Thornton Tomasetti

311 Somerset Street West

Ottawa, Ontario

SW21031

Prepared For

Josh Zaret

Gemstone Corporation
(on behalf of the Somerset O'Connor Limited Partnership)
252 Argyle Avenue
Ottawa, ON K2P 1B9
Tel: 613.248.8999
josh@gemstonecorp.com

NOISE IMPACT STUDY

Prepared By

Martin Villeneuve, P.Eng.

Thornton Tomasetti
116 Albert Street, 3rd Floor
Ottawa, ON K1P 5G3
+1.613.565.1800
mvilleneuve@thorntontomasetti.com
www.ThorntonTomasetti.com

Reviewed By

Galen Wong, M.A.Sc.
Senior Project Director

January 29, 2021

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1.0 Introduction

At the request of Gemstone Corporation, on behalf of the Somerset O'Connor Limited Partnership, Thornton Tomasetti (TT) presents this Noise Impact Study (NIS) for the proposed 16-storey mixed-use (15-storey residential) building (Project) to be located at 311 Somerset Street West, Ottawa, Ontario. The ground floor will feature two commercial spaces, and the building will have two levels of underground parking. Floors 2 to 16 will consist of residential units. There are rooftop amenity areas located on the 10th floor (south side) and on the 17th floor (mechanical penthouse - east side). The objective of this study is to determine if the proposed Project can meet the noise guidelines of the City of Ottawa and the Ontario Ministry of the Environment, Conservation and Parks (MECP).

2.0 Site

A site plan for the Project and an aerial photo of the Project area are provided in Appendix A, Figure 1 and Figure 2. A zoning map of the project area is provided in Appendix A, Figure 3. The Project is located in a traditional mainstreet zone (zone TM, shown in Figure 3). West, east and south of the Project are other traditional mainstreet zones, whereas north of the project are residential zones (R4UD and R5B). Approximately 65m to the northwest is a major institutional zone (I2).

There is currently a surface parking lot occupying the Project site, which is to be removed.

3.0 Noise Sources

This NIS assesses noise impacts from nearby surface transportation sources on the Project. The surface transportation sources impacting the Project are road traffic on Somerset Street West and O'Connor Street. These roads are designated as an Urban Arterial road by Schedule F of the City of Ottawa Official Plan[1].

Based on site visits conducted by TT on January 26, 2021, and a review of satellite photos of the area, there are no significant stationary noise sources nearby that may impact the Project. Rooftop air handling units (AHU) and several small exhaust fans were visible on the rooftop of the building at 315 Somerset Street West – however, at ground level, they produced negligible noise levels (relative to the ambient background noise) during our site visits.

4.0 Noise Assessment Criteria

The City of Ottawa requirements for environmental noise impact studies are outlined in the City's Environmental Noise Control Guidelines[2] (ENCG) and are based on the Ontario Ministry of the Environment, Conservation, and Parks (MECP) document Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning[3] (NPC-300).

4.1 Surface Transportation Noise Assessment Criteria

Sound level limits outlined in ENCG for road traffic noise impacting on noise-sensitive areas applicable to the Project are summarized in Table 1. Sound level limits are given in A-weighted, equivalent sound levels (L_{eq}, dBA), defined in both ENCG and NPC-300.

Additionally, ENCG and NPC-300 provide requirements for building components, ventilation, and warning clauses to be used in sale and lease agreements. These requirements are based on calculated sound levels at OLAs and the plane-of-window of bedrooms and living/dining rooms. Sound level limits and associated requirements applicable to the Project are summarized in Table 2 and Table 3. Warning clause types are defined in NPC-300.

Table 1: Sound Level Limits for Noise-Sensitive Areas – Road Noise

Type of Space	Time Period	Maximum L_{eq} (dBA)
Outdoor Living Area	Daytime (07:00 to 23:00)	55
Living/dining, den areas of residences, hospitals, schools, etc. (indoor)	Daytime (07:00 to 23:00)	45
	Nighttime (23:00 to 07:00)	45
Sleeping quarters of residences (indoor)	Daytime (07:00 to 23:00)	45
	Nighttime (23:00 to 07:00)	40
General offices, reception areas, retail stores, etc. (indoor)	Daytime (07:00 to 23:00)	50

Table 2: Building Component and Ventilation Requirements – Road Noise

Time Period	Sound Level, L_{eq} (dBA), at Bedroom or Living/Dining Room Plane-of-Window	Building Component Requirement	Ventilation Requirement
Daytime (07:00 – 23:00)	$55 < L_{eq} \leq 65$	Building components must be compliant with the Ontario Building Code (OBC)	Forced air heating with provision for central air conditioning
	$L_{eq} > 65$	Building components (walls, windows, etc.) should be designed to achieve indoor sound level criteria in Table 1	Central air conditioning
Nighttime (23:00 – 07:00)	$50 < L_{eq} \leq 60$	Building components must be compliant with the Ontario Building Code (OBC)	Forced air heating with provision for central air conditioning
	$L_{eq} > 60$	Building components (walls, windows, etc.) should be designed to achieve indoor sound level criteria in Table 1	Central air conditioning

Table 3: Warning Clause Requirements

Assessment Location	Time Period	Sound Level, L_{eq} (dBA)	Warning Clause Requirement
Bedroom or Living/Dining Room Plane-of-Window	Daytime (07:00 – 23:00)	$55 < L_{eq} \leq 65$	Type C Required
		$L_{eq} > 65$	Type D Required
	Nighttime (23:00 – 07:00)	$50 < L_{eq} \leq 60$	Type C Required
		$L_{eq} > 60$	Type D Required
Outdoor Living Areas	Daytime (07:00 – 23:00)	$55 < L_{eq} \leq 60$	If noise control measures are not provided, Type A is required
		$L_{eq} > 60$	Noise control measures must be provided to reduce levels to 60 dBA or lower; if resultant level is above 55 dBA, Type B is required

5.0 Sound Level Calculations

5.1 Points of Reception

Six point of reception (POR) was chosen at points on the building façade that are most exposed to the transportation noise source identified in Section 3.0. There are two rooftop amenity areas, one on the south portion of the 10th floor and another on the east portion of the 17th floor, and each is considered an Outdoor Living Area (OLA), subject to the requirements of Table 1 and Table 3. Site plans showing the locations of the POR and the OLA are provided in Appendix A, Figure 4 to Figure 8. The locations of the PORs are summarized in Table 4.

Table 4: Points of Reception and Outdoor Living Areas

Point of Reception (POR)	Level	POR Height (m)	Location	Notes/Comments
POR 1	2	6.2	Southeast corner	Representative of sound levels on the plane-of-window areas of southeast-facing rooms on the lower portion of the building.
POR 2	2	6.2	South façade	Representative of sound levels on the plane-of-window areas of south- and east-facing rooms on the lower portion of the building.
POR 3	2	6.2	West façade	Representative of sound levels on the plane-of-window areas of north- and west-facing rooms on the entire building.
POR 4	11	33.8	Southeast corner	Representative of sound levels on the plane-of-window areas of southeast-facing rooms on the upper portion of the building.
POR 5	11	33.8	South façade	Representative of sound levels on the plane-of-window areas of south- and east-facing rooms on the upper portion of the building.
POR 6	Ground	1.5	East façade	Representative of sound levels on the plane-of-window areas of east-facing commercial spaces.
OLA 1	10	30.6	South Rooftop	Outdoor Living Area on 10th Floor.
OLA 2	17	52.4	East Rooftop	Outdoor Living Area on 17th Floor (Mechanical Penthouse).

5.2 Road Traffic Noise Parameters

The "ultimate" road traffic data for the road traffic noise source identified in Section 3.0, including the Annual Average Daily Traffic (AADT), were obtained from the ENCG, based on the road classifications provided in the City of Ottawa Official Plan, and are summarized in Table 5.

Table 5: Traffic Parameters

Road Name	Implied Roadway Class	Speed Limit (km/h)	AADT (Vehicles per day)	Day/Night Split (%)	Medium Trucks (%)	Heavy Trucks (%)
Somerset St. W.	2-Lane Urban Arterial - Undivided	50	15,000	92/8	7	5
O'Connor St.	2-Lane Urban Arterial - Undivided	50	15,000	92/8	7	5

5.3 Calculated Sound Levels

Sound levels were calculated at each POR using software developed by the MECP for the assessment of road and rail noise, STAMSON 5.04. Scaled site plans showing distances and angles used in STAMSON are provided in Appendix B, and details of these calculations are provided in Appendix A. Corrections were made to the calculation results, as detailed in Appendix D, in the following circumstances due to limitations of the STAMSON software:

- Due to the distance between the PORs and each road being less than the 15m minimum limit in STAMSON, a correction (level increase) was made to calculation results for POR 1, 2 and 6;
- Due to the height of the upper floors (Levels 11 to 16) and its distance from the roads, an adjustment was made in the calculations for POR 4 and 5, accounting for the actual distance of the PORs from the centerline of the roads in "Receiver-source distance".

The calculated daytime and nighttime levels are presented in Table 6, along with the building component, ventilation, and warning clause requirements, as applicable.

Of note, for some PORs on the lower portion of the building (floors 10 and lower), traffic noise is partially obstructed from neighbouring buildings as follows (see Figure 10 and Figure 14 for details):

- Noise from O'Connor Street is partially obstructed by the 3-storey building at 310 Somerset Street West south of the Project, which was modelled by SACL by limiting the exposure angle to 75 degrees for POR 2.
- Noise from Somerset Street West is partially obstructed by the 7-storey building at 263 Somerset Street West east of the Project, which was modelled by SACL by limiting the exposure angle to -70 degrees for POR 6.

For both OLAs, the edges of the Project's amenity areas obstructs noise from Somerset Street West and O'Connor Street. In both cases, this was modelled by SACL as a noise barrier in STAMSON, with a height corresponding to the elevation height of the edges associated with the amenity area. See Figure 15 and Figure 16 for details.

The sound level predictions were modelled with sound-reflective ground surfaces between both streets and the receptors.

