT A1, GUEST SUITE
SCALE: 3/16"-1'-0"



TWO BEDROOM - UNIT D
SCALE: 3/16"-1'-0"



ONE BEDROOM - UNIT D1
SCALE: 3/16"-1'-0"



TWO BEDROOM - UNIT E
SCALE: 3/16"-1'-0"

NOTE:

- Refer to overall plan and exterior elevations for window types.
- Refer to overall plan for unit door numbers.
- Refer to overall plan for unit orientation.
- Refer to drawing a2.0 to a2.6 for Reflected Ceiling Plans.
- Refer to drawing a8.2 for Washroom/Kitchen Plans and Elev.
- Refer to drawing a8.3 for Typical Millwork Section Details

Breakdown of Units			Req'd No. Barrier Free Units		
One Bedroom Units	=	39	BF One Bedroom	=	8
Two Bedroom Units	=	69	BF Two Bedroom	=	14
Total	=	108	Total No. B.F. Units	=	22

seal

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project
Proposed Apartment Complex
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Sudbury, ON

david ELLIS architect inc.
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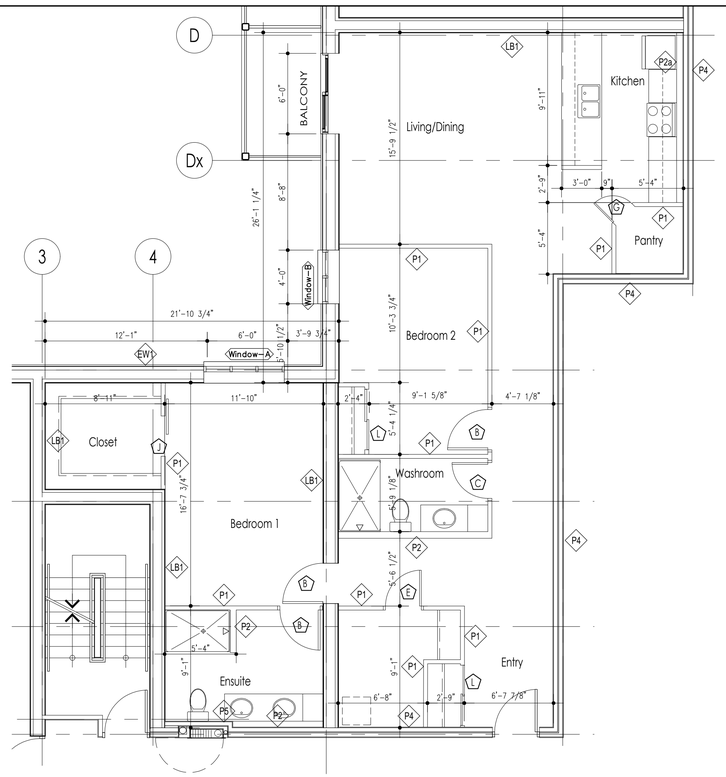
revisions

scale 3/16"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

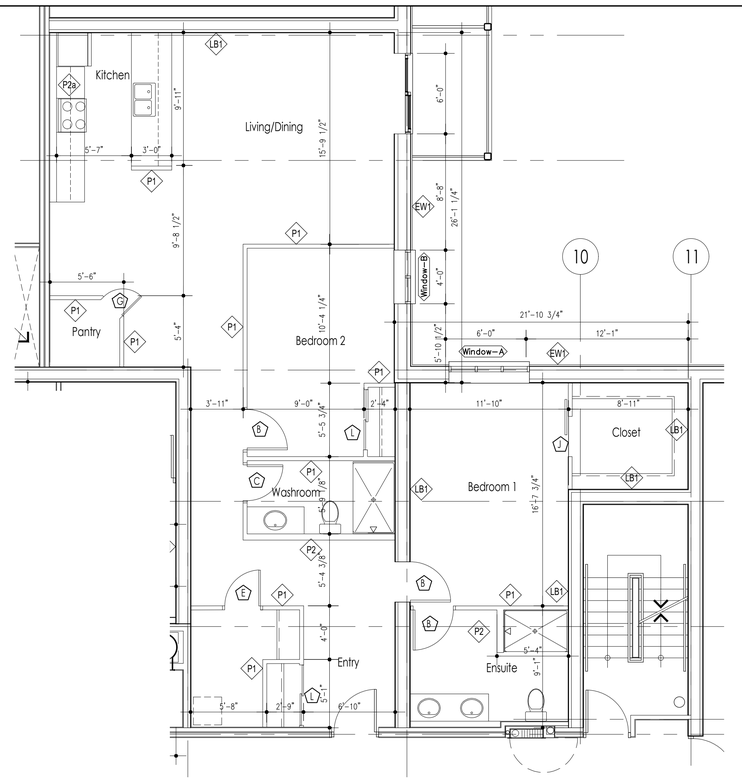
drawing
Unit Detail Plans

project number
23-05

a-1.7



TWO BEDROOM - UNIT C
SCALE: 3/16"-1'-0"



TWO BEDROOM - UNIT C1
SCALE: 3/16"-1'-0"

REFER TO SEPARATE FINISH SCHEDULE AND MILLWORK SPECIFICATION FOR ALTERNATE FINISHES TO UNIT C AND C1 ON LEVEL 9.

NOTE:

- Refer to overall plan and exterior elevations for window types.
- Refer to overall plan for unit door numbers.
- Refer to overall plan for unit orientation.
- Refer to drawing a2.0 to a2.6 for Reflected Ceiling Plans.
- Refer to drawing a8.2 for Washroom/Kitchen Plans and Elev.
- Refer to drawing a8.3 for Typical Millwork Section Details

Breakdown of Units			Req'd No. Barrier Free Units		
One Bedroom Units	=	39	BF One Bedroom	=	8
Two Bedroom Units	=	69	BF Two Bedroom	=	14
Total	=	108	Total No. B.F. Units	=	22

seal

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project
Proposed Apartment Complex
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Sudbury, ON

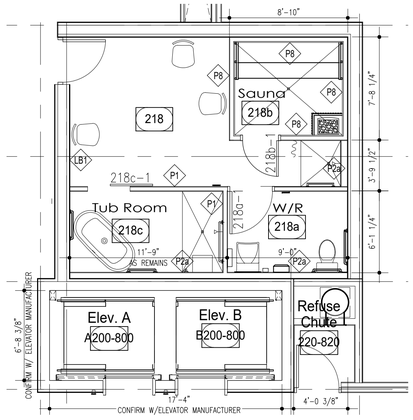
revisions

scale 3/16"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

drawing
Unit Detail Plans

project number 23-05

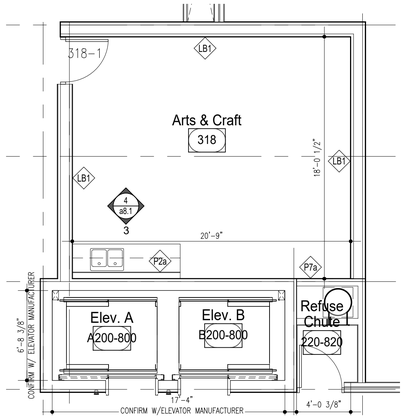
a-1.8



LEVEL TWO
COMMON AREA
SCALE: 3/16"-1'-0"

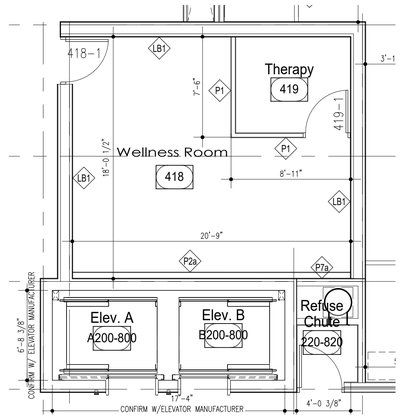
218 | 218a | 218b | 218c

REFER TO DRAWING DETAIL 1/a8.1 FOR DETAIL LAYOUT OF SAUNA AND TUB ROOM.



