

**VAN GAAL LANDS – CLARIDGE DEVELOPMENT  
1039 TERRY FOX DRIVE AND 5331 FERNBANK ROAD  
NOISE IMPACT FEASIBILITY REPORT**

Prepared By:

**NOVATECH**

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

Novatech File: 117198  
Ref: R-2018-118

Submitted: October 10, 2018

October 10, 2018

City of Ottawa  
Planning and Infrastructure Approvals  
110 Laurier Street West, 4<sup>th</sup> Floor  
Ottawa, ON, K1P 1J1

**Attention: Rosanna Baggs**

**Reference: Van Gaal Lands – Claridge Development  
1039 Terry Fox Drive and 5331 Fernbank Road  
Noise Impact Feasibility Report  
Our File No.: 117198**

---

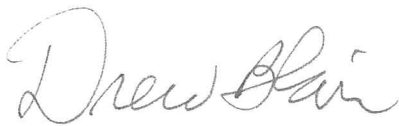
Enclosed for your review are three (3) copies of the Noise Impact Feasibility Report for Van Gaal Lands (Claridge Development) located in at 1039 Terry Fox Drive and 5331 Fernbank Road. The report is submitted in support of an application for Draft Plan of Subdivision.

This study evaluates the environmental impact of noise from traffic on the outdoor living areas and assesses the feasibility of mitigation measures to attenuate noise to acceptable levels.

Please contact the undersigned should you have any questions or comments pertaining to the enclosed report.

Yours truly,

**NOVATECH**



Drew Blair, P. Eng.  
Project Manager, Land Development Engineering

Cc: Shawn Malhotra, Claridge Homes

## TABLE OF CONTENTS

|  |           |
|--|-----------|
| <b>1.0 INTRODUCTION .....</b>                            | <b>1</b>  |
| <b>2.0 BACKGROUND .....</b>                              | <b>1</b>  |
| 2.1 PROJECT DESCRIPTION .....                            | 1         |
| 2.2 NOISE SOURCES .....                                  | 2         |
| <b>3.0 CITY OF OTTAWA NOISE CONTROL GUIDELINES .....</b> | <b>3</b>  |
| 3.1 SOUND LEVEL CRITERIA.....                            | 3         |
| 3.2 ALTERNATIVE METHODS FOR NOISE ATTENUATION.....       | 3         |
| 3.3 NOISE ATTENUATION REQUIREMENTS .....                 | 3         |
| 3.4 VENTILATION REQUIREMENTS .....                       | 4         |
| 3.5 BUILDING COMPONENT ASSESSMENT .....                  | 4         |
| 3.6 WARNING CLAUSES .....                                | 4         |
| 3.7 SUMMARY OF NOISE ATTENUATION REQUIREMENTS.....       | 7         |
| <b>4.0 PREDICTION OF OUTDOOR NOISE LEVELS.....</b>       | <b>7</b>  |
| 4.1 ROADWAY TRAFFIC.....                                 | 7         |
| 4.2 NOISE LEVEL ANALYSIS .....                           | 8         |
| 4.3 NOISE LEVEL RESULTS .....                            | 8         |
| <b>5.0 CONCLUSIONS.....</b>                              | <b>11</b> |

### Appendices

- Appendix A: Excerpts from the City of Ottawa Environmental Noise Control Guidelines, MOE's NPC-300, the City of Ottawa's Transportation Master Plan and Official Plan
- Appendix B: Sound Level Calculations
- Appendix C: Grading Plan – 117198-GR

### Tables

- Table 1: Noise Attenuation Measure Requirements
- Table 2: Traffic and Roadway Parameters
- Table 3: Simulation Results – Outdoor Living Areas
- Table 4: Predicted Noise Levels at Various Wall Heights, OLA 1
- Table 5: Predicted Noise Levels at Various Wall Heights, OLA 7
- Table 6: Simulation Results – Plane of Window

### Figures

- Figure 1: Site Location
- Figure 2: Concept Plan
- Figure 3: Receiver Location Plan
- Figure 4: Noise Attenuation Measures Plan

### Drawings

- 117198 – Grading Plan

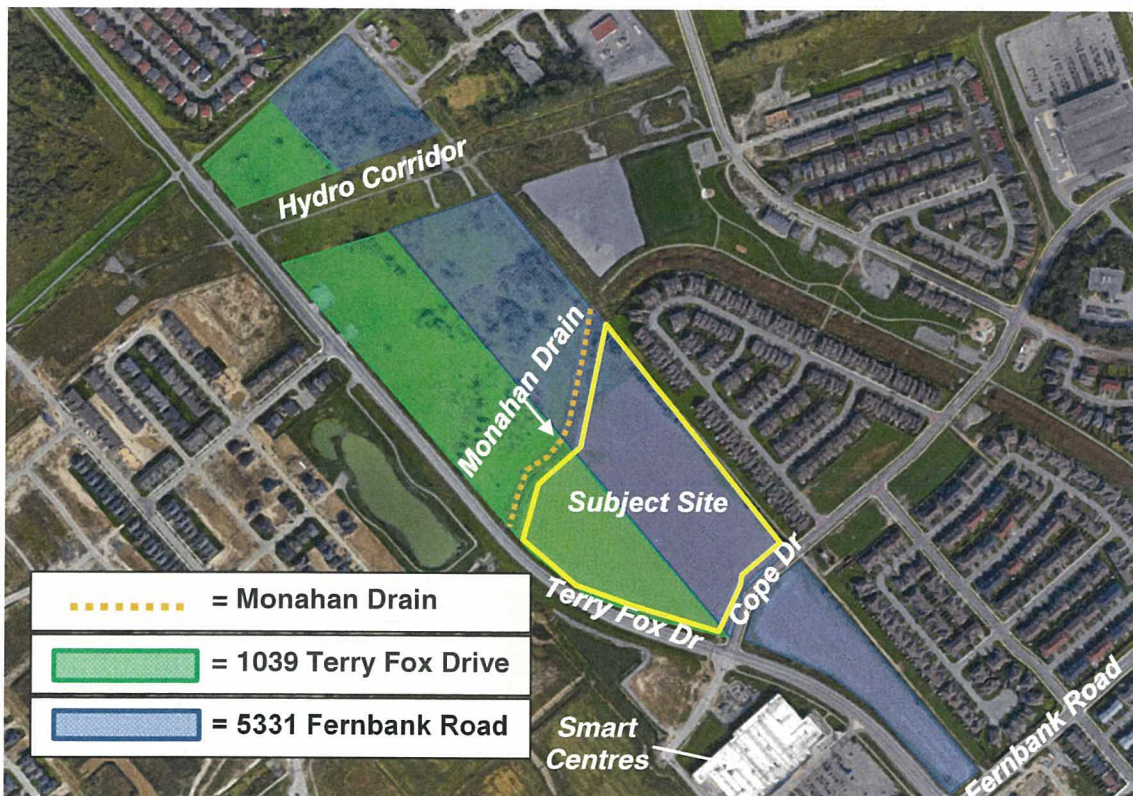
## 1.0 INTRODUCTION

This report is submitted on behalf of the developer, Claridge Homes as part of the Draft Plan of Subdivision process for the proposed Van Gaal Lands development located at 1039 Terry Fox Drive and 5331 Fernbank Road. This report assesses the environmental impact of noise on the proposed development and outlines the recommended mitigation measures if required.

## 2.0 BACKGROUND

### 2.1 Project Description

The Subject Site is approximately 8.15 hectares in area and is located immediately north of the intersection of Terry Fox Drive and Cope Drive, as shown on **Figure 1**. The Subject Site has approximately 146 metres of frontage along Cope Drive and approximately 325 metres of frontage along Terry Fox Drive. The topography is generally flat with a gentle slope from the south to the north.



**Figure 1 – Site Location:** 1039 Terry Fox and 5331 Fernbank Rd (Image Source: Google Maps, 2018)

The following describes the existing and planned land uses adjacent to the subject site:

**North:** The Van Gaal Lands currently extend north of the Monahan Drain to the Trans Canada Trail and are used for cattle grazing but are intended for future employment uses. A hydro corridor cuts through this northern portion in the east-west direction.



**East:** The lands east of the proposed subdivision are existing detached dwellings with frontage on Northgraves Crescent in the adjacent Soho West Community.

**South:** Cope Drive, a two-lane collector road, bounds the Subject Site to the south. The Van Gaal Lands extend south of Cope Drive to Fernbank Road. An application for a shopping plaza is contemplated for this southern portion of the Van Gaal Lands by Smart centres.

**West:** Terry Fox Drive, a two-lane arterial road, bounds the Subject Site to the west. The Blackstone residential community is located on the west side of Terry Fox and is within the Fernbank Community Design Plan area. Additional future uses will include residential, local commercial, and a secondary school.

**Southwest:** A Smart Centres plaza (5357 Fernbank Road) is located at the southwest corner of Terry Fox Drive and Cope Drive.

Plans are to develop a residential subdivision on the subject site, as shown on **Figure 2 – Concept Plan**, which will consist of 129 townhouse units and 55 single units for a total of 184 units.

## 2.2 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 or major collector roadway, or a rapid-transit corridor.

The potential surface road noise source for this site that was considered for the purposes of this study is Terry Fox Drive and Cope Drive as all other roadways within the zone of influence were not arterial or major collector roadways. For the purposes of this report, Terry Fox Drive and Cope Drive will be considered the noise sources.

Terry Fox Drive is classified as an urban arterial roadway with a 44.5m protected ROW in the City of Ottawa Transportation Master Plan and Official Plan. Terry Fox Drive is currently a 2-lane undivided arterial road with a posted speed of 80km/hr fronting the Van Gaal Lands. As per Map 11 in the Transportation Master Plan (TMP), Road Network – 2031 Affordable Network, there are no plans to widen Terry Fox Drive prior to 2031. Therefore, for the purposes of this report, a 2-lane undivided arterial road with an AADT level of 15,000 veh/day and a posted speed of 80km/hr will be utilized. Refer to **Appendix A** for the excerpt from the TMP.

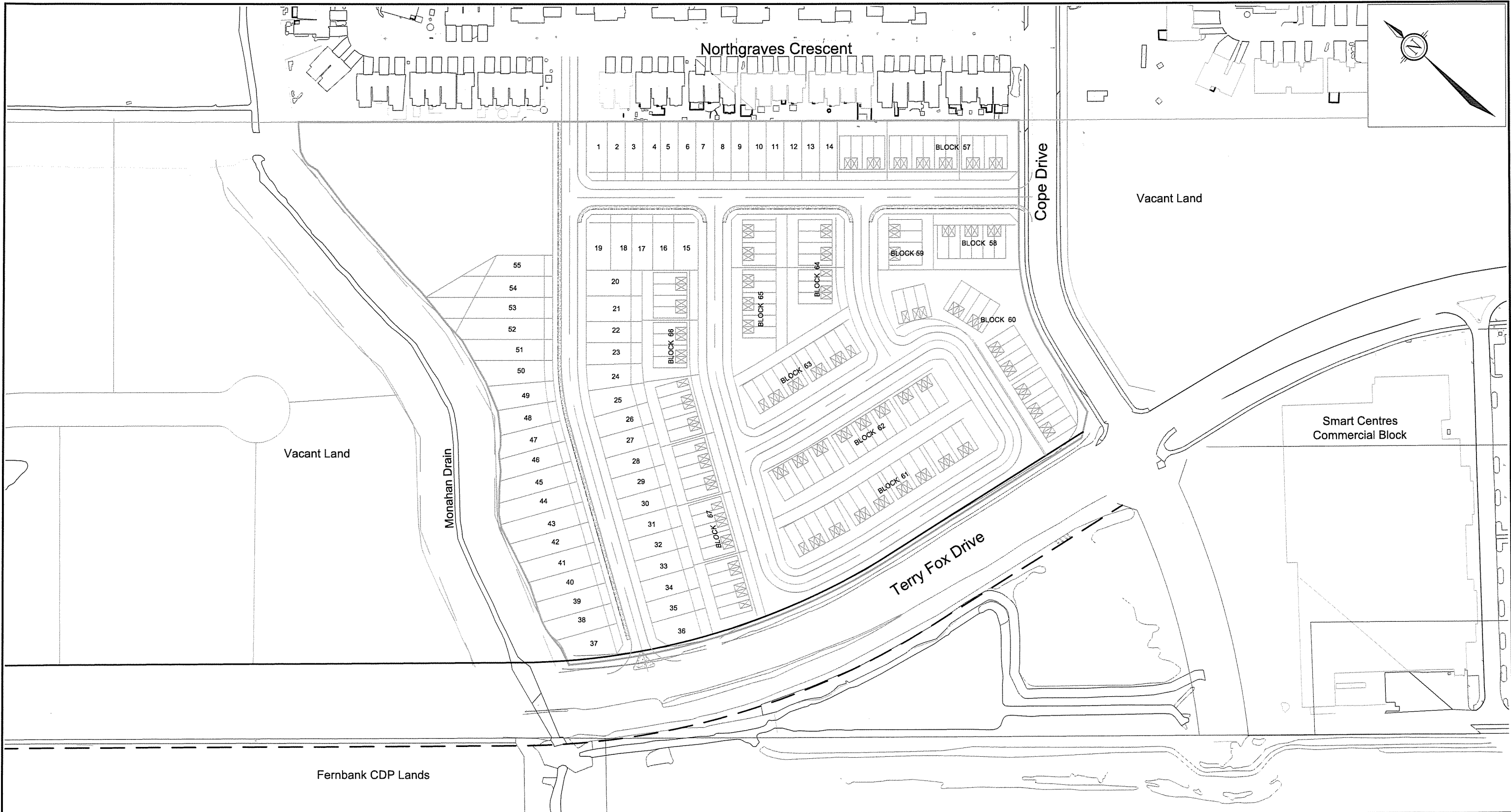
Cope Drive is classified as an urban collector roadway with a 24m protected ROW with an AADT level of 8,000 veh/day and a posted speed limit of 50km/hr.

There is no railway ROW within 250m that impacts the site.

There is no airport noise affecting this site.

There are no stationary noise sources that affect this site.

M:\2017\117198\CAD\Design\117198-NC.dwg, Fig-2-Concept, Oct 05, 2018 - 3:14pm, szorgel



## LEGEND

PROPERTY LINE

**NOVATECH**

Engineers, Planners & Landscape Architects  
Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario, Canada K2M 1P6

Telephone  
Facsimile  
Website

(613) 254-9643  
(613) 254-5867  
www.novatech-eng.com

VAN GAAL LANDS - CLARIDGE  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## CONCEPT PLAN

SCALE 1 : 2000

DATE OCT 2018 JOB 117198 FIGURE 2

CUT1117198 DIM/2 270mm V182mm

### 3.0 CITY OF OTTAWA NOISE CONTROL GUIDELINES

#### 3.1 Sound Level Criteria

The City of Ottawa is concerned with noise from aircraft, roads, transitways, and railways, as expressed 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 level for indoor bedrooms is 40dBA 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 Plane of Window 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 3.0m from the building façade, 1.5m above grade.
- **Plane of Window (POW):** The indoor living space where the sound levels will affect the living room area during daytime hours and bedrooms during nighttime hours. POW noise levels are considered inside the building, 1.5m above the ground for the daytime and 4.5m above the ground for nighttime.

