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Institutional  
  
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Restoration

## 495 Richmond Road City of Ottawa

### Noise Impact Feasibility Report

**495 Richmond Road**  
**City of Ottawa**  
**Noise Impact Feasibility Report**

Prepared By:

**NOVATECH**  
Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario  
K2M 1P6

Novatech File: 125090  
Ref: R-2025-101

Submitted: November 07, 2025

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November 07, 2025

City of Ottawa  
Planning, Development and Building Services Department (PDBS)  
110 Laurier Avenue West, 4<sup>th</sup> Floor  
Ottawa ON, K1P 1J1

**Attention: Mohammed Fawzi, P.Eng. – Senior Project Manager**  
**Reference: 495 Richmond Road**  
**Noise Impact Feasibility Report**  
**Our File No.: 125090**

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Please find enclosed the 'Noise Impact Feasibility Report' for the above-noted development located at 495 Richmond Road in the City of Ottawa. This report is being submitted in support of a site plan application for the proposed development.

This report evaluates the environmental impact of noise from traffic and rail and assesses the feasibility of mitigation measures to attenuate noise to acceptable levels.

Please contact the undersigned should you have any questions or comments on this report.

Yours truly,

**NOVATECH**



Greg MacDonald, P. Eng.  
Director, Land Development and Public Sector Infrastructure

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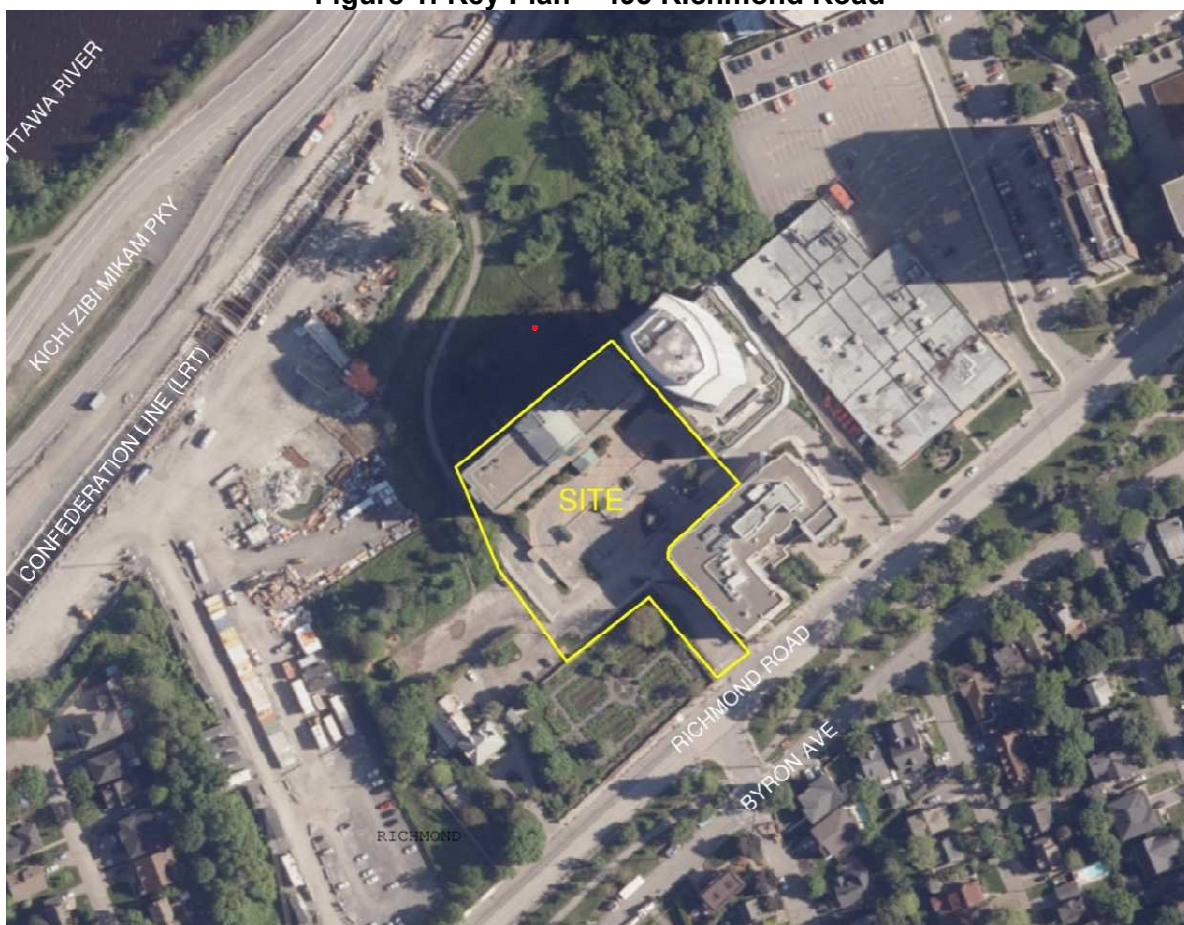


## 1.0 INTRODUCTION

Novatech has been retained to prepare a Noise Impact Feasibility Report to assess the impact of noise from traffic and rail for the proposed site plan located at 495 Richmond Road within the City of Ottawa. The proposed development is a conversion of the existing 7-storey commercial building into a residential building. The report is in support of a site plan application for the subject development and predicts noise levels. **Figure 1 - Key Plan** shows the site location.

An aerial of the subject site is provided in **Figure 1 – Key Plan – 495 Richmond Road**.

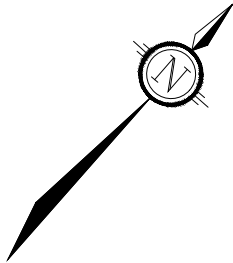
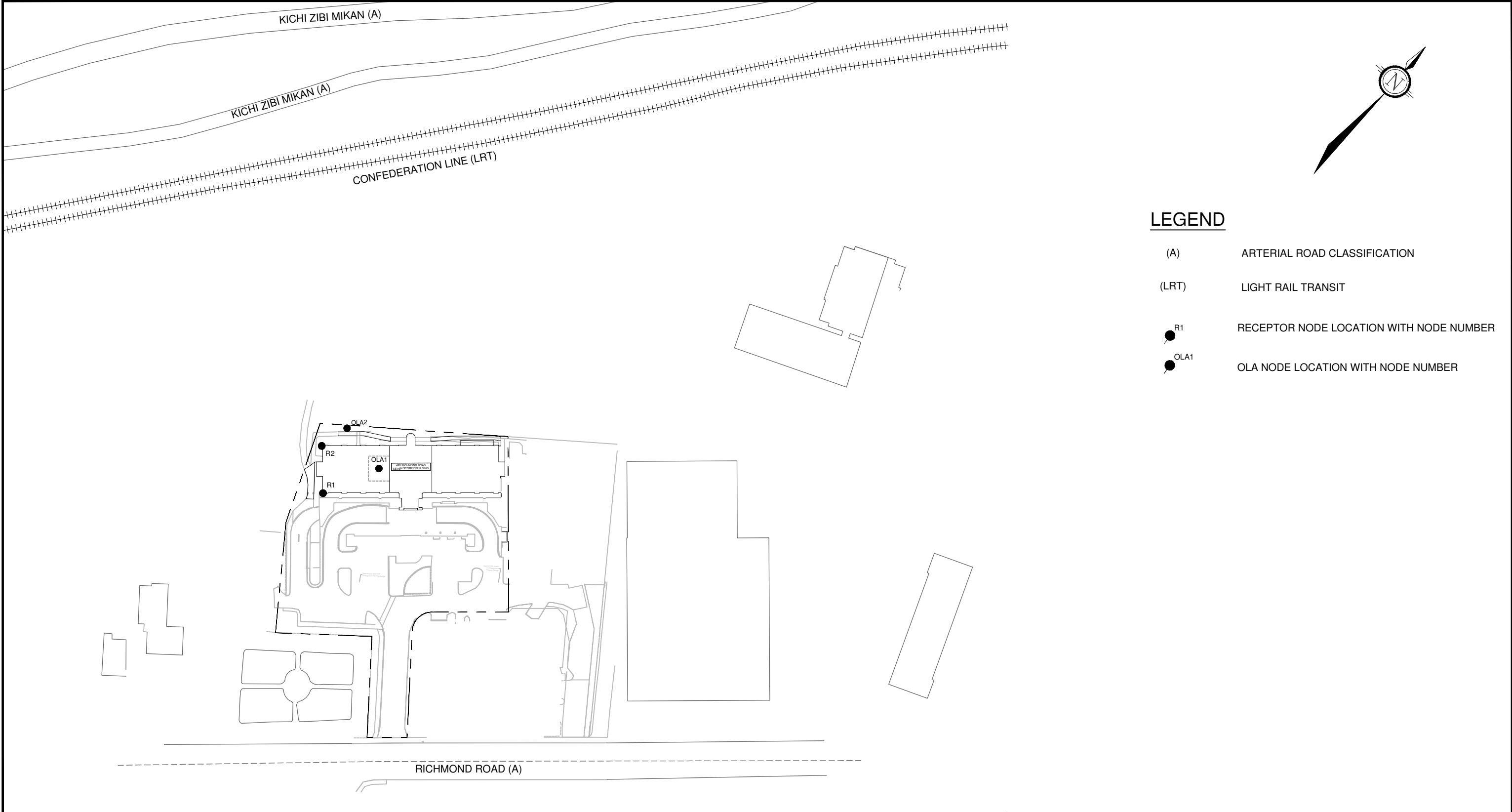
**Figure 1: Key Plan – 495 Richmond Road**



The residential building will have a total of 143 units, including 31 studios, 62 one bedroom, 20 one bedroom + den, 18 two bedroom, and 12 two bedroom + den units. The locations of all nodes used to predict the noise levels at the building are included in **Figure 2 – Node Location Plan**, where R1 and R2 are selected for indoor noise receivers; OLA1 and OLA2 are selected as the roof top amenity area and exterior amenity area respectively. Refer to **Figure 4 – Roof Top Amenity Area** and **Figure 5 – Detailed Cross Section** for noise analysis set up.

This report follows recommendations of the City of Ottawa's Environmental Noise Control Guidelines (ENCG) and MOEE NPC-300 Environmental Noise Guideline.

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**LEGEND**

- (A) ARTERIAL ROAD CLASSIFICATION
- (LRT) LIGHT RAIL TRANSIT
- R1 RECEPTOR NODE LOCATION WITH NODE NUMBER
- OLA1 OLA NODE LOCATION WITH NODE NUMBER



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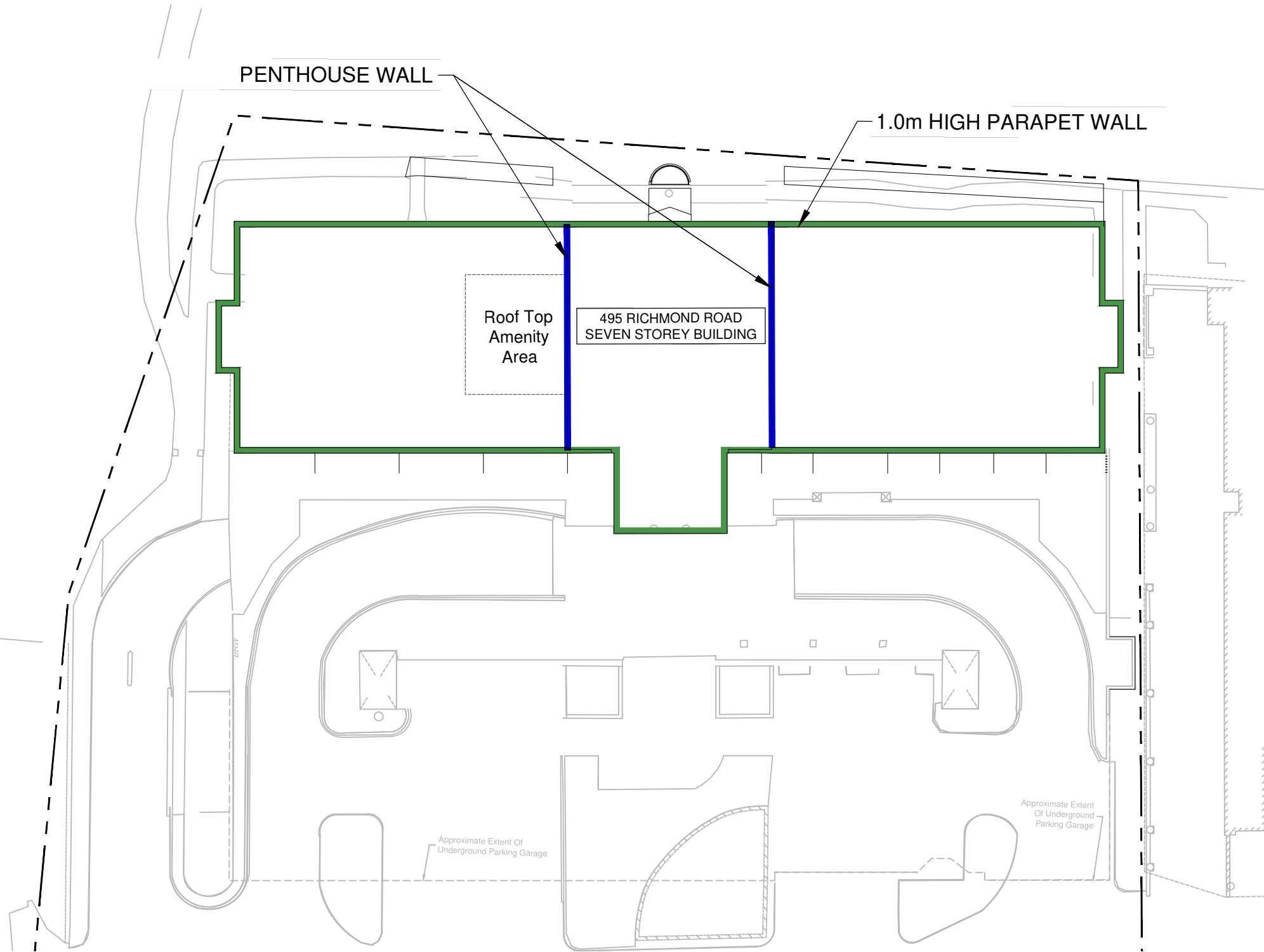
CITY OF OTTAWA  
495 RICHMOND ROAD

**NODE LOCATION PLAN**

SCALE 1 : 1500 0 15 30 45 60

DATE	NOV 2025	JOB	125090	FIGURE	FIGURE 2
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**LEGEND**

- PARAPET WALL
- PENTHOUSE WALL

<b>NOVATECH</b> Engineers, Planners & Landscape Architects Suite 200, 240 Michael Cowpland Drive Ottawa, Ontario, Canada K2M 1P6  Telephone (613) 254-9643 Facsimile (613) 254-5867 Website www.novatech-eng.com	CITY OF OTTAWA 495 RICHMOND ROAD	
	ROOF TOP AMENITY AREA PLAN	
	SCALE 1 : 400	0 4 8 12 16
	DATE OCT 2025	JOB 125090
		FIGURE FIGURE 4

Noise  
Source  
(LRT)



5m

A vertical dimension line with arrows at both ends, labeled "3m".