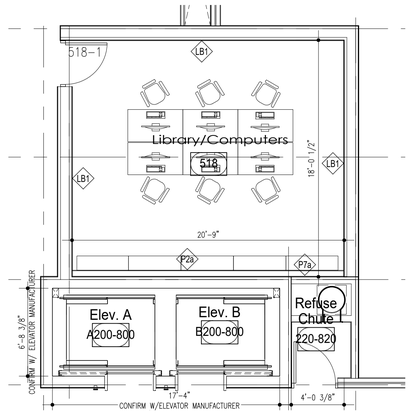
LEVEL THREE
COMMON AREA
SCALE: 3/16"-1'-0"

318



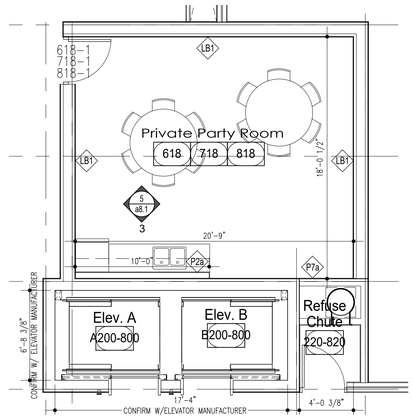
LEVEL FOUR
COMMON AREA
SCALE: 3/16"-1'-0"

418 | 419



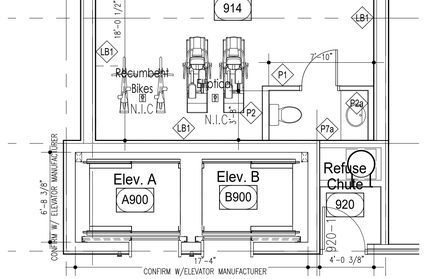
LEVEL FIVE
COMMON AREA
SCALE: 3/16"-1'-0"

518



LEVEL SIX - EIGHT
COMMON AREA
SCALE: 3/16"-1'-0"

618 | 718 | 818



LEVEL NINE
GYM
SCALE: 3/16"-1'-0"

914

REFER TO DRAWING DETAIL 3/a8.0 FOR DETAIL LAYOUT OF GYM WASHROOM.

REFER TO DRAWING 8.1 FOR COMMON ROOM WASHROOMS AND KITCHEN ETTE PLANS AND ELEVATIONS.

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revisions

scale 3/16"=1'-0"
date May, 2024
checked by d ellis
drawn by smackey

drawing
Common Room Detail Plans

project number
23-05

a-1.9

SITE PLAN DATA ADDRESS: 0 FIELDSTONE DRIVE, CITY OF GREATER SUDBURY				
ZONING REQUIREMENT	REQUIRED	PROVIDED		
		BUILDING 1	BUILDING 2	BUILDING 3
ZONING	EXISTING: R1-5 RESIDENTIAL PROPOSED: R4 HIGH DENSITY RESIDENTIAL			
LOT AREA		2.02 ha	2.50 ha	3.36 ha
MIN. LOT AREA	65m² PER UNIT	187m²/UNIT	231m²/UNIT	320m²/UNIT
MIN. LOT FRONTAGE	30.0m	30.0m	30.0m	30.0m
MIN. LOT DEPTH	45.0m	248.3m	220.8m	105.7m
MIN. FRONT YARD SETBACK	10.0m	20.3m	19.6m	20.3m
MIN. REAR YARD SETBACK	14.0m (10+1m PER STOREY OVER 5)	175.4m	176.1m	73.1m
MIN. INT. SIDE YARD SETBACK	14.0m (10+1m PER STOREY OVER 5)	15.1m	17.6m	48.6m
MIN. CORNER SIDE YARD SETBACK	10m	–	–	–
MIN. LOT COVERAGE	50%	7.9%	6.4%	4.6%
MIN. LANDSCAPED OPEN SPACE	30%	68.0%	74.4%	81.0%
MAX. BUILDING HEIGHT	<63.0m	30m ±	30m ±	30m ±
LANDSCAPING (F.Y. SETBACK)	3m	3.3m	3.5m	3.3m
PARKING REQUIREMENTS 1.5/UNIT WITH 25% REDUCTION FOR AFFORDABLE HOUSING (30% AFFORDABLE)	(76)(1.5)=114 (32)(1.125)=36 114+36=150 REQ'D=150 SPACES	105 + 45 U/G =150 SPACES	105 + 45 U/G =150 SPACES	105 + 45 U/G =150 SPACES
BICYCLE PARKING	0.5 SPACES / UNIT =54 SPACES	30 + 24 U/G =54 SPACES	30 + 24 U/G =54 SPACES	30 + 24 U/G =54 SPACES
SNOW REMOVAL: TO REMAIN ON SITE IN LOCATIONS AS NOTED ON PLAN C-1 REFUSE REMOVAL: REFUSE BINS LOCATED INSIDE BUILDINGS (GARBAGE ROOM)				

EXISTING OSP OPEN SPACE - PRIVATE ZONING

EXISTING R1-5 LOW DENSITY RESIDENTIAL ONE ZONING

EXISTING R1-5 LOW DENSITY RESIDENTIAL ONE ZONING

EXISTING R1-5 LOW DENSITY RESIDENTIAL ONE ZONING

EXISTING OSP OPEN SPACE - PRIVATE ZONING

PROPERTY LINE
265.9m
FUTURE STREET
20.0m
3.0m
31.2m
3m LANDSCAPE BUFFER
MIN. 10m C.S.Y. SETBACK
MIN. 14m R.Y. SETBACK
PROPOSED LOT AREA=1.5 ha±
SNOW STORAGE
MIN. 14m S.Y. SETBACK
BUILDING 1
108 UNITS - 9 STY. BLDG.
MAIN FLOOR ELEV. 315.40
BASEMENT ELEV. 312.15
PARKING = 105 ABOVE + 45 BELOW BLDG.
BICYCLE PARKING 6 SPACES EACH
PROPOSED LOT AREA=2.28 ha±
BUILDING 2
108 UNITS - 9 STY. BLDG.
MAIN FLOOR ELEV. 320.85
BASEMENT ELEV. 317.60
PARKING = 105 ABOVE + 45 BELOW BLDG.
BICYCLE PARKING 18 SPACES
TO U/G PARKING
1.5m SIDEWALK
MIN. 10m F.Y. SETBACK
LANDSCAPE
3m FRONT YARD LANDSCAPE BUFFER
ROCK FACE
6m ACCESS ROAD
BUILDING 3
108 UNITS - 9 STY. BLDG.
MAIN FLOOR ELEV. 328.70
BASEMENT ELEV. 325.45
PARKING = 105 ABOVE + 45 BELOW BLDG.
LOADING
PROPOSED LOT AREA=3.46 ha±
MIN. 10m F.Y. SETBACK
PROPERTY LINE
78.3m
159.9m
220.8m
72.7m
239.5m
106.6m
105.7m
NORTH FIELD CRESCENT
FIELDSTONE DRIVE
SUNRISE RIDGE DRIVE
KINGSVIEW DRIVE
EXIST DRY POND
BLOCK 14
LOT 1
LOT 2
LOT 3
LOT 5
LOT 6
LOT 9
LOT 10
LOT 11
LOT 12
LOT 13
LOT 14
LOT 15
LOT 22
LOT 23
LOT 24
LOT 25
LOT 26
LOT 27
LOT 28
LOT 29
LOT 30
LOT 34
LOT 37

