NOISE IMPACT FEASIBILITY STUDY
ISLAM CARE CENTRE
312 LISGAR STREET
OTTAWA, ONTARIO

FOR

ISLAM CARE CENTRE

PREPARED BY

SAM KULENDRAN, B.A.Sc., P.Eng.

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FEBRUARY 18, 2026

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INTRODUCTION

At the request of the Islam Care Centre, J.E. COULTER ASSOCIATES LIMITED has reviewed the proposed Islam Care Centre at 312 Lisgar Street in Ottawa, Ontario, for potential noise impact (see Appendix A, Figures 1 and 2). The purpose of this feasibility noise study is to establish noise mitigation measures that may be necessary as a result of transportation (roadways) and stationary sources to satisfy the requirements of the City of Ottawa and the Ministry of the Environment, Conservation and Parks (MECP) noise guidelines (see Appendix D, References 1 and 4).

SITE DESCRIPTION

The proposed site is located at 312 Lisgar Street (see Appendix A, Figures 3 to 10 for plans and elevations). This proposed institutional building is a 3-storey structure to be primarily a mosque (place of worship) and community health and resource centre and is considered by MECP to be a noise-sensitive institutional purpose building.

NOISE CRITERIA

The City of Ottawa's Environmental Noise Control Guidelines (ENCG) and MECP's *NPC-300* Noise Guidelines applies to the proposed institutional development site.

Transportation Sources

The proposed development is considered by MECP to be a noise-sensitive institutional purpose building.

MECP indoor sound limits for transportation sources applicable to noise-sensitive land uses have been expanded and present guidelines for acceptable indoor sound levels that are extended to land uses and developments that are not normally considered noise sensitive. The specified values are maximum sound levels and apply to the indicated indoor spaces with the windows and doors closed. The sound level limits in Table 1 are presented as information, for good-practice design objectives.

Table 1: Supplementary Indoor Sound Level Limits			
Type of Space	**Time Period**	**L_{eq} (dBA)**	
		Road	**Rail**
General offices, reception areas, retail stores, etc.	07:00–23:00	50	45
Living/dining areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, theatres, **places of worship**, libraries, individual or semiprivate offices, conference rooms, reading rooms, etc.	07:00–23:00	45	40
Sleeping quarters of hotels/motels	23:00–07:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	23:00–07:00	40	35

Stationary Sources

A review of the area found that there were no off-site stationary noise sources (i.e., mechanical ventilation sources) that would impact this proposed institutional development from a noise perspective. As the proposed building will have inoperable windows, it is considered to be noise insensitive.

On-site rooftop mechanical ventilation is a potential noise concern for those noise-sensitive residences in the immediate area. At this time, there are no specific details but a general review has been undertaken.

TRANSPORTATION NOISE SOURCES

The potential transportation noise concern for this proposed development is the traffic on Lisgar and Bank Streets to the north and west, respectively, and Cooper Street to the south.

Based on the City of Ottawa's Environmental Noise Control Guidelines (Table 1.7), the traffic volumes as shown in Table 2, below, were assumed for Lisgar and Bank streets.

Table 2: Ultimate Traffic Volumes					
Roadway	**AADT (Veh/Day)**	**Truck Percentage**		**Day/Night Split (%)**	**Posted Speed Limit**
		Medium	**Heavy**		
Bank Street, 2 lanes Urban Arterial (2-UAU)	15,000	7%	5%	92/8	50 kph
Lisgar Street, 2 lanes Urban Collector (2-UCU)	8,000	7%	5%	92/8	50 kph
Cooper Street, 2 lanes Urban Collector (2-UCU)	8,000	7%	5%	92/8	50 kph

PROJECTED SOUND LEVELS

The MECP's *ORNAMENT* noise prediction procedure (*STAMSON Version 5.04* computer programme) was used to predict the sound levels. *STAMSON 5.04* uses the daily traffic volumes for the road and basic topographical information for the site in its calculations (see Appendix B).

Table 3, below, provides the projected unmitigated sound levels at various locations exposed to Lisgar and Bank streets. The distances between the source and receivers and segment angles are provided in Appendix A, Figures 11 to 14 . The centrelines of Lisgar, Bank and Cooper streets are approximately 12m, 49m and 43m from the closest building façades, respectively.

Table 3: Projected Sound Levels

Location	Daytime (dB L_{eq})				Nighttime (dB L_{eq})			
	Lisgar Street	**Bank Street**	**Cooper Street**	**Total**	**Lisgar Street**	**Bank Street**	**Cooper Street**	**Total**
Loc 1 – NE Façade	67	56	--	**67**	59	48	--	**59**
Loc 2 – NW Façade	67	58	44	**67**	59	50	37	**60**
Loc 3 – SE Façade	--	--	60	**60**	--	--	52	**52**
Loc 4 – SW Façade	57	50	52	**58**	49	44	44	**51**

As summarized in the table above, the projected total sound levels generated by Lisgar, Bank and Cooper streets are typical for a downtown urban area. Given the modest sound levels, standard commercial glazing (typically 6mm double glazing on a 13mm air gap) is sufficient. As MECP's supplementary noise guidelines are suggestions and not required, the interior sound levels from exterior traffic noise in the noise-sensitive areas (prayer areas) are expected to be well within these guidelines. The calculated interior ambient sound levels from traffic noise is expected to be below 40 dBA. No further upgrades are needed.

ON-SITE MECHANICAL EQUIPMENT

A preliminary review was undertaken for the rooftop mechanical ventilation equipment for the Islam Care Centre. The provided information regarding the anticipated equipment is very preliminary and can change. For this report, the system assumed is a cold-climate VRF (Variable Refrigeration Flow) System with heat recovery, integrated with a DOAS (Dedicated Outdoor Air System) that includes Energy Recovery Ventilation (ERV). The analysis assumed that the HVAC equipment is operating at a 100% duty cycle between 0700 and 2300 hours (daytime). At night, with reduced loads, the HVAC equipment is assumed to be operating at a 50% duty cycle.

For this preliminary review, four off-site points of reception were considered for the analysis of the rooftop mechanical ventilation system at the Islam Care Centre. They are:

R1: 300 Lisgar Street – Apartment Building (West Façade)
R2: 369 Cooper Street – 3 Storey Building (North Façade)
R3: 311 Lisgar Street – 3-Storey Apartment Building (South Façade)
R4: Bank Street – Apartments above commercial (East Façade).

The sound levels were calculated using the MECP's sound level exclusion limits of 50 dB L_{eq} (1 hour) daytime and 45 dB L_{eq} (1 hour) nighttime. The existing ambient sound levels during the daytime at the off-site receptors is expected to range from 50 to 55 dB L_{eq} At nighttime, the ambient traffic is expected to be approximately 45 dB $L_{eq.}$ This represents the worst-case scenario.

Table 4: Sound Levels (1 Hour L_{eq}) at Residential Locations (Unmitigated) – Rooftop HVAC Units (Class 1)

SOURCE	R1	R2	R3	R4
Daytime: 0700–2300 Hours (Quietest 1 Hour)				
DOAS – Rooftop	59.1	34.1	39.5	46.8
VRF Units – Rooftop	48.6	22.2	28.1	29.8
Air-Cooled Condensers – Rooftop	51.5	26.8	32.6	40.0
Total Sound Level	60	36	41	48
MECP Criteria (Daytime), Class 1	50	50	50	50
Noise Impact (dB)	10	-14	- 9	- 2
Meets Noise Criteria	**NO**	**YES**	**YES**	**YES**
Nighttime: 2300–0700 Hours (Quietest 1 Hour)				
DOAS – Rooftop	56.1	31.1	36.5	43.8
VRF Units – Rooftop	45.6	19.2	25.1	26.8
Air-Cooled Condensers – Rooftop	48.5	23.8	29.6	37.0
Total Sound Level	57	33	38	45
MECP Criteria (Nighttime), Class 1	45	45	45	45
Noise Impact (dB)	12	-12	- 7	0
Meets Noise Criteria	**NO**	**YES**	**YES**	**YES**

The unmitigated sound levels are expected to generate a 10 to 12 dB noise impact at R1 (apartment building to the east) given the short setback. As the unmitigated sound level will be well above MECP's noise criteria during the daytime and nighttime periods at the adjacent apartment building to the east, noise control measures will be required.

All other points of reception are sufficiently set back and meet the MECP's noise criteria.

At the time of final mechanical design, the rooftop HVAC equipment should be reviewed to ensure the development itself meets the City of Ottawa's noise criteria. If noise control measures are required, this may include but not be limited to the installation of intake and exhaust silencers, enclosures, barriers, locating equipment as far back as possible for noise-sensitive receptors, or the selection of quieter equipment.

CONCLUSIONS

As the building will be provided with doubled-glazed windows throughout, MECP's suggested interior noise guidelines are expected to be met. These are considered to be standard construction measures used on many buildings in urban areas and not an onerous requirement.

The rooftop ventilation equipment is expected to have a noise impact, unmitigated, at the adjacent residential properties. Noise control measures need to be considered at the time of detailed design to meet the noise guidelines.

RECOMMENDATIONS

To meet the current noise guidelines of the City of Ottawa and MECP, the following recommendations are proposed:

1. It is recommended that noise control measures be considered for the rooftop ventilation equipment at the proposed building as the unmitigated sound level will be well above MECP's noise criteria during the daytime and nighttime periods at the adjacent apartment building to the east.

2. At this time, there are no specific details regarding the rooftop ventilation systems. As the existing residential apartment buildings directly to the east will be overlooking the rooftop equipment, noise control measures are expected to include but not be limited to intake and exhaust silencers on HVAC equipment (cooling towers and air cooled chillers), insulated ducting and the selection of quieter equipment, and the use of various frequency drives.

