112 NELSON STREET

RESIDENTIAL PROJECT DESIGN BRIEF

July 20, 2021
Revision 3

WOODMAN ARCHITECT & ASSOCIATES LTD.

Design Brief
112 Nelson Street
Residential Project
for
Forum / SLP 112 Nelson Limited Partnership

Prepared by:
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Jain Sustainability Consultants Inc.
Paterson Group
Urban Equation

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1.0
INTRODUCTION AND BACKGROUND TO THE PROJECT

1.0 Introduction and Background to the Project

Located in Ottawa Lower Town, the block is bounded by King Edward Avenue, Rideau Street, Nelson Street and York Street. The Site has a total land area of 0.73 acres or 31,747 square feet.

The Site is currently occupied, the property is situated mid-block with frontage on Nelson Street and occupies the middle of the block by a two storey metal siding warehouse situated at the west side of the property. This building was constructed in 1956 and will have to be demolished.

The property has been shown to be a focal point for urban intensification in the Ottawa core. New development will improve and expand the current area amenities serving the local population.

The Property is located within one Kilometer of the University of Ottawa, The By-ward Market and Downtown Ottawa.

Ottawa is the most educated City in the Country as over 50% of the population has graduated with a post-secondary education.

Ottawa's economy is dominated by the Public Services as part of the Government of Canada. Also, Ottawa has developed as a major technology hub.

As the Capital of the Country, Ottawa has been the centre for culture and tourism with independently run boutiques, shops and galleries complete with high-end restaurants, casual dining, pubs, bars, clubs and outside patios. The market has it all.

The new O-Train Confederation Line is located within 600 metres and, with Phase II complete, the Rideau station will expand the connectivity of this Site to the Eastern, Western and Southern limits of the City.

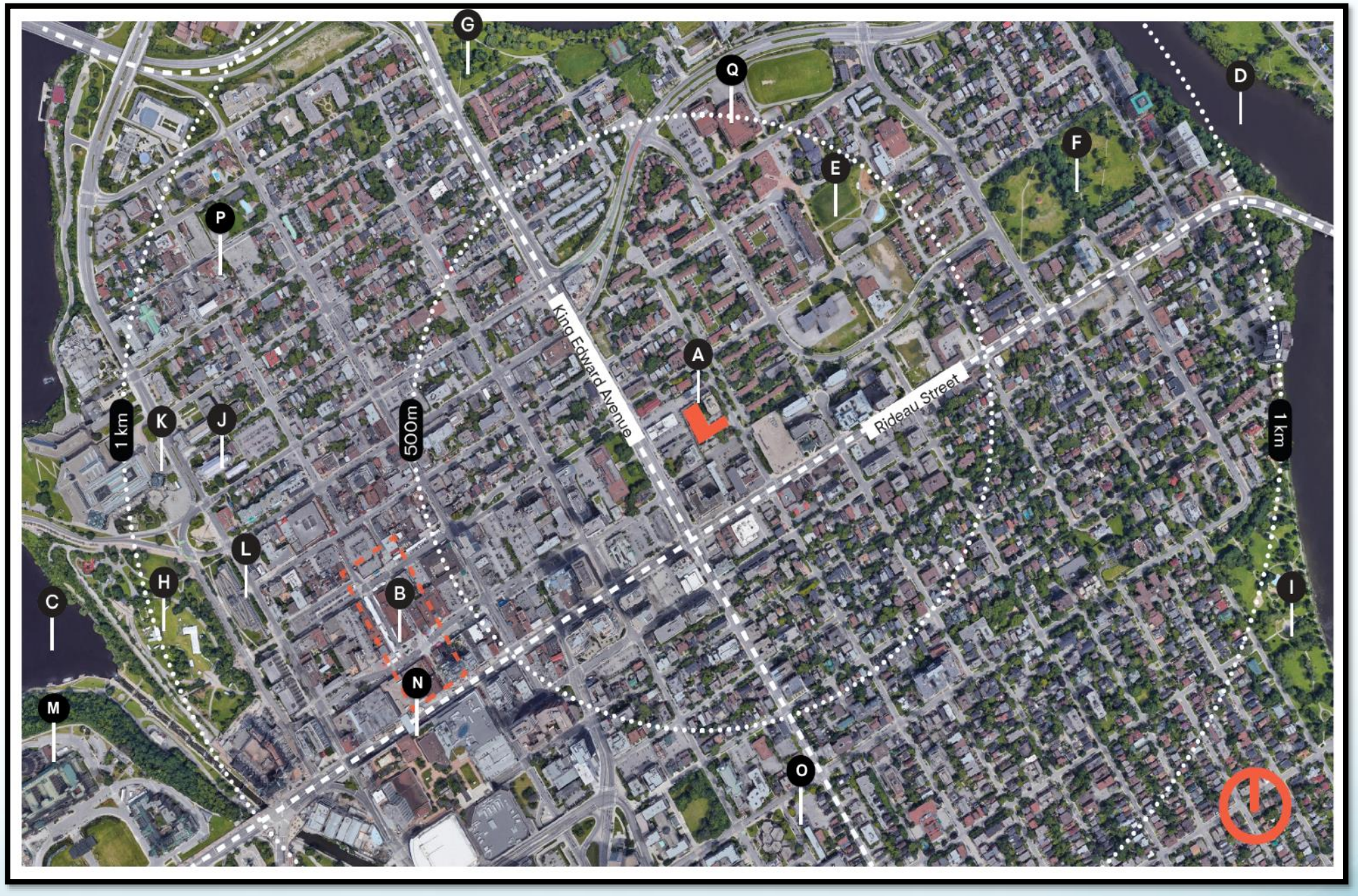
112 Nelson Street is a property with an Approved Residential Development status adjacent to the By-ward Market. The property comprises an "L" parcel which through neighborhood consultation with City Planners has been Approved for a nine storey terraced residential development with an allowable 151,588 SF of
above grade GFA plus 27.243 SF below grade GFA.

Section 37 contributions have been negotiated to include a Parkland donation and a semi-public plaza on Nelson Street at the entrance to the project.

CONTEXT

Legend

A Site
B ByWard Market
C Ottawa River
D Rideau River
E Jules Morin Park
F MacDonald Gardens Park
G Bordeleau Park
H Major Hills Park
I Strathcona Park
J Notre-Dame Cathedral Basilica
K National Gallery of Canada
L United States Embassy
M Parliament of Canada
N Rideau Shopping Centre
O University of Ottawa
P Bruyere Elisabeth Hospital
Q De La Salle High School



VIEW POINTS

A Nelson and Rideau Street

B Cumberland and Rideau Street

C Dalhousie and York Street

D Beasoleil and Chapel Street

E Beasoleil and St Patrick Street

F King Edward Avenue and St Patrick

G Nelson Street – Facing Site

H King Edward Avenue – Facing Site

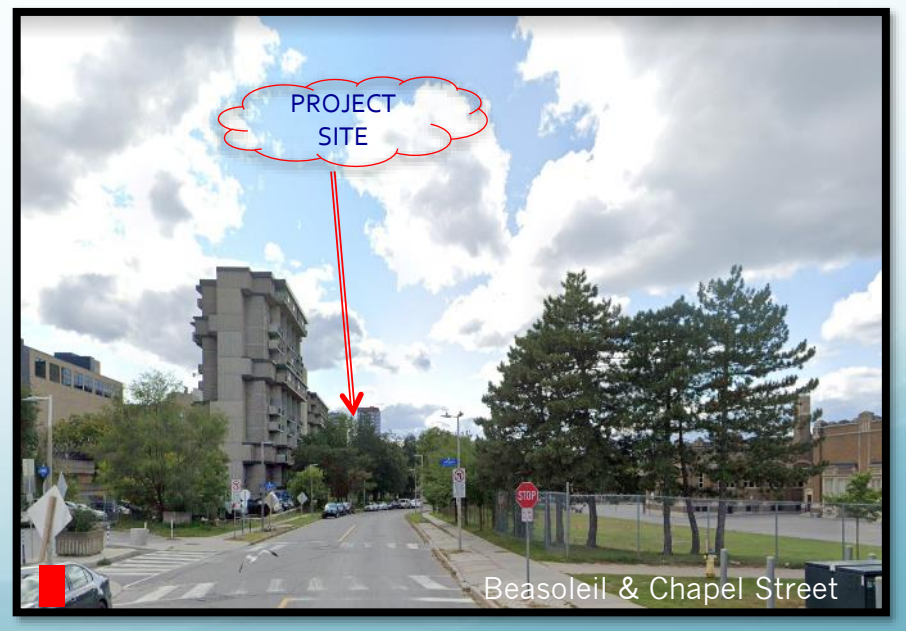
I York Street – Rear View

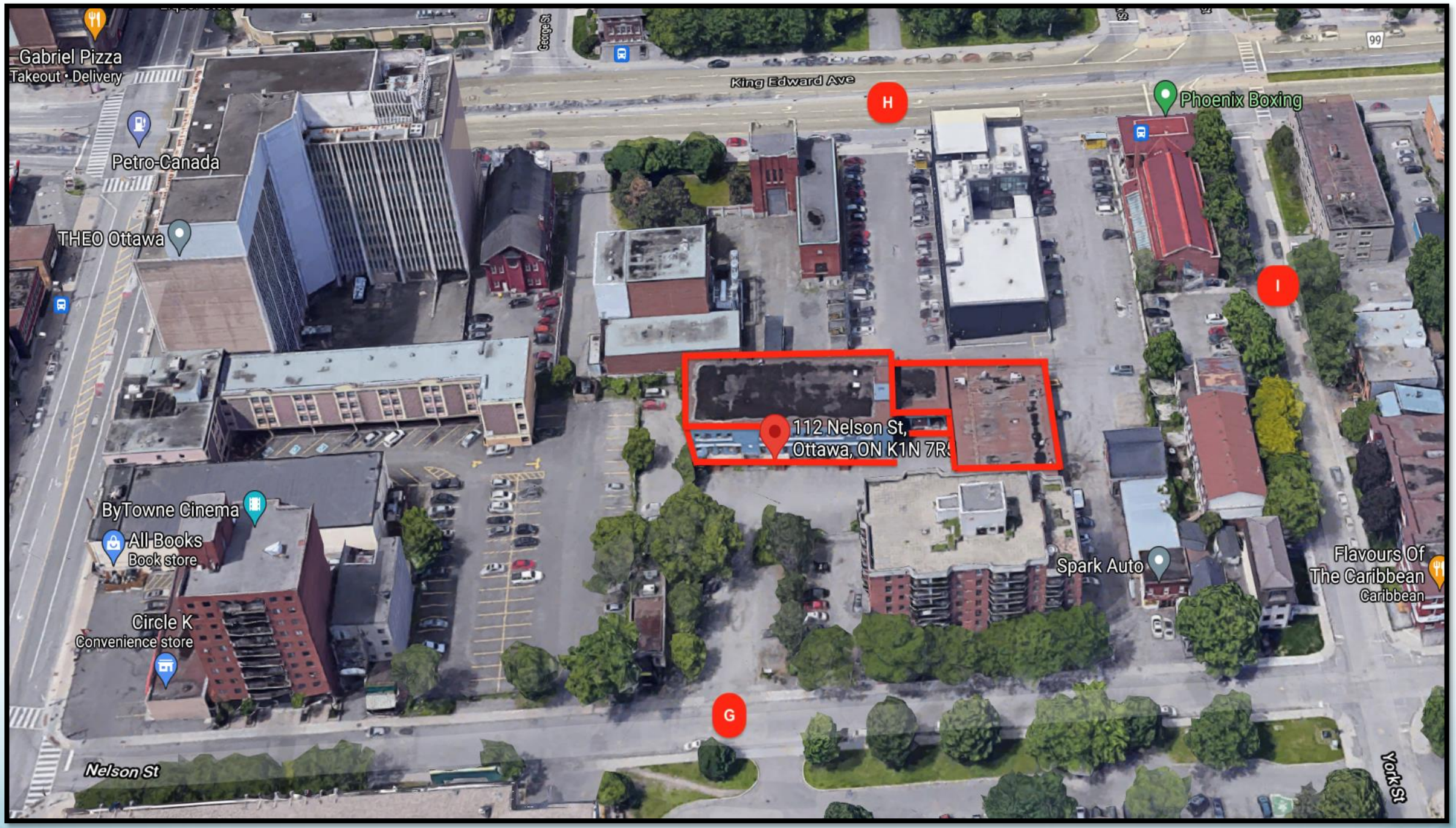

PROJECT
SITE
pharmacy
Nelson and Rideau Street


PROJECT
SITE
Beausoleil &t. Patrick Street


PROJECT
SITE
LUXURY CONDOS
Cumberland & Rideau Street


PROJECT
SITE
Dalhousie
Dalhousie & York Street


PROJECT
SITE
STOP
Beasoleil & Chapel Street


Gabriel Pizza
Takeout • Delivery
Petro-Canada
THEO Ottawa
George St
King Edward Ave
H
99
Phoenix Boxing
I
112 Nelson St,
Ottawa, ON K1N 7R
ByTowne Cinema
All Books
Book store
Circle K
Convenience store
Spark Auto
Flavours Of
The Caribbean
Caribbean
G
Nelson St
York St

112 Nelson Street

King Edward Avenue and St Patrick Street

Nelson Street – Facing Site

King Edward Avenue – Facing Site

York Street – Rear View of Site

3.0
DESIGN OBJECTIVE

3. Design Objective

The target is to attract young professionals seeking an urban setting, proximate to the City Core. This attraction will be exemplified by having a totally furnished 100% purpose built rental building complete with a fully equipped diverse amenity component created to encourage fully interactive uses and support active and healthy lifestyles. The units will be ultra efficient micro spaced in area where attention will be given to active flexibility being provided by the flex location of wall elements, to generate adjustability depending upon the required use in the moment.

4.0
DESCRIPTION OF THE DESIGN

4.1
ARCHITECTURAL DESIGN

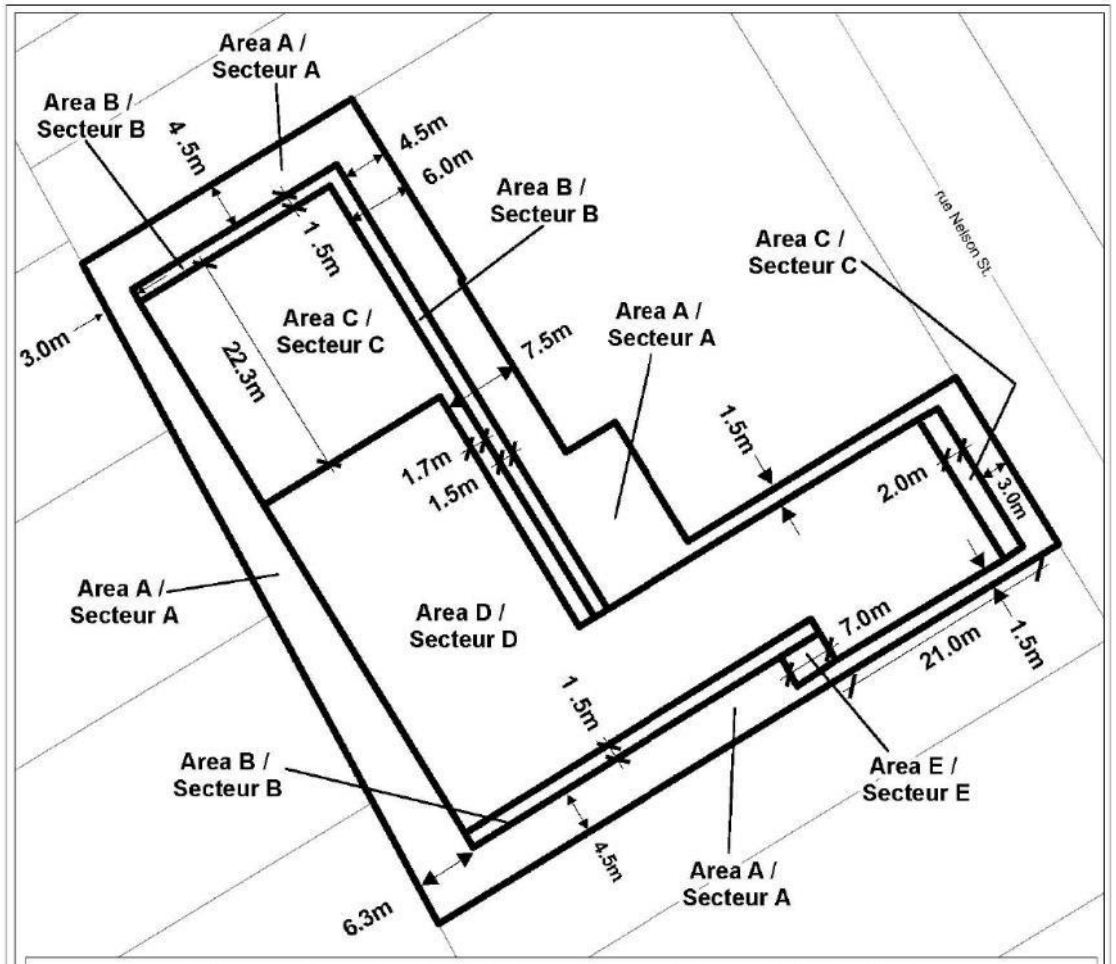
4. Description of Design

4.1.1 Site Orientation, Landscaping, and Parking

The Site is "L" shaped having frontage on Nelson Street on its East boundary with a restrictive width of approximately 18.5 metres. The building orientation, massing and maximum permitted building height on the Site are conforming in General terms to Schedule 421 to the City of Ottawa Zoning By-Law No 2008-250. In specific terms they are conforming to Attachment 13 to By-Law Number 2020-299 passed October 14,2020.

Although limited in area, landscaping will form an integral component of the design. It will include dense vegetation barriers around the perimeter of the site, green spaces forming part of the exterior courtyard and entrance plaza, privacy gardens on the balconies and a roof garden on the 7th floor roof terrace.

Parking has been limited to spaces only for visitors, supported with Vrtucar spaces, scooter parking and capacity for 322 bicycles.



MAXIMUM PERMITTED BUILDING HEIGHT / MAXIMUM NUMBER OF STOREYS
LA HAUTEUR DE BÂTIMENT MAXIMALE PERMISE / NOMBRE D'ÉTAGES MAXIMAL

Area /Secteur A : No buildings permitted/Aucun bâtiment permis
Area /Secteur B : 14m (4 storeys/ étages)
Area /Secteur C : 17m (5 storeys/ étages)
Area /Secteur D : 30m (9 storeys/ étages)
Area /Secteur E : 4m (1 storey/ étage)

Minimum required setbacks/
Retraits minimaux requis

Minimum required stepbacks/
Reculs minimaux requis

Ottawa

D02-02-17-0114	18-0592-X

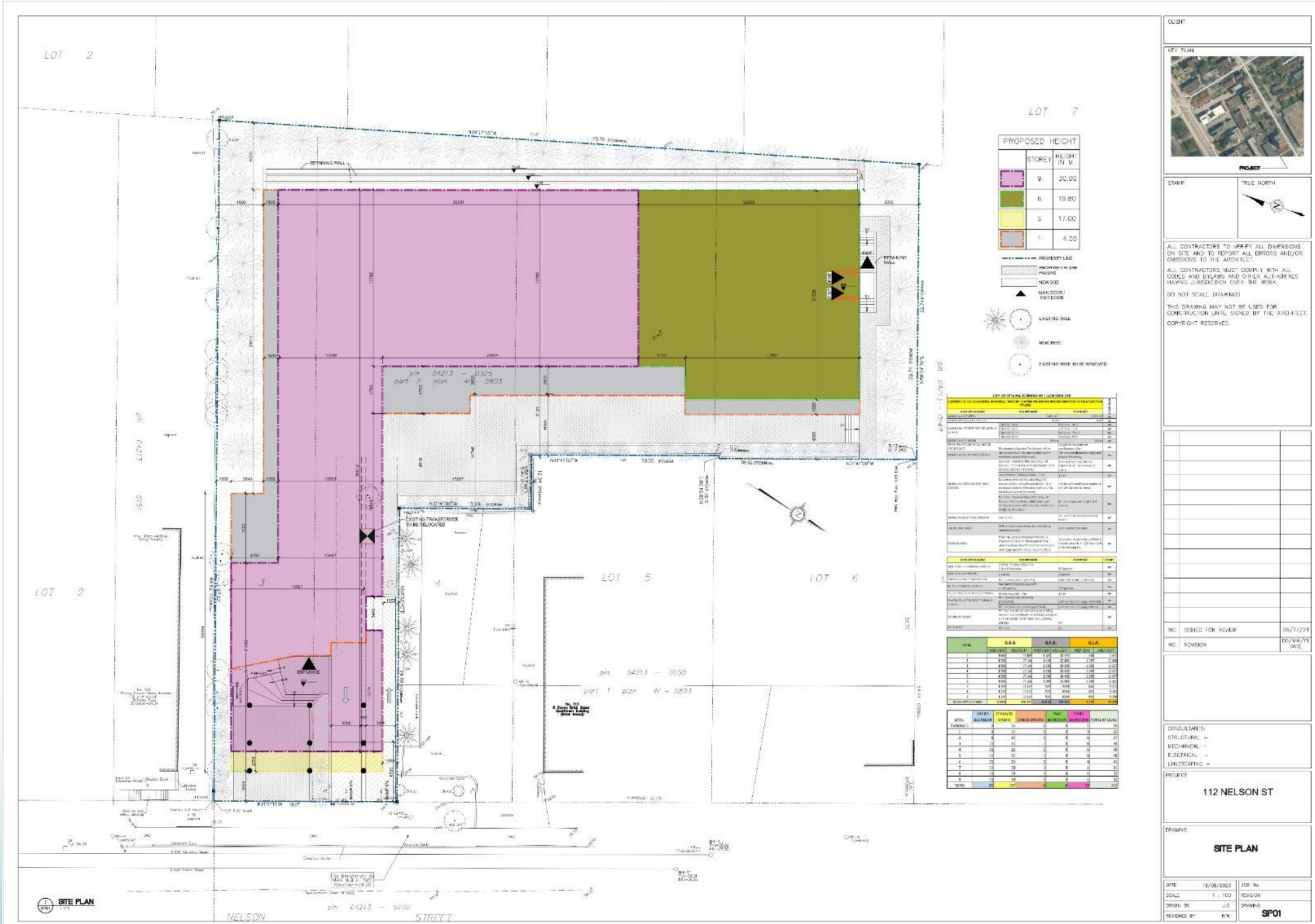
M:\Zoning_Bylaw\Schedules\

This is Schedule 421 to Zoning By-law No. 2008-250
Annexe 421 au Règlement de zonage n° 2008-250

This is Attachment 13 to By-law Number 2020-299, passed October 14, 2020
Pièce jointe n° 13 du Règlement municipal n° 2020-299, adopté le 14 octobre, 2020

NOT TO SCALE

SITE PLAN


LOT 2
LOT 7
LOT 5
LOT 6
RETAINING WALL
EXISTING TRANSFORMER TO BE RELOCATED
ENTRANCE
NELSON STREET
SITE PLAN
PROPOSED HEIGHT
STOREY
HEIGHT IN M
9 30.00
6 19.80
5 17.00
1 4.00
PROPERTY LINE
NEW DOOR
MAIN DOOR / ENTRANCE
EXISTING TREE
NEW TREE
EXISTING TREE TO BE REMOVED
CLIENT
KEY PLAN
PROJECT
STAMP
TRUE NORTH
ALL CONTRACTORS TO VERIFY ALL DIMENSIONS ON SITE AND TO REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.
ALL CONTRACTORS MUST COMPLY WITH ALL CODES AND BYLAWS AND OTHER AUTHORITIES HAVING JURISDICTION OVER THE WORK.
DO NOT SCALE DRAWINGS
THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT.
COPYRIGHT RESERVED.
NO. ISSUED FOR REVIEW 06/11/21
NO. REVISION DD/MM/YY DATE
CONSULTANTS:
STRUCTURAL –
MECHANICAL –
ELECTRICAL –
LANDSCAPING –
112 NELSON ST
SITE PLAN
DATE 18/08/2020
SCALE 1 : 100
DRAWN BY JD
REVIEWED BY R.K.
JOB No.
REVISION
DRAWING SP01

4.1.2
EXTERIOR DESIGN

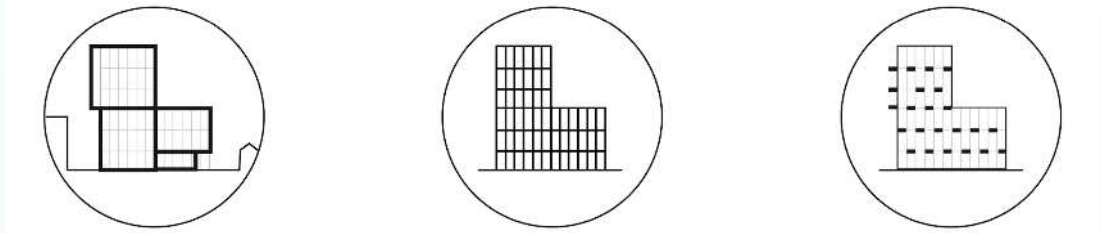
4.1.2 Exterior Design

The exterior design is founded on reflecting the scale and having sensitivity to its surroundings. The area is made up of a mixture of low-rise, mid-rise and high-rise buildings. The design is contextual in that it utilizes differential textures as masses all composed of a composition of blocks built in proportions reflecting its relationship to the surrounding elements.