KEY PLAN

ENGINEER'S SEAL:

DATE	REV.	REVISION	BY	APP'D
24-05-24	2	REVISIONS PER CITY COMMENTS	TP	JML
23-10-19	1	ISSUED FOR TRAFFIC STUDY	KTN	JML
23-05-17	0	ISSUED FOR RE-ZONING	KTN	JML

CLIENT:

SALDAN CONSTRUCTION GROUP
DESIGN • BUILD • RENOVATE • MANAGE

CONSULTANT:

TULLOCH

PROJECT TITLE:

SUNRISE RIDGE SUBDIVISION SUDBURY, ON

DRAWING TITLE:

SITE PLAN

KTN	JL / KN		JML
DRAWN	DESIGNED	CHECKED	APPROVED
1:750		MAY 17, 2023	
SCALE		DATE	

230722	2	C1
PROJECT No.	REVISION	DRAWING

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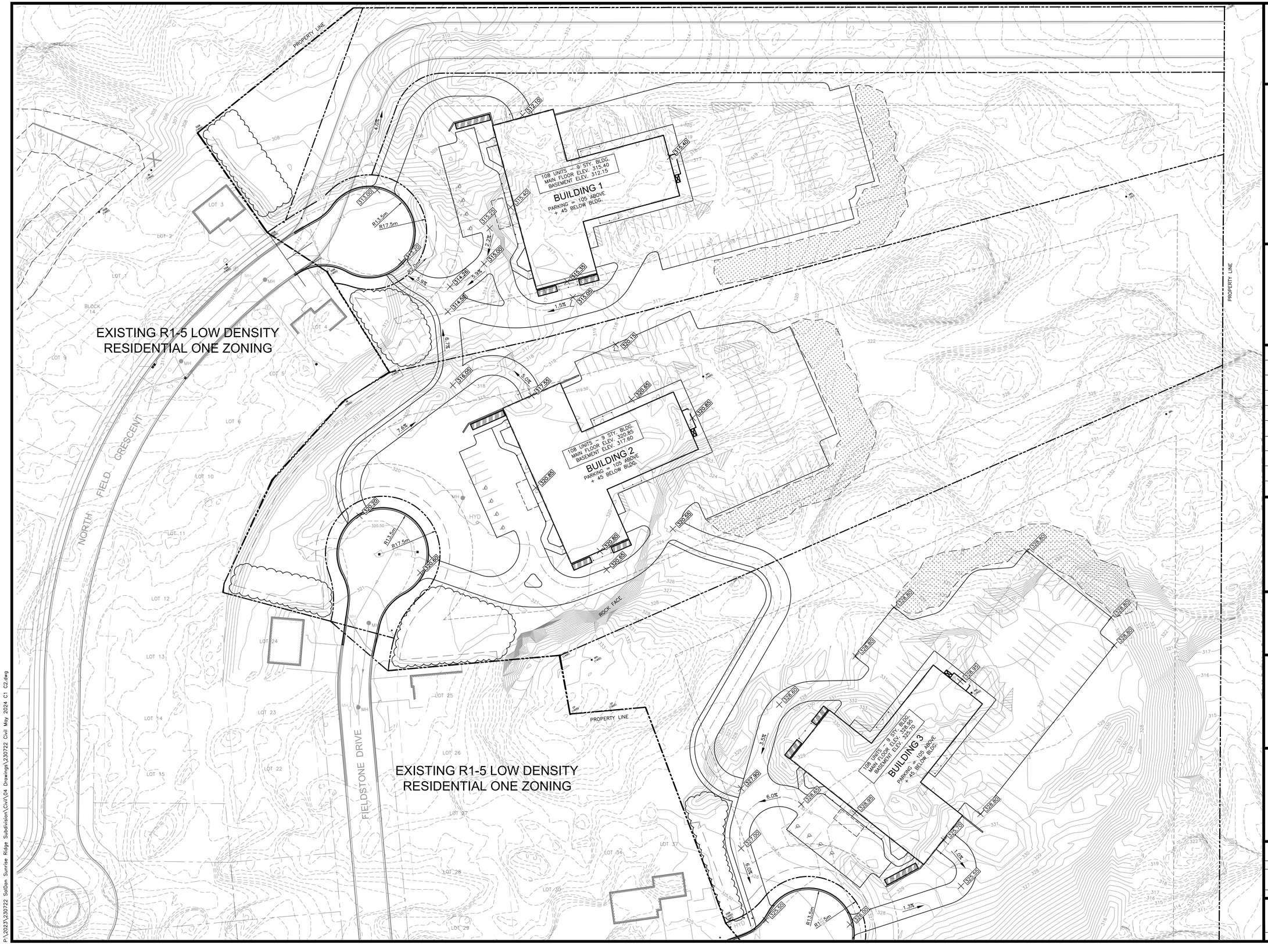

N

KEY PLAN

ENGINEER'S SEAL:

PRELIMINARY

DATE	REV.	REVISION	BY	APP'D
24-05-24	2	REVISIONS PER CITY COMMENT	TP	JML
23-10-19	1	ISSUED FOR TRAFFIC STUDY	KTN	JML
23-05-17	0	ISSUED FOR RE-ZONIG	KTN	JML

CLIENT:

SALDAN CONSTRUCTION GROUP
DESIGN • BUILD • RENOVATE • MANAGE

CONSULTANT:

TULLOCH

PROJECT TITLE:

SUNRISE RIDGE SUBDIVISION SUDBURY, ON

DRAWING TITLE:

PRELIMINARY GRADING PLAN

DRAWN	DESIGNED	CHECKED	APPROVED
KTN	JML		JML

SCALE	DATE
1:500	MAY 24, 2023

PROJECT No.	REVISION	DRAWING
230722	2	C2

P:\2023\230722 SalDan Sunrise Ridge Subdivision\Civil\04 Drawings\230722 Civil May 2024 C1 C2.dwg

SUNRISE RIDGE DEVELOPMENT

SUDBURY, ONTARIO

PEDESTRIAN WIND IMPACT ASSESSMENT

PROJECT #2408719
JUNE 6, 2024

SUBMITTED TO

Joseph Caricari, OAA
Partner
caricari@caricarilee.com

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1. INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was retained to conduct a qualitative assessment of the pedestrian wind conditions expected on and around the proposed Sunrise Ridge Development in Sudbury, Ontario. This effort is intended to inform good design and has been conducted in support of Zoning By-Law Amendment Application for the project.