99m

– 105m

- 117m

- 134m

———— 108m

– 118m

Diagram illustrating the noise receiver locations for two adjacent buildings:

- Left Building:**
  - Noise Receiver (R2 - Seventh Floor)
  - Parapet Wall (Typical)
- Right Building:**
  - Noise Receiver (R1 - Seventh Floor)
  - Noise Receiver (OLA1 - Roof Top Amenity)
- Distance:** 5m

495 Richmond Road

26.5m-

22.9m

Noise Receiver  
(OLA2 - Exterior Amenity)

Noise Source  
(Richmond Road)

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495 RICHMOND ROAD

### DETAILED CROSS SECTION

SCALE

NOT TO SCALE

DATE \_\_\_\_\_

DATE OCT 2025

DATE	JOB	DESCRIPTION	AMOUNT	STATUS
10/1/2023	101	...	...	...
10/2/2023	102	...	...	...
10/3/2023	103	...	...	...
10/4/2023	104	...	...	...
10/5/2023	105	...	...	...
10/6/2023	106	...	...	...
10/7/2023	107	...	...	...
10/8/2023	108	...	...	...
10/9/2023	109	...	...	...
10/10/2023	110	...	...	...
10/11/2023	111	...	...	...
10/12/2023	112	...	...	...
10/13/2023	113	...	...	...
10/14/2023	114	...	...	...
10/15/2023	115	...	...	...
10/16/2023	116	...	...	...
10/17/2023	117	...	...	...
10/18/2023	118	...	...	...
10/19/2023	119	...	...	...
10/20/2023	120	...	...	...
10/21/2023	121	...	...	...
10/22/2023	122	...	...	...
10/23/2023	123	...	...	...
10/24/2023	124	...	...	...
10/25/2023	125	...	...	...
10/26/2023	126	...	...	...
10/27/2023	127	...	...	...
10/28/2023	128	...	...	...
10/29/2023	129	...	...	...
10/30/2023	130	...	...	...
10/31/2023	131	...	...	...
11/1/2023	132	...	...	...
11/2/2023	133	...	...	...
11/3/2023	134	...	...	...
11/4/2023	135	...	...	...
11/5/2023	136	...	...	...
11/6/2023	137	...	...	...
11/7/2023	138	...	...	...
11/8/2023	139	...	...	...
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11/19/2023	150	...	...	...
11/20/2023	151	...	...	...
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11/23/2023	154	...	...	...
11/24/2023	155	...	...	...
11/25/2023	156	...	...	...
11/26/2023	157	...	...	...
11/27/2023	158	...	...	...
11/28/2023	159	...	...	...
11/29/2023	160	...	...	...
11/30/2023	161	...	...	...
12/1/2023	162	...	...	...
12/2/2023	163	...	...	...
12/3/2023	164	...	...	...
12/4/2023	165	...	...	...
12/5/2023	166	...	...	...
12/6/2023	167	...	...	...
12/7/2023	168	...	...	...
12/8/2023	169	...	...	...
12/9/2023	170	...	...	...
12/10/2023	171	...	...	...
12/11/2023	172	...	...	...
12/12/2023	173	...	...	...
12/13/2023	174	...	...	...
12/14/2023	175	...	...	...
12/15/2023	176	...	...	...
12/16/2023	177	...	...	...
12/17/2023	178	...	...	...
12/18/2023	179	...	...	...
12/19/2023	180	...	...	...
12/20/2023	181	...	...	...
12/21/202				

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FIGURE

FIGURE 5

## 2.0 NOISE CRITERIA, NOISE SOURCES AND NOISE ATTENATION METHODS

The City of Ottawa criteria for noise from aircraft, roads, transitways, and railways is outlined in **Tables 2.2a: Sound Level Limit for Outdoor Living Areas – Road and Rail, Table 2.2b: Sound Level Limit for Indoor Living Areas Road and Rail, and Table 2.2c: Supplementary Sound Level Limits for Indoor Spaces – Road and Rail of the ENCG**. The maximum suggested sound levels for outdoor and indoor living areas between 7am and 11pm are 55 dBA and 45 dBA, respectively. The maximum suggested sound levels for indoor bedrooms are 40 dBA between 11pm and 7am. For reference, **Tables 2.2a, 2.2b and 2.2c of the ENCG** are included in **Appendix A**.

Outdoor Living Area and Indoor Living Area receivers are defined as:

- **Outdoor Living Area (OLA):** The outdoor amenity area provided for quiet enjoyment of the outdoor environment during the daytime period (i.e., backyards, terraces, and patios). OLA noise levels are considered 1.5m above grade.
- **Indoor living Area (ILE):** The indoor living area is provided for the quiet enjoyment of the living/ dining and sleeping quarters within a dwelling, during both the day-time and night-time periods. ILE noise levels are considered inside the building 1.5m above the floor level.

The noise level criteria are summarized in **Table 1:**

**Table 1: Noise Level Criteria**

Time Period	Receiver Location	Noise Level Criteria (Leq)	
		Road	Rail
Daytime (07:00 – 23:00)	OLA	55 dBA	55 dBA
Daytime (07:00 – 23:00)	ILE - living/ dining rooms	45 dBA	40 dBA
Nighttime (23:00 – 07:00)	ILE - sleeping quarters	40 dBA	35 dBA

For modelling purposes, predicted noise levels for ILE's are taken at the Plane of Window (POW) with noise attenuation being provided by the building envelope. This will be discussed further in the following sections of this report.

### 2.1 Noise Sources

The City of Ottawa Official Plan stipulates that a noise study shall be prepared when a new development is proposed within 100 metres of an arterial, major collector, collector road, or light rail transit corridor. Richmond Road and the Light Rail Transit (Confederation Line) are the noise sources that will be considered for this site.

Richmond Road is classified as an undivided four-lane urban Arterial roadway in the City of Ottawa Official Plan. **Table 2** outlines the Richmond Road noise parameters.

**Table 2: Traffic and Roadway Parameters**

Criteria	Richmond Road
Roadway Classification	4-Lane Urban Arterial Un-Divided
Annual Average Daily Traffic (AADT)	30,000 vehicles/day
Day/Night Split (%)	92/8
Medium Trucks (%)	7
Heavy Trucks (%)	5
Posted Speed	50 km/hr

The Light Rail Transit (Confederation Line) needs to take into consideration the number of trips, the speed of the light rail and type of engine for STAMSON noise analysis. Consistent with the nearby 342 Rossevelt development, the light rail parameters assumed in the report are shown in **Table 3**.

**Table 3: Light Rail Parameters**

Criteria	Confederation Line
Engine Type	Electric
Maximum Speed	80 km/hr
Number of Trips	488/day
Length of Train	4

## 2.2 Methods for Noise Attenuation

When OLA or ILE sound levels are predicted to be approximately equal to or less than the maximum suggested levels in ENCG (Table 1), attenuation measures are not required. If the predicted noise levels are found to exceed the limits, noise mitigation and /or warning clauses are required. Warning clauses are discussed in section 2.5. The City of Ottawa's preferred noise mitigation methods are:

- Increasing the amount of soft ground between the noise sources and noise receptor,
- Inserting noise insensitive land between the noise source and the noise receptor,
- Orientate the building to provide shelter to noise sensitive areas,
- Install acoustic (noise) barriers,
- Install air conditioning and forced air ventilation, and
- Enhance construction techniques and construction quality.

## 2.3 Noise Barrier Requirements

Acoustic (noise) barriers are typically the most effective noise mitigation measure listed in Section 2.2. However, acoustic barriers are also typically visually unappealing and expensive to install and maintain. Acoustic barriers are typically only considered when all other noise mitigation techniques listed in Section 2.2 are not sufficient to reduce predicted noise levels below the maximum allowable. Only noise mitigation measures that are economically and administratively feasible will be considered.

Acoustic barriers, if required, must conform to Part 3 of the City of Ottawa's Environmental Noise Control Guidelines (2016), and include the following characteristics:

- Minimum height of 2.2m
- Maximum height of 2.5m, unless approved by the City
- Located 0.30m inside the private property line
- Have a surface mass density of not less than 20kg/sq.m
- Have no holes or gaps.

## 2.4 Ventilation Requirements

A forced air heating system with provision for a central air conditioning system is required if the plane of window daytime noise level is between 55 dBA and 65 dBA and/or the nighttime noise level is between 50 dBA and 60 dBA.

The installation of a central air conditioning system is required when the daytime noise level exceeds 65 dBA and/or the nighttime noise level exceeds 60 dBA.

## 2.5 Warning Clauses

When predicted noise levels exceed the specified criteria, the City of Ottawa and the MOE recommend warning clauses be registered as a notice on title and incorporated into the lease/rental/sale agreements to warn potential purchaser/buyers/tenants of the possible elevated noise levels.

Typical warning clauses should be registered as shown below. Warning clauses are extracted from **Part 4, Appendix A the City of Ottawa ENCG** and excerpts have been provided in **Appendix A** of this report. As stated in the City of Ottawa ENCG, due to the variation of noise impacts for any given site, it may be necessary to amend the example warning clauses to recognize the site conditions in each development.

### Type A

“Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some outdoor activities as the sound levels may exceed the sound level limits of the City and Ministry of the Environment.”

“To help address the need for sound attenuation this development has been designed so as to provide an outdoor amenity area and indoor environment that is within provincial guidelines. Measures for sound attenuation include:

- An acoustic barrier”

“To ensure that provincial sound level limits are not exceeded it is important to maintain sound attenuation features.”

“The acoustic barrier shall be maintained and kept in good repair by the property owner. Any maintenance, repair or replacement is the responsibility of the owner and shall be with the same material or to the same standards, having the same colour, appearance and function of the original.”

Additionally, if a tolerance of 5 dBA is being considered in some areas, it is recommended an additional noise clause be registered on title and incorporated into the agreement of purchase and sales:

### Type B

“Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road/rail/Light Rail/transitway traffic may, on occasion, interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment by up to 5 dBA.”

“To help address the need for sound attenuation this development has been designed so as to provide an outdoor amenity area and indoor environment that is within provincial guidelines.

### Type C

“Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some outdoor activities as the sound levels may exceed the sound level limits of the City and Ministry of the Environment.”

“To help address the need for sound attenuation this development has been designed so as to provide an outdoor amenity area and indoor environment that is within provincial guidelines. Measures for sound attenuation may include:

- Multi-pane glass
- Double brick veneer”

“To ensure that provincial sound level limits are not exceeded it is important to maintain sound attenuation features.”

“This dwelling unit has also been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment”

### Type D

“Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some outdoor activities as the sound levels may exceed the sound level limits of the City and Ministry of the Environment.”

“To help address the need for sound attenuation this development has been designed so as to provide an outdoor amenity area and indoor environment that is within provincial guidelines. Measures for sound attenuation may include:

- Multi-pane glass
- Double brick veneer
- High sound transmission class walls”

“To ensure that provincial sound level limits are not exceeded it is important to maintain sound attenuation features.”

“This dwelling unit has also been supplied with a central air conditioning system and other measures 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 City and the Ministry of the Environment”

For units with multiple types of warning clauses, similar/identical wording can be combined as to not duplicate wording/information.



## 2.6 Building Component Assessment

When plane of window noise levels exceeds 65 dBA (daytime) or 60 dBA (nighttime) the exterior cladding system of the building envelope must be acoustically assessed to ensure indoor sound criteria are achieved. This includes analysis of the exterior wall, door, and/or glazing system specifications as appropriate.

The NRC research document entitled “*Acoustic Insulation Factor: A Rating for the Insulation of Buildings against Noise* (June 1980, JD Quirt)” is used to assess the building components and the required acoustic insulation factor (AIF). This method is recognized by the City of Ottawa.

The required AIF is based on the Outside  $L_{eq}$ , Indoor  $L_{eq}$  required, and the number of exterior façade components.

Minimum Required AIF = Outside  $L_{eq}$  – Indoor  $L_{eq}$  +  $10 \log_{10}$  (Number of Components) + 2dB

Where, N = Number of components (walls and windows)

L = Sound Level expressed on a common decibel scale.

## 2.7 Summary of Attenuation Requirements

**Table 4** summarizes the required noise attenuation measures and warning clauses should sound criteria be exceeded. Excerpts from the MOE NPC-300 and City of Ottawa ENCG documents are included in **Appendix A** for reference.

**Table 4: Noise Attenuation Measure Requirements**

Assessment Location	L <sub>eq</sub> (dBA)	Outdoor Control Measures	Indoor Control Measures		Warning Clause
			Ventilation Requirements	Building Components	
Outdoor Living Area (OLA)	Less than 55	None required	N/A	N/A	None required
	Between 55 and 60	Control measures (barriers) may not be required but should be considered	N/A	N/A	Required if resultant L <sub>eq</sub> exceeds 55 dBA Type A* or Type B**
	More than 60	Barriers required	N/A	N/A	Required if resultant L <sub>eq</sub> exceeds 55 dBA Type A* or Type B*
Plane of Living Room Window (POW)	Less than 55	N/A	None Required	None Required	None Required
	Between 55 and 65	N/A	Forced air heating with provision for central air conditioning	None Required	Required Type C
	More Than 65	N/A	Central Air Conditioning	Acoustical performance of the windows and walls should be specified	Required Type D
Plane of Sleeping Quarters Window (POW)	Less than 50	N/A	None Required	None Required	None Required
	Between 50 and 60	N/A	Forced air heating with provision for central air conditioning	None Required	Required Type C
	More than 60	N/A	Central Air Conditioning	Acoustical performance of the windows and walls should be specified	Required Type D

\*Type A warning clause refers to units requiring a noise barrier that mitigates noise below 55dBA.

\*\*Type B warning clause refers to units requiring a noise barrier but is technically or economically not feasible to reduce levels below 55dBA and a tolerance of up to 5dBA can be granted by the City.

### 3.0 PREDICTED NOISE LEVELS

Noise levels were analyzed using Version 5.03 of the STAMSON computer program. The predicted noise levels are listed in **Table 5** and **Table 6** below.

**Table 5: Simulation Results – Outdoor Living Areas**

Receiver Location*	Calculated Noise Level (dBA) 7:00-23:00		Outdoor Mitigation Method
	Un-attenuated	Attenuated	
OLA 1	53.96	-	N/A
OLA 2	52.36	-	N/A

\*Locations found on **Figure 2 – Node Location Plan**

From **Table 5**, Noise level of both OLA1 and OLA2 are lower than 55dBA and therefore no attenuated measures are required. Refer to **Appendix B** for noise calculations.

**Table 6: Simulation Results – Indoor living Area**

Receiver Location*	Un-attenuated Predicted Noise Level (dBA)		Mitigation Method
	7:00-23:00	23:00-7:00	
R1 (7 <sup>th</sup> Floor)	60.85	53.25	<ul style="list-style-type: none"> <li>• Installation of Forced Air Heating with provision for Air Conditioning</li> <li>• Warning Clause Type C</li> </ul>
R2 (7 <sup>th</sup> Floor)	55.60	49.00	<ul style="list-style-type: none"> <li>• Installation of Forced Air Heating with provision for Air Conditioning</li> <li>• Warning Clause Type C</li> </ul>

\*Locations found on **Figure 2 – Node Location Plan**

Based on the results listed in **Table 6** it is recommended that all units be supplied with Forced Air Heating with provisions for Central Air Conditioning and the inclusion of Noise Warning Clause Type C be registered as a notice on title and incorporated into the lease/rental/sale agreements.