#### 3.2 Alternative Methods for Noise Attenuation

When OLA sound levels are predicted to be approximately equal to or less than 55 dBA attenuation measures are not required. If the predicted noise levels are found to exceed 55 dBA, physical forms of mitigation is suggested and which may also include the provision of warning clauses to inform purchasers of the expected noise levels and specific mitigation measures.

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 zones;
- Construction of sound or acoustic barriers;
- Installation of air conditioning and ventilation; and
- Enhanced construction techniques and construction quality.

#### 3.3 Noise Attenuation Requirements

When the noise attenuation measures listed above do not reduce noise levels below 55 dBA in the Outdoor Living Area, control measures (barriers) are required to reduce the Leq below or 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;
- Situated 0.30m inside the private property line;
- A surface mass density not less than 20kg/sq.m; and
- No holes or gaps.

### 3.4 Ventilation Requirements

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

### 3.5 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 *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, windows and roof);

L = Sound Level expressed on a common decibel scale.

### 3.6 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.

It is recommended that the following noise clauses be registered on title and incorporated into the agreement of purchase and sales as required. Results can be found in **Table 3** from Section 4.3 of this report:

#### Type 1

“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 2

“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. 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.”



### Type 3

“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 4

“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. Specific warning clauses will be identified for each unit during detailed design.

### 3.7 Summary of Noise Attenuation Requirements

**Table 1** 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 1: 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 1* or Type 2** |
|                                   | More than 60          | Barriers required  | N/A  | N/A   | Required if resultant L <sub>eq</sub> exceeds 55 dBA Type 1* or Type 2*  |
| 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 3  |
|                                   | More Than 65          | N/A  | Central Air Conditioning                                       | Acoustical performance of the windows and walls should be specified | Required Type 4  |
| 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 3  |
|                                   | More than 60          | N/A  | Central Air Conditioning                                       | Acoustical performance of the windows and walls should be specified | Required Type 4  |

\*Type 1 warning clause refers to units requiring a noise barrier that mitigates noise below 55dBA.

\*\*Type 2 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.

## 4.0 PREDICTION OF OUTDOOR NOISE LEVELS

### 4.1 Roadway Traffic

Noise levels from Terry Fox Drive and Cope Drive were assessed using the ultimate road (as per the 2031 Affordable Network Plan in the TMP) and traffic parameters below from "Appendix B of the City of Ottawa's Environmental Noise Control Guidelines, 2016". The

posted speed is consistent with the current conditions fronting the Van Gaal Lands. The traffic and roadway parameters used for sound level predictions are shown in Table 2.

**Table 2: Traffic and Roadway Parameters**

|                                     | <b>Terry Fox Drive</b>          | <b>Cope Drive</b>      |
|-------------------------------------|---------------------------------|------------------------|
| Roadway Classification              | 2-Lane Urban Arterial-Undivided | 2-Lane Urban Collector |
| Annual Average Daily Traffic (AADT) | 15,000 vehicles/day             | 8,000 vehicles/day     |
| Day/Night Split (%)                 | 92/8                            | 92/8                   |
| Medium Trucks (%)                   | 7                               | 7                      |
| Heavy Trucks (%)                    | 5                               | 5                      |
| Posted Speed                        | 80 km/hr                        | 50 km/hr               |

For reference, excerpts from the ENCG confirming the Terry Fox Drive and Cope Drive AADT are included in **Appendix A**.

## 4.2 Noise Level Analysis

The noise levels were analyzed using Version 5.03 of the STAMSON computer program issued by the MOE. Proposed grades were required for the software and were obtained from preliminary elevations on the Grading Plan (117198-GR), which has been included in **Appendix C** of this report.

For the purposes of this report, townhouse units within the development used as barriers in the noise calculations have an assumed height of 6.0m (typical 2-storey).

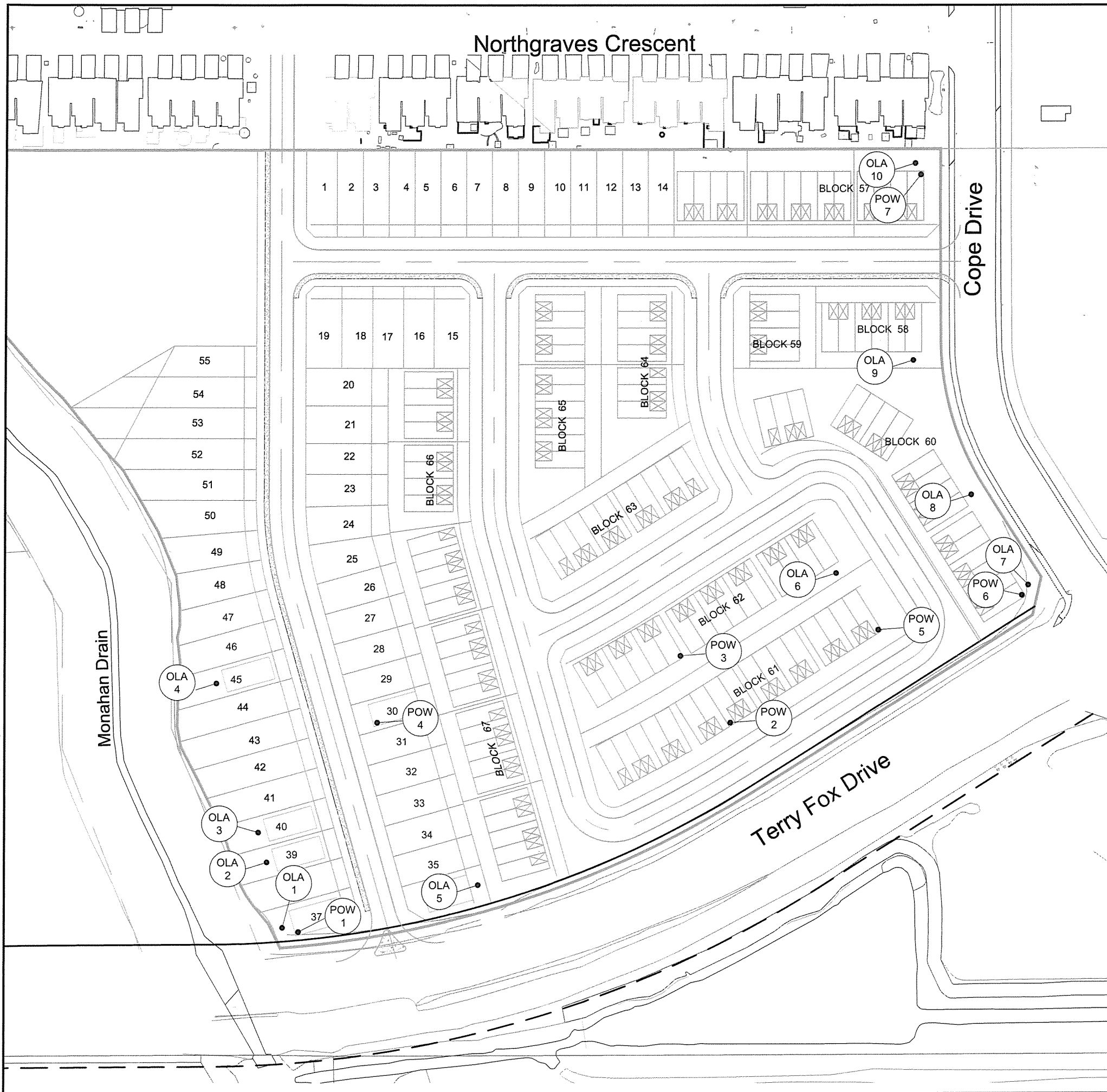
Receiver locations used in the noise simulations are shown on **Figure 3** – Receiver Location Plan.

## 4.3 Noise Level Results

Simulated noise levels for the units adjacent to Terry Fox Drive and Cope Drive exceed the allowable noise level criteria, resulting in the requirement for outdoor noise mitigation (noise barriers) and indoor noise mitigation, which may include the installation of forced air ventilation, air conditioning, a building façade analysis and warning clauses. The building façade analysis, specific warning clauses and other indoor mitigation details will be confirmed as part of the detailed design.

The predicted noise levels and mitigated noise levels at the selected receiver locations within the development are illustrated in **Table 3**.

M:\2017\117198\CAD\Design\117198-NC.dwg, Fig.3-Receiver, Oct 05, 2018 - 3:14pm, szorgel



## LEGEND

OLA  
1

PROPERTY LINE

POW  
1

RECEIVER - OUTDOOR LIVING AREA (OLA)

RECEIVER - PLANE OF WINDOW / INDOOR LIVING AREA (POW)



EXAMPLE UNIT FOOTPRINT WITH MINIMUM SETBACKS

## NOTES:

1. ROADWAY CLASSIFICATION AS PER CITY OF OTTAWA OFFICIAL PLAN, SCHEDULE E, OFFICIAL PLAN, URBAN ROAD NETWORK.
2. REFER TO GRADING PLAN (117198-GR) FOR ALL PRELIMINARY GRADING INFORMATION.
3. NOISE BARRIER REFERS TO ANY COMBINATION OF NOISE WALL, BERM AND/OR RETAINING WALL.

**NOVATECH**

Engineers, Planners & Landscape Architects  
Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario, Canada K2M 1P6

Telephone  
Facsimile  
Website

(613) 254-9643  
(613) 254-5867  
www.novatech-eng.com

VAN GAAL LANDS - CLARIDGE  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## NOISE RECEIVER LOCATION PLAN

SCALE 1 : 1500

DATE OCT 2018 JOB 117198 FIGURE 3

CUT11V17 DM12 270mm V192mm

**Table 3: Simulation Results – Outdoor Living Areas**

| Receiver Location* | File                      | Calculated Noise Level (dBA)<br>7:00-23:00 |            | Outdoor Mitigation Method**          |
|--------------------|---------------------------|--|------------|--------------------------------------|
|                    |                           | Un-attenuated                              | Attenuated |                                      |
| OLA 1              | ola1.te /<br>ola1unat.te  | 68.47                                      | 59.86      | 3.7m Barrier                         |
| OLA 2              | ola2.te /<br>ola2unat.te  | 61.69                                      | 58.89      | 3.7m Barrier<br>(Primarily for OLA1) |
| OLA 3              | ola3.te /<br>ola3unat.te  | 60.07                                      | 58.54      | 3.7m Barrier<br>(Primarily for OLA1) |
| OLA 4              | ola4.te /<br>ola4unat.te  | 55.18                                      | 54.85      | 3.7m Barrier<br>(Primarily for OLA1) |
| OLA 5              | ola5.te /<br>ola5unat.te  | 67.60                                      | 59.15      | 3.5m Barrier                         |
| OLA 6              | ola6.te /<br>ola6unat.te  | 54.27                                      | -          | N/A                                  |
| OLA 7              | ola7.te /<br>ola7unat.te  | 67.39                                      | 59.78      | 3.35m Barrier                        |
| OLA 8              | ola8.te /<br>ola8unat.te  | 64.13                                      | 57.70      | 2.95m Barrier                        |
| OLA 9              | ola9.te /<br>ola9unat.te  | 60.95                                      | 55.56      | 2.85m Barrier                        |
| OLA 10             | ola10.te /<br>ola10una.te | 60.50                                      | 54.13      | 2.25m Barrier                        |

\*Locations correspond to receivers found on Figure 3 – Noise Receiver Location Plan

\*\*Barrier height is any combination of noise wall, berm, and/or retaining wall

Since the noise barriers are required to tie into the existing surrounding lands, barrier heights are in reference to the total barrier height above existing ground.

Figures in **Appendix B** show angles used in the detailed modeling calculations. The noise levels for all receiver locations generated from STAMSON are listed in **Table 3** with detailed modeling results in **Appendix B**.

There is a significant reduction in outdoor noise levels throughout the site, however, most receivers are still above the new OLA guideline of 55 dBA (the previous guideline as of January 2016 was 60 dBA). To further reduce the noise levels to the new criteria would result in a noise wall height of 4.5m or greater in several locations exposed to Terry Fox Drive. A 4.5m barrier is the maximum barrier height as stated in the ENCG and a 4.5m wall would be aesthetically unappealing to the local residents and its advantages (further reducing noise) would be minimal compared to additional cost along Terry Fox Drive. As per section 3.4 of the ENCG, if there's no technically or economically feasible way to achieve the City's criteria, a tolerance of up to 5 dBA may be granted at the City's discretion. **Tables 4 and 5** show the relationship between the height of wall and the predicted daytime and nighttime mitigated noise levels at various locations. These locations will also require an additional warning clause for the 5dBA tolerance. Figures in **Appendix B** show angles used in the detailed modeling calculations. The noise levels for all receiver locations generated from STAMSON are listed in Table 4 and 5 with detailed modeling results in **Appendix B**.



**Table 4: Predicted Noise Levels at Various Wall Heights, OLA 1**

| OLA 1 – Barrier height is any combination of noise wall, berm, and/or retaining wall |           |                       |                         |
|--|-----------|-----------------------|-------------------------|
| Height of Barrier (m)  |           | Noise Level Day (dBA) | Noise Level Night (dBA) |
| 4.25   | ola130.te | 58.08                 | 61.17                   |
| 4.75   | ola135.te | 56.70                 | 61.17                   |
| 5.25   | ola145.te | 55.61                 | 56.21                   |
| 5.75   | ola150.te | 54.75                 | 54.32                   |

**Table 5: Predicted Noise Levels at Various Wall Heights, OLA 7**

| OLA 7 – Barrier height is any combination of noise wall, berm, and/or retaining wall |           |                       |                         |
|--|-----------|-----------------------|-------------------------|
| Height of Barrier (m)  | File      | Noise Level Day (dBA) | Noise Level Night (dBA) |
| 3.75   | ola730.te | 58.35                 | 60.18                   |
| 4.25   | ola735.te | 56.87                 | 60.18                   |
| 4.75   | ola740.te | 55.71                 | 56.06                   |
| 5.25   | ola745.te | 54.78                 | 54.85                   |

Most of the site has been oriented to minimize the noise effects from Terry Fox Drive with a window street and having only side yards exposed. As a result, only OLAs within close proximity to Terry Fox Drive require noise mitigation as units further away have significant shielding.

The predicted daytime and nighttime noise levels and required mitigation for the Plane of Window are shown in **Table 6**.