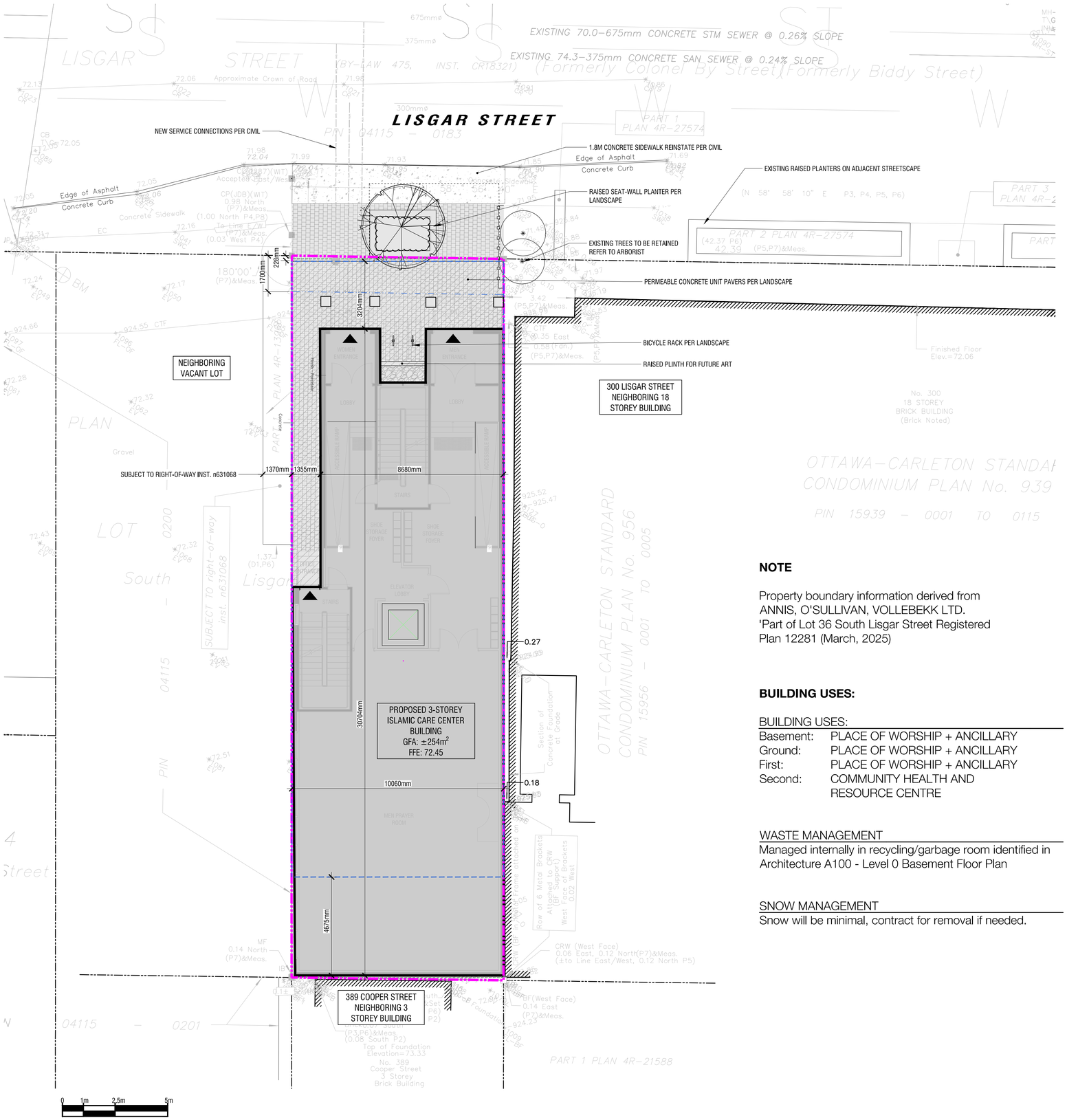
3. It is recommended a review of the final mechanical design be completed to ensure there are no off-site noise impacts, as required by the City of Ottawa and MECP's *NPC-300* noise criteria.

\hp

APPENDIX A: FIGURES


PROPOSED ISLAMIC CENTRE-->
312 Lisgar St
Lisgar St
Nepean St
O'Connor St
Cooper St
North & Navy
J:unique kitchen
Sandbox Tattoos Ottawa
Prohibition Public House
Arlo Wine & Restaurant
31
36
81 m
Google Earth

FIGURE 1



1 **SITE PLAN**
SP1 **1:100**

NOTE

Property boundary information derived from ANNIS, O'SULLIVAN, VOLLEBEKK LTD. 'Part of Lot 36 South Lisgar Street Registered Plan 12281 (March, 2025)

BUILDING USES:

BUILDING USES:	
Basement:	PLACE OF WORSHIP + ANCILLARY
Ground:	PLACE OF WORSHIP + ANCILLARY
First:	PLACE OF WORSHIP + ANCILLARY
Second:	COMMUNITY HEALTH AND RESOURCE CENTRE

WASTE MANAGEMENT

Managed internally in recycling/garbage room identified in Architecture A100 - Level 0 Basement Floor Plan

SNOW MANAGEMENT

Snow will be minimal, contract for removal if needed.

SITE INFORMATION

ZONING	I1A (1912)

LOT DIMENSIONS	
Minimum lot width	10.06 m
Minimum lot area	344 m²

SETBACKS	F.Y.	S.Y.	R.Y.	I.S.Y
	1.7m	0m	0m	4.5m (EXCEPT GROUND FLOOR)

SITE AREA	
Total Site Area:	344.6 m²

BUILDING	
Height:	3 Storeys (15m)
Area:	254 m²

GFA	
Basement:	304 m²
Ground:	254 m²
First:	254 m²
Second:	244 m²
Roof:	50 m²
Total:	1106 m²

PARKING	Required	Provided
	0	0

LANDSCAPE AREA	
Provided	34 m²

PROJECT CONSULTANTS

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LRL ENGINEERING SERVICES
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ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
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NEPEAN, ON K2E 7S6
PHONE: 613-727-0850

Client / Client

ISLAM CARE CENTRE

key plan / plan repère

legend / légende

- PROPERTY LINE
- APPROXIMATE LINE OF REQUIRED SETBACK
- APPROXIMATE EXTENT OF BUILDING BELOW
- APPROXIMATE EXTENT OF BUILDING ABOVE
- DECIDUOUS TREE FORM SHRUB (SEE LANDSCAPE NOTES & SCHEDULE FOR SPECIES AND QUANTITIES)
- EXISTING TREES TO BE PROTECTED
- CIP CONCRETE
- UNIT PAVING
- RIVERWASH STONE
- BUILDING OVERHANG ABOVE

NOT FOR CONSTRUCTION

rev'n	description / la description	yyyy/mm/dd
03	re-issue for Site Plan Control	2025/12/01
02	issue for Site Plan Control	2025/10/28
01	issue for Site Plan Control	2025/07/28
00	issue for Client review	2025/06/10

FOTENN Planning + Design
420 O'Connor Street
Ottawa, ON, CANADA K2P 1W4
613.730.5709
fotenn.com

north / le nord

stamp / le cachet

ONTARIO ASSOCIATION OF LANDSCAPE ARCHITECTS
F. DOUGLAS FOUNTAIN
OALA MEMBER

project / projet

312 Lisgar St.

drawing / dessin

SITE PLAN

designed / conçu	drawn / dessiné	reviewed / examiné
ST / DF	ST	DF

date: MAY 2025
project number / No. du projet:

drawing number / No. du dessin: **SP 1**

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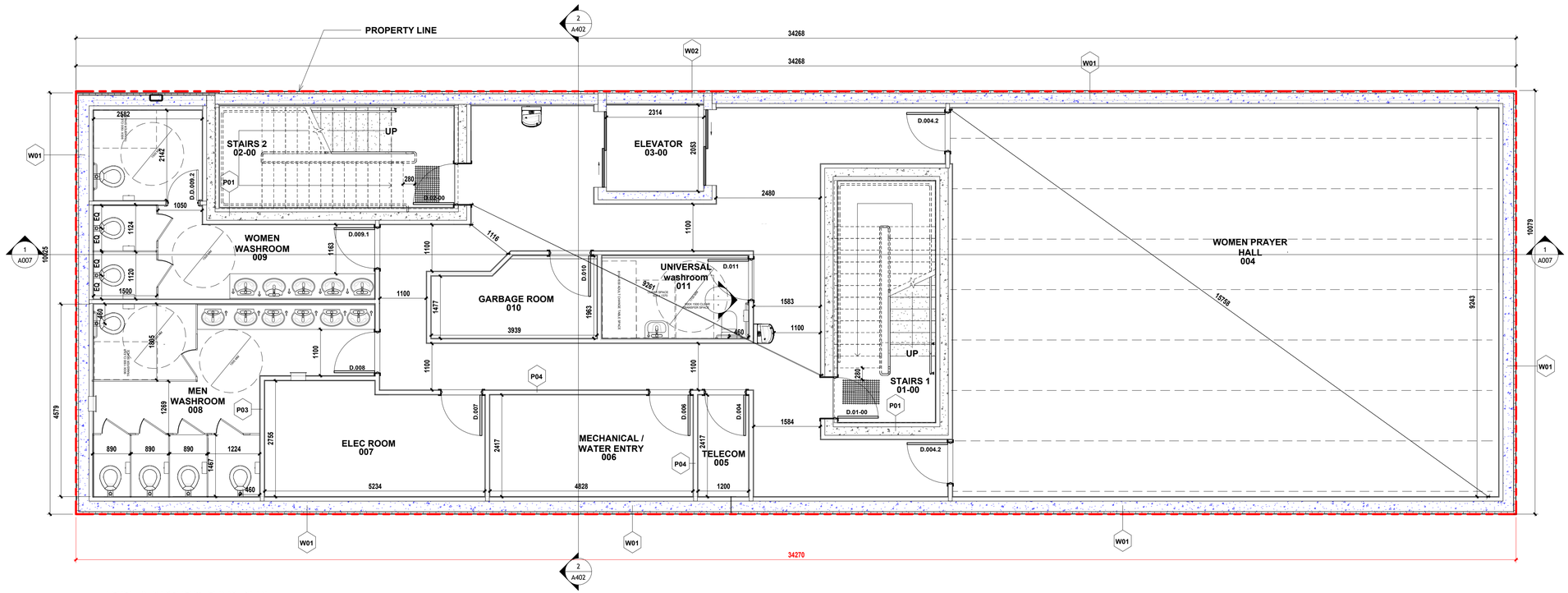

1 LEVEL 0 BASEMENT FLOOR PLAN

1 : 50

ISLAM CARE CENTRE

No.	Description	Date
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Consultant:

Project Name:
ISLAM CARE CENTRE

Project number:
2501-00

Client:
ISLAM CARE CENTRE

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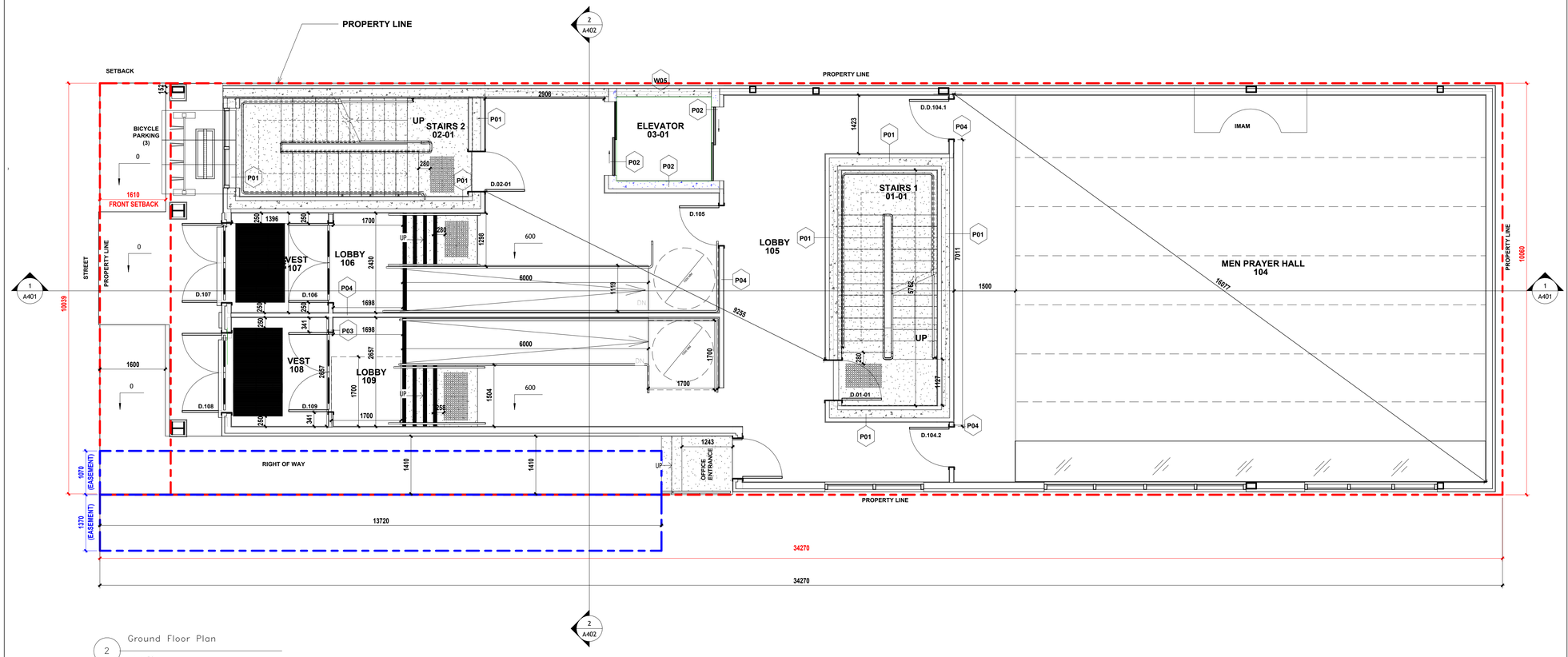

2 Ground Floor Plan

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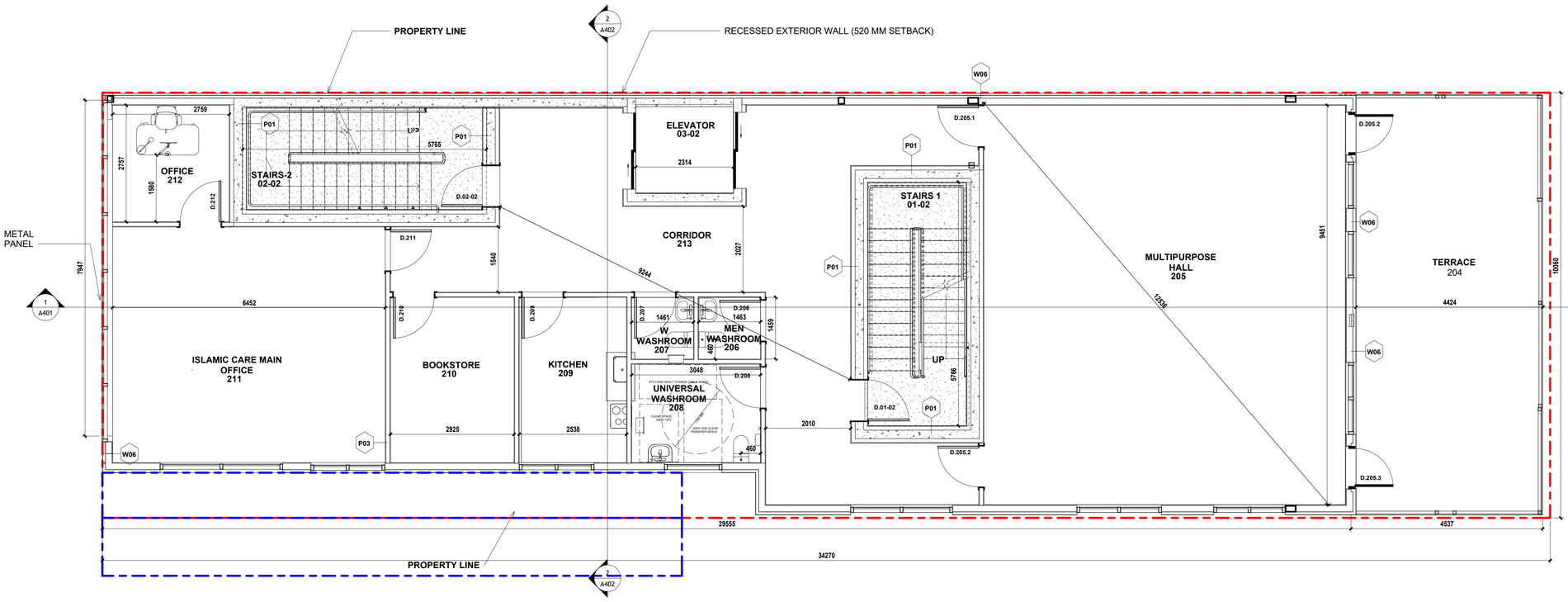

1 SECOND FLOOR PLAN

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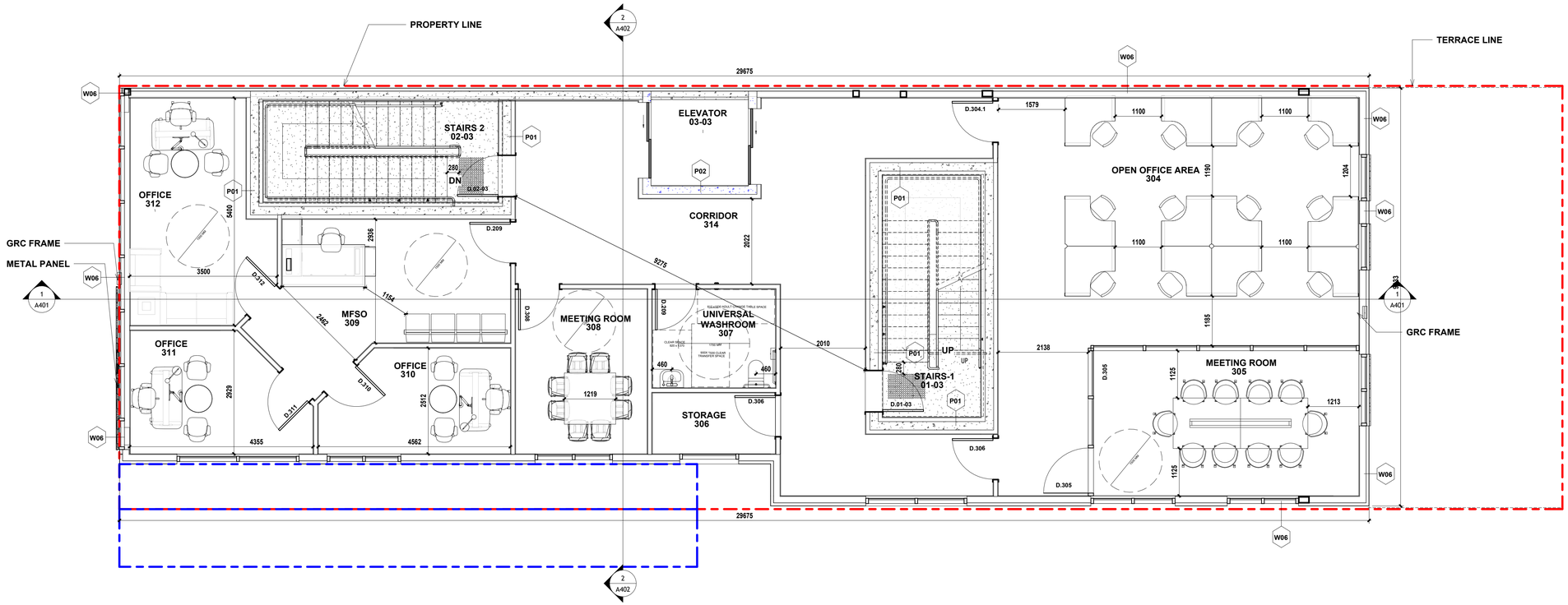

2 THIRD FLOOR PLAN

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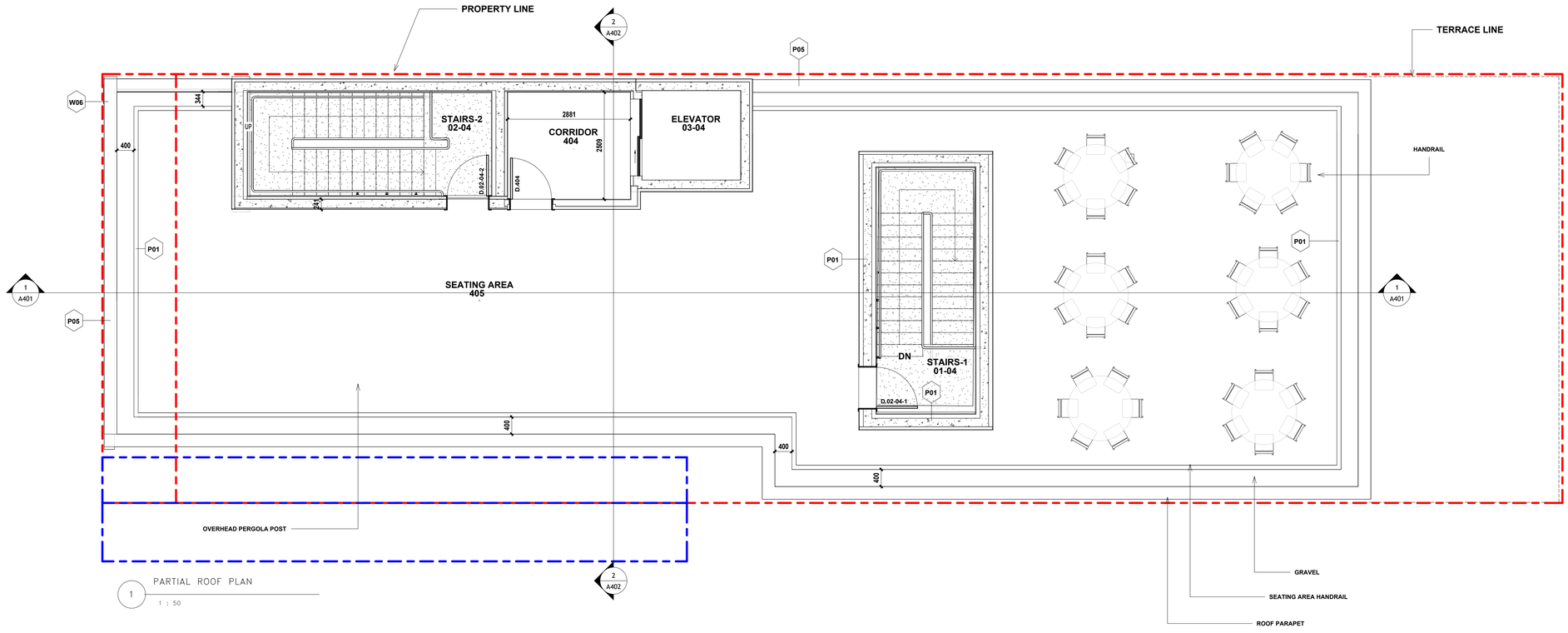