A two-storey façade supergrid has been introduced to create modularity to the design. A balcony strategy has been introduced to reinforce the residential character of the building, to provide the opportunity to introduce a green component to the design and, through strategic placement, provide solar shading where concentrations of sunlight are expected.

Utilizing major and minor themes, the two-storey façade grid will be the dominant (major) element in the wall composition. This will be a pre-manufactured panelized textured, molded and mechanically fastened series of components framing indented infill elements (minor) made up of textured metal panels and glazing in metal frames. The glazing component will not exceed 40% of each wall assembly.

A DESIGN PROCESS THAT IS BASED ON SCALE AND SENSIBILITY TO ITS SURROUNDINGS



Scale and context

Façade blockage, in harmony with contextual built proportions

Façade Grid

Uniform modularity enhancing the 2 storey unit gird

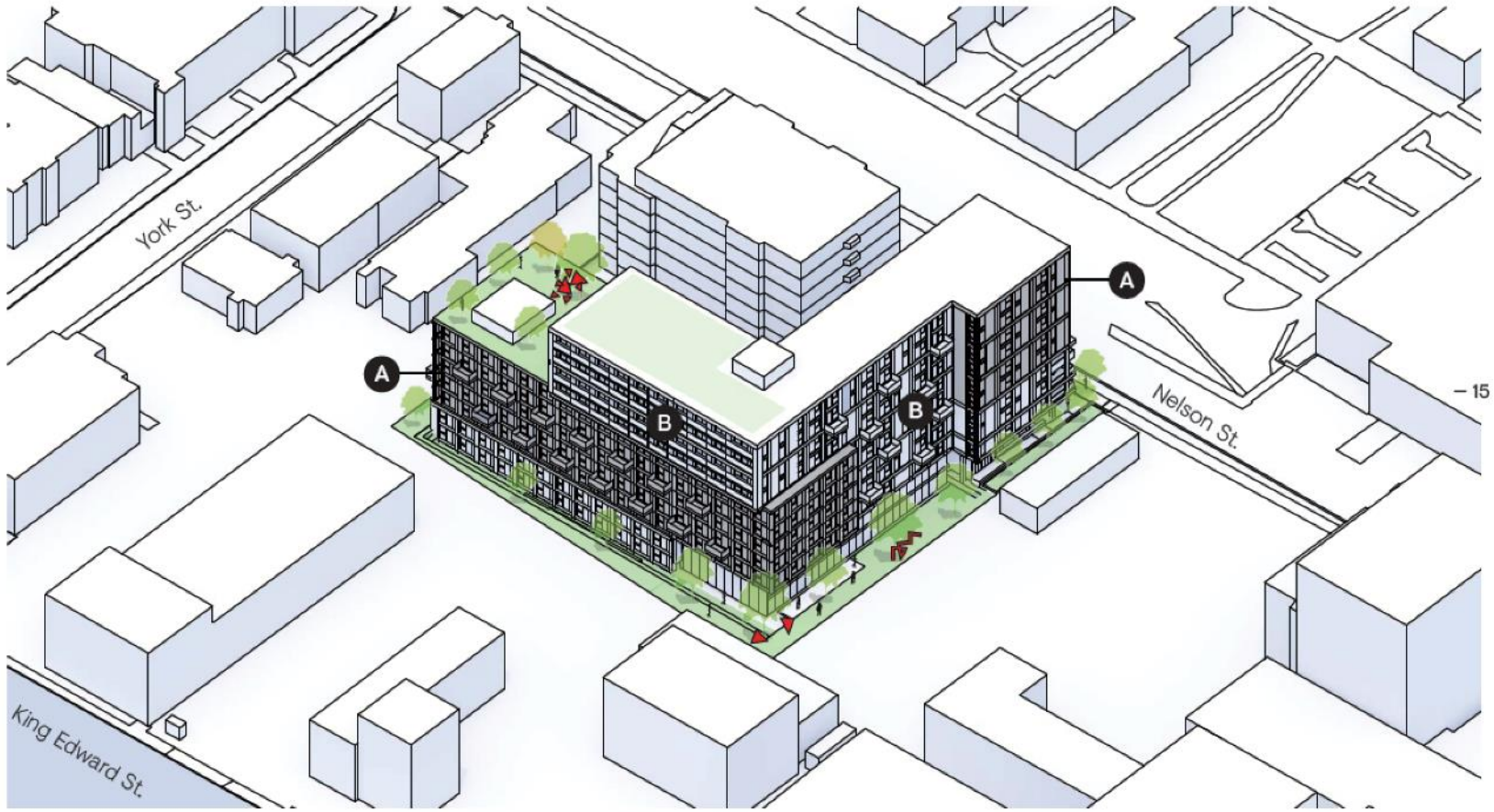
Balcony Strategy

Balcony pattern –making. The
Façade acting as a mural for the neighbourhood.

Concept

A Dark masonry brick grid with charcoal windows
The windows are paired vertically with charcoal aluminum panel inserts.

B White metal aluminum panels with large balconies
The windows are paired vertically with charcoal aluminum panel inserts.

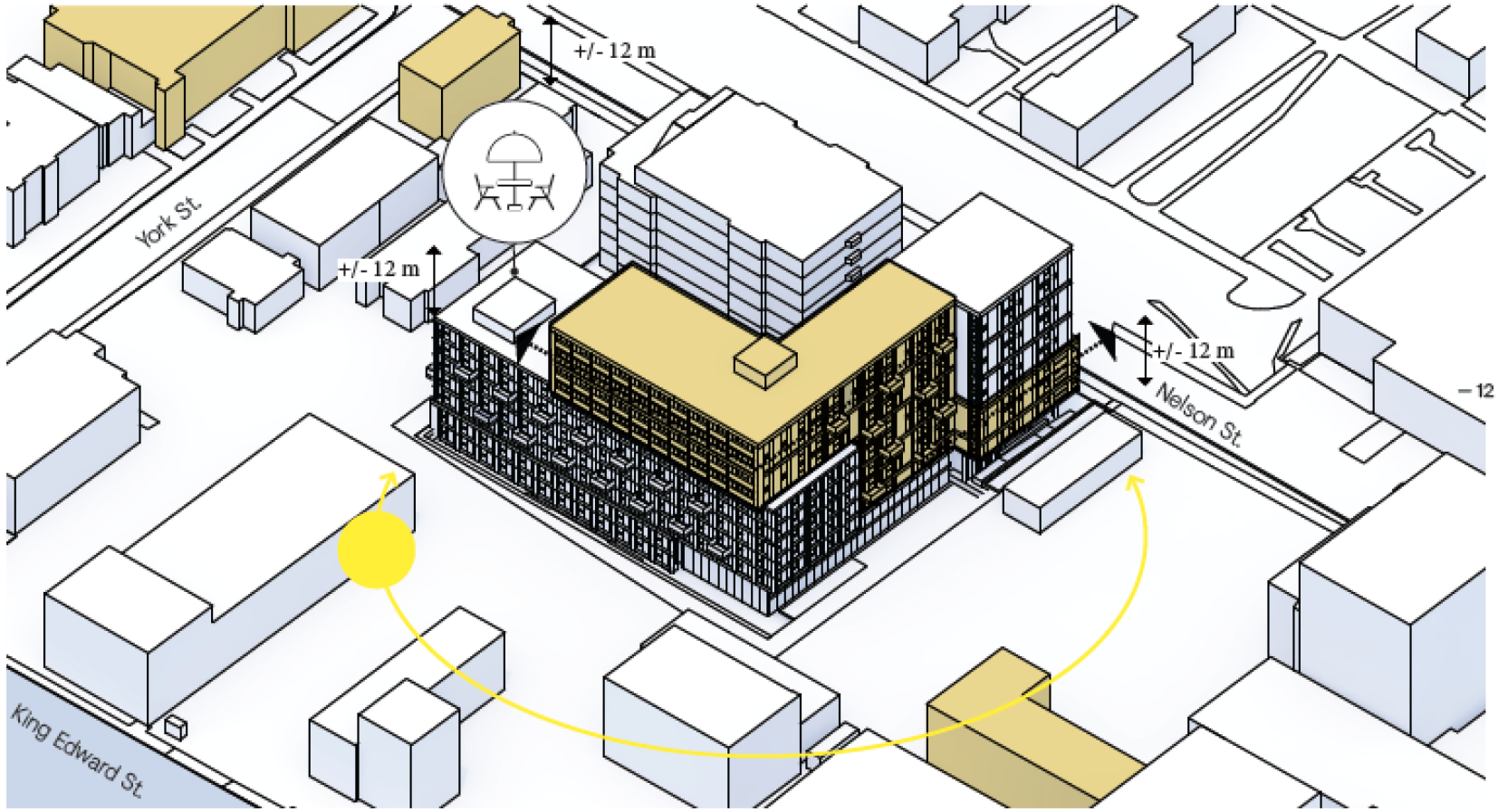


Concept

Projection of midscale volume (+/- 12 m) facing the entrance on Nelson.

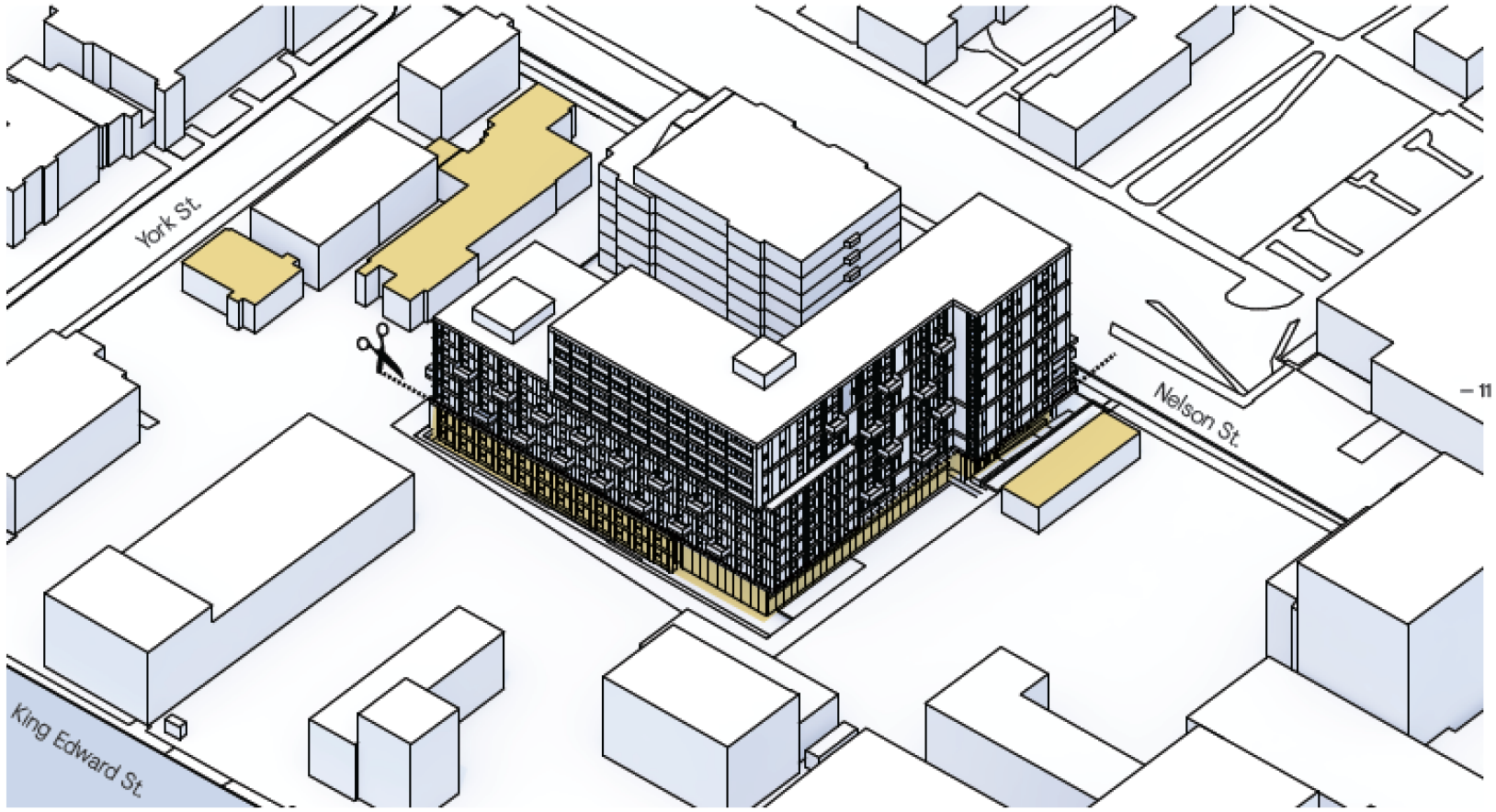
That same scale object is transposed to the 7 th floor where the common terrace is located.

This terrace benefits of optimal afternoon sun and views of the city.



Concept

Materiality differenciation of the first floor to create an alignment with the existing scale of the residential buildings in the surroundings.

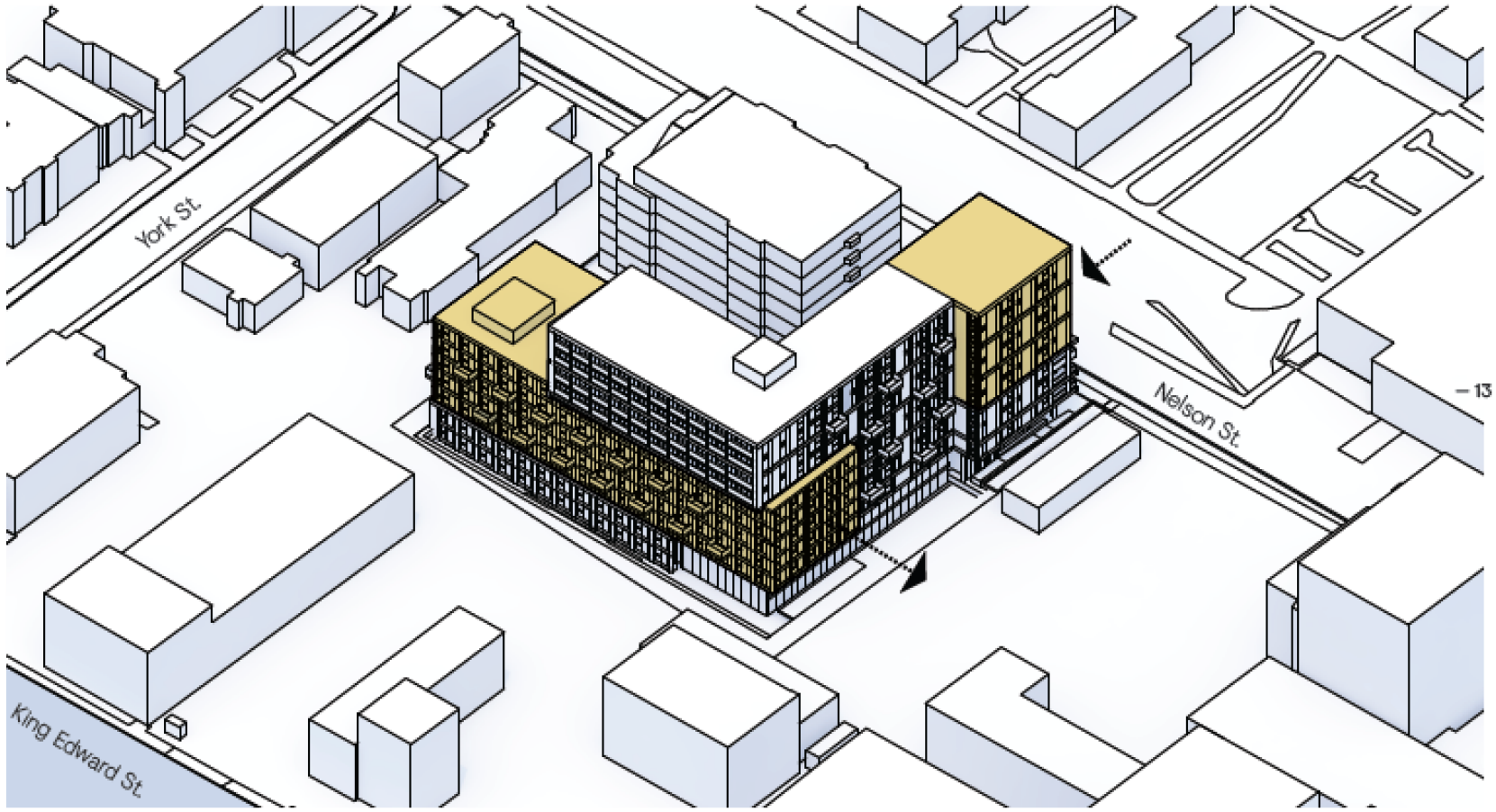


Concept

Midscale setbacks allow us to reduce the scale of the project.

Materiality is reversed from the front to the back of the building.

The verticality of the Nelson facade is also transformed into horizontal stratification facing King Edward Street.



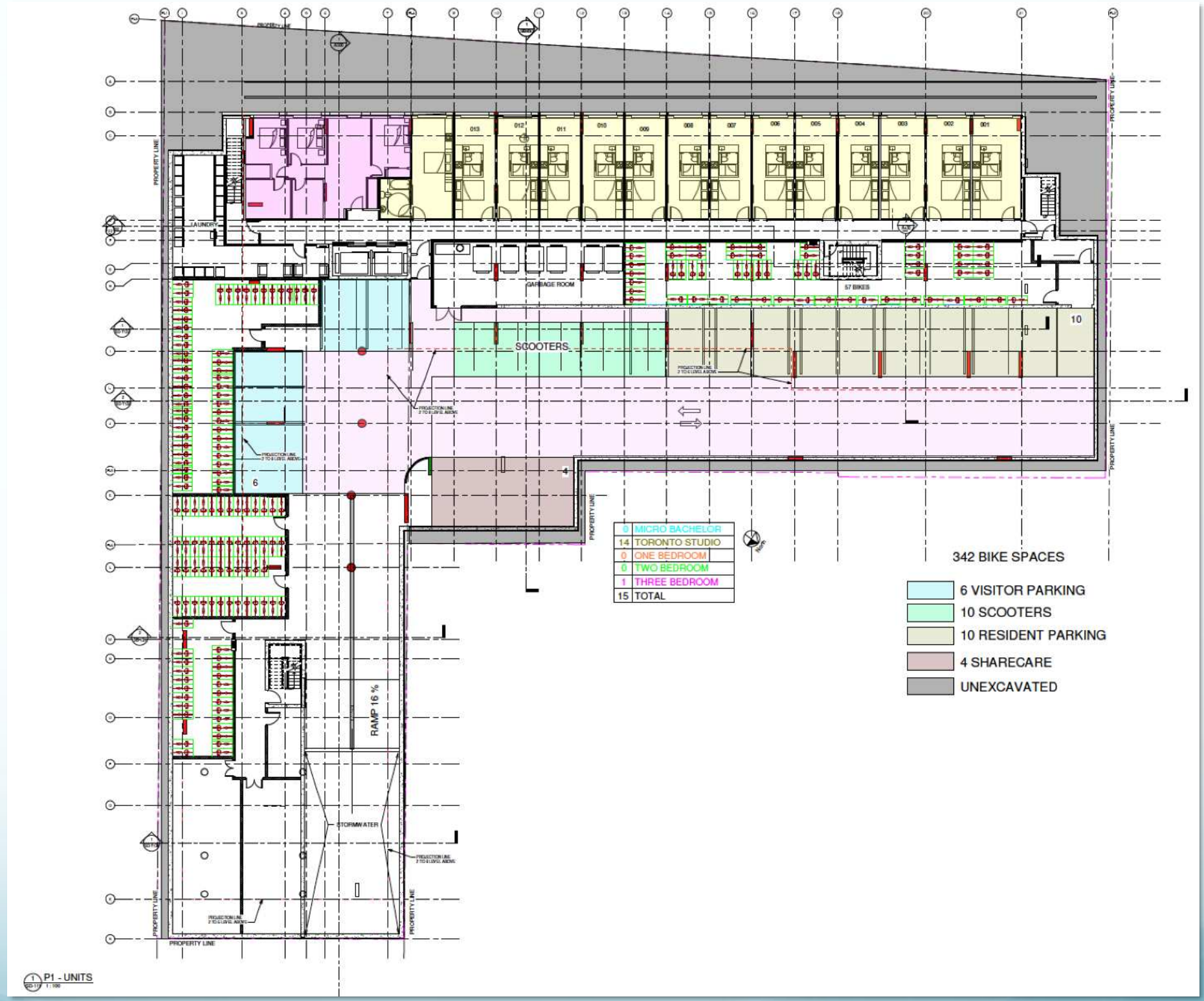
Concept

Projection of large vegetated balconies looking over the buildings located on King Edward Street.