Table 6: Calculated Sound Levels at PORs

POR	Daytime L_{eq} (dBA)	Nighttime L_{eq} (dBA)	Building Component Requirement	Ventilation Requirement	Warning Clause Requirement
POR 1	72	65	Building components designed to achieve indoor sound level criteria.	Central air conditioning	Type D
POR 2	70	63	Building components designed to achieve indoor sound level criteria.	Central air conditioning	Type D
POR 3	64	57	OBC-compliant	Forced air heating with provision for central air conditioning	Type C
POR 4	68	60	Building components designed to achieve indoor sound level criteria.	Central air conditioning	Type D
POR 5	66	59	Building components designed to achieve indoor sound level criteria.	Central air conditioning	Type D
POR 6	70	N/A	Building components designed to achieve indoor sound level criteria.	Central air conditioning	Type D
OLA 1	55	N/A	N/A	N/A	N/A
OLA 2	53	N/A	N/A	N/A	N/A

6.0 Noise Control Requirements

6.1 Building Component Requirements

Building components for all south- and east-facing residential and commercial units must be designed to achieve indoor sound level criteria. The sound transmission loss of the building façade glazing and wall components required to meet ENCG / MECP interior sound levels with the above calculated outdoor sound levels were determined based on calculated building component percentages from the drawings. The glazing and exterior wall minimum transmission losses, in terms of Sound Transmission Class (STC), are provided in Table 7.

Of note, the lower noise levels for a typical north- and west- facing residential unit (represented by POR 3 in Table 6) is such that any OBC-compliant building façade construction will meet the ENCG / MECP interior sound levels in those locations.

Table 7: Building Envelope Minimum Requirements

Component	Maximum Component Area Percentage Versus Floor Area of Room	Minimum STC Required
Southeast Corner Rooms in Residential Units (Floors 2 to 10)		
Fixed Glazing	12%	31
Operable Glazing	7%	28
Exterior Wall	54%	38
South- / East-Facing Rooms in Residential Units (Floors 2 to 10)		
Fixed Glazing	17%	30
Operable Glazing	5%	25
Exterior Wall	41%	35
Southeast Corner Rooms in Residential Units (Floors 11 to 16)		
Fixed Glazing	30%	31
Operable Glazing	8%	25
Exterior Wall	45%	33
South- / East-Facing Rooms in Residential Units (Floors 11 to 16)		
Fixed Glazing	34%	29
Operable Glazing	9%	24
Exterior Wall	45%	31
Southeast Corner Commercial Unit (Ground Floor)		
Fixed Glazing	38%	31
Operable Glazing	3%	21
Exterior Wall	33%	31
East-Facing Commercial Units (Ground Floor)		
Fixed Glazing	22%	26
Operable Glazing	23%	27
Exterior Wall	134%	35

Typical minimum constructions for exterior wall and glazing were determined to provide a basis for the final design and are presented below.

Exterior Wall

Wall assemblies in the exterior façade are required to meet a minimum of STC 38 in the worst-case locations (southeast corner), based on the calculated outdoor sound levels in Table 6. This can usually be achieved using typical constructions, such as EW1, described below:

- 12.7mm gypsum board;
- Vapour barrier;
- 38mm x 89mm studs;
- 50mm (or thicker) mineral wool or glass fibre batts in stud cavities;
- Exterior sheathing;
- Wood siding (or metal siding on fibre backer board).

Glazing

The minimum glazing requirements for each of the facades and types of units of the building are presented below. The glazing requirements are presented in the form 3 (6) 3 to denote 3 mm glass (6 mm airspace) 3 mm glass. Of note, operable glazing include glazed doors and patio doors.

- Southeast corner rooms in residential units (floors 2 to 10):
  - Fixed glazing – 2 (13) 2
  - Operable glazing – 3 (6) 3
- South- / East-facing rooms in residential units (floors 2 to 10):
  - Fixed glazing – 2 (13) 2
  - Operable glazing – OBC-compliant glazing
- Southeast corner rooms in residential units (floors 11 to 16):
  - Fixed glazing – 3 (6) 3
  - Operable glazing – OBC-compliant glazing
- South- / East-facing rooms in residential units (floors 11 to 16):
  - Fixed glazing – 2 (6) 2
  - Operable glazing – OBC-compliant glazing
- Southeast corner commercial unit (floor 1):
  - Fixed glazing – 2 (13) 2
  - Operable glazing – OBC-compliant glazing
- East-facing commercial units (floor 1):
  - Fixed glazing – OBC-compliant glazing
  - Operable glazing – 2 (6) 2

The above constructions are provided for reference only – STC requirements should be verified with the glazing manufacturer. Any constructions with equivalent or greater STC values will be acceptable. Changes in window sizes and unit layouts will change these requirements. Specifically, reduced window sizes will reduce the window requirements.

6.2 Ventilation Requirements

For the residential and non-residential units facing south and east, central air conditioning is required to be installed. For the residential units facing west and north, forced-air heating with provision for central air conditioning is required to be installed. If central air conditioning is being provided to all units, which we assume is the case, the ventilation requirements is met.

6.3 Outdoor Living Area Mitigation

Since the calculated noise levels at OLA 1 and OLA 2 are equal to or below 55 dBA, no noise mitigation measures are required.

6.4 Warning Clause Requirements

Per the ENCG, warning clause Type 'C' must be included in agreements of offers of purchase and sale, as well as any lease/rental agreements associated with residential units that face north or west for the Project. Sample wording from the ENCG have been adapted below for the Project.

WARNING CLAUSE TYPE 'C':

> "This dwelling unit has been designed with the provision for adding central air conditioning at the owner's discretion. Installation of central air conditioning by the owner will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

Similarly, per the ENCG, warning clause Type 'D' must be included in agreements of offers of purchase and sale, as well as any lease/rental agreements associated with residential units that face south or east for the Project. If central air conditioning is provided to all units, the Type 'D' warning clause is required for all units. Sample wording from the ENCG have been adapted below for the Project.

WARNING CLAUSE TYPE 'D':

> "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

7.0 Impact of the Project on Surrounding Area

Mechanical equipment within the Project may be considered as a stationary noise source which may impact nearby noise-sensitive areas. Mechanical equipment selections have not yet been made, precluding a detailed analysis at this time. The final mechanical design will be required to comply with ENCG sound level limits from a stationary source at all nearby noise-sensitive areas.

8.0 Concluding Comments

With the implementation of the proposed mitigation measures outlined in Section 6.0, the noise impact of the nearby transportation noise sources on the Project is expected to meet the requirements of the City of Ottawa and the MECP. The proposed Project should therefore be approved from a noise perspective.

DISCLAIMER - Achieving the required noise control requirements relies on correct incorporation of noise control recommendations into Architectural and Mechanical drawings and specifications, as well as correct installation during construction. On Request, TT will conduct drawing reviews and onsite reviews of noise control measures and provide observations as appropriate; however, notwithstanding the foregoing, it is expressly understood and agreed that TT shall not have control or charge of, and shall not be responsible for the acts or omissions, including but not limited to means, methods, techniques, sequences and procedures, of the Design Professionals and/or Contractors performing design and/or construction on the Project. Accordingly, TT shall not be held responsible for the failure of any party to properly incorporate the noise control measures stated in this report.

---------- End ----------

9.0 References

1. City of Ottawa. Official Plan, Schedule F – Central Area / Inner City Road Network, 2013.

2. City of Ottawa. Environmental Noise Control Guidelines, January 2016.

3. Ontario Ministry of the Environment and Climate Change. Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning, Publication NPC-300, August 2013

4. City of Ottawa. geoOttawa, 2019. [Online]. Available: http://maps.ottawa.ca/geoottawa/. [Accessed: 28- January- 2021].