1 PARTIAL ROOF PLAN

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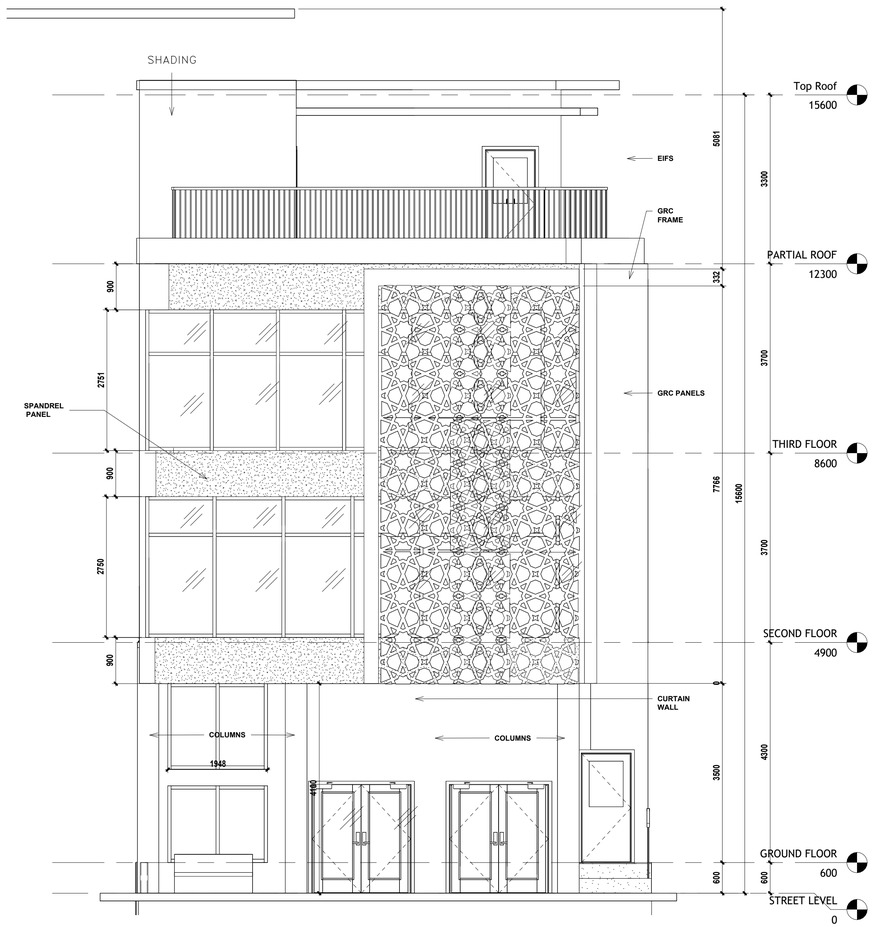

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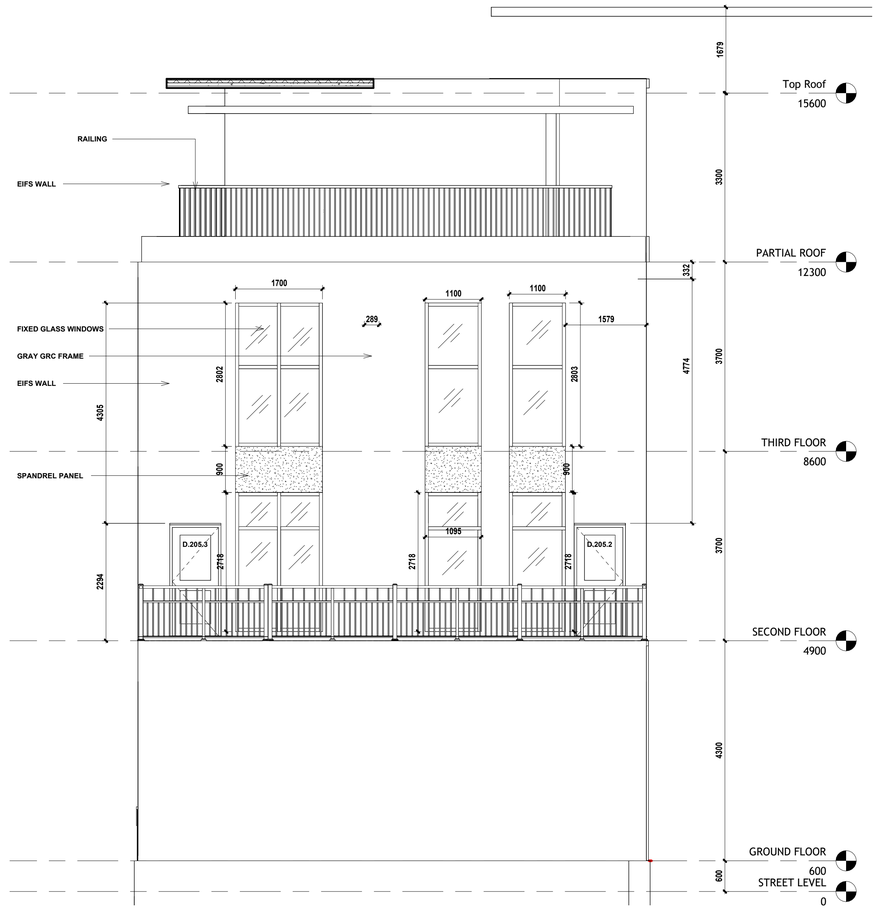

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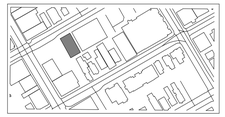
ISLAM CARE CENTRE



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2 WEST ELEVATION
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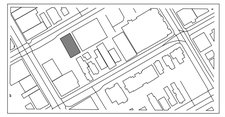
ISLAM CARE CENTRE



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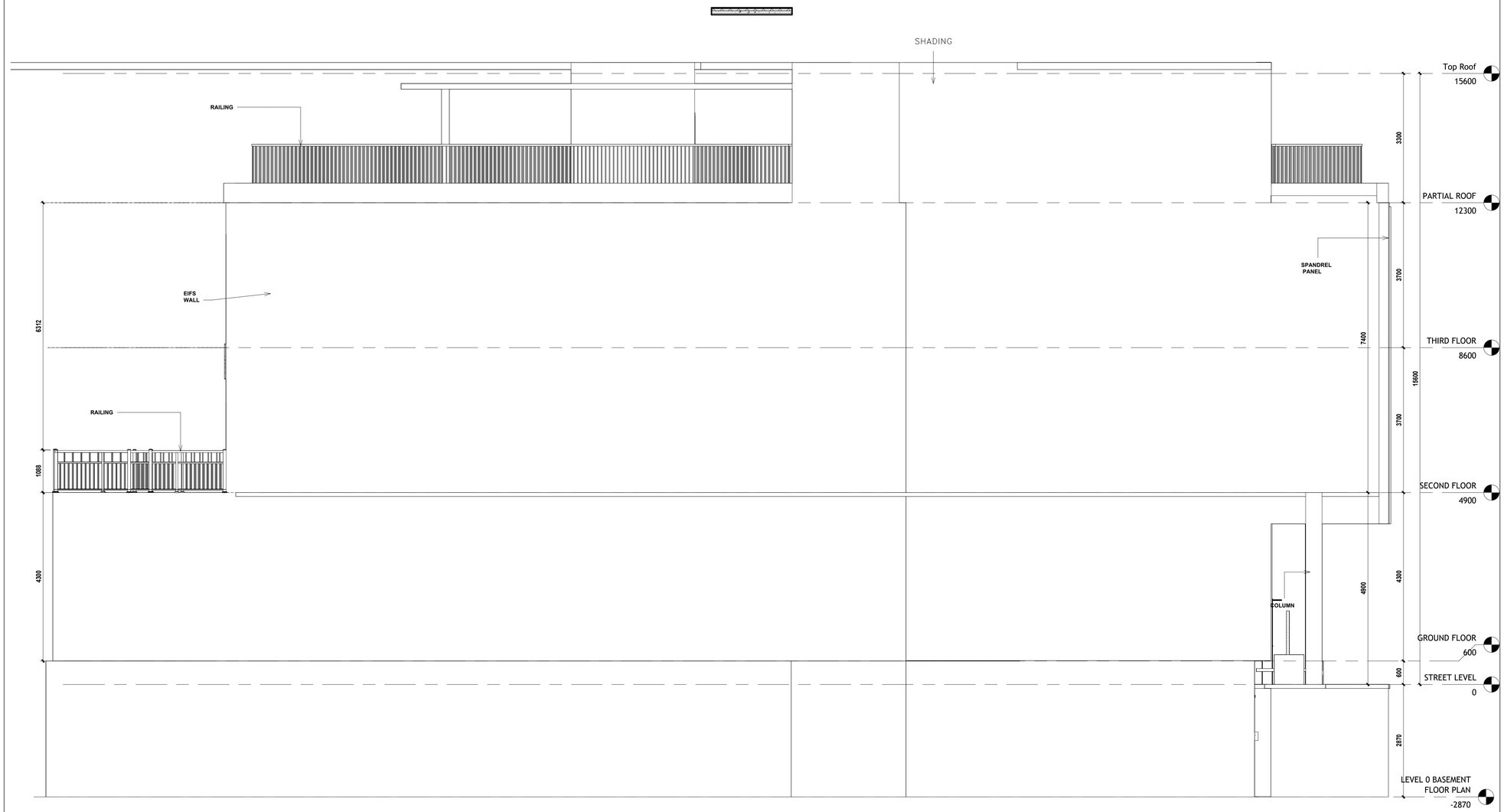

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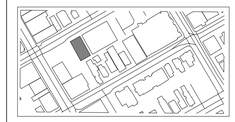
ISLAM CARE CENTRE