Refer to **Figure 3 – Noise Mitigation Plan** for all proposed noise mitigation measures. Refer to **Appendix B** for noise calculation.

#### 4.0 CONCLUSION

This report recommends:

The installation of Forced Air Heating with provision for Central Air Conditioning and the inclusion of Noise Warning Clause Type C be registered as a notice on title and incorporated into the lease/rental/sale agreements of all the units in the proposed development.

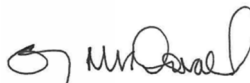
#### NOVATECH ENGINEERING CONSULTANTS LTD.

Report By:

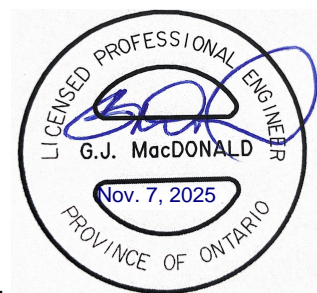


**Ming Fang, C.E.T., B.Eng**  
Design Technologist

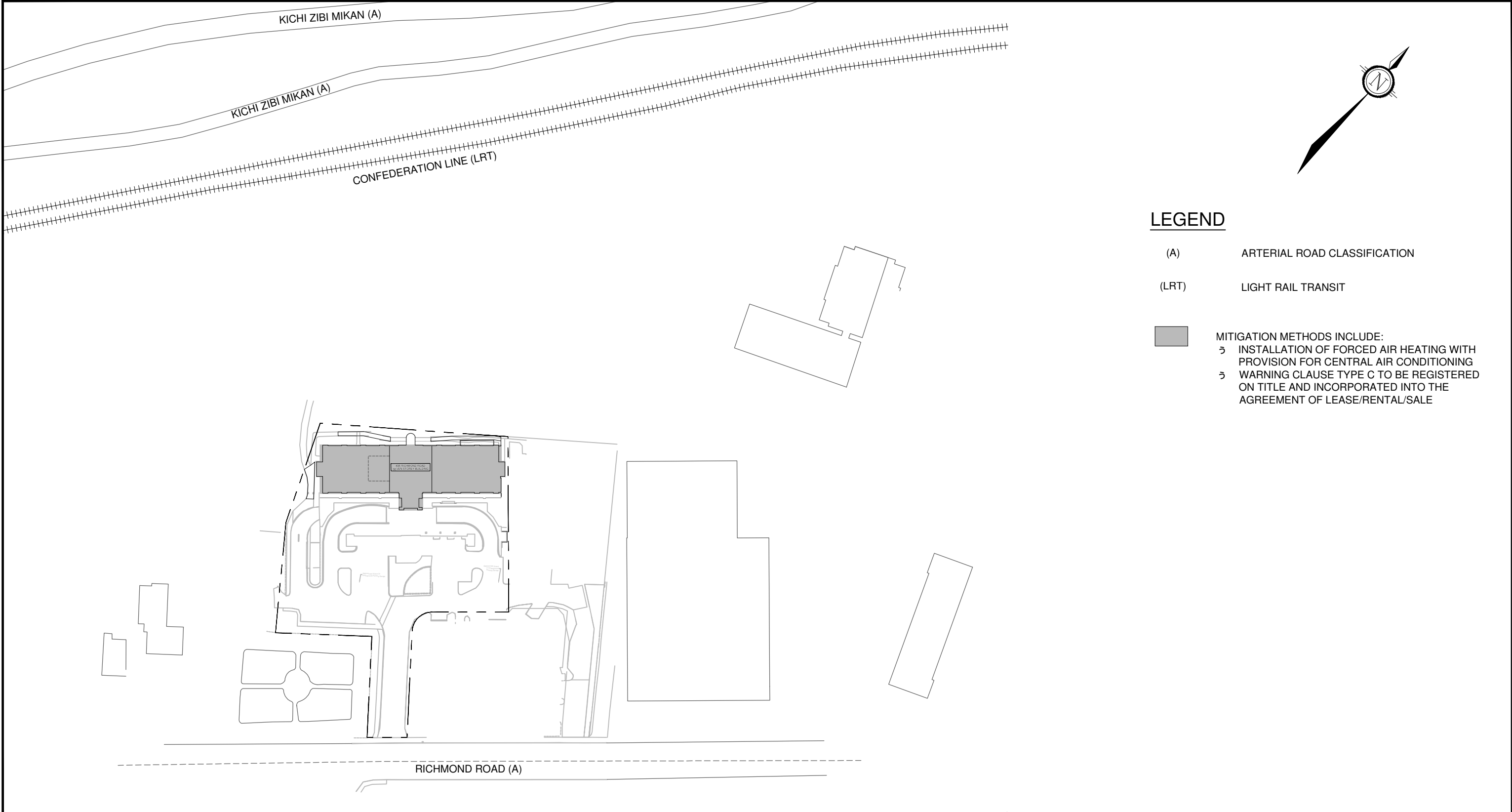
Reviewed By:



**Greg MacDonald, P. Eng.**  
Director - Land Development and  
Public Sector Infrastructure



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LEGEND

(A) ARTERIAL ROAD CLASSIFICATION

(LRT) LIGHT RAIL TRANSIT



- MITIGATION METHODS INCLUDE:
- 5 INSTALLATION OF FORCED AIR HEATING WITH PROVISION FOR CENTRAL AIR CONDITIONING
  - 5 WARNING CLAUSE TYPE C TO BE REGISTERED ON TITLE AND INCORPORATED INTO THE AGREEMENT OF LEASE/RENTAL/SALE



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CITY OF OTTAWA  
495 RICHMOND ROAD

NOISE MITIGATION PLAN

SCALE 1 : 1500 0 15 30 45 60

DATE	NOV 2025	JOB	125090	FIGURE	FIGURE 3
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## **APPENDIX A:**

EXCERPTS FROM THE CITY OF OTTAWA ENVIRONMENTAL NOISE CONTROL GUIDELINES, THE MOE'S NPC-300, THE CITY OF OTTAWA'S OFFICIAL PLAN, ARCHITECT SITE PLAN

# **ENVIRONMENTAL NOISE CONTROL GUIDELINES: Introduction and Glossary**

January 2016

**Table 2.2a: Sound Level Limit for Outdoor Living Areas - Road and Rail**

(from NPC-300, 2013 Table C-1)

Time Period	Required Leq (16) (dBA)
16-hour, 07:00 – 23:00	55

**Table 2.2b: Sound Level Limit for Indoor Living Areas Road and Rail**

(from NPC-300, 2013 Table C-2)

Type of Space	Time Period	Required Leq (dBA)	
		Road	Rail
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	07:00 – 23:00	45	40
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	23:00 – 07:00	45	40
Sleeping quarters	07:00 – 23:00	45	40
	23:00 – 07:00	40	35

The Province also provides for supplementary indoor sound level limits for land uses not generally considered noise sensitive (see Table 2.2c below). These good practice design objectives should be addressed in any noise study prepared for the City. These supplementary sound level limits are based on the windows and doors to an indoor space being closed.

**Table 2.2c: Supplementary Sound Level Limits for Indoor Spaces - Road and Rail (adapted from NPC-300 Table C-9)**

Type of Space	Time Period	Required Leq (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	16 hours between 07:00 – 23:00	50	45
Theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	16 hours between 07:00 – 23:00	45	40
Sleeping quarters of hotels/motels	8 hours between 23:00 – 07:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	8 hours between 23:00 – 07:00	40	35

## Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

**Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions**

Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % <sup>1</sup>
NA <sup>2</sup>	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6-UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
23-34	4-Lane Major Collector (4-UMCU)	24,000	40-60	92/8	7	5
30-35.5	2-Lane Rural Arterial (2-RAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Urban Arterial (2-UAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Major Collector (2-UMCU)	12,000	40-60	92/8	7	5
30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

<sup>1</sup> The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

<sup>2</sup> The number of lanes is determined by the future mature state of the roadway.



# Environmental Noise Guideline

Stationary and Transportation Sources –  
Approval and Planning

Publication NPC-300

**Table C-10**  
**Supplementary Indoor Aircraft Noise Limits**  
**(Applicable over 24-hour period)**

Type of Space	Indoor NEF/NEP*
General offices, reception areas, retail stores, etc.	15
Individual or semi-private offices, conference rooms, etc.	10
Living/dining areas of residences, sleeping quarters of hotels/motels, theatres, libraries, schools, daycare centres, places of worship, etc.	5
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	0

\* The indoor NEF/NEP values listed in Table C-10 are not obtained from NEF/NEP contour maps. The values are representative of the indoor sound levels and are used as assessment criteria for the evaluation of acoustical insulation requirements.

## **C7 Noise Control Measures**

The following sections provide MOE guidance for appropriate noise control measures. These sections constitute requirements that are applied to MOE approvals for stationary sources. This information is also provided as guidance which land use planning authorities may consider adopting.

The definition in Part A describes the various types and application of noise control measures. All the noise control measures described in the definition are appropriate to address the impact of noise of transportation sources (road, rail and aircraft) on planned sensitive land uses. Only some of the noise control measures described in the definition are appropriate to address the noise impact of stationary sources on planned sensitive land uses.

### **C7.1 Road Noise Control Measures**

#### **C7.1.1 Outdoor Living Areas**

If the 16-Hour Equivalent Sound Level,  $L_{eq}(16)$  in the OLA is greater than 55 dBA and less than or equal to 60 dBA, noise control measures may be applied to reduce the sound level to 55 dBA. If measures are not provided, prospective purchasers or tenants should be informed of potential noise problems by a warning clause Type A.

If the 16-Hour Equivalent Sound Level,  $L_{eq}(16)$  in the OLA is greater than 60 dBA, noise control measures should be implemented to reduce the level to 55 dBA. Only in cases where the required noise control measures are not feasible for technical, economic or administrative reasons would an excess above the limit (55 dBA) be acceptable with a warning clause Type B. In the above situations, any excess above the limit will not be acceptable if it exceeds 5 dBA.

## **C7.1.2 Plane of a Window – Ventilation Requirements**

### **C7.1.2.1 Daytime Period, 07:00 – 23:00 Hours**

Noise control measures may not be required if the  $L_{eq}$  (16) daytime sound level in the plane of a bedroom or living/dining room window is less than or equal to 55 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 55 dBA and less than or equal to 65 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Warning clause Type C is also recommended.

If the daytime sound level in the plane of a bedroom or living/dining room window is greater than 65 dBA, installation of central air conditioning should be implemented with a warning clause Type D. In addition, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limits in Table C-2. The location and installation of the outdoor air conditioning device should comply with sound level limits of Publication NPC-216, Reference [32], and guidelines contained in Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices, Reference [6], or should comply with other criteria specified by the municipality.

### **C7.1.2.2 Nighttime Period, 23:00 – 07:00 Hours**

Noise control measures may not be required if the  $L_{eq}$  (8) nighttime sound level in the plane of a bedroom or living/dining room window is less than or equal to 50 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 50 dBA and less than or equal to 60 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. Warning clause Type C is also recommended.

If the nighttime sound level in the plane of a bedroom or living/dining room window is greater than 60 dBA, installation of central air conditioning should be implemented, with a warning clause Type D. In addition, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the sound level limits in Table C-2. The location and installation of the outdoor air conditioning device should comply with sound level limits of Publication NPC-216, Reference [32], and guidelines contained in Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices, Reference [6], or should comply with other criteria specified by the municipality.

## **C7.1.3 Indoor Living Areas – Building Components**

If the nighttime sound level outside the bedroom or living/dining room windows exceeds 60 dBA or the daytime sound level outside the bedroom or living/dining area windows exceeds 65 dBA, building components including windows, walls and doors, where applicable, should be designed so that the indoor sound levels comply with the

sound level limits in Table C-2. The acoustical performance of the building components (windows, doors and walls) should be specified.

## **C7.2 Rail Noise Control Measures**

### **C7.2.1 Outdoor Living Areas**

Whistle noise is not included in the determination of the outdoor daytime sound level due to railway trains. All the provisions of Section C7.1.1 apply also to noise control requirements for rail noise.

### **C7.2.2 Plane of a Window – Ventilation Requirements**

Whistle noise is not included in the determination of the sound level in the plane of a window. All the provisions of Section C7.1.2 apply also to noise control requirements for rail noise.

### **C7.2.3 Indoor Living Areas – Building Components**

The sound level,  $L_{eq}$ , during the daytime (16-hour) and nighttime (8-hour) periods is determined using the prediction method STEAM, Reference [34], immediately outside the dwelling envelope. Whistle noise is included in the determination of the sound level.

If the nighttime sound level outside the bedroom or living/dining room windows exceeds 55 dBA or the daytime sound level outside the bedroom or living/dining area windows exceeds 60 dBA, building components including windows, walls and doors, where applicable, need to be designed so that the indoor sound levels comply with the sound level limits in Table C-2. The acoustical performance of the building components (windows, doors and walls) needs to be specified.

In addition, the exterior walls of the first row of dwellings next to railway tracks are to be built to a minimum of brick veneer or masonry equivalent construction, from the foundation to the rafters when the rail traffic  $L_{eq}$  (24-hour), estimated at a location of a nighttime receptor, is greater than 60 dBA, and when the first row of dwellings is within 100 metres of the tracks.

## **C7.3 Combination of Road and Rail Noise**

The noise impact in the OLA and in the plane of a window, and the requirements for outdoor measures, ventilation measures and warning clauses, should be determined by combining road and rail traffic sound levels.

The assessment of the indoor sound levels and the resultant requirement for the acoustical descriptors of the building components should be done separately for road

In Class 4 areas, where windows for noise sensitive spaces are assumed to be closed, the use of central air conditioning may be acceptable if it forms an essential part of the overall building designs.

### **C7.9 Verification of Noise Control Measures**

It is recommended that the implementation of noise control measures be verified by qualified individuals with experience in environmental acoustics.

## **C8 Warning Clauses**

The use of warning clauses or easements in respect of noise are recommended when circumstances warrant. Noise warning clauses may be used to warn of potential annoyance due to an existing source of noise and/or to warn of excesses above the sound level limits. Direction on the use of warning clauses should be included in agreements that are registered on title to the lands in question. The warning clauses would be included in agreements of Offers of Purchase and Sale, lease/rental agreements and condominium declarations. Alternatively, the use of easements in respect of noise may be appropriate in some circumstances. Additional guidance on the use of noise warning clauses is provided in Section C7.1.1, Section C7.1.2.1, Section C7.1.2.2, Section C7.3 and Section C7.4.

### **C8.1 Transportation Sources**

The following warning clauses may be used individually or in combination:

TYPE A: (see Section C7.1.1)

“Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air traffic) may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment.”

TYPE B: (see Section C7.1.1 and Section C7.4)

“Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic (rail traffic) (air traffic) may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment.”

TYPE C: (see Section C7.1.2.1, Section C7.1.2.2 and Section C7.4)

“This dwelling unit has been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of

central air conditioning by the occupant in low and medium density developments 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.”

TYPE D: (see Section C7.1.2.1, Section C7.1.2.2 and Section C7.4)

“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.”