Appendix A - Site Plans

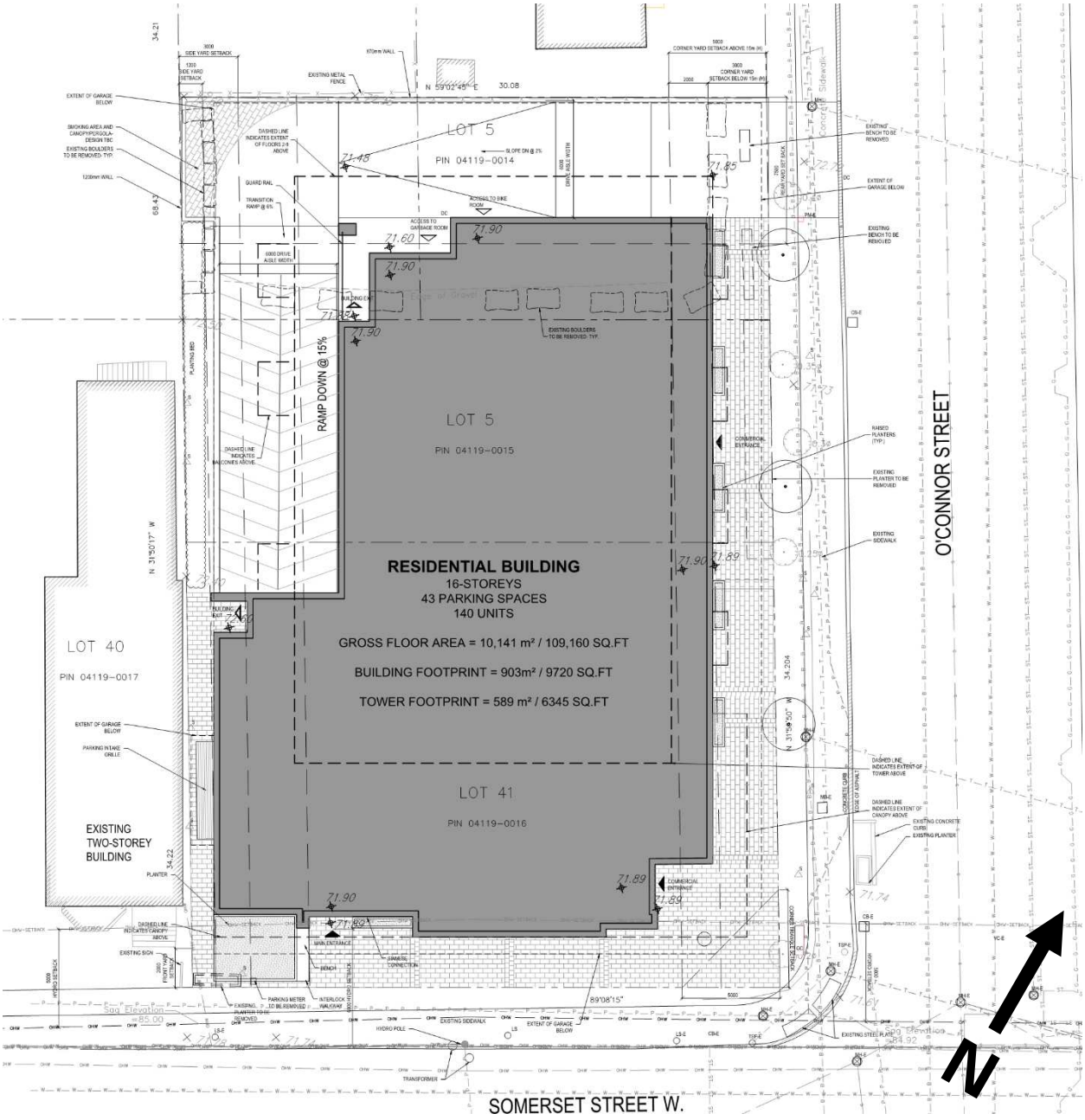

Figure 1: Site Plan of the project

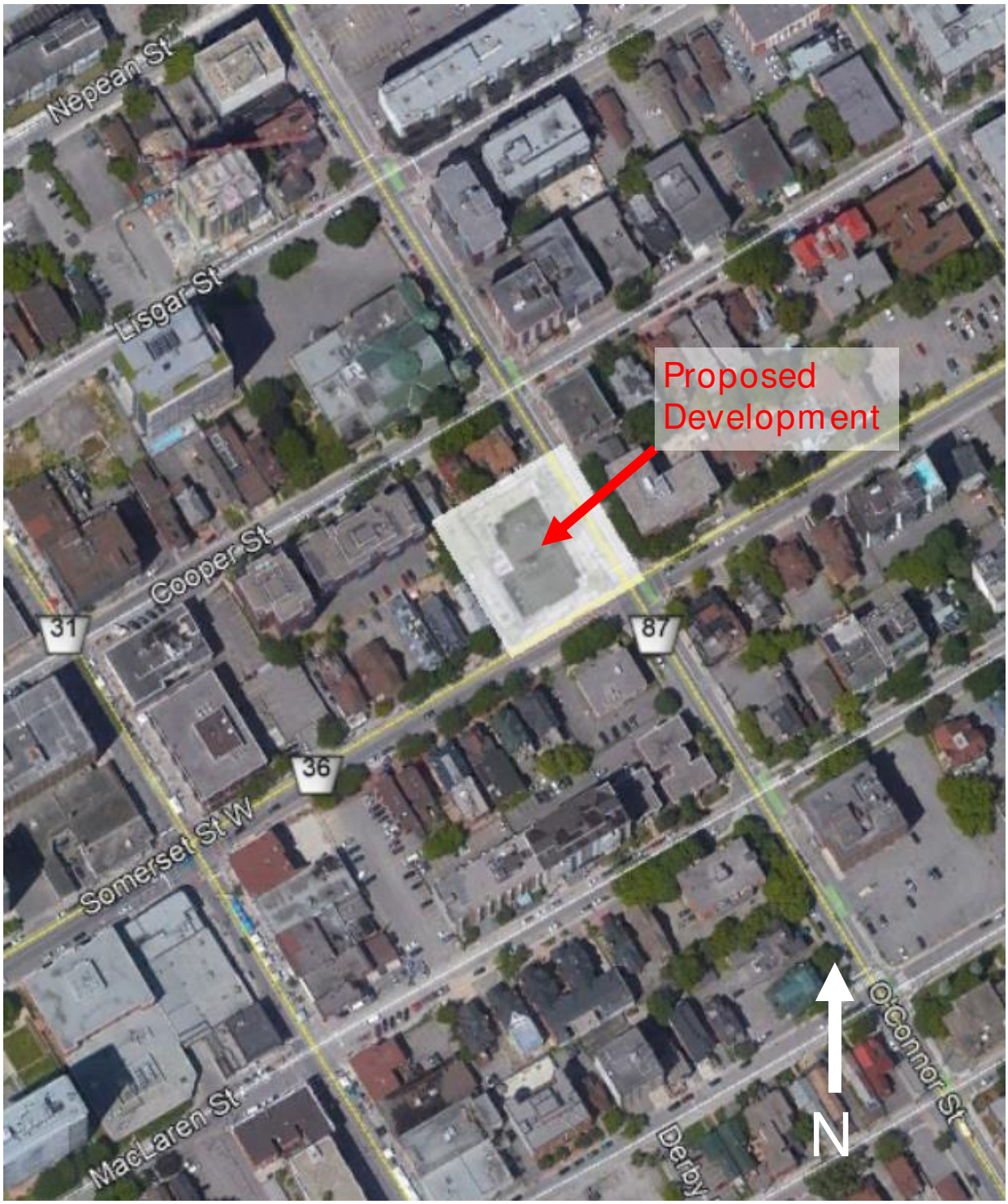

Figure 2: Aerial view of the site and surroundings

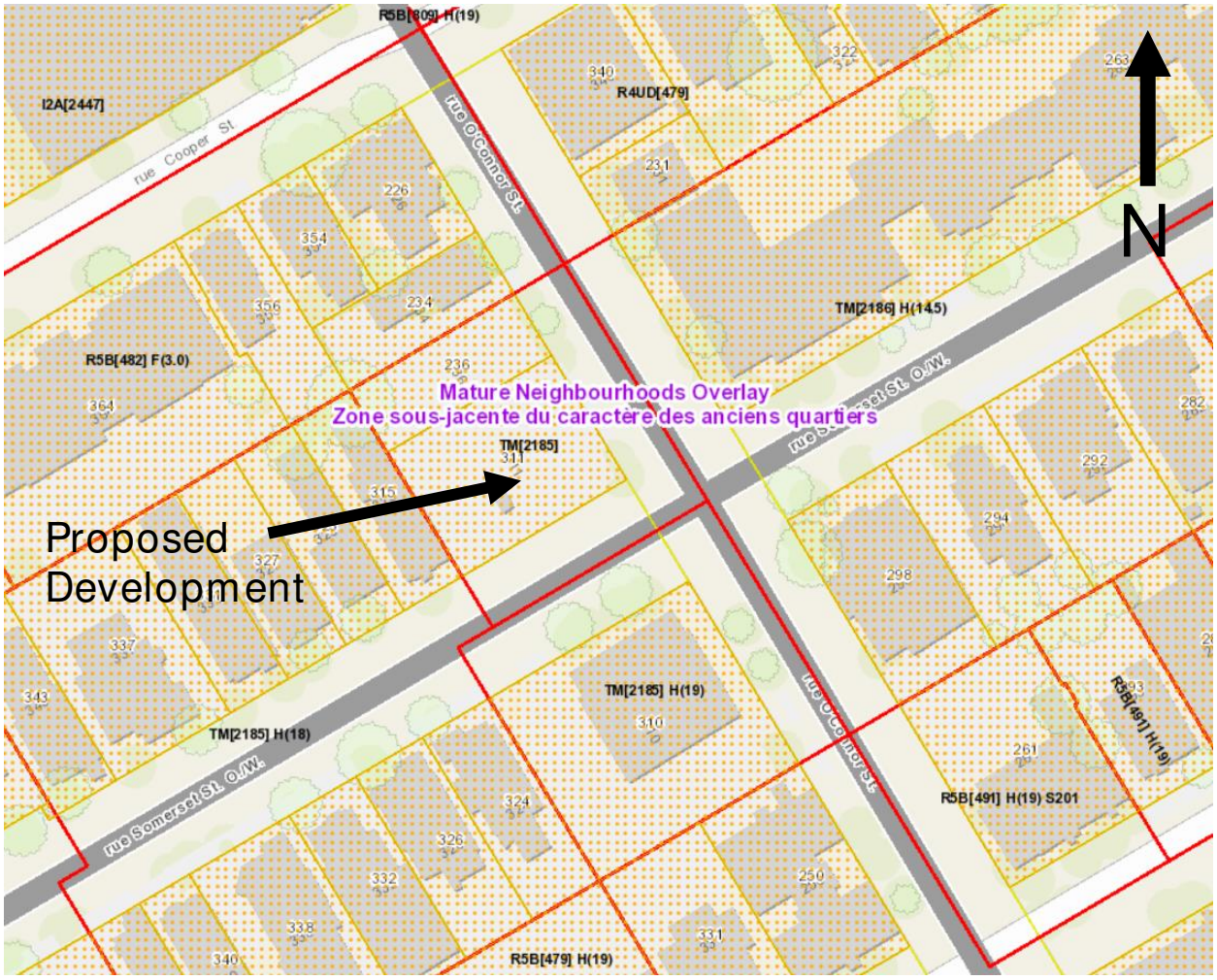

Figure 3: Zoning map of the project area[4]