The project site is located up-hill, to the north of Kingsview Drive and to the east of North Field Crescent (Image 1). The site is currently unoccupied and surrounded mainly by low-rise buildings in the northwest and southwest directions and open lots in the easterly directions.

The proposed project, shown in Image 2, consists of three 9-storey residential buildings. All three buildings will have the same massing design and will have outdoor gardens on their roofs.

Pedestrian areas of interest include the main entrances along the west and east façades, sidewalks/walkways around the sites, the surface parking lots, as well as the outdoor garden on the roofs of the buildings (Image 3).

Due to the slight difference in the orientations of buildings, reference will be made to Project North, which will be consistent for all three buildings, and is depicted in Image 3.

Image 1: Aerial View of the Existing Site and Surroundings (Credit: Google Earth)

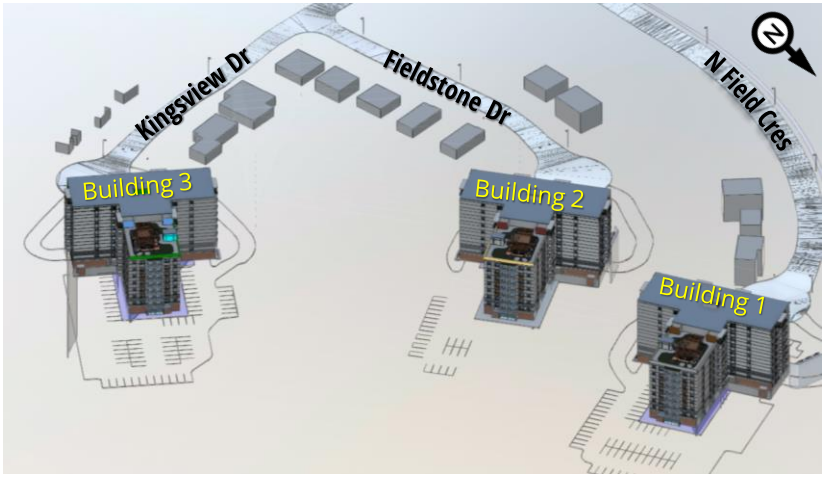
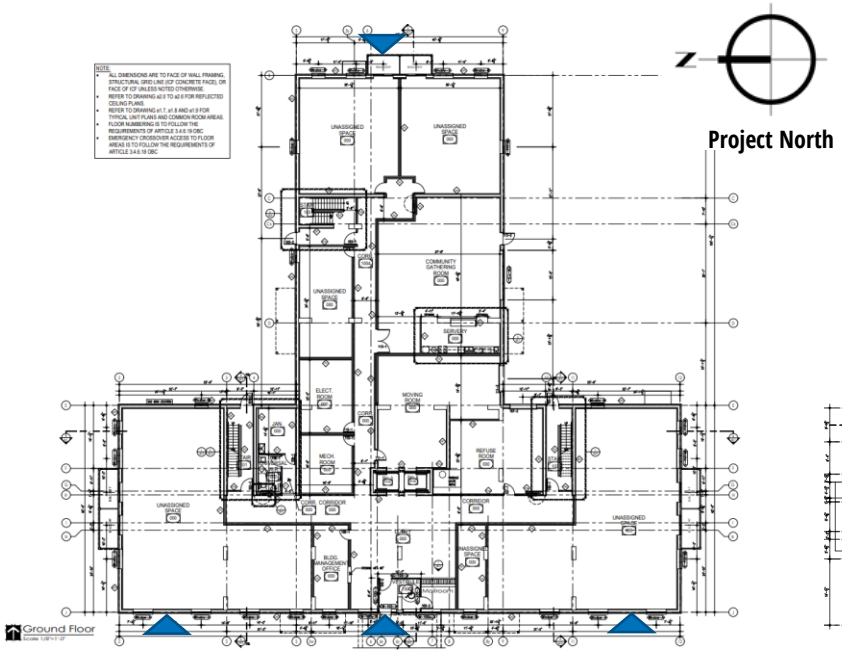


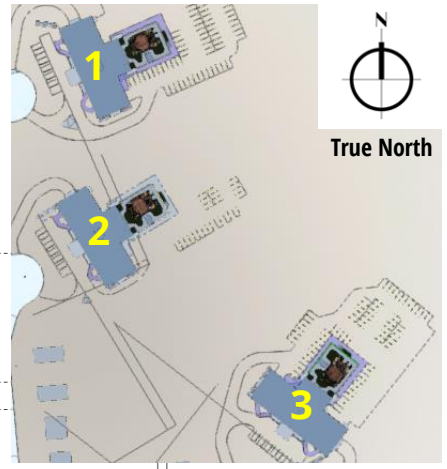
Image 2: 3D Model of the Proposed Project

1. INTRODUCTION

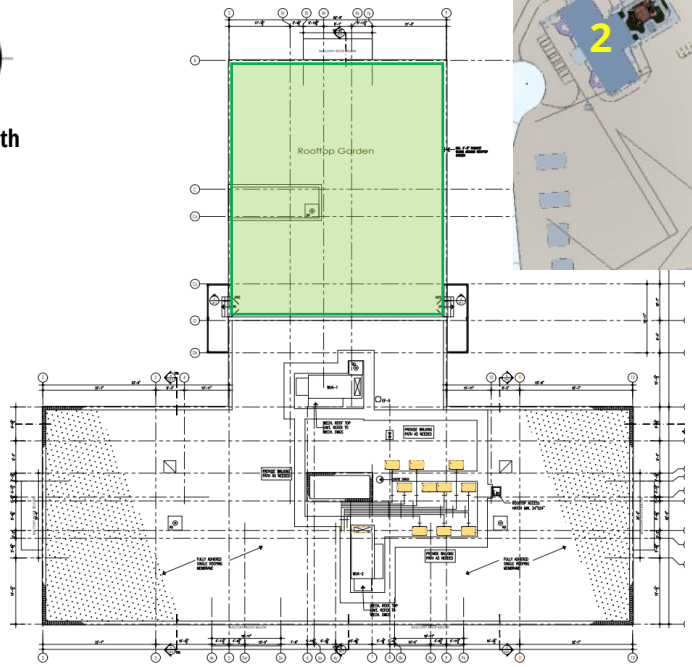


Ground floor plan

Project North



True North



Roof Plan

: Main Entrance

: Rooftop Garden

Image 3: Key Areas of Interest (Courtesy of David Ellis ARCHITECTS)

RWDI Project #2408719
June 6, 2024

2. METHODOLOGY

Predicting wind speeds and occurrence frequencies is complex. It involves the combined assessment of building geometry, orientation, position and height of surrounding buildings, upstream terrain and the local wind climate.

Over the years, RWDI has conducted thousands of wind-tunnel model studies on pedestrian wind conditions around buildings, yielding a broad knowledge base. In some situations, this knowledge and experience, together with literature, allow for a reliable, consistent and efficient desktop estimation of pedestrian wind conditions without wind-tunnel testing. This approach provides a screening-level estimation of potential wind conditions and offers conceptual wind control measures for improved wind comfort, where necessary.