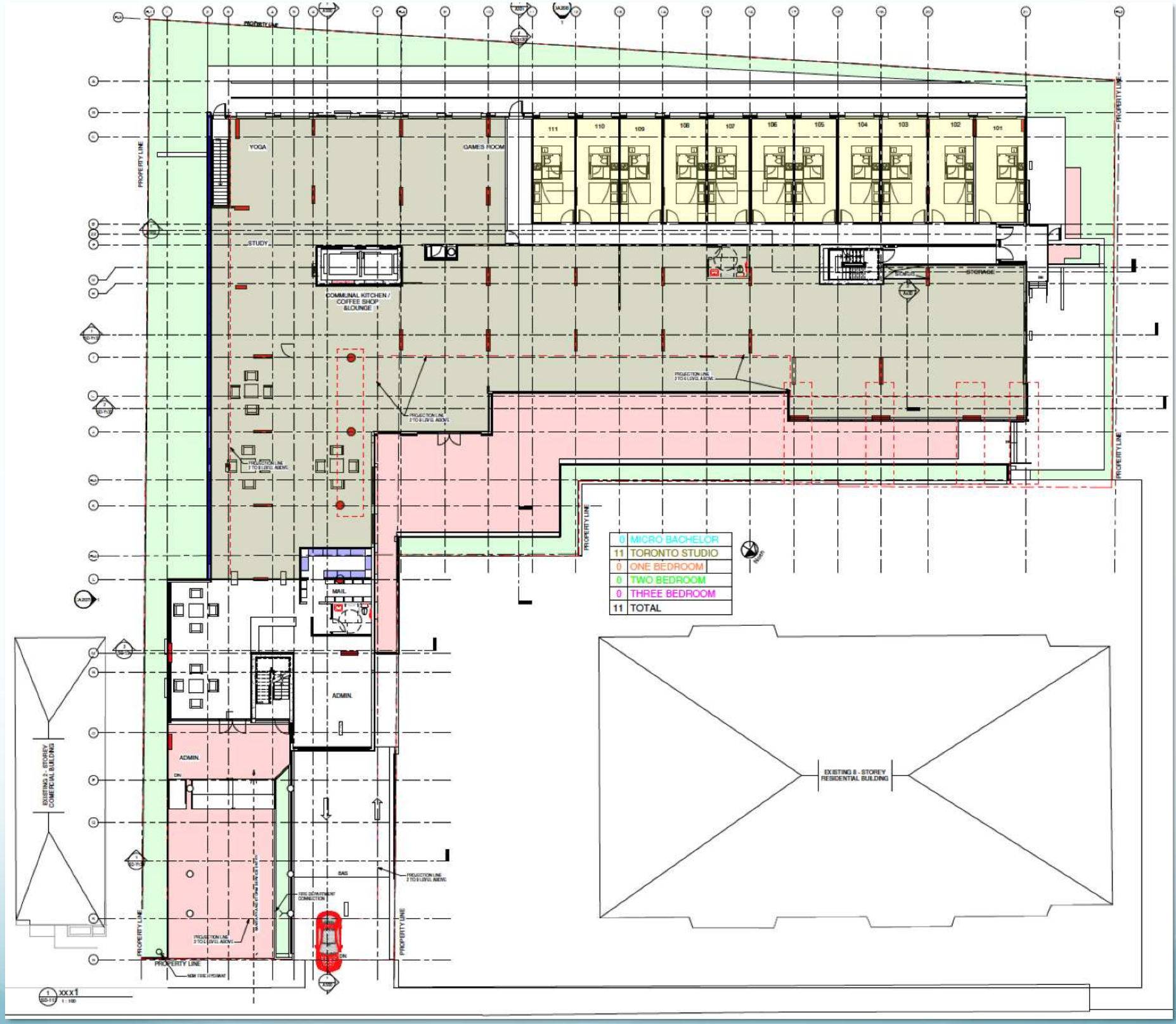
These balconies also help control solar gain on this south/west facade.

4.1.3
FLOOR PLANS

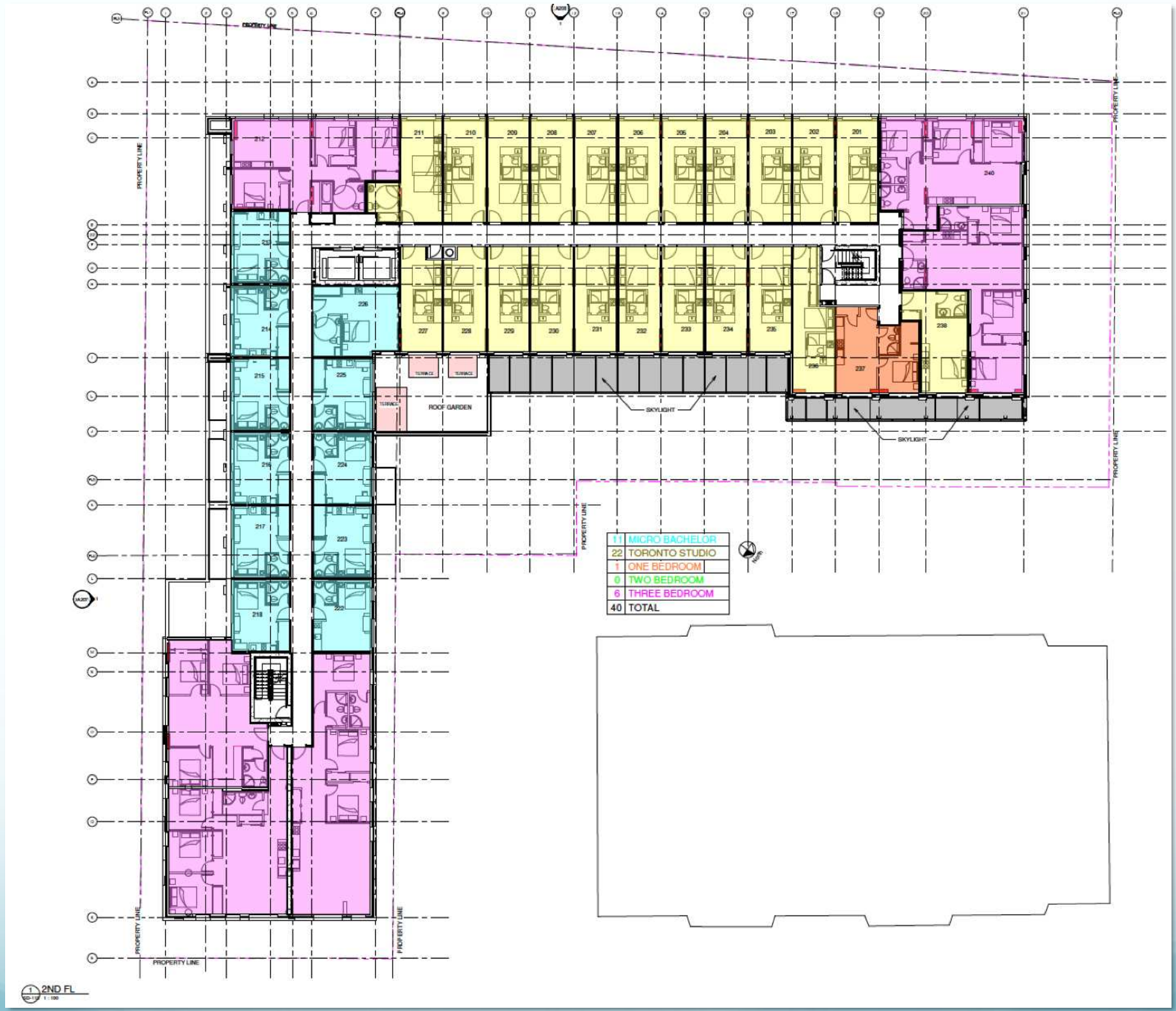
PARKING LEVEL 1



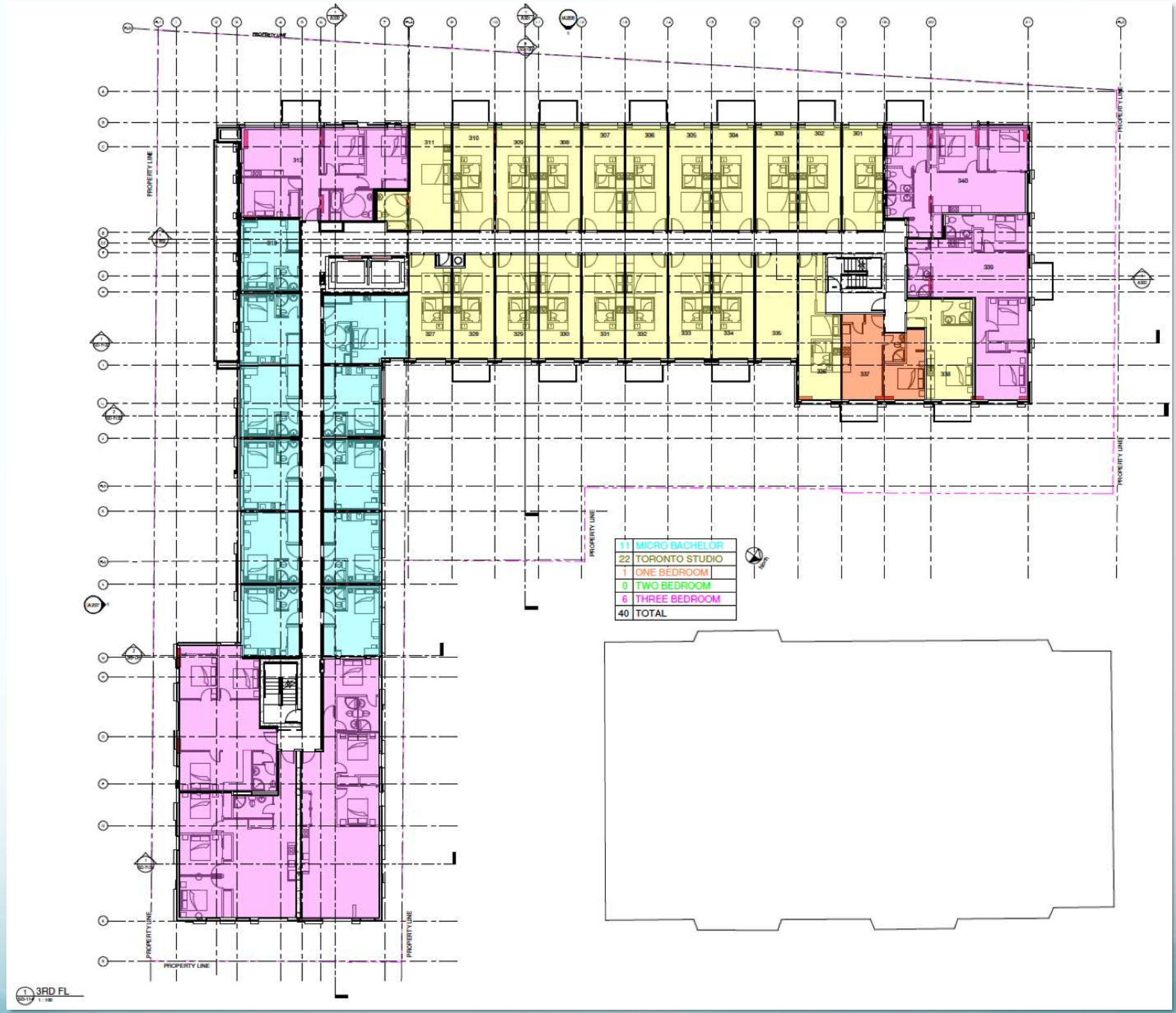
LEVEL 1


YOGA
GAMES ROOM
STUDY
COMMUNAL KITCHEN / COFFEE SHOP &LOUNGE
STORAGE
MAIL
ADMIN.
ADMIN.
BAS
PROPERTY LINE
PROJECTION LINE 2 TO 5 LEVEL ABOVE
EXISTING 3 - STOREY COMMERCIAL BUILDING
EXISTING 8 - STOREY RESIDENTIAL BUILDING
0 MICRO BACHELOR
11 TORONTO STUDIO
0 ONE BEDROOM
0 TWO BEDROOM
0 THREE BEDROOM
11 TOTAL

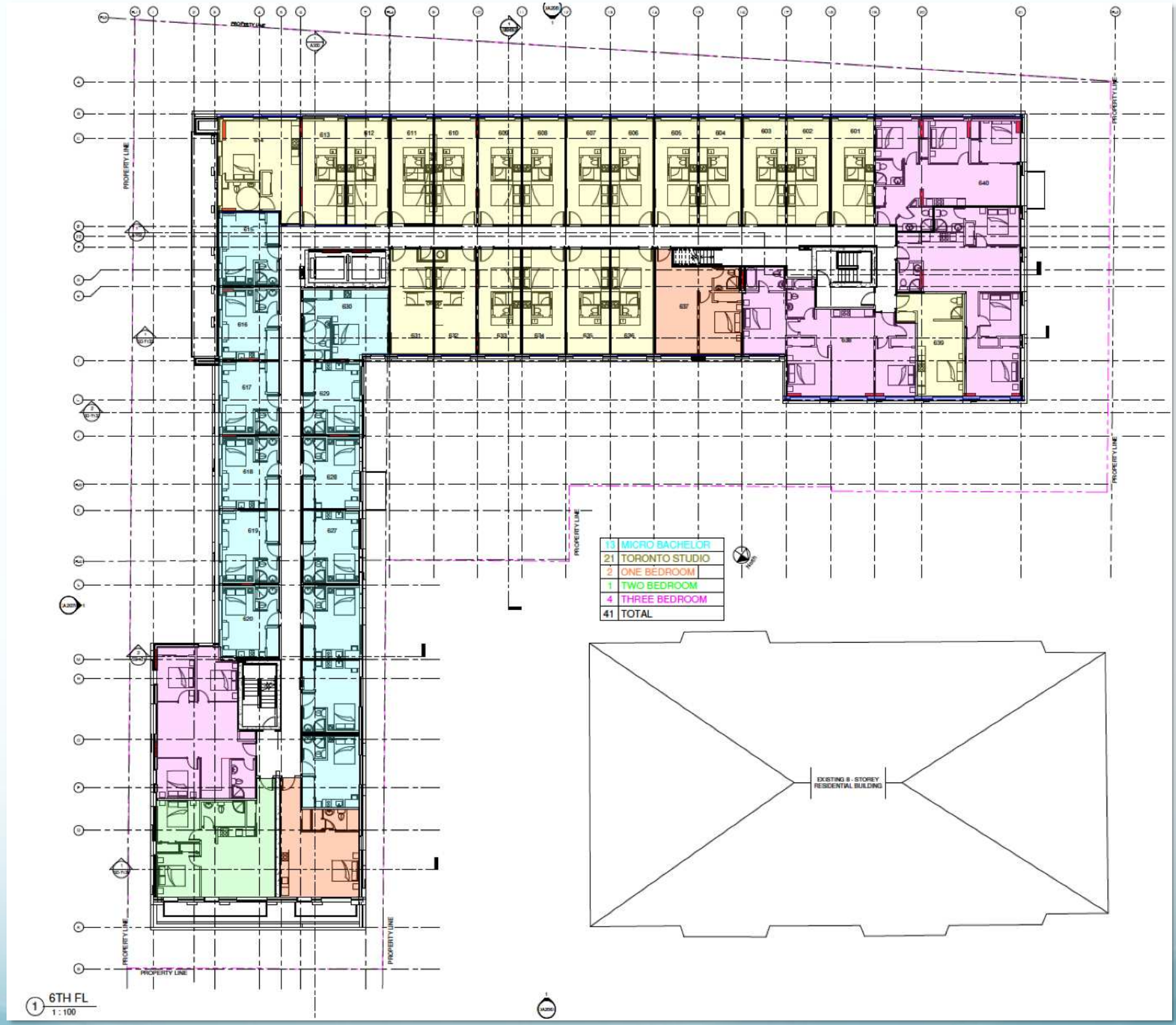
LEVEL 2


PROPERTY LINE
ROOF GARDEN
TERRACE
SKYLIGHT
11 MICRO BACHELOR
22 TORONTO STUDIO
1 ONE BEDROOM
0 TWO BEDROOM
6 THREE BEDROOM
40 TOTAL
NORTH
2ND FL

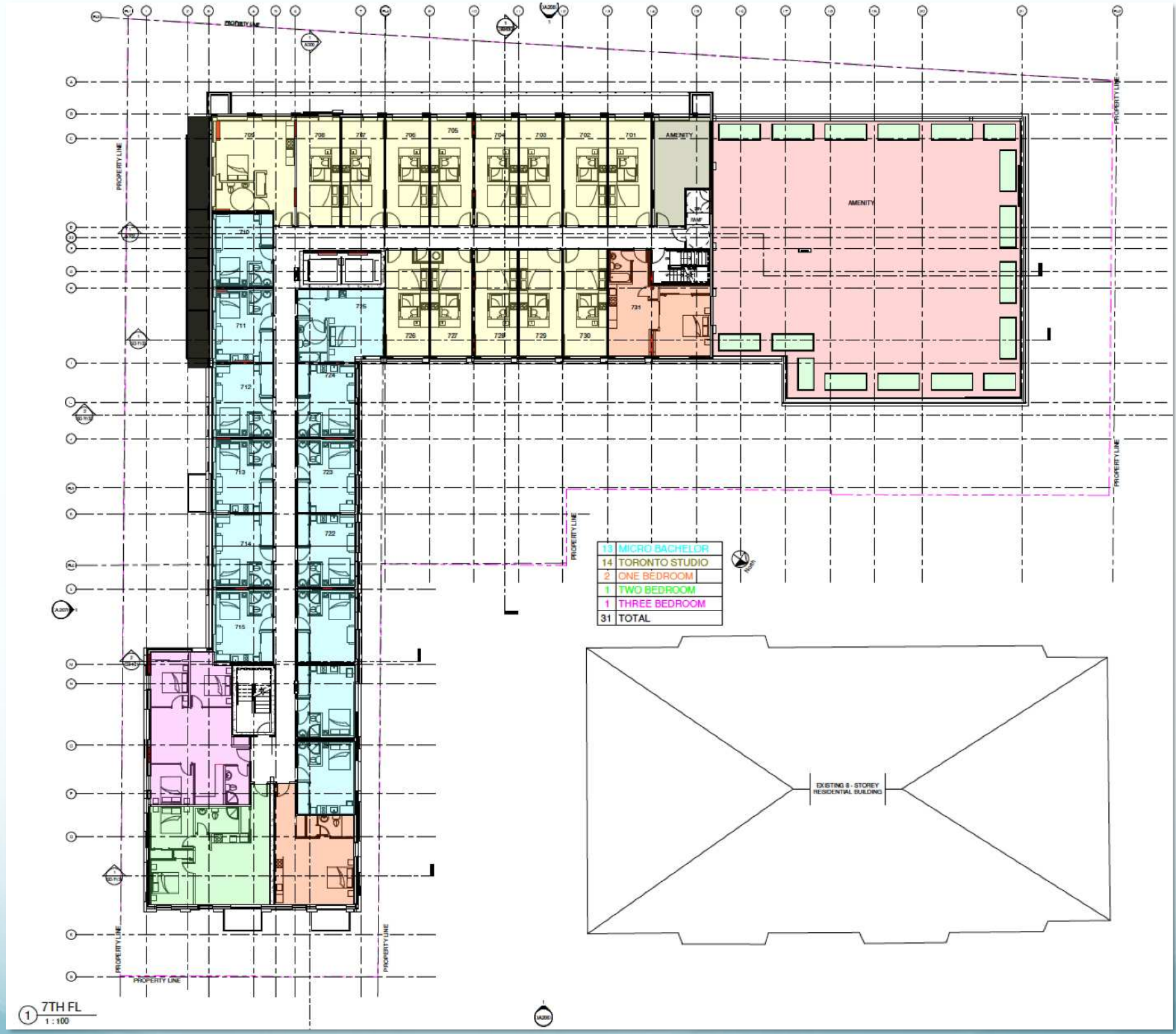
LEVELS 3 /4 / 5


PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
11 MICRO BACHELOR
22 TORONTO STUDIO
1 ONE BEDROOM
0 TWO BEDROOM
6 THREE BEDROOM
40 TOTAL
3RD FL

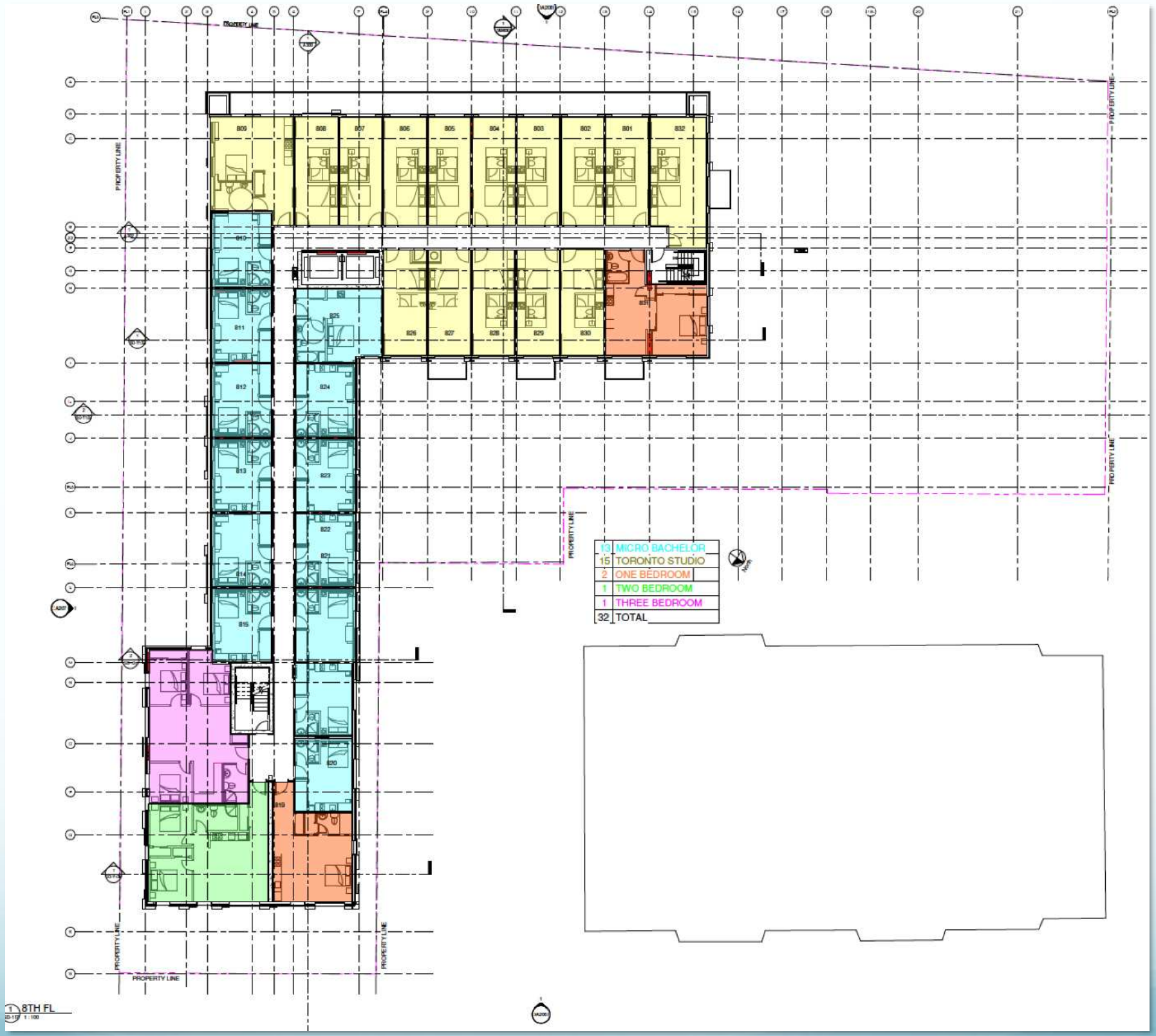
LEVEL 6


PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
13 MICRO BACHELOR
21 TORONTO STUDIO
2 ONE BEDROOM
1 TWO BEDROOM
4 THREE BEDROOM
41 TOTAL
EXISTING 8 - STOREY RESIDENTIAL BUILDING
1 6TH FL
1 : 100