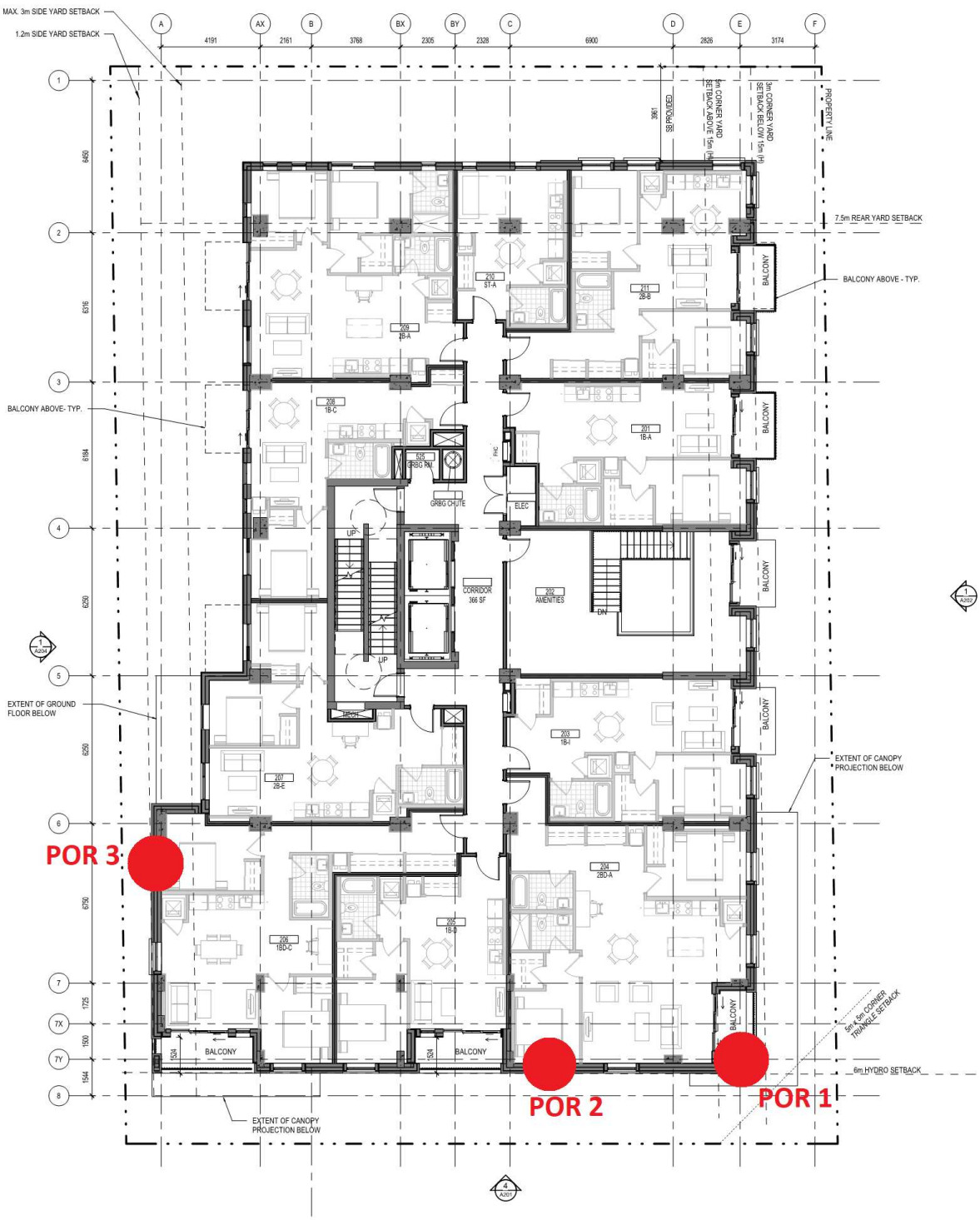

Figure 4: Points of Reception at the 2nd level

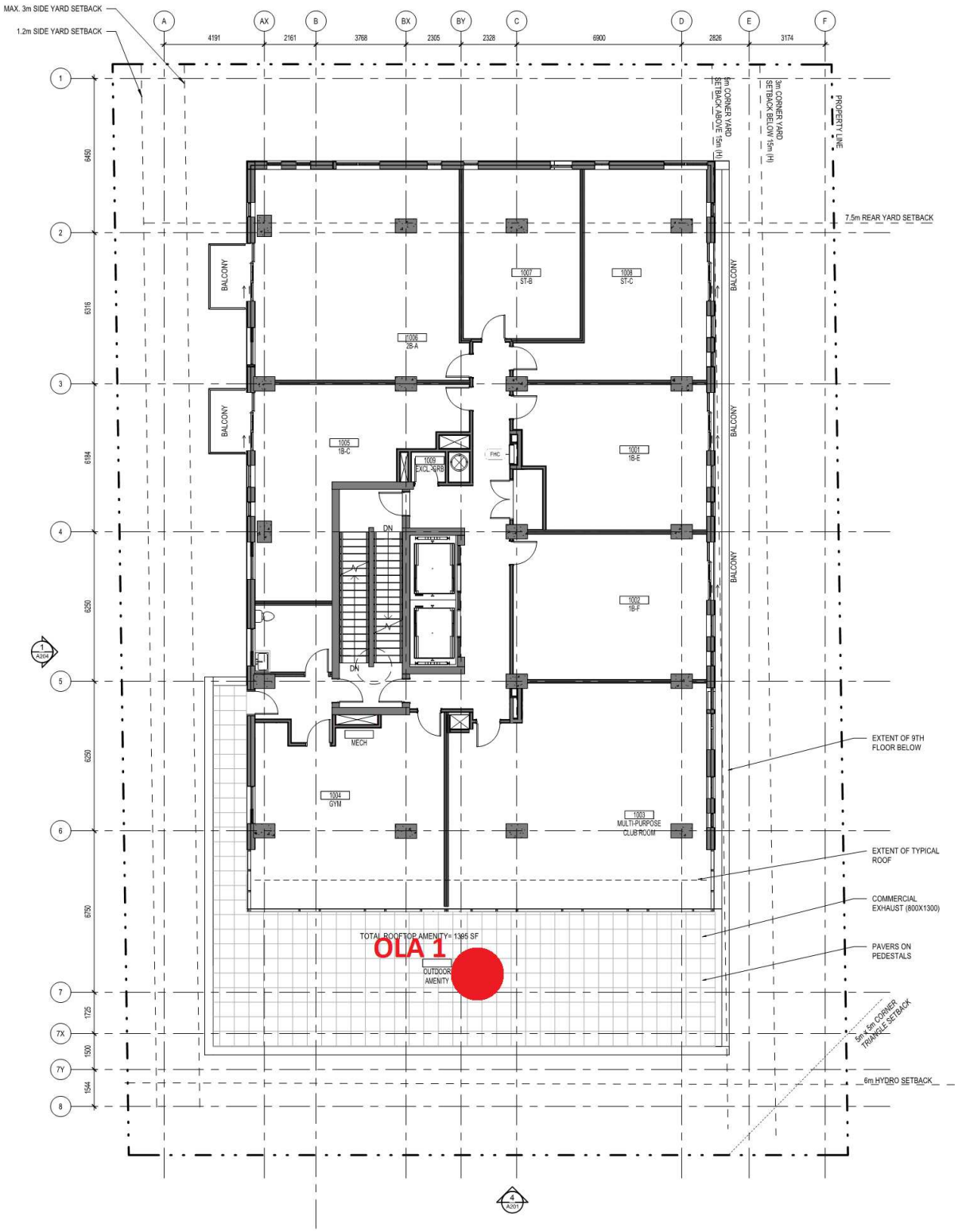

Figure 5: Outdoor Living Area on 10th level

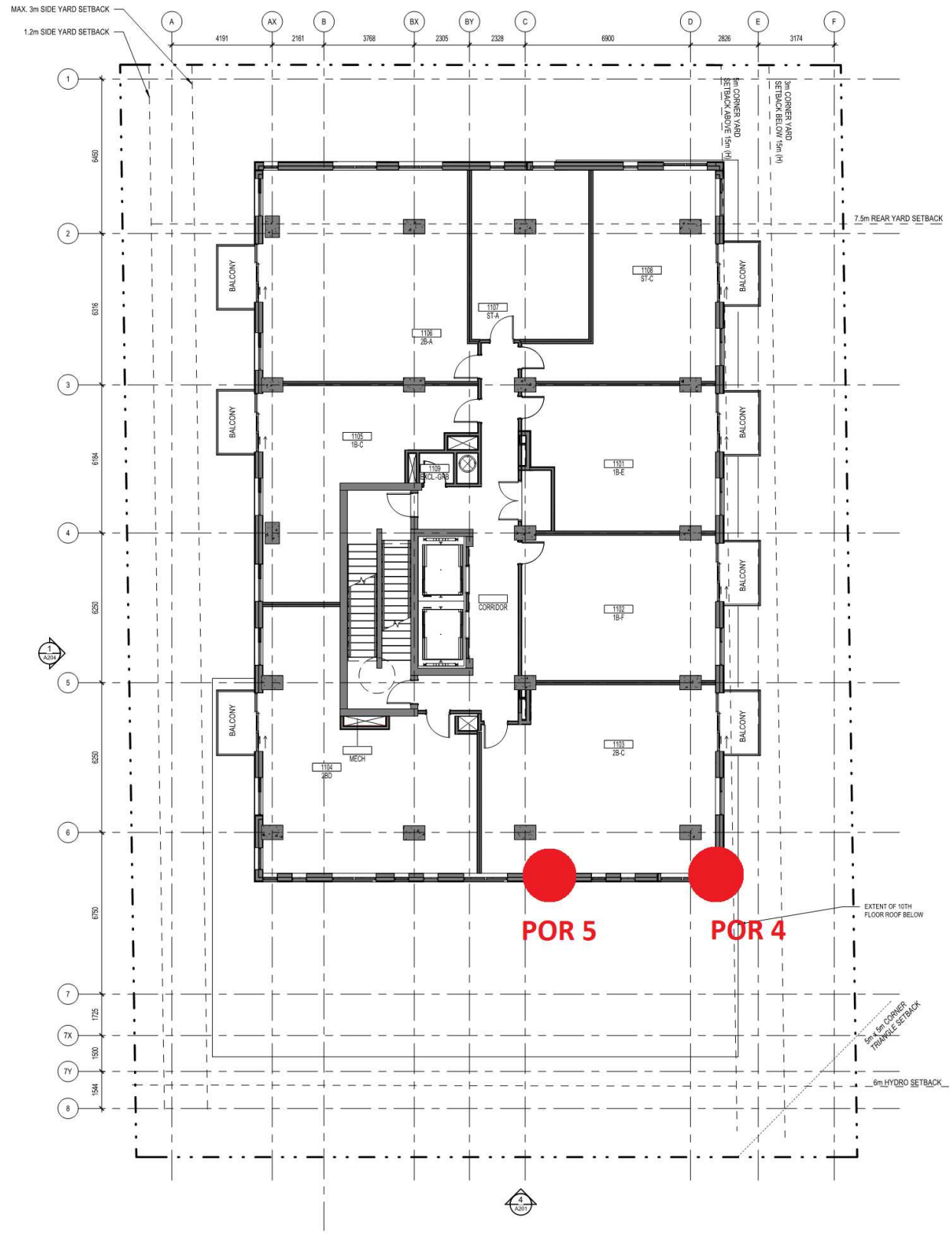

Figure 6: Points of Reception at the 11th level

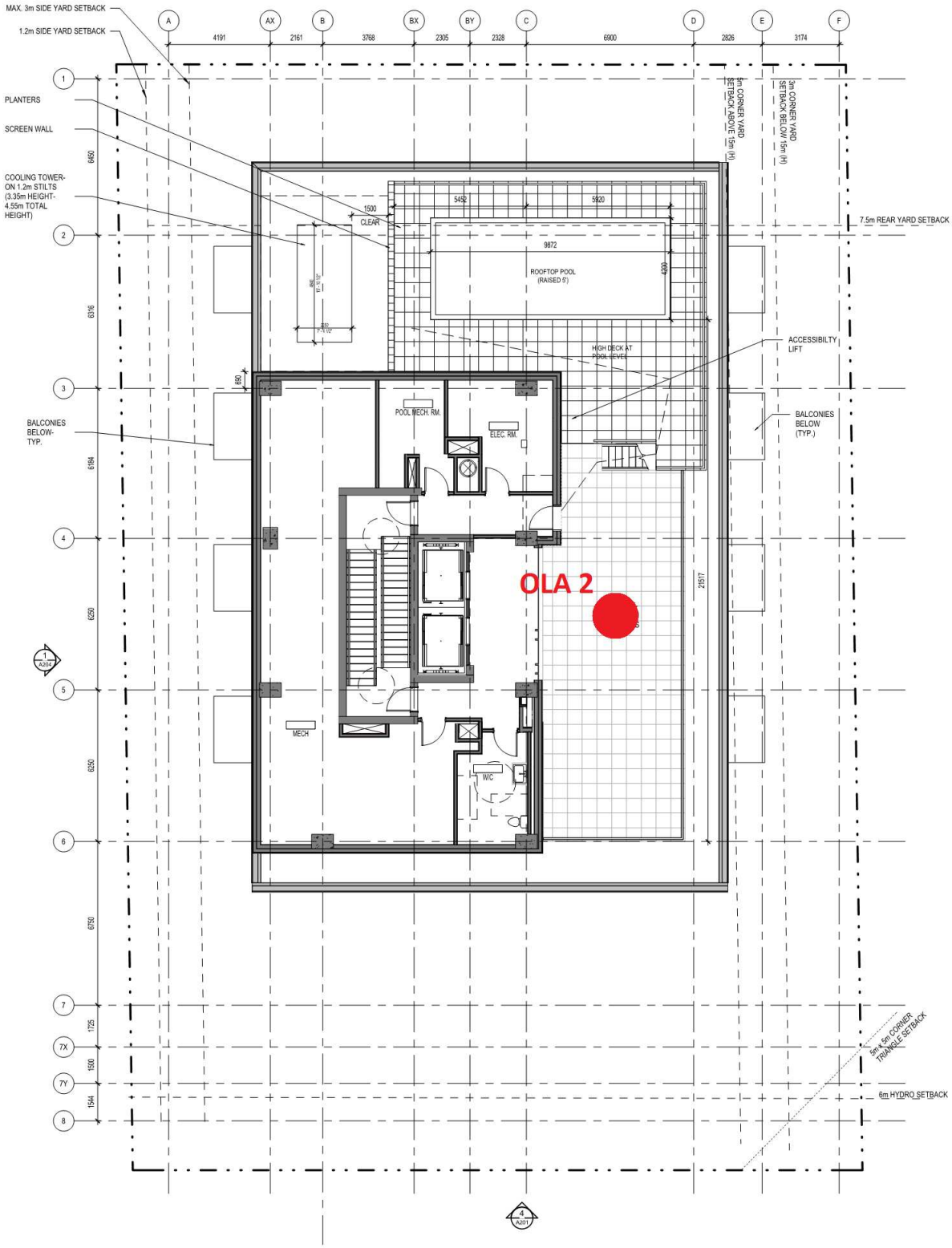