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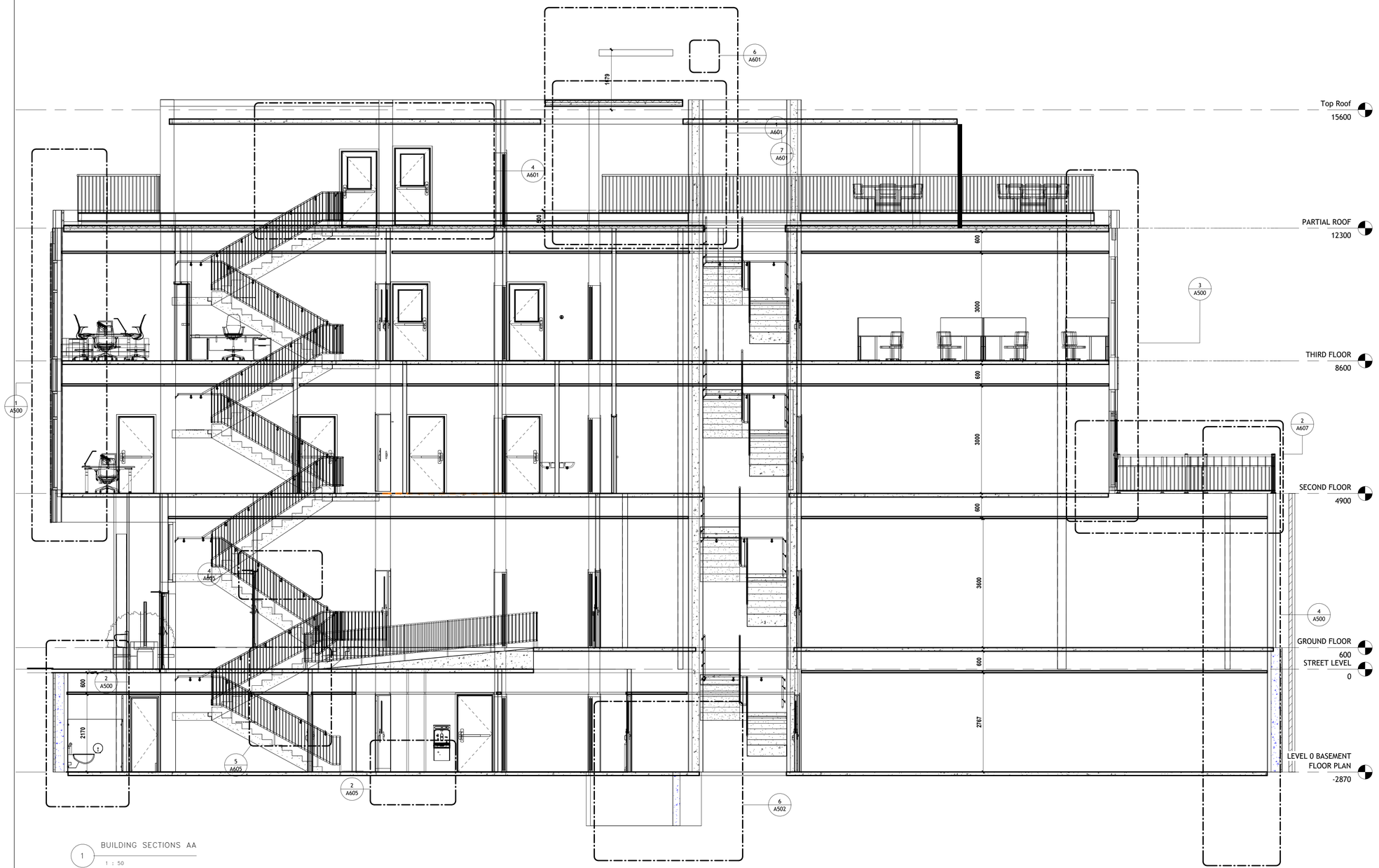

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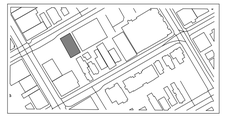
ISLAM CARE CENTRE



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ISLAM CARE CENTRE

Project number:
2501-00

ISLAM CARE CENTRE

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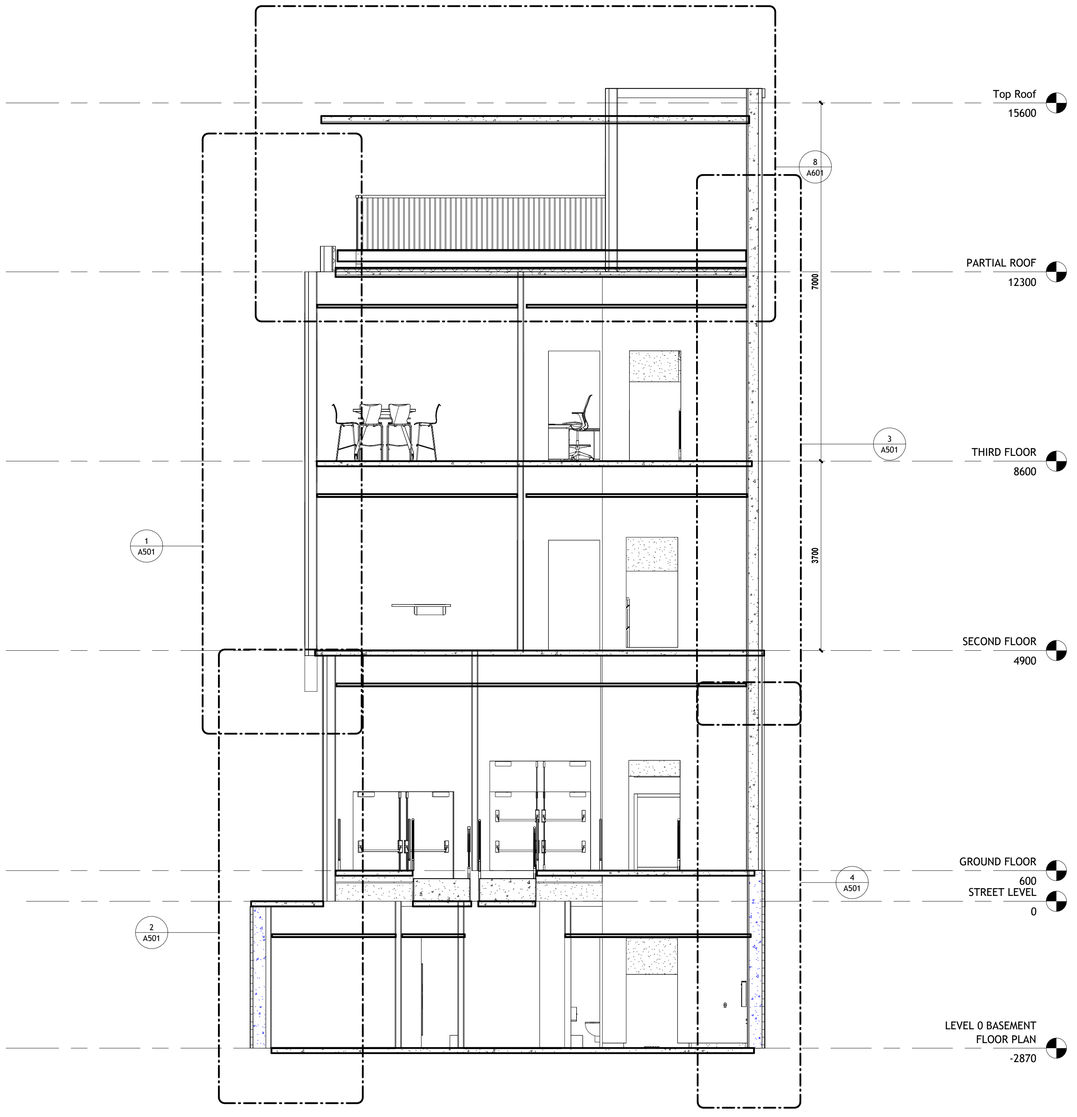

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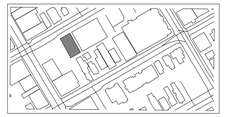
ISLAM CARE CENTRE