## **C8.2 Stationary Sources**

It is not acceptable to use warning clauses in place of physical noise control measures to identify an excess over the MOE sound level limits. Warning clause (Type E) for stationary sources may identify a potential concern due to the proximity of the facility but it is not acceptable to justify exceeding the sound level limits.

TYPE E: (see Section C7.6)

“Purchasers/tenants are advised that due to the proximity of the adjacent industry (facility) (utility), noise from the industry (facility) (utility) may at times be audible.”

## **C8.3 Class 4 Area Notification**

TYPE F: (see Section B9.2 and Section C4.4.2)

“Purchasers/tenants are advised that sound levels due to the adjacent industry (facility) (utility) are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed.”

## Appendix A: Warning Clauses

Under the Official Plan and this guideline warning clauses may be required to be incorporated into development through development agreements, registration on title and inclusion in Agreements of Purchase and Sale. This requirement may be included in any development, regardless of whether it is considered a noise sensitive land use.

A warning clause provides recognition for the City, Province landowner or tenants that noise may be a concern, that noise may be audible at times or even quite loud, and, depending on the type of development, provincial guidelines for noise may be exceeded. Warning clauses also recognize that environmental noise is a potential health hazard that does impact people and neighbourhoods. It is for this reason that, unless a non-noise sensitive land use is established, a warning clause should also include noise mitigation.

A warning clause is not considered a form of noise mitigation. It is not acceptable therefore to use warning clauses in place of physical noise control measures to identify an excess over the MOE or City noise limits. The reason for a warning clause on all development is twofold. Firstly, it is important to note that a land use that although the development may not be considered noise sensitive it may include employees or tenants that are personally sensitive to noise. A warning clause provides protection against complaints to the ministry of Environment should provincial guidelines be exceeded. Secondly, a warning clause on title could obviate the need for a new noise study in the future. In a redevelopment scenario the warning clause would provide recognition of the extent noise conditions.

Given the variation in potential intensity and impact of noise it will often be necessary to amend warning clauses to recognize the site specific conditions in each development. Final wording of any warning clause is to be approved by the City.

The following subsections provide example text to be adapted into warning clauses.

## Surface Transportation Warning Clauses

*Table A1 Surface Transportation Warning Clauses*

Type	Example	Notes
Generic	<p><i>Purchasers/tenants are advised that sound levels due to increasing road/rail/Light Rail/transitway traffic may occasionally interfere with some outdoor activities as the sound levels may exceed the sound level limits of the City and the Ministry of the Environment.</i></p> <p><i>To help address the need for sound attenuation this development has been designed so as to provide an outdoor amenity area that is within provincial guidelines. Measures for sound attenuation include:</i></p> <ul style="list-style-type: none"> <li><i>• A setback of buildings from the noise source and</i></li> <li><i>• An acoustic barrier.</i></li> </ul> <p><i>To ensure that provincial sound level limits are not exceeded it is important to maintain sound attenuation features.</i></p> <p><i>The acoustic barrier shall be maintained and kept in good repair by the property owner. Any maintenance, repair or replacement is the responsibility of the owner and shall be with the same material or to the same standards, having the same colour, appearance and function of the original.</i></p> <p><i>Additionally this development includes trees and shrubs to screen the source of noise from occupants.</i></p>	<p>The generic warning clause outlines that MOE sound levels may be exceeded but the indoor environment and outdoor amenity areas are within guidelines.</p> <p>Mitigation measures are described including urban design features.</p> <p>Mention is also made of landscaping to screen the development visually from the source of noise.</p>
Extensive mitigation of indoor and	<p><i>“Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units,</i></p>	<p>The warning clause makes reference to MOE sound levels</p>



**Table A1 Surface Transportation Warning Clauses**

Type	Example	Notes
outdoor amenity area	<p><i>sound levels due to increasing road/rail/Light Rail/transitway traffic may, on occasion, interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.</i></p> <p><i>To help address the need for sound attenuation this development includes:</i></p> <ul style="list-style-type: none"> <li>• <i>multi-pane glass;</i></li> <li>• <i>double brick veneer;</i></li> <li>• <i>an earth berm; and</i></li> <li>• <i>an acoustic barrier.</i></li> </ul> <p><i>To ensure that provincial sound level limits are not exceeded it is important to maintain these sound attenuation features.</i></p> <p><i>The acoustic barrier shall be maintained and kept in good repair by the property owner. Any maintenance, repair or replacement is the responsibility of the owner and shall be with the same material or to the same standards, having the same colour, appearance and function of the original.</i></p> <p><i>This dwelling unit has also been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City and the Ministry of the Environment.</i></p>	<p>being exceeded from time to time and that there are sound attenuation features and landscaping within the development that should be maintained.</p> <p>An option for air conditioning is noted as well as landscaping to screen the source of noise.</p>

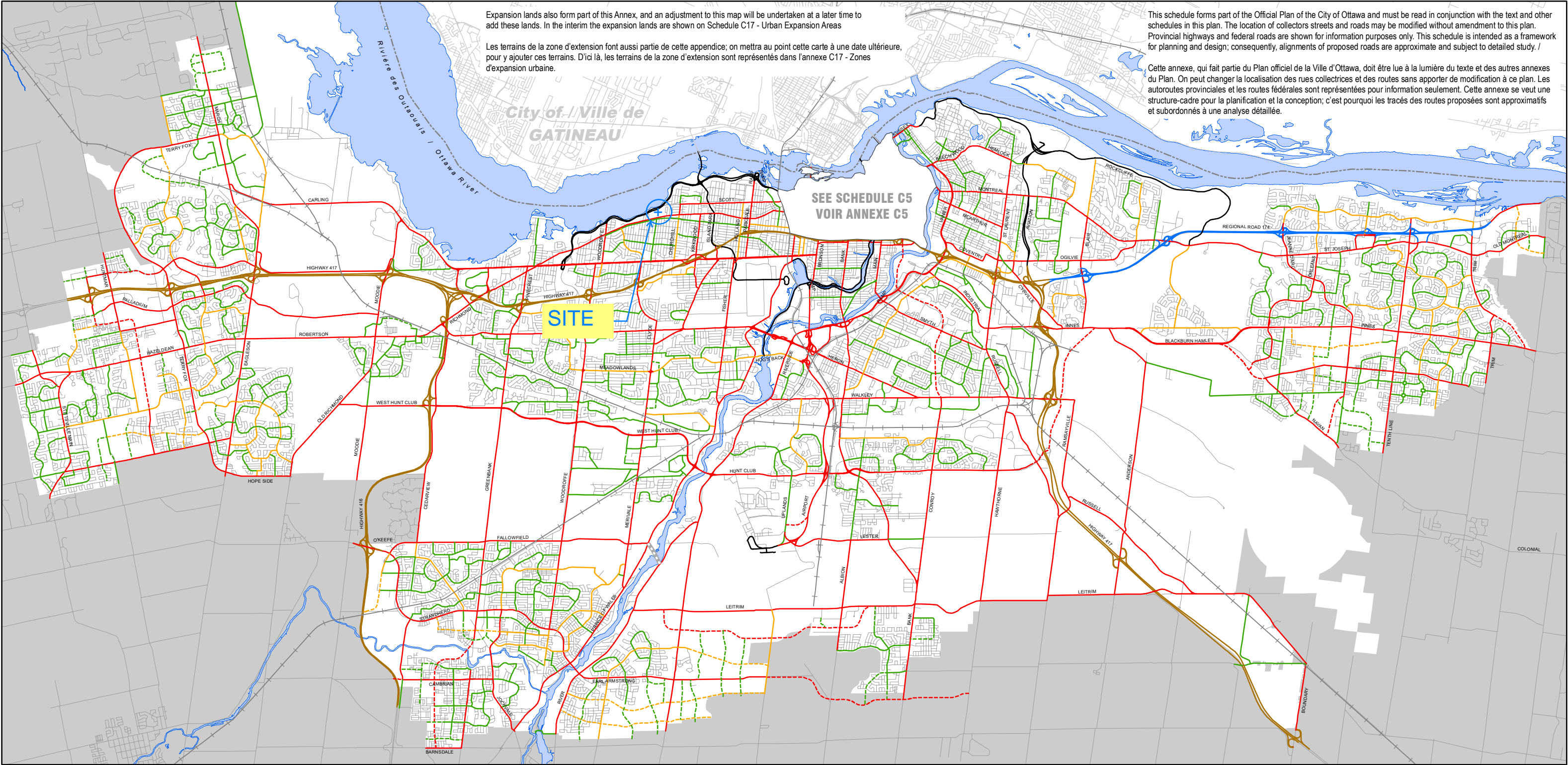
**Table A1 Surface Transportation Warning Clauses**

Type	Example	Notes
	<i>Additionally this development includes trees and shrubs to screen the source of noise from occupants.</i>	
No outdoor amenity area	<p><i>Purchasers/tenants are advised that sound levels due to increasing road/rail/Light Rail/transitway traffic will interfere with outdoor activities as the sound levels exceed the sound level limits of the City and the Ministry of the Environment.</i></p> <p><i>To help address the need for sound attenuation this development includes:</i></p> <ul style="list-style-type: none"> <li>• multi-pane glass;</li> <li>• double brick veneer;</li> <li>• high sound transmission class walls.</li> </ul> <p><i>To ensure that provincial sound level limits are not exceeded it is important to maintain these sound attenuation features.</i></p> <p><i>This dwelling unit has been supplied with a central air conditioning system and other measures 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 City and the Ministry of the Environment</i></p>	This warning clause notes that only an indoor environment is being provided for.

## Stationary Source Warning Clauses

The Province notes that it is not acceptable to use warning clauses in place of physical noise control measures to identify an excess over the MOE sound level limits for stationary sources. The generic warning clause for stationary sources (called Type E in NPC-300) may identify a potential concern due to the proximity of the facility but it is not possible to justify exceeding the sound level limits.

The wording of the generic stationary noise warning clause may also be used as the basis for new development adjacent to areas licensed for mineral aggregate extraction.



This schedule forms part of the Official Plan of the City of Ottawa and must be read in conjunction with the text and other schedules in this plan. The location of collectors streets and roads may be modified without amendment to this plan. Provincial highways and federal roads are shown for information purposes only. This schedule is intended as a framework for planning and design; consequently, alignments of proposed roads are approximate and subject to detailed study. /

Cette annexe, qui fait partie du Plan officiel de la Ville d'Ottawa, doit être lue à la lumière du texte et des autres annexes du Plan. On peut changer la localisation des rues collectrices et des routes sans apporter de modification à ce plan. Les autoroutes provinciales et les routes fédérales sont représentées pour information seulement. Cette annexe se veut une structure-cadre pour la planification et la conception; c'est pourquoi les tracés des routes proposées sont approximatifs et subordonnés à une analyse détaillée.

- |                                       |       |   |                      |   |                              |
|---------------------------------------|-------|---|----------------------|---|------------------------------|
| Arterial - Existing                   | —     | Artère - Établie                          | Provincial Highway   | — | Route provinciale            |
| Arterial - Future (alignment defined) | - - - | Artère - Future (alignement déterminée)   | Federally Owned Road | — | Chemins de propriété fédéral |
| Major Collector - Existing            | —     | Grande collectrice - Établie              | City Freeway         | — | Autoroute municipale         |
| Major Collector - Future              | - - - | Grande collectrice - Future               |                      |   |                              |
| Collector - Existing                  | —     | Collectrice - Établie                     |                      |   |                              |
| Collector - Future                    | - - - | Collectrice - Future                      |                      |   |                              |
| River Crossing (corridor undefined)   | - - - | Traversée de rivière (couloir non défini) |                      |   |                              |

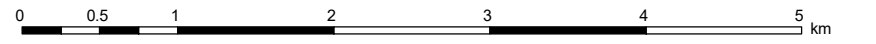


## Official Plan / Plan officiel

### Schedule C4 - Urban Road Network Annexe C4 Réseau routier urbain

Approved on November 4, 2022  
Approuvé le 4 novembre 2022

Consolidation and Amendments / Consolidation et amendements







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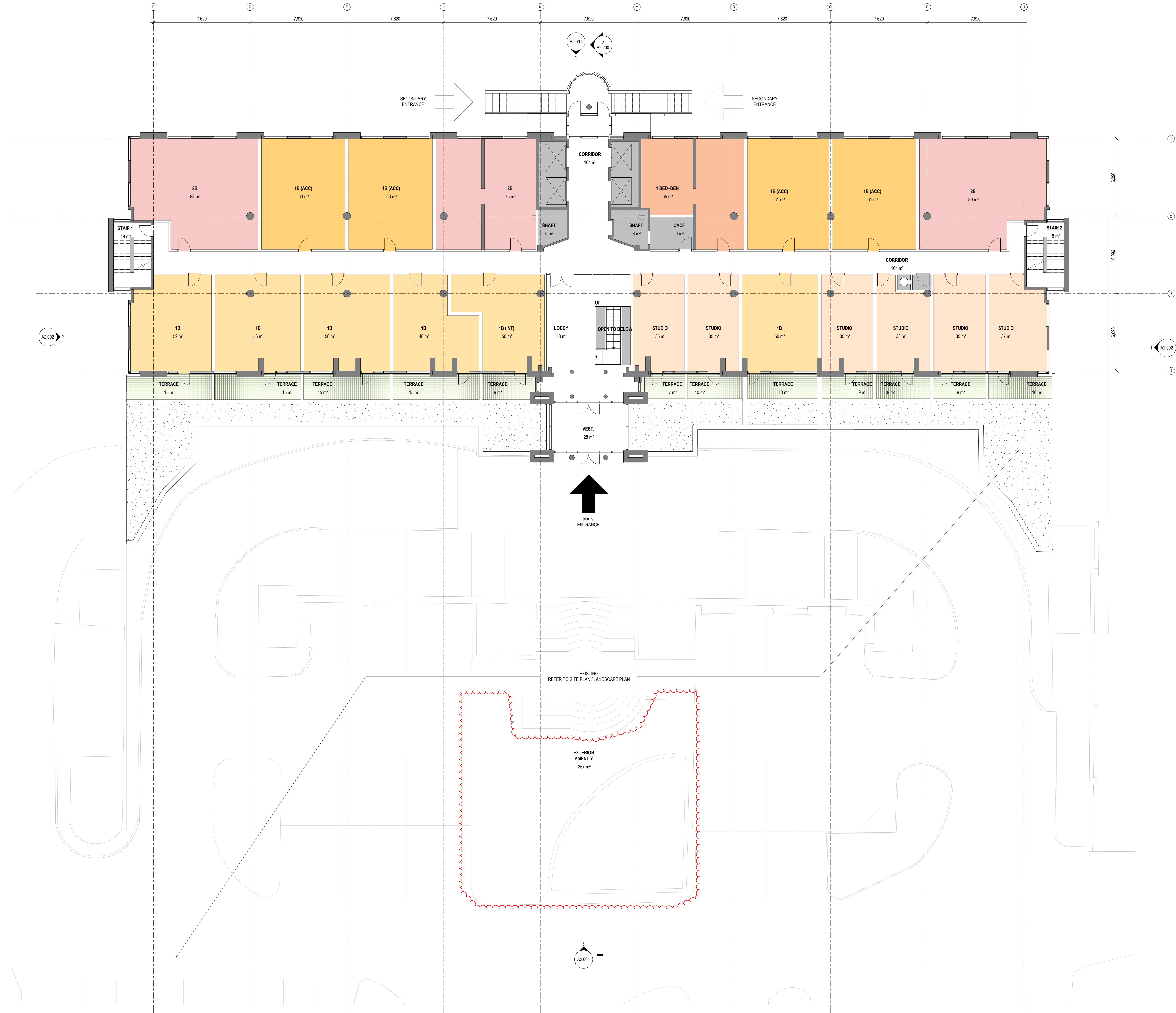
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1 LEVEL - 01 (GROUND FLOOR)