Figure 7: Outdoor Living Area on 17th level

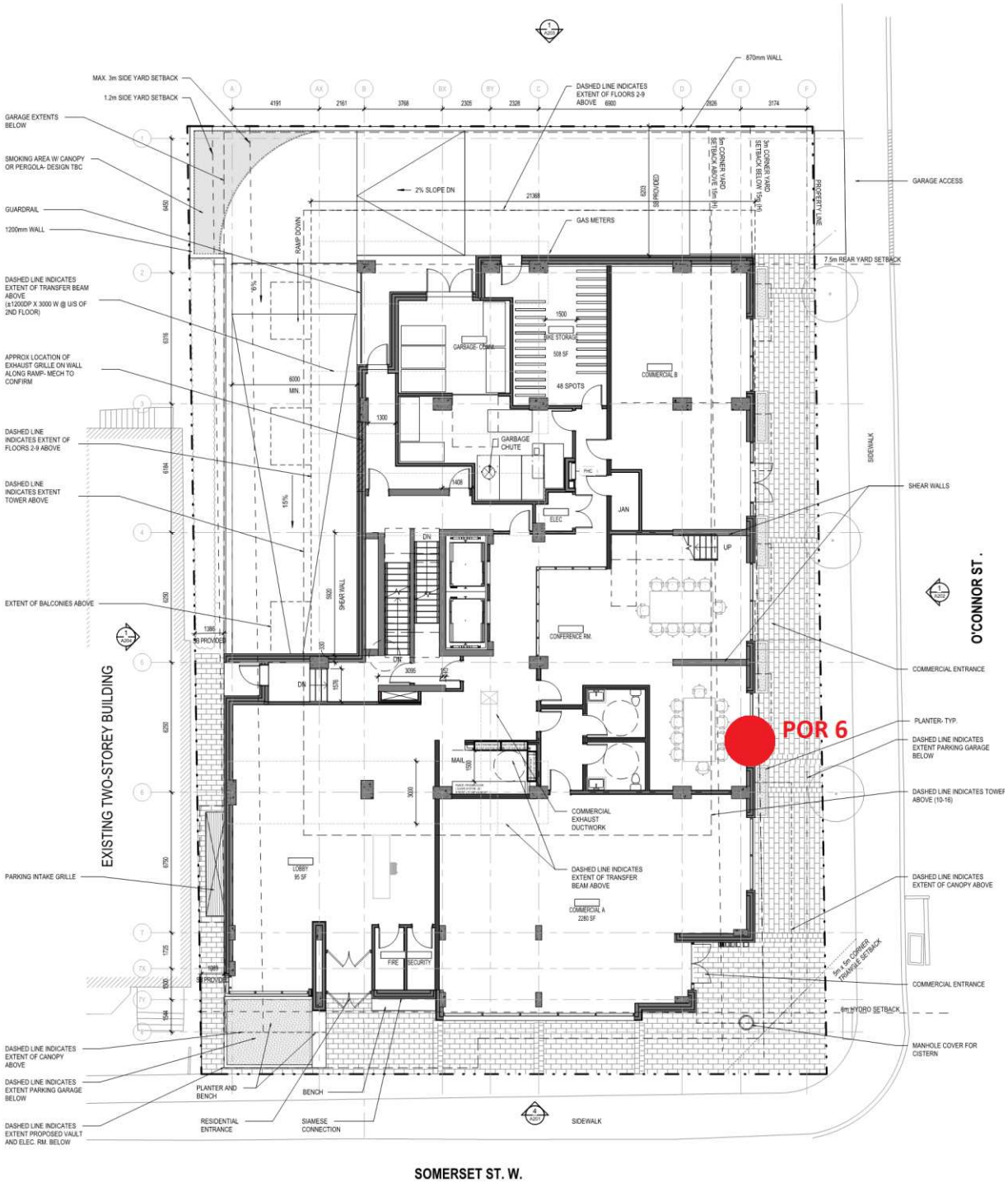

Figure 8: Points of Reception at the 1st level

Appendix B - Distances and Angles Used in STAMSON 5.04

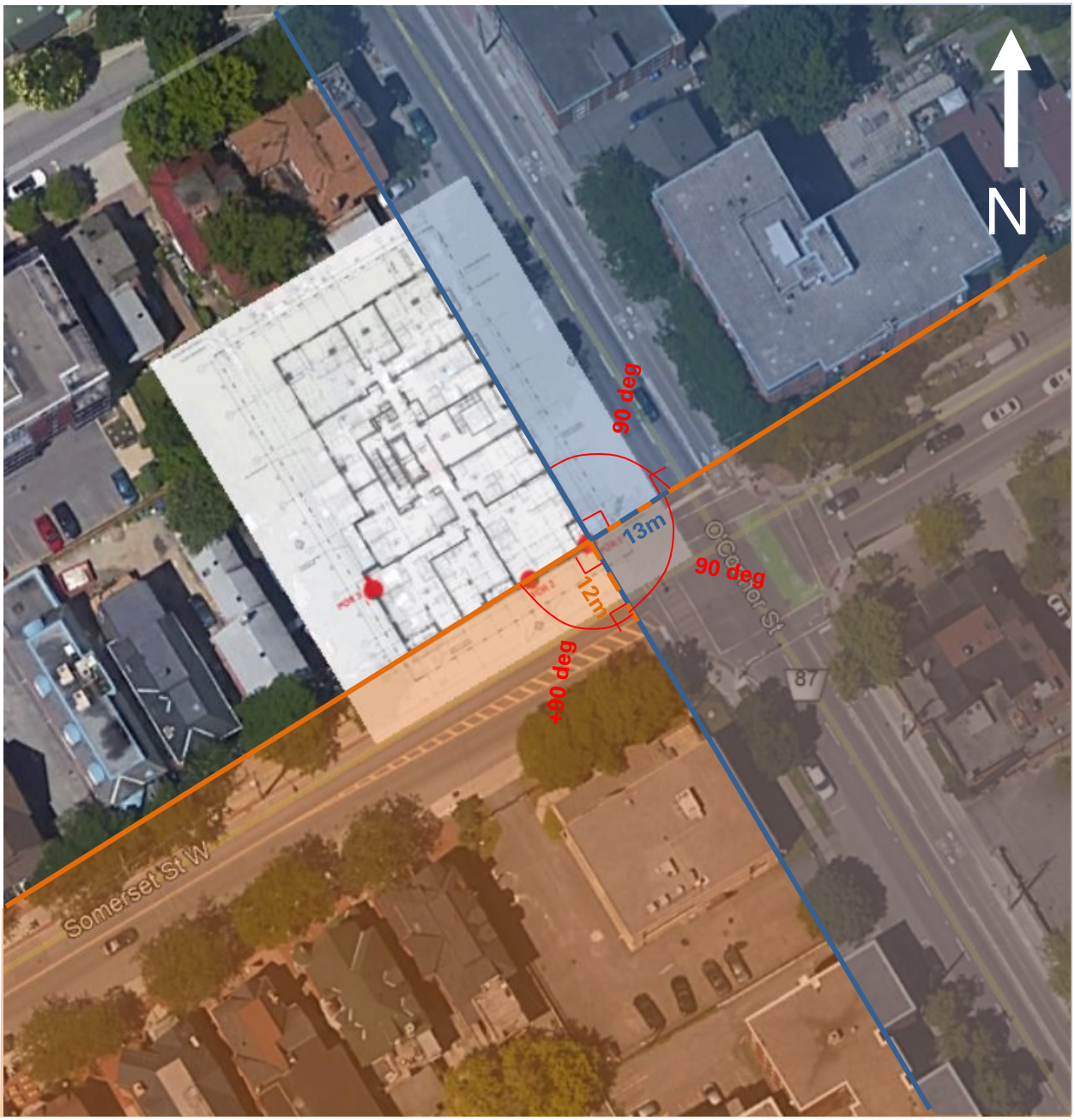

Figure 9: POR 1 distances and exposure angles to Somerset Street West and O'Connor Street.