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ISLAM CARE CENTRE

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JULY 01/25

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BUILDING SECTION BB

Sheet Number
A402

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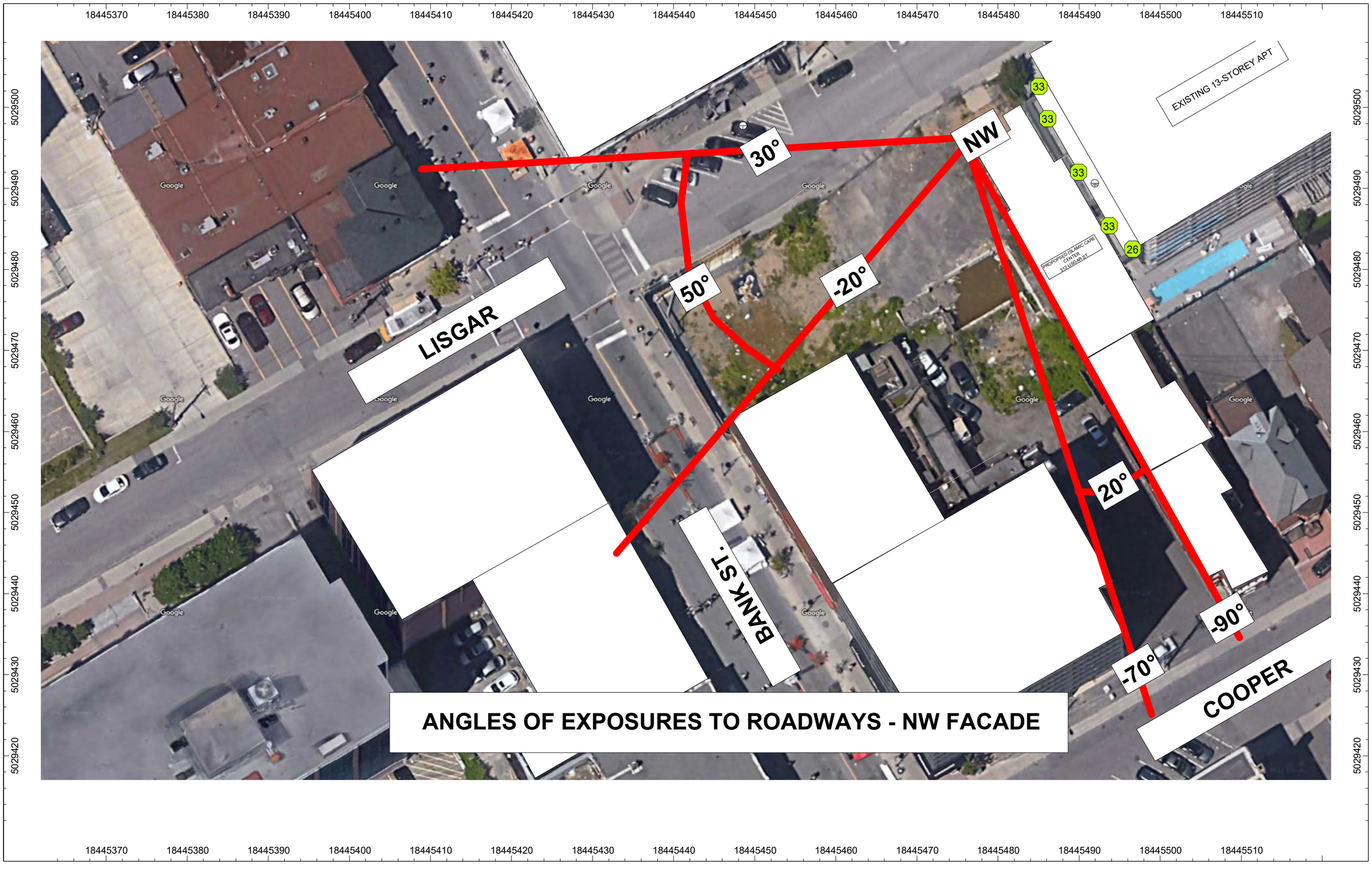
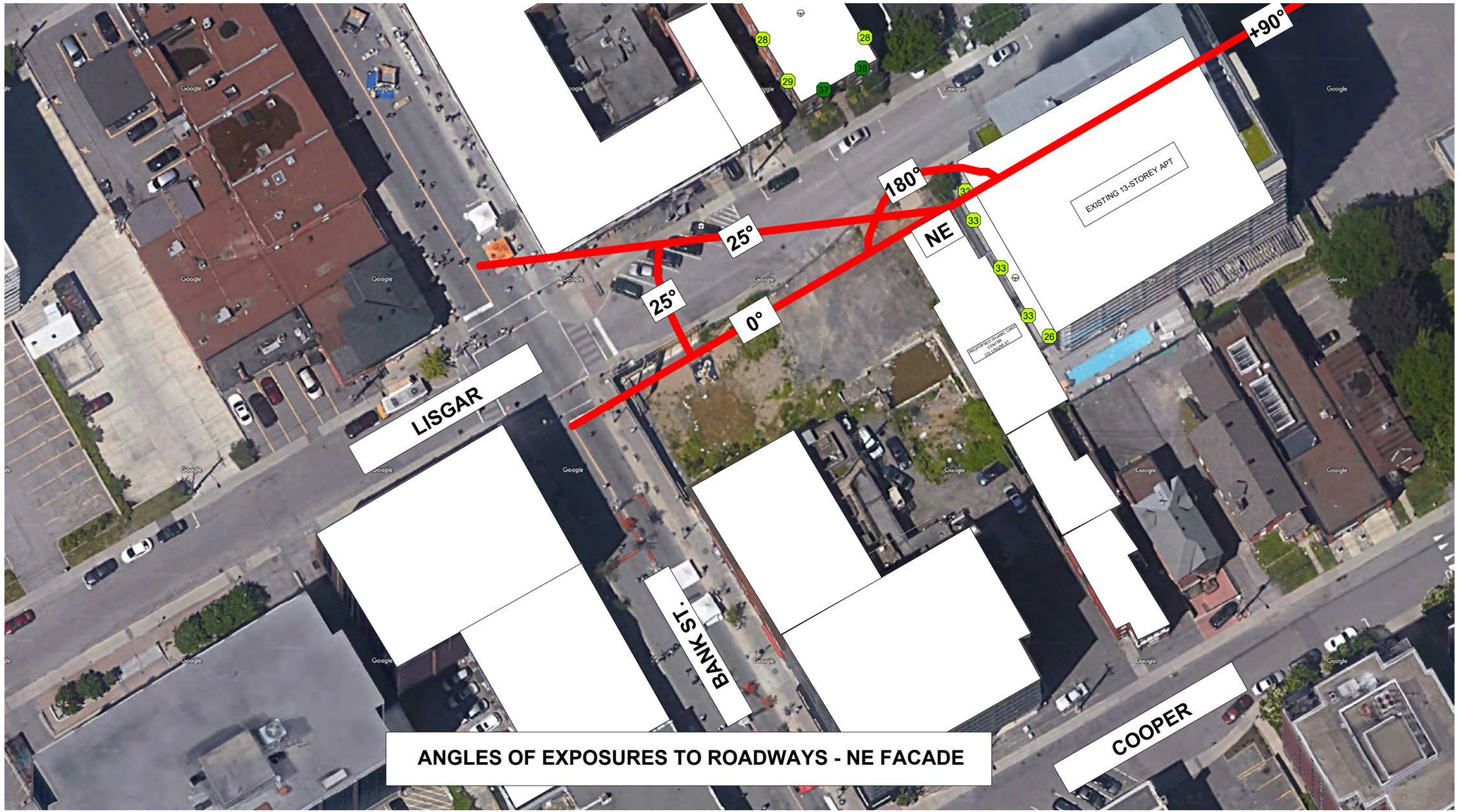
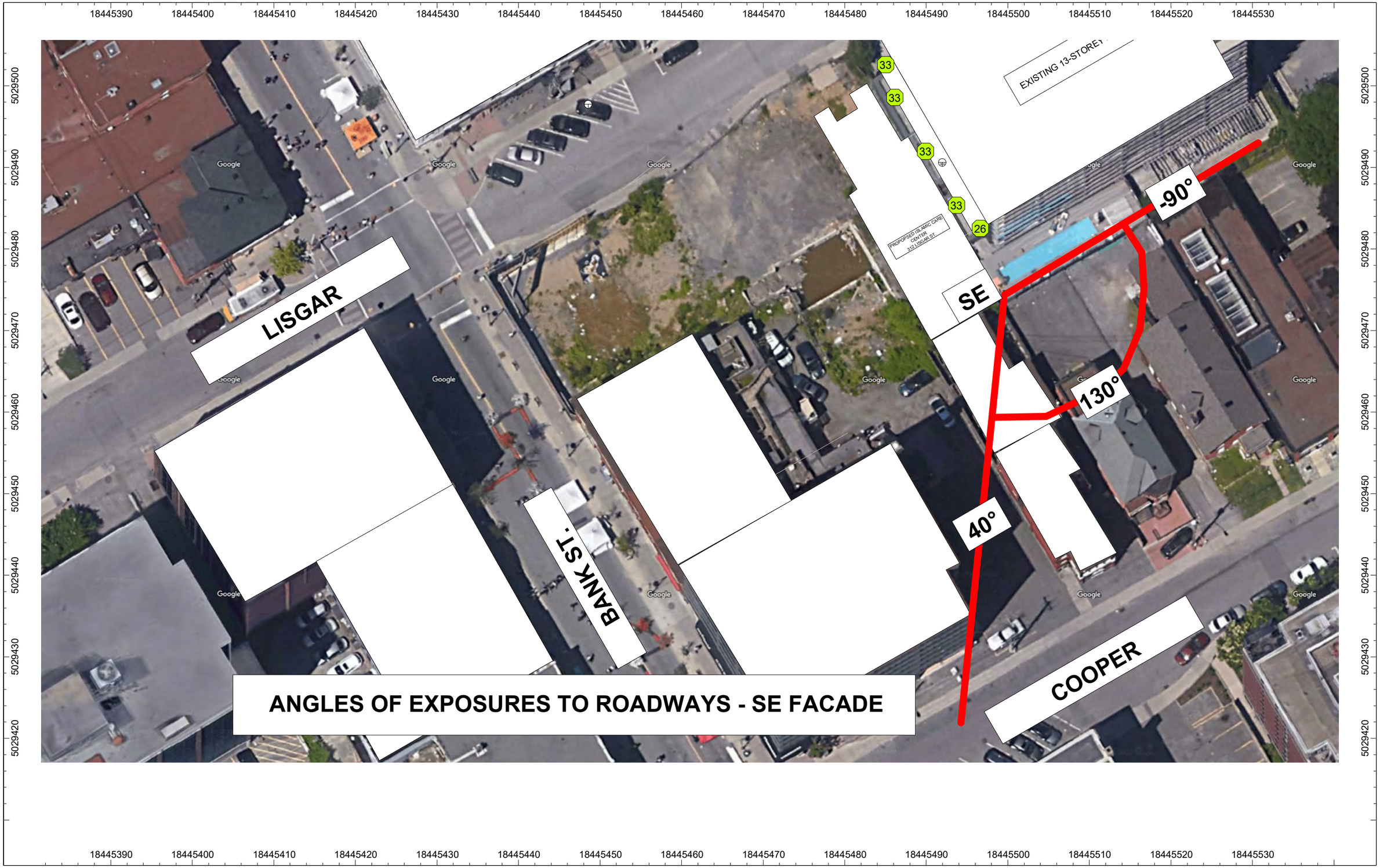


ANGLES OF EXPOSURES TO ROADWAYS - NW FACADE



ANGLES OF EXPOSURES TO ROADWAYS - NE FACADE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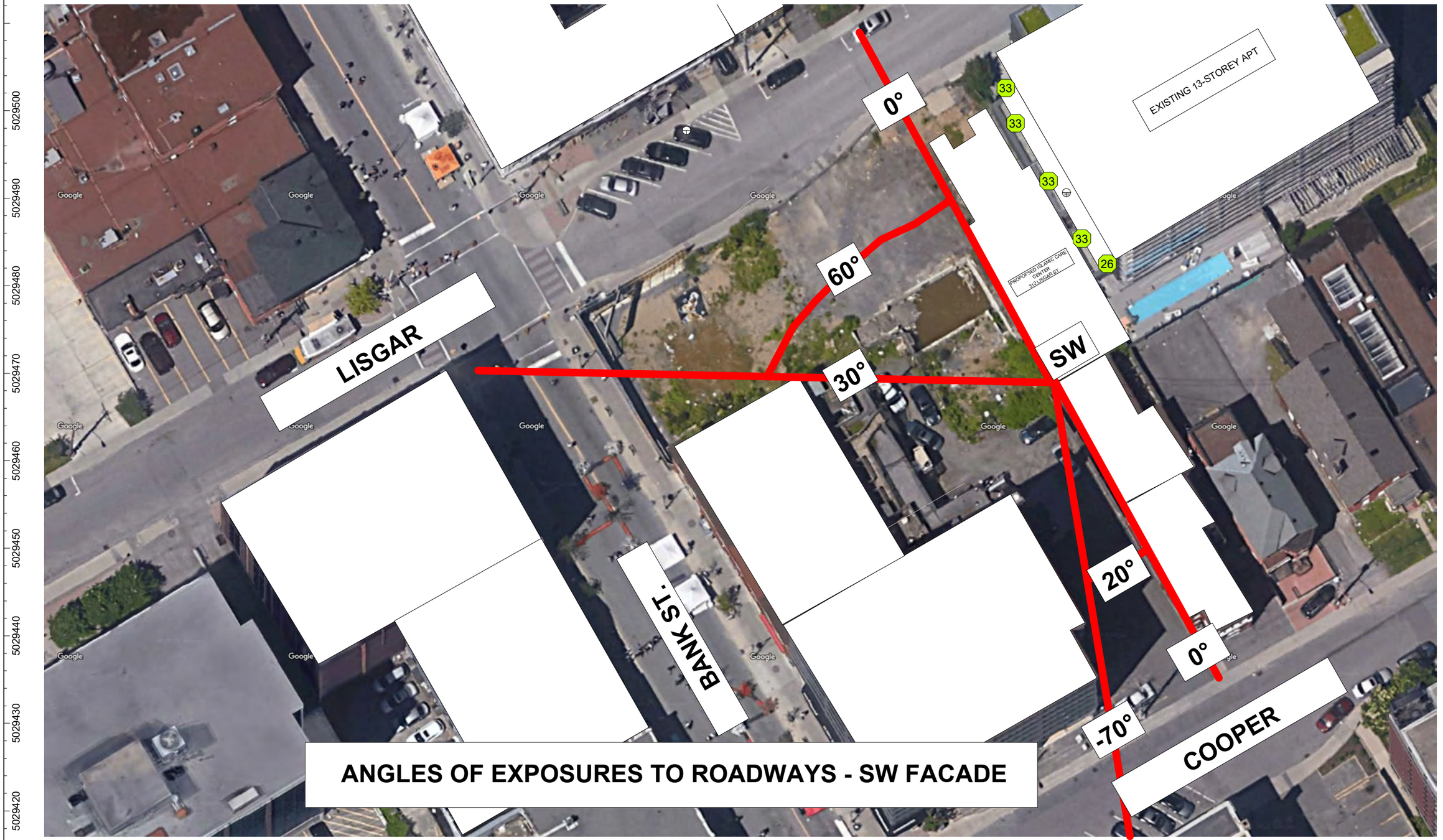
5029420
LISGAR
BANK ST.
COOPER
EXISTING 13-STOREY
PROPOSED ISLAMIC CARE CENTER
312 LISGAR ST
33
33
33
26
SE
-90°
130°
40°
Google
ANGLES OF EXPOSURES TO ROADWAYS - SE FACADE