**Table 6: Simulation Results – Plane of Window**

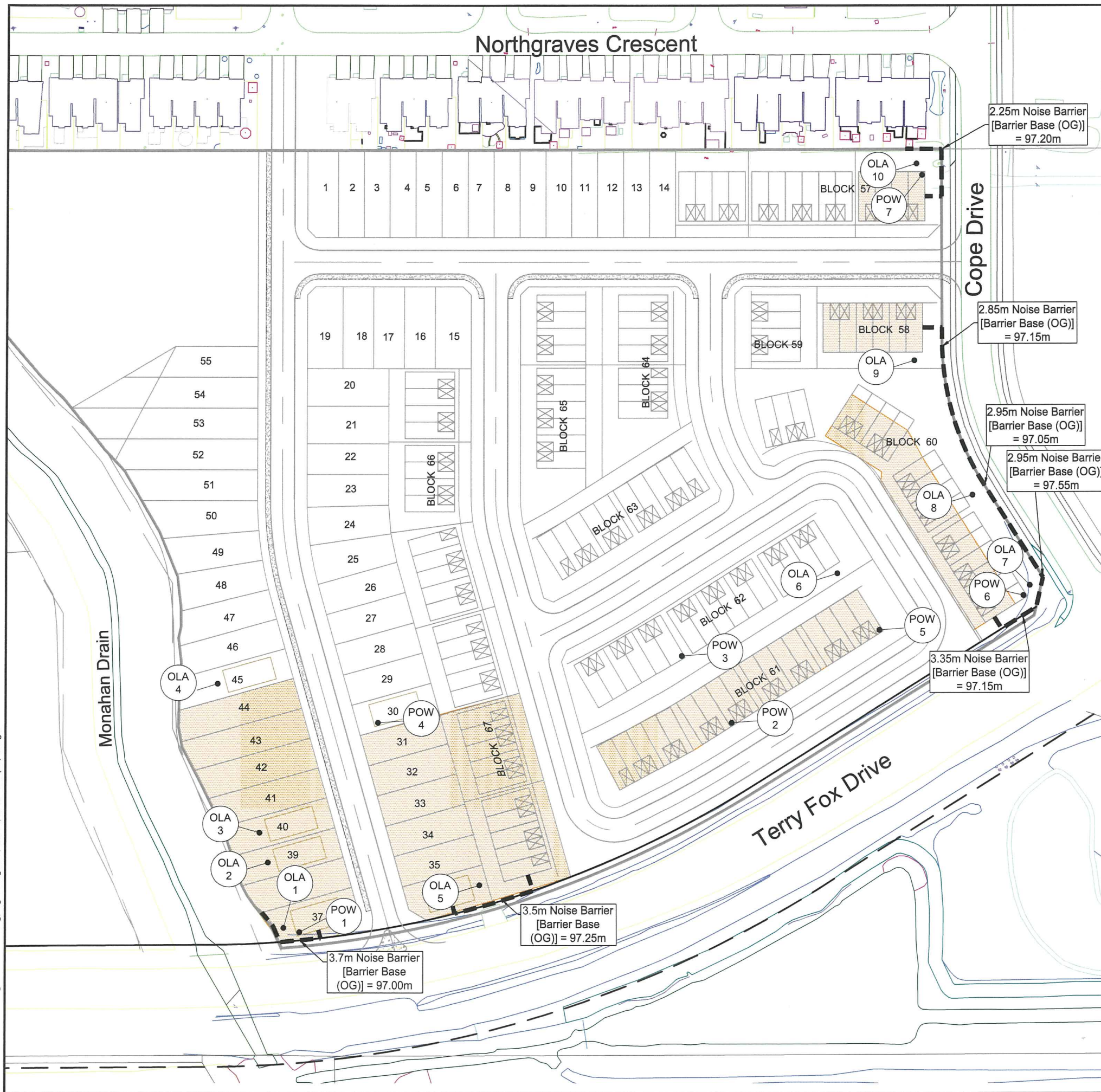
| Receiver Location* | File        | Calculated Noise Level 7:00-23:00 (dBa) | Calculated Noise Level 23:00-7:00 (dBa) | Mitigation Method**                             |
|--------------------|-------------|---|---|---|
|                    |             | Un-attenuated                           | Un-attenuated                           |   |
| POW1               | pow1unat.te | 70.71                                   | 63.12                                   | Indoor Mitigation Required**<br>Warning Clauses |
| POW2               | pow2unat.te | 64.55                                   | 56.96                                   | Indoor Mitigation Required**<br>Warning Clauses |
| POW3               | pow3unat.te | 51.59                                   | 44.00                                   |   |
| POW4               | pow4unat.te | 54.54                                   | 46.94                                   |   |
| POW5               | pow5unat.te | 63.97                                   | 56.37                                   | Indoor Mitigation Required**<br>Warning Clauses |
| POW6               | pow6unat.te | 68.42                                   | 60.83                                   | Indoor Mitigation Required**<br>Warning Clauses |
| POW7               | pow7unat.te | 62.80                                   | 55.21                                   | Indoor Mitigation Required**<br>Warning Clauses |

\*Locations correspond to receivers found on Figure 3 – Noise Receiver Location Plan

\*\*Indoor mitigation refers to either the installation of forced air ventilation or air conditioning and a building façade analysis.



M:\2017\117198\CAD\Design\117198-NC.dwg, Fig.4-Mitigation, Oct 05, 2018 - 3:14pm, szorgel



## LEGEND

- PROPERTY LINE
- PROPOSED NOISE BARRIER (ANY COMBINATION OF NOISE WALL, BERM, AND/OR RETAINING WALL)
- RECEIVER - OUTDOOR LIVING AREA (OLA)
- RECEIVER - PLANE OF WINDOW / INDOOR LIVING AREA (POW)
- EXAMPLE UNIT FOOTPRINT WITH MINIMUM SETBACKS
- INDOOR MITIGATION REQUIRED AND WARNING CLAUSES BE REGISTERED ON TITLE AND INCORPORATED INTO THE AGREEMENT OF PURCHASE AND SALES

## NOTES:

- ROADWAY CLASSIFICATION AS PER CITY OF OTTAWA OFFICIAL PLAN, SCHEDULE E, OFFICIAL PLAN, URBAN ROAD NETWORK.
- REFER TO GRADING PLAN (117198-GR) FOR ALL PRELIMINARY GRADING INFORMATION.
- NOISE BARRIER REFERS TO ANY COMBINATION OF NOISE WALL, BERM AND/OR RETAINING WALL.

**NOVATECH**

Engineers, Planners & Landscape Architects  
Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario, Canada K2M 1P6

Telephone  
Facsimile  
Website

(613) 254-9643  
(613) 254-5867  
www.novatech-eng.com

VAN GAAL LANDS - CLARIDGE  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## NOISE ATTENUATION MEASURES PLAN

SCALE 1 : 1500

DATE OCT 2018 JOB 117198 FIGURE 4

SLT11V17 DIMS 270mm V122mm

Figures in **Appendix B** show angles used in the detailed modeling calculations. The noise levels for all receiver locations generated from STAMSON are listed in **Table 6** with detailed modeling results in **Appendix B**.

Indoor mitigation requirements and specific warning clauses will be completed as part of the detailed design as stated in Part 4, Section 3.2 of the ENCG.

For units requiring a building façade analysis during detailed design, when the floor layouts are finalized, the AIF valves can be verified to ensure the appropriate window and wall type assemblies are installed to mitigate the predicted noise levels. However, based on past experience, the minimum window and wall type assemblies required by the Ontario Building Code (OBC) will be sufficient to mitigate the indoor noise levels below the City's criteria for most of the site.

Refer to **Figure 4 – Noise Attenuation Measures Plan** for locations and details of required mitigation.

## 5.0 CONCLUSIONS

An analysis of the roadway traffic along Terry Fox Drive and Cope Drive indicates attenuation measures will be necessary for Van Gaal Lands project.

The following is a summary of the attenuation measures and notice requirements to be placed on title for the following units. Lot and Block numbers correspond to **Figure 2 – Concept Plan**:

### **Residential – Lots 37 and 38**

- Installation of a 3.7m Noise Barrier

### **Residential – Lot 36 and Block 67 (portion of block)**

- Installation of a 3.5m Noise Barrier

### **Residential –Block 58**

- Installation of a 2.85m Noise Barrier

### **Residential – Block 60**

- Installation of a 2.95-3.35m Noise Barrier

### **Residential – Block 57 (portion of block)**

- Installation of a 2.25m Noise Barrier

### **Residential – Lots 31-36, 37-44 and Blocks 57 (portion of block), 58, 60, 61, 67 (portion of block)**

- Indoor noise mitigation required (may include the installation of forced air ventilation or air conditioning and a building façade analysis). To be confirmed during detailed design;
- Warning Clauses Required, to be confirmed during detailed design.



In closing, Novatech respectfully requests the City of Ottawa accept the findings of this Noise Impact Feasibility Report for the Van Gaal Lands located at 1039 Terry Fox Drive and 5331 Fernbank Road as part of the Draft Plan of Subdivision Approval submission.

**NOVATECH**

Authored by:



Steve Zorgel, P.Eng.  
Project Coordinator

Reviewed by:

A handwritten signature in blue ink that reads "Drew Blair".

Drew Blair, P.Eng.  
Project Manager

## **APPENDIX A**

### **EXCERPTS FROM THE CITY OF OTTAWA ENVIRONMENTAL NOISE CONTROL GUIDELINES, THE MOE'S NPC-300, THE CITY OF OTTAWA'S TRANSPORTATION MASTER PLAN AND OFFICIAL 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<br>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

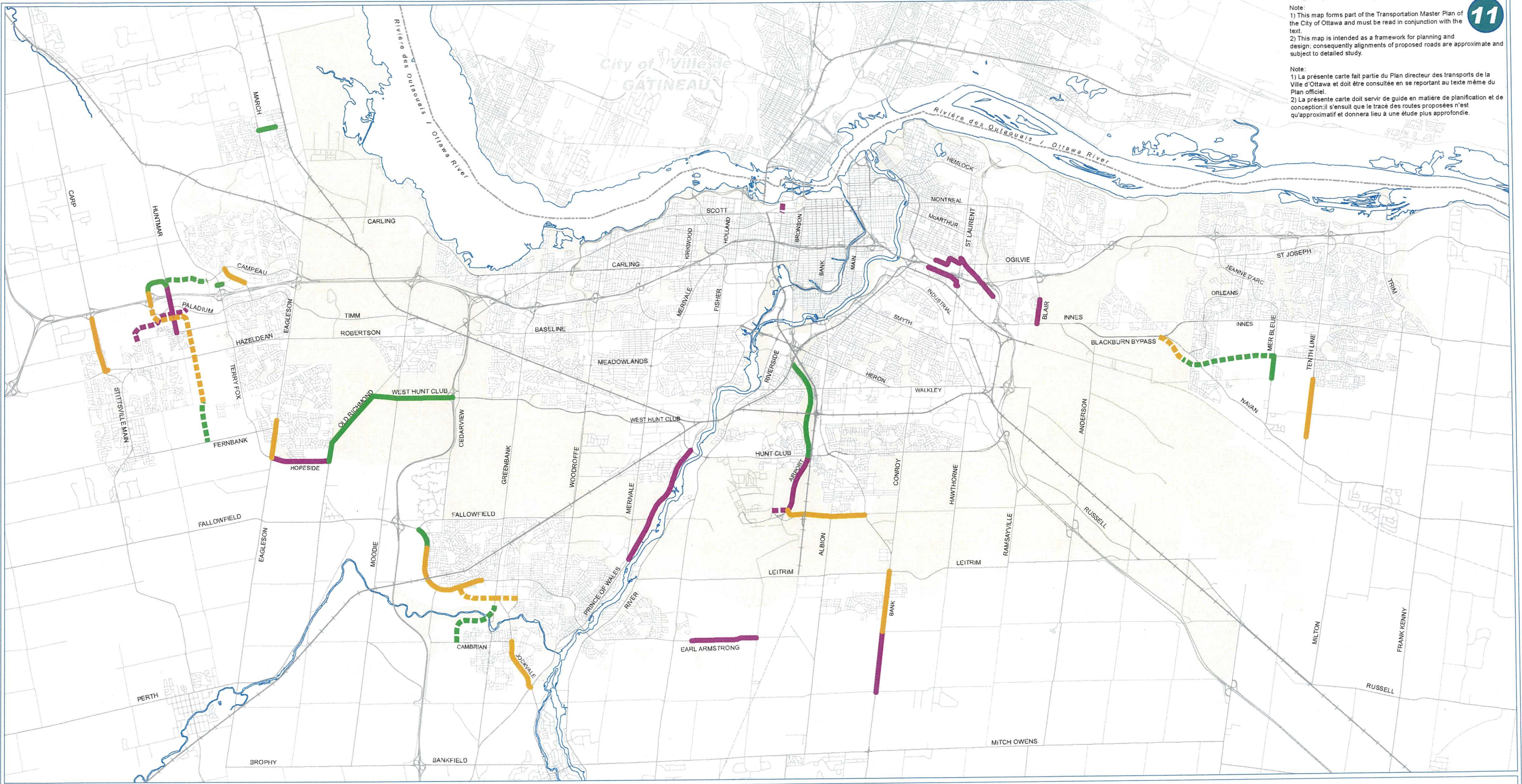
The Province notes that it is not acceptable to use warning clauses in place of physical noise control measures to identify an excess over the MOE sound level limits for stationary sources. The generic warning clause for stationary sources (called Type E in NPC-300) may identify a potential concern due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



Note:  
1) This map forms part of the Transportation Master Plan of the City of Ottawa and must be read in conjunction with the text.  
2) This map is intended as a framework for planning and design; consequently alignments of proposed roads are approximate and subject to detailed study.

Note:  
1) La présente carte fait partie du Plan directeur des transports de la Ville d'Ottawa et doit être consultée en se reportant au texte même du Plan officiel.  
2) La présente carte doit servir de guide en matière de planification et de conception; il s'ensuit que le tracé des routes proposées n'est qu'approximatif et donnera lieu à une étude plus approfondie.



- |                                |                                      |
|--------------------------------|--------------------------------------|
| Phase 1 (2014 - 2019) Widening | Phase 1 (2014 - 2019) Élargissement  |
| Phase 1 (2014 - 2019) New Road | Phase 1 (2014 - 2019) Nouvelle route |
| Phase 2 (2020 - 2025) Widening | Phase 2 (2020 - 2025) Élargissement  |
| Phase 2 (2020 - 2025) New Road | Phase 2 (2020 - 2025) Nouvelle route |
| Phase 3 (2026 - 2031) Widening | Phase 3 (2026 - 2031) Élargissement  |
| Phase 3 (2026 - 2031) New Road | Phase 3 (2026 - 2031) Nouvelle route |