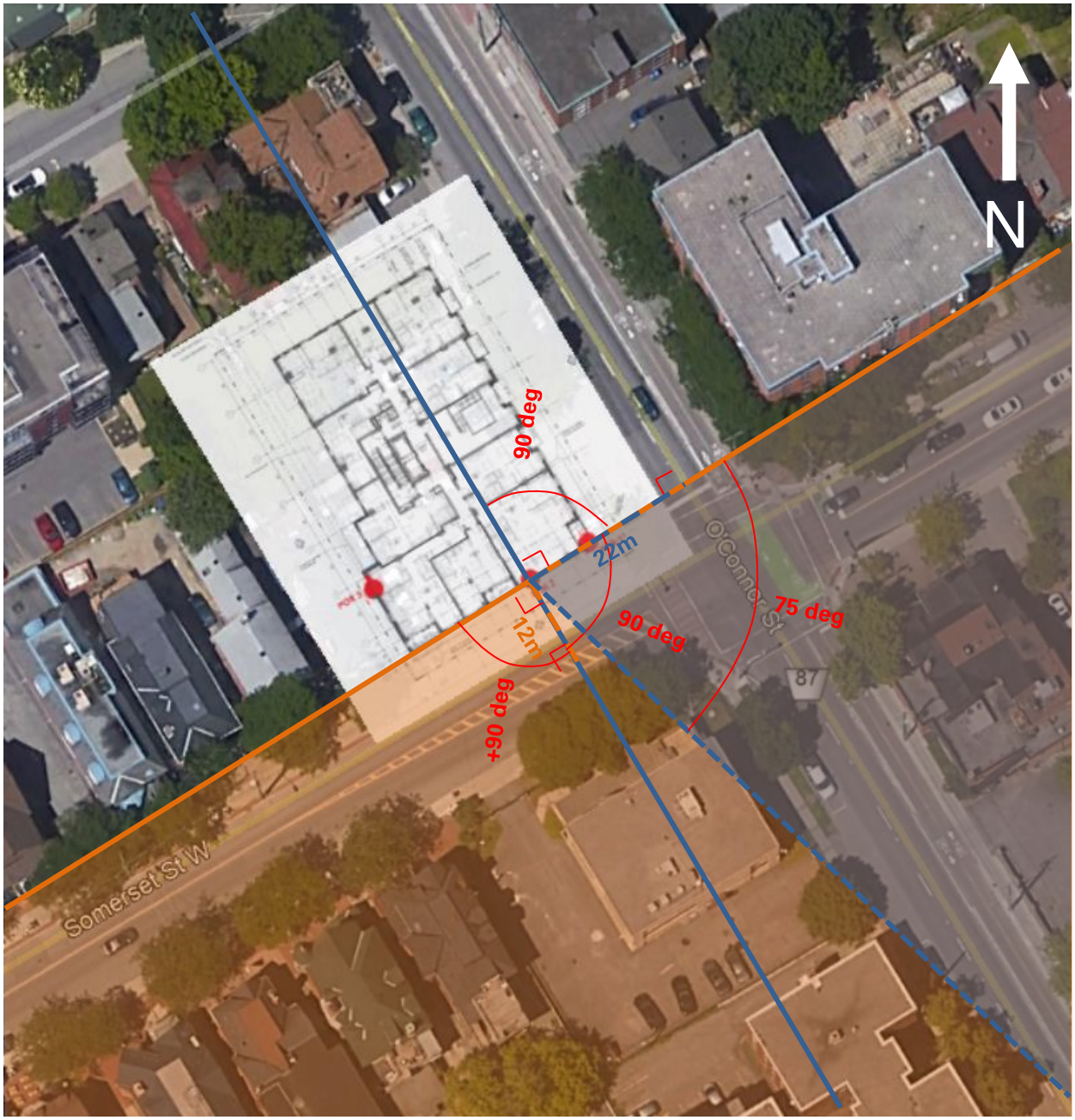

Figure 10: POR 2 distances and exposure angles to Somerset Street West and O'Connor Street.

Figure 11: POR 3 distances and exposure angles to Somerset Street West (no exposure to O'Connor St).

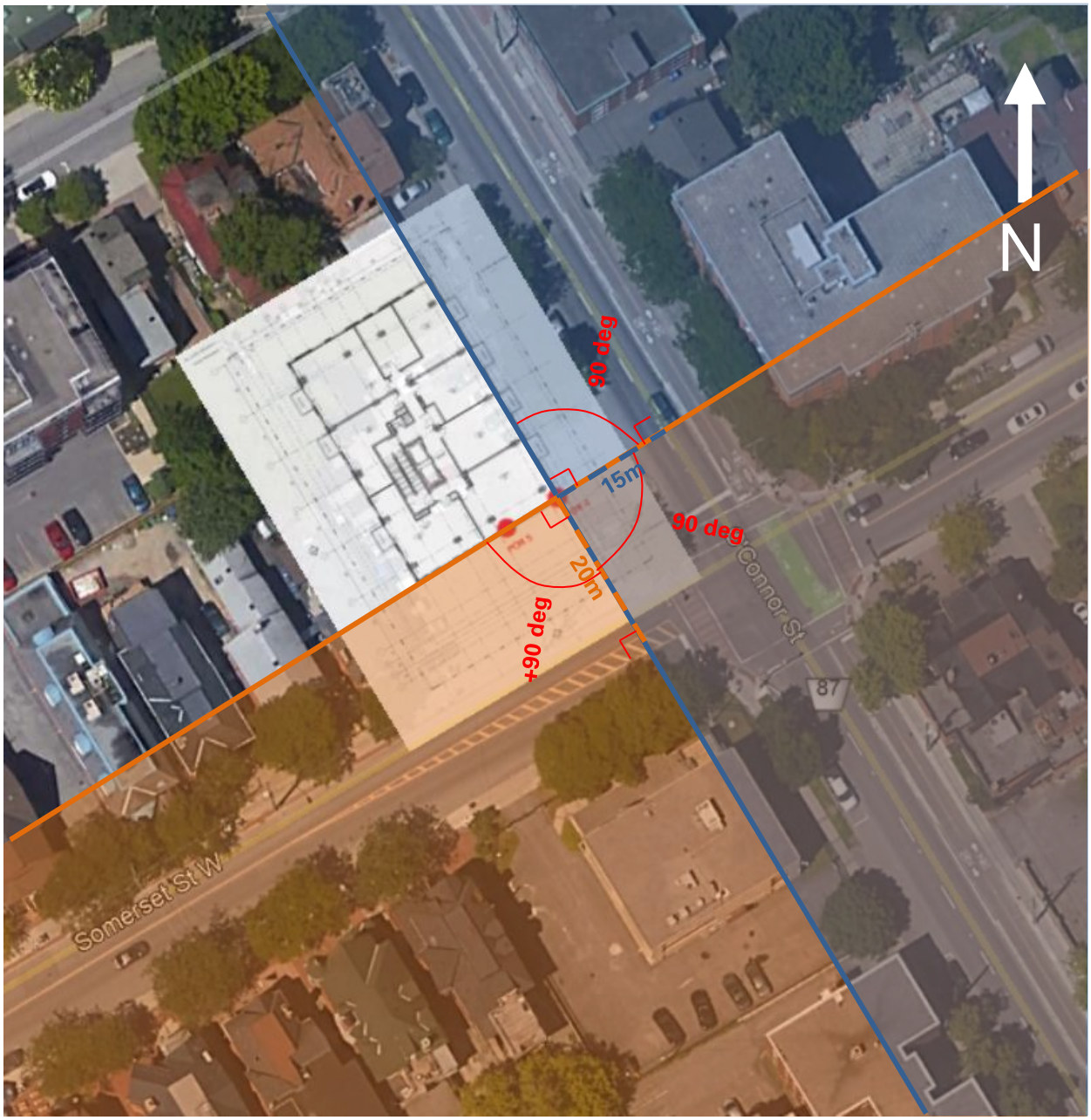

Figure 12: POR 4 distances and exposure angles to Somerset Street West and O'Connor Street.

Figure 13: POR 5 distances and exposure angles to Somerset Street West and O'Connor Street.