In order to quantify and confirm the predicted conditions or refine any of the suggested conceptual wind control measures, physical scale model tests in a boundary-layer wind tunnel would typically be required.

RWDI's assessment is based on the following:

- 3D model received from Caricari Lee Architects on July 4th, 2023, and design drawings received from SalDan Construction Group on June 3rd, 2024;
- A review of the regional long-term meteorological data from Sudbury Airport;
- Use of RWDI's proprietary software (*WindEstimator*[1]) for providing a screening-level numerical estimation of potential wind conditions around generalized building forms;
- Wind-tunnel studies and desktop assessments undertaken by RWDI for similar projects in the area;
- RWDI's engineering judgement and knowledge of wind flows around buildings[1, 2]; and,
- RWDI Criteria for pedestrian wind comfort and safety.

Note that other microclimate issues such as those relating to cladding and structural wind loads, door operability, snow drifting and loading, building air quality, etc. are not part of the scope of this assessment.

1. H. Wu, C.J. Williams, H.A. Baker and W.F. Waechter (2004), "Knowledge-based Desk-Top Analysis of Pedestrian Wind Conditions", *ASCE Structure Congress 2004,* Nashville, Tennessee.
2. H. Wu and F. Kriksic (2012). "Designing for Pedestrian Comfort in Response to Local Climate", *Journal of Wind Engineering and Industrial Aerodynamics*, vol.104-106, pp.397-407.
3. C.J. Williams, H. Wu, W.F. Waechter and H.A. Baker (1999), "Experience with Remedial Solutions to Control Pedestrian Wind Problems", *10th International Conference on Wind Engineering*, Copenhagen, Denmark.

3. METEOROLOGICAL DATA

Meteorological data from Sudbury Airport for the period from 1990 to 2020 were used as a reference for wind conditions in the area as this is the nearest station to the site with long-term, hourly wind data. The distributions of wind frequency and directionality for the summer (May through October) and winter (November through April) seasons are shown in the wind roses in Image 4.

When all winds are considered, winds from the northeast, and southwest directions are predominant in both the summer and winter as indicated by the wind roses. During the winter, winds from the northwest are also frequent.

Strong winds of a speed greater than 30 km/h measured at the airport (red and yellow bands) occur more often in the winter than in the summer season.

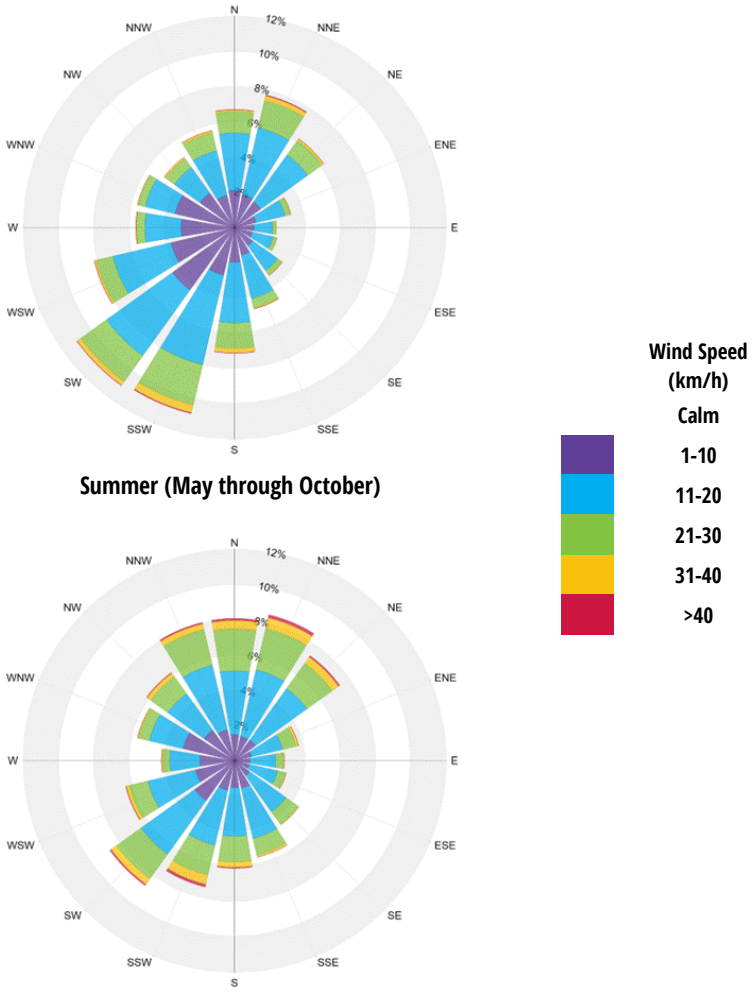


Image 4: Directional Distribution of Winds Approaching Sudbury Airport (1990 to 2020)

4. WIND CRITERIA

The RWDI pedestrian wind criteria are used in the current study. These criteria have been developed by RWDI through research and consulting practice since 1974. They have also been widely accepted by municipal authorities, building designers and the city planning community. The criteria are as follows:

4.1 Safety Criterion

Pedestrian safety is associate with excessive gust that can adversely affect a pedestrian's balance and footing. If strong winds that can affect a person's balance (**> 90 km/h**) occur more than **0.1%** of the time or 9 hours per year, the wind conditions are considered severe.

4.2 Pedestrian Comfort Criteria

Wind comfort can be categorized by typical pedestrian activities:

Sitting (≤ 10 km/h): Calm or light breezes desired for outdoor seating areas where one can read a paper without having it blown away.

Standing (≤ 14 km/h): Gentle breezes suitable for main building entrances and bus stops.

Strolling (≤ 17 km/h): Moderate winds that would be appropriate for window shopping and strolling along a downtown street, plaza or park.

Walking (≤ 20 km/h): Relatively high speeds that can be tolerated if one's objective is to walk, run or cycle without lingering.

Uncomfortable: The comfort category for walking is not met.

Wind conditions are considered suitable for sitting, standing, strolling or walking if the associated mean wind speeds are expected for at least four out of five days (**80% of the time**). Wind control measures are typically required at locations where winds are rated as uncomfortable or they exceed the wind safety criterion.

Note that these wind speeds are assessed at the pedestrian height (i.e., 1.5 m above grade or the concerned floor level), typically lower than those recorded in the airport (10 m height in an open terrain).

These criteria for wind forces represent average wind tolerance. They are sometimes subjective, and regional differences in wind climate and thermal conditions as well as variations in age, health, clothing, etc. can also affect people's perception of the wind climate.

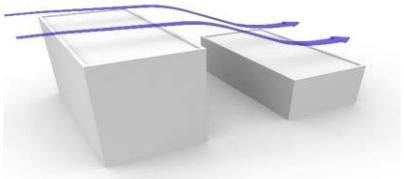
For the current development, wind speeds comfortable for walking or strolling are appropriate for sidewalks and parking lots; lower wind speeds comfortable for standing are required for the building main entrances, where pedestrians may linger, and calm wind speeds suitable for sitting are desired in areas where passive activities are anticipated, such as the rooftop gardens, during the summer season when these areas are typically in use.

