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3400 Woodroffe Avenue

Noise Impact Assessment

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**Phoenix Homes
3400 Woodroffe Avenue**

Prepared by:

NOVATECH

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

November 5, 2025

Ref: R-2025-81
Novatech File No. 124147

November 5, 2025

BY COURIER

City of Ottawa
Planning and Growth Management Department
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1

Attention: Tracey Scaramozzino, Planner II, Development Review, South

**Reference: Phoenix Homes
3400 Woodroffe Avenue
Noise Impact Assessment
Our File No.: 124147**

Please find enclosed the 'Noise Impact Assessment' for the 3400 Woodroffe Avenue development.

Please contact the undersigned with any questions, or if you require additional information.

Sincerely,

NOVATECH



Lucas Wilson, P.Eng.
Project Engineer

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1.0 INTRODUCTION

This report is submitted on behalf of the developer, Phoenix Homes for the proposed development located at 3400 Woodroffe Avenue, herein called the 'Subject Site'. This report assesses the environmental impact of noise on the proposed development and outlines the mitigation measures that will be required.

The subject site is located within Barrhaven, 100 metres south of the Woodroffe Avenue and Paul Metivier Drive intersection. The site is approximately 2.36 hectares and is bounded by existing residential and the Longfields Community Church to the north, Woodroffe Avenue to the east, and existing residential lands to the south and west. A key plan of the area is presented below in **Figure 1-1**.

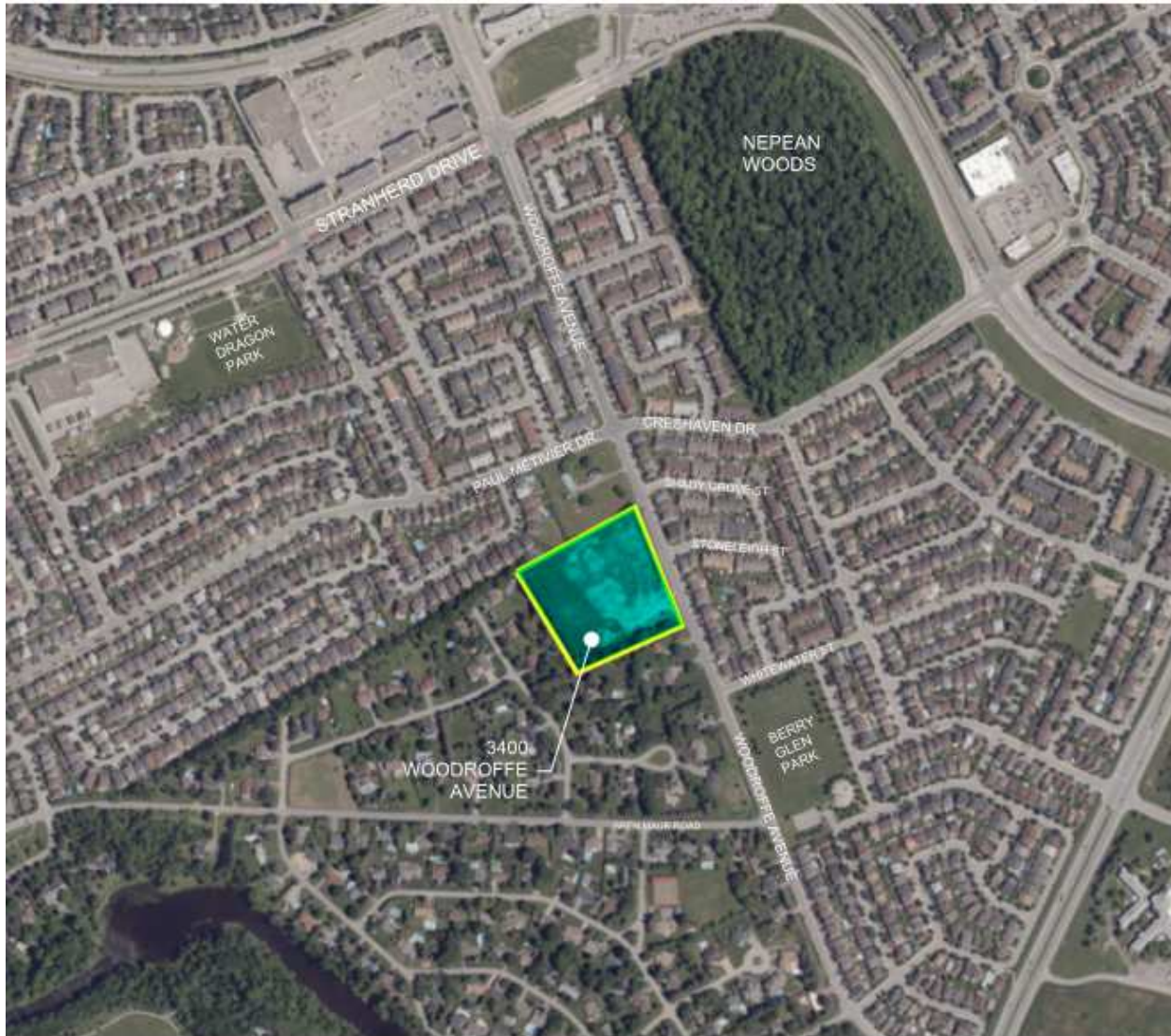


Figure 1-1 Key Plan

The site is vacant with an approximate 10m strip of wooded area running along the west and south property lines. The proposed development will consist of 160 units mixed between nine Terrace Flats blocks (108 units), three three-storey back-to-back Townhome blocks (32 units) and three townhome blocks (20 units). The proposed site plan is shown in **Figure 1-2**.



Figure 1-2 Site Plan

This report assesses the impacts of sound from vehicular traffic on the proposed development using the Ministry of the Environment (MOE) Stamson 5.0 software and outlines any necessary noise attenuation requirements for compliance with the City of Ottawa Environmental Noise Control Guidelines (ENCG) and the MOE Environmental Noise Guidelines (MOE Publication NPC-300).

2.0 CITY OF OTTAWA ENVIRONMENTAL NOISE CONTROL GUIDELINES

2.1 Sound Level Criteria

The City of Ottawa is concerned with noise from aircraft, roads, railways and transitways as expressed in the City of Ottawa Official Plan (May 2003). These policies are supported by the Environmental Noise Control Guidelines (ENCG) which is a technical document that outlines the specific sound level criteria. The City of Ottawa's *Environmental Noise Control Guidelines (ENCG)*, January, 2016 and the Ministry of Environment's *Environmental Noise Guidelines, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300* have been used for the purpose of this report. As per Section 2.2 of the City of Ottawa Noise Control Guidelines (2016), unless otherwise noted, developments should be consistent with NPC-300 (MOE publication, 2013).

The areas that must be assessed for acoustic protection include the Outdoor Living Area (OLA) and the Outdoor Plane of Window (POW).

These locations are defined as:

- **Outdoor Living Area (OLA):** The Outdoor Living Area is defined as that part of the outdoor amenity area provided for the quiet enjoyment of the outdoor environment during the daytime period. These amenity areas are typically backyards, gardens, terraces, patios and common outdoor living areas. The OLA noise target for traffic noise sources is 55 dBA. This criterion may be exceeded by an amount not greater than 5 dBA, subject to justification and the use of a Warning Clause. OLA noise levels are analysed at 3.0m from the building façade, 1.5m above grade.
- **Plane of Window (POW):** The plane of window is defined as the indoor living space where the sound levels will affect the living room area during daytime hours and bedrooms during night time hours. The residential Plane of Window noise target for traffic noise sources is 55 dBA during the day and 50 dBA at night. If this criterion is exceeded, the property may be subject to building component analysis and warning clauses. The sound criterion is broadly summarized in **Table 2-1**. POW noise levels are analysed 1.5m above grade for the first storey, 4.7m above grade for the second storey and 7.5m above grade for the third storey.

Table 2-1 City of Ottawa Outdoor Plane of Window Sound Level Criteria

TIME PERIOD	RECEIVER LOCATION	SOUND LEVEL CRITERIA
Daytime (07:00 - 23:00 hrs)	Plane of Living Room Window	55 dBA
Night time (23:00 - 07:00 hrs)	Plane of Bedroom Window	50 dBA

Compliance with the outdoor sound level criteria generally ensures compliance with the indoor sound level criteria which is summarized below in **Table 2-2**.

Table 2-2 Indoor Sound Level Criteria

TIME PERIOD	RECEIVER LOCATION	SOUND LEVEL CRITERIA
Daytime (07:00 - 23:00 hrs)	Living/Dining Rooms of residential dwelling units , hospitals, schools, nursing homes, day-care centres, theatres, places of worship, individual or semiprivate offices, conference rooms etc.	45 dBA
Night Time (23:00 - 07:00 hrs)	Sleeping quarters of residential units , hospitals, nursing homes, senior citizen homes, etc.	40 dBA

2.2 Noise Attenuation Requirements

When sound levels are predicted to be less than the specified criteria for daytime and night time conditions, no attenuation measures are required on the part of the proponent. As the noise criteria are exceeded, a combination of attenuation measures is recommended by the City of Ottawa and the MOE to modify the development environment.

These attenuation measures may include any or all of the following:

- Distance setback with soft ground;
- Insertion of noise insensitive land uses between the source and sensitive receptor;
- Orientation of building to provide sheltered zone;
- Construction of a noise barrier wall and/or berm;
- Installation of a forced air ventilation system with provision for central air;
- Installation of central air;
- Acoustically selected building façade components

2.2.1 Noise Barrier

Noise barriers should only be used when other noise control measures have been considered, and there is no other alternative. For the purpose of this study, when noise levels exceed 60 dBA in the Outdoor Living Area, control measures (barriers) are required to reduce the Leq to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible.

The noise barriers are to be compliant with the City standard for noise barriers and have the following characteristics.

- Minimum height of 2.2m;
- Maximum height of 2.5m (unless approved by the City of Ottawa);
- Situated 0.30m inside the private property;
- A surface mass density not less than 20kg/sq.m; and
- No holes or gaps.