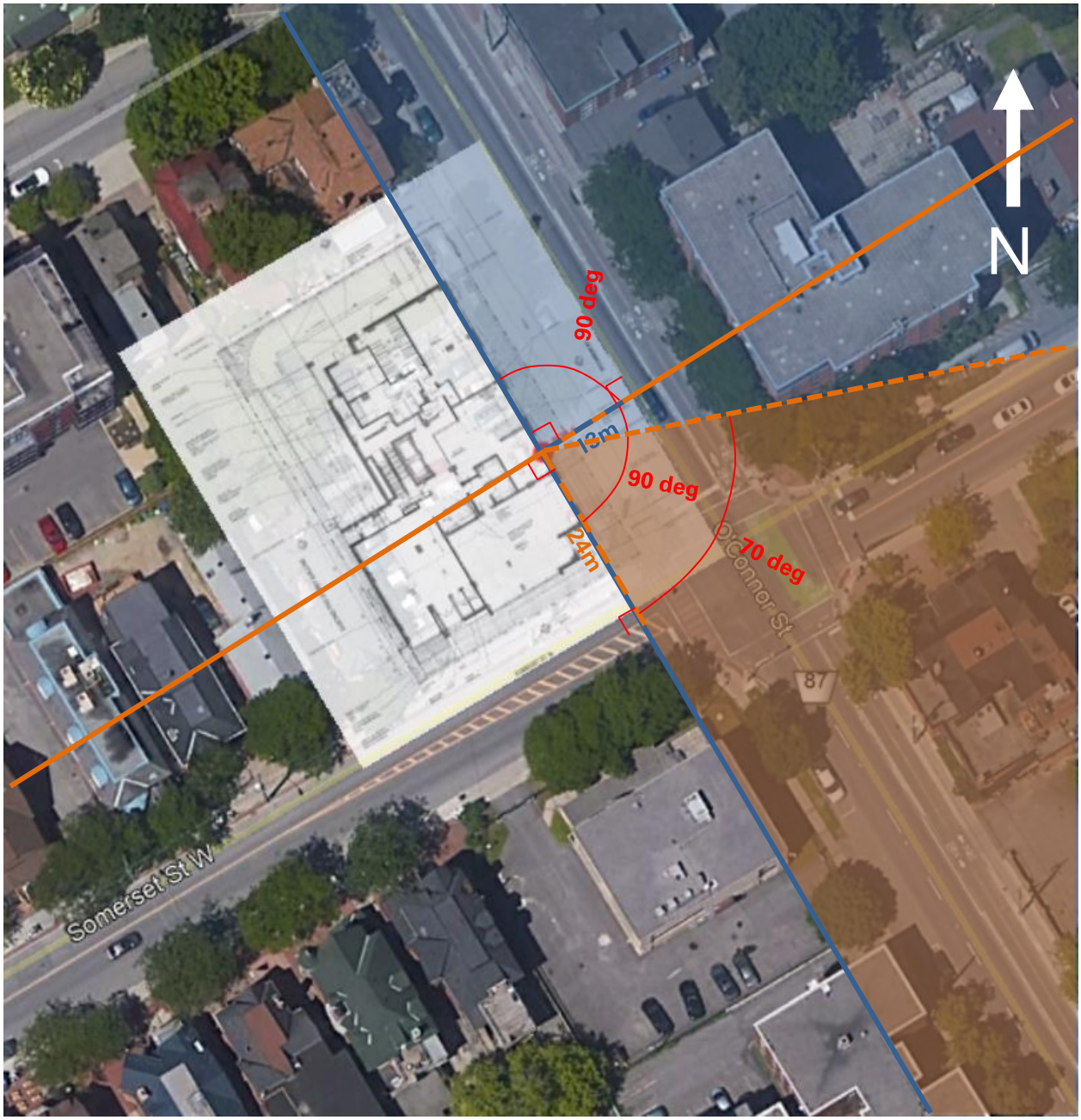

Figure 14: POR 6 distances and exposure angles to Somerset Street West and O'Connor Street.

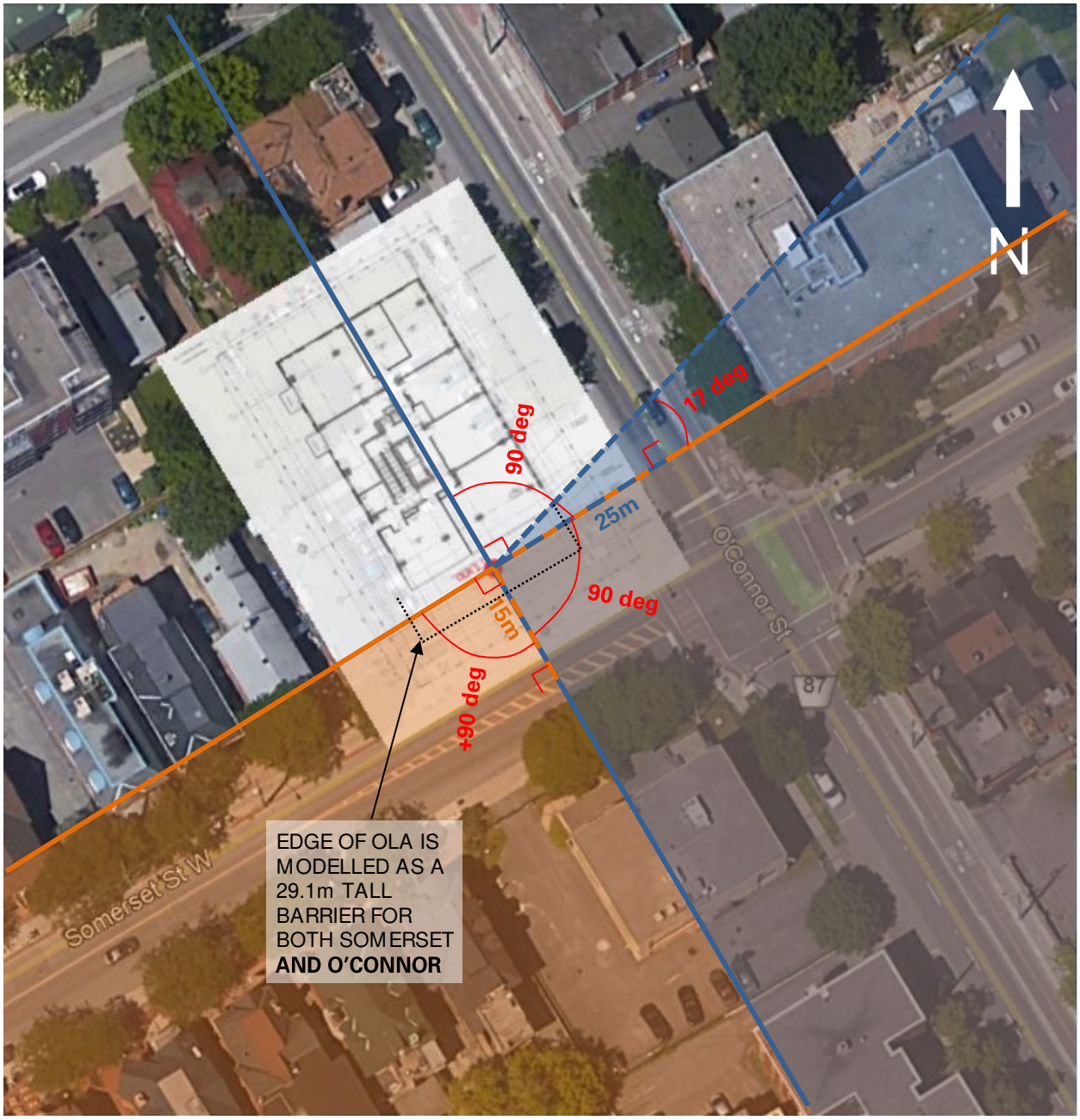

Figure 15: OLA 1 distances and exposure angles to Somerset Street West and O'Connor Street.

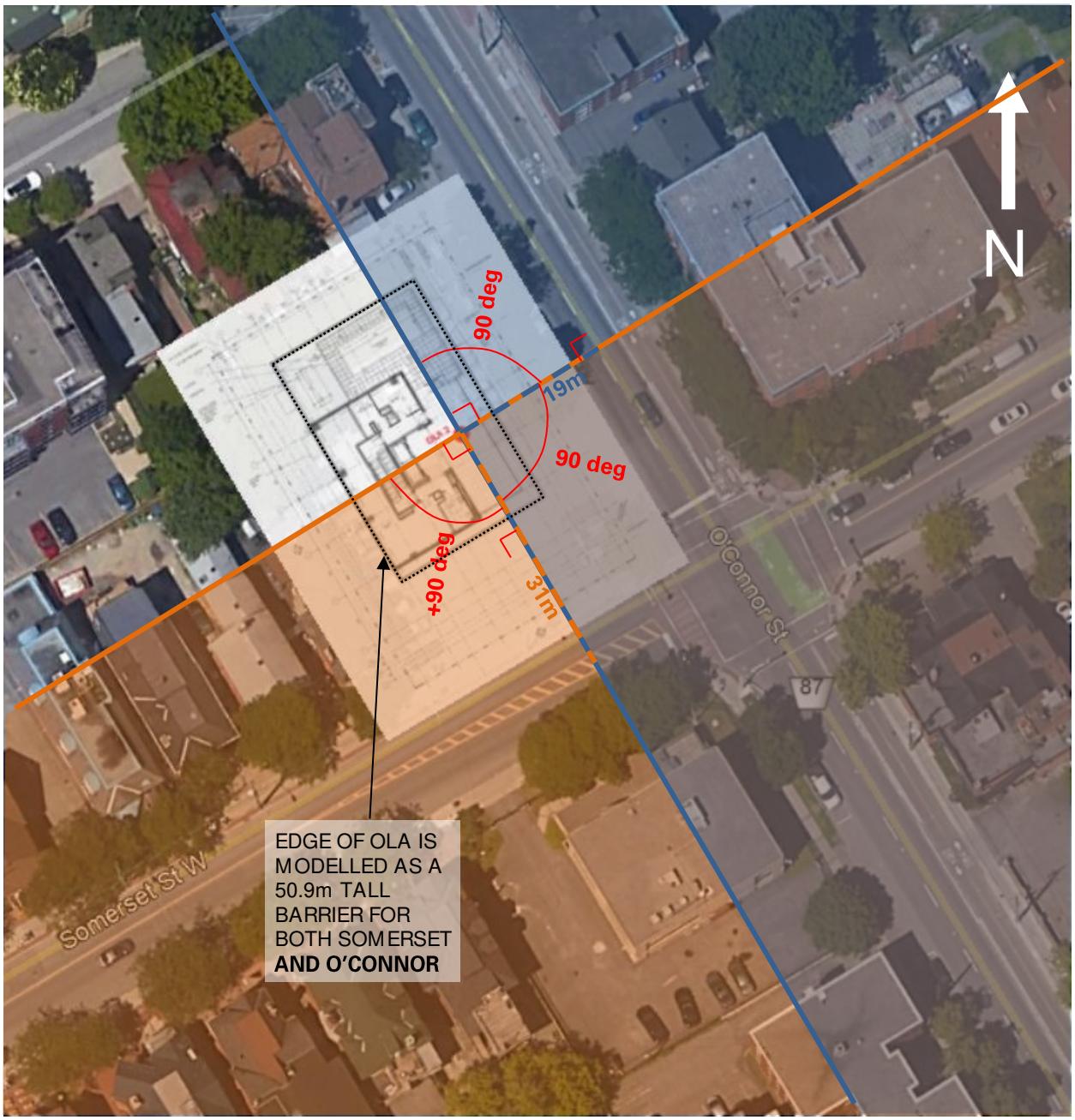

Figure 16: OLA 2 distances and exposure angles to Somerset Street West and O'Connor Street.