5. RESULTS AND DISCUSSION

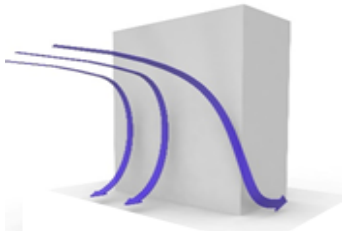
5.1 Wind Flow Around Buildings

Short buildings do not redirect winds significantly to cause adverse wind conditions at pedestrian areas (Image 5a). Tall buildings tend to intercept the stronger winds at higher elevations and redirect them to the ground level (Downwashing). These winds subsequently move around exposed building corners, causing a localized increase in wind activity due to Corner Acceleration (Image 5b). If these building / wind combinations occur for prevailing winds, there is a greater potential for increased wind activity and *uncomfortable* conditions.

Design details such as stepped massing, tower step-back from a podium edge, deep canopies close to ground level, wind screens / tall trees with dense underplanting, etc. (Image 6) can help reduce wind speeds. The choice and effectiveness of these measures would depend on the exposure and orientation of the site with respect to the prevailing wind directions and the size and massing of the proposed buildings.

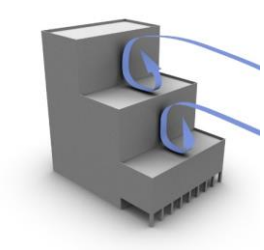


a) Wind flow over built terrain of uniform height

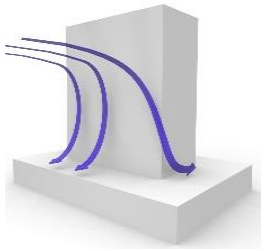


b) Downwashing and Corner Acceleration

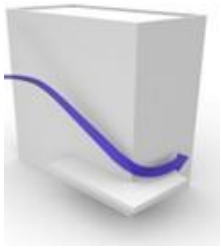
Image 5: Generalized Wind Flows



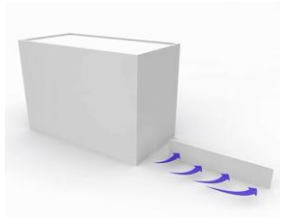
Stepped Massing



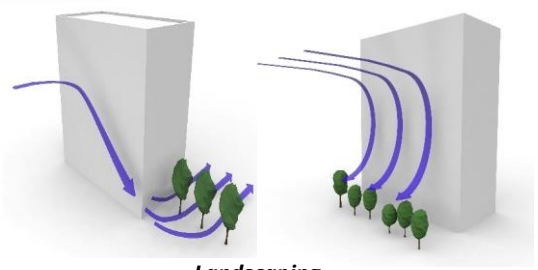
Podium



Canopy



Wind Screens



Landscaping

Image 6: Examples of Common Wind Control Measures

5.2 Existing Scenario

The existing site is unoccupied and surrounded mainly by a mix of suburban neighbourhoods and open lots. There are no significant structures that would deflect ambient winds to ground to cause adverse wind impacts, but all three building sites are slightly elevated and fairly exposed to the higher wind speeds in prevailing wind directions. Currently, wind conditions on sidewalks around the site are considered comfortable for standing or strolling in the summer, and for strolling or walking in the winter. Wind conditions exceeding the safety criterion are not expected.

5.3 Proposed Scenario: Wind Flow

The proposed buildings, at 9 storeys, will be taller than buildings in the immediate surroundings. Downwashing and corner acceleration flows are predicted to result in increased wind activity around the buildings and nearby pedestrian areas with the highest speeds expected around the northwest corners of the buildings.

Although the project will increase wind speeds in the immediate surroundings, several features of the building massing are favourable towards reducing the potential for severe wind impacts. These features are summarized in the following points:

- The buildings orientation with respect to the prevailing winds is a good design feature since the façades with the setbacks due to the T-shaped floor plan are subjected to the prevailing north, northeasterly and northwesterly winds, thereby reducing the effective width and area available for winds to be downwashed and redirected around.
- The canopies above the lobby entrances and the vestibules at the east entrances are also positive design features for wind control.
- The location of the rooftop gardens is positive as it is sheltered by the buildings themselves from the prevailing southwesterly winds.

The following sections provide a discussion of the potential wind conditions around the project, taking these features into account. The expected wind flow pattern and conditions are shown in Images 7 and 8.

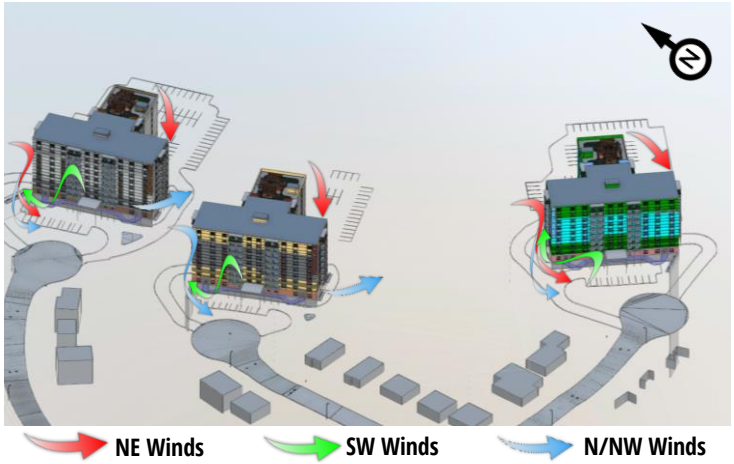
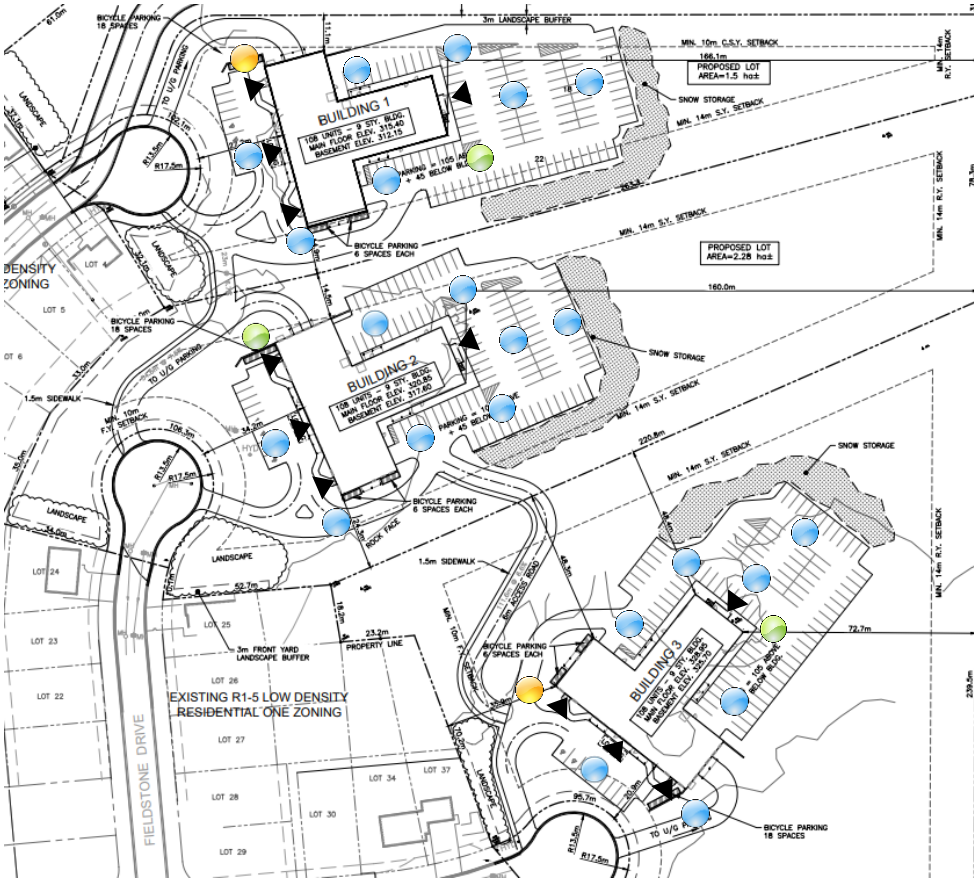