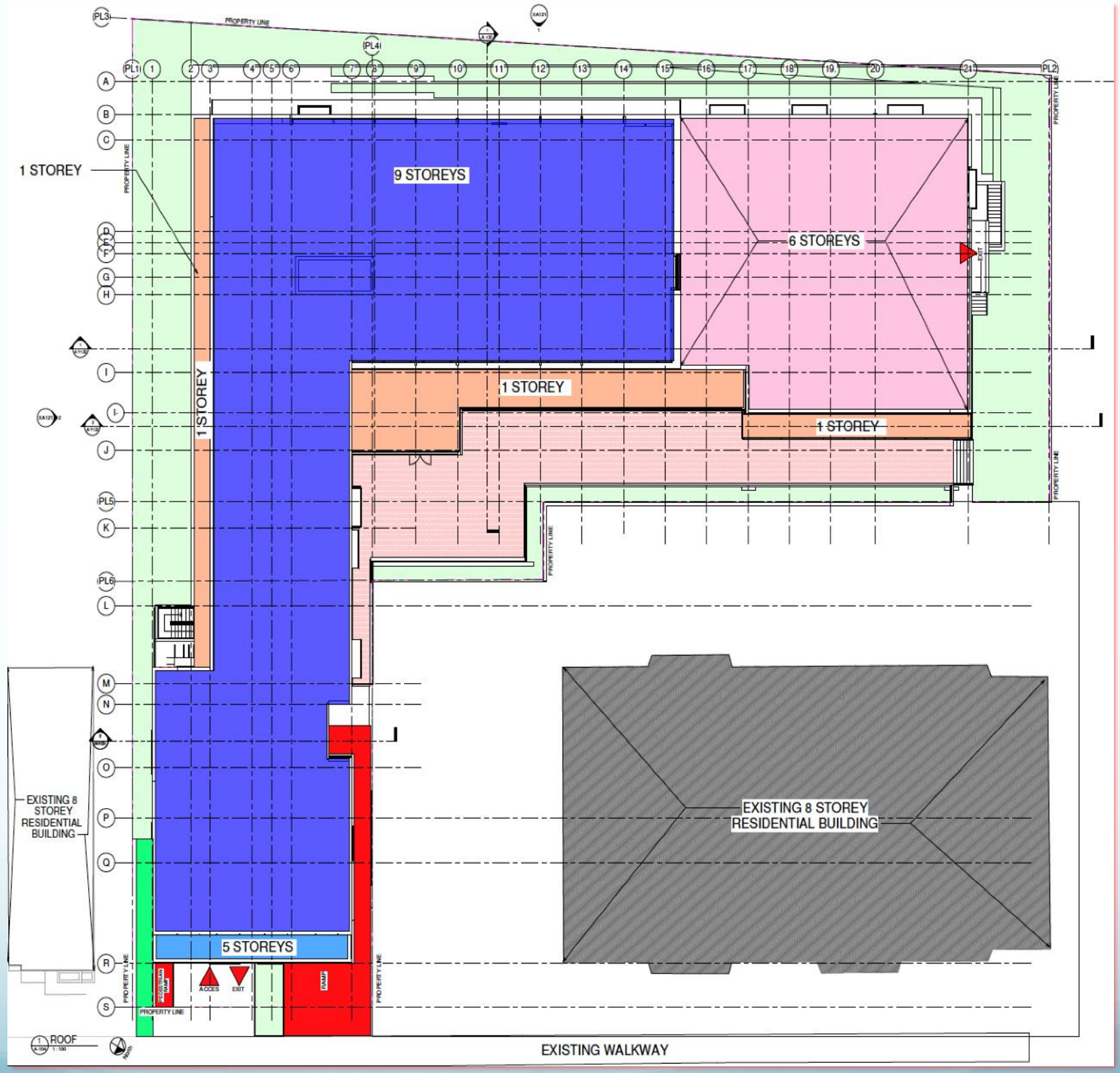
LEVEL 7


PROPERTY LINE
AMENITY
AMENITY
705
706
707
708
709
710
711
712
713
714
715
722
723
724
725
726
727
728
729
730
731
13 MICRO BACHELOR
14 TORONTO STUDIO
2 ONE BEDROOM
1 TWO BEDROOM
1 THREE BEDROOM
31 TOTAL
EXISTING 8 - STOREY RESIDENTIAL BUILDING
1 7TH FL
1 : 100

LEVELS 8 & 9


PROPERTY LINE
809
808
807
806
805
804
803
802
801
832
810
811
812
813
825
826
827
828
829
830
824
823
822
821
820
815
819
835
13 MICRO BACHELOR
15 TORONTO STUDIO
2 ONE BEDROOM
1 TWO BEDROOM
1 THREE BEDROOM
32 TOTAL
1 8TH FL

ROOF PLAN


PROPERTY LINE
1 STOREY
9 STOREYS
6 STOREYS
1 STOREY
1 STOREY
1 STOREY
EXIT
5 STOREYS
ACCES
EXIT
RAMP
EXISTING 8 STOREY RESIDENTIAL BUILDING
EXISTING 8 STOREY RESIDENTIAL BUILDING
EXISTING WALKWAY
ROOF

4.1.4
SUMMARY OF BUILDING AREAS

112 NELSON STREET STATISTICS

LEVEL	UNIT TYPE					
	MICRO BACHELOR	TORONTO STUDIO	ONE BEDROOM	TWO BEDROOM	THREE BEDROOM	TOTAL
PARKING 1	0	14	0	0	1	15
1	0	14	0	0	0	14
2	8	22	1	0	6	37
3	11	22	1	0	6	40
4	11	22	1	0	6	40
5	11	22	1	0	6	40
6	11	25	1	0	4	41
7	11	18	1	0	1	31
8	11	19	1	0	1	32
9	11	19	1	0	1	32
TOTAL	85	197	8	0	32	322

Number of 3 Bedroom UnitS Required = 32

LEVEL	G.B.A		G.F.A.		G.L.A.	
	Area sq.m.	Area sq. ft.	Area sq.m.	Area sq. ft.	Area sq.m.	Area sq. ft.
PARKING 1	2,440	26,264	448	4,827	433	4,662
1	1,662	17,889	1,183	12,735	338	3,642
2	1,593	17,148	1,411	15,186	1,197	12,888
3	1,593	17,148	1,338	14,402	1,269	13,657
4	1,593	17,148	1,338	14,402	1,269	13,657
5	1,593	17,148	1,338	14,402	1,269	13,657
6	1,595	17,168	1,299	13,982	1,249	13,441
7	1,144	12,314	924	9,944	856	9,215
8	1,144	12,314	924	9,944	891	9,593
9	1,144	12,314	924	9,944	891	9,590
TOTAL PARKING + UPPER LEVELS	15,501	166,855	11,127	119,768	9,662	104,002

PARKING			
LEVEL	NUMBER OF PARKING SPACES	BIKES	SCOOTERS
PARKING LEVEL 1	20	340	12
TOTAL	20	322	12

PARKING REQUIREMENTS		
VISITOR PARKING	(# Unit-12) *0, 10 or a maximum of 6	6
RESIDENT PARKING	(# Units-12)*, 4	124
TOTAL (Required)		130

Number of Required Provided = 21

AMENITY AREA SCENARIO 'A' (350 UNITS) (Area in sq. ft.)					
USING THE TOTAL AREA OF SOFT AMENITY ON GRADE	REQUIRED	PROVIDED			
		INTERIOR	ROOF	ON GRADE	BALCONY 20%
LEVEL 1		9,076		10,134	
LEVEL 2		603	150		
LEVEL 7		340	4,556		2,834
SUB-TOTAL	20,795	10,019	4,706	10,134	2,834
TOTAL		27,693			
DIFFERENCE		6,898			

Required = 6sq.m. / Unit or 64,58sq ft 20,795

4.1.5
BUILDING ELEVATIONS

EAST ELEVATION

PRECAST

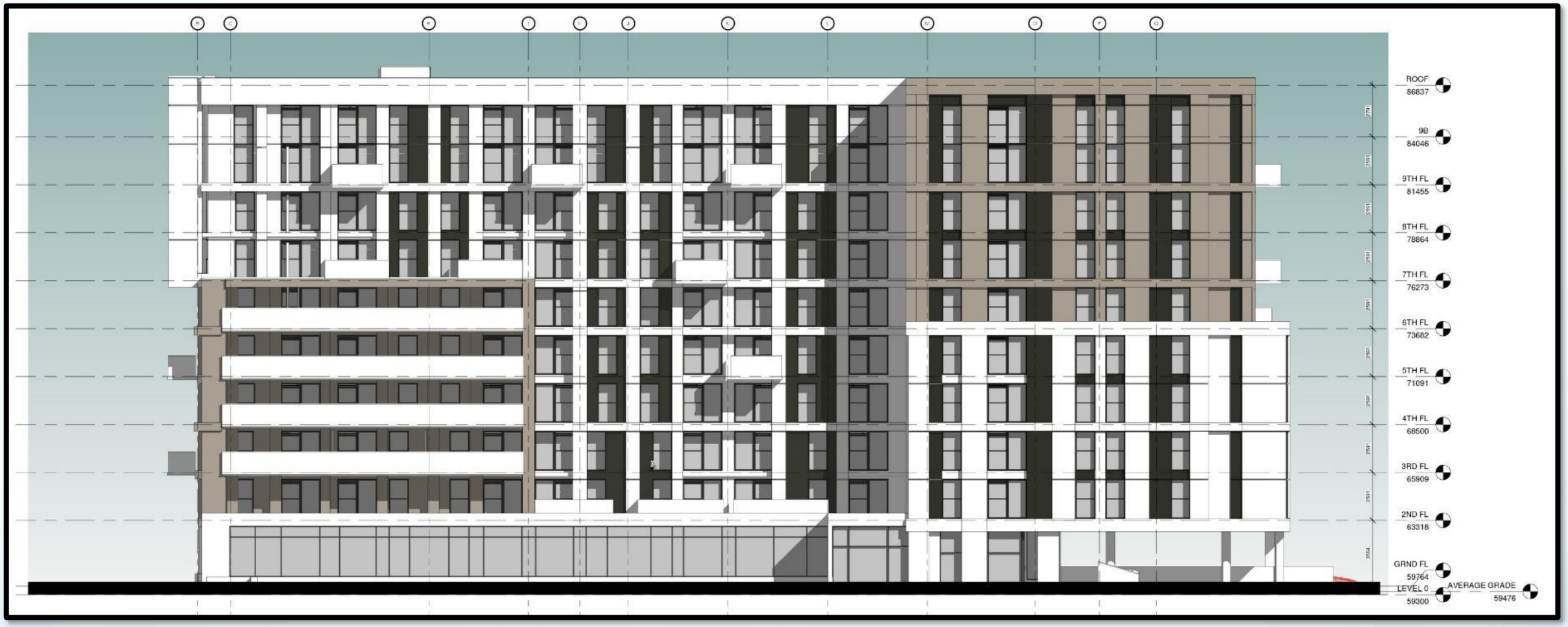
BRICK

METAL PANEL

GLASS RAILING

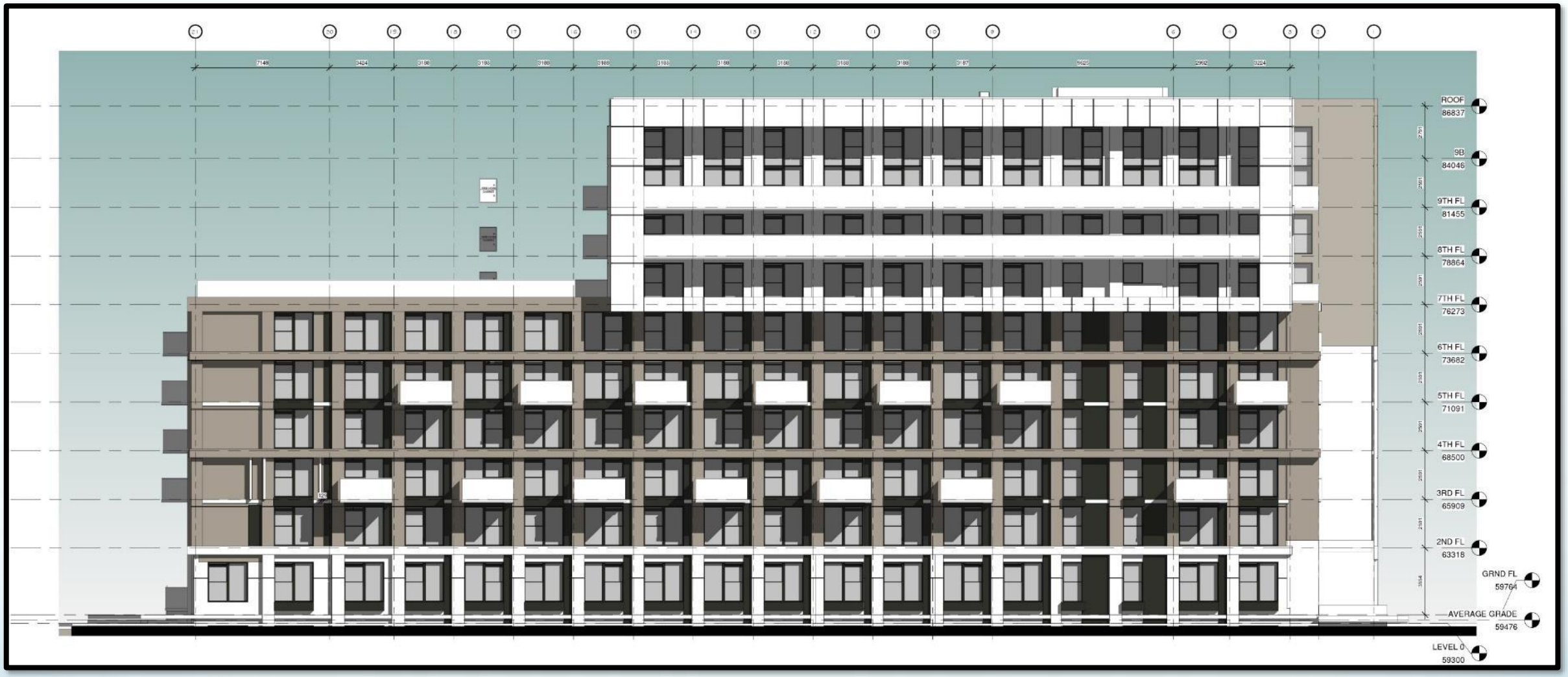
ALUMINUM WINDOW

SOUTH ELEVATION



PRECAST | BRICK | METAL PANEL | GLASS RAILING | ALUMINUM WINDOW

WEST ELEVATION



PRECAST

BRICK

METAL PANEL

GLASS RAILING

ALUMINUM WINDOW

NORTH ELEVATION

PRECAST

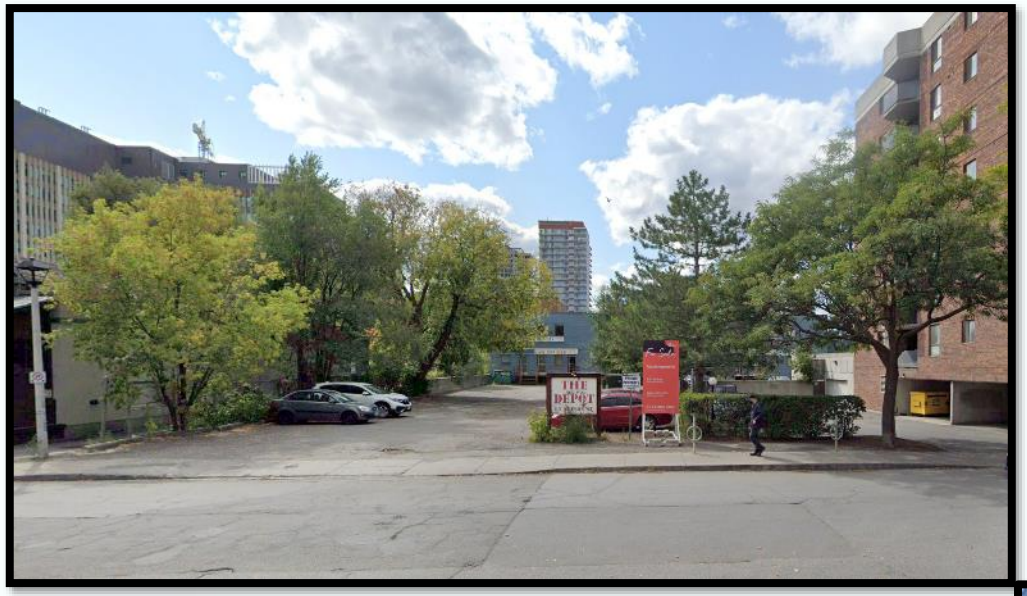
BRICK

METAL PANEL

GLASS RAILING

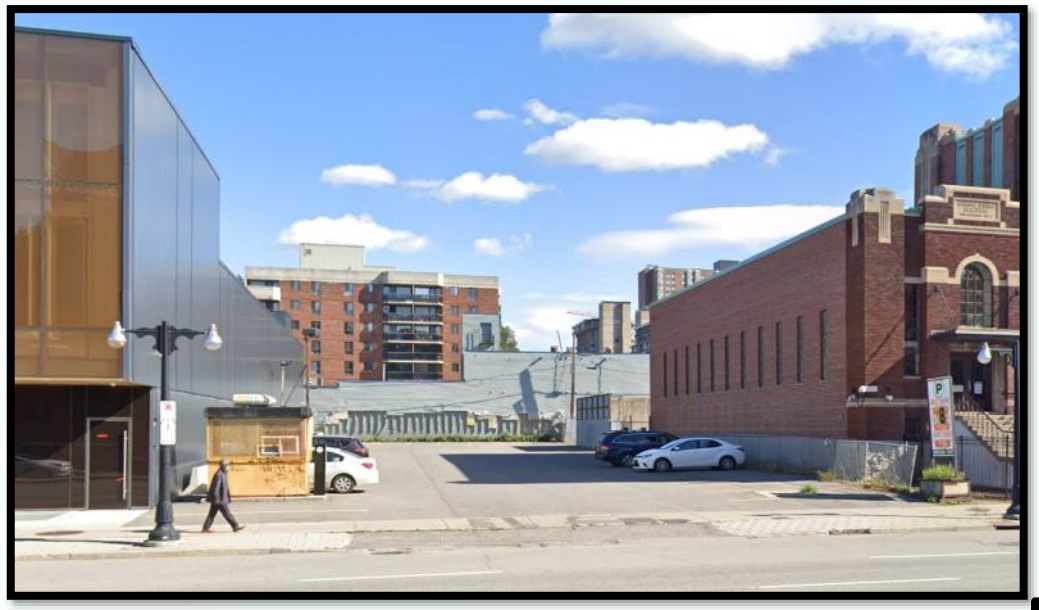
ALUMINUM WINDOW

4.1.6
PERSPECTIVES

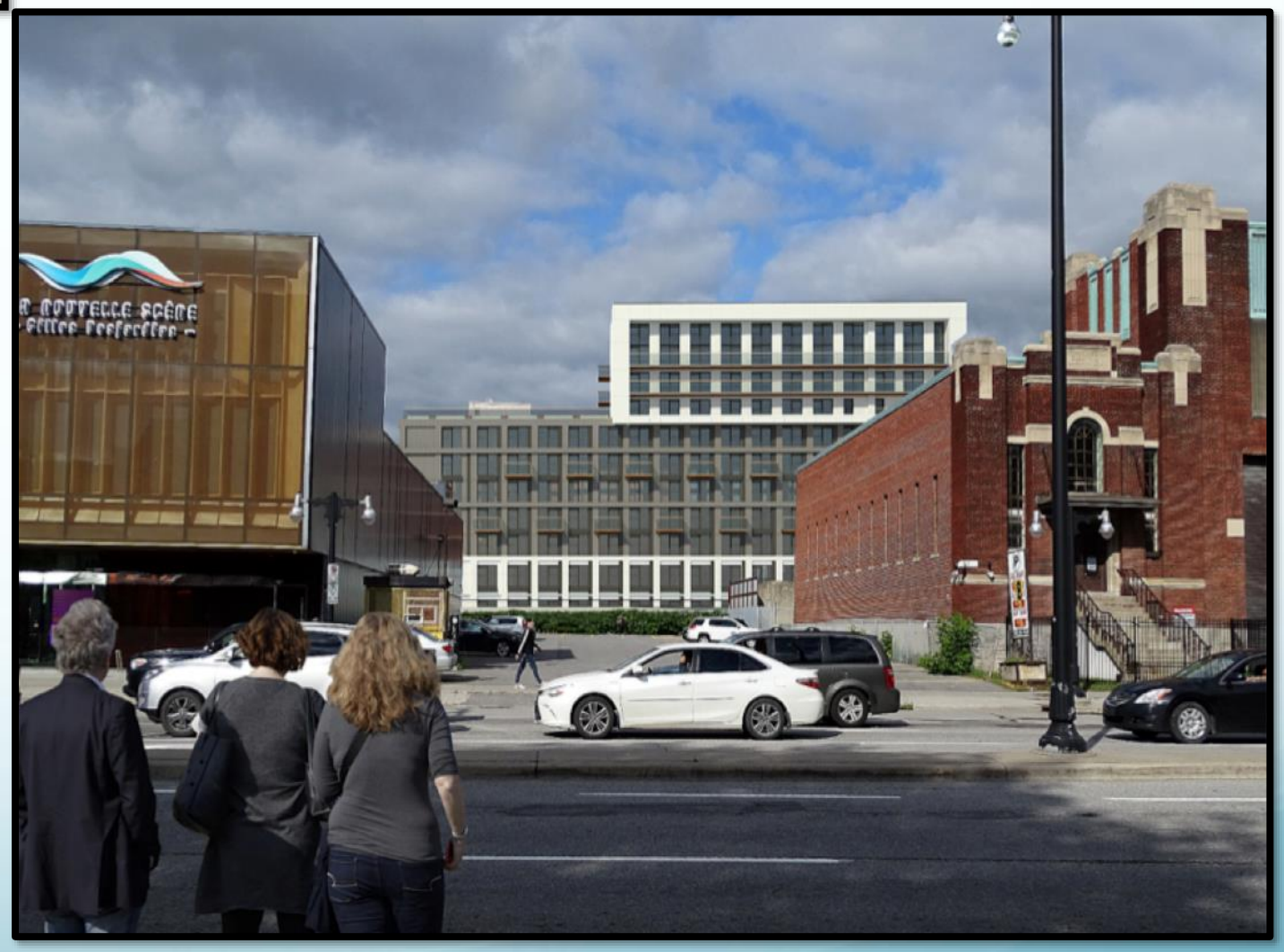


Entrance on Nelson St.