ANGLES OF EXPOSURES TO ROADWAYS - SW FACADE

APPENDIX B: SOUND LEVEL CALCULATIONS

STAMSON 5.0 NORMAL REPORT Date: 08-09-2025 33:54:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ne.te Time Period: Day/Night 16/8 hours
Description: NE Facade (3rd Storey)

Road data, segment # 1: Lisgar St. (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
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: Lisgar 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 : 12.00 / 12.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 2: Bank 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 : 10.00
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: Bank St. (day/night)

Angle1 Angle2 : 0.00 deg 25.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 40.00 / 40.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Lisgar St. (day)

Source height = 1.50 m

ROAD (0.00 + 66.72 + 0.00) = 66.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.75	0.00	0.97	0.00	0.00	0.00	0.00	66.72

Segment Leq : 66.72 dBA

Results segment # 2: Bank St. (day)

Source height = 1.50 m

ROAD (0.00 + 55.65 + 0.00) = 55.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	25	0.00	68.48	0.00	-4.26	-8.57	0.00	0.00	0.00	55.65

Segment Leq : 55.65 dBA

Total Leq All Segments: 67.05 dBA

Results segment # 1: Lisgar St. (night)

Source height = 1.50 m

ROAD (0.00 + 59.13 + 0.00) = 59.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	58.16	0.00	0.97	0.00	0.00	0.00	0.00	59.13

Segment Leq : 59.13 dBA

Results segment # 2: Bank St. (night)

Source height = 1.50 m

ROAD (0.00 + 48.05 + 0.00) = 48.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	25	0.00	60.88	0.00	-4.26	-8.57	0.00	0.00	0.00	48.05

Segment Leq : 48.05 dBA

Total Leq All Segments: 59.46 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.05
(NIGHT): 59.46

STAMSON 5.0 NORMAL REPORT Date: 08-09-2025 33:54:12
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: nw.te Time Period: Day/Night 16/8 hours
Description: NW Facade (3rd Storey)

Road data, segment # 1: Lisgar St. (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
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: Lisgar 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 : 12.00 / 12.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 2: Bank 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 : 10.00
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: Bank St. (day/night)

Angle1 Angle2 : -20.00 deg 30.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 49.00 / 49.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 3: Cooper St. (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
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 # 3: Cooper 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 : 73.00 / 73.00 m
Receiver height : 7.50 / 7.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 5.00 deg Angle2 : 90.00 deg
Barrier height : 30.00 m
Barrier receiver distance : 50.00 / 50.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m

Results segment # 1: Lisgar St. (day)

Source height = 1.50 m

ROAD (0.00 + 66.72 + 0.00) = 66.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.75	0.00	0.97	0.00	0.00	0.00	0.00	66.72

Segment Leq : 66.72 dBA

Results segment # 2: Bank St. (day)

Source height = 1.50 m

ROAD (0.00 + 57.78 + 0.00) = 57.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	30	0.00	68.48	0.00	-5.14	-5.56	0.00	0.00	0.00	57.78

Segment Leq : 57.78 dBA

Results segment # 3: Cooper St. (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	7.50	3.39	3.39

ROAD (43.31 + 36.35 + 0.00) = 44.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	5	0.00	65.75	0.00	-6.87	-15.56	0.00	0.00	0.00	43.31
5	90	0.00	65.75	0.00	-6.87	-3.26	0.00	0.00	-19.27	36.35

Segment Leq : 44.11 dBA

Total Leq All Segments: 67.26 dBA

Results segment # 1: Lisgar St. (night)

Source height = 1.50 m

ROAD (0.00 + 59.13 + 0.00) = 59.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	58.16	0.00	0.97	0.00	0.00	0.00	0.00	59.13

Segment Leq : 59.13 dBA

Results segment # 2: Bank St. (night)

Source height = 1.50 m

ROAD (0.00 + 50.18 + 0.00) = 50.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-20	30	0.00	60.88	0.00	-5.14	-5.56	0.00	0.00	0.00	50.18

Segment Leq : 50.18 dBA

Results segment # 3: Cooper St. (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	7.50	3.39	3.39

ROAD (35.72 + 28.76 + 0.00) = 36.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	5	0.00	58.16	0.00	-6.87	-15.56	0.00	0.00	0.00	35.72
5	90	0.00	58.16	0.00	-6.87	-3.26	0.00	0.00	-19.27	28.76

Segment Leq : 36.52 dBA

Total Leq All Segments: 59.67 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.26
(NIGHT): 59.67

STAMSON 5.0 NORMAL REPORT Date: 08-09-2025 33:54:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: se.te Time Period: Day/Night 16/8 hours
Description: SE Facade (3rd Storey)

Road data, segment # 1: Cooper St. (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
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: Cooper St. (day/night)

Angle1 Angle2 : -90.00 deg 40.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 43.00 / 43.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Results segment # 1: Cooper St. (day)

Source height = 1.50 m

ROAD (0.00 + 59.76 + 0.00) = 59.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	40	0.00	65.75	0.00	-4.57	-1.41	0.00	0.00	0.00	59.76

Segment Leq : 59.76 dBA

Total Leq All Segments: 59.76 dBA

Results segment # 1: Cooper St. (night)

Source height = 1.50 m

ROAD (0.00 + 52.17 + 0.00) = 52.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	40	0.00	58.16	0.00	-4.57	-1.41	0.00	0.00	0.00	52.17

Segment Leq : 52.17 dBA

Total Leq All Segments: 52.17 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.76
(NIGHT): 52.17

STAMSON 5.0 NORMAL REPORT Date: 08-09-2025 33:54:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: sw.te Time Period: Day/Night 16/8 hours
Description: SW Facade (3rd Storey)

Road data, segment # 1: Lisgar St. (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 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): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
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: Lisgar St. (day/night)

Angle1 Angle2 : -60.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 42.00 / 42.00 m
Receiver height : 7.50 / 7.50 m
Topography : 1 (Flat/gentle slope; no barrier)

Road data, segment # 2: Bank 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 : 10.00
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: Bank 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  :  49.00 / 40.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   9.00 m
Barrier receiver distance :  25.00 / 16.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m

Road data, segment # 3: Cooper St. (day/night)
----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    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):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :  10.00
    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 # 3: Cooper St. (day/night)
--------------------------------------------
Angle1   Angle2           :   0.00 deg   20.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  43.00 / 43.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)

Results segment # 1: Lisgar St. (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.51 + 0.00) = 56.51 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -60      0   0.00  65.75   0.00  -4.47  -4.77   0.00   0.00   0.00  56.51
-------------------------------------------------------------------------------