2.2.2 Ventilation Requirements

A forced air heating system with provision for a central air conditioning system is required if the daytime noise levels are between 55 dBA and 65 dBA and/or night time noise levels are 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 night time noise levels exceed 60 dBA.

2.2.3 Building Component Assessment

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

The NRC research *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} + $\log_{10}$ (Number of Components) + 2dB

Where, N = Number of components (walls, windows and roof);
L = Sound Level expressed on a common decibel scale.

2.2.4 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 sales agreements to warn potential purchaser/buyers/tenants of the possible elevated noise levels.

The following typical warning clauses are extracted from Section C8.1 of the MOE NPC-300 document.

Warning Clause Type A

“Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the City’s and the Ministry of the Environment’s noise criteria.”

Warning Clause 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 traffic may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the City’s and the Ministry of the Environment’s noise criteria.”

Warning Clause Type C

“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 will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City’s and the Ministry of the Environment’s noise criteria.”

Warning Clause Type D

"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria."

2.2.5 Summary of Noise Attenuation Measure Requirements

Table 2-3 summarizes the noise attenuation measure requirements and warning clauses should sound criteria be exceeded.

Table 2-3 Outdoor, Ventilation and Warning Clause Requirements (NPC-300)

Assessment Location	L _{eq} (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 _{eq} exceeds 55 dBA Type A
	More than 60	Barriers required	N/A	N/A	Required if resultant L _{eq} exceeds 55 dBA 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 Bedroom 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

3.0 NOISE SOURCES

The City of Ottawa Official Plan and Environmental Noise Control Guidelines (ENCG) stipulate that a noise impact assessment is required when a noise sensitive development is within proximity to a surface transportation (road or rail), stationary and aircraft noise sources.

Due to the site location, only roadway noise will be considered. The following distances to roadway noise sources are applicable to the subject site:

- Within 100m from the right-of-way of an existing/proposed arterial/collector

Figure 3-1 shows the noise sources that have an impact on this development. Woodroffe Avenue and Paul Metivier Drive (Major Collector) and Whitewater Street (Collector) are located within 100m of the development.

3.1 Woodroffe Ave., Paul Métivier Dr. (Major Collector) and Whitewater St. (Collector)

Woodroffe Avenue and Paul Métivier Drive are classified as Urban Major Collectors (2-UMCU) and Whitewater Street is classified as an Urban Collector (2-UCU) Roadway in the 2013 Transportation Master Plan – Map 6. An Annual Average Daily Traffic (AADT) value of 12,000 is specified for a Major Collector (2-UMCU), while a value of 8,000 is specified for a Collector (2-UCU).

As per Table B1 of Appendix B of the ENCG, **Table 3-1** outlines the traffic parameters used to calculate the sound levels for the development.

Table 3-1 Woodroffe Ave., Paul Métivier Dr. and Whitewater St. Noise Parameters

Roadway Classification	2-Lane Urban Major Collector	2-Lane Urban Collector
	Woodroffe Ave, Paul Metivier Dr.	Whitewater St.
Annual Average Daily Traffic (AADT)	12,000 veh/day	8,000 veh/day
Day/Night Split (%)	92/8	92/8
Heavy Trucks (%)	5	5
Medium Trucks (%)	7	7
Posted Speed Limit	50 km/hr	50 km/hr
Road Gradient	1.0%	1.0%

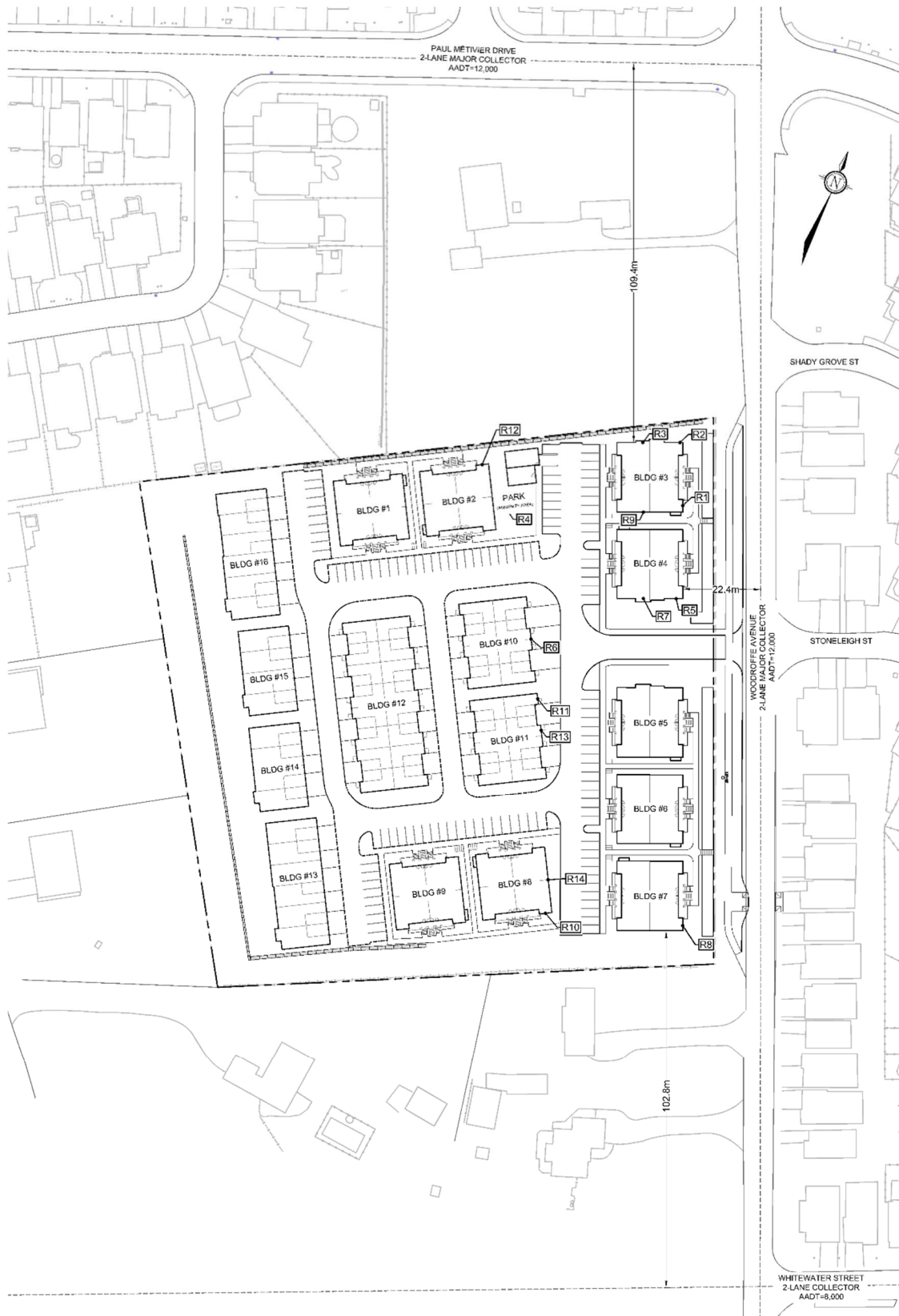


Figure 3-1 Noise Sources

4.0 NOISE LEVEL PREDICTIONS

4.1 Modeling

Noise levels are calculated using the STAMSON computer program, version 5.03. Road data is input into the program as applicable, whereupon the program calculates an A-weighted 16 hour L_{eq} noise level for the daytime and an 8 hour L_{eq} noise level for the night time. The results of these computer calculations are presented in **Appendix A** and summarized in **Table 4-1** and **Table 4-2**.

Table 4-1 OLA Noise Level Summary

LOCATION	OUTDOOR LIVING AREA NOISE LEVEL – L_{eq} - (dBA)
	Unattenuated
R4 (Amenity Area - Park)	54.48

Table 4-2 POW Noise Level Summary

LOCATION	PLANE OF WINDOW (POW) NOISE LEVEL – L_{eq} - (dBA)	
	DAYTIME	NIGHT TIME
R1 (Ground Floor)	65.77	58.17
R2 (Ground Floor)	60.49	52.89
R3 (Ground Floor)	58.19	50.59
R5 (Ground Floor)	59.75	52.15
R6 (Ground Floor)	56.85	49.25
R7 (Ground Floor)	56.87	50.08
R8 (Ground Floor)	65.80	58.20
R9 (Ground Floor)	55.25	47.65
R10 (Ground Floor)	57.66	50.06
R11 (Ground Floor)	56.15	48.55
R12 (Ground Floor)	52.63	45.03
R13 (Ground Floor)	54.97	47.37
R14 (Ground Floor)	56.85	49.25

4.2 Outdoor Control Measures

The shared amenity space (on-site park) is located in the interior of the site, surrounded by buildings and surface parking. The OLA noise level is below the minimum requirement of 55 dBA (54.48 dBA); therefore, no mitigation measures or warning clauses are required.

4.3 Indoor Control Measures

Warning clauses are required on title relating to the requirement of forced air heating with provision for central air conditioning and required central air conditioning.

Units 'C' and 'D' in Buildings 3 to 7 (all levels), Units 'A' and 'B' in Building 8 (all levels), Units 'A', 'B', 'C', and 'D' in Building 10 and Units 'A' and 'B' in Building 11 require forced air heating with provision for central air conditioning and associated warning clause Type C. These units are identified below in **Figure 5-1**.

Typical wording for Type C warning clause: "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 will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria."

Units 'A' and 'B' in Buildings 3 to 7 (all levels) require central air conditioning and associated warning clause Type D and are identified below in **Figure 5-1** and include all units facing Woodroffe Avenue.

Typical wording for Type D warning clause: "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 noise levels are within the City's and the Ministry of the Environment's noise criteria."