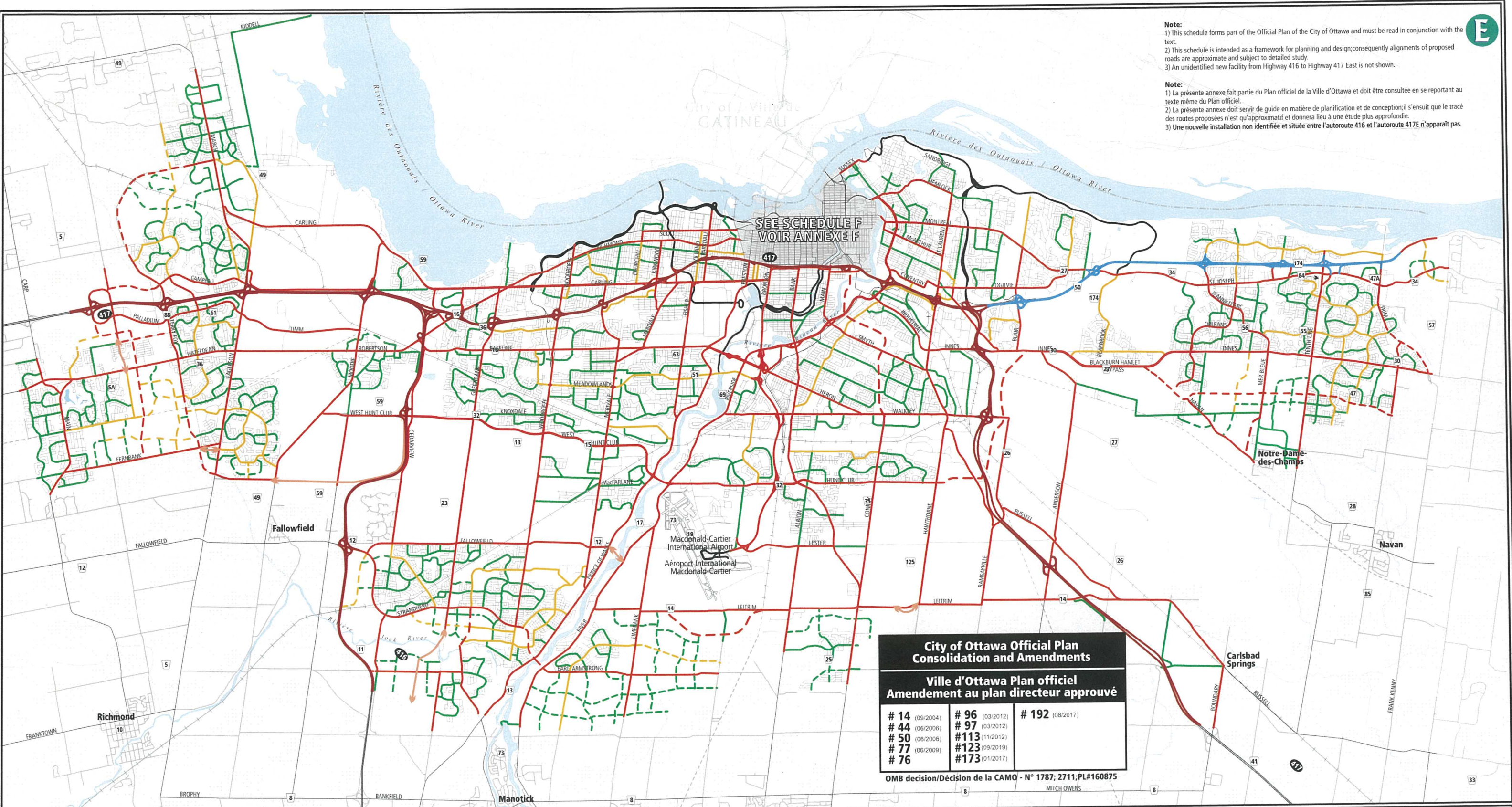
TRANSPORTATION MASTER PLAN - Map 11

**ROAD NETWORK – 2031 AFFORDABLE NETWORK**

PLAN DIRECTEUR DES TRANSPORTS - Carte 11

**RÉSEAU ROUTIER - RÉSEAU ABORDABLE 2031**





**Note:**  
1) This schedule forms part of the Official Plan of the City of Ottawa and must be read in conjunction with the text.  
2) This schedule is intended as a framework for planning and design; consequently alignments of proposed roads are approximate and subject to detailed study.  
3) An unidentified new facility from Highway 416 to Highway 417 East is not shown.

**Note:**  
1) La présente annexe fait partie du Plan officiel de la Ville d'Ottawa et doit être consultée en se reportant au texte même du Plan officiel.  
2) La présente annexe doit servir de guide en matière de planification et de conception; il s'ensuit que le tracé des routes proposées n'est qu'approximatif et donnera lieu à une étude plus approfondie.  
3) Une nouvelle installation non identifiée et située entre l'autoroute 416 et l'autoroute 417E n'apparaît pas.

| City of Ottawa Official Plan Consolidation and Amendments          |                 |                 |
|--|-----------------|-----------------|
| Ville d'Ottawa Plan officiel Amendement au plan directeur approuvé |                 |                 |
| # 14 (08/2004)   | # 96 (03/2012)  | # 192 (08/2017) |
| # 44 (06/2006)   | # 97 (03/2012)  |                 |
| # 50 (06/2006)   | # 113 (11/2012) |                 |
| # 77 (06/2009)   | # 123 (09/2019) |                 |
| # 76   | # 173 (01/2017) |                 |

OMB decision/Décision de la CAMO - N° 1787; 2711; PL#160875

MITCH OWENS

**Official Plan - Schedule E**  
**Urban Road Network**  
**Plan officiel - Annexe E**  
**Routes Arterial - Urbain**

Prepared by: Planning and Growth Management Department, Mapping & Graphics Unit

Préparé par : Service de l'urbanisme et de la gestion de la croissance, Unité de la cartographie et des graphiques

- Provincial Highway

City Freeway

Federally Owned Road

Existing

Proposed

(Alignment defined)
- Route provinciale

Autoroute de ville

Chemins de propriété fédéral

Établie

Proposé

(Alignement déterminée)

- Arterials

Existing

Proposed

(Alignment Defined)

Conceptual

(Alignment Undefined)
- Artère

Établie

Proposé

(Alignement déterminée)

Conceptuelle

(Alignement à déterminée)

- Major Collectors

Existing

Proposed
- Grande collectrice

Établie

Proposé
- Collectors

Existing

Proposed
- Collectrice

Établie

Proposé

Scale / Échelle

2km 0 1 2 3 4km



## **APPENDIX B**

### **SOUND LEVEL CALCULATIONS**

- Part 1 - Attenuated Results
- Part 2 - Unattenuated Results
- Part 3 - Barrier Height / Sound Level Comparison Files
- Part 4 - Stamson Modelling Angles

## **PART 1 (APPENDIX B)**

### Attenuated Results



Filename: ola1.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Terry Fox (day/night)

-----  
Angle1 Angle2 : -90.00 deg -54.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 20.20 / 20.20 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -54.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 3.50 / 3.50 m  
Source elevation : 97.55 m  
Receiver elevation : 98.15 m  
Barrier elevation : 98.25 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: Terry Fox (day/night)

```

-----
Angle1   Angle2           : -54.00 deg   90.00 deg
Wood depth           :      0      (No woods.)
No of house rows     :      0 / 0
Surface              :      1      (Absorptive ground surface)
Receiver source distance : 20.20 / 20.20 m
Receiver height       :   1.50 / 4.50 m
Topography           :      4      (Elevated; with barrier)
Barrier angle1        : -54.00 deg   Angle2 : 90.00 deg
Barrier height        :   2.50 m
Elevation             :   1.50 m
Barrier receiver distance : 5.00 / 5.00 m
Source elevation      :  97.55 m
Receiver elevation    :  98.15 m
Barrier elevation     :  98.20 m
Reference angle       :   0.00

```

Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 47.91 ! 47.91
2.Terry Fox ! 1.50 ! 59.57 ! 59.57
-----+-----+-----+-----
Total                                     59.86 dBA

```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 44.93 ! 44.93
2.Terry Fox ! 1.50 ! 61.07 ! 61.07 *
-----+-----+-----+-----
Total                                     61.17 dBA

```

\* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 59.86  
(NIGHT): 61.17

Filename: ola2.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF House (day/night)

-----  
Angle1 Angle2 : -90.00 deg -17.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 44.40 / 44.40 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -17.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 27.30 / 27.30 m  
Source elevation : 97.60 m  
Receiver elevation : 97.90 m  
Barrier elevation : 98.05 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF Barrier (day/night)

```

-----
Angle1   Angle2           : -17.00 deg   51.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 44.40 / 44.40 m
Receiver height       :      1.50 / 4.50 m
Topography           :      4           (Elevated; with barrier)
Barrier angle1        : -17.00 deg   Angle2 : 51.00 deg
Barrier height        :      2.20 m
Elevation             :      1.50 m
Barrier receiver distance : 22.40 / 22.40 m
Source elevation       :      97.60 m
Receiver elevation     :      97.90 m
Barrier elevation      :      97.35 m
Reference angle       :      0.00

```

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

```

-----
Car traffic volume   : 12144/1056 veh/TimePeriod *
Medium truck volume  :  966/84   veh/TimePeriod *
Heavy truck volume   :  690/60   veh/TimePeriod *
Posted speed limit   :    80 km/h
Road gradient         :      0 %
Road pavement        :      1 (Typical asphalt or concrete)

```

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

```

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

```

Data for Segment # 3: TF Open (day/night)

```

-----
Angle1   Angle2           : 51.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 44.40 / 44.40 m
Receiver height       :      1.50 / 4.50 m
Topography           :      3           (Elevated; no barrier)
Elevation             :      1.50 m
Reference angle       :      0.00

```

Result summary (day)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 48.54 | ! | 48.54     |
| 2.TF Barrier | ! | 1.50   | ! | 55.85 | ! | 55.85     |
| 3.TF Open    | ! | 1.50   | ! | 55.03 | ! | 55.03     |
| Total        |   |        |   |       |   | 58.89 dBA |

Result summary (night)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 43.36 | ! | 43.36     |
| 2.TF Barrier | ! | 1.50   | ! | 53.23 | ! | 53.23 *   |
| 3.TF Open    | ! | 1.50   | ! | 48.27 | ! | 48.27     |
| Total        |   |        |   |       |   | 54.76 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 58.89  
(NIGHT): 54.76

Filename: ola3.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod  
Medium truck volume : 966/84      veh/TimePeriod  
Heavy truck volume : 690/60      veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF House (day/night)

-----  
Angle1    Angle2 : -90.00 deg    -15.00 deg  
Wood depth : 0                    (No woods.)  
No of house rows : 0 / 0  
Surface : 1                        (Absorptive ground surface)  
Receiver source distance : 55.50 / 55.50 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4                     (Elevated; with barrier)  
Barrier angle1 : -90.00 deg    Angle2 : -15.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 38.10 / 38.10 m  
Source elevation : 97.65 m  
Receiver elevation : 97.75 m  
Barrier elevation : 98.05 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod \*  
Medium truck volume : 966/84      veh/TimePeriod \*  
Heavy truck volume : 690/60      veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF Barrier (day/night)



```

-----
Angle1   Angle2           : -15.00 deg   23.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 55.50 / 55.50 m
Receiver height       :      1.50 / 4.50 m
Topography           :      4           (Elevated; with barrier)
Barrier angle1        : -15.00 deg   Angle2 : 23.00 deg
Barrier height        :      2.50 m
Elevation             :      1.50 m
Barrier receiver distance : 30.80 / 30.80 m
Source elevation       :      97.65 m
Receiver elevation     :      97.75 m
Barrier elevation      :      97.35 m
Reference angle       :      0.00

```

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

```

-----
Car traffic volume   : 12144/1056 veh/TimePeriod *
Medium truck volume  :  966/84   veh/TimePeriod *
Heavy truck volume   :  690/60   veh/TimePeriod *
Posted speed limit   :    80 km/h
Road gradient         :      0 %
Road pavement        :      1 (Typical asphalt or concrete)

```

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

```

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

```

Data for Segment # 3: TF Open (day/night)

```

-----
Angle1   Angle2           : 23.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 55.50 / 55.50 m
Receiver height       :      1.50 / 4.50 m
Topography           :      3           (Elevated; no barrier)
Elevation             :      1.50 m
Reference angle       :      0.00

```

Result summary (day)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 47.75 | ! | 47.75     |
| 2.TF Barrier | ! | 1.50   | ! | 51.59 | ! | 51.59     |
| 3.TF Open    | ! | 1.50   | ! | 57.08 | ! | 57.08     |
| Total        |   |        |   |       |   | 58.54 dBA |

Result summary (night)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 42.27 | ! | 42.27     |
| 2.TF Barrier | ! | 1.50   | ! | 49.42 | ! | 49.42 *   |
| 3.TF Open    | ! | 1.50   | ! | 50.23 | ! | 50.23     |
| Total        |   |        |   |       |   | 53.22 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 58.54  
(NIGHT): 53.22

Filename: ola4.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF House (day/night)

-----  
Angle1 Angle2 : -90.00 deg -12.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 110.90 / 110.90 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -12.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 94.80 / 94.80 m  
Source elevation : 97.65 m  
Receiver elevation : 98.05 m  
Barrier elevation : 98.05 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF Barrier (day/night)

```

-----
Angle1   Angle2           : -12.00 deg   -2.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 110.90 / 110.90 m
Receiver height       :      1.50 / 4.50 m
Topography           :      4           (Elevated; with barrier)
Barrier angle1        : -12.00 deg   Angle2 : -2.00 deg
Barrier height        :      2.50 m
Elevation             :      1.50 m
Barrier receiver distance : 74.70 / 74.70 m
Source elevation      :      97.65 m
Receiver elevation    :      98.05 m
Barrier elevation     :      97.55 m
Reference angle       :      0.00

```

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

```

-----
Car traffic volume   : 12144/1056 veh/TimePeriod *
Medium truck volume  :  966/84   veh/TimePeriod *
Heavy truck volume   :  690/60   veh/TimePeriod *
Posted speed limit   :    80 km/h
Road gradient        :      0 %
Road pavement        :      1 (Typical asphalt or concrete)

```

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

```

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

```

Data for Segment # 3: TF Open (day/night)

```

-----
Angle1   Angle2           : -2.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 110.90 / 110.90 m
Receiver height       :      1.50 / 4.50 m
Topography           :      3           (Elevated; no barrier)
Elevation             :      1.50 m
Reference angle       :      0.00

```

Result summary (day)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 44.57 | ! | 44.57     |
| 2.TF Barrier | ! | 1.50   | ! | 41.57 | ! | 41.57     |
| 3.TF Open    | ! | 1.50   | ! | 54.19 | ! | 54.19     |
| Total        |   |        |   |       |   | 54.85 dBA |

Result summary (night)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 38.60 | ! | 38.60     |
| 2.TF Barrier | ! | 1.50   | ! | 39.07 | ! | 39.07 *   |
| 3.TF Open    | ! | 1.50   | ! | 47.53 | ! | 47.53     |
| Total        |   |        |   |       |   | 48.57 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 54.85  
(NIGHT): 48.57

Filename: ola5.te Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Open (day/night)

-----  
Angle1 Angle2 : -90.00 deg 59.00 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 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 59.00 deg  
Barrier height : 2.50 m  
Elevation : 1.50 m  
Barrier receiver distance : 7.40 / 7.40 m  
Source elevation : 97.30 m  
Receiver elevation : 98.15 m  
Barrier elevation : 98.25 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)



```

-----
Angle1   Angle2       : 59.00 deg  90.00 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 / 4.50 m
Topography      :      4      (Elevated; with barrier)
Barrier angle1   : 59.00 deg  Angle2 : 90.00 deg
Barrier height   :  6.00 m
Elevation        :  1.50 m
Barrier receiver distance :  4.40 / 4.40 m
Source elevation : 97.30 m
Receiver elevation : 98.15 m
Barrier elevation : 98.25 m
Reference angle  :  0.00

```

Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.TF Open      ! 1.50 ! 58.87 ! 58.87
2.TF House     ! 1.50 ! 47.18 ! 47.18
-----+-----+-----+-----
Total                                     59.15 dBA

```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.TF Open      ! 1.50 ! 60.26 ! 60.26 *
2.TF House     ! 1.50 ! 44.13 ! 44.13
-----+-----+-----+-----
Total                                     60.36 dBA

```

TOTAL Leq FROM ALL SOURCES (DAY): 59.15  
(NIGHT): 60.36

Filename: ola7.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Barr (day/night)

-----  
Angle1 Angle2 : -90.00 deg 45.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 27.10 / 27.10 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 45.00 deg  
Barrier height : 2.60 m  
Elevation : 1.20 m  
Barrier receiver distance : 5.70 / 5.70 m  
Source elevation : 98.00 m  
Receiver elevation : 97.90 m  
Barrier elevation : 97.90 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

```

-----
Angle1   Angle2           : 45.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 27.10 / 27.10 m
Receiver height       :      1.50 / 4.50 m
Topography           :      4           (Elevated; with barrier)
Barrier angle1        : 45.00 deg   Angle2 : 90.00 deg
Barrier height        :      6.00 m
Elevation            :      1.20 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation      : 98.00 m
Receiver elevation    : 97.90 m
Barrier elevation     : 98.00 m
Reference angle       :      0.00