Segment Leq : 56.51 dBA
```

Results segment # 2: Bank St. (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	7.50	4.44	4.44

ROAD (0.00 + 50.39 + 0.00) = 50.39 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	68.48	0.00	-5.14	0.00	0.00	0.00	-12.95	50.39

Segment Leq : 50.39 dBA

Results segment # 3: Cooper St. (day)

Source height = 1.50 m

ROAD (0.00 + 51.63 + 0.00) = 51.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	20	0.00	65.75	0.00	-4.57	-9.54	0.00	0.00	0.00	51.63

Segment Leq : 51.63 dBA

Total Leq All Segments: 58.47 dBA

Results segment # 1: Lisgar St. (night)

Source height = 1.50 m

ROAD (0.00 + 48.91 + 0.00) = 48.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-60	0	0.00	58.16	0.00	-4.47	-4.77	0.00	0.00	0.00	48.91

Segment Leq : 48.91 dBA

Results segment # 2: Bank St. (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	7.50	5.10	5.10

ROAD (0.00 + 43.90 + 0.00) = 43.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	60.88	0.00	-4.26	0.00	0.00	0.00	-12.72	43.90

Segment Leq : 43.90 dBA

Results segment # 3: Cooper St. (night)

Source height = 1.50 m

ROAD (0.00 + 44.04 + 0.00) = 44.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	20	0.00	58.16	0.00	-4.57	-9.54	0.00	0.00	0.00	44.04

Segment Leq : 44.04 dBA

Total Leq All Segments: 51.06 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.47
(NIGHT): 51.06

CADNAA – DAYTIME SOUND LEVEL FROM HVAC (UNMITIGATED)

DAYTIIME - UNMITIGATED SOUND LEVEL FROM HVAC

Receiver
Name: R1 - West
ID: R1
X: 18445492.74 m
Y: 5029491.17 m
Z: 16.50 m

Point Source, ISO 9613, Name: "DOAS", ID: "DOAS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
1	18445486.34	5029486.75	17.60	0	D	500	85.0	0.0	0.0	0.0	0.0	28.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	59.1
3	18445486.34	5029486.75	17.60	1	D	500	85.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	34.0

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
6	18445485.56	5029488.05	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	29.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	49.0
12	18445485.56	5029488.05	17.60	1	D	500	75.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	24.0

Point Source, ISO 9613, Name: "HVAC #1", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
14	18445486.87	5029485.65	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	29.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	48.8
18	18445486.87	5029485.65	17.60	1	D	500	75.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	24.0

Point Source, ISO 9613, Name: "VRF", ID: "VRF"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
20	18445487.44	5029487.36	17.60	0	D	500	73.0	0.0	0.0	0.0	0.0	27.4	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	48.6
24	18445487.44	5029487.36	17.60	1	D	500	73.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	21.9

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
28	18445485.23	5029486.08	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	30.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	47.8
32	18445485.23	5029486.08	17.60	1	D	500	75.0	0.0	0.0	0.0	0.0	53.7	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	24.1

Receiver
Name: R2 North
ID: R2
X: 18445503.10 m
Y: 5029457.68 m
Z: 7.50 m

Point Source, ISO 9613, Name: "DOAS", ID: "DOAS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
7	18445486.34	5029486.75	17.60	0	D	500	85.0	0.0	0.0	0.0	0.0	41.9	0.1	-3.0	0.0	0.0	11.9	0.0	0.0	34.1

Point Source, ISO 9613, Name: "HVAC #1", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
15	18445486.87	5029485.65	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	41.6	0.1	-3.0	0.0	0.0	11.7	0.0	0.0	24.7

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
22	18445485.23	5029486.08	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	41.9	0.1	-3.0	0.0	0.0	11.9	0.0	0.0	24.2

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
26	18445485.56	5029488.05	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	42.2	0.1	-3.0	0.0	0.0	12.2	0.0	0.0	23.5

Point Source, ISO 9613, Name: "VRF", ID: "VRF"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
31	18445487.44	5029487.36	17.60	0	D	500	73.0	0.0	0.0	0.0	0.0	41.9	0.1	-3.0	0.0	0.0	11.8	0.0	0.0	22.2

Receiver
Name: R3 South
ID: R3
X: 18445471.80 m
Y: 5029520.20 m
Z: 7.50 m

Point Source, ISO 9613, Name: "DOAS", ID: "DOAS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
4	18445486.34	5029486.75	17.60	0	D	500	85.0	0.0	0.0	0.0	0.0	42.6	0.1	-3.0	0.0	0.0	7.3	0.0	0.0	38.1
8	18445486.34	5029486.75	17.60	1	D	500	85.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	33.9

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
10	18445485.56	5029488.05	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	42.2	0.1	-3.0	0.0	0.0	6.8	0.0	0.0	28.9

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
16	18445485.23	5029486.08	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	42.6	0.1	-3.0	0.0	0.0	6.3	0.0	0.0	29.0
25	18445485.23	5029486.08	17.60	1	D	500	75.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	24.0

Point Source, ISO 9613, Name: "HVAC #1", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
27	18445486.87	5029485.65	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	42.8	0.1	-3.0	0.0	0.0	7.7	0.0	0.0	27.4
29	18445486.87	5029485.65	17.60	1	D	500	75.0	0.0	0.0	0.0	0.0	53.9	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	23.9

Point Source, ISO 9613, Name: "VRF", ID: "VRF"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
33	18445487.44	5029487.36	17.60	0	D	500	73.0	0.0	0.0	0.0	0.0	42.5	0.1	-3.0	0.0	0.0	6.5	0.0	0.0	26.9
34	18445487.44	5029487.36	17.60	1	D	500	73.0	0.0	0.0	0.0	0.0	53.9	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	21.8

Receiver
Name: R4 East
ID: R4
X: 18445461.88 m
Y: 5029468.71 m
Z: 7.50 m

Point Source, ISO 9613, Name: "DOAS", ID: "DOAS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
2	18445486.34	5029486.75	17.60	0	D	500	85.0	0.0	0.0	0.0	0.0	41.1	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	46.8
5	18445486.34	5029486.75	17.60	1	D	500	85.0	0.0	0.0	0.0	0.0	51.0	0.2	-3.0	0.0	0.0	15.8	0.0	0.0	21.0

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
9	18445485.23	5029486.08	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	40.8	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	37.2
11	18445485.23	5029486.08	17.60	1	D	500	75.0	0.0	0.0	0.0	0.0	50.9	0.2	-3.0	0.0	0.0	15.8	0.0	0.0	11.1

Point Source, ISO 9613, Name: "HVAC #1", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
13	18445486.87	5029485.65	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	41.1	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	36.9
17	18445486.87	5029485.65	17.60	1	D	500	75.0	0.0	0.0	0.0	0.0	51.0	0.2	-3.0	0.0	0.0	15.8	0.0	0.0	11.0

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
19	18445485.56	5029488.05	17.60	0	D	500	75.0	0.0	0.0	0.0	0.0	41.2	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	36.8
21	18445485.56	5029488.05	17.60	1	D	500	75.0	0.0	0.0	0.0	0.0	51.0	0.2	-3.0	0.0	0.0	15.8	0.0	0.0	11.0

Point Source, ISO 9613, Name: "VRF", ID: "VRF"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
23	18445487.44	5029487.36	17.60	0	D	500	73.0	0.0	0.0	0.0	0.0	41.4	0.1	-3.0	0.0	0.0	4.8	0.0	0.0	29.7
30	18445487.44	5029487.36	17.60	1	D	500	73.0	0.0	0.0	0.0	0.0	51.1	0.2	-3.0	0.0	0.0	15.8	0.0	0.0	8.9

CADNAA – NIGHTTIME SOUND LEVEL FROM HVAC (UNMITIGATED)

Receiver
Name: R1 - West
ID: R1
X: 18445492.74 m
Y: 5029491.17 m
Z: 16.50 m

Point Source, ISO 9613, Name: "DOAS", ID: "DOAS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
1	18445486.34	5029486.75	17.60	0	N	500	82.0	0.0	0.0	0.0	0.0	28.9	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	56.1
3	18445486.34	5029486.75	17.60	1	N	500	82.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	31.0

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
6	18445485.56	5029488.05	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	29.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	46.0
12	18445485.56	5029488.05	17.60	1	N	500	72.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	21.0

Point Source, ISO 9613, Name: "HVAC #1", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
14	18445486.87	5029485.65	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	29.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	45.8
18	18445486.87	5029485.65	17.60	1	N	500	72.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	21.0

Point Source, ISO 9613, Name: "VRF", ID: "VRF"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
20	18445487.44	5029487.36	17.60	0	N	500	70.0	0.0	0.0	0.0	0.0	27.4	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	45.6
24	18445487.44	5029487.36	17.60	1	N	500	70.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	18.9

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
28	18445485.23	5029486.08	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	30.2	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	44.8
32	18445485.23	5029486.08	17.60	1	N	500	72.0	0.0	0.0	0.0	0.0	53.7	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	21.1

Receiver
Name: R2 North
ID: R2
X: 18445503.10 m
Y: 5029457.68 m
Z: 7.50 m

Point Source, ISO 9613, Name: "DOAS", ID: "DOAS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
7	18445486.34	5029486.75	17.60	0	N	500	82.0	0.0	0.0	0.0	0.0	41.9	0.1	-3.0	0.0	0.0	11.9	0.0	0.0	31.1

Point Source, ISO 9613, Name: "HVAC #1", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
15	18445486.87	5029485.65	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	41.6	0.1	-3.0	0.0	0.0	11.7	0.0	0.0	21.7

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
22	18445485.23	5029486.08	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	41.9	0.1	-3.0	0.0	0.0	11.9	0.0	0.0	21.2

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
26	18445485.56	5029488.05	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	42.2	0.1	-3.0	0.0	0.0	12.2	0.0	0.0	20.5

Point Source, ISO 9613, Name: "VRF", ID: "VRF"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
31	18445487.44	5029487.36	17.60	0	N	500	70.0	0.0	0.0	0.0	0.0	41.9	0.1	-3.0	0.0	0.0	11.8	0.0	0.0	19.2

Receiver
Name: R3 South
ID: R3
X: 18445471.80 m
Y: 5029520.20 m
Z: 7.50 m

Point Source, ISO 9613, Name: "DOAS", ID: "DOAS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
4	18445486.34	5029486.75	17.60	0	N	500	82.0	0.0	0.0	0.0	0.0	42.6	0.1	-3.0	0.0	0.0	7.3	0.0	0.0	35.1
8	18445486.34	5029486.75	17.60	1	N	500	82.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	30.9

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
10	18445485.56	5029488.05	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	42.2	0.1	-3.0	0.0	0.0	6.8	0.0	0.0	25.9

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
16	18445485.23	5029486.08	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	42.6	0.1	-3.0	0.0	0.0	6.3	0.0	0.0	26.0
25	18445485.23	5029486.08	17.60	1	N	500	72.0	0.0	0.0	0.0	0.0	53.8	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	21.0

Point Source, ISO 9613, Name: "HVAC #1", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
27	18445486.87	5029485.65	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	42.8	0.1	-3.0	0.0	0.0	7.7	0.0	0.0	24.4
29	18445486.87	5029485.65	17.60	1	N	500	72.0	0.0	0.0	0.0	0.0	53.9	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	20.9

Point Source, ISO 9613, Name: "VRF", ID: "VRF"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
33	18445487.44	5029487.36	17.60	0	N	500	70.0	0.0	0.0	0.0	0.0	42.5	0.1	-3.0	0.0	0.0	6.5	0.0	0.0	23.9
34	18445487.44	5029487.36	17.60	1	N	500	70.0	0.0	0.0	0.0	0.0	53.9	0.3	-3.0	0.0	0.0	0.0	0.0	0.0	18.8

Receiver
Name: R4 East
ID: R4
X: 18445461.88 m
Y: 5029468.71 m
Z: 7.50 m

Point Source, ISO 9613, Name: "DOAS", ID: "DOAS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
2	18445486.34	5029486.75	17.60	0	N	500	82.0	0.0	0.0	0.0	0.0	41.1	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	43.8
5	18445486.34	5029486.75	17.60	1	N	500	82.0	0.0	0.0	0.0	0.0	51.0	0.2	-3.0	0.0	0.0	15.8	0.0	0.0	18.0

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
9	18445485.23	5029486.08	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	40.8	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	34.2
11	18445485.23	5029486.08	17.60	1	N	500	72.0	0.0	0.0	0.0	0.0	50.9	0.2	-3.0	0.0	0.0	15.8	0.0	0.0	8.1

Point Source, ISO 9613, Name: "HVAC #1", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
13	18445486.87	5029485.65	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	41.1	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	33.9
17	18445486.87	5029485.65	17.60	1	N	500	72.0	0.0	0.0	0.0	0.0	51.0	0.2	-3.0	0.0	0.0	15.8	0.0	0.0	8.0

Point Source, ISO 9613, Name: "Mitsubishi", ID: "MITSU"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
19	18445485.56	5029488.05	17.60	0	N	500	72.0	0.0	0.0	0.0	0.0	41.2	0.1	-3.0	0.0	0.0	0.0	0.0	0.0	33.8
21	18445485.56	5029488.05	17.60	1	N	500	72.0	0.0	0.0	0.0	0.0	51.0	0.2	-3.0	0.0	0.0	15.8	0.0	0.0	8.0

Point Source, ISO 9613, Name: "VRF", ID: "VRF"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
23	18445487.44	5029487.36	17.60	0	N	500	70.0	0.0	0.0	0.0	0.0	41.4	0.1	-3.0	0.0	0.0	4.8	0.0	0.0	26.7
30	18445487.44	5029487.36	17.60	1	N	500	70.0	0.0	0.0	0.0	0.0	51.1	0.2	-3.0	0.0	0.0	15.8	0.0	0.0	5.9

APPENDIX C: NOISE CRITERIA

The noise study will be based on the following criteria for residential units, as required by the City of Ottawa and MECP.

TABLE C-9 – SUPPLEMENTARY INDOOR SOUND LEVEL LIMITS			
Type of Space	**Time Period**	**L_{eq} (dBA)**	
		Road	**Rail**
General offices, reception areas, retail stores, etc.	07:00–23:00	45	40
Living/dining areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, theatres, **places of worship**, libraries, individual or semiprivate offices, conference rooms, reading rooms, etc.	23:00–07:00	45	40
Sleeping quarters of hotels/motels	07:00–23:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	23:00–07:00	40	35

All calculations are based on the Architectural Plans and Elevations by ArchiCANA Architect, dated March 22, 2025.

L_{eq} (Definition)

The L_{eq} is defined as the mean energy of the noise level averaged over the measurement period. It can be considered as the continuous steady noise level which would have the same acoustic energy as the real fluctuating noise measured over the same period of time.

APPENDIX D: REFERENCES

1. “City of Ottawa Environmental Noise Control Guidelines,” January 2016.

2. Ministry of the Environment’s *STAMSON* Computer Programme (*Version 5.04*) for the IBM PC.

3. Ministry of the Environment, *ORNAMENT*, “Ontario Road Noise Analysis Method for Environment and Transportation,” November 1988.

4. Ministry of the Environment, “Publication NPC-300, Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning,” August 2013.