Appendix C - STAMSON 5.04 Calculations

```
STAMSON 5.0        SUMMARY REPORT        Date: 28-01-2021 22:15:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 311s_p1.te           Time Period: Day/Night 16/8 hours
Description: Noise level prediction at POR 1.


Road data, segment # 1: Somerset StW (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Somerset StW (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   6.20 / 6.20   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: O'Connor St (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00
```

```
Data for Segment # 2: O'Connor St (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   6.20 / 6.20   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Somerset StW	1.50	68.48	68.48
2.O'Connor St	1.50	68.48	68.48
Total			71.49 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Somerset StW	1.50	60.88	60.88
2.O'Connor St	1.50	60.88	60.88
Total			63.89 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 71.49
                           (NIGHT): 63.89
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 28-01-2021 22:16:03
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 311s_p2.te           Time Period: Day/Night 16/8 hours
Description: Noise level prediction at POR 2.


Road data, segment # 1: Somerset StW (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Somerset StW (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   6.20 / 6.20   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: O'Connor St (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: O'Connor St (day/night)
-----------------------------------------------
```

```
Angle1   Angle2           :   0.00 deg   75.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  22.00 / 22.00  m
Receiver height           :   6.20 / 6.20   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Somerset StW	1.50	68.48	68.48
2.O'Connor St	1.50	63.01	63.01
Total			69.56 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Somerset StW	1.50	60.88	60.88
2.O'Connor St	1.50	55.42	55.42
Total			61.97 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 69.56
                           (NIGHT): 61.97
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 28-01-2021 22:16:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 311s_p3.te           Time Period: Day/Night 16/8 hours
Description: Noise level prediction at POR 3.


Road data, segment # 1: Somerset StW (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Somerset StW (day/night)
-----------------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :   6.20 / 6.20   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.Somerset StW     !     1.50 !    64.22 !    64.22
--------------------+----------+----------+----------
                      Total                  64.22 dBA


Result summary (night)
----------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.Somerset StW     !     1.50 !    56.62 !    56.62
```

```
---------------------+----------+----------+----------
                      Total                   56.62 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 64.22
                           (NIGHT): 56.62
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 28-01-2021 23:10:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 311s_p4.te           Time Period: Day/Night 16/8 hours
Description: Noise level prediction at POR 4.


Road data, segment # 1: Somerset StW (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Somerset StW (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  37.70 / 37.70  m
Receiver height           :  33.80 / 33.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: O'Connor St (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: O'Connor St (day/night)
-----------------------------------------------
```

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  35.30 / 35.30  m
Receiver height           :  33.80 / 33.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Somerset StW	1.50	64.48	64.48
2.O'Connor St	1.50	64.76	64.76
Total			67.63 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Somerset StW	1.50	56.88	56.88
2.O'Connor St	1.50	57.17	57.17
Total			60.04 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 67.63
                           (NIGHT): 60.04
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 28-01-2021 23:18:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 311s_p5.te           Time Period: Day/Night 16/8 hours
Description: Noise level prediction at POR 5.


Road data, segment # 1: Somerset StW (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Somerset StW (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  37.70 / 37.70  m
Receiver height           :  33.80 / 33.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: O'Connor St (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: O'Connor St (day/night)
-----------------------------------------------
```

```
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  38.80 / 38.80  m
Receiver height           :  33.80 / 33.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Somerset StW	1.50	64.48	64.48
2.O'Connor St	1.50	61.34	61.34
Total			66.20 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Somerset StW	1.50	56.88	56.88
2.O'Connor St	1.50	53.75	53.75
Total			58.60 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 66.20
                           (NIGHT): 58.60
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 28-01-2021 22:17:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 311s_p6.te           Time Period: Day/Night 16/8 hours
Description: Noise level prediction at POR 6.


Road data, segment # 1: Somerset StW (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Somerset StW (day/night)
-----------------------------------------------
Angle1   Angle2           : -70.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  24.00 / 24.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: O'Connor St (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: O'Connor St (day/night)
-----------------------------------------------
```

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Result summary (day)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Somerset StW	1.50	62.34	62.34
2.O'Connor St	1.50	68.48	68.48
Total			69.43 dBA

Result summary (night)

	source height (m)	Road Leq (dBA)	Total Leq (dBA)
1.Somerset StW	1.50	54.74	54.74
2.O'Connor St	1.50	60.88	60.88
Total			61.83 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 69.43
                           (NIGHT): 61.83
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 28-01-2021 23:31:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 311s_o1.te           Time Period: Day/Night 16/8 hours
Description: Noise level prediction at OLA 1.


Road data, segment # 1: Somerset StW (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Somerset StW (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :  30.60 / 30.60  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  29.10 m
Barrier receiver distance :   4.00 / 4.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Road data, segment # 2: O'Connor St (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
```

```
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: O'Connor St (day/night)
-----------------------------------------------
Angle1   Angle2           : -17.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :  30.60 / 30.60  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -17.00 deg   Angle2 : 90.00 deg
Barrier height            :  29.10 m
Barrier receiver distance :  10.00 / 10.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.Somerset StW     !     1.50 !    54.14 !    54.14
 2.O'Connor St      !     1.50 !    46.67 !    46.67
--------------------+----------+----------+----------
                      Total                  54.86 dBA


Result summary (night)
----------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.Somerset StW     !     1.50 !    46.55 !    46.55
 2.O'Connor St      !     1.50 !    39.07 !    39.07
--------------------+----------+----------+----------
                      Total                  47.26 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 54.86
                           (NIGHT): 47.26
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 28-01-2021 23:35:31
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 311s_o2.te           Time Period: Day/Night 16/8 hours
Description: Noise level prediction at OLA 2.


Road data, segment # 1: Somerset StW (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Somerset StW (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  31.00 / 31.00  m
Receiver height           :  52.40 / 52.40  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  50.90 m
Barrier receiver distance :  11.00 / 11.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Road data, segment # 2: O'Connor St (day/night)
-----------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
```

```
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: O'Connor St (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  19.00 / 19.00  m
Receiver height           :  52.40 / 52.40  m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  50.90 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00


Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.Somerset StW     !     1.50 !    47.53 !    47.53
 2.O'Connor St      !     1.50 !    51.32 !    51.32
--------------------+----------+----------+----------
                      Total                  52.84 dBA


Result summary (night)
----------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+----------+----------+----------
 1.Somerset StW     !     1.50 !    39.93 !    39.93
 2.O'Connor St      !     1.50 !    43.73 !    43.73
--------------------+----------+----------+----------
                      Total                  45.24 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 52.84
                           (NIGHT): 45.24
```

Appendix D – Corrections Made to STAMSON 5.04 Calculations

Due to limitations in STAMSON, the following adjustments have been made to some calculation results:

- Due to the distance between the PORs and each road being less than the 15m minimum limit in STAMSON, a correction (level increase) was made to calculation results for POR 1, 2 and 6;
- Due to the height of the upper floors (Levels 11 to 16) and its distance from the roads, an adjustment was made in the calculations for POR 4 and 5, accounting for the actual distance of the PORs from the centerline of the roads in "Receiver-source distance".

Minimum Distance (Applicable to POR 1, 2 & 6)

The minimum source-receiver separation distance allowed by STAMSON is 15 metres. However, some PORs are located less than 15 m from the middle of Somerset Street West and/or O'Connor Street. Some results were therefore adjusted (increased) to account for the shorter separation distance, based on the propagation properties of a linear sound source. Calculations are shown in the table below.

Point of Reception (POR)	Time of Day	Road	STAMSON Noise Level Prediction at 15m (dBA)	Actual POR-Road Distance (m)	Adjustment	Resulting Noise Level Prediction Per Road (dBA)	Resulting Total Noise Level Prediction (dBA)
POR 1	Daytime (7h-23h)	Somerset St. W.	68.48	12	10log(15/12) = 0.97 dB increase	69.45	72.29
		O'Connor St.	68.48	13	10log(15/13) = 0.62 dB increase	69.10	
	Nighttime (23h-7h)	Somerset St. W.	60.88	12	10log(15/12) = 0.97 dB increase	61.85	64.69
		O'Connor St.	60.88	13	10log(15/13) = 0.62 dB increase	61.50	
POR 2	Daytime (7h-23h)	Somerset St. W.	68.48	12	10log(15/12) = 0.97 dB increase	69.45	70.34
		O'Connor St.	63.01	22	22m > 15m … no adj. needed.	63.01	
	Nighttime (23h-7h)	Somerset St. W.	60.88	12	10log(15/12) = 0.97 dB increase	61.85	62.74
		O'Connor St.	55.42	22	22m > 15m … no adj. needed.	55.42	
POR 6	Daytime (7h-23h)	Somerset St. W.	62.34	24	24m > 15m … no adj. needed.	62.34	69.93
		O'Connor St.	68.48	13	10log(15/13) = 0.62 dB increase	69.10	

Vertical Separation (Applicable to POR 4 & 5)

STAMSON calculates the noise attenuation due to the source-receiver distance using the "horizontal" distance only (i.e., height differences between the source and receiver are not accounted for in the calculation of noise attenuation due to distance). This provides valid results only if the horizontal source-receiver distance is much larger than the vertical distance. In the case of the proposed development, a tall building with transportation corridors in close proximity, the horizontal and vertical source-receive distances are of the same order of magnitude for POR 4 and 5. Therefore, per ORNAMENT [4, Section 5.5.3], "other means of assessment are necessary" to account for the noise attenuation due to distance.

In order to produce accurate results, the source-receiver distance entered represented the diagonal distance from the PORs to the centre of Somerset Street West and O'Connor Street, rather than the horizontal projection as expected by STAMSON. These PORs include reflective ground surfaces and no intervening barriers. Calculations are shown in the table below.

Point of Reception (POR)	Time of Day	Road	Horizontal Source-Receiver Distance (m)	Vertical Source-Receive Distance per Elevation Drawings (m)	Resulting Diagonal Source-Receiver Distance (m)	STAMSON Noise Level Prediction Using Diagonal Distance (dBA)	Resulting Total Noise Level Prediction (dBA)
POR 4	Daytime (7h-23h)	Somerset St. W.	20	32	$\sqrt{20^2 + 32^2} = 37.7$	64.48	67.63
		O'Connor St.	15	32	$\sqrt{15^2 + 32^2} = 35.3$	64.76	
	Nighttime (23h-7h)	Somerset St. W.	20	32	$\sqrt{20^2 + 32^2} = 37.7$	56.88	60.04
		O'Connor St.	15	32	$\sqrt{15^2 + 32^2} = 35.3$	57.17	
POR 5	Daytime (7h-23h)	Somerset St. W.	20	32	$\sqrt{20^2 + 32^2} = 37.7$	64.48	66.20
		O'Connor St.	22	32	$\sqrt{22^2 + 32^2} = 38.8$	61.34	
	Nighttime (23h-7h)	Somerset St. W.	20	32	$\sqrt{20^2 + 32^2} = 37.7$	56.88	58.60
		O'Connor St.	22	32	$\sqrt{22^2 + 32^2} = 38.8$	53.75	

Of note, both OLA STAMSON predictions were not adjusted per the method described above, due to the fact that the barrier attenuation factor would affect the result. The OLA predictions are therefore conservative in nature, and both below the 55 dBA threshold described in Table 1.