4.4 Building Component Assessment

4.4.1 Units facing Woodroffe Avenue

The worst-case sound level is located at R8 facing Woodroffe Avenue and is above the 65 dBA (daytime) allowances at 65.80 dBA. Night-time sound levels are under the 60 dBA allowance at 58.20 dBA. Therefore, an analysis of the cladding system is warranted due to daytime sound levels. To comply with the ENCG policies, the building envelope will require a minimum AIF rating to provide the indoor noise levels as shown above in **Table 2-2**. Compliance at the worst-case receiver points will demonstrate compliance for all locations.

The acoustical insulation factor for residential living rooms is calculated as follows:

Two Building Components: $AIF = 65.80 \text{ dBA} - 45 \text{ dBA} + 10\log(2) \text{ dBA} + 2 \text{ dBA} = 26$

To comply with the ENCG policies, the buildings will require a minimum AIF rating of 26 to provide the appropriate indoor noise levels. Presented below are recommended building materials that provide the required AIF rating. These building materials are only suggestions and can be substituted with equivalent building materials that meet or exceed the AIF rating.

Walls with EW1 compositions (refer to **Appendix A** for applicable worksheets) have an AIF range of 29 to 39 depending on the exterior wall to interior floor area ratio; this exceeds the minimum requirement for 2 components. A standard residential window section employs 3mm glazing x 13mm air space x 3mm glazing, which has an AIF of 26 with a window to floor area ratio of 63%.

When the building floor plans and exterior facade have been finalized, the tables in **Appendix A** shall be referenced to ensure that the selected building components exceed the minimum AIF rating.

5.0 CONCLUSIONS AND RECOMMENDATIONS

To meet the requirements for compliance with the City of Ottawa Environmental Noise Control Guidelines and the MOE Environmental Noise Guideline the following measures are required.

Outdoor Control Measures

The noise level in the shared amenity space is below 55 dBA, therefore no warning clause is required.

Indoor Control Measures

All building faces fronting on Woodroffe Avenue will comply with the ENCG indoor noise policy employing EW1 wall components and standard residential window sections 3mm glazing x 13mm air space x 3mm glazing with a maximum window to floor area ratio of 63%.

Units 'C' and 'D' in Buildings 3 to 7 (all levels), Units 'A' and 'B' in Building 8 (all levels), Units 'A', 'B', 'C', and 'D' in Building 10 and Units 'A' and 'B' in Building 11 require forced air heating with provision for central air conditioning and associated warning clause Type C. These units are identified below in **Figure 5-1**.

Units 'A' and 'B' in Buildings 3 to 7 (all levels) require central air conditioning and associated warning clause Type D and are identified below in **Figure 5-1** and are limited to all units facing Woodroffe Avenue.

Building Component Assessment

All building faces will comply with the ENCG indoor noise policy employing Ontario Building Code minimum building components.

Warning Clauses

Warning clauses are to be placed on title and in the purchase and sale agreements as indicated above and in **Figure 5-1**. The following typical warning clauses are extracted from Section C8.1 of the MOE NPC-300 document.

Warning Clause Type 'C'

"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 will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria."

Warning Clause Type 'D'

"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor noise levels are within the City's and the Ministry of the Environment's noise criteria."



Figure 5-1 Construction Requirements and Warning Clauses

If you have any questions or comments with regards to this report, please do not hesitate to contact the undersigned.

Respectfully issued,

NOVATECH

Prepared By:



Lucas Wilson, P.Eng.
Project Engineer

Reviewed By:



Mark Bissett, P.Eng.
Senior Project Manager

APPENDIX A

Stamson Model Output AIF Component Assessment

Filename: r1.te Time Period: Day/Night 16/8 hours
 Description:

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

```
-----
Car traffic volume : 9715/845    veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume : 552/48    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): 12000
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: Woodroffe (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 : 22.40 / 22.40 m
Receiver height : 1.50 / 1.50 m
Topography : 3                      (Elevated; no barrier)
Elevation : 1.80 m
Reference angle : 0.00
```

Results segment # 1: Woodroffe (day)

Source height = 1.50 m

ROAD (0.00 + 65.77 + 0.00) = 65.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.51	0.00	-1.74	0.00	0.00	0.00	0.00	65.77

Segment Leq : 65.77 dBA

Total Leq All Segments: 65.77 dBA

Results segment # 1: Woodroffe (night)

Source height = 1.50 m

ROAD (0.00 + 58.17 + 0.00) = 58.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.91	0.00	-1.74	0.00	0.00	0.00	0.00	58.17

Segment Leq : 58.17 dBA

Total Leq All Segments: 58.17 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.77
(NIGHT): 58.17

Filename: r2.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 23.30 / 23.30 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 1.80 m
Reference angle : 0.00

Road data, segment # 2: Paul M. (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Paul M. (day/night)

```

-----
Angle1   Angle2       : -47.00 deg   39.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 109.20 / 109.20 m
Receiver height  :      1.50 / 1.50 m
Topography      :      3      (Elevated; no barrier)
Elevation       :      1.80 m
Reference angle  :      0.00

```

Results segment # 1: Woodroffe (day)

Source height = 1.50 m

ROAD (0.00 + 60.06 + 0.00) = 60.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.61	67.51	0.00	-3.07	-4.38	0.00	0.00	0.00	60.06

Segment Leq : 60.06 dBA

Results segment # 2: Paul M. (day)

Source height = 1.50 m

ROAD (0.00 + 50.19 + 0.00) = 50.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-47	39	0.61	67.51	0.00	-13.85	-3.47	0.00	0.00	0.00	50.19

Segment Leq : 50.19 dBA

Total Leq All Segments: 60.49 dBA

Results segment # 1: Woodroffe (night)

Source height = 1.50 m

ROAD (0.00 + 52.46 + 0.00) = 52.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.61	59.91	0.00	-3.07	-4.38	0.00	0.00	0.00	52.46

Segment Leq : 52.46 dBA

Results segment # 2: Paul M. (night)

Source height = 1.50 m

ROAD (0.00 + 42.59 + 0.00) = 42.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-47	39	0.61	59.91	0.00	-13.85	-3.47	0.00	0.00	0.00	42.59

Segment Leq : 42.59 dBA

Total Leq All Segments: 52.89 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.49
(NIGHT): 52.89

Filename: r3.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 34.00 / 34.00 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 1.80 m
Reference angle : 0.00

Road data, segment # 2: Paul M. (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Paul M. (day/night)

Angle1 Angle2 : -45.00 deg 42.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 109.40 / 109.40 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 1.80 m
Reference angle : 0.00

Results segment # 1: Woodroffe (day)

Source height = 1.50 m

ROAD (0.00 + 57.43 + 0.00) = 57.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.61	67.51	0.00	-5.71	-4.38	0.00	0.00	0.00	57.43

Segment Leq : 57.43 dBA

Results segment # 2: Paul M. (day)

Source height = 1.50 m

ROAD (0.00 + 50.23 + 0.00) = 50.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	42	0.61	67.51	0.00	-13.86	-3.42	0.00	0.00	0.00	50.23

Segment Leq : 50.23 dBA

Total Leq All Segments: 58.19 dBA

Results segment # 1: Woodroffe (night)

Source height = 1.50 m

ROAD (0.00 + 49.83 + 0.00) = 49.83 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.61	59.91	0.00	-5.71	-4.38	0.00	0.00	0.00	49.83

Segment Leq : 49.83 dBA

Results segment # 2: Paul M. (night)

Source height = 1.50 m

ROAD (0.00 + 42.63 + 0.00) = 42.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	42	0.61	59.91	0.00	-13.86	-3.42	0.00	0.00	0.00	42.63

Segment Leq : 42.63 dBA

Total Leq All Segments: 50.59 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.19
(NIGHT): 50.59

Filename: r4.te Time Period: Day/Night 16/8 hours
 Description:

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

```
-----
Car traffic volume : 9715/845    veh/TimePeriod *
Medium truck volume : 773/67    veh/TimePeriod *
Heavy truck volume : 552/48    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): 12000
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: Woodroffe (day/night)