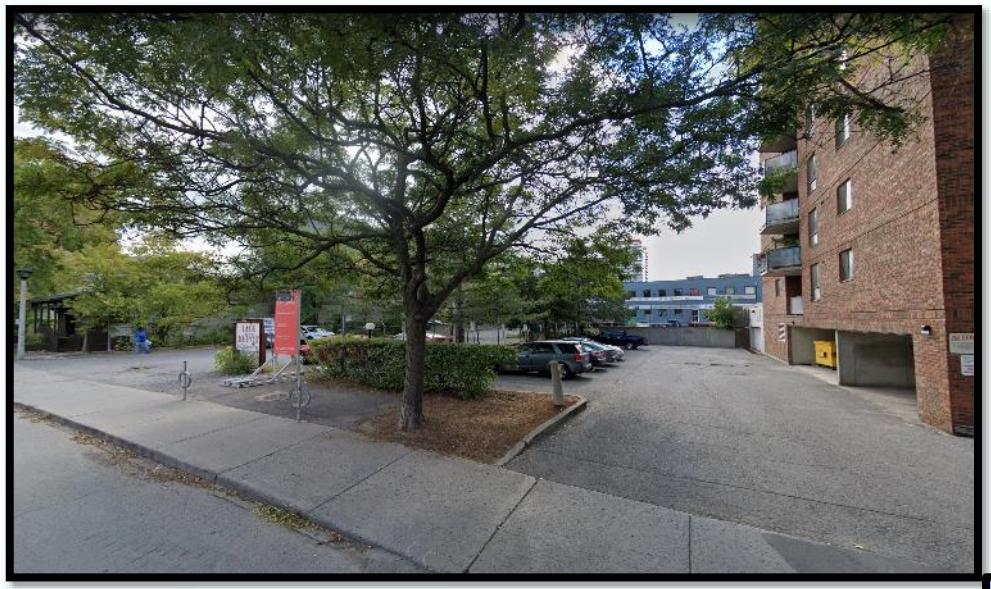
East Side Nelson St.



King Edward St.



York St.



West Side Nelson St.

4.1.7
CIRCULATION

4.1.7 Circulation

The principal point of access to the site will be from Nelson Street for both vehicles, service and pedestrians. For vehicles and service there is an off-street ramp connecting grade to one half basement level. This half basement level includes 15 in-ground apartment units with primary access from the level above. There is a laundry room, a garbage room, a mechanical room, an electrical vault and a primary electrical service room, a pump room and bicycle storage space for 342 bicycles. Vehicular parking is provided for 20 visitor spaces and 10 scooters.

The principal pedestrian access is indented from the street and separated by a pedestrian parquet. The point of entry is elevated from the street level and is connected by a combination of ceremonial steps landings and a ramp. The path of travel to the elevators has a gated control point and a visual interconnectivity experience with numerous amenity options and outdoor terrace.

On the upper levels each permitted space-plan floor is divided into up to 40 suite elements accessed by a central spine corridor. Levels seventh through ninth are reduced in area and replaced with a large communal roof terrace at the roof of level seven. The north staircase serving the upper three floors has been offset, but remains connected to the staircase serving the lower floors of the building.

4.1.8

FUNCTIONAL LAYOUT AND INTERIOR FEATURES

4.1.8 Functional Layout and Interior Features

4.1.8.1 Amenities

Target: The key audience is the students living within the compound.

Objective: Offer a variety of activities as a key signature for SmartLiving

Program: Lobby will consist of a Communal kitchen/coffee bar, study area, yoga area, gym area, exterior gym, small retail shop (TBD), game area (low and high tech ex: board games and video games), workshop area (ex: DIY bike repair) and a privacy garden.

On the seventh floor the program will consist of a BBQ area, sun bathing space, a roof garden, urban agriculture and flexible space for yoga.

Interior spaces giving residents a sense of belonging

1-A

Communal Kitchen and Coffee Bar

1-B

Indoor Gym and Training Facilities

1-C

Games area

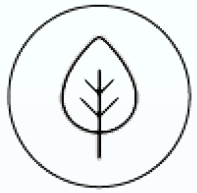
1-D

Workshop, Repair Space

1-E

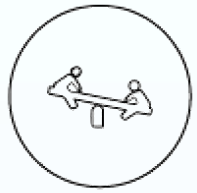
Yoga

An Inclusive courtyard animated throughout the seasons



2-A

Natural zones



2-B

Playground

2-D

Private Space

2-E

Urbain Art

Programmed rooftops giving the building an identity while enhancing the quality of life of its residents.

3-A

BBQ area and relaxation

3-B

Sports and activities

3-C

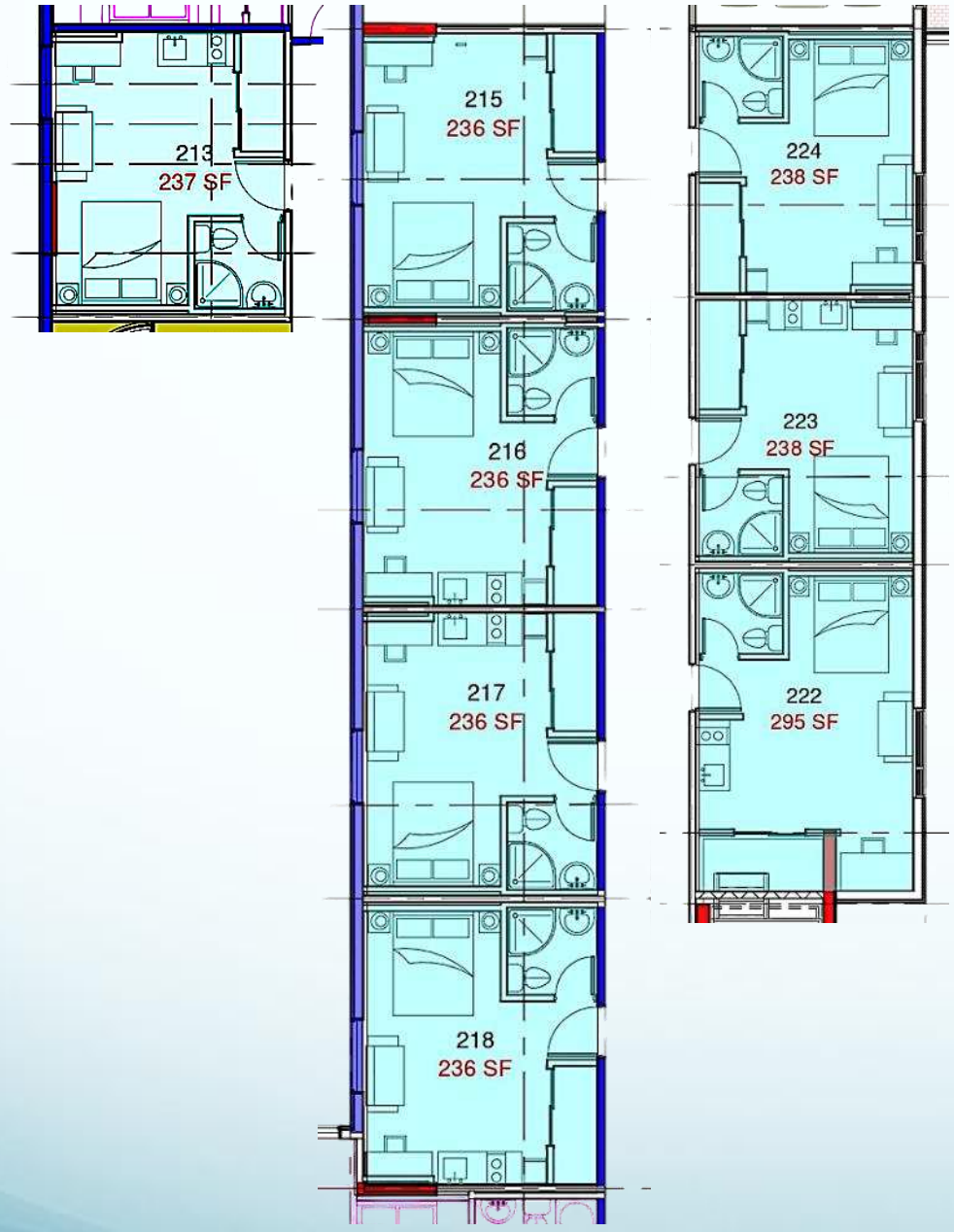
Art Installations

3-D

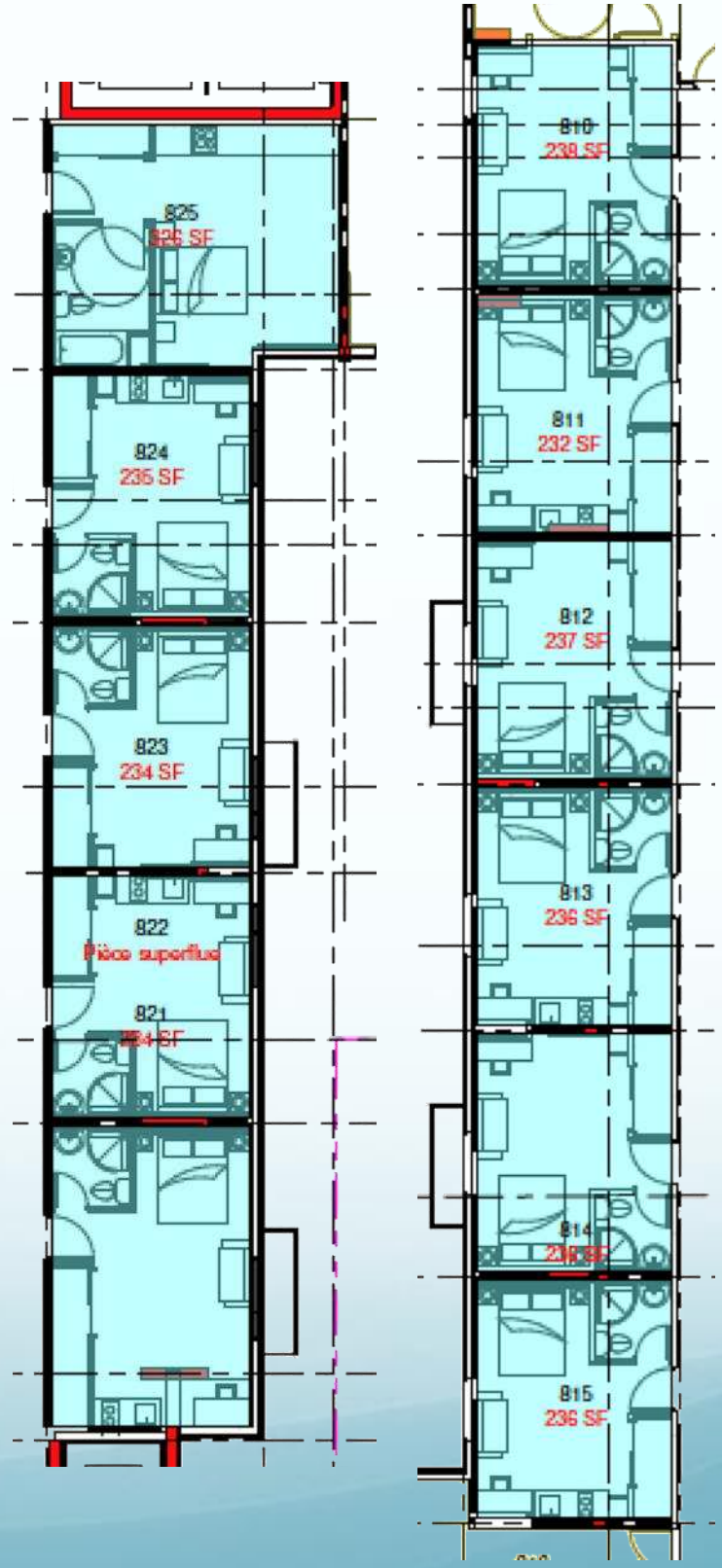
Urbain Agriculture


MINT

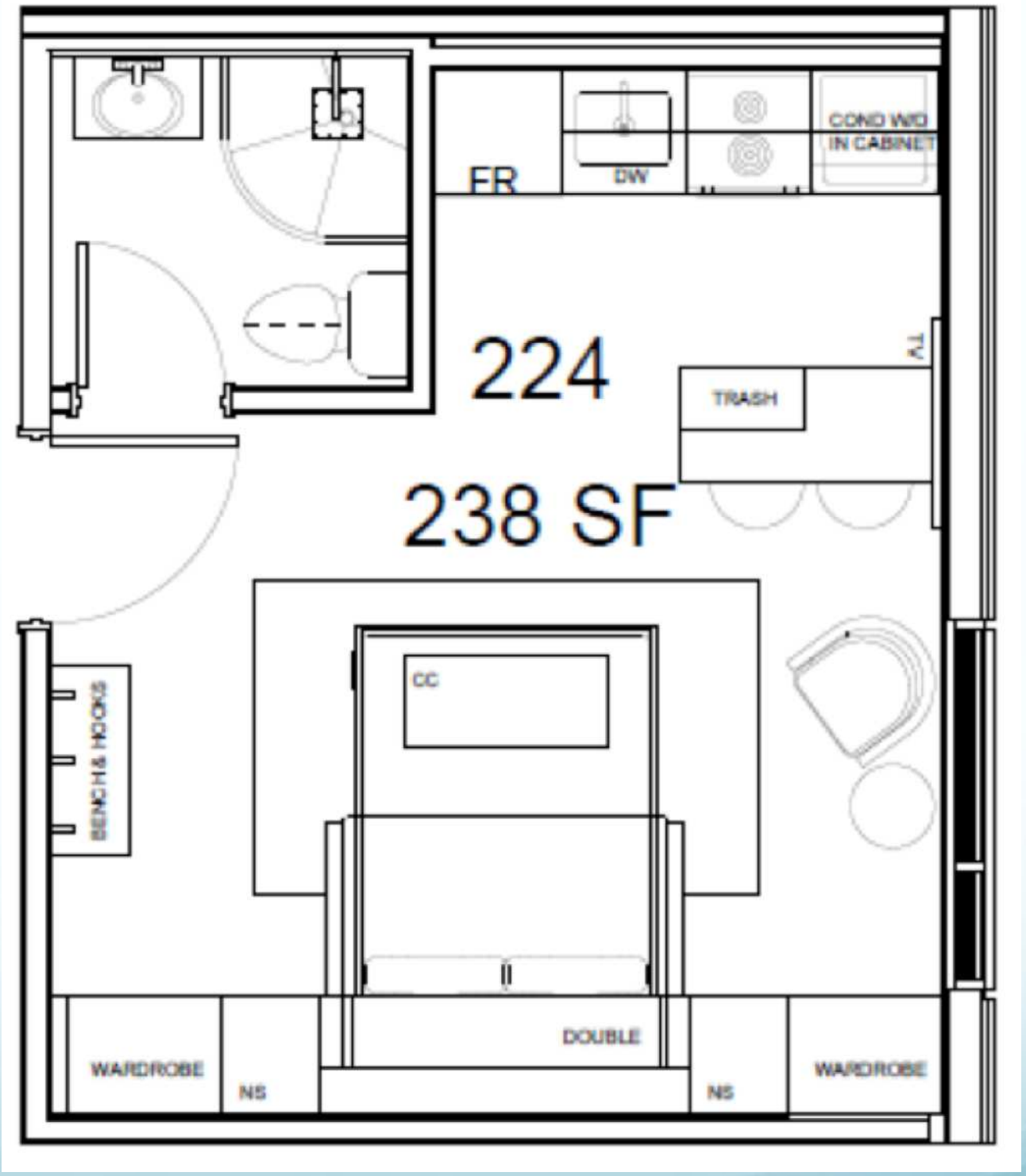
MICRO BACHELOR – SECOND FLOOR PROPOSED LAYOUT



MICRO BACHELOR – THIRD TO EIGHT FLOOR PROPOSED LAYOUT



MICRO BACHELOR
PROPOSED LAYOUT



MICRO BACHELOR - STUDIO
PROPOSED LAYOUT

Furniture, fixtures and equipment are being supplied by Owner

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PROPOSED LAYOUT

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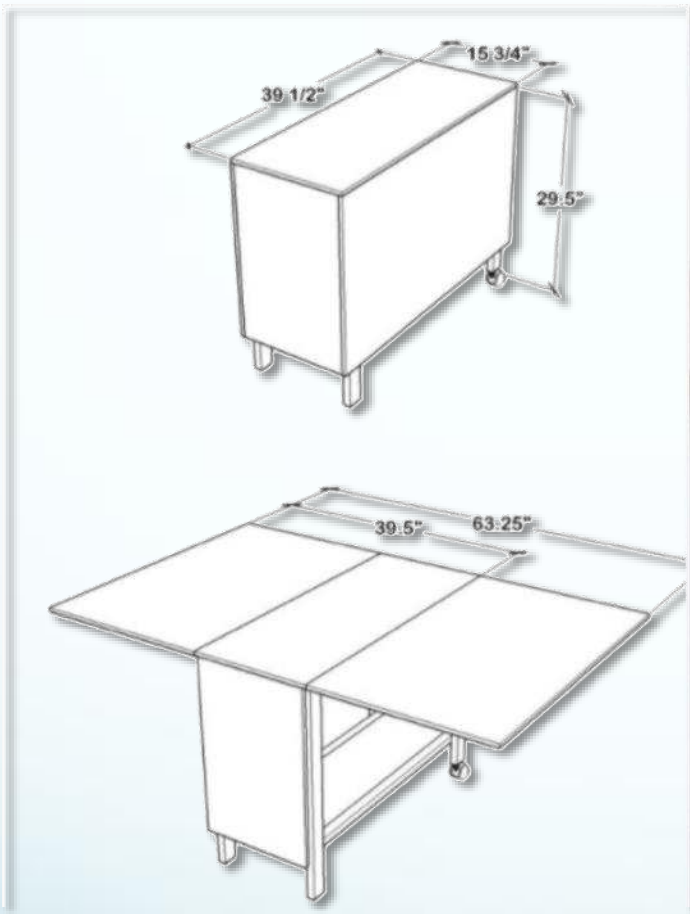
MICRO BACHELOR - STUDIO
PROPOSED LAYOUT