Image 7: Predicted Flow Pattern around the Proposed Buildings

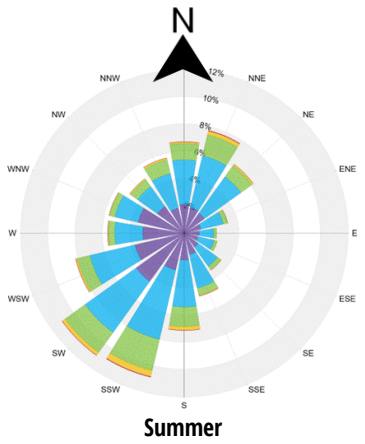
5. RESULTS AND DISCUSSION

5.4 Proposed Scenario: Predicted Wind Conditions (Summer)



WIND CATEGORIES

- Sitting / Standing
- Strolling
- Walking
- Uncomfortable

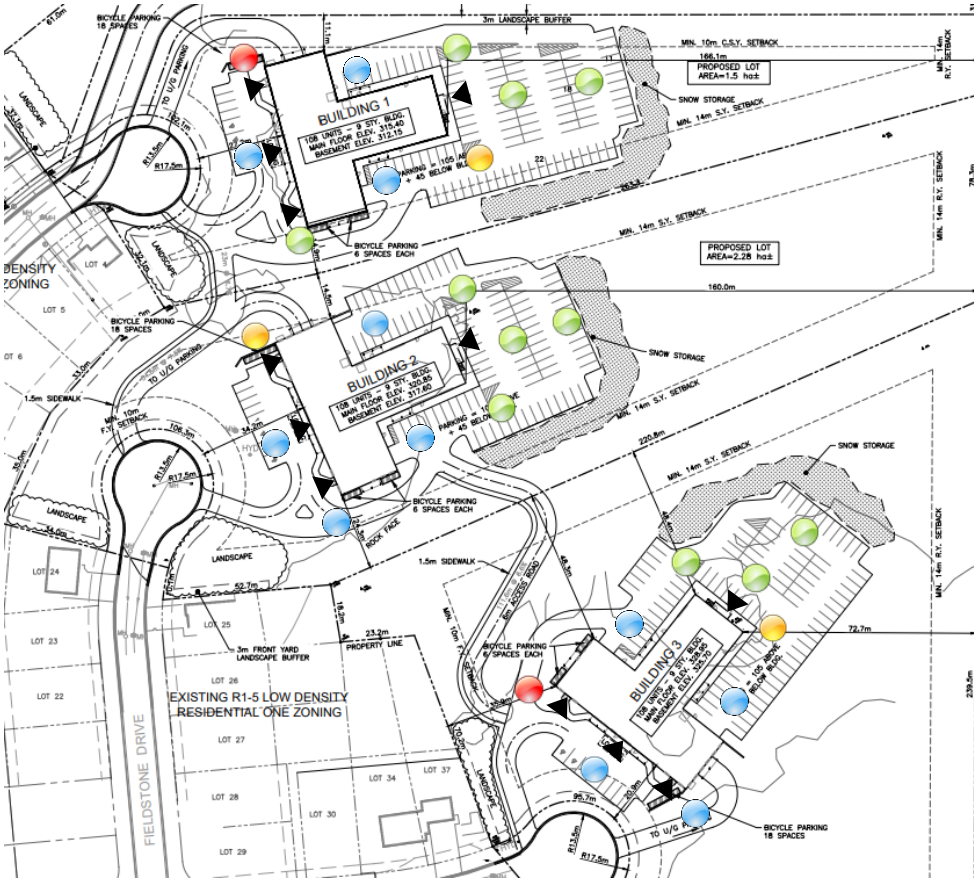


Summer

Image 8a: Predicted Wind Conditions – Grade Level – Summer

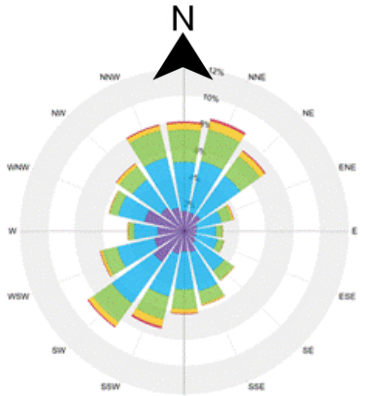
5. RESULTS AND DISCUSSION

5.4 Proposed Scenario: Predicted Wind Conditions (Winter)



WIND CATEGORIES

- Sitting / Standing
- Strolling
- Walking
- Uncomfortable



Winter

Image 8b: Predicted Wind Conditions – Grade Level – Winter

5.5 Proposed Scenario: Wind Safety

At 9 storeys, the proposed buildings are taller than the existing buildings in the surrounding area, but this height is considered moderate from a wind impact perspective. The local wind climate, moderate height and positive design features alluded to in Section 5.3 reduce the potential for severe wind gusts. Therefore, wind conditions around the project are expected to meet the wind safety criterion at grade level.

5.6 Proposed Scenario: Wind Comfort

A detailed discussion of the expected wind conditions at various areas of interest with respect to the prescribed criteria and applicability of the results follows in Subsections 5.6.1 through 5.6.3. Recommendations for wind control, where necessary, are included in Section 5.7.

5.6.1 Building Entrances

The lobby entrances are located along the west façades of the buildings, protected by a deep and 1 storey high canopy (Image 9). Although lobby entrances are on the windward side of the building with respect to the predominant south-westerly winds, the large canopy creates a platform that will disrupt downwash and reduce the impact of winds at the entrances. Along the same façade of each building, there are entrances closer to the southwest corners, which due to the orientation of buildings, these entrances will be protected from most of the prevailing winds. As a result, wind conditions at the lobby and southwest entrances are expected to be comfortable for sitting or standing throughout the year (Image 8), which is appropriate for the intended use.

The entrances along the east façades of the buildings are exposed to the prevailing north-easterly winds in the summer, and north, north-easterly and north-westerly winds in the winter. While appropriate wind conditions are expected near these entrances during the summer (Image 8a), wind speeds conducive to strolling or walking are expected at the entrances during the winter months (Image 8b), which is higher than desired for entrance use. It is worth noting, however, that the east entrances are equipped with vestibules, which provide an area where pedestrians can take shelter from occasional high wind speeds.