```
-----
Angle1    Angle2                      : -47.00 deg    78.00 deg
Wood depth : 0                      (No woods.)
No of house rows : 1 / 1
House density : 70 %
Surface : 2                      (Reflective ground surface)
Receiver source distance : 73.40 / 73.40 m
Receiver height : 1.50 / 1.50 m
Topography : 3                      (Elevated; no barrier)
Elevation : 1.80 m
Reference angle : 0.00
```

Results segment # 1: Woodroffe (day)

Source height = 1.50 m

ROAD (0.00 + 54.48 + 0.00) = 54.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-47	78	0.00	67.51	0.00	-6.90	-1.58	0.00	-4.56	0.00	54.48

Segment Leq : 54.48 dBA

Total Leq All Segments: 54.48 dBA

Results segment # 1: Woodroffe (night)

Source height = 1.50 m

ROAD (0.00 + 46.88 + 0.00) = 46.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-47	78	0.00	59.91	0.00	-6.90	-1.58	0.00	-4.56	0.00	46.88

Segment Leq : 46.88 dBA

Total Leq All Segments: 46.88 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.48
(NIGHT): 46.88

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Filename: r5.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (day/night)

Angle1 Angle2 : 0.00 deg 86.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 24.25 / 24.25 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 1.80 m
Reference angle : 0.00

Results segment # 1: Woodroffe (day)

Source height = 1.50 m

ROAD (0.00 + 59.75 + 0.00) = 59.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	86	0.61	67.51	0.00	-3.35	-4.41	0.00	0.00	0.00	59.75

Segment Leq : 59.75 dBA

Total Leq All Segments: 59.75 dBA

Results segment # 1: Woodroffe (night)

Source height = 1.50 m

ROAD (0.00 + 52.15 + 0.00) = 52.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	86	0.61	59.91	0.00	-3.35	-4.41	0.00	0.00	0.00	52.15

Segment Leq : 52.15 dBA

Total Leq All Segments: 52.15 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.75
(NIGHT): 52.15

Filename: r6.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 66.20 / 66.20 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -66.00 deg Angle2 : -15.00 deg
Barrier height : 10.00 m
Elevation : 1.80 m
Barrier receiver distance : 24.70 / 24.70 m
Source elevation : 102.00 m
Receiver elevation : 104.00 m
Barrier elevation : 104.00 m
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (day/night)

 Angle1 Angle2 : 0.00 deg 84.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 66.20 / 66.20 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : 18.00 deg Angle2 : 74.00 deg
 Barrier height : 10.00 m
 Elevation : 1.80 m
 Barrier receiver distance : 24.70 / 24.70 m
 Source elevation : 102.00 m
 Receiver elevation : 104.00 m
 Barrier elevation : 104.00 m
 Reference angle : 0.00

Results segment # 1: Woodroffe (day)

 Source height = 1.50 m

Barrier height for grazing incidence

Source	! Receiver	! Barrier	! Elevation of
Height (m)	! Height (m)	! Height (m)	! Barrier Top (m)
-----+-----+-----+-----			
1.50 !	1.50 !	0.75 !	104.75

ROAD (52.31 + 35.89 + 50.27) = 54.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-90	-66	0.00	67.51	0.00	-6.45	-8.75	0.00	0.00	0.00	52.31
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-66	-15	0.00	67.51	0.00	-6.45	-5.48	0.00	0.00	-19.70	35.89
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-15	0	0.00	67.51	0.00	-6.45	-10.79	0.00	0.00	0.00	50.27
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Segment Leq : 54.48 dBA

Results segment # 2: Woodroffe (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.50	!	1.50	!	0.75	!	104.75

ROAD (51.06 + 36.76 + 48.51) = 53.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	18	0.00	67.51	0.00	-6.45	-10.00	0.00	0.00	0.00	51.06
18	74	0.00	67.51	0.00	-6.45	-5.07	0.00	0.00	-19.23	36.76
74	84	0.00	67.51	0.00	-6.45	-12.55	0.00	0.00	0.00	48.51

Segment Leq : 53.08 dBA

Total Leq All Segments: 56.85 dBA

Results segment # 1: Woodroffe (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.50	!	1.50	!	0.75	!	104.75

ROAD (44.71 + 28.29 + 42.67) = 46.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	59.91	0.00	-6.45	-8.75	0.00	0.00	0.00	44.71
-66	-15	0.00	59.91	0.00	-6.45	-5.48	0.00	0.00	-19.70	28.29
-15	0	0.00	59.91	0.00	-6.45	-10.79	0.00	0.00	0.00	42.67

Segment Leq : 46.88 dBA

Results segment # 2: Woodroffe (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	1.50	0.75	104.75

ROAD (43.46 + 29.16 + 40.91) = 45.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	18	0.00	59.91	0.00	-6.45	-10.00	0.00	0.00	0.00	43.46
18	74	0.00	59.91	0.00	-6.45	-5.07	0.00	0.00	-19.23	29.16
74	84	0.00	59.91	0.00	-6.45	-12.55	0.00	0.00	0.00	40.91

Segment Leq : 45.49 dBA

Total Leq All Segments: 49.25 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.85
(NIGHT): 49.25

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Filename: r7.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (day/night)

Angle1 Angle2 : 0.00 deg 66.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 33.70 / 33.70 m
Receiver height : 1.50 / 7.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 1.80 m
Reference angle : 0.00

Results segment # 1: Woodroffe (day)

Source height = 1.50 m

ROAD (0.00 + 56.87 + 0.00) = 56.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	66	0.61	67.51	0.00	-5.65	-5.00	0.00	0.00	0.00	56.87

Segment Leq : 56.87 dBA

Total Leq All Segments: 56.87 dBA

Results segment # 1: Woodroffe (night)

Source height = 1.50 m

ROAD (0.00 + 50.08 + 0.00) = 50.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	66	0.43	59.91	0.00	-5.01	-4.82	0.00	0.00	0.00	50.08

Segment Leq : 50.08 dBA

Total Leq All Segments: 50.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.87
(NIGHT): 50.08

Filename: r8.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (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 : 22.30 / 22.30 m
Receiver height : 1.50 / 7.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 1.80 m
Reference angle : 0.00

Road data, segment # 2: Whitewater (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 : 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): 8000
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: Whitewater (day/night)