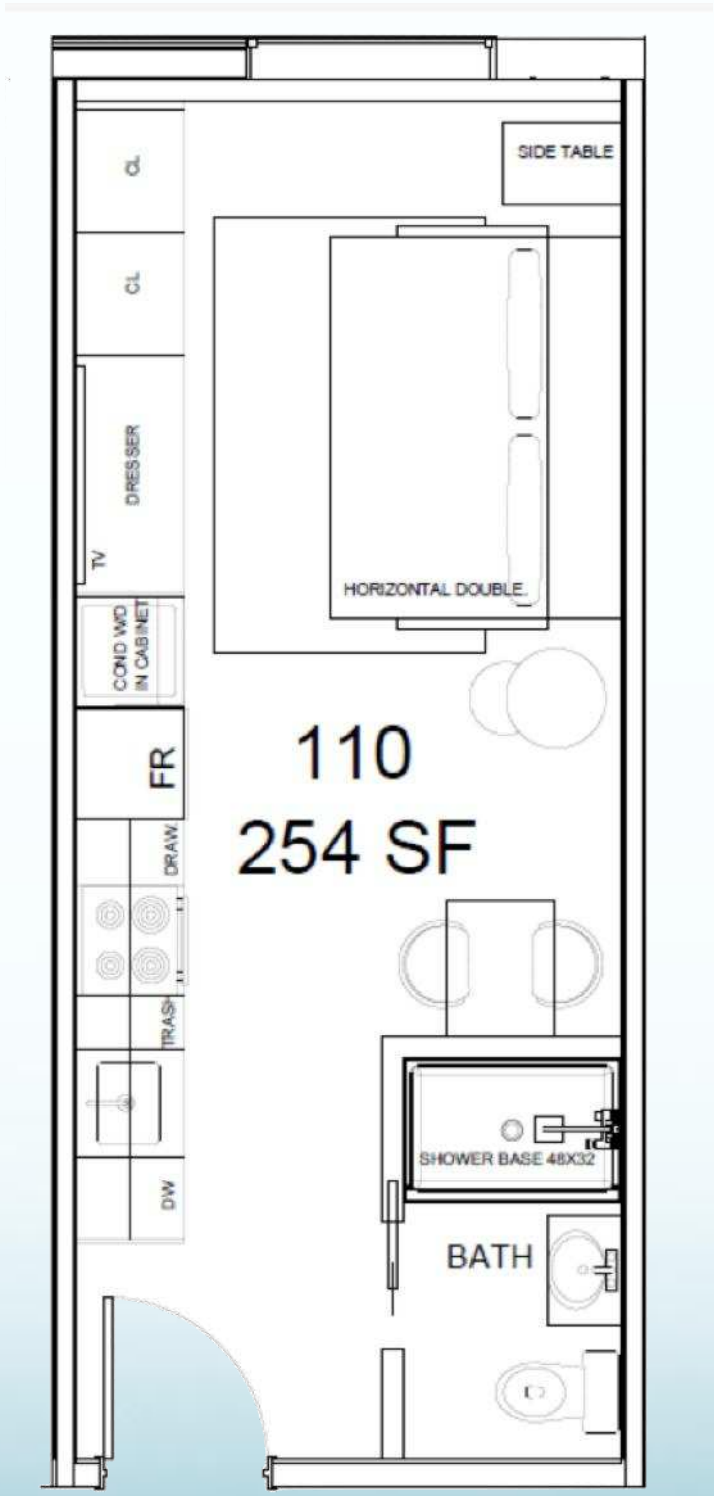


Furniture, fixtures and equipment are being supplied by Owner

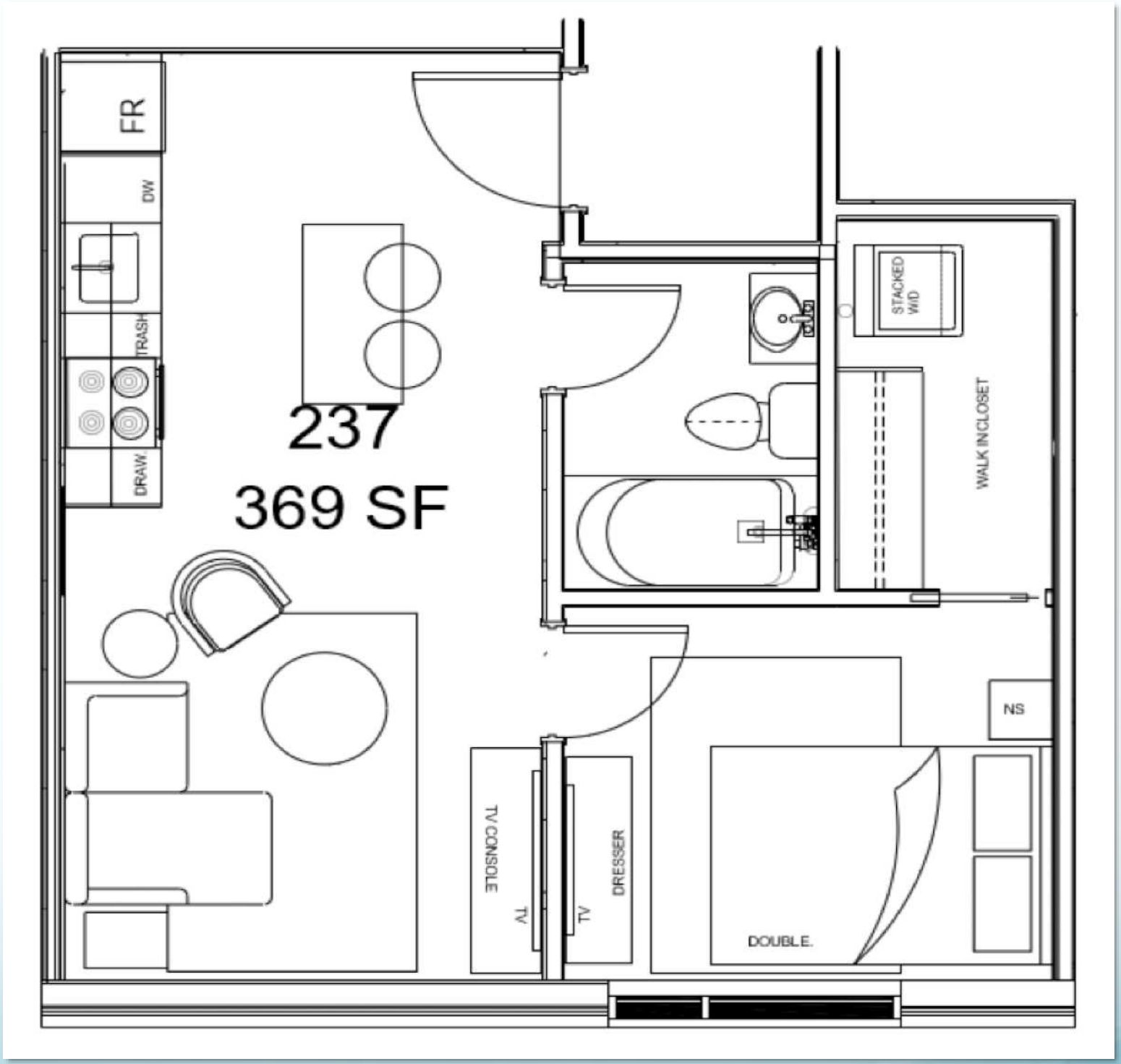
MICRO BACHELOR - STUDIO
PROPOSED LAYOUT

Furniture, fixtures and equipment are being supplied by Owner

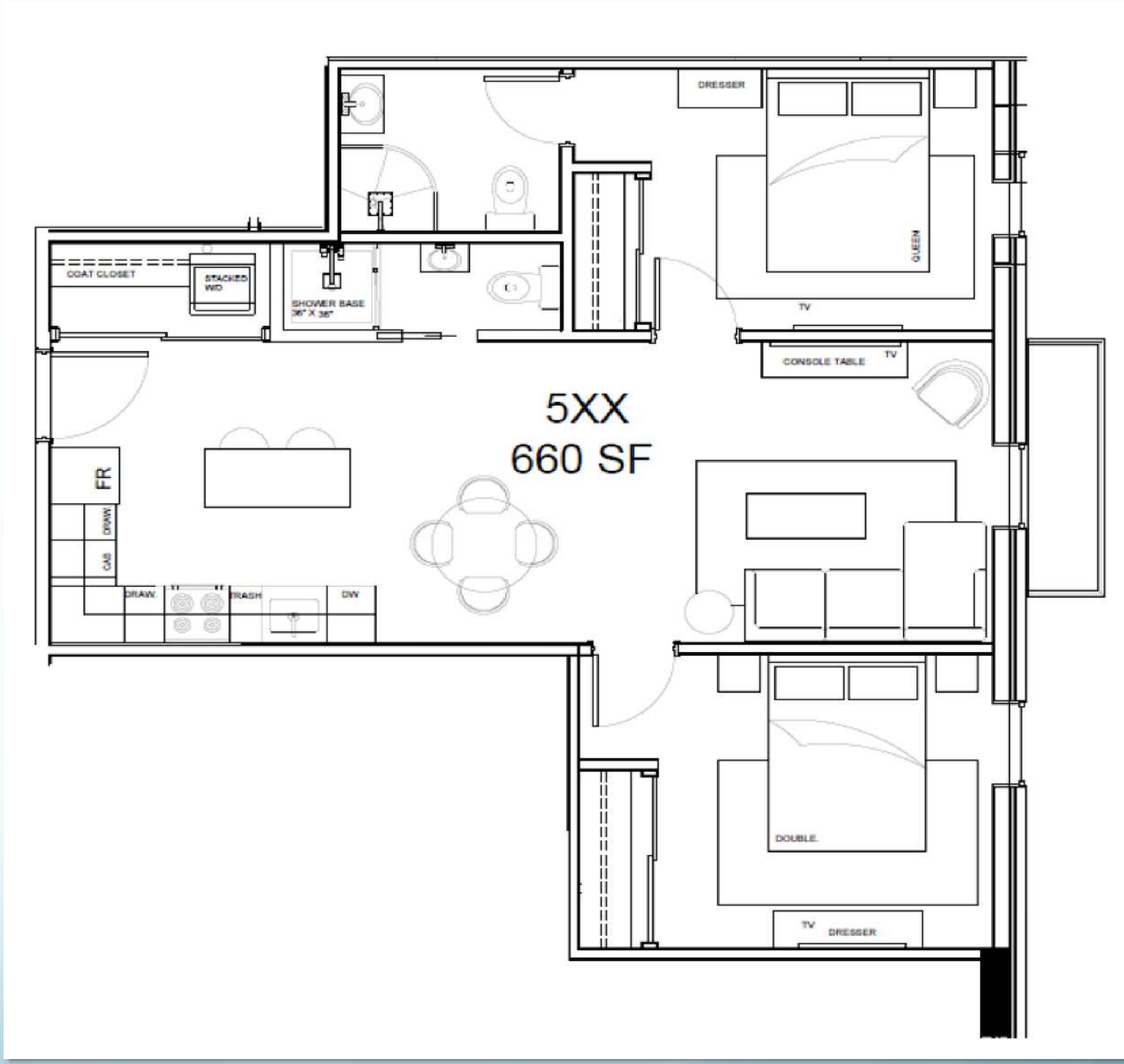
STUDIO
PROPOSED LAYOUT



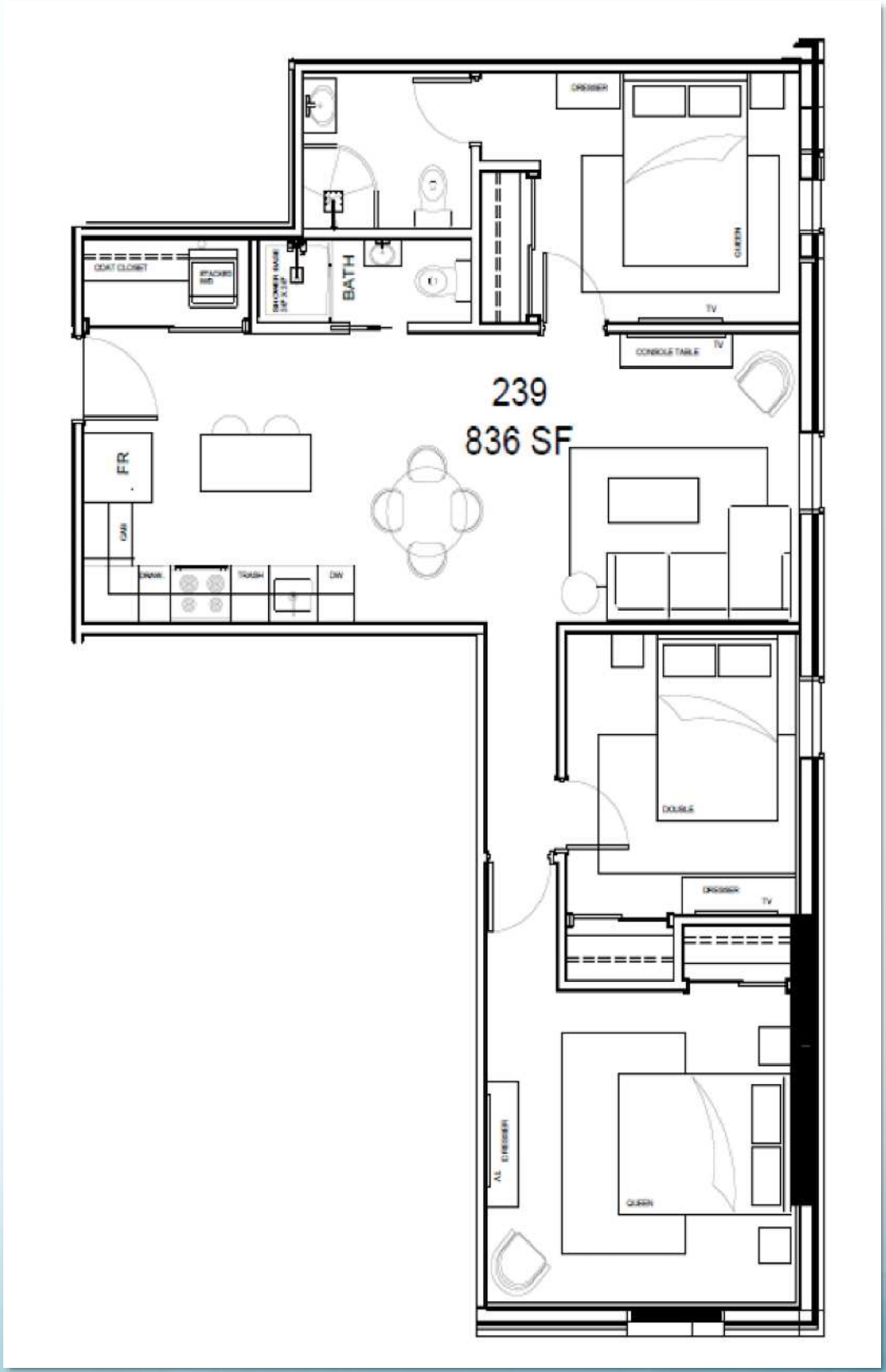
ONE BEDROOM
PROPOSED LAYOUT



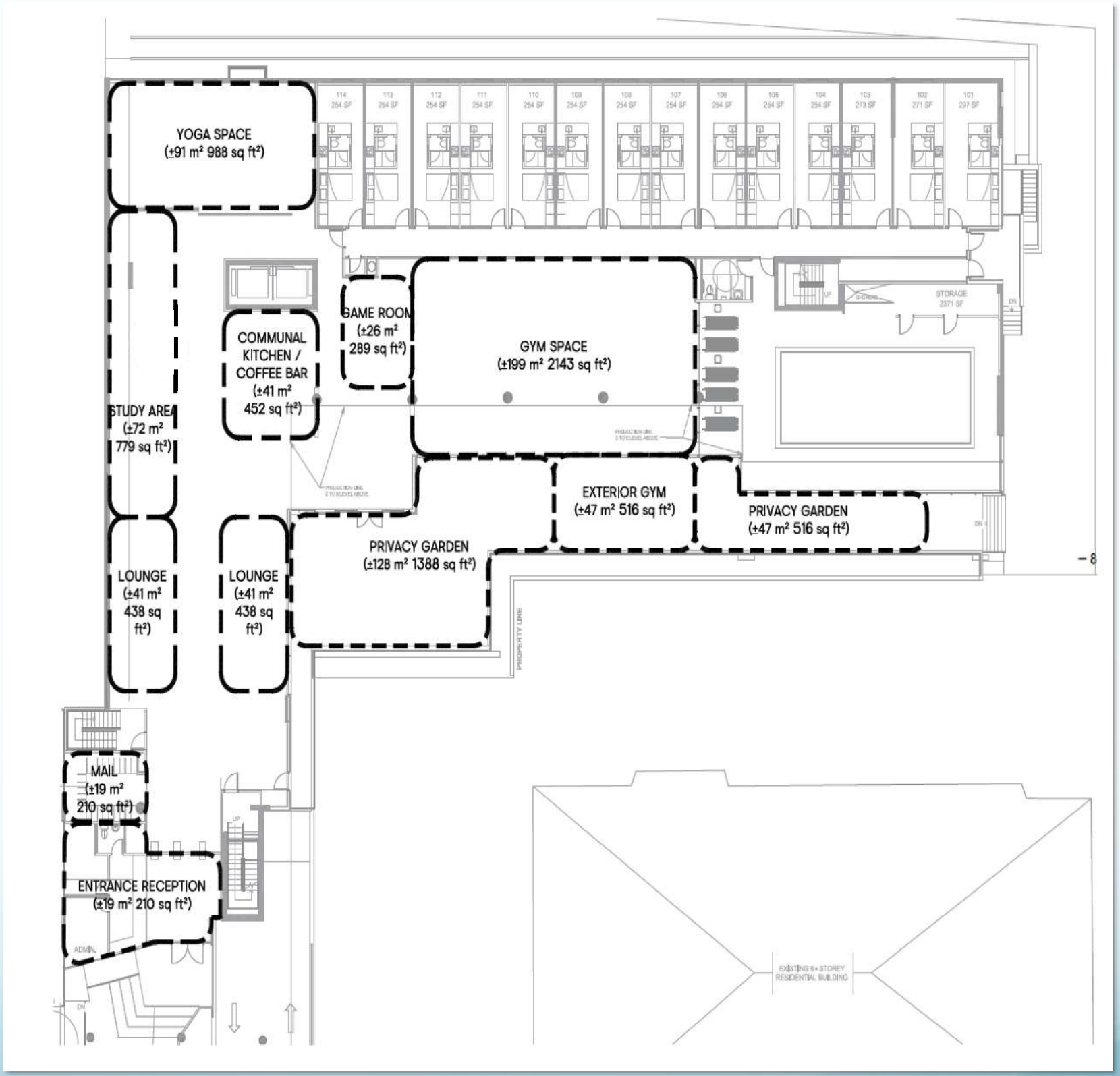
TWO BEDROOM
PROPOSED LAYOUT



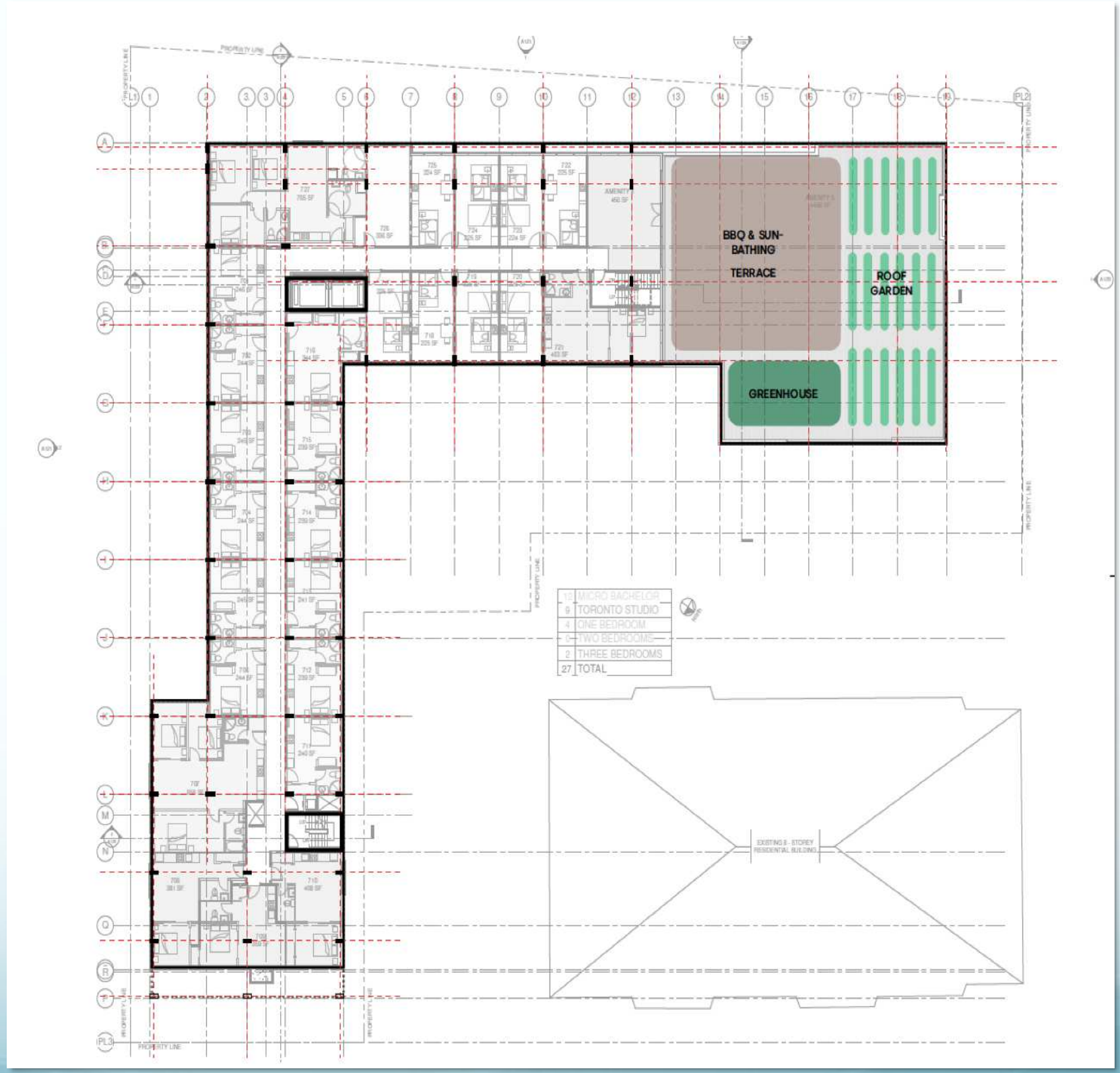
THREE BEDROOM
PROPOSED LAYOUT



AMENITIES PROPOSAL
LEVEL GROUND FLOOR



AMENITIES PROPOSAL
LEVEL SEVEN TO ROOF



4.1.9
FINISHES

4.1.9 Finishes

4.1.9.1 Bathroom Finish Standards:

- **Floors & Wet Areas:** Tile
- **Show Plans & Tubs:** Acrylic White
- **Plumbing Fixtures:** Chrome – low flow where possible
- **Shower Walls:** Tile (may be needed on ceilings in basement due to ceiling height)
- **Vanity:** Wall mounted with storage
- **Storage:** Above toilets – medicine cabinet and/or tower storage
- **Vanity Mirrors:** LED Mirrors
- **Lighting:** Recessed LED light in shower and above sink – 3000K
- **Accessories:** Tissue holder, tower bar, hand tower bar, robe hook, grab bars for universal bathrooms

4.1.9.2 Suites Finish Standards:

- **Floors:** LVT
- **Kitchen:**
  - Cabinets - Flat panel – melamine
  - Appliances - Stainless
  - Hardware - Black or stainless
  - Countertops - Granite
  - Backsplash - Tile
- **Walls & Ceilings:** Paint, Prime + 2 coats finish
- **Base & Trim:** Eggshell
- **Lighting:** 5 ½" pre primed base: 3" pre
- **Storage:** Prime case
- **HVAC:** TBD – all LED 3000K
- **Closet:** Maximize wherever possible
  Occupancy sensors
  Shelf and rod

4.1.9.3 Corridor Finish Standards:

- **Floors:** Carpet
- **Walls:** Paint: Optional – wall covering, millwork detail at suite doors
- **Lighting:** Wall sconce at each entry door: accent lighting with LED strip lights (optional)
- **Ceiling Lighting:** Recessed LED lighting – occupancy sensors
- **Elevator Walk-off:** Wall mounted with storage

4.1.9.4 Stairwell Finish Standards:

- **Walls:** Concrete, no paint
- **Steps:** Concrete
  Metal – Colour TBD
- **Railings:** Painted to match railings
- **Stringers:** 2x2 or 4x2 LED panel lighting
- **Lighting:** Maximize wherever possible
- **Storage:** Occupancy sensors

4.2
STRUCTURAL
DESIGN

4.2 STRUCTURAL Design

4.2.1 Design Live Loads

Structural design live loads should be as per Ontario Building Code minimum requirements:

- Residential areas 1.9 kPa
- Assembly areas 4.8 kPa
- Balconies 4.8 kPa
- Exits 4.8 kPa
- Equipment /service rooms 3.6 kPa
- Parking areas 2.4 kPa
- Exterior areas 12.0 kPa

4.2.1 Foundations

The proposed development includes 1 level of underground with the top of finished slab approximately 2.5m below grade. Based on geotechnical recommendations, the foundation system for the project at this depth is proposed to be a reinforced concrete raft foundation placed over the native stiff silty clay. SLS bearing capacity for the raft at this elevation will be 200 kPa.

A 75mm thick lean concrete mudslab should be placed on the silty clay shortly after the completion of excavation to limit potential disturbance of the native material due to drying and construction activities. The raft slab will be approximately 1000mm thick reinforced concrete to support the proposed structure above. A layer of Granular A will be required above the raft slab to allow the installation of pipes and services and to provide a suitable base for the slab on grade. The thickness of the granular layer will depend on the piping requirements but will likely be a minimum of 600mm. The slab on grade will be a 125mm concrete slab with welded wire mesh.

Basement walls will be 300mm reinforced concrete around the perimeter of the excavation and will bear directly on the raft slab.

4.2.2 Structural System and Framing

The 9/6 storey development is proposed to be constructed with reinforced cast-in-place concrete. To optimize floor to floor heights and reduce the weight impact on the raft foundation below, column spacing was adjusted to allow 200mm thick typical floor concrete slabs. Slabs will be designed as flat slabs with no drop panels or column capitals on the typical floors.

Ground floor and terrace roof slabs will be 300mm thick concrete slabs due to the assembly occupancy required for the various amenity spaces. Drop panels may be required locally at exterior areas where large amounts of soil/landscaping are present.

Concrete columns will support the slabs. Columns will be either circular or rectangular to suit architectural needs. Maximum column size will be 600mm round or 300x900 rectangular and will reduce in size on the upper floors of the building.

4.2.1 Foundations

The proposed development includes 1 level of underground with the top of finished slab approximately 2.5m below grade. Based on geotechnical recommendations, the foundation system for the project at this depth is proposed to be a reinforced concrete raft foundation placed over the native stiff silty clay. SLS bearing capacity for the raft at this elevation will be 200 kPa.