SCALE: 1 : 100



SHEET NOTES

- AREAS LEGEND
- 1 BED
  - 1 BED (ACC)
  - 1 BED + DEN
  - 2 BED
  - CIRCULATION
  - EXTERIOR AMENITY
  - SERVICE SPACE
  - SHAFTS
  - STAIRS
  - STUDIO
  - TERRACES

GENERAL NOTES

- LEGEND
- EXISTING STRUCTURE
  - NEW STRUCTURE

KEY PLAN

495 RICHMOND ROAD

495 RICHMOND RD  
OTTAWA, ON K2A 3W9

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Architect  
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Quasar Consulting Group  
M&E Consultant  
250 Rowntree Dairy Rd,  
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RJC Engineers  
Building Envelope Consultant  
100 University Ave,  
Toronto, ON M5J 2Y1  
Tel: (416) 977-5335

Seal / Signature

△ Date Description

IN PROGRESS

Project Name

DOV CAPITAL  
CORPORATION

Project Number

067.1403.000

Description

LEVEL - 01 (GROUND FLOOR)

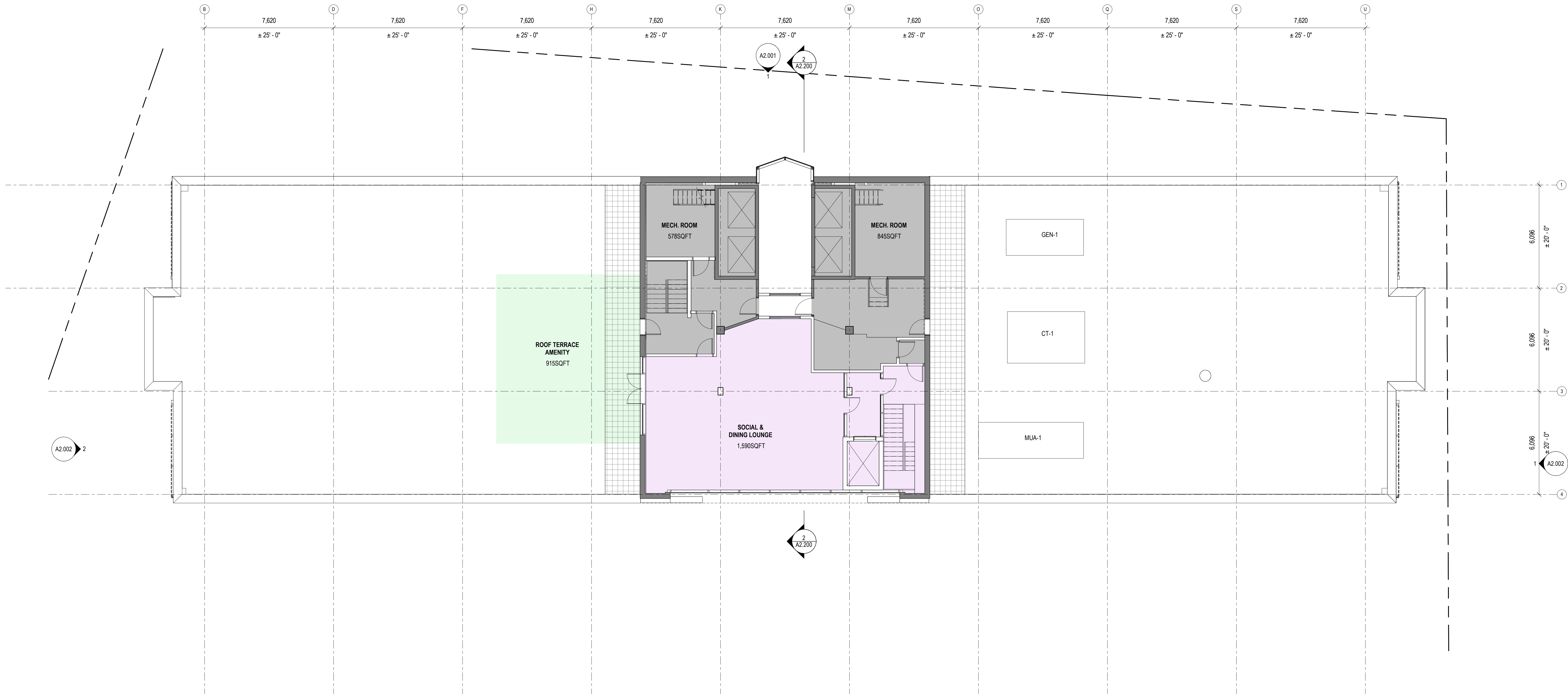
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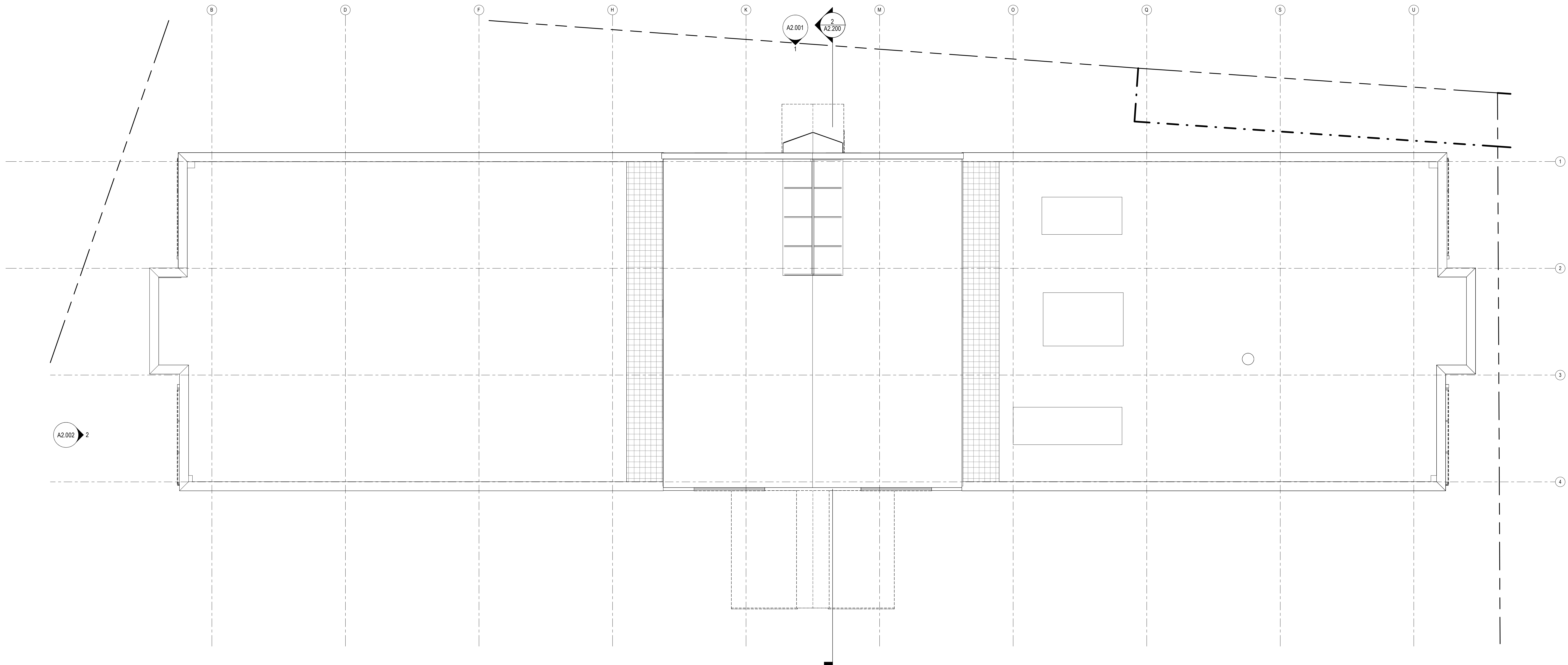
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2 LEVEL - 08  
SCALE: 1:100



1 ROOF PLAN  
SCALE: 1:100



SHEET NOTES

- AREAS LEGEND
- CIRCULATION
  - EXTERIOR AMENITY
  - INTERIOR AMENITY
  - SERVICE SPACE
  - STAIRS

GENERAL NOTES

495 RICHMOND ROAD  
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△ Date Description

Seal / Signature

Project Name

DOV CAPITAL  
CORPORATION

Project Number

067.1403.000

Description

LEVEL 08 & ROOF PLAN

Scale

1 : 100

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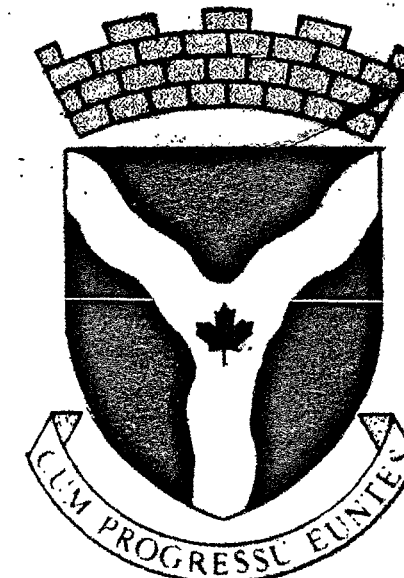
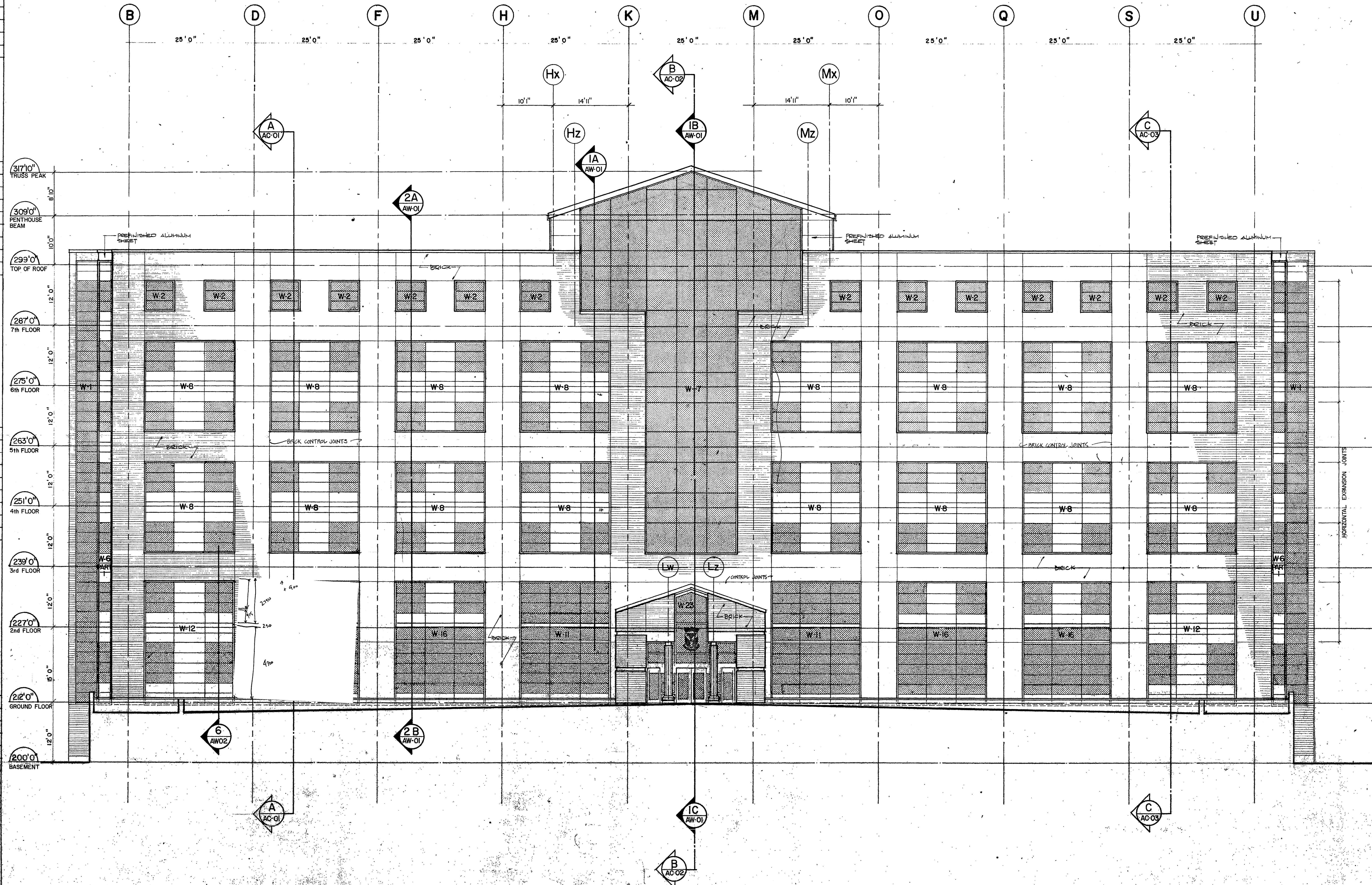
SITE SERVICES

ELECTRICAL

MECHANICAL

STRUCTURAL

ARCHITECTURAL



Regional Municipality  
of Ottawa - Carleton

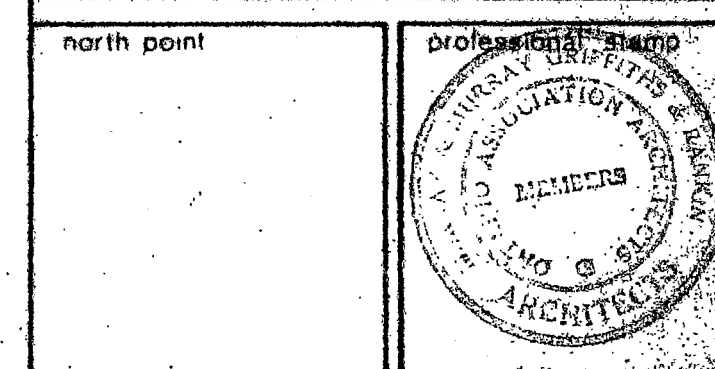
222 Queen St. Ottawa  
Ontario Canada K1P-5Z3

10/11 TENDER PKG 10 & 11 12 MAR 84  
EXPANDED Joints REVISED 10 DEC 83 M.B.  
7 TENDER PKG 7 30 11/83  
GENERAL REVISION 2/11/83  
5 MECHANICAL & ELECTRICAL TENDER 1/11/83  
4 CONCRETE TENDER 2/10/83

MURRAY & MURRAY  
GRIFFITHS & RANKIN

141 Sussex Drive Ottawa K1N 8Z6 Ontario Canada 237-5216

consultant  
CONSTRUCTION MANAGERS **ELLIS-DON**  
STRUCTURAL ROBERT HALL & ASSOCIATES LTD.  
MECHANICAL SMITH & ANDERSEN CONSULTING ENG.  
ELECTRICAL WOOD, BANANI & ASSOCIATES LTD.  
SITE SERVICES OLIVER MANGIONE  
LANDSCAPE WHEELER DOUGLAS & ASSOCIATES LTD.