```

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

```

-----
Angle1   Angle2           : -90.00 deg   30.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 18.40 / 18.40 m
Receiver height       :      1.50 / 4.50 m
Topography           :      2           (Flat/gentle slope; with
barrier)
Barrier angle1        : -90.00 deg   Angle2 : 30.00 deg
Barrier height        :      2.60 m
Barrier receiver distance : 5.60 / 5.60 m
Source elevation      : 97.70 m
Receiver elevation    : 97.90 m
Barrier elevation     : 97.80 m
Reference angle       :      0.00

```

Result summary (day)

|             | ! source | ! Road  | ! Total   |
|-------------|----------|---------|-----------|
|             | ! height | ! Leq   | ! Leq     |
|             | ! (m)    | ! (dBA) | ! (dBA)   |
| 1.TF Barr   | ! 1.50   | ! 58.38 | ! 58.38   |
| 2.TF House  | ! 1.50   | ! 46.92 | ! 46.92   |
| 3.Cope Barr | ! 1.50   | ! 53.28 | ! 53.28   |
| Total       |          |         | 59.78 dBA |

Result summary (night)

|             | ! source | ! Road  | ! Total   |
|-------------|----------|---------|-----------|
|             | ! height | ! Leq   | ! Leq     |
|             | ! (m)    | ! (dBA) | ! (dBA)   |
| 1.TF Barr   | ! 1.50   | ! 58.82 | ! 58.82 * |
| 2.TF House  | ! 1.50   | ! 44.50 | ! 44.50   |
| 3.Cope Barr | ! 1.50   | ! 54.03 | ! 54.03 * |
| Total       |          |         | 60.18 dBA |

\* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 59.78  
(NIGHT): 60.18

Filename: ola8.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Barr (day/night)

-----  
Angle1 Angle2 : -90.00 deg 4.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 66.00 / 66.00 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 4.00 deg  
Barrier height : 2.60 m  
Elevation : 1.20 m  
Barrier receiver distance : 43.50 / 43.50 m  
Source elevation : 98.00 m  
Receiver elevation : 97.75 m  
Barrier elevation : 97.90 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

```

-----
Angle1   Angle2           :   4.00 deg   90.00 deg
Wood depth           :           0       (No woods.)
No of house rows     :           0 / 0
Surface              :           1       (Absorptive ground surface)
Receiver source distance : 66.00 / 66.00 m
Receiver height      :   1.50 / 4.50 m
Topography           :           4       (Elevated; with barrier)
Barrier angle1       :   4.00 deg   Angle2 : 90.00 deg
Barrier height       :   6.00 m
Elevation            :   1.20 m
Barrier receiver distance : 41.70 / 41.70 m
Source elevation     :   98.00 m
Receiver elevation   :   97.75 m
Barrier elevation    :   98.00 m
Reference angle      :   0.00

```

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

```

-----
Angle1   Angle2           : -90.00 deg   70.00 deg
Wood depth           :           0       (No woods.)
No of house rows     :           0 / 0
Surface              :           1       (Absorptive ground surface)
Receiver source distance : 17.90 / 17.90 m
Receiver height      :   1.50 / 4.50 m
Topography           :           2       (Flat/gentle slope; with
barrier)
Barrier angle1       : -90.00 deg   Angle2 : 70.00 deg
Barrier height       :   2.50 m
Barrier receiver distance : 5.60 / 5.60 m
Source elevation     :   97.10 m
Receiver elevation   :   97.75 m
Barrier elevation    :   97.50 m
Reference angle      :   0.00

```



Result summary (day)

|             | ! source ! | Road  | ! Total   |
|-------------|------------|-------|-----------|
|             | ! height ! | Leq   | ! Leq     |
|             | ! (m) !    | (dBA) | ! (dBA)   |
| 1.TF Barr   | ! 1.50 !   | 52.97 | ! 52.97   |
| 2.TF House  | ! 1.50 !   | 48.20 | ! 48.20   |
| 3.Cope Barr | ! 1.50 !   | 55.12 | ! 55.12   |
| Total       |            |       | 57.70 dBA |

Result summary (night)

|             | ! source ! | Road  | ! Total   |
|-------------|------------|-------|-----------|
|             | ! height ! | Leq   | ! Leq     |
|             | ! (m) !    | (dBA) | ! (dBA)   |
| 1.TF Barr   | ! 1.50 !   | 47.30 | ! 47.30   |
| 2.TF House  | ! 1.50 !   | 43.05 | ! 43.05   |
| 3.Cope Barr | ! 1.50 !   | 55.42 | ! 55.42 * |
| Total       |            |       | 56.26 dBA |

\* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 57.70  
(NIGHT): 56.26

Filename: ola9.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod  
Medium truck volume : 966/84      veh/TimePeriod  
Heavy truck volume : 690/60      veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Open (day/night)

-----  
Angle1    Angle2 : -90.00 deg    12.00 deg  
Wood depth : 0                      (No woods.)  
No of house rows : 0 / 0  
Surface : 1                      (Absorptive ground surface)  
Receiver source distance : 118.60 / 118.60 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4                      (Elevated; with barrier)  
Barrier angle1 : -90.00 deg    Angle2 : 12.00 deg  
Barrier height : 2.50 m  
Elevation : 1.20 m  
Barrier receiver distance : 50.00 / 50.00 m  
Source elevation : 98.10 m  
Receiver elevation : 97.70 m  
Barrier elevation : 97.50 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod \*  
Medium truck volume : 966/84      veh/TimePeriod \*  
Heavy truck volume : 690/60      veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

```

-----
Angle1   Angle2           : 12.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 118.60 / 118.60 m
Receiver height       :      1.50 / 4.50 m
Topography           :      4           (Elevated; with barrier)
Barrier angle1        : 12.00 deg   Angle2 : 90.00 deg
Barrier height        :      6.00 m
Elevation             :      1.20 m
Barrier receiver distance : 94.40 / 94.40 m
Source elevation       :      98.10 m
Receiver elevation     :      97.70 m
Barrier elevation      :      98.00 m
Reference angle       :      0.00

```

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

```

-----
Angle1   Angle2           : -90.00 deg   -47.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 23.20 / 23.20 m
Receiver height       :      1.50 / 4.50 m
Topography           :      2           (Flat/gentle slope; with
barrier)
Barrier angle1        : -90.00 deg   Angle2 : -47.00 deg
Barrier height        :      2.50 m
Barrier receiver distance : 10.10 / 10.10 m
Source elevation       :      97.25 m
Receiver elevation     :      97.70 m
Barrier elevation      :      97.80 m
Reference angle       :      0.00

```

Road data, segment # 4: Cope Open (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 # 4: Cope Open (day/night)

```

-----
Angle1   Angle2           : -47.00 deg   54.00 deg
Wood depth           : 0             (No woods.)
No of house rows     : 0 / 0
Surface              : 1             (Absorptive ground surface)
Receiver source distance : 23.20 / 23.20 m
Receiver height       : 1.50 / 4.50 m
Topography           : 2             (Flat/gentle slope; with
barrier)
Barrier angle1       : -47.00 deg   Angle2 : 54.00 deg
Barrier height        : 2.50 m
Barrier receiver distance : 10.10 / 10.10 m
Source elevation      : 97.25 m
Receiver elevation     : 97.70 m
Barrier elevation      : 97.50 m
Reference angle       : 0.00

```

Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.TF Open      ! 1.50 ! 50.56 ! 50.56
2.TF House     ! 1.50 ! 45.55 ! 45.55
3.Cope House   ! 1.50 ! 47.10 ! 47.10
4.Cope Open    ! 1.50 ! 52.01 ! 52.01
-----+-----+-----+-----
Total                                     55.56 dBA

```

Result summary (night)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF Open    | ! | 1.50   | ! | 47.57 | ! | 47.57 *   |
| 2.TF House   | ! | 1.50   | ! | 39.85 | ! | 39.85     |
| 3.Cope House | ! | 1.50   | ! | 46.19 | ! | 46.19 *   |
| 4.Cope Open  | ! | 1.50   | ! | 52.33 | ! | 52.33 *   |
| Total        |   |        |   |       |   | 54.46 dBA |

\* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 55.56  
(NIGHT): 54.46

Filename: ola10.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Angle1    Angle2 : -90.00 deg    -70.00 deg  
Wood depth : 0      (No woods.)  
No of house rows : 0 / 0  
Surface : 1      (Absorptive ground surface)  
Receiver source distance : 22.10 / 22.10 m  
Receiver height : 1.50 / 4.50 m  
Topography : 2      (Flat/gentle slope; with  
barrier)  
Barrier angle1 : -90.00 deg    Angle2 : -70.00 deg  
Barrier height : 6.00 m  
Barrier receiver distance : 3.20 / 3.20 m  
Source elevation : 97.10 m  
Receiver elevation : 97.25 m  
Barrier elevation : 97.30 m  
Reference angle : 0.00

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

-----

|                           |        |               |                                   |
|---------------------------|--------|---------------|-----------------------------------|
| Angle1                    | Angle2 | : -70.00 deg  | 45.00 deg                         |
| Wood depth                | :      | 0             | (No woods.)                       |
| No of house rows          | :      | 0 / 0         |                                   |
| Surface                   | :      | 1             | (Absorptive ground surface)       |
| Receiver source distance  | :      | 22.10 / 22.10 | m                                 |
| Receiver height           | :      | 1.50 / 4.50   | m                                 |
| Topography                | :      | 2             | (Flat/gentle slope; with barrier) |
| Barrier angle1            | :      | -70.00 deg    | Angle2 : 45.00 deg                |
| Barrier height            | :      | 2.20          | m                                 |
| Barrier receiver distance | :      | 9.00 / 9.00   | m                                 |
| Source elevation          | :      | 97.10         | m                                 |
| Receiver elevation        | :      | 97.25         | m                                 |
| Barrier elevation         | :      | 97.25         | m                                 |
| Reference angle           | :      | 0.00          |                                   |

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

-----

|                          |        |               |                             |
|--------------------------|--------|---------------|-----------------------------|
| Angle1                   | Angle2 | : 45.00 deg   | 90.00 deg                   |
| Wood depth               | :      | 0             | (No woods.)                 |
| No of house rows         | :      | 0 / 0         |                             |
| Surface                  | :      | 1             | (Absorptive ground surface) |
| Receiver source distance | :      | 22.10 / 22.10 | m                           |

Receiver height : 1.50 / 4.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : 45.00 deg Angle2 : 90.00 deg  
 Barrier height : 6.00 m  
 Barrier receiver distance : 3.00 / 3.00 m  
 Source elevation : 97.10 m  
 Receiver elevation : 97.25 m  
 Barrier elevation : 97.35 m  
 Reference angle : 0.00

Result summary (day)

|              | ! source ! | Road  | ! Total   |
|--------------|------------|-------|-----------|
|              | ! height ! | Leq   | ! Leq     |
|              | ! (m) !    | (dBA) | ! (dBA)   |
| 1.Cope House | ! 1.50 !   | 39.02 | ! 39.02   |
| 2.Cope Open  | ! 1.50 !   | 53.78 | ! 53.78   |
| 3.Cope House | ! 1.50 !   | 40.91 | ! 40.91   |
| Total        |            |       | 54.13 dBA |

Result summary (night)

|              | ! source ! | Road  | ! Total   |
|--------------|------------|-------|-----------|
|              | ! height ! | Leq   | ! Leq     |
|              | ! (m) !    | (dBA) | ! (dBA)   |
| 1.Cope House | ! 1.50 !   | 36.14 | ! 36.14   |
| 2.Cope Open  | ! 1.50 !   | 53.05 | ! 53.05 * |
| 3.Cope House | ! 1.50 !   | 38.20 | ! 38.20   |
| Total        |            |       | 53.27 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 54.13  
 (NIGHT): 53.27

## **PART 2 (APPENDIX B)**

### Unattenuated Results

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

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Terry Fox (day/night)

-----  
Angle1 Angle2 : -90.00 deg -54.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 20.20 / 20.20 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -54.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 3.50 / 3.50 m  
Source elevation : 97.55 m  
Receiver elevation : 98.15 m  
Barrier elevation : 98.25 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: Terry Fox (day/night)

```

-----
Angle1   Angle2           : -54.00 deg   90.00 deg
Wood depth           :      0      (No woods.)
No of house rows     :      0 / 0
Surface              :      1      (Absorptive ground surface)
Receiver source distance : 20.20 / 20.20 m
Receiver height       :   1.50 / 4.50 m
Topography           :      3      (Elevated; no barrier)
Elevation            :   1.50 m
Reference angle       :   0.00

```

Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 47.91 ! 47.91
2.Terry Fox ! 1.50 ! 68.43 ! 68.43
-----+-----+-----+-----
Total                                     68.47 dBA

```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 44.93 ! 44.93
2.Terry Fox ! 1.50 ! 61.07 ! 61.07
-----+-----+-----+-----
Total                                     61.17 dBA

```

TOTAL Leq FROM ALL SOURCES (DAY): 68.47  
(NIGHT): 61.17

Filename: ola2unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF House (day/night)

-----  
Angle1 Angle2 : -90.00 deg -17.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 44.40 / 44.40 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -17.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 27.30 / 27.30 m  
Source elevation : 97.60 m  
Receiver elevation : 97.90 m  
Barrier elevation : 98.05 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF Barrier (day/night)



```

-----
Angle1   Angle2           : -17.00 deg   51.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 44.40 / 44.40 m
Receiver height       :      1.50 / 4.50 m
Topography           :      3           (Elevated; no barrier)
Elevation            :      1.50 m
Reference angle       :      0.00

```

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

```

-----
Car traffic volume   : 12144/1056 veh/TimePeriod *
Medium truck volume  :  966/84   veh/TimePeriod *
Heavy truck volume   :  690/60   veh/TimePeriod *
Posted speed limit   :    80 km/h
Road gradient        :      0 %
Road pavement        :      1 (Typical asphalt or concrete)

```

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

```

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

```

Data for Segment # 3: TF Open (day/night)

```

-----
Angle1   Angle2           : 51.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 44.40 / 44.40 m
Receiver height       :      1.50 / 4.50 m
Topography           :      3           (Elevated; no barrier)
Elevation            :      1.50 m
Reference angle       :      0.00

```

Result summary (day)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 48.54 | ! | 48.54     |
| 2.TF Barrier | ! | 1.50   | ! | 60.36 | ! | 60.36     |
| 3.TF Open    | ! | 1.50   | ! | 55.03 | ! | 55.03     |
| Total        |   |        |   |       |   | 61.69 dBA |

Result summary (night)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 43.36 | ! | 43.36     |
| 2.TF Barrier | ! | 1.50   | ! | 53.23 | ! | 53.23     |
| 3.TF Open    | ! | 1.50   | ! | 48.27 | ! | 48.27     |
| Total        |   |        |   |       |   | 54.76 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 61.69  
(NIGHT): 54.76

Filename: ola3unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod  
Medium truck volume :    966/84        veh/TimePeriod  
Heavy truck volume :    690/60        veh/TimePeriod  
Posted speed limit :     80 km/h  
Road gradient :        0 %  
Road pavement :        1 (Typical asphalt or concrete)

Data for Segment # 1: TF House (day/night)

-----  
Angle1    Angle2                      : -90.00 deg    -15.00 deg  
Wood depth :            0            (No woods.)  
No of house rows :        0 / 0  
Surface :            1            (Absorptive ground surface)  
Receiver source distance :    55.50 / 55.50    m  
Receiver height :        1.50 / 4.50    m  
Topography :            4            (Elevated; with barrier)  
Barrier angle1 :    -90.00 deg    Angle2 : -15.00 deg  
Barrier height :        6.00 m  
Elevation :            1.50 m  
Barrier receiver distance :    38.10 / 38.10    m  
Source elevation :        97.65 m  
Receiver elevation :        97.75 m  
Barrier elevation :        98.05 m  
Reference angle :        0.00

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod    \*  
Medium truck volume :    966/84        veh/TimePeriod    \*  
Heavy truck volume :    690/60        veh/TimePeriod    \*  
Posted speed limit :     80 km/h  
Road gradient :        0 %  
Road pavement :        1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF Barrier (day/night)