```

-----
Angle1   Angle2       : -46.00 deg   -15.00 deg
Wood depth      :      0           (No woods.)
No of house rows :      3 / 3
House density    :      90 %
Surface         :      2           (Reflective ground surface)
Receiver source distance : 103.90 / 103.90 m
Receiver height  :      1.50 / 1.50 m
Topography      :      3           (Elevated; no barrier)
Elevation       :      1.80 m
Reference angle  :      0.00
  
```

Results segment # 1: Woodroffe (day)

Source height = 1.50 m

ROAD (0.00 + 65.79 + 0.00) = 65.79 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	67.51	0.00	-1.72	0.00	0.00	0.00	0.00	65.79

Segment Leq : 65.79 dBA

Results segment # 2: Whitewater (day)

Source height = 1.50 m

ROAD (0.00 + 39.17 + 0.00) = 39.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	-15	0.00	65.75	0.00	-8.41	-7.64	0.00	-10.53	0.00	39.17

Segment Leq : 39.17 dBA

Total Leq All Segments: 65.80 dBA

Results segment # 1: Woodroffe (night)

Source height = 1.50 m

ROAD (0.00 + 58.19 + 0.00) = 58.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.91	0.00	-1.72	0.00	0.00	0.00	0.00	58.19

Segment Leq : 58.19 dBA

Results segment # 2: Whitewater (night)

Source height = 1.50 m

ROAD (0.00 + 31.58 + 0.00) = 31.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	-15	0.00	58.16	0.00	-8.41	-7.64	0.00	-10.53	0.00	31.58

Segment Leq : 31.58 dBA

Total Leq All Segments: 58.20 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.80
(NIGHT): 58.20

Filename: r9.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (day/night)

Angle1 Angle2 : 0.00 deg 24.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.70 / 33.70 m
Receiver height : 1.50 / 1.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 1.80 m
Reference angle : 0.00

Results segment # 1: Woodroffe (day)

Source height = 1.50 m

ROAD (0.00 + 55.25 + 0.00) = 55.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	24	0.00	67.51	0.00	-3.52	-8.75	0.00	0.00	0.00	55.25

Segment Leq : 55.25 dBA

Total Leq All Segments: 55.25 dBA

Results segment # 1: Woodroffe (night)

Source height = 1.50 m

ROAD (0.00 + 47.65 + 0.00) = 47.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	24	0.00	59.91	0.00	-3.52	-8.75	0.00	0.00	0.00	47.65

Segment Leq : 47.65 dBA

Total Leq All Segments: 47.65 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.25
(NIGHT): 47.65

Filename: r10.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (day/night)

Angle1 Angle2 : -7.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 61.80 / 61.80 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -7.00 deg Angle2 : 14.00 deg
Barrier height : 10.00 m
Elevation : 1.80 m
Barrier receiver distance : 21.00 / 21.00 m
Source elevation : 102.00 m
Receiver elevation : 104.00 m
Barrier elevation : 104.00 m
Reference angle : 0.00

Road data, segment # 2: Whitewater (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 : 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): 8000
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: Whitewater (day/night)

 Angle1 Angle2 : -53.00 deg -32.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 3 / 3
 House density : 95 %
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 107.90 / 107.90 m
 Receiver height : 1.50 / 1.50 m
 Topography : 3 (Elevated; no barrier)
 Elevation : 1.80 m
 Reference angle : 0.00

Results segment # 1: Woodroffe (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	1.50	0.82	104.82

ROAD (0.00 + 32.03 + 57.62) = 57.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-7	14	0.00	67.51	0.00	-6.15	-9.33	0.00	0.00	-20.00	32.03
14	90	0.00	67.51	0.00	-6.15	-3.74	0.00	0.00	0.00	57.62

Segment Leq : 57.63 dBA

Results segment # 2: Whitewater (day)

 Source height = 1.50 m

ROAD (0.00 + 36.09 + 0.00) = 36.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-53	-32	0.00	65.75	0.00	-8.57	-9.33	0.00	-11.76	0.00	36.09

Segment Leq : 36.09 dBA

Total Leq All Segments: 57.66 dBA

Results segment # 1: Woodroffe (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	1.50	0.82	104.82

ROAD (0.00 + 24.43 + 50.02) = 50.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-7	14	0.00	59.91	0.00	-6.15	-9.33	0.00	0.00	-20.00	24.43
14	90	0.00	59.91	0.00	-6.15	-3.74	0.00	0.00	0.00	50.02

Segment Leq : 50.03 dBA

Results segment # 2: Whitewater (night)

Source height = 1.50 m

ROAD (0.00 + 28.50 + 0.00) = 28.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-53	-32	0.00	58.16	0.00	-8.57	-9.33	0.00	-11.76	0.00	28.50

Segment Leq : 28.50 dBA

Total Leq All Segments: 50.06 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.66
(NIGHT): 50.06

Filename: r11.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffel (day/night)

Angle1 Angle2 : -90.00 deg -9.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 64.20 / 64.20 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -74.00 deg Angle2 : -35.00 deg
Barrier height : 10.00 m
Elevation : 1.80 m
Barrier receiver distance : 22.80 / 22.80 m
Source elevation : 102.00 m
Receiver elevation : 104.00 m
Barrier elevation : 104.00 m
Reference angle : 0.00

Road data, segment # 2: Woodroffe2 (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe2 (day/night)

 Angle1 Angle2 : -9.00 deg 83.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 64.20 / 64.20 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -9.00 deg Angle2 : 70.00 deg
 Barrier height : 10.00 m
 Elevation : 1.80 m
 Barrier receiver distance : 22.80 / 22.80 m
 Source elevation : 102.00 m
 Receiver elevation : 104.00 m
 Barrier elevation : 104.00 m
 Reference angle : 0.00

Results segment # 1: Woodroffel (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	1.50	0.79	104.79

ROAD (50.69 + 35.50 + 52.79) = 54.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-74	0.00	67.51	0.00	-6.31	-10.51	0.00	0.00	0.00	50.69
-74	-35	0.00	67.51	0.00	-6.31	-6.64	0.00	0.00	-19.05	35.50
-35	-9	0.00	67.51	0.00	-6.31	-8.40	0.00	0.00	0.00	52.79

Segment Leq : 54.93 dBA

Results segment # 2: Woodroffe2 (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	1.50	0.79	104.79

ROAD (0.00 + 37.91 + 49.78) = 50.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-9	70	0.00	67.51	0.00	-6.31	-3.58	0.00	0.00	-19.71	37.91
70	83	0.00	67.51	0.00	-6.31	-11.41	0.00	0.00	0.00	49.78

Segment Leq : 50.06 dBA

Total Leq All Segments: 56.15 dBA

Results segment # 1: Woodroffel (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	!	1.50	!	0.79	!	104.79	

ROAD (43.09 + 27.90 + 45.19) = 47.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-74	0.00	59.91	0.00	-6.31	-10.51	0.00	0.00	0.00	43.09
-74	-35	0.00	59.91	0.00	-6.31	-6.64	0.00	0.00	-19.05	27.90
-35	-9	0.00	59.91	0.00	-6.31	-8.40	0.00	0.00	0.00	45.19

Segment Leq : 47.33 dBA

Results segment # 2: Woodroffe2 (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	!	1.50	!	0.79	!	104.79	

ROAD (0.00 + 30.31 + 42.18) = 42.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-9	70	0.00	59.91	0.00	-6.31	-3.58	0.00	0.00	-19.71	30.31