Project title  
**R.M.O.C.**  
495 Richmond Road  
OTTAWA CANADA

Drawing title  
**SOUTH ELEVATION**

Drawn A.B.S.	Approved A.E.O.	Scales 1/8"=1'-0"	Date 12 MAR 84
Job no. 8311	Drawing no. AE-OI	Revision R2	

Figured dimensions only should be taken from this drawing.  
All contractors must read the site and be responsible for layout  
and checking all dimensions that relate to this work.



SITE SERVICES

ELECTRICAL

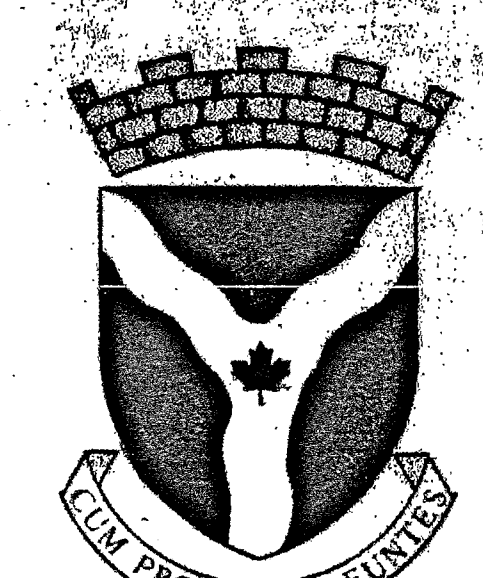
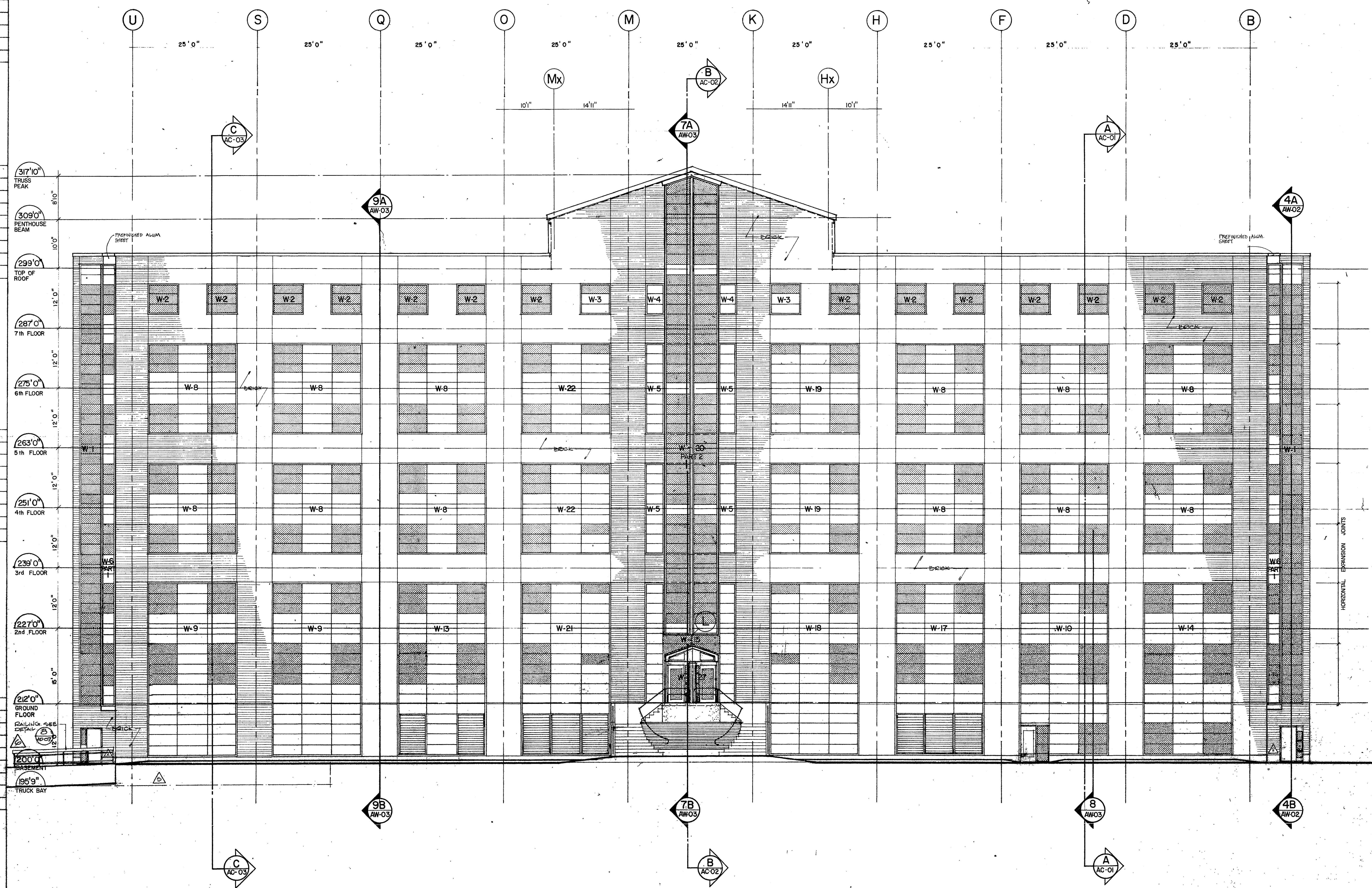
MECHANICAL

STRUCTURAL

ARCHITECTURAL

AE-001	AE-002	12/13/84
AE-003	AE-004	12/13/84
AE-005	AE-006	12/13/84
BT-001	BT-002	12/13/84

8311



Regional Municipality  
of Ottawa - Carleton

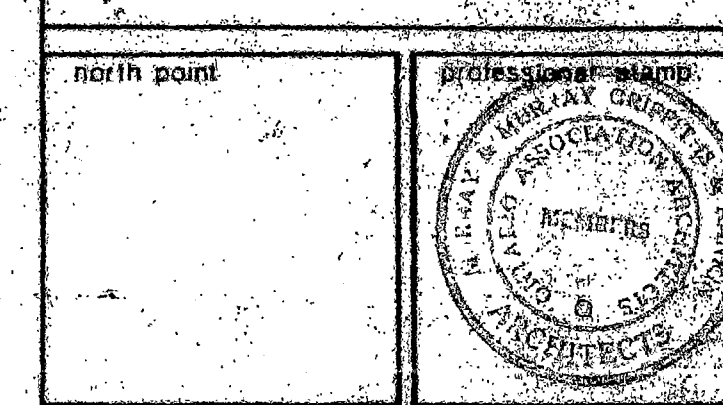
222 Queen St. Ottawa  
Ontario Canada K1P-5Z3

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7	TENDER PKG 7	30 NOV 83
4	NEW LANDING BY FLR. ELEV. 190'-0"	25 NOV 83
4	GENERAL REVISION	21/11/83
6	WATERPROOFING AT PERIMETER	6.1
5	REAR PORCH ADDED	16/11/83
5	MECHANICAL & ELECTRICAL TENDER	1/11/83
4	NEW CONCRETE ELEV. 20'-0" WAS 20'-0"	24 OCT 83
4	CONCRETE TENDER	21 OCT 83
no	revision	date
		by

**MURRAY & MURRAY  
GRIFFITHS & RANKIN**

architects & planning consultants  
541 Sussex Drive Ottawa K1N 6Z5 Ontario Canada 237-3215

consultant	
CONSTRUCTION MANAGERS	<b>ELLIS - DON</b> LIMITED
STRUCTURAL	ROBERT HALLSALL & ASSOCIATES LTD.
MECHANICAL	SMITH & ANDERSEN CONSULTING ENG.
ELECTRICAL	WOOD, BANANI & ASSOCIATES LTD.
SITE SERVICES	OLIVER MANGIONE MCALLA & ASSOC.
LANDSCAPE	WHEELER DOUGLAS & ASSOCIATES LTD.



project title:  
**R.M.O.C.**  
495 Richmond Road  
OTTAWA CANADA

drawing title:  
**NORTH ELEVATION**





drawn D. BROOKS	approved	scales 1/8"=1'-0"	date 12-14-84
job no. 8311	drawing no. AE-02	revision R6	







Notes: Dimensions only should be taken from this drawing.  
All contractors must read the drawing and be responsible for  
checking all dimensions that relate to this work.






## GENERAL NOTES

- 
- |  |                                |
|--|--------------------------------|
|  | ADJACENT BUILDING              |
|  | EXISTING ROAD                  |
|  | EXISTING LOADING AREA          |
|  | EXISTING PEDESTRIAN PATH       |
|  | PROPOSED GREEN SPACE           |
|  | EXISTING GREEN SPACE TO REMAIN |

-  PROPERTY LINE  
 ADJACENT PROPERTY LINES & EASEMENT BOUNDARIES  
 EXISTING PARKING LEVEL BELOW  
 OUTLINE BELOW

- |   |                                    |
|---|------------------------------------|
| (E)  | EXISTING LOADING ENTRY             |
| (E)  | EXISTING EXIT                      |
| (E)  | EXISTING PRIMARY ENTRANCE          |
|      | EXISTING VEHICLE TRAFFIC DIRECTION |
| (E)  | EXISTING FIRE HYDRANT              |
| (E)  | EXISTING SIAMSE                    |
| $\begin{array}{c} \text{---} XX' - XX'' \\ \text{---} XXXXX \end{array}$                  | EXISTING DIMENSION                 |
| $\begin{array}{c} \text{---} XX' - XX'' \\ \text{---} XXXX \end{array}$                   | PROPOSED DIMENSION                 |
| $\begin{array}{c} \text{---} EL + XX XX' \\ \text{---} (XX' - XX'') \end{array}$          | EXISTING GRADE                     |

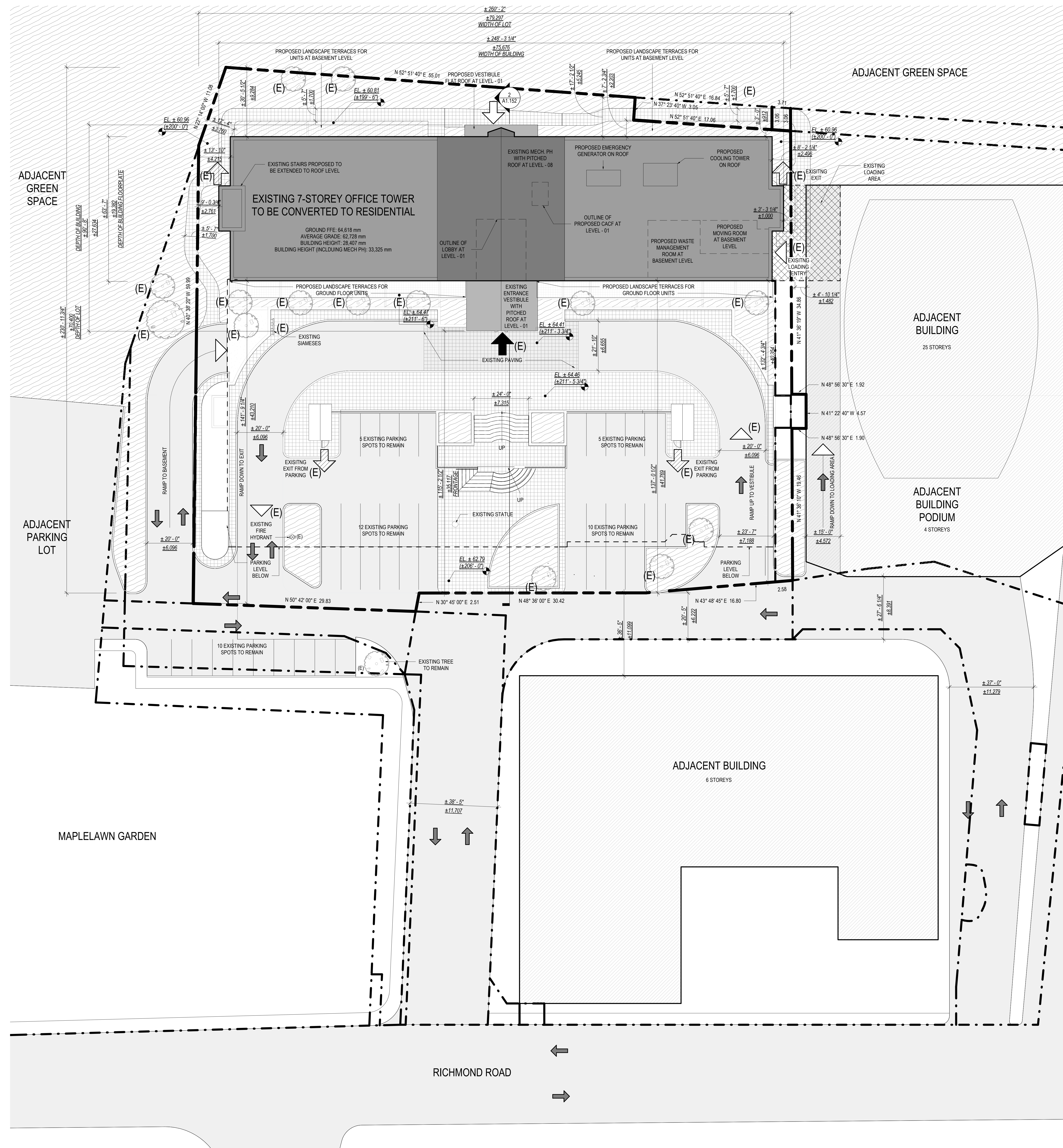
- (E)
- |   |                         |
|---|-------------------------|
|  | PROPOSED TREE           |
|  | EXISTING TREE TO REMAIN |
|  | DEMOLISHED TREE         |

Seal / Signature

Project Name	DOV CAPITAL CORPORATION
Project Number	067.1403.000
Description	SITE PLAN

Scale  
1 : 200

A1.151



1 SITE PLAN  
SCALE: 1:200

## **APPENDIX B**

### SOUND LEVEL CALCULATIONS



Filename: ola1t.te                      Time Period: Day/Night 16/8 hours  
 Description: OLA1 - ROOF TOP AMENITY AREA

Rail data, segment # 1: LRT (day/night)

Train Type	! Trains	! Speed (km/h)	!# loc /Train	!# Cars /Train	! Eng type	!Cont !weld
1. LRT	! 449.0/39.0	! 80.0	! 1.0	! 4.0	! Elec	! Yes

Data for Segment # 1: LRT (day/night)

Angle1	Angle2	: -83.00 deg	35.00 deg
Wood depth		: 0	(No woods.)
No of house rows		: 0 / 0	
Surface		: 1	(Absorptive ground surface)
Receiver source distance		: 122.00 / 122.00 m	
Receiver height		: 1.50 / 1.50 m	
Topography		: 4	(Elevated; with barrier)
No Whistle			
Barrier angle1		: -83.00 deg	Angle2 : 35.00 deg
Barrier height		: 1.00 m	
Elevation		: 33.62 m	
Barrier receiver distance		: 9.00 / 9.00 m	
Source elevation		: 57.50 m	
Receiver elevation		: 91.12 m	
Barrier elevation		: 91.12 m	
Reference angle		: 0.00	

↑

Rail data, segment # 2: LRT (day/night)

Train Type	! Trains	! Speed (km/h)	!# loc /Train	!# Cars /Train	! Eng type	!Cont !weld
1. LRT	! 449.0/39.0	! 80.0	! 0.0	! 4.0	! Elec	! Yes

Data for Segment # 2: LRT (day/night)

Angle1	Angle2	: 35.00 deg	74.00 deg
Wood depth		: 0	(No woods.)
No of house rows		: 0 / 0	
Surface		: 1	(Absorptive ground surface)
Receiver source distance		: 122.00 / 122.00 m	
Receiver height		: 1.50 / 1.50 m	
Topography		: 4	(Elevated; with barrier)

No Whistle

Barrier angle1 : 35.00 deg Angle2 : 74.00 deg  
Barrier height : 5.70 m  
Elevation : 33.62 m  
Barrier receiver distance : 3.00 / 3.00 m  
Source elevation : 57.50 m  
Receiver elevation : 91.12 m  
Barrier elevation : 91.12 m  
Reference angle : 0.00

↑

Result summary (day)

```
-----
!   Loc   !   Wheel   ! Whistle   ! Whistle   !   Total
!   Leq   !   Leq   ! Left Leq ! Right Leq !   Leq
!   (dBA) !   (dBA) !   (dBA)  !   (dBA)  !   (dBA)
-----+-----+-----+-----+-----
1.LRT      !   43.89 !   47.11 !      --   !      --   !   48.80 *
2.LRT      !    0.00 !    0.00 !      --   !      --   !    0.00 *
-----+-----+-----+-----+-----
                        Total                                48.80 dBA
```

\* Bright Zone !