Lateral loads such as wind and earthquake will be resisted using cast-in-place concrete shear walls around stair and elevator shafts, or in areas that do not affect the unit layout such as in party walls between units. With the seismic site class D provided, shear walls will be approximately 350mm thick.

Assumed Concrete Strengths:

- Suspended Slabs: 30 MPa
- Columns: 35 MPa
- Shear Walls: 35 MPa
- Foundation Walls: 30 MPa (35 Mpa in parking areas)
- Slab-on-grade: 32 Mpa
- Raft Slab: 30 Mpa
- Lean concrete mudslab: 15 MPa

4.2.4 Geotechnical Recommendations

From a geotechnical perspective, the subject site is considered adequate for the proposed development. Based on the subsurface conditions encountered in the Test holes and the anticipated building loads, it is expected that an end bearing piled foundation or a raft foundation placed over either a stiff silty clay or compact glacial till bearing surface will suitable for the proposed building with 2 or 3 levels of underground parking.

The above and other considerations are further discussed in the following Report:
https://www.dropbox.com/sh/y9z0cvuajmd40bc/AADYfuMajodWdc7JLj9BT8gna?dl=0

4.2.5 Background Information

It is understood that the building will now consist of one basement level constructed over a raft slab foundation. Based on subsurface soil information obtained from the geotechnical investigation, the raft foundation with one basement level will be founded within a silty clay deposit. The raft slab foundation geotechnical recommendations provided in the above mentioned geotechnical report were given for a two to three level basement, therefore the design parameters provided herein should be considered for one basement level.

4.2.6 Geotechnical Recommendations for Raft Slab with One Basement Level

The design of the raft foundation is required to consider the relative stiffness of the reinforced concrete slab and the supporting bearing medium. A common method of modeling the soil structure interaction is to consider the bearing medium to be elastic and to assign a subgrade modulus. However, silty clay is not elastic and limits have to be placed on the stress ranges of a particular modulus. The proposed building can be designed using the following parameters and will be subject to a potential total and differential settlement of 25 and 20mm, respectively.

For design purposes, it was assumed that the base of the raft foundation for the proposed multi-storey building will be located at an approximate geodetic elevation of 56 to 55 m depth with one underground level.

The amount of settlement of the raft slab will be dependent on the sustained raft contact pressure. The bearing resistance value at SLS (contact pressure) of 200 kPa will be considered acceptable. The loading conditions for the contact pressure are based on sustained loads, that are generally taken to be 100% Dead Load and 50% Live Load. The contact pressure provided considers the stress relief associated with the soil removal required for the proposed building. The factored bearing resistance (contact pressure) at ULS can be taken as 300 kPa. A geotechnical resistance factor of 0.5 was applied to the bearing resistance value at ULS.

The modulus of subgrade reaction was calculated to be 7.5 MPa/m for a contact pressure of 200 kPa.

The raft slab must be founded upon an undisturbed soil bearing surface. An undisturbed soil bearing surface consists of a surface from which all topsoil and deleterious materials, such as loose, frozen or disturbed soil, whether in situ or not, have been removed, in the dry, prior to the placement of concrete.

Where a raft foundation is utilized, it is recommended that a minimum 50 to 75 mm thick lean concrete mud slab be placed on the subgrade shortly after the completion of the excavation. The main purpose of the mud slab is to reduce the risk of disturbance of the subgrade under the traffic of workers and equipment.

The final excavation to the raft bearing surface level and the placing of the mud slab should be done in smaller sections to avoid exposing large areas of the silty clay to potential disturbance due to drying.

4.3
MECHANICAL DESIGN

4.3 MECHANICAL Design

The Mechanical Design and installation will be done to the following codes, regulations and standards, but limited to:

1. A.S.H.R.A.E.
2. 2012 Ontario Building Code including SB-10
3. Ontario Plumbing Code
4. City of Ottawa By-Law
5. Gas Code B-149.1
6. N.F.P.A. Code
7. CSA C448- Design and Installation of Ground Source Heat Pumps

4.3.1 HVAC System

Option 1 (Water Source Heat Pump System)

This option will consist of vertical heat pumps with integrated E.R.V.'s located in the apartments and horizontal heat pumps located in the ceiling spaces for the common areas will be connected to a 200 Ton closed circuit cooling tower and the two 2 million BTU/hr. each high-efficiency boilers.

Vertical Heat Pumps with integrated E.R.V.'s will be as follows:

- Micro-bachelor and Studio apartments (282): 9,000 BTU/hr. each
- 1 bedroom apartments (8): 12,000 BTU/hr. each
- 3 bedroom apartments (32): 24,000 BTU/hr. each

Two pumps with capacity of 600 g.p.m. at 90 feet head will circulate water through the heat pumps.

Two gas-fired make-up air units (8,000 cfm capacity each) will pressurize the corridors, supply make-up air for the Dryers and provide fresh air for the common areas.

Advantages

1. Heat pump system is more energy-efficient and costs less than the four-pipe fan-coil system.
2. It can provide heating or cooling anytime of the year.

Disadvantages

1. It has a little higher sound level than the fan-coils but if it is only located in the living room (and not the bedrooms) and if it is smaller than 1.5 Tons in capacity, then it is generally acceptable.

Option 2 (Ground Source Heat Pump System)

This option will require a ground loop which will consist of 50 wells 650 feet deep. Each well will be 5" in diameter and 15 feet apart from each other. Each well will contain 1-1/4" high density polyethylene pipe in U-shape. Each 10 wells will be connected together and 5 supply and return pipes will be brought into the mechanical room and connected to 8" supply and return headers. There will be a plate and frame heat exchange between the ground loop and building loop.

Two pumps with capacity of 600 g.p.m. each will pump the 25% propylene glycol solution from the heat exchange to the heat pumps and two pumps with integrated E.R.V.'s will pump 25% propylene glycol solution from heat exchange to the ground loop.

Vertical heat pumps will be as follows:

- Micro-bachelor and Studio apartments (282): 9,000 BTU/hr. each
- 1 bedroom apartments (8): 12,000 BTU/hr. each
- 3 bedroom apartments (32): 24,000 BTU/hr. each

Two make-up air units (8,000 cfm capacity each) connected to geo-thermal will pressurize the corridors, supply make-up air for the Dryers and provide fresh air for the common areas.

The geo-thermal system will not require any back up energy system. Connection to water pre-heat can be considered if the modeling shows that the loop temperature can rise to a point that it can pre-heat the domestic water. Cost and benefit of connecting the geo-thermal system to snow melt system will be studied.

Advantages

1. More energy-efficient than Option 1 and other options.
2. Very small mechanical room is required.

Disadvantages

1. More expensive than Option 1 and other options.

4.3.2 HVAC DISTRIBUTION – DUCTWORK AND PIPING

- Heating and cooling for the suites will be provided by vertical stack heat pump units with integrated E.R.V.'s with minimum 65% efficiency ECM fans in each residential unit. The units are to be provided with 2-way open/close control valves, auto flow balancing valves, strainer, and bypass for start-up/flushing co.

  Their minimum EER and COP are to be as follows:
  1) EER: 11.5 heating
  2) COP: 5.0 cooling

- The heat pumps in each suite will be in the interior of the suite and ducted to condition each space. It is recommended that the return air grille for the heat pump unit is located outside the bedrooms to avoid occupant noise complaints. The return air grille will be used to access the fan, coil, compressor, controls and replace the filter during maintenance.
- Exhaust air from the washrooms and general exhaust from the kitchen will be ducted to the E.R.V.'s on the heat pump
- Horizontal heat pumps for the common areas will have supply and return ductwork
- Supply ductwork from the make-up air units will not be insulated
- Supply and return ductwork for the heat pumps for the common areas will be soundlined
- All piping for the heat pump system will be Schedule 40
- All hot water piping will be insulated
- Heat pump piping with Option 1 will not be insulated but for the Option 2 will be insulated
- Expansion of pipes will be considered and anchors will be provided at centre point of building with spring-style riser clamps above and below to allow for free expansion.
- Pressure independent balancing valves will be provided for each riser.

4.3.3 MECHANICAL EQUIPMENT

- With heat pump Option 1, a closed-circuit cooling tower and boiler will be required. They will be located in a Penthouse Mechanical Room (Approximately 1,000 square feet) on the roof.
- Two pumps will be required to circulate water through the heat pumps for Option 1.

- For Option 2, a mechanical room (Approximately 200 square feet) will be required on the ground floor to house the two sets of circulating pumps, plate and frame heat exchanger, supply and return headers, expansion tank, chemical feed system and propylene glycol tank.

4.3.4 PARKING GARAGE VENTILATION AND HEATING

- Variable speed exhaust fans will be provided for ventilation at each level of Garage
- Fans will be controlled by CO Sensors in the Garage
- All vestibules for elevator lobby and stairwells will be pressurized
- Storage areas etc. will also be ventilated
- Parking Garage will be heated to maintain 50°F Temperature in the Garage using gas-fired boilers with Option and geo-thermal with Option 2.

4.3.5 HVAC CONTROLS

- A Building Automation System is recommended to monitor and control the Cooling Tower, Boilers, Pumps and common area heat pumps for Option 1. It should also monitor any sump pumps, exhaust fans etc.
- Heat pump loop temperature will be maintained between 60°F and 90°F. The cooling tower and boilers will be off when the loop temperature is in this range. When the temperature of the loop will drop below 60°F, boilers will inject heat into the loop. When temperature of the loop will increase above 90°F, heat will be rejected through the cooling tower.
- VFD will be provided on the pumps. A pressure sensor will be provided in the piping loop to control the VFD.
- For geo-thermal system, a stand alone B.A.S. system will be provided to modulate the building distribution temperature to the specified set points by adjusting the pump speed within the geothermal mechanical room. This system will also monitor the make-up air unit, sump pump and common area heat pumps.

4.3.6 OPERATING COST

- Ground Source heat pump system will be more energy-efficient than the heat pumps with cooling tower and boiler and therefore will have lower operating costs.

4.3.7 PLUMBING AND DRAINAGE

- Plumbing fixtures will be water conserving
- All water risers 4” and larger will be of copper or steel. All risers smaller than 4” will be copper or Aquarise
- Water piping within the suites will be PEX
- Drainage piping will be cast iron or PVC
- All water piping will be insulated
- High-efficiency gas-fired boilers with storage tanks will be provided for domestic hot water with Option 1 and geo-thermal system will be used to heat the domestic water with Option 2.
- Storm drainage system will be provided for the roof

4.3.8 SPRINKLER SYSTEM

- A sprinkler system will be provided throughout the building and will meet NFPA requirement
- The whole sprinkler system will be ‘wet’ including the Garage because the Garage will be heated.
- A fire pump will be required and it will be connected to the generator.
- A stand-pipe system will also be provided.

4.4
ELECTRICAL
DESIGN

4.4 ELECTRICAL Design

THE ELECTRICAL DESIGN AND INSTALLATION WILL BE DONE TO THE FOLLOWING CODES, REGULATIONS AND STANDARDS, BUT NOT LIMITED TO:

1. Ontario Building Code (OBC)
2. Ontario Electrical Safety Code (OESC)
3. Ontario Fire Code (OFC)
4. Illuminating Engineering Society of North America (IESNA)
5. ASHRAE 90.1 2013 & MNECB
6. CAN/ULC-S524 - Installation of Fire Alarm Systems
7. CAN/ULC-S537 - Verification of Fire Alarm Systems

4.4.1 Description of Electrical System and Schematics

4.4.1.1. Power service

a. Power sources to the building:
   i) Hydro Ottawa will be the Electrical service supplier as permanent service under normal operating condition.
   ii) A natural gas stand-by generator located on roof will serve as Emergency back-up power service for building emergency service loads including fire pump, emergency lighting, fire alarm system, smoke control system equipment, elevators to meet OBC requirement.

b. Utility Service:
   i) Building estimated Utility service from Hydro Ottawa will be 1600A, 347/600V 3PH with 322 dwelling units.
   ii) Primary and secondary concrete underground concrete encased duct banks will be provided for incoming service from street as per Hydro standard for primary and secondary per OESC.
   iii) Will work with Hydro of service TR location and find out if Hydro vault is required.

4.4.1.2. Power distribution system

a. Main electrical room will locate in P1 level.
b. 347/600V power distribution system will be a simple radial system.
c. 600V 3PH 4W main switchboard locates in main electrical room, including but not limited to below sections for a fully operation power distribution main switchboard: secondary incoming service section, main breaker and Hydro bulk meter device compartment section, branch breakers for Suites power distribution section; Public loads breaker and metering compartment section; another section for Public loads power distribution branch breakers, and TVSS.

d. Power will be distributed to the following:

i) 600V distribution panel boards fed from main switchboard Public loads section to serve Elevators, large Mechanical loads in basement and mechanical equipment on penthouse level.
ii) 600V-120/208V Dry-type transformers with distribution panel boards located in main electrical room and in mechanical penthouse, run risers to power distribution panel located in each floor electrical room to serve Suite panels on that floor.
iii) Provide Dry-type 600V-120/208V transformers with distribution panel boards to serve building 120/208V Public loads, including but not limited to public/Service area lighting/receptacles, Amenity space power and lighting loads, miscellaneous, Mechanical equipment, etc.

4.4.1.3. Metering

a. Utility bulk meter for main incoming service and separate Hydro meter for fire pump.
b. Sub-metering system for Dwelling suites. Client will decide Sub-metering supplier by Ottawa Hydro or by Third party.
c. Coffee shop will apply separate Hydro meter when leasing agreement is available.

4.4.1.4. Emergency power system & Emergency lighting

a. One outdoor natural gas emergency standby generator with Level 2 enclosure to meet CSA 282-15 located on Roof will be provided in accordance with Ontario Building Code, OESC, CSA standards and AHJ requirement. Its capacity will be sized to accommodate building life safety loads and non-life safety loads to comply with CSA 282-15 and NFPA.
b. Emergency power system shall supply power to the following:

(i) Fire alarm systems.
(ii) Elevators.
(iii) Fire protections water supply pumps.
(iv) Smoke control systems equipment;
(v) Emergency lighting;
(vi) As required by building code and authorities, having jurisdiction.
(vii) Non-life safety loads per Client request.

c. The system shall include the following:

(i) Generator set shall be located on Roof.
(ii) Gas piping.
(iii) Automatic transfer switches and all associated 2hr rated conductors.
(iv) Power distribution system up to but not including the life safety equipment.

4.4.1.5. Equipment

a. Main switchboard will be service entrance type, 347/600V 3PH 4W, IC rating shall have min. 50KA as per distribution system coordination study recommendation.
b. Switchboards, distribution panel boards will be aluminum bus, main incoming circuit breaker with GFI protection is required. Main switchboard main amperage rating shall match main incoming service breaker.
c. Lighting panels, 120/208V receptacle panels and suite panels will be aluminum bus, circuit breaker type.
d. Aluminum conductors (NUAL type, 90 °rated insulation) will be allowed in size #2 AWG and larger.
e. Conceal conduits and wires except in unfinished areas and service spaces.

4.4.1.6. Grounding

a. Provide all grounding and bonding to conform to the latest Ontario Electrical Safety Code.
b. Provide one base building grounding system for power system, bonding and Telecommunication (Security/TV/Telephone) system grounding.
c. Pad-mount TR grounding shall follow Hydro and OESC grounding design criteria if applicable.

4.4.1.7. Electric heaters

a. Provide electric heaters (where hot water heaters are not feasible) & power supplies for Mechanical pipe tracing system in accordance with Mechanical requirements. All heaters will be controlled by built-in thermostats.

4.4.2 Lighting and Light Fixtures

4.4.2.1 Lighting:

a. Lighting levels and Lighting fixtures selection shall be in accordance with IESNA Standards and meet ASHRAE 90.1 lighting power density requirement in coordination with Architect ceiling types, finish, and per Owner's specific requirements.
b. Exterior lighting level will meet local municipal requirement.

4.4.2.2 Lighting Fixtures

a. Interior lighting fixtures will be recessed or surface mounted LED luminaires. The luminaires selection will be 3500K~4000K with minimum CRI 80.
b. Exterior lighting fixtures will be wall and pole mounted LED luminaires. The luminaires selection will be 4000K.
c. The Exit signs shall be energy efficient LED type, fed from Generator source.
d. Suite lighting: ceiling lights in suites shall follow interior/architectural/ Landlord requirement.

4.4.2.3 Lighting Control

a. Exterior lighting will be controlled through photocell sensor and Timer with relay panel.
b. Interior spaces lighting control will follow ASHRAE 90.1 2013 to meet code requirement.

4.4.3 Fire alarm system

1. Fire alarm system will be a fully addressable, single stage, zoned, non-coded electrically supervised system, conforming to the requirements of all latest editions of Building Code sand CSA standards.
2. Provide smoke and heat detectors per OBC, pull stations, signaling appliances (horn and strobes) in Suite and in common area, all auxiliary equipment and wiring, and connections to other equipment and systems.
3. Provide CO detectors in accordance with requirements of Ontario Building Code.
4. In each suite, provide 120V smoke alarm and smoke/CO combo devices in living space and in each bedroom to meet OBC requirement.

4.4.4 Communication and Security Systems

4.4.4.1 Telecommunications rough-in pathway system

a. The infrastructure for a communications system will be provided for this facility based on Owner's requirements. Cables, jacks, racks, patch panel and switches will be under a separate scope/contract.
b. Incoming telecommunication services will be provided to the building by Local Telecom utility.
c. Incoming service Conduits run from property line to Electrical room.
d. Suite Communication boxes Bell P3000 by electrical trade.
e. In suite communication wiring by electrical trade from communication boxes to specified locations.

4.4.4.2 Entryphone access control system

a. Power supplies to and rough-in conduits and back boxes for Entry phone Access control system will be provided at designated doors as per the architectural door schedule and as required by Client's Telecom system and Security Consultant/Provider.

4.4.4.3 Security systems

a. Will coordinate with Client Security/ Access control/CCTV systems to design rough-ins and pathway for Access controlled doors, such as door status monitoring, card readers and intercom.
b. CCTV system rough-in conduits and back boxes will be provided at locations per Security Consultant/Provider design requirement if any.

4.4.5 Controls and other Features

4.4.5.1 Emergency Call Assistant kit

1. Provide emergency call assistant kit for all public Universal washrooms;
2. Provide power supplies and control wires in conduits for architectural power operated doors and push buttons.

5.0
OUTLINE
SPECIFICATIONS

5.0 OUTLINE SPECIFICATIONS

5.1 SUBSTRUCTURE

- **A10 FOUNDATIONS:**
  Reinforced cast-in-place concrete raft foundation to CSA A23.1, placed over native soil. Refer to 4.2 STRUCTURAL Design.

- **A20 SUBGRADE ENCLOSURES:**
  Cast-in-place reinforced concrete walls to CSA A23.1, 300 mm thick, bearing on the raft foundation; self-adhered or torch-on bituminous sheet waterproofing; drainage composite with filter fabric; extruded polystyrene insulation to CAN/ULC S701, Type IV, Minimum R20insulation value.

- **A40 SLABS-ON-GRADE:**
  125 mm concrete slab with welded wire mesh reinforcement to CSA A23.1 on 'Permiator' or 'Stego Wrap' polyolefin-based vapour retarder on a 600+ mm granular base over the raft foundation. Refer to 4.2 STRUCTURAL Design.

- **A60 WATER MITIGATION:**
  Perimeter drainage tile consisting of perforated high-density polyethylene tubing clear crushed stone bed with filter fabric sock integrated with the drainage composite. Underslab drainage system if required by soil conditions.

5.2 SHELL

- **B10 SUPERSTRUCTURE:**
  B1010 **Floor Construction:** Suspended cast-in-place reinforced concrete slab to CSA A23.1 with 'Isokorb' structural thermal break system at the perimeter. Refer to 4.2 STRUCTURAL Design.

  B1020 **Roof Construction:** Suspended cast-in-place reinforced concrete slab to CSA A23.1 with 'Isokorb' structural thermal break system at the perimeter. Refer to 4.2 STRUCTURAL Design.

  B1030 **Stairs:** Precast concrete to CSA A23.4 with steel railings and guards conforming to OBC requirements.

- **B20 EXTERIOR VERTICAL ENCLOSURES:**
  B2010 **Exterior Walls:**
  Wall Type 1: 90 mm masonry veneer to CSA A370 and CSA A371; 25 mm airspace; 76 mm 'Rockwool' mineral fibre insulation to ASTM C612,R12.9 thermal insulation value; 'Blueskin SA' non-permeable air/vapour/moisture barrier; 'Densglas" fibreglass-faced gypsum boardsheathing to ASTM C1177; 152 mm metal stud framing to CSA S136 and CSA S136.1; mineral fibre thermal insulation batts toCAN/ULC S702, Type 1, R22.5 thermal insulation value; 13 mm gypsum board; paint finish to MPI premium grade.

Wall Type 2: Prefinished metal panelling; metal substructure engineered by the panelling manufacturer; 76 mm 'Rockwool' mineral fibre insulationto ASTM C612 installed sequentially with the metal substructure, R12.9 thermal insulation value; 'Blueskin SA' non-permeableair/vapour/moisture barrier; 'Densglas" fibreglass-faced gypsum board sheathing to ASTM C1177; 152 mm metal stud framing toCSA S136 and CSA S136.1; mineral fibre thermal insulation batts to CAN/ULC S702, Type 1, R22.5 thermal

- B2020 **Exterior Windows:**
  Proprietary aluminum windows to AAMA/WDMA/CSA 101/I.S.2/A440 and Canadian Supplement CSA A440S1with tested performance in compliance with OBC requirements; charcoal permadotic finish AA-M12-C22-A41, Class 1; double insulating glass units to CAN/CGSB 12.8.

- B2050 **Exterior Doors:**
  Glazed aluminum doors and frames:
  By the same manufacturer as the aluminum windows with tested performance in compliance with OBC requirements; charcoal permadotic finish AA-M12-C22- A41, Class 1; double insulating glass units to CAN/CGSB 12.8 with tempered glass to CAN/CGSB 12.1 in both doors and sidelights; automatic entrance hardware compliant with OBC barrier-free requirements.

  Steel doors and frames (service doors):
  Insulated hollow steel doors with thermally broken hollow steel frames to CSDFMA standards, on-site paint finish to MPI PremiumGrade.

  Overhead doors (parking garage):
  Insulated sectional overhead doors, steel interior and exterior skins, rigid polyurethane foam core, factory-applied paint finish, power operation.

- B2070 **Exterior Louvres and Vents:**
  Fabricated from aluminum extrusions, weather resistant blade profiles, frame profiles to suit adjacent construction; insect screens; charcoal permadotic finish AA-M12-C22-A41, Class 1; sizes to suit performance requirements and aesthetic requirements; blank panels as required.

B30 EXTERIOR HORIZONTAL ENCLOSURES

- B3010 **Roofing:**
  2-ply modified bituminous roofing on 6 mm multi-ply asphaltic protection board; on polyisocyanurate foam insulation board with glass fibre reinforced organic facer to CAN/ULC A704, Type III, minimum R35 thermal insulation value on self-adhesive modified bituminous vapour barrier on concrete slab.