70	83	0.00	59.91	0.00	-6.31	-11.41	0.00	0.00	0.00	42.18

Segment Leq : 42.46 dBA

Total Leq All Segments: 48.55 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.15
(NIGHT): 48.55

STAMSON 5.0 NORMAL REPORT Date: 11-09-2025 08:20:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r12.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (day/night)

Angle1 Angle2 : -90.00 deg -7.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 80.20 / 80.20 m
Receiver height : 7.50 / 7.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 1.80 m
Reference angle : 0.00

Results segment # 1: Woodroffe (day)

Source height = 1.50 m

ROAD (0.00 + 52.63 + 0.00) = 52.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-7	0.43	67.51	0.00	-10.38	-4.49	0.00	0.00	0.00	52.63

Segment Leq : 52.63 dBA

Total Leq All Segments: 52.63 dBA

Results segment # 1: Woodroffe (night)

Source height = 1.50 m

ROAD (0.00 + 45.03 + 0.00) = 45.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-7	0.43	59.91	0.00	-10.38	-4.49	0.00	0.00	0.00	45.03

Segment Leq : 45.03 dBA

Total Leq All Segments: 45.03 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.63
(NIGHT): 45.03

STAMSON 5.0 NORMAL REPORT Date: 11-09-2025 08:20:45
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r13.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffel (day/night)

Angle1 Angle2 : -90.00 deg -30.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.20 / 63.20 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -76.00 deg Angle2 : -43.00 deg
Barrier height : 10.00 m
Elevation : 1.80 m
Barrier receiver distance : 44.00 / 44.00 m
Source elevation : 102.00 m
Receiver elevation : 104.00 m
Barrier elevation : 104.00 m
Reference angle : 0.00

Road data, segment # 2: Woodroffe2 (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
 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: Woodroffe2 (day/night)

 Angle1 Angle2 : -30.00 deg 83.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 64.20 / 64.20 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : -30.00 deg Angle2 : 69.00 deg
 Barrier height : 10.00 m
 Elevation : 1.80 m
 Barrier receiver distance : 22.00 / 22.00 m
 Source elevation : 102.00 m
 Receiver elevation : 104.00 m
 Barrier elevation : 104.00 m
 Reference angle : 0.00

Results segment # 1: Woodroffel (day)

 Source height = 1.50 m

Barrier height for grazing incidence

Source	! Receiver	! Barrier	! Elevation of
Height (m)	! Height (m)	! Height (m)	Barrier Top (m)
-----+-----+-----+-----			
1.50 !	1.50 !	0.10 !	104.10

ROAD (50.17 + 34.65 + 49.85) = 53.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-90	-76	0.00	67.51	0.00	-6.25	-11.09	0.00	0.00	0.00	50.17
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-76	-43	0.00	67.51	0.00	-6.25	-7.37	0.00	0.00	-19.25	34.65
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-43	-30	0.00	67.51	0.00	-6.25	-11.41	0.00	0.00	0.00	49.85
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Segment Leq : 53.09 dBA

Results segment # 2: Woodroffe2 (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.50	!	1.50	!	0.81	!	104.81

ROAD (0.00 + 38.80 + 50.11) = 50.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	69	0.00	67.51	0.00	-6.31	-2.60	0.00	0.00	-19.80	38.80
69	83	0.00	67.51	0.00	-6.31	-11.09	0.00	0.00	0.00	50.11

Segment Leq : 50.42 dBA

Total Leq All Segments: 54.97 dBA

Results segment # 1: Woodroffel (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
1.50	!	1.50	!	0.10	!	104.10

ROAD (42.57 + 27.05 + 42.25) = 45.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-76	0.00	59.91	0.00	-6.25	-11.09	0.00	0.00	0.00	42.57
-76	-43	0.00	59.91	0.00	-6.25	-7.37	0.00	0.00	-19.25	27.05
-43	-30	0.00	59.91	0.00	-6.25	-11.41	0.00	0.00	0.00	42.25

Segment Leq : 45.49 dBA

Results segment # 2: Woodroffe2 (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source	!	Receiver	!	Barrier	!	Elevation of
Height (m)	!	Height (m)	!	Height (m)	!	Barrier Top (m)
-----	+	-----	+	-----	+	-----
1.50	!	1.50	!	0.81	!	104.81

ROAD (0.00 + 31.20 + 42.51) = 42.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-30	69	0.00	59.91	0.00	-6.31	-2.60	0.00	0.00	-19.80	31.20
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
69	83	0.00	59.91	0.00	-6.31	-11.09	0.00	0.00	0.00	42.51
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Segment Leq : 42.82 dBA

Total Leq All Segments: 47.37 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.97
(NIGHT): 47.37

STAMSON 5.0 NORMAL REPORT Date: 11-09-2025 08:28:31
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r14.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Woodroffe (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 66.20 / 66.20 m
Receiver height : 1.50 / 1.50 m
Topography : 4 (Elevated; with barrier)
Barrier angle1 : -66.00 deg Angle2 : -15.00 deg
Barrier height : 10.00 m
Elevation : 1.80 m
Barrier receiver distance : 24.70 / 24.70 m
Source elevation : 102.00 m
Receiver elevation : 104.00 m
Barrier elevation : 104.00 m
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
 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: Woodroffe (day/night)

 Angle1 Angle2 : 0.00 deg 84.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 66.20 / 66.20 m
 Receiver height : 1.50 / 1.50 m
 Topography : 4 (Elevated; with barrier)
 Barrier angle1 : 18.00 deg Angle2 : 74.00 deg
 Barrier height : 10.00 m
 Elevation : 1.80 m
 Barrier receiver distance : 24.70 / 24.70 m
 Source elevation : 102.00 m
 Receiver elevation : 104.00 m
 Barrier elevation : 104.00 m
 Reference angle : 0.00

Results segment # 1: Woodroffe (day)

 Source height = 1.50 m

Barrier height for grazing incidence

Source	! Receiver	! Barrier	! Elevation of
Height (m)	! Height (m)	! Height (m)	! Barrier Top (m)
-----+-----+-----+-----			
1.50 !	1.50 !	0.75 !	104.75

ROAD (52.31 + 35.89 + 50.27) = 54.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-90	-66	0.00	67.51	0.00	-6.45	-8.75	0.00	0.00	0.00	52.31
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-66	-15	0.00	67.51	0.00	-6.45	-5.48	0.00	0.00	-19.70	35.89
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
-15	0	0.00	67.51	0.00	-6.45	-10.79	0.00	0.00	0.00	50.27
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Segment Leq : 54.48 dBA

Results segment # 2: Woodroffe (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	1.50	0.75	104.75

ROAD (51.06 + 36.76 + 48.51) = 53.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	18	0.00	67.51	0.00	-6.45	-10.00	0.00	0.00	0.00	51.06
18	74	0.00	67.51	0.00	-6.45	-5.07	0.00	0.00	-19.23	36.76
74	84	0.00	67.51	0.00	-6.45	-12.55	0.00	0.00	0.00	48.51

Segment Leq : 53.08 dBA

Total Leq All Segments: 56.85 dBA

Results segment # 1: Woodroffe (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	1.50	0.75	104.75

ROAD (44.71 + 28.29 + 42.67) = 46.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-66	0.00	59.91	0.00	-6.45	-8.75	0.00	0.00	0.00	44.71