↑

Result summary (night)

```
-----
!   Loc   !   Wheel   ! Whistle   ! Whistle   !   Total
!   Leq   !   Leq   ! Left Leq ! Right Leq !   Leq
!   (dBA) !   (dBA) !   (dBA)  !   (dBA)  !   (dBA)
-----+-----+-----+-----+-----
1.LRT      !   36.28 !   39.51 !      --   !      --   !   41.20 *
2.LRT      !    0.00 !    0.00 !      --   !      --   !    0.00 *
-----+-----+-----+-----+-----
                        Total                                41.20 dBA
```

\* Bright Zone !

↑

Road data, segment # 1: Richmond (day/night)

```
-----
Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

24 hr Traffic Volume (AADT or SADT): 30000  
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: Richmond (day/night)

-----  
Angle1 Angle2 : -90.00 deg -54.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 2 / 2  
House density : 90 %  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 118.00 / 118.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -54.00 deg  
Barrier height : 75.00 m  
Elevation : 26.92 m  
Barrier receiver distance : 3.00 / 3.00 m  
Source elevation : 64.20 m  
Receiver elevation : 91.12 m  
Barrier elevation : 64.60 m  
Reference angle : 0.00

↑

Road data, segment # 2: Richmond (day/night)

-----  
Car traffic volume : 24288/2112 veh/TimePeriod \*  
Medium truck volume : 1932/168 veh/TimePeriod \*  
Heavy truck volume : 1380/120 veh/TimePeriod \*  
Posted speed limit : 50 km/h  
Road gradient : 1 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000  
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: Richmond (day/night)

-----  
Angle1 Angle2 : -54.00 deg -24.00 deg

Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 2 (Reflective ground surface)  
 Receiver source distance : 118.00 / 118.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 4 (Elevated; with barrier)  
 Barrier angle1 : -54.00 deg Angle2 : -24.00 deg  
 Barrier height : 5.70 m  
 Elevation : 26.92 m  
 Barrier receiver distance : 3.00 / 3.00 m  
 Source elevation : 64.20 m  
 Receiver elevation : 91.12 m  
 Barrier elevation : 91.12 m  
 Reference angle : 0.00

↑

Road data, segment # 3: Richmond (day/night)

-----  
 Car traffic volume : 24288/2112 veh/TimePeriod \*  
 Medium truck volume : 1932/168 veh/TimePeriod \*  
 Heavy truck volume : 1380/120 veh/TimePeriod \*  
 Posted speed limit : 50 km/h  
 Road gradient : 1 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000  
 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 # 3: Richmond (day/night)

-----  
 Angle1 Angle2 : -24.00 deg 90.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 2 (Reflective ground surface)  
 Receiver source distance : 118.00 / 118.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 4 (Elevated; with barrier)  
 Barrier angle1 : -24.00 deg Angle2 : 90.00 deg  
 Barrier height : 1.00 m  
 Elevation : 26.92 m  
 Barrier receiver distance : 9.00 / 9.00 m  
 Source elevation : 64.20 m  
 Receiver elevation : 91.12 m  
 Barrier elevation : 91.12 m

Reference angle : 0.00

↑

Result summary (day)

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.Richmond	!	1.50	!	36.06	!	36.06
2.Richmond	!	1.50	!	34.75	!	34.75
3.Richmond	!	1.50	!	52.20	!	52.20
Total						52.38 dBA

↑

Result summary (night)

	!	source	!	Road	!	Total
	!	height	!	Leq	!	Leq
	!	(m)	!	(dBA)	!	(dBA)
1.Richmond	!	1.50	!	28.46	!	28.46
2.Richmond	!	1.50	!	27.15	!	27.15
3.Richmond	!	1.50	!	44.60	!	44.60
Total						44.78 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 53.96  
(NIGHT): 46.36

↑

↑

Filename: ola2t.te                      Time Period: Day/Night 16/8 hours  
 Description: OLA2 - EXTERIOR AMENITY AREA

Rail data, segment # 1: LRT (day/night)

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train	!# Cars !/Train	! Eng type !	!Cont !weld
1. LRT	! 449.0/39.0 !	! 80.0 !	! 1.0 !	! 4.0 !	! Elec !	! Yes

Data for Segment # 1: LRT (day/night)

Angle1    Angle2                      : -84.00 deg    79.00 deg  
 Wood depth                      :        0        (No woods.)  
 No of house rows                :        0 / 0  
 Surface                          :        1        (Absorptive ground surface)  
 Receiver source distance        : 104.00 / 104.00 m  
 Receiver height                 :    1.50 / 1.50    m  
 Topography                      :        4        (Elevated; with barrier)  
 No Whistle  
 Barrier angle1                  : -84.00 deg    Angle2 : 79.00 deg  
 Barrier height                  :    3.00 m  
 Elevation                        :    3.18 m  
 Barrier receiver distance       : 99.00 / 99.00    m  
 Source elevation                :    57.50 m  
 Receiver elevation              :    60.68 m  
 Barrier elevation               :    57.50 m  
 Reference angle                :    0.00

↑  
 Result summary (day)

	! Loc !	! Wheel !	! Whistle !	! Whistle !	! Total !
	! Leq !	! Leq !	! Left Leq !	! Right Leq !	! Leq !
	! (dBA) !	! (dBA) !	! (dBA) !	! (dBA) !	! (dBA) !
1.LRT	! 50.43 !	! 42.63 !	! -- !	! -- !	! 51.10 *
Total					51.10 dBA

\* Bright Zone !

↑  
 Result summary (night)



	! Loc !	Wheel !	Whistle !	Whistle !	Total !
	! Leq !	Leq !	Left Leq !	Right Leq !	Leq !
	! (dBA) !	(dBA) !	(dBA) !	(dBA) !	(dBA) !
1.LRT	! 42.83 !	35.03 !	-- !	-- !	43.50 *
Total					43.50 dBA

\* Bright Zone !



Road data, segment # 1: Richmond (day/night)

```

-----
Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 30000
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: Richmond (day/night)

```

-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 134.00 / 134.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 56.00 deg
Barrier height : 26.50 m
Barrier receiver distance : 6.00 / 6.00 m
Source elevation : 64.20 m
Receiver elevation : 60.68 m
Barrier elevation : 64.62 m
Reference angle : 0.00

```



Result summary (day)

-----

	! source	! Road	! Total
	! height	! Leq	! Leq
	! (m)	! (dBA)	! (dBA)
1.Richmond	! 1.50	! 46.36	! 46.36
	Total		46.36 dBA

↑  
Result summary (night)

	! source	! Road	! Total
	! height	! Leq	! Leq
	! (m)	! (dBA)	! (dBA)
1.Richmond	! 1.50	! 38.76	! 38.76
	Total		38.76 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 52.36  
(NIGHT): 44.76

↑

↑

Filename: r1t.te                      Time Period: Day/Night 16/8 hours  
Description: R1 - POW SEVENTH FLOOR

Road data, segment # 1: Richmond (day/night)

-----  
Car traffic volume : 24288/2112 veh/TimePeriod \*  
Medium truck volume : 1932/168 veh/TimePeriod \*  
Heavy truck volume : 1380/120 veh/TimePeriod \*  
Posted speed limit : 50 km/h  
Road gradient : 1 %  
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000  
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: Richmond (day/night)

-----  
Angle1 Angle2 : -90.00 deg -69.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 1 / 1  
House density : 90 %  
Surface : 2 (Reflective ground surface)  
Receiver source distance : 108.00 / 108.00 m  
Receiver height : 1.50 / 1.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -69.00 deg  
Barrier height : 75.00 m  
Elevation : 23.32 m  
Barrier receiver distance : 3.00 / 3.00 m  
Source elevation : 64.20 m  
Receiver elevation : 87.52 m  
Barrier elevation : 64.60 m  
Reference angle : 0.00

↑

Road data, segment # 2: Richmond (day/night)

-----  
Car traffic volume : 24288/2112 veh/TimePeriod \*  
Medium truck volume : 1932/168 veh/TimePeriod \*  
Heavy truck volume : 1380/120 veh/TimePeriod \*

Posted speed limit : 50 km/h  
 Road gradient : 1 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 30000  
 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: Richmond (day/night)

-----  
 Angle1 Angle2 : -69.00 deg 90.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 108.00 / 108.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 4 (Elevated; with barrier)  
 Barrier angle1 : -69.00 deg Angle2 : -21.00 deg  
 Barrier height : 26.50 m  
 Elevation : 23.32 m  
 Barrier receiver distance : 45.00 / 45.00 m  
 Source elevation : 64.20 m  
 Receiver elevation : 87.52 m  
 Barrier elevation : 64.60 m  
 Reference angle : 0.00

↑  
 Result summary (day)

-----  

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
-----+-----+-----+-----			
1.Richmond	! 1.50 !	34.37 !	34.37
2.Richmond	! 1.50 !	60.84 !	60.84
-----+-----+-----+-----			
Total			60.85 dBA

↑  
 Result summary (night)

-----  

! source !	Road !	Total
! height !	Leq !	Leq

	!	(m)	!	(dBA)	!	(dBA)
1.Richmond	!	1.50	!	26.77	!	26.77
2.Richmond	!	1.50	!	53.24	!	53.24
		Total				53.25 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 60.85  
(NIGHT): 53.25

↑

↑

Filename: r2t.te                      Time Period: Day/Night 16/8 hours  
 Description: R2 - POW SEVENTH FLOOR

Rail data, segment # 1: LRT (day/night)

Train Type	! Trains !	! Speed ! (km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng type !	!Cont !weld
1. LRT	! 449.0/39.0 !	! 80.0 !	! 1.0 !	! 4.0 !	! Elec !	! Yes

Data for Segment # 1: LRT (day/night)

Angle1    Angle2                      : -83.00 deg    77.00 deg  
 Wood depth                      :        0        (No woods.)  
 No of house rows                :        0 / 0  
 Surface                          :        1        (Absorptive ground surface)  
 Receiver source distance        : 110.00 / 110.00 m  
 Receiver height                 :    1.50 / 1.50    m  
 Topography                      :        4        (Elevated; with barrier)  
 No Whistle  
 Barrier angle1                  : -83.00 deg    Angle2 : 77.00 deg  
 Barrier height                  :    3.00 m  
 Elevation                        :    30.03 m  
 Barrier receiver distance       : 105.00 / 105.00 m  
 Source elevation                :    57.50 m  
 Receiver elevation              :    87.52 m  
 Barrier elevation               :    57.50 m  
 Reference angle                :    0.00

↑  
 Result summary (day)

	! Loc !	! Wheel !	! Whistle !	! Whistle !	! Total !
	! Leq !	! Leq !	! Left Leq !	! Right Leq !	! Leq !
	! (dBA) !	! (dBA) !	! (dBA) !	! (dBA) !	! (dBA) !
1.LRT	! 55.10 !	! 51.25 !	! -- !	! -- !	! 56.60 *
Total					56.60 dBA

\* Bright Zone !

↑  
 Result summary (night)

	! Loc	! Wheel	! Whistle	! Whistle	! Total
	! Leq	! Leq	! Left Leq	! Right Leq	! Leq
	! (dBA)	! (dBA)	! (dBA)	! (dBA)	! (dBA)
1.LRT	! 47.50	! 43.65	! --	! --	! 49.00 *
Total					49.00 dBA

\* Bright Zone !