The northwest corner of each of the buildings is affected by most prevailing winds year-round. Therefore, windy conditions are expected near the northwest entrances throughout the year (Image 8). Wind tunnel testing could be conducted at a later design stage to confirm these wind predictions and to develop wind control solutions, if necessary.

Image 9: Lobby Entrance Design

5.6 Proposed Scenario: Wind Comfort (Cont'd)

5.6.2 Sidewalks, Walkways and Parking Lots

Wind conditions at most areas at the ground level around the project, including sidewalks, walkways, and parking lots, are predicted to be comfortable for sitting, standing or strolling in the summer. Higher wind speeds comfortable for strolling or walking are expected near the northwest corners of all three buildings (Image 8a), and near the southeast corners of Buildings 1 and 3. Building 2 will be relatively sheltered by Building 1 for the north and northeast winds; hence, lower wind speeds are expected around it. The predicted wind speeds are appropriate for the intended use.

In the winter (Image 8b), due to the seasonal wind climate in the area, higher wind activity is expected throughout the project site, with conditions remaining comfortable for the intended usage at most areas. However, uncomfortable wind conditions may occur in the northwest sides of Buildings 1 and 3, where parking lot or pedestrian walkway maybe located. These wind conditions are not ideal for any area accessible by pedestrians and would be caused by a combination of north, northeasterly, northwesterly, and southwesterly winds accelerating around the northwest corners of the buildings (Image 7).

5.6.3 Rooftop Gardens

We understand that rooftop gardens are proposed on the east side of the buildings (Image 10). Although the proposed buildings will be taller than buildings in the predominant wind directions, the rooftop gardens will be protected by the massing from the strong southwesterly prevailing winds in the summer, when these areas will be typically in use. Additionally, the outdoor garden and seating areas are located away from the corners, under a large trellis, which are positive design features/considerations to reduce wind impact. As such, wind conditions at the amenity spaces are expected to be comfortable for sitting or standing in the summer, which is generally appropriate for passive uses. Higher wind speeds comfortable for strolling may occur near the exposed edges and corners of the amenity space.

In the winter, higher wind activity is expected near the exposed corners, but this may not be of concern as these areas are not expected to be used for passive activities in the cold months.

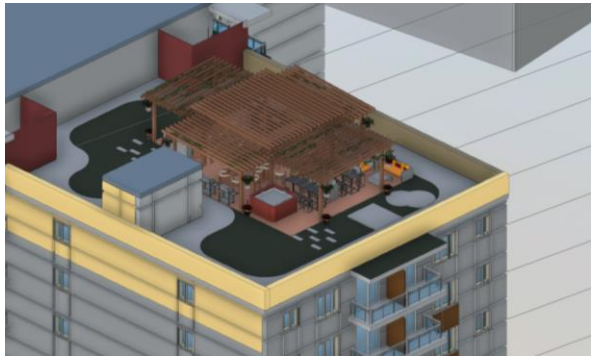


Image 10: Rooftop Garden

5.7 Recommendations

5.7.1 Northwest Corner

To lower wind speeds near the northwest corners of the buildings, we recommended the use of wide canopies along the exposed north and west façades of Buildings 1 and 3 and wrapped around the corners to help deflect downwashing winds and moderate the wind impact. The canopy would be helpful towards reducing the wind speeds near the northwest entrances as well. Alternatively, dense coniferous landscaping/ wind screens may be considered to reduce the wind speeds and/or to keep pedestrians away from the windy areas – see Image 11 for examples.

Image 11: Examples of Wind Control Measures near Building Corners

5.7.2 Entrances

If the northwest and east sides entrances are main entrances, it is recommended to recess them from the main façades to achieve calmer wind speeds in their vicinity. Alternatively, wind screens and/or tall planters are recommended at the south side of the northwest entrances, and at the north side of the east entrances, perpendicular to the façades. Examples are shown in Image 12 for reference.

Image 12: Examples of Wind Control Measures near Entrances

5.7.3 Rooftop Gardens

We understand that railings, approximately 1.1 m tall, are considered around the rooftop amenity spaces. If lower wind speeds comfortable for sitting are desired throughout the amenity spaces, we recommend increasing the railing height at least to 2 m to provide sheltering from the horizontal winds coming from northeast directions.

6. SUMMARY

RWDI was retained to provide an assessment of the potential pedestrian level wind impact of the proposed Sunrise Ridge Development in Sudbury, Ontario. Our assessment was based on the local wind climate, the current design of the proposed development, the existing surrounding buildings, our experience with wind tunnel testing of similar buildings, and screening-level modelling of the proposed building.

Our findings are summarized as follows:

- The project site is located slightly up-hill, and therefore, it is exposed to stronger winds.
- The proposed buildings will be taller than buildings in the predominant wind directions, and therefore will cause an increase in wind speeds at localized areas around them.
- The buildings design incorporated several wind-responsive features which will moderate the potential wind impacts on the surroundings.
- Wind conditions on and around the proposed buildings are not expected to exceed the recommended criteria for pedestrian safety.
- Suitable wind conditions are predicted at the lobby and southwest entrances for all three buildings throughout the year. Higher wind speeds are expected near the northwest and east entrances.
- In general, conditions on sidewalks, walkways and parking lots around the proposed buildings are expected to be comfortable for the intended use throughout the year. Higher wind speeds and potentially uncomfortable wind conditions may occur near the northwest corner of Buildings 1 and 3 during the winter months.
- Wind conditions on the rooftop gardens are expected to be appropriate for passive uses at most areas during the summer, when these areas will be typically in use.
- Wind control measures have been discussed for the northwest corners of the buildings, entrances, and rooftop gardens in order to achieve appropriate wind conditions.
- Wind tunnel testing is suggested to quantify and assess the wind comfort and safety conditions on and around the project site and to confirm the effectiveness of any mitigation.

7. STATEMENT OF LIMITATIONS

7.1 Design Assumptions

The findings/recommendations in this report are based on the building geometry and architectural drawings communicated to RWDI on July 4th, 2023, and June 3rd, 2024, listed below. Should the details of the proposed design and/or geometry of the building change significantly,

File Name	File Type	Date Received (mm/dd/yyyy)
23-05.Sunrise Ridge Development - With Buildings- Shadow Study	Revit	07/04/2023
23-05. Sunrise Ridge Plans	PDF	06/03/2024
230722 Civil May 2024 C1 - Table Updated	PDF	06/03/2024
230722 Civil May 2024 C2	PDF	06/03/2024
Sunrise Ridge Render - 4k	PNG	06/03/2024

7.2 Changes to the Design or Environment

It should be noted that wind comfort is subjective and can be sensitive to changes in building design and operation that are possible during the life of a building. These could be, for example: outdoor programming, operation of doors, elevators, and shafts pressurizing the tower, changes in furniture layout, etc.. In the event of changes to the design, construction, or operation of the building in the future, RWDI could provide an assessment of their impact on the discussions included in this report. It is the responsibility of Others to contact RWDI to initiate this process.

7.3 Limitations

This report was prepared by Rowan Williams Davies & Irwin Inc. for CARICARI LEE ARCHITECTS ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein and authorized scope. The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

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

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