-66	-15	0.00	59.91	0.00	-6.45	-5.48	0.00	0.00	-19.70	28.29
-15	0	0.00	59.91	0.00	-6.45	-10.79	0.00	0.00	0.00	42.67

Segment Leq : 46.88 dBA

Results segment # 2: Woodroffe (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	1.50	0.75	104.75

ROAD (43.46 + 29.16 + 40.91) = 45.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	18	0.00	59.91	0.00	-6.45	-10.00	0.00	0.00	0.00	43.46
18	74	0.00	59.91	0.00	-6.45	-5.07	0.00	0.00	-19.23	29.16
74	84	0.00	59.91	0.00	-6.45	-12.55	0.00	0.00	0.00	40.91

Segment Leq : 45.49 dBA

Total Leq All Segments: 49.25 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.85
(NIGHT): 49.25

TABLE 5: Acoustic Insulation Factor for Various Types of Windows

Window area as a percentage of total floor area of room (1)														Single glazing		Double glazing of indicated glass thickness						Triple glazing			
4	5	6	8	10	13	16	20	25	32	40	50	63	80	Thickness	2mm and 2mm glass	3mm and 3mm glass	4mm and 4mm glass	5mm and 5mm glass	6mm and 6mm glass	3mm, 3mm and 3mm glass	3mm, 3mm and 6mm glass				
Acoustic Insulation Factor (AIR) (2)														Thickness	Interpane spacing in mm (3)						Interpane spacings in mm (5)				
35	34	33	32	31	30	29	28	27	26	25	24	23	22		3mm	4mm	5mm	6mm	7mm	8mm	6,6	6,10			
36	35	34	33	32	31	30	29	28	27	26	25	24	23	3mm	13	6	6	6	6	6	6,15	6,10			
37	36	35	34	33	32	31	30	29	28	27	26	25	24	3mm	15	6	6	6	6	6	6,20	6,15			
38	37	36	35	34	33	32	31	30	29	28	27	26	25	4mm, 6mm	18	13	6	6	6	6	6,30	6,20			
39	38	37	36	35	34	33	32	31	30	29	28	27	26		12	16	13	6	6	6,6	6,6				
40	39	38	37	36	35	34	33	32	31	30	29	28	27	9mm (4)	28	20	16	13	13	6,10	6,6				
41	40	39	38	37	36	35	34	33	32	31	30	29	28		35	25	20	16	16	6,15	6,10				
42	41	40	39	38	37	36	35	34	33	32	31	30	29	12mm (4)	42	32	25	20	20	6,20	6,15				
43	42	41	40	39	38	37	36	35	34	33	32	31	30		50	40	32	25	24	6,30	6,20				
44	43	42	41	40	39	38	37	36	35	34	33	32	31		53	50	40	32	30	6,40	6,30				
45	44	43	42	41	40	39	38	37	36	35	34	33	32		80	63	50	40	37	6,50	6,40				
46	45	44	43	42	41	40	39	38	37	36	35	34	33		100	80	63	55	50	6,65	6,50				
47	46	45	44	43	42	41	40	39	38	37	36	35	34		125	100	80	75	70	6,80	6,65				
48	47	46	45	44	43	42	41	40	39	38	37	36	35		130	125	100	95	90	6,100	6,80				
49	48	47	46	45	44	43	42	41	40	39	38	37	36												
50	49	48	47	46	45	44	43	42	41	40	39	38	37												

Source: National Research Council, Division of Building Research, June 1980.

Explanatory Notes:

- 1) Where the calculated percentage window area is not presented as a column heading, the nearest percentage column in the table values should be used.
- 2) AIR data listed in the table are for well-fitted weatherstripped units that can be opened. The AIR values apply only when the windows are closed. For windows fixed and sealed to the frame, add three (3) to the AIR given in the table. The nearest listed values should be used.
- 3) If the interpane spacing or glass thickness for a specific double glazed window is not listed in the table, the nearest listed values should be used.
- 4) The AIR ratings for 9mm and 12mm glass are for laminated glass only; for solid glass subtract two (2) from the AIR value listed in the table.
- 5) If the interpane spacings for a specific triple-glazed window are not listed in the table, use the listed case whose combined spacings are nearest the actual combined spacing.
- 6) The AIR data listed in the table are for typical windows, but details of glass mounting, window seals, etc. may result in slightly different performance for some manufacturers' products. If laboratory sound transmission loss data (conforming to ASTM test method E-90) are available, these should be used to calculate the AIR.

Table 6.3 - Acoustic Insulation Factor for Various Types of Exterior Wall

	Percentage of exterior wall area to total floor area of room											Type of Exterior Wall
	16	20	25	32	40	50	63	80	100	125	160	
Acoustic	39	38	37	36	35	34	33	32	31	30	29	EW1
Insulation	41	40	39	38	37	36	35	34	33	32	31	EW2
Factor	44	43	42	41	40	39	38	37	36	35	34	EW3
	47	46	45	44	43	42	41	40	39	38	37	EW4
	48	47	46	45	44	43	42	41	40	39	38	EW1R
	49	48	47	46	45	44	43	42	41	40	39	EW2R
	50	49	48	47	46	45	44	43	42	41	40	EW3R
	55	54	53	52	51	50	49	48	47	46	45	EW5
	56	55	54	53	52	51	50	49	48	47	46	EW4R
	58	57	56	55	54	53	52	51	50	49	48	EW6
	59	58	57	56	55	54	53	52	51	50	49	EW7 or EW5R
	63	62	61	60	59	58	57	56	55	54	53	EW8

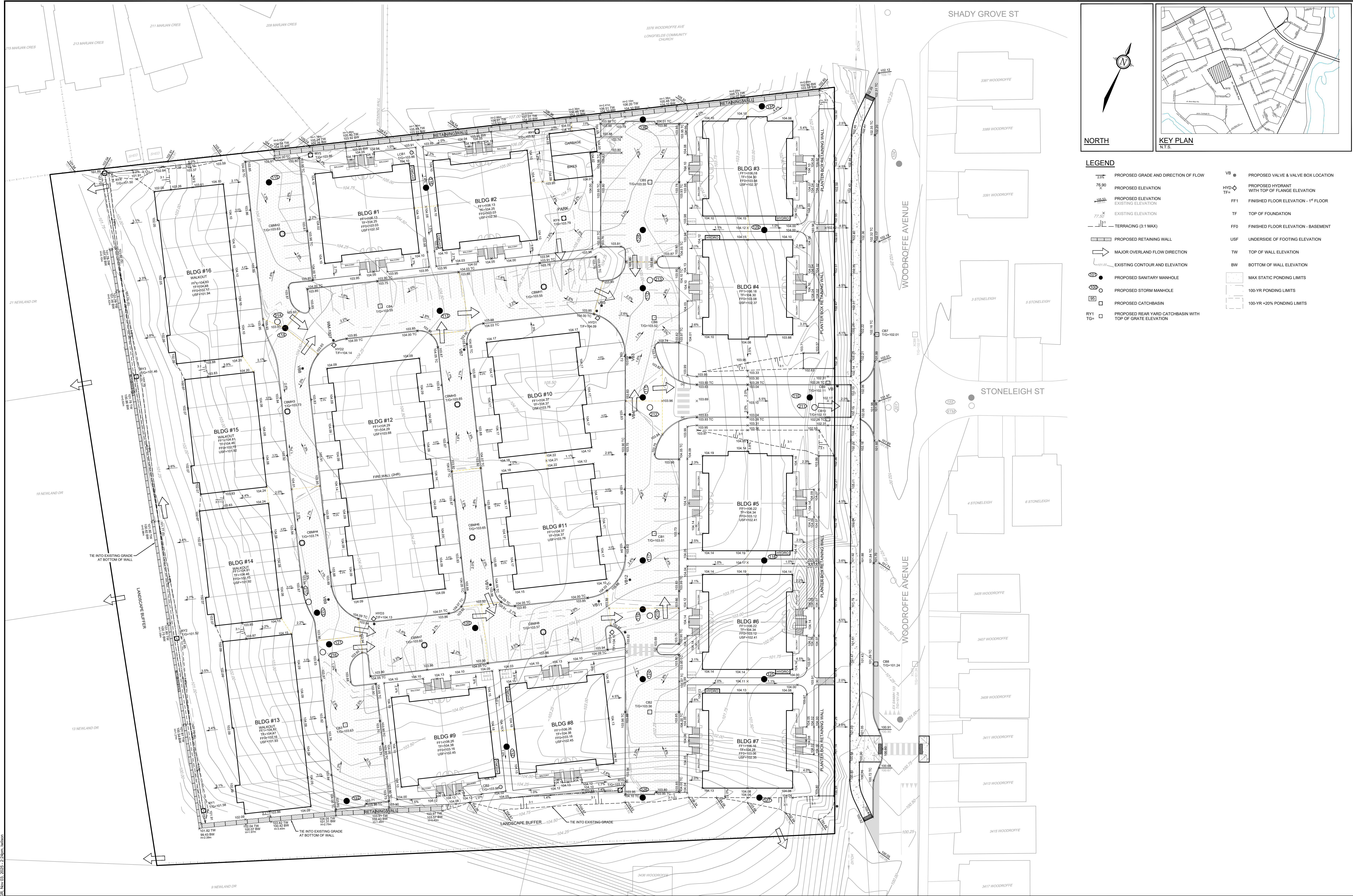
Source : National Research Council, Division of Building Research, December 1980.

Explanatory Notes :

- 1) Where the calculated percentage wall area is not presented as a column heading, the nearest percentage column in the table should be used.
- 2) The common structure of walls EW1 to EW5 is composed of 12.7 mm gypsum board, vapour barrier, and 38 x 89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in inter-stud cavities.
- 3) EW1 denotes exterior wall as in Note 2), plus sheathing, plus wood siding or metal siding and fibre backer board.
EW2 denotes exterior wall as in Note 2), plus rigid insulation (25-30 mm), and wood siding or metal siding and fibre backer board.
EW3 denotes simulated mansard with structure as in Note 2), plus sheathing, 28 x 89 mm framing, sheathing, and asphalt roofing material.
EW4 denotes exterior wall as in Note 2), plus sheathing and 20 mm stucco.
EW5 denotes exterior wall as in Note 2), plus sheathing, 25 mm air space, 100 mm brick veneer.
EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 100 mm back-up block, 100 mm face brick.
EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 140 mm back-up block, 100 mm face brick.
EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 200 mm concrete.
- 4) R signifies the mounting of the interior gypsum board on resilient clips.
- 5) An exterior wall conforming to rainscreen design principles and composed of 12.7 mm gypsum board, 100 mm concrete block, rigid insulation (25-50 mm), 25 mm air space, and 100 mm brick veneer has the same AIF as EW6.
- 6) An exterior wall described in EW1 with the addition of rigid insulation (25-50 mm) between the sheathing and the external finish has the same AIF as EW2.

APPENDIX B

**124147-GR (Grading Plan)
Site Plan**



NORTH

KEY PLAN
N.T.S.

LEGEND			
	PROPOSED GRADE AND DIRECTION OF FLOW		PROPOSED VALVE & VALVE BOX LOCATION
	PROPOSED ELEVATION		PROPOSED HYDRANT WITH TOP OF FLANGE ELEVATION
	EXISTING ELEVATION		FF1 FINISHED FLOOR ELEVATION - 1 ST FLOOR
	EXISTING CONTOUR AND ELEVATION		TF TOP OF FOUNDATION
	TERRACING (3:1 MAX)		FF0 FINISHED FLOOR ELEVATION - BASEMENT
	PROPOSED RETAINING WALL		USF UNDERSIDE OF FOOTING ELEVATION
	MAJOR OVERLAND FLOW DIRECTION		TW TOP OF WALL ELEVATION
	PROPOSED SANITARY MANHOLE		BW BOTTOM OF WALL ELEVATION
	PROPOSED STORM MANHOLE		MAX STATIC PONDING LIMITS
	PROPOSED CATCHBASIN		100-YR PONDING LIMITS
	PROPOSED REAR YARD CATCHBASIN WITH TOP OF GRATE ELEVATION		100-YR +20% PONDING LIMITS

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