```

-----
Angle1   Angle2           : -15.00 deg   23.00 deg
Wood depth           :           0       (No woods.)
No of house rows     :           0 / 0
Surface              :           1       (Absorptive ground surface)
Receiver source distance : 55.50 / 55.50 m
Receiver height       :    1.50 / 4.50 m
Topography           :           3       (Elevated; no barrier)
Elevation            :    1.50 m
Reference angle       :    0.00

```

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

```

-----
Car traffic volume   : 12144/1056 veh/TimePeriod *
Medium truck volume  :  966/84   veh/TimePeriod *
Heavy truck volume   :  690/60   veh/TimePeriod *
Posted speed limit   :    80 km/h
Road gradient        :    0 %
Road pavement        :    1 (Typical asphalt or concrete)

```

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

```

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

```

Data for Segment # 3: TF Open (day/night)

```

-----
Angle1   Angle2           : 23.00 deg   90.00 deg
Wood depth           :           0       (No woods.)
No of house rows     :           0 / 0
Surface              :           1       (Absorptive ground surface)
Receiver source distance : 55.50 / 55.50 m
Receiver height       :    1.50 / 4.50 m
Topography           :           3       (Elevated; no barrier)
Elevation            :    1.50 m
Reference angle       :    0.00

```

Result summary (day)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 47.75 | ! | 47.75     |
| 2.TF Barrier | ! | 1.50   | ! | 56.50 | ! | 56.50     |
| 3.TF Open    | ! | 1.50   | ! | 57.08 | ! | 57.08     |
| Total        |   |        |   |       |   | 60.07 dBA |

Result summary (night)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 42.27 | ! | 42.27     |
| 2.TF Barrier | ! | 1.50   | ! | 49.42 | ! | 49.42     |
| 3.TF Open    | ! | 1.50   | ! | 50.23 | ! | 50.23     |
| Total        |   |        |   |       |   | 53.22 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 60.07  
(NIGHT): 53.22

Filename: ola4unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod  
Medium truck volume : 966/84      veh/TimePeriod  
Heavy truck volume : 690/60      veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF House (day/night)

-----  
Angle1    Angle2 : -90.00 deg    -12.00 deg  
Wood depth : 0                      (No woods.)  
No of house rows : 0 / 0  
Surface : 1                      (Absorptive ground surface)  
Receiver source distance : 110.90 / 110.90 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4                      (Elevated; with barrier)  
Barrier angle1 : -90.00 deg    Angle2 : -12.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 94.80 / 94.80 m  
Source elevation : 97.65 m  
Receiver elevation : 98.05 m  
Barrier elevation : 98.05 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod \*  
Medium truck volume : 966/84      veh/TimePeriod \*  
Heavy truck volume : 690/60      veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF Barrier (day/night)

-----

Angle1 Angle2 : -12.00 deg -2.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 110.90 / 110.90 m  
 Receiver height : 1.50 / 4.50 m  
 Topography : 3 (Elevated; no barrier)  
 Elevation : 1.50 m  
 Reference angle : 0.00

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

-----  
 Car traffic volume : 12144/1056 veh/TimePeriod \*  
 Medium truck volume : 966/84 veh/TimePeriod \*  
 Heavy truck volume : 690/60 veh/TimePeriod \*  
 Posted speed limit : 80 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 3: TF Open (day/night)

-----  
 Angle1 Angle2 : -2.00 deg 90.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 110.90 / 110.90 m  
 Receiver height : 1.50 / 4.50 m  
 Topography : 3 (Elevated; no barrier)  
 Elevation : 1.50 m  
 Reference angle : 0.00



Result summary (day)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 44.57 | ! | 44.57     |
| 2.TF Barrier | ! | 1.50   | ! | 45.88 | ! | 45.88     |
| 3.TF Open    | ! | 1.50   | ! | 54.19 | ! | 54.19     |
| Total        |   |        |   |       |   | 55.18 dBA |

Result summary (night)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House   | ! | 1.50   | ! | 38.60 | ! | 38.60     |
| 2.TF Barrier | ! | 1.50   | ! | 39.07 | ! | 39.07     |
| 3.TF Open    | ! | 1.50   | ! | 47.53 | ! | 47.53     |
| Total        |   |        |   |       |   | 48.57 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 55.18  
(NIGHT): 48.57

Filename: ola5unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Open (day/night)

-----  
Angle1 Angle2 : -90.00 deg 59.00 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 / 4.50 m  
Topography : 3 (Elevated; no barrier)  
Elevation : 1.50 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

-----  
Angle1 Angle2 : 59.00 deg 90.00 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 / 4.50 m  
 Topography : 4 (Elevated; with barrier)  
 Barrier angle1 : 59.00 deg Angle2 : 90.00 deg  
 Barrier height : 6.00 m  
 Elevation : 1.50 m  
 Barrier receiver distance : 4.40 / 4.40 m  
 Source elevation : 97.30 m  
 Receiver elevation : 98.15 m  
 Barrier elevation : 98.25 m  
 Reference angle : 0.00

Result summary (day)

|            | ! source<br>! height<br>! (m) | ! Road<br>! Leq<br>! (dBA) | ! Total<br>! Leq<br>! (dBA) |
|------------|-------------------------------|----------------------------|-----------------------------|
| 1.TF Open  | ! 1.50                        | ! 67.56                    | ! 67.56                     |
| 2.TF House | ! 1.50                        | ! 47.18                    | ! 47.18                     |
| Total      |                               |                            | 67.60 dBA                   |

Result summary (night)

|            | ! source<br>! height<br>! (m) | ! Road<br>! Leq<br>! (dBA) | ! Total<br>! Leq<br>! (dBA) |
|------------|-------------------------------|----------------------------|-----------------------------|
| 1.TF Open  | ! 1.50                        | ! 60.26                    | ! 60.26                     |
| 2.TF House | ! 1.50                        | ! 44.13                    | ! 44.13                     |
| Total      |                               |                            | 60.36 dBA                   |

TOTAL Leq FROM ALL SOURCES (DAY): 67.60  
 (NIGHT): 60.36

Filename: ola6unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF House (day/night)

-----  
Angle1 Angle2 : -90.00 deg -39.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 69.80 / 69.80 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -39.00 deg  
Barrier height : 6.00 m  
Elevation : 1.20 m  
Barrier receiver distance : 44.70 / 44.70 m  
Source elevation : 97.70 m  
Receiver elevation : 97.80 m  
Barrier elevation : 98.00 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF Open (day/night)

```

-----
Angle1   Angle2           : -39.00 deg   -17.00 deg
Wood depth           :           0       (No woods.)
No of house rows     :           0 / 0
Surface              :           1       (Absorptive ground surface)
Receiver source distance : 69.80 / 69.80 m
Receiver height       : 1.50 / 4.50 m
Topography           :           3       (Elevated; no barrier)
Elevation            : 1.20 m
Reference angle       : 0.00

```

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

```

-----
Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)

```

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

```

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

```

Data for Segment # 3: TF House (day/night)

```

-----
Angle1   Angle2           : -17.00 deg   90.00 deg
Wood depth           :           0       (No woods.)
No of house rows     :           0 / 0
Surface              :           1       (Absorptive ground surface)
Receiver source distance : 69.80 / 69.80 m
Receiver height       : 1.50 / 4.50 m
Topography           :           4       (Elevated; with barrier)
Barrier angle1       : -17.00 deg   Angle2 : 90.00 deg
Barrier height        : 6.00 m
Elevation            : 1.20 m
Barrier receiver distance : 9.00 / 9.00 m
Source elevation       : 97.70 m
Receiver elevation     : 97.80 m
Barrier elevation      : 98.00 m
Reference angle       : 0.00

```

Road data, segment # 4: Cope Open (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 # 4: Cope Open (day/night)

```
-----
Angle1 Angle2      : -90.00 deg 35.00 deg
Wood depth          : 0 (No woods.)
No of house rows    : 1 / 1
House density       : 95 %
Surface            : 1 (Absorptive ground surface)
Receiver source distance : 75.00 / 75.00 m
Receiver height     : 1.50 / 4.50 m
Topography         : 1 (Flat/gentle slope; no barrier)
Reference angle     : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.TF House ! 1.50 ! 46.43 ! 46.43
2.TF Open ! 1.50 ! 52.16 ! 52.16
3.TF House ! 1.50 ! 46.21 ! 46.21
4.Cope Open ! 1.50 ! 42.30 ! 42.30
-----+-----+-----+-----
Total 54.27 dBA
```

Result summary (night)

|             | ! | source | ! | Road  | ! | Total     |
|-------------|---|--------|---|-------|---|-----------|
|             | ! | height | ! | Leq   | ! | Leq       |
|             | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House  | ! | 1.50   | ! | 41.21 | ! | 41.21     |
| 2.TF Open   | ! | 1.50   | ! | 45.21 | ! | 45.21     |
| 3.TF House  | ! | 1.50   | ! | 44.35 | ! | 44.35     |
| 4.Cope Open | ! | 1.50   | ! | 35.45 | ! | 35.45     |
| Total       |   |        |   |       |   | 48.87 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 54.27  
(NIGHT): 48.87



Filename: ola7unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Barr (day/night)

-----  
Angle1 Angle2 : -90.00 deg 45.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 27.10 / 27.10 m  
Receiver height : 1.50 / 4.50 m  
Topography : 3 (Elevated; no barrier)  
Elevation : 1.20 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

-----  
Angle1 Angle2 : 45.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 27.10 / 27.10 m

Receiver height : 1.50 / 4.50 m  
 Topography : 4 (Elevated; with barrier)  
 Barrier angle1 : 45.00 deg Angle2 : 90.00 deg  
 Barrier height : 6.00 m  
 Elevation : 1.20 m  
 Barrier receiver distance : 3.00 / 3.00 m  
 Source elevation : 98.00 m  
 Receiver elevation : 97.90 m  
 Barrier elevation : 98.00 m  
 Reference angle : 0.00

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

-----  
 Angle1 Angle2 : -90.00 deg 30.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 18.40 / 18.40 m  
 Receiver height : 1.50 / 4.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

Result summary (day)

-----  

|             | ! source ! | Road !  | Total     |
|-------------|------------|---------|-----------|
|             | ! height ! | Leq !   | Leq       |
|             | ! (m) !    | (dBA) ! | (dBA)     |
| 1.TF Barr   | ! 1.50 !   | 66.07 ! | 66.07     |
| 2.TF House  | ! 1.50 !   | 46.92 ! | 46.92     |
| 3.Cope Barr | ! 1.50 !   | 61.43 ! | 61.43     |
| Total       |            |         | 67.39 dBA |

 -----

Result summary (night)

|             | ! source ! | Road  | ! Total   |
|-------------|------------|-------|-----------|
|             | ! height ! | Leq   | ! Leq     |
|             | ! (m) !    | (dBA) | ! (dBA)   |
| 1.TF Barr   | ! 1.50 !   | 58.82 | ! 58.82   |
| 2.TF House  | ! 1.50 !   | 44.50 | ! 44.50   |
| 3.Cope Barr | ! 1.50 !   | 54.03 | ! 54.03   |
| Total       |            |       | 60.18 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 67.39  
(NIGHT): 60.18

Filename: ola8unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Barr (day/night)

-----  
Angle1 Angle2 : -90.00 deg 4.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 66.00 / 66.00 m  
Receiver height : 1.50 / 4.50 m  
Topography : 3 (Elevated; no barrier)  
Elevation : 1.20 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

-----  
Angle1 Angle2 : 4.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 66.00 / 66.00 m

Receiver height : 1.50 / 4.50 m  
 Topography : 4 (Elevated; with barrier)  
 Barrier angle1 : 4.00 deg Angle2 : 90.00 deg  
 Barrier height : 6.00 m  
 Elevation : 1.20 m  
 Barrier receiver distance : 41.70 / 41.70 m  
 Source elevation : 98.00 m  
 Receiver elevation : 97.75 m  
 Barrier elevation : 98.00 m  
 Reference angle : 0.00

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

-----  
 Angle1 Angle2 : -90.00 deg 70.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 17.90 / 17.90 m  
 Receiver height : 1.50 / 4.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

Result summary (day)

-----  

|             | ! source ! | Road !  | Total     |
|-------------|------------|---------|-----------|
|             | ! height ! | Leq !   | Leq       |
|             | ! (m) !    | (dBA) ! | (dBA)     |
| 1.TF Barr   | ! 1.50 !   | 57.89 ! | 57.89     |
| 2.TF House  | ! 1.50 !   | 48.20 ! | 48.20     |
| 3.Cope Barr | ! 1.50 !   | 62.81 ! | 62.81     |
| Total       |            |         | 64.13 dBA |

 -----

Result summary (night)

|             | ! | source | ! | Road  | ! | Total     |
|-------------|---|--------|---|-------|---|-----------|
|             | ! | height | ! | Leq   | ! | Leq       |
|             | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF Barr   | ! | 1.50   | ! | 51.02 | ! | 51.02     |
| 2.TF House  | ! | 1.50   | ! | 43.05 | ! | 43.05     |
| 3.Cope Barr | ! | 1.50   | ! | 55.42 | ! | 55.42     |
| Total       |   |        |   |       |   | 56.95 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 64.13  
(NIGHT): 56.95

Filename: ola9unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Open (day/night)

-----  
Angle1 Angle2 : -90.00 deg 12.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 118.60 / 118.60 m  
Receiver height : 1.50 / 4.50 m  
Topography : 3 (Elevated; no barrier)  
Elevation : 1.20 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

-----  
Angle1 Angle2 : 12.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)



Receiver source distance : 118.60 / 118.60 m  
 Receiver height : 1.50 / 4.50 m  
 Topography : 4 (Elevated; with barrier)  
 Barrier angle1 : 12.00 deg Angle2 : 90.00 deg  
 Barrier height : 6.00 m  
 Elevation : 1.20 m  
 Barrier receiver distance : 94.40 / 94.40 m  
 Source elevation : 98.10 m  
 Receiver elevation : 97.70 m  
 Barrier elevation : 98.00 m  
 Reference angle : 0.00

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

-----  
 Angle1 Angle2 : -90.00 deg -47.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 23.20 / 23.20 m  
 Receiver height : 1.50 / 4.50 m  
 Topography : 2 (Flat/gentle slope; with barrier)  
 Barrier angle1 : -90.00 deg Angle2 : -47.00 deg  
 Barrier height : 6.00 m  
 Barrier receiver distance : 3.00 / 3.00 m  
 Source elevation : 97.25 m  
 Receiver elevation : 97.70 m  
 Barrier elevation : 97.80 m  
 Reference angle : 0.00

Road data, segment # 4: Cope Open (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 # 4: Cope Open (day/night)