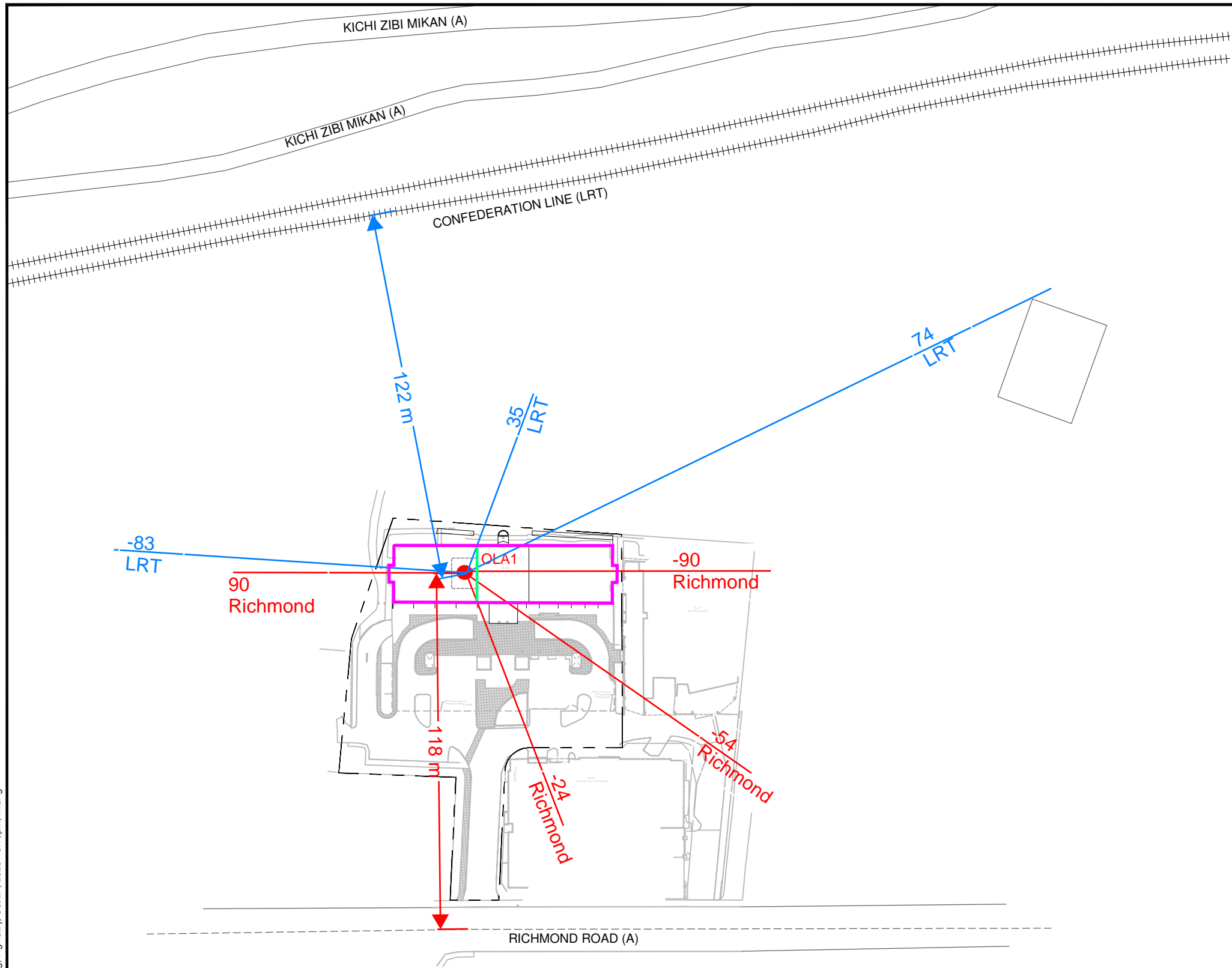
⬆

TOTAL Leq FROM ALL SOURCES (DAY): 56.60  
(NIGHT): 49.00

⬆

⬆

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### LEGEND

- OLA1
- Penthouse
- Parapet Wall

**NOVATECH**

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Facsimile (613) 254-5867  
Website [www.novatech-eng.com](http://www.novatech-eng.com)

CITY OF OTTAWA  
495 RICHMOND ROAD

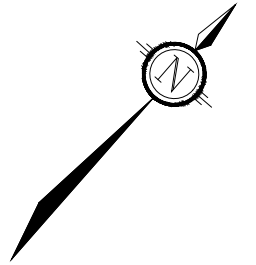
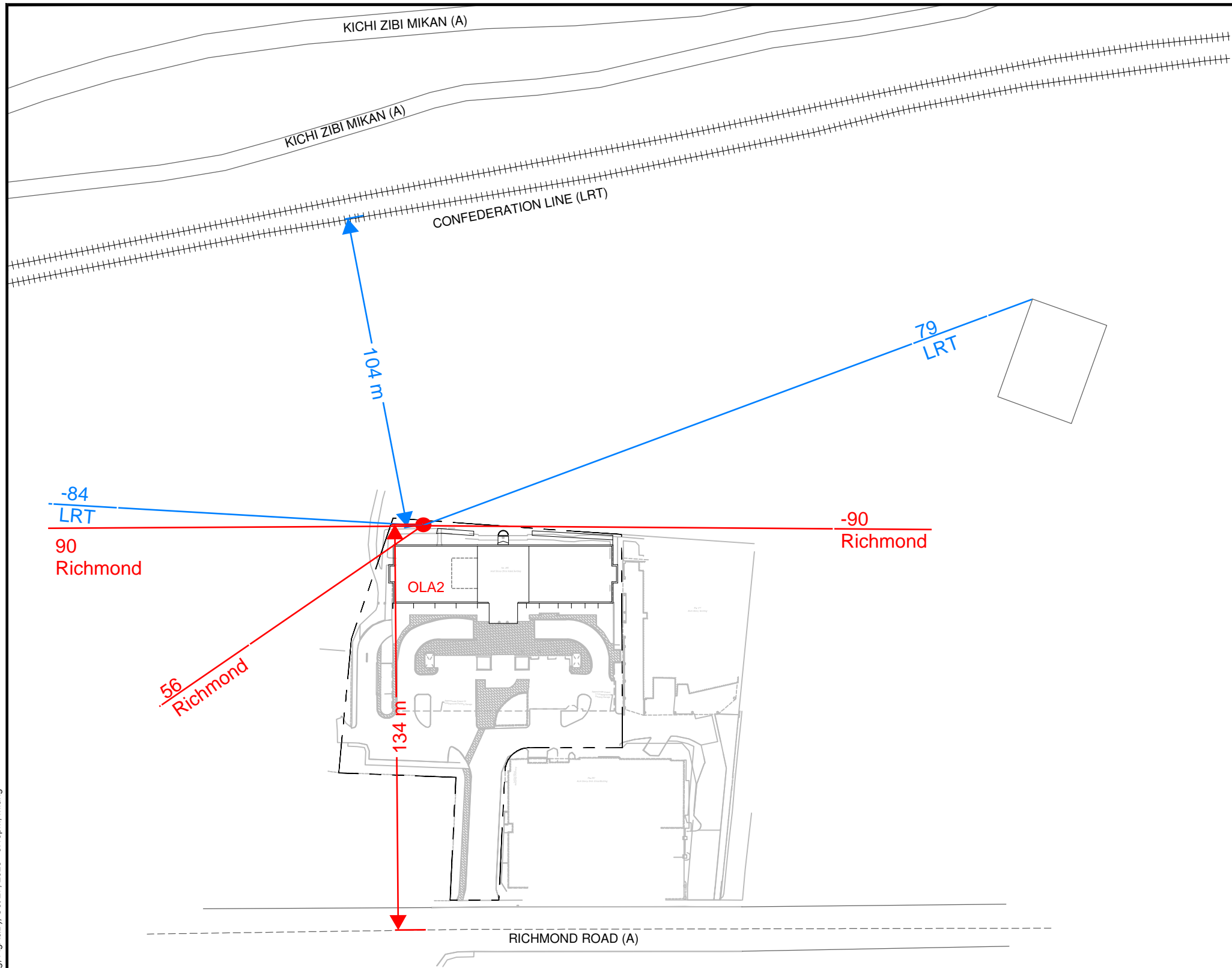
### ANGLES AND DISTANCES

SCALE 1 : 1500 0 15 30 45 60

DATE	OCT 2025	JOB	125090	FIGURE	FIG-OLA1
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M:\2025\125090\CAD\Civil\Figures\Noise\125090-NC.dwg, FigA&D, Oct 27, 2025 - 3:18pm, mfang



## LEGEND

OLA2

**NOVATECH**

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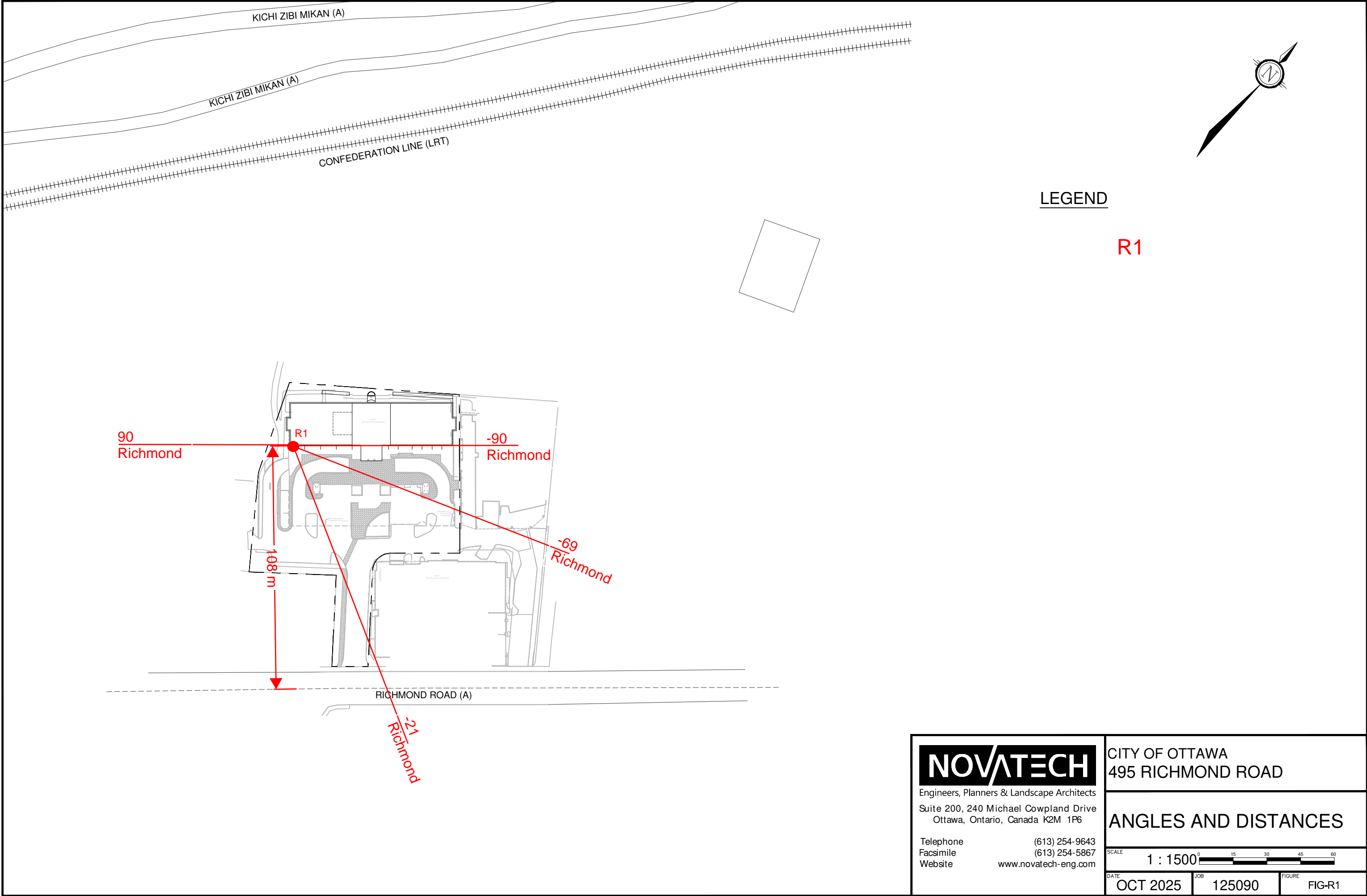
CITY OF OTTAWA  
495 RICHMOND ROAD

## ANGLES AND DISTANCES

SCALE 1 : 1500

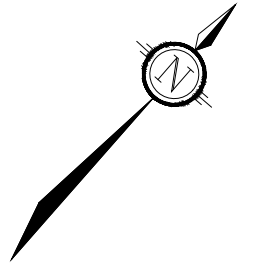
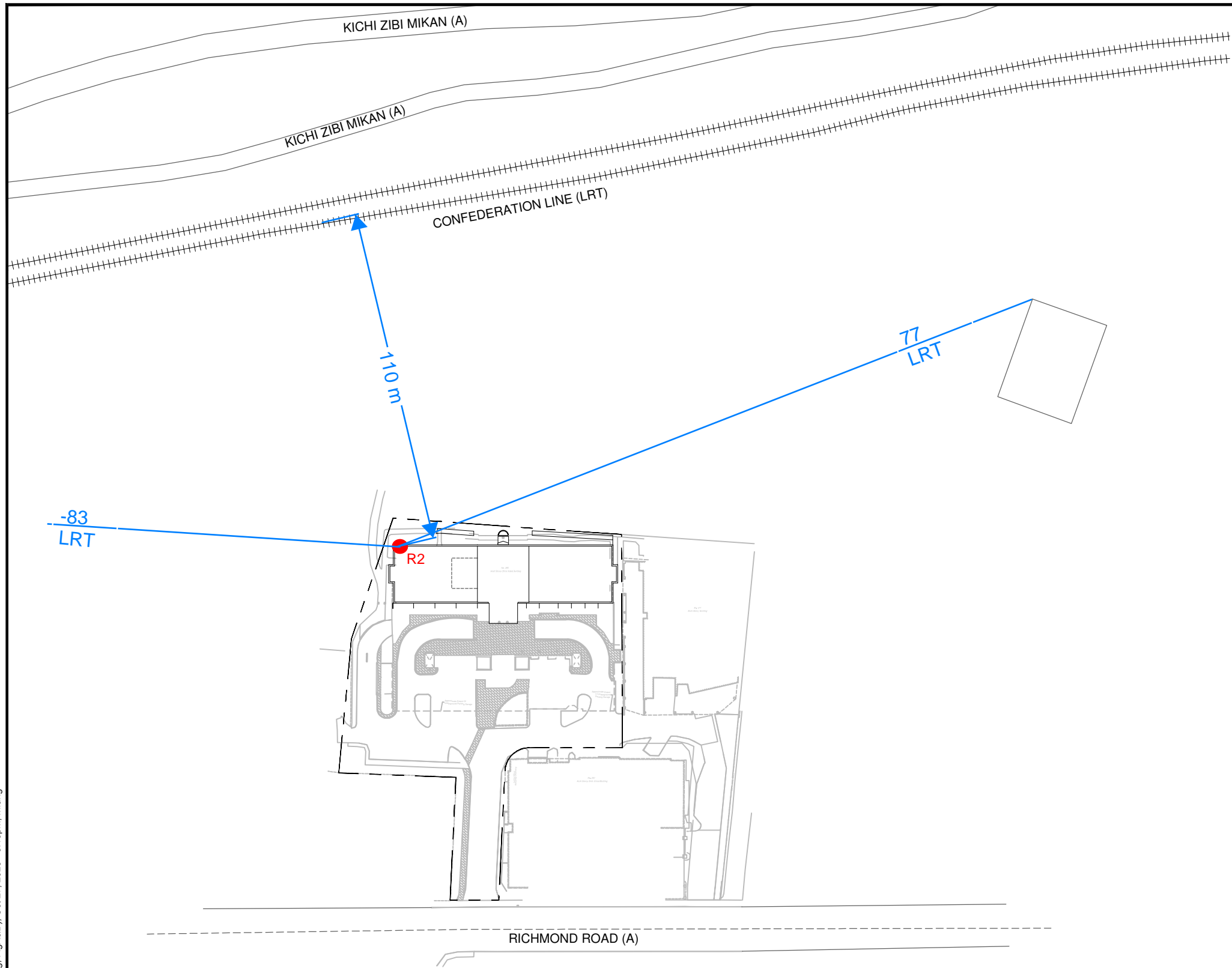
DATE	OCT 2025	JOB	125090	FIGURE	FIG-OLA2
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<b>NOVATECH</b> Engineers, Planners & Landscape Architects Suite 200, 240 Michael Cowpland Drive Ottawa, Ontario, Canada K2M 1P6  Telephone (613) 254-9643 Facsimile (613) 254-5867 Website www.novatech-eng.com	CITY OF OTTAWA 495 RICHMOND ROAD		
	<b>ANGLES AND DISTANCES</b>		
	SCALE 1 : 1500		
	DATE OCT 2025	JOB 125090	FIGURE FIG-R1

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R2



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ANGLES AND DISTANCES

SCALE 1 : 1500

DATE	OCT 2025	JOB	125090	FIGURE	FIG-R2
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