PHOENIX HOMES
SINCE 1988
18A BENTLEY AVE
OTTAWA, ON, K2E 6T8

No.	REVISION	DATE	BY
1.	SITE PLAN APPLICATION	NOV 5/25	MAB

SCALE
1:300
0 3 6 9 12

DESIGN	LRW
CHECKED	MAB
DRAWN	LPA
CHECKED	MAB
APPROVED	MAB

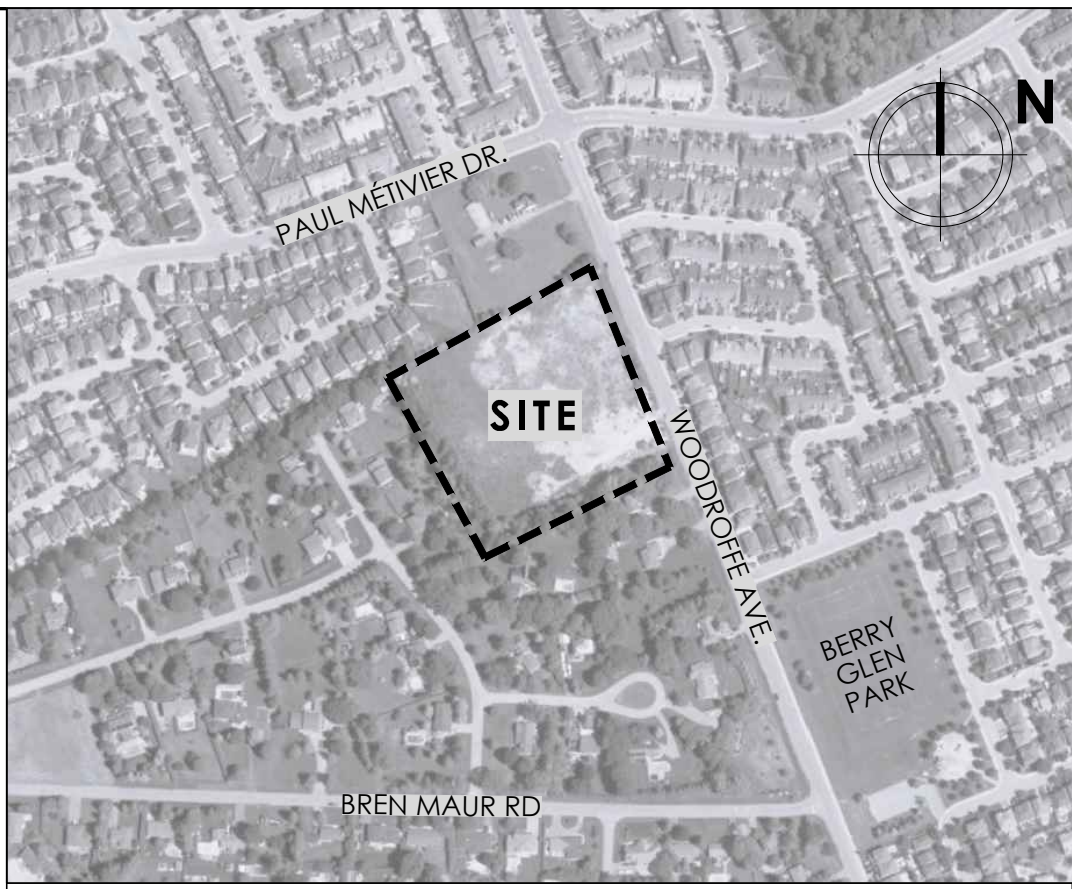
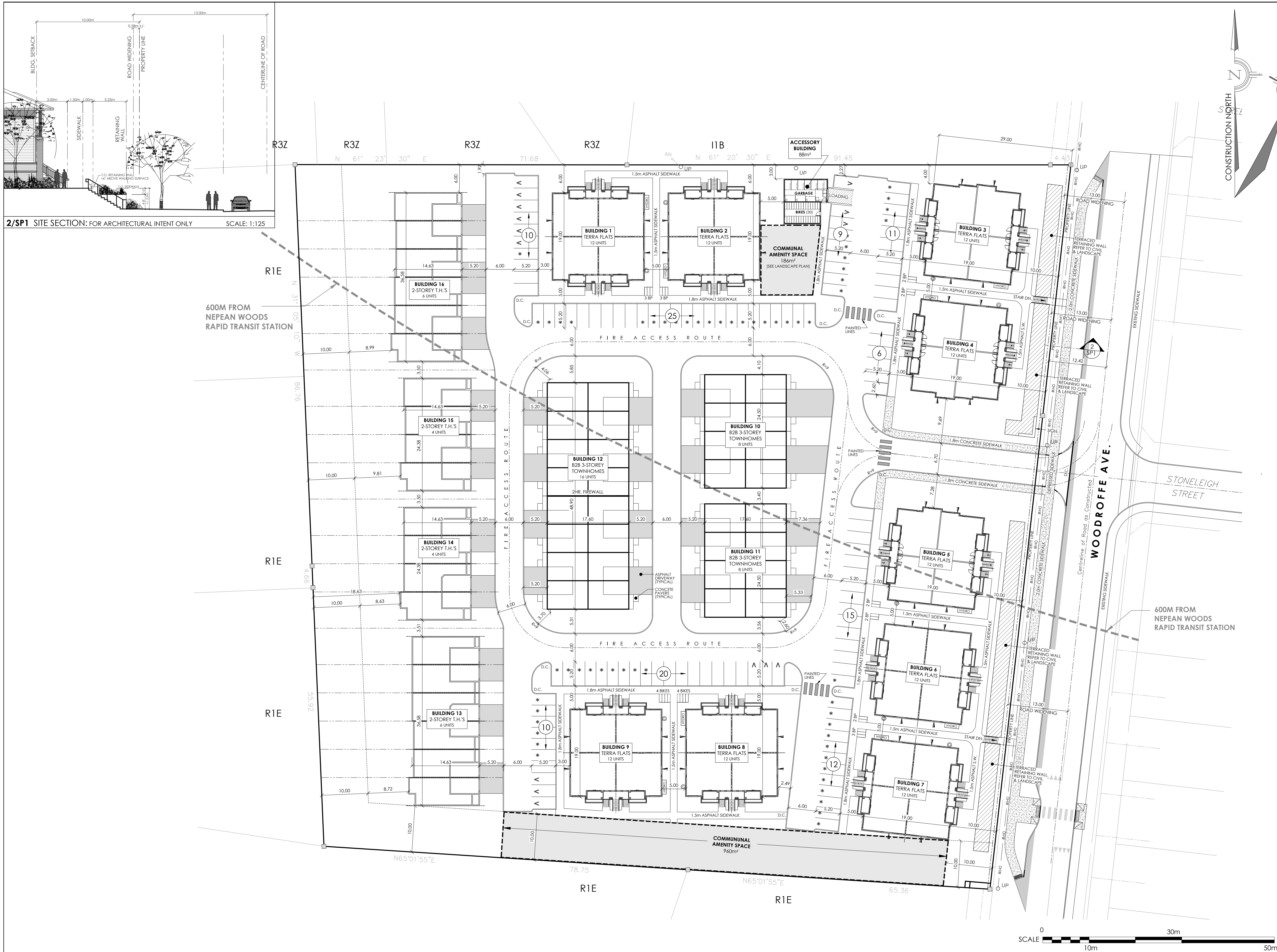
FOR REVIEW ONLY

NOVATECH
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
3400 WOODROFFE AVENUE

GRADING PLAN

PROJECT No.	124147
REV	REV #1
DRAWING No.	124147-GR



AREA PLAN: SCALE: NTS

SITE INFORMATION:

SITE AREA = 2.37ha (5.85 Acres.)		
ZONING: R1VY(636)		
PROPOSED ZONING: R47 PUD		
LOT WIDTH (MIN.):	REQUIRED: 18.00 m	PROVIDED: 157.39 m
LOT AREA (MIN.):	1,400 m²	23,661.35 m²
BUILDING HEIGHT (MAX.):	TOWNHOUSE: 10.00 m	9.37 m
	STACKED DWELLING: 11.00 m	10.02 m
FRONT YARD (MIN.):	3.00 m	10.00 m
REAR YARD (MIN.):	6.00 m	18.63 m
INTERIOR SIDE YARD (MIN.):	TOWNHOUSE: 1.50 m (1ST 21.0m)	4.00 m
	STACKED DWELLING: 1.50 m	6.00 m
ACCESSORY BLDG. SIZE (MAX.):	55.00 m²	88.00 m²
ACCESSORY BLDG. HEIGHT (MAX.):	3.60 m	3.54 m
ACCESSORY BLDG. INTERIOR SIDE YARD (MIN.):	6.00 m	3.00 m

UNIT COUNTS:

	TERRA FLATS	828 TOWNS	2-STORY TOWNS
BUILDING 1=	TERRA FLATS		
BUILDING 2=	TERRA FLATS		
BUILDING 3=	TERRA FLATS		
BUILDING 4=	TERRA FLATS		
BUILDING 5=	TERRA FLATS		
BUILDING 6=	TERRA FLATS		
BUILDING 7=	TERRA FLATS		
BUILDING 8=	TERRA FLATS		
BUILDING 9=	TERRA FLATS		
BUILDING 10=	828 3-STORY TOWNHOMES	8 UNITS	
BUILDING 11=	828 3-STORY TOWNHOMES	8 UNITS	
BUILDING 12=	828 3-STORY TOWNHOMES	16 UNITS	
BUILDING 13=	2-STORY TOWNHOMES		6 UNITS
BUILDING 14=	2-STORY TOWNHOMES		4 UNITS
BUILDING 15=	2-STORY TOWNHOMES		4 UNITS
BUILDING 16=	2-STORY TOWNHOMES		6 UNITS
TOTAL =	108 UNITS	32 UNITS	20 UNITS
TOTAL ALL UNITS =	160 UNITS		

RESIDENT PARKING REQUIRED:

AREA 'X'	AREA 'C'	TOTAL
TERRA FLATS [60 UNITS]	TERRA FLATS [48 UNITS]	88 SPACES
PARKING REQUIRED= 0.5/ d.u. = 30 SPACES	PARKING REQUIRED= 1.2/ d.u. = 58 SPACES	
828 TOWNHOMES [13 UNITS]	828 TOWNHOMES [19 UNITS]	24 SPACES
PARKING REQUIRED= 0.75/ d.u. = 10 SPACES	PARKING REQUIRED= 0.75/ d.u. = 14 SPACES	
TOWNHOMES [6 UNITS]	TOWNHOMES [14 UNITS]	16 SPACES
PARKING REQUIRED= 0.75/ d.u. = 5 SPACES	PARKING REQUIRED= 0.75/ d.u. = 11 SPACES	
TOTAL RESIDENT PARKING REQ.: 128 SPACES		

VISITOR PARKING REQUIRED:

AREA 'X'	AREA 'C'
TERRA FLATS [60 UNITS (-12)]	TERRA FLATS [48 UNITS]
PARKING REQUIRED= 0.1/ d.u. = 5 SPACES	PARKING REQUIRED= 0.2/ d.u. = 10 SPACES
TOTAL VISITOR PARKING REQ.: 15 SPACES	

PARKING PROVIDED:

TERRA FLATS [108 UNITS]	88 RESIDENT + 15 VISITOR
PARKING REQUIRED =	103 RESIDENT + 15 VISITOR
TOTAL PROVIDED =	
828 TOWNHOMES [32 UNITS]	24 SPACES (DRIVEWAYS/ GARAGES)
PARKING REQUIRED =	
TOTAL PROVIDED =	
TOWNHOMES [20 UNITS]	16 SPACES (DRIVEWAYS/ GARAGES)
PARKING REQUIRED =	
TOTAL PROVIDED =	

PARKING SPACE DIMENSIONS ARE 2.4m X 5.2m STANDARD.
PARKING SPACES MARKED WITH * ARE 2.4m X 5.2m (59 SPACES) (50% max.)

BICYCLE PARKING REQUIREMENTS:

BICYCLE PARKING REQUIRED= 0.5/d.u. x 108 d.u. =	54 SPACES
BICYCLE PARKING PROVIDED =	57 SPACES (30 INDOORS, 27 SURFACE)
ALL EXTERIOR BIKE SPACES ARE 0.60m X 1.80m HORIZONTAL w/ MIN. 1.50m ACCESS AISLE.	
ALL INTERIOR BIKE SPACES ARE 0.50m X 1.50m VERTICAL w/ MIN. 1.50m ACCESS AISLE.	
PROVIDE FIXED PARKING RACKS FOR ALL BIKE SPACES.	

AMENITY SPACE REQUIREMENTS:

AMENITY SPACE REQUIRED = 6m²/ d.u. x 108 d.u. =	648m²
50% COMMUNAL AMENITY AREA REQUIRED =	324m²
COMMUNAL AMENITY AREA PROVIDED =	1,146m²
PRIVATE AMENITY AREA PROVIDED =	432m² (4m²/BALCONY/d.u.)
TOTAL AMENITY AREA PROVIDED =	1,578m²

LEGEND/ ABBREVIATIONS:

D.C.	DEPRESSED CURB	⊗	GAS METERS LOCATION	⬮	LIGHT STANDARD
CRW	CONCRETE RETAINING WALL	⊕	WATER/ SANITARY CONNECTION	⬮	WALL MOUNTED LIGHT FIXTURE
W.I.	WROUGHT IRON	⊕	WATER/ SANITARY CONNECTION	⬮	TRANSFORMER
TWS	TACTILE WALKING SURFACE INDICATOR	⊕	STORM CONNECTION	⬮	TWSI
CONC.	CONCRETE	⊕	SIAMENSE CONNECTIONS	⬮	BICYCLE PARKING (BP) SPACE
ASPH.	ASPHALT	⊕	FIRE HYDRANT	⬮	VISITOR PARKING SPACE

NOTE:
SITE PLAN TO BE READ IN CONJUNCTION WITH:
- SITE SERVICES AND GRADING PLANS PREPARED BY NOVATECH ENGINEERING CONSULTANTS.
- LANDSCAPE PLAN PREPARED BY JAMES B. LENNOX AND ASSOCIATES INC.
NOTE:
SITE BOUNDARIES DERIVED FROM: PLAN 4R-37128
PLAN OF SURVEY OF PART OF LOT 12 CONCESSION 2 (IDEAL FRONT)
Geographic Township of Nepean CITY OF OTTAWA
Surveyed by Annis, O'Sullivan, Vollebæk Ltd.

M. David Blakely
Architect Inc.
2200 Prince of Wales Dr. Suite 101 Ottawa, Ontario
Phone (613) 226-8811 Fax (613) 226-7942 K2E 6Z9

GENERAL NOTES:
1. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS. ANY DISCREPANCY MUST BE REPORTED TO M. DAVID BLAKELY ARCHITECT INC.
2. ALL WORK AND MATERIALS TO BE IN COMPLIANCE WITH ALL CODES, REGULATIONS, & BY-LAWS.
3. ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST THE PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND PRESENT AS IF THEY WERE INCLUDED WITH THE PLANS IN CONTRACT DOCUMENTS.
4. DO NOT SCALE DRAWINGS.
5. THIS DRAWING SHALL NOT BE USED OR COPIED WITHOUT THE AUTHORIZATION OF THE ARCHITECT.
6. THIS DRAWING SHALL NOT BE USED FOR PERMIT OR CONSTRUCTION UNLESS THE DRAWING BEARS THE ARCHITECT'S SEAL AND SIGNATURE.

OWNER: PHOENIX HOMES
18A BENTLEY AVE.
OTTAWA, ON K2E 6T8
(613) 723-7227
ARCHITECT: M. DAVID BLAKELY ARCHITECT INC.
2200 PRINCE OF WALES DR., SUITE 101
OTTAWA, ON K2E 6Z9
(613) 226-8811
CIVIL ENGINEER: NOVATECH ENGINEERING CONSULTANTS
240 MICHAEL COWPLAND DR. SUITE 101
KANATA, ON K2M 0H7
(613) 254-9443

LANDSCAPE ARCHITECT: JAMES B. LENNOX AND ASSOCIATES INC.
3332 CARLING AVE.
NEPEAN, ON K2H 5A8
(613) 722-5168
SURVEYOR: ANNIS O'SULLIVAN VOLLEBÆK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ON K2E 7S6
(613) 727-0850

SEAL

12.		MB.	24.
11.		MB.	23.
10.		MB.	22.
9.		MB.	21.
8.		MB.	20.
7.		MB.	19.
6.		MB.	18.
5.	22/10/25	2-STORY T.H. REVISED/ FOR COORDINATION	17.
4.	15/09/25	ROAD WIDENING AS PER SURVEY/ FOR COORDINATION	16.
3.	16/07/25	AS PER CLIENT	15.
2.	01/04/25	REVISED AS PER CLIENT/ FOR REVIEW	14.
1.	24/09/24	AS PER CITY COMMENTS/ FOR COORDINATION	13.
NO.	DATE (D/M/Y)	DESCRIPTION	INT.
		REVISIONS	

SEAL

12.		MB.	24.
11.		MB.	23.
10.		MB.	22.
9.		MB.	21.
8.		MB.	20.
7.		MB.	19.
6.		MB.	18.
5.	22/10/25	2-STORY T.H. REVISED/ FOR COORDINATION	17.
4.	15/09/25	ROAD WIDENING AS PER SURVEY/ FOR COORDINATION	16.
3.	16/07/25	AS PER CLIENT	15.
2.	01/04/25	REVISED AS PER CLIENT/ FOR REVIEW	14.
1.	24/09/24	AS PER CITY COMMENTS/ FOR COORDINATION	13.
NO.	DATE (D/M/Y)	DESCRIPTION	INT.
		REVISIONS	

SCALE

0	10m	30m	50m
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A B C

A - DETAIL NUMBER	B - SHEET NUMBER (DETAIL REQUIRED)	C - SHEET NUMBER (DETAIL LOCATION)
-------------------	------------------------------------	------------------------------------

PROJECT: 3400 WOODROFFE AVE.
PLANNED UNIT DEVELOPMENT
OTTAWA, ONTARIO
CLIENT: PHOENIX HOMES
18A Bentley Ave Ottawa, ON K2E 6T8

DRAWING TITLE: SITE PLAN
DATE: SEPT. 2024
SCALE: 1 : 400
SHEET NO.: SP1
DRAWN BY: mdb
CHECKED: MDB