- B3020 **Roof Appurtenances:**
  Roof Hatch: 'Bilco Model S50TB', single leaf, thermally broken, ladder access type, size 914 mm x 762 mm, complete with interior access ladder and rooftop safety railing system.

  Walkways: Recycled rubber mats purpose-made for protecting roof membranes, top face embossed, underside grooved for drainage, size 1219mm x 1829 mm x 19 mm thick.

  Pipe penetrations:
  'Thaler' factory prefabricated insulated aluminum sleeve flashings with integral deck flange.

- B3040 **Rooftop Decks:**
  Precast concrete paving slabs to CSA A231.1 on asphalt pads; filter fabric; extruded polystyrene insulation to CAN/ULC S701, Type IV, Minimum R35 insulation value; 2-ply modified bituminous waterproofing or hot-applied rubberized bituminous waterproofing membrane on concrete slab.

5.3 INTERIORS

5.3.1 C10 INTERIOR CONSTRUCTION

- C1010 **Interior Partitions:**
  13 mm gypsum board on non-loadbearing steel stud framing.
  For sound control and fire-resistant partitions, mineral fibre acoustical fire batts to CAN/ULC S702, Type 1 installed in the stud space.
  For fire-resistant assemblies, Type X gypsum board of thickness and number of layers as required to achieve the specified fire resistance in accordance with ULC tested assemblies.
  For partitions to receive ceramic wall tile, 'DensShield' fibreglass-faced gypsum board tile backer to ASTM C1178 in lieu of or in addition to standard gypsum board.

- C1020 **Interior Windows:**
  Fire-Rated:
  Hollow steel frames with clear fire-rated ceramic glazing, compliant with OBC requirements; paint finish to MPI premium grade.

  Non-Rated:
  Proprietary aluminum framing system with clear tempered glass to CAN/CGSB 12.1; manufacturer's anodized or coated finish selected to suit interior colour scheme.

- **C1030 Interior Doors:**
  Public Spaces (45 minutes fire rating), Exit Doors (1 ½ hour fire rating), Suite Entry Doors (20 minutes fire rating):
  Flush solid core wood interior doors, 45 mm thick, AWMAC Type PC-5, Custom Grade; paint grade veneer for paint finish; hardwood veneer to suit interior colour scheme for clear or stain finish.

  Within Suites:
  Flush honeycomb core wood doors, 35 mm thick, plain or embossed hardboard faces to CAN/CGSB 11.3. paint finish to MPI premium grade.
  Utility Spaces and Fire-Rated Doors (more than 20 minutes fire rating):
  Hollow steel doors and frames to CSDFMA standards and compliant with ULC requirements for the required fire rating, on-site paint finish to MPI
  Premium Grade.

- **C1070 Suspended Ceiling Construction:**
  Gypsum Board:
  Conventional metal framing with galvanized cold-rolled steel members to ASTM C645, layout, member spacing and sizes to suit loads supported and compliant with ULC design requirements for fire-resistance where applicable.
  OR
  Equivalent proprietary tee-bar-based system.

  Acoustical Panels:
  Proprietary exposed prepainted galvanized cold-rolled steel tee system to ASTM C365, grid layout to suit panel size; lay-in acoustical panels to ASTM E1284, selected to meet specific performance requirements and interior design concept.

- **C1090 Interior Specialties:** Mirrors:
  Channel frame, wall-mounted, custom sizes.
  Mail and Parcel Boxes: Wall-mounted, centrally located in public spaces to Canada Post standards; standard of acceptance: Canadian Mailbox Co.

  Bathroom Accessories:
  Toilet tissue dispensers: Single roll, wall-mounted, Standard of acceptance: ASI Watrous #0705Z.
  Towel bars: Square profile, 457 mm long, wall-mounted, Standard of acceptance: ASI Watrous #0760-Z.
  Grab bars (accessible suites): 32 mm dia., peened grip, concealed mounting, configuration in compliance with OBC barrier-free requirements, Standard of acceptance: ASI Watrous 3100 Series.
  Mirrors: Channel frame, wall-mounted, custom sizes.
  Mail and Parcel Boxes: Wall-mounted, centrally located in public spaces to Canada Post standards; standard of acceptance: Canadian Mailbox Co.

5.3.2 C20 INTERIOR FINISHES

Refer to 4.1.5 - Finishes.

5.4 SERVICES

- **D10 Conveying**

  D1010 **Vertical Conveying Systems:** Elevators - 2 machine room less, traction 2500lbs, elevator each at 350/min with rigidized stainless steel cab finishes. One elevator must meet the requirement of OBC 2012 latest version 3.2.6.5 elevators for use by Firefighters.

  D1050 **Material Handling:** Garbage chutes as required to serve population.

- **D20 Plumbing**

  Standard plumbing fixtures and fittings; supply and waste systems compliant with OBC requirements.

- **D30 HVAC Systems**

  Refer to 4.3 - MECHANICAL Design.

- **D40 Fire Protection**

  Refer to 4.3.3 - Sprinkler System and 4.4.3 - Fire Alarm System.

- **D50 Electrical**

  Refer to 4.4 - ELECTRICAL Design.

- **D60 Communications**

  TV cable and internet service to each unit.
  Refer also to 4.4.4 - Communications and Security Systems.

- **D70 Electronic Safety and Security**

  Refer to 4.4.5 - Controls and Other Features.

5.5 EQUIPMENT AND FURNISHINGS

- **E10 Equipment**

  E1010 Vehicle and Pedestrian Equipment: Electronic access control systems.

  E1040 Commercial Equipment:

  Bicycle racks: Galvanized steel, configuration to suit locations.

  Laundry facilities, centrally located to serve the population.

  Tenant storage lockers.

  E1060 Residential Equipment:

  Stove

  Refrigerator

  Dishwasher

  Microwave

  E1070 Entertainment and Recreational Equipment: As required for each amenity. Refer to 4.1.4 - Functional layout and Interior Features.

- **E20 Furnishings**

  E 2010 Fixed Furnishings: Bathroom and kitchen casework, melamine board construction, flush overlay design to AWMAC custom grade; solid surface countertops. Refer also to 4.2.5 - Finishes.

  Other fixed furnishings as required for each amenity. Refer to 4.1.4 - Functional layout and Interior Features.

5.6 SITEWORK

- **F20 Site Improvements**

  Hard and soft landscaping in conformance with City of Ottawa requirements. Refer to 4.1.1 - Site Orientation, Landscaping and Parking.

- **F30 Liquid and Gas Site Utilities**

  Utilities in conformance with City of Ottawa and utility company requirements.

- **F40 Electrical Site Improvements**

  Electrical service in conformance with City of Ottawa and utility company requirements.

Building Envelope Requirements for Climate Zone 6 (A, B) (I-P)

Opaque Elements	NonResidential		Residential		Semiheated	
	Assembly	Insulation	Assembly	Insulation	Assembly	Insulation
	Max. U-Value	Min R-Value	Max. U-Value	Min R-Value	Max. U-Value	Min R-Value
Roofs						
Insulation Entirely Above Deck	U-0.029	R-35 ci	U-0.029	**R-35 ci**	U-0.057	R-17 ci
Metal Building *	U-0.023	R-25 + R-11 + R-11 Ls	U-0.026	**R-25 + R-11 + R-11 Ls**	U-0.054	R-19 + R-11 Ls
Attic and Other	U-0.019	R-60	U-0.019	**R-60**	U-0.031	R-38
Walls, Above Grade						
Mass	U-0.048	R-19 ci	U-0.048	**R-20 ci**	U-0.091	R-10 ci
Metal Building	U-0.045	R-13 + R-19 ci	U-0.045	**R-13 + R-19 ci**	U-0.085	R-13 + R-6.5 ci
Steel Framed	U-0.044	R-13 + R-15 ci	U-0.044	**R-13 + R-15 ci**	U-0.076	R-13 + R-6 ci
Wood Frame and Other	U-0.046	R-13 + R-10 ci	U-0.046	**R-13 + R-10 ci**	U-0.080	R-13 + R-1 ci
Wall, Below Grade						
Below Grade Wall	C-0.050	R-20 ci	C-0.050	**R-20 ci**	C-0.119	R-7.5 ci
Floors						
Mass	U-0.046	R-18.7 ci	U-0.046	**R-18.7 ci**	U-0.078	R-9.7 ci
Steel Joist	U-0.029	R-38 + R-4 ci	U-0.029	**R-38 + R-4 ci**	U-0.047	R-25
Wood Frame and Other	U-0.024	R-38 + R-3 ci	U-0.024	**R-38 + R-3 ci**	U-0.046	R-21
Slab On-Grade Floors						
Unheated	F-0.459	R-15 for 48 in.	F-0.391	**R-10 full slab**	F-0.730	NR
Heated	F-0.619	R-10 full slab	F-0.604	**R-10 full slab**	F-0.774	R-15 for 48 in.
Opaque Doors						
Swinging	U-0.45		U-0.45		U-0.63	
Nonswinging	U-0.45		U-0.45		U-0.45	

Fenestration	Assembly	Assembly		Assembly	Assembly		Assembly	Assembly	
	Max. U-Value	Max. SHGC	Min. VT/SHGC	Max. U-Value	Max. SHGC	Min. VT/SHGC	Max. U-Value	Max. SHGC	Min. VT/SHGC
Vertical Fenestration, 0% - 40% of Wall									
Nonmetal framing: all	U-0.29	0.4	1.10	U-0.29	**0.4**	**1.10**	U-0.41	NR	NR
Metal framing: fixed	U-0.38			U-0.38			U-0.46		
Metal framing: operable	U-0.45			U-0.45			U-0.53		
Metal framing: entrance door	U-0.69			U-0.61			U-0.69		
Skylight, 0% - 3% of Roof									
All types	U-0.45		NR	U-0.45		**NR**	U-0.77	NR	NR

The following definitions apply: ci = continuous insulation, Ls - linear system, NR = no (insulation) requirement.

6.0

SUSTAINABLE DESIGN FEATURES

6.0 SUSTAINABLE Design Features

6.1 Defining Sustainability Goals

Defining sustainability goals. The sustainability goals will indicate the broad desired outcomes for the project. The goals will provide clear direction on the types of strategies that should be considered by your team during concept and schematic design, construction and operations. They will be written such that they can be included in branding and communications activities. Moreover, they will inform your approach to demonstrating environmental and social governance and guide our review of third-party certification systems.

6.1.2 The Defining Decade for Climate Change

The Intergovernmental Panel on Climate Change's (IPCC) Special Report on Global Warming of 1.5°C, released in October 2018, advanced two primary conclusions: the effects of climate change are already being felt, and without rapid and far-reaching transitions in land use, industry, transport, and city planning, those effects will continue to worsen.

The report found that limiting global warming to 1.5°C, the upper limit beyond which management and adaptation will rely on unproven technologies, will require reaching net zero carbon by 2050.

As of 2019, the rise in global temperature already reached 1°C; in order to prevent eclipsing a 1.5°C increase, global net human-caused emissions of carbon dioxide need to be reduced by 45 percent from 2010 levels by 2030. In other words, we now have nine years to act, and that action must be intentional, swift, and cooperative. The health and well-being of humans, communities, and the ecosystems on which we rely is dependent on reaching this end.

6.1.3 Purpose

With the identification of three sustainability themes, which will help inform goal-setting and our review of third-party certification systems.

To define the themes, we asked four key questions (Appendix A provides analysis related to each question):

1. What makes a Smart Living Properties project unique?
2. What are the City's sustainability expectations?
3. What are the site's physical opportunities?
4. What is this project already delivering?

The results of this analysis will form the foundation of your Owner's Project Requirements (OPRs). The OPRs will be the core document used to communicate your sustainability commitments to the broader design and consultant team and inform design decision-making along the way. In addition to providing a path to certification, the OPRs will include best practices in sustainability.
Once finalized, the OPRs will reflect not only the themes identified in this report, but also goals and performance requirements drawn from one or more certification systems.

Having completed the background work, we believe that this project has the opportunity to deliver a new kind of sustainable building - we are excited to help shape that story in the next phases of work.

6.2 Sustainability Themes

The following themes are informed by our understanding of the collective context: who Smart Living Properties is, what the City is expecting, the site's unique physical context and the strategies already included in the architectural drawing set. While preliminary, the themes should be considered indicative of where we think the project's focus should be, which in turn will inform what third-party certification systems we review in Phase 2.

6.2.1 Preliminary Theme Statements

6.2.1.1 Low Carbon Living

112 Nelson Street is designed and built to reduce carbon emissions. In doing so, it will support the global call to action to combat the negative effects of climate change. Achieving low carbon and energy also offers a number of benefits, including supporting municipal targets; reducing lifecycle and operating costs; reducing carbon emissions; and demonstrating leadership.

- Optimized window-to-wall ratio
- Improved glazing system performance
- Increased air tightness
- High performance wall assemblies with minimized thermal bridging
- Low-carbon thermal energy for heating and cooling
- Low-flow water fixtures
- Renewable energy generation

6.2.1.2 Sustainable Building

112 Nelson Street demonstrates excellence in sustainable building design. It operates efficiently and sustainably through attention to indoor and outdoor water use, waste stream management, indoor air quality, and environmentally-friendly material selection.

- Low-flow fittings and fixtures
- Tri-sort waste chutes
- Water metering
- Low-emitting materials
- Enhanced ventilation
- Recycled materials
- Rainwater capture and reuse

6.3 What makes Smart Living Properties Project Unique

6.3.1 Designed for Urban Professionals and Students

The desire for living in environmentally, socially and culturally responsible developments has been amplified through the Covid-19 pandemic. Indeed, the importance of nature, equity, mental and physical health, healthy food and active transportation is greater than ever. To maintain a leadership position in the marketplace, this project will need to deliver on all fronts.

6.3.2 Located in Urban Hubs and Centres

The benefits of locating this projects in our urban centres are obvious: access to transit infrastructure, parks and open spaces, retail offerings, cultural landmarks and activities, and active transportation routes and corridors. The location of this site becomes extremely important for certification systems like LEED and Fitwel, which reward credits for location and transportation related considerations.

6.3.3 More Amenities than your typical Building Development

In order to compensate for smaller unit sizes, Smart Living Properties willprovide a broad range of community-centric interior and exterior amenity spaces. The provision of amenity space pays dividends by creating opportunities for healthy, sustainable and social lifestyles. Moreover, it positions projects to achieve certification under health and lifestyle focused third-party systems like Fitwel.

This project has the opportunity to deliver a new kind of sustainability - a smart green building that reduces environmental impact, reduces utility costs and creates a culture of sustainability.

6.4 What are the City's Sustainability Expectations

6.4.1 Ottawa Official Plan

Ottawa's Official Plan (the OP) advances a vision for the future growth of the city supported by a policy framework to guide physical development until 2031. The OP codifies the importance of sustainability in Section 2 – Strategic Directions, through a focus on managing growth, providing infrastructure, maintaining environmental integrity and building livable communities.
Managing Growth: Growth will be distributed throughout the urban area to strengthen the city's liveable communities through intensification and infill.

Providing Infrastructure: Development should occur in higher-density mixed use nodes and corridors that provide concentrated destinations that are more easily served by good-quality transit.
Maintaining Environmental Integrity: Improve air quality, reduce greenhouse gas emissions, protect natural features, manage groundwater resources and plan for forests and greenspaces.
Building Liveable Communities: Project should embrace the basics, including good housing, employment, ample greenspace, a sense of history and culture.

6.4.2 Ottawa High Performance Developments Standard

The new Official Plan provides policy direction to develop a high-performance development standard (HPDS) for projects submitting Plan of Subdivision, Zoning By-law Amendment and/or Site Plan Control applications. Changes to the City's Green Building Policy will be consistent with this approach. The HPDS will cover a wide array of sustainability metrics, including building energy efficiency and thermal performance based on criteria set out in the Ontario Building Code with progression towards net zero energy ready buildings. Higher performance be encouraged through incentives. While still in development, draft requirements and metrics can inform the approach to sustainability.

6.5 What are the Site's Physical Opportunities

6.5.1 Proximity to Cultural Amenities

112 Nelson is an urban infill project within walking distance of an array of cultural amenities: MacDonald Gardens Park, Jules Morin Park, Ottawa Public Library and Byward Market.
It also enjoys close proximity to an array of retail offerings and public and private schools. While schools are not necessarily enticing to our targeted demographic, they are relevant to LEED, which awards points for the number of types of amenities within walking distance of a project.

6.5.2 10 Minute Walk to the University of Ottawa

While our chosen demographic extends beyond students, this will be an enticing place of residence for university-goers. That means fewer cars, a desire for opportunities to socialize, and, of course, a heightened awareness of ecological, environmental, cultural and social sustainability.

6.5.4 Proximity to a Multi-Modal Transportation Network

The project is ideally situated to support cyclists ("very bikeable" per Walk Score). It is within a short cycle of the Rideau River Pathway system and is served by a cycling network consisting of trails, dedicated lanes and otherwise bicycle-friendly roads. Given the proximity of amenities, the site also supports walking (a 94 "walker's paradise" Walk Score). Finally, the site is serviced by the Rideau Street bus line, supporting its 91 "rider's paradise" Walk Score. Reducing the need for single occupancy vehicle trips not only represents good design, but it is also rewarded by third-party certification systems like LEED and Fitwel.

6.5.5 Access to Nature

In addition to nearby parks and open spaces, future residents will benefit from unobstructed views of the Rideau and Ottawa Rivers, including their unique ecological systems. Studies have shown that visual access to nature can improve mental health and productivity. In addition, third-party certifications systems like Fitwel award points for views of nature from common spaces.

6.6 What is 112 Nelson Already Delivering

6.6.1 Demonstrated Commitment to Sustainability

CARBON AND ENERGY	ACCESS TO NATURE	CULTURE AND COMMUNITY
• Rooftop PV • Geothermal	• Courtyard with Natural Features • Terraces	• Coffee Shop • Games Area • Lounge/Relax Space • Urban Art • Workshop

FOOD	HEALTHY LIFESTYLES	TRAVEL AND TRANSPORT
• Rooftop Greenhouse • Rooftop Garden • Communal Kitchen • Barbecue Area	• Indoor Gym • Training Facilities • Playground • Sports and Activities	• 200 Bike Parking Spaces • Bike Repair Station • Reduced Parking Supply

7.0
BUILDING CODE ANALYSIS

Item	Ontario Building Code Data Matrix Parts 3 or 9			Building Code Reference (References are to Division B unless noted [A] for Division A or [C] for Division C.)	
1	Project Description:	☐ Change of Use	☒ New ☐ Addition ☐ Alteration ☐ Part 11 (11.1 to 11.4)	☒ Part 3 1.1.2. [A]	☐ Part 9 1.1.2. [A] & 9.10.1.3.
2	Major Occupancy(s)	C		3.1.2.1.(1)	9.10.2.
3	Building Area (m²)	Existing ____	New 1662 Total ____	1.4.1.2. [A]	1.4.1.2. [A]
4	Gross Area	Existing ____	New 15501 Total ____	1.4.1.2. [A]	1.4.1.2. [A]
5	Number of Storeys	Above grade 9	Below grade 1	1.4.1.2. [A]&3.2.1.1.	1.4.1.2[A] & 9.10.4
6	Number of Streets/Fire Fighter Access	2		3.2.2.10. & 3.2.5.	9.10.20.
7	Building Classification	3.2.2.42		3.2.2.20.-.83	9.10.2.
8	Sprinkler System Proposed	☒ entire building ☐ selected compartments ☐ selected floor areas ☐ basement ☐ in lieu of roof rating ☐ not required		3.2.2.20.-.83 3.2.1.5. 3.2.2.17. INDEX	9.10.8.2. INDEX
9	Standpipe required	☒ Yes ☐ No		3.2.9.	N/A
10	Fire Alarm required	☒ Yes ☐ No		3.2.4.	9.10.18.
11	Water Service/Supply is Adequate	☒ Yes ☐ No		3.2.5.7.	N/A
12	High Building	☒ Yes ☐ No		3.2.6.	N/A
13	Construction Restrictions Actual Construction	☐ Combustible permitted ☐ Combustible	☒ Non-combustible required ☐ Non-combustible	☐ Both ☐ Both	3.2.2.20.-.83	9.10.6.
14	Mezzanine(s) Area m² ____				3.2.1.1.(3)-(8)	9.10.4.1.
15	Occupant load based on Basement: Occupancy C Load 34 persons 1st Floor Occupancy C Load 28 persons 2nd Floor Occupancy C Load 80 persons 3rd Floor Occupancy C Load 86 persons (Additional floor areas continued on last page)	☐ m²/person	☒ design of building		3.1.17.	9.9.1.3.
16	Barrier-free Design	☒ Yes ☐ No (Explain) ____			3.8.	9.5.2.
17	Hazardous Substances	☐ Yes ☒ No			3.3.1.2. & 3.3.1.19.	9.10.1.3.(4)

18	Required Fire Resistance Rating (FRR)	Horizontal Assemblies FRR (Hours)		Listed Design No. or Description (SG-2)		3.2.2.20.-.83 & 3.2.1.4.		9.10.8. 9.10.9.			
		Floors 2 Hours									
		Roof 0 Hours									
		Mezzanine 1 Hours									
		FRR of Supporting Members		Listed Design No. Or Description (SG-2)							
		Floors 2 Hours									
		Roof 0 Hours									
		Mezzanine 1 Hours									
19	Spatial Separation – Construction of Exterior Walls							3.2.3.		9.10.14.	
	Wall	Area of EBF (m²)	L.D. (m)	L/H or H/L	Permitted Max. % of Openings	Proposed % of Openings	FRR (Hours)	Listed Design or Description	Comb Const	Comb. Constr. Nonc. Cladding	Non-comb. Constr.
	North				>50	40				X	X
	South				>50	40				X	X
	East				>50	40				X	X
	West				>50	40				X	X

20	Plumbing Fixture Requirements					Building Code Reference ☒ Part 3	☐ Part 9
	Male/Female Count @ ____% / ____%, except as noted otherwise	Occupant Load	BC Table Number	Fixtures Required	Fixtures Provided		
	Basement: Occupancy ____						
	Occupancy C	34		15	15		
	1st Floor: Occupancy C	28		14	14		
	Occupancy ____						
	2nd Floor: Occupancy C	80		37	37		
	Occupancy ____						
	3rd Floor: Occupancy C	86		40	40		
	Occupancy ____						
	(Adjust as Required for Additional Floors or Occupancies)						
21	Other (describe) ____						

15 (Occupant Load - Continued)

4	Floor	Occupancy C	Load 86	persons	
5	Floor	Occupancy C	Load 86	persons	
6	Floor	Occupancy C	Load 98	persons	
7	Floor	Occupancy C	Load 66	persons	
8	Floor	Occupancy C	Load 68	persons	
9	Floor	Occupancy C	Load 68	persons	
____	Floor	Occupancy ____	Load ____	persons	
____	Floor	Occupancy ____	Load ____	persons	
____	Floor	Occupancy ____	Load ____	persons	
____	Floor	Occupancy ____	Load ____	persons	

9.0
CONSTRUCTION COST ESTIMATE

TO FOLLOW