```

-----
Angle1  Angle2      : -47.00 deg  54.00 deg
Wood depth          : 0          (No woods.)
No of house rows    : 0 / 0
Surface             : 1          (Absorptive ground surface)
Receiver source distance : 23.20 / 23.20 m
Receiver height     : 1.50 / 4.50 m
Topography          : 1          (Flat/gentle slope; no barrier)
Reference angle     : 0.00

```

Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.TF Open      ! 1.50 ! 54.23 ! 54.23
2.TF House     ! 1.50 ! 45.55 ! 45.55
3.Cope House   ! 1.50 ! 40.48 ! 40.48
4.Cope Open    ! 1.50 ! 59.70 ! 59.70
-----+-----+-----+-----
Total                                     60.95 dBA

```

Result summary (night)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF Open    | ! | 1.50   | ! | 47.57 | ! | 47.57     |
| 2.TF House   | ! | 1.50   | ! | 39.85 | ! | 39.85     |
| 3.Cope House | ! | 1.50   | ! | 37.80 | ! | 37.80     |
| 4.Cope Open  | ! | 1.50   | ! | 52.33 | ! | 52.33     |
|              |   | Total  |   |       |   | 53.87 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 60.95  
(NIGHT): 53.87

Filename: ola10una.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Angle1    Angle2 : -90.00 deg    -70.00 deg  
Wood depth : 0      (No woods.)  
No of house rows : 0 / 0  
Surface : 1      (Absorptive ground surface)  
Receiver source distance : 22.10 / 22.10 m  
Receiver height : 1.50 / 4.50 m  
Topography : 2      (Flat/gentle slope; with  
barrier)  
Barrier angle1 : -90.00 deg    Angle2 : -70.00 deg  
Barrier height : 6.00 m  
Barrier receiver distance : 3.20 / 3.20 m  
Source elevation : 97.10 m  
Receiver elevation : 97.25 m  
Barrier elevation : 97.30 m  
Reference angle : 0.00

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

-----

|                          |        |               |                                 |
|--------------------------|--------|---------------|---------------------------------|
| Angle1                   | Angle2 | : -70.00 deg  | 45.00 deg                       |
| Wood depth               | :      | 0             | (No woods.)                     |
| No of house rows         | :      | 0 / 0         |                                 |
| Surface                  | :      | 1             | (Absorptive ground surface)     |
| Receiver source distance | :      | 22.10 / 22.10 | m                               |
| Receiver height          | :      | 1.50 / 4.50   | m                               |
| Topography               | :      | 1             | (Flat/gentle slope; no barrier) |
| Reference angle          | :      | 0.00          |                                 |

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

-----

|                           |        |               |                                   |
|---------------------------|--------|---------------|-----------------------------------|
| Angle1                    | Angle2 | : 45.00 deg   | 90.00 deg                         |
| Wood depth                | :      | 0             | (No woods.)                       |
| No of house rows          | :      | 0 / 0         |                                   |
| Surface                   | :      | 1             | (Absorptive ground surface)       |
| Receiver source distance  | :      | 22.10 / 22.10 | m                                 |
| Receiver height           | :      | 1.50 / 4.50   | m                                 |
| Topography                | :      | 2             | (Flat/gentle slope; with barrier) |
| Barrier angle1            | :      | 45.00 deg     | Angle2 : 90.00 deg                |
| Barrier height            | :      | 6.00 m        |                                   |
| Barrier receiver distance | :      | 3.00 / 3.00   | m                                 |
| Source elevation          | :      | 97.10 m       |                                   |

Receiver elevation : 97.25 m  
 Barrier elevation : 97.35 m  
 Reference angle : 0.00

Result summary (day)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.Cope House | ! | 1.50   | ! | 39.02 | ! | 39.02     |
| 2.Cope Open  | ! | 1.50   | ! | 60.42 | ! | 60.42     |
| 3.Cope House | ! | 1.50   | ! | 40.91 | ! | 40.91     |
| Total        |   |        |   |       |   | 60.50 dBA |

Result summary (night)

|              | ! | source | ! | Road  | ! | Total     |
|--------------|---|--------|---|-------|---|-----------|
|              | ! | height | ! | Leq   | ! | Leq       |
|              | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.Cope House | ! | 1.50   | ! | 36.14 | ! | 36.14     |
| 2.Cope Open  | ! | 1.50   | ! | 53.05 | ! | 53.05     |
| 3.Cope House | ! | 1.50   | ! | 38.20 | ! | 38.20     |
| Total        |   |        |   |       |   | 53.27 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 60.50  
 (NIGHT): 53.27

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

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

-----  
 Car traffic volume : 12144/1056 veh/TimePeriod  
 Medium truck volume : 966/84 veh/TimePeriod  
 Heavy truck volume : 690/60 veh/TimePeriod  
 Posted speed limit : 80 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Terry Fox (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 : 16.30 / 16.30 m  
 Receiver height : 4.50 / 4.50 m  
 Topography : 3 (Elevated; no barrier)  
 Elevation : 1.50 m  
 Reference angle : 0.00

Result summary (day)

-----  

|             |   |        |   |       |   |           |
|-------------|---|--------|---|-------|---|-----------|
|             | ! | source | ! | Road  | ! | Total     |
|             | ! | height | ! | Leq   | ! | Leq       |
|             | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| -----       | + | -----  | + | ----- | + | -----     |
| 1.Terry Fox | ! | 1.50   | ! | 70.71 | ! | 70.71     |
| -----       | + | -----  | + | ----- | + | -----     |
|             |   | Total  |   |       |   | 70.71 dBA |

Result summary (night)

-----  

|             |   |        |   |       |   |           |
|-------------|---|--------|---|-------|---|-----------|
|             | ! | source | ! | Road  | ! | Total     |
|             | ! | height | ! | Leq   | ! | Leq       |
|             | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| -----       | + | -----  | + | ----- | + | -----     |
| 1.Terry Fox | ! | 1.50   | ! | 63.12 | ! | 63.12     |
| -----       | + | -----  | + | ----- | + | -----     |
|             |   | Total  |   |       |   | 63.12 dBA |



TOTAL Leq FROM ALL SOURCES (DAY): 70.71  
(NIGHT): 63.12

Filename: pow2unat.te Time Period: Day/Night 16/8 hours  
 Description:

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

```
-----
Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: Terry Fox (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 : 40.75 / 40.75 m
Receiver height : 4.50 / 4.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 1.00 m
Reference angle : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 64.55 ! 64.55
-----+-----+-----+-----
Total 64.55 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 56.96 ! 56.96
-----+-----+-----+-----
Total 56.96 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 64.55  
(NIGHT): 56.96

Filename: pow3unat.te Time Period: Day/Night 16/8 hours  
 Description:

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

```
-----
Car traffic volume : 12144/1056 veh/TimePeriod
Medium truck volume : 966/84 veh/TimePeriod
Heavy truck volume : 690/60 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: Terry Fox (day/night)

```
-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 95 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 70.90 / 70.90 m
Receiver height : 4.50 / 4.50 m
Topography : 3 (Elevated; no barrier)
Elevation : 1.00 m
Reference angle : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 51.59 ! 51.59
-----+-----+-----+-----
Total 51.59 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 44.00 ! 44.00
-----+-----+-----+-----
Total 44.00 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 51.59  
(NIGHT): 44.00

Filename: pow4unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF House (day/night)

-----  
Angle1    Angle2                      : -90.00 deg    -6.00 deg  
Wood depth                            : 0              (No woods.)  
No of house rows                      : 0 / 0  
Surface                                : 1              (Absorptive ground surface)  
Receiver source distance : 88.80 / 88.80 m  
Receiver height                        : 4.50 / 4.50 m  
Topography                             : 4              (Elevated; with barrier)  
Barrier angle1                        : -90.00 deg    Angle2 : -6.00 deg  
Barrier height                         : 6.00 m  
Elevation                               : 1.50 m  
Barrier receiver distance : 70.70 / 70.70 m  
Source elevation                        : 97.20 m  
Receiver elevation                      : 98.00 m  
Barrier elevation                       : 98.05 m  
Reference angle                        : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF Open (day/night)

```

-----
Angle1   Angle2           :  -6.00 deg   20.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance :  88.80 / 88.80 m
Receiver height       :    4.50 / 4.50 m
Topography            :      3           (Elevated; no barrier)
Elevation             :    1.50 m
Reference angle       :    0.00
  
```

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

```

-----
Car traffic volume   : 12144/1056 veh/TimePeriod *
Medium truck volume  :  966/84   veh/TimePeriod *
Heavy truck volume   :  690/60   veh/TimePeriod *
Posted speed limit   :    80 km/h
Road gradient         :      0 %
Road pavement        :      1 (Typical asphalt or concrete)
  
```

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

```

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

Data for Segment # 3: TF House (day/night)

```

-----
Angle1   Angle2           :  20.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance :  88.80 / 88.80 m
Receiver height       :    4.50 / 4.50 m
Topography            :      4           (Elevated; with barrier)
Barrier angle1        :  20.00 deg   Angle2 : 90.00 deg
Barrier height         :    6.00 m
Elevation              :    1.50 m
Barrier receiver distance :  65.20 / 65.20 m
Source elevation       :    97.20 m
Receiver elevation     :    98.00 m
Barrier elevation      :    98.05 m
Reference angle        :    0.00
  
```

Result summary (day)

|            | ! | source | ! | Road  | ! | Total     |
|------------|---|--------|---|-------|---|-----------|
|            | ! | height | ! | Leq   | ! | Leq       |
|            | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House | ! | 1.50   | ! | 47.40 | ! | 47.40     |
| 2.TF Open  | ! | 1.50   | ! | 52.27 | ! | 52.27     |
| 3.TF House | ! | 1.50   | ! | 47.82 | ! | 47.82     |
| Total      |   |        |   |       |   | 54.54 dBA |

Result summary (night)

|            | ! | source | ! | Road  | ! | Total     |
|------------|---|--------|---|-------|---|-----------|
|            | ! | height | ! | Leq   | ! | Leq       |
|            | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House | ! | 1.50   | ! | 39.81 | ! | 39.81     |
| 2.TF Open  | ! | 1.50   | ! | 44.67 | ! | 44.67     |
| 3.TF House | ! | 1.50   | ! | 40.22 | ! | 40.22     |
| Total      |   |        |   |       |   | 46.94 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 54.54  
(NIGHT): 46.94



STAMSON 5.0                      SUMMARY REPORT                      Date: 25-05-2018 14:40:03  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: pow5unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod  
Medium truck volume :    966/84        veh/TimePeriod  
Heavy truck volume :    690/60        veh/TimePeriod  
Posted speed limit :     80 km/h  
Road gradient :        0 %  
Road pavement :        1 (Typical asphalt or concrete)

Data for Segment # 1: TF House (day/night)

-----  
Angle1    Angle2                      : -90.00 deg    -58.00 deg  
Wood depth                            :        0        (No woods.)  
No of house rows                      :        0 / 0  
Surface                                :        1        (Absorptive ground surface)  
Receiver source distance :    43.00 / 43.00    m  
Receiver height                        :    4.50 / 4.50    m  
Topography                            :        4        (Elevated; with barrier)  
Barrier angle1                        : -90.00 deg    Angle2 : -58.00 deg  
Barrier height                         :    6.00 m  
Elevation                              :    1.20 m  
Barrier receiver distance :    15.80 / 15.80    m  
Source elevation                       :    97.70 m  
Receiver elevation                     :    98.00 m  
Barrier elevation                      :    98.00 m  
Reference angle                        :    0.00

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod    \*  
Medium truck volume :    966/84        veh/TimePeriod    \*  
Heavy truck volume :    690/60        veh/TimePeriod    \*  
Posted speed limit :     80 km/h  
Road gradient :        0 %  
Road pavement :        1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF Open (day/night)

```
-----
Angle1   Angle2           : -58.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 43.00 / 43.00 m
Receiver height       :  4.50 / 4.50 m
Topography            :      3           (Elevated; no barrier)
Elevation             :  1.20 m
Reference angle       :  0.00
```

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

```
-----
Angle1   Angle2           : -90.00 deg   19.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      1 / 1
House density        :    95 %
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 43.00 / 43.00 m
Receiver height       :  4.50 / 4.50 m
Topography            :      1           (Flat/gentle slope; no barrier)
Reference angle       :  0.00
```

Result summary (day)

|             | ! | source | ! | Road  | ! | Total     |
|-------------|---|--------|---|-------|---|-----------|
|             | ! | height | ! | Leq   | ! | Leq       |
|             | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House  | ! | 1.50   | ! | 50.26 | ! | 50.26     |
| 2.TF Open   | ! | 1.50   | ! | 63.72 | ! | 63.72     |
| 3.Cope Open | ! | 1.50   | ! | 45.54 | ! | 45.54     |
| Total       |   |        |   |       |   | 63.97 dBA |

Result summary (night)

|             | ! | source | ! | Road  | ! | Total     |
|-------------|---|--------|---|-------|---|-----------|
|             | ! | height | ! | Leq   | ! | Leq       |
|             | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF House  | ! | 1.50   | ! | 42.66 | ! | 42.66     |
| 2.TF Open   | ! | 1.50   | ! | 56.12 | ! | 56.12     |
| 3.Cope Open | ! | 1.50   | ! | 37.94 | ! | 37.94     |
| Total       |   |        |   |       |   | 56.37 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 63.97  
(NIGHT): 56.37

Filename: pow6unat.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056    veh/TimePeriod  
Medium truck volume : 966/84    veh/TimePeriod  
Heavy truck volume : 690/60    veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Open (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 : 25.30 / 25.30 m  
Receiver height : 4.50 / 4.50 m  
Topography : 3    (Elevated; no barrier)  
Elevation : 1.20 m  
Reference angle : 0.00

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

-----  
Angle1    Angle2 : -90.00 deg    21.00 deg  
Wood depth : 0    (No woods.)  
No of house rows : 0 / 0  
Surface : 1    (Absorptive ground surface)  
Receiver source distance : 22.40 / 22.40 m

Receiver height : 4.50 / 4.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

Result summary (day)

|             | ! source ! | Road  | ! Total   |
|-------------|------------|-------|-----------|
|             | ! height ! | Leq   | ! Leq     |
|             | ! (m) !    | (dBA) | ! (dBA)   |
| 1.TF Open   | ! 1.50 !   | 67.77 | ! 67.77   |
| 2.Cope Open | ! 1.50 !   | 59.88 | ! 59.88   |
| Total       |            |       | 68.42 dBA |

Result summary (night)

|             | ! source ! | Road  | ! Total   |
|-------------|------------|-------|-----------|
|             | ! height ! | Leq   | ! Leq     |
|             | ! (m) !    | (dBA) | ! (dBA)   |
| 1.TF Open   | ! 1.50 !   | 60.17 | ! 60.17   |
| 2.Cope Open | ! 1.50 !   | 52.29 | ! 52.29   |
| Total       |            |       | 60.83 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 68.42  
 (NIGHT): 60.83

Filename: pow7unat.te                      Time Period: Day/Night 16/8 hours  
 Description:

Road data, segment # 1: Cope (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 # 1: Cope (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 : 19.10 / 19.10 m
Receiver height     : 4.50 / 4.50 m
Topography          : 1          (Flat/gentle slope; no barrier)
Reference angle     : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Cope   ! 1.50 ! 62.80 ! 62.80
-----+-----+-----+-----
Total                                         62.80 dBA
```

Result summary (night)

|        | ! source ! | Road  | ! Total   |
|--------|------------|-------|-----------|
|        | ! height ! | Leq   | ! Leq     |
|        | ! (m) !    | (dBA) | ! (dBA)   |
| 1.Cope | ! 1.50 !   | 55.21 | ! 55.21   |
| Total  |            |       | 55.21 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 62.80  
(NIGHT): 55.21

## **PART 3 (APPENDIX B)**

Barrier Height / Sound Level Comparison Files



Filename: ola130.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Terry Fox (day/night)

-----  
Angle1 Angle2 : -90.00 deg -54.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 20.20 / 20.20 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -54.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 3.50 / 3.50 m  
Source elevation : 97.55 m  
Receiver elevation : 98.15 m  
Barrier elevation : 98.25 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: Terry Fox (day/night)

```

-----
Angle1   Angle2       : -54.00 deg   90.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      0 / 0
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 20.20 / 20.20 m
Receiver height  :    1.50 / 4.50 m
Topography      :      4      (Elevated; with barrier)
Barrier angle1   : -54.00 deg   Angle2 : 90.00 deg
Barrier height   :    3.00 m
Elevation        :    1.50 m
Barrier receiver distance : 5.00 / 5.00 m
Source elevation :   97.55 m
Receiver elevation :   98.15 m
Barrier elevation :   98.20 m
Reference angle  :    0.00

```

#### Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox !    1.50 !  47.91 !  47.91
2.Terry Fox !    1.50 !  57.64 !  57.64
-----+-----+-----+-----
Total                                     58.08 dBA

```

#### Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox !    1.50 !  44.93 !  44.93
2.Terry Fox !    1.50 !  61.07 !  61.07 *
-----+-----+-----+-----
Total                                     61.17 dBA

```

\* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 58.08  
(NIGHT): 61.17

Filename: ola135.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Terry Fox (day/night)

-----  
Angle1 Angle2 : -90.00 deg -54.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 20.20 / 20.20 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -54.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 3.50 / 3.50 m  
Source elevation : 97.55 m  
Receiver elevation : 98.15 m  
Barrier elevation : 98.25 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: Terry Fox (day/night)

```

-----
Angle1   Angle2           : -54.00 deg   90.00 deg
Wood depth           :      0      (No woods.)
No of house rows     :      0 / 0
Surface              :      1      (Absorptive ground surface)
Receiver source distance : 20.20 / 20.20 m
Receiver height       :   1.50 / 4.50 m
Topography           :      4      (Elevated; with barrier)
Barrier angle1        : -54.00 deg   Angle2 : 90.00 deg
Barrier height        :   3.50 m
Elevation             :   1.50 m
Barrier receiver distance : 5.00 / 5.00 m
Source elevation      :  97.55 m
Receiver elevation     :  98.15 m
Barrier elevation      :  98.20 m
Reference angle       :   0.00

```

Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 47.91 ! 47.91
2.Terry Fox ! 1.50 ! 56.08 ! 56.08
-----+-----+-----+-----
Total                                     56.70 dBA

```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 44.93 ! 44.93
2.Terry Fox ! 1.50 ! 61.07 ! 61.07 *
-----+-----+-----+-----
Total                                     61.17 dBA

```

\* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 56.70  
(NIGHT): 61.17

Filename: ola140.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Terry Fox (day/night)

-----  
Angle1 Angle2 : -90.00 deg -54.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 20.20 / 20.20 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -54.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 3.50 / 3.50 m  
Source elevation : 97.55 m  
Receiver elevation : 98.15 m  
Barrier elevation : 98.25 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: Terry Fox (day/night)

```

-----
Angle1   Angle2           : -54.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 20.20 / 20.20 m
Receiver height       :    1.50 / 4.50 m
Topography           :      4           (Elevated; with barrier)
Barrier angle1        : -54.00 deg   Angle2 : 90.00 deg
Barrier height        :    4.00 m
Elevation             :    1.50 m
Barrier receiver distance : 5.00 / 5.00 m
Source elevation       :   97.55 m
Receiver elevation     :   98.15 m
Barrier elevation      :   98.20 m
Reference angle       :    0.00

```

Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 47.91 ! 47.91
2.Terry Fox ! 1.50 ! 54.80 ! 54.80
-----+-----+-----+-----
Total                                     55.61 dBA

```

Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 44.93 ! 44.93
2.Terry Fox ! 1.50 ! 55.87 ! 55.87
-----+-----+-----+-----
Total                                     56.21 dBA

```

TOTAL Leq FROM ALL SOURCES (DAY): 55.61  
(NIGHT): 56.21

Filename: ola145.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Terry Fox (day/night)

-----  
Angle1 Angle2 : -90.00 deg -54.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 20.20 / 20.20 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : -54.00 deg  
Barrier height : 6.00 m  
Elevation : 1.50 m  
Barrier receiver distance : 3.50 / 3.50 m  
Source elevation : 97.55 m  
Receiver elevation : 98.15 m  
Barrier elevation : 98.25 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: Terry Fox (day/night)

```

-----
Angle1   Angle2           : -54.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 20.20 / 20.20 m
Receiver height       :    1.50 / 4.50 m
Topography           :      4           (Elevated; with barrier)
Barrier angle1        : -54.00 deg   Angle2 : 90.00 deg
Barrier height        :    4.50 m
Elevation            :    1.50 m
Barrier receiver distance : 5.00 / 5.00 m
Source elevation      :   97.55 m
Receiver elevation    :   98.15 m
Barrier elevation     :   98.20 m
Reference angle       :    0.00

```

#### Result summary (day)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 47.91 ! 47.91
2.Terry Fox ! 1.50 ! 53.74 ! 53.74
-----+-----+-----+-----
Total                                     54.75 dBA

```

#### Result summary (night)

```

-----
! source ! Road ! Total
! height ! Leq  ! Leq
! (m)    ! (dBA) ! (dBA)
-----+-----+-----+-----
1.Terry Fox ! 1.50 ! 44.93 ! 44.93
2.Terry Fox ! 1.50 ! 53.79 ! 53.79
-----+-----+-----+-----
Total                                     54.32 dBA

```

TOTAL Leq FROM ALL SOURCES (DAY): 54.75  
 (NIGHT): 54.32



Filename: ola730.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Barr (day/night)

-----  
Angle1 Angle2 : -90.00 deg 45.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 27.10 / 27.10 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 45.00 deg  
Barrier height : 3.00 m  
Elevation : 1.20 m  
Barrier receiver distance : 5.70 / 5.70 m  
Source elevation : 98.00 m  
Receiver elevation : 97.90 m  
Barrier elevation : 97.90 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

```

-----
Angle1   Angle2           : 45.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 27.10 / 27.10 m
Receiver height       :    1.50 / 4.50 m
Topography           :      4           (Elevated; with barrier)
Barrier angle1        : 45.00 deg   Angle2 : 90.00 deg
Barrier height        :    6.00 m
Elevation             :    1.20 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation       :   98.00 m
Receiver elevation     :   97.90 m
Barrier elevation      :   98.00 m
Reference angle       :    0.00

```

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

```

-----
Angle1   Angle2           : -90.00 deg   30.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 18.40 / 18.40 m
Receiver height       :    1.50 / 4.50 m
Topography           :      2           (Flat/gentle slope; with
barrier)
Barrier angle1        : -90.00 deg   Angle2 : 30.00 deg
Barrier height        :    3.00 m
Barrier receiver distance : 5.60 / 5.60 m
Source elevation       :   97.70 m
Receiver elevation     :   97.90 m
Barrier elevation      :   97.80 m
Reference angle       :    0.00

```

Result summary (day)

|             | ! | source | ! | Road  | ! | Total     |
|-------------|---|--------|---|-------|---|-----------|
|             | ! | height | ! | Leq   | ! | Leq       |
|             | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF Barr   | ! | 1.50   | ! | 56.88 | ! | 56.88     |
| 2.TF House  | ! | 1.50   | ! | 46.92 | ! | 46.92     |
| 3.Cope Barr | ! | 1.50   | ! | 51.69 | ! | 51.69     |
| Total       |   |        |   |       |   | 58.35 dBA |

Result summary (night)

|             | ! | source | ! | Road  | ! | Total     |
|-------------|---|--------|---|-------|---|-----------|
|             | ! | height | ! | Leq   | ! | Leq       |
|             | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF Barr   | ! | 1.50   | ! | 58.82 | ! | 58.82 *   |
| 2.TF House  | ! | 1.50   | ! | 44.50 | ! | 44.50     |
| 3.Cope Barr | ! | 1.50   | ! | 54.03 | ! | 54.03 *   |
| Total       |   |        |   |       |   | 60.18 dBA |

\* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 58.35  
(NIGHT): 60.18

Filename: ola735.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Barr (day/night)

-----  
Angle1 Angle2 : -90.00 deg 45.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 27.10 / 27.10 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 45.00 deg  
Barrier height : 3.50 m  
Elevation : 1.20 m  
Barrier receiver distance : 5.70 / 5.70 m  
Source elevation : 98.00 m  
Receiver elevation : 97.90 m  
Barrier elevation : 97.90 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

```

-----
Angle1   Angle2           : 45.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 27.10 / 27.10 m
Receiver height       : 1.50 / 4.50 m
Topography           :      4           (Elevated; with barrier)
Barrier angle1        : 45.00 deg   Angle2 : 90.00 deg
Barrier height        : 6.00 m
Elevation             : 1.20 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation       : 98.00 m
Receiver elevation     : 97.90 m
Barrier elevation      : 98.00 m
Reference angle       : 0.00

```

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

```

-----
Angle1   Angle2           : -90.00 deg   30.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 18.40 / 18.40 m
Receiver height       : 1.50 / 4.50 m
Topography           :      2           (Flat/gentle slope; with
barrier)
Barrier angle1        : -90.00 deg   Angle2 : 30.00 deg
Barrier height        : 3.50 m
Barrier receiver distance : 5.60 / 5.60 m
Source elevation       : 97.70 m
Receiver elevation     : 97.90 m
Barrier elevation      : 97.80 m
Reference angle       : 0.00

```

Result summary (day)

|             | ! source ! | Road  | ! Total   |
|-------------|------------|-------|-----------|
|             | ! height ! | Leq   | ! Leq     |
|             | ! (m) !    | (dBA) | ! (dBA)   |
| 1.TF Barr   | ! 1.50 !   | 55.27 | ! 55.27   |
| 2.TF House  | ! 1.50 !   | 46.92 | ! 46.92   |
| 3.Cope Barr | ! 1.50 !   | 50.02 | ! 50.02   |
| Total       |            |       | 56.87 dBA |

Result summary (night)

|             | ! source ! | Road  | ! Total   |
|-------------|------------|-------|-----------|
|             | ! height ! | Leq   | ! Leq     |
|             | ! (m) !    | (dBA) | ! (dBA)   |
| 1.TF Barr   | ! 1.50 !   | 58.82 | ! 58.82 * |
| 2.TF House  | ! 1.50 !   | 44.50 | ! 44.50   |
| 3.Cope Barr | ! 1.50 !   | 54.03 | ! 54.03 * |
| Total       |            |       | 60.18 dBA |

\* Bright Zone !

TOTAL Leq FROM ALL SOURCES (DAY): 56.87  
(NIGHT): 60.18

Filename: ola740.te Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Barr (day/night)

-----  
Angle1 Angle2 : -90.00 deg 45.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 27.10 / 27.10 m  
Receiver height : 1.50 / 4.50 m  
Topography : 4 (Elevated; with barrier)  
Barrier angle1 : -90.00 deg Angle2 : 45.00 deg  
Barrier height : 4.00 m  
Elevation : 1.20 m  
Barrier receiver distance : 5.70 / 5.70 m  
Source elevation : 98.00 m  
Receiver elevation : 97.90 m  
Barrier elevation : 97.90 m  
Reference angle : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

```

-----
Angle1   Angle2           : 45.00 deg   90.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 27.10 / 27.10 m
Receiver height       :  1.50 / 4.50 m
Topography           :      4           (Elevated; with barrier)
Barrier angle1       : 45.00 deg   Angle2 : 90.00 deg
Barrier height        :  6.00 m
Elevation             :  1.20 m
Barrier receiver distance :  3.00 / 3.00 m
Source elevation      : 98.00 m
Receiver elevation     : 97.90 m
Barrier elevation      : 98.00 m
Reference angle       :  0.00

```

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

```

-----
Angle1   Angle2           : -90.00 deg   30.00 deg
Wood depth           :      0           (No woods.)
No of house rows     :      0 / 0
Surface              :      1           (Absorptive ground surface)
Receiver source distance : 18.40 / 18.40 m
Receiver height       :  1.50 / 4.50 m
Topography           :      2           (Flat/gentle slope; with
barrier)
Barrier angle1       : -90.00 deg   Angle2 : 30.00 deg
Barrier height        :  4.00 m
Barrier receiver distance :  5.60 / 5.60 m
Source elevation      : 97.70 m
Receiver elevation     : 97.90 m
Barrier elevation      : 97.80 m
Reference angle       :  0.00

```



Result summary (day)

|             | ! | source | ! | Road  | ! | Total     |
|-------------|---|--------|---|-------|---|-----------|
|             | ! | height | ! | Leq   | ! | Leq       |
|             | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF Barr   | ! | 1.50   | ! | 53.97 | ! | 53.97     |
| 2.TF House  | ! | 1.50   | ! | 46.92 | ! | 46.92     |
| 3.Cope Barr | ! | 1.50   | ! | 48.66 | ! | 48.66     |
| Total       |   |        |   |       |   | 55.71 dBA |

Result summary (night)

|             | ! | source | ! | Road  | ! | Total     |
|-------------|---|--------|---|-------|---|-----------|
|             | ! | height | ! | Leq   | ! | Leq       |
|             | ! | (m)    | ! | (dBA) | ! | (dBA)     |
| 1.TF Barr   | ! | 1.50   | ! | 54.72 | ! | 54.72     |
| 2.TF House  | ! | 1.50   | ! | 44.50 | ! | 44.50     |
| 3.Cope Barr | ! | 1.50   | ! | 48.97 | ! | 48.97     |
| Total       |   |        |   |       |   | 56.06 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 55.71  
(NIGHT): 56.06

Filename: ola745.te                      Time Period: Day/Night 16/8 hours  
Description:

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod  
Medium truck volume : 966/84 veh/TimePeriod  
Heavy truck volume : 690/60 veh/TimePeriod  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: TF Barr (day/night)

-----  
Angle1    Angle2                      : -90.00 deg    45.00 deg  
Wood depth                            : 0              (No woods.)  
No of house rows                      : 0 / 0  
Surface                                : 1              (Absorptive ground surface)  
Receiver source distance : 27.10 / 27.10 m  
Receiver height                        : 1.50 / 4.50 m  
Topography                             : 4              (Elevated; with barrier)  
Barrier angle1                         : -90.00 deg    Angle2 : 45.00 deg  
Barrier height                         : 4.50 m  
Elevation                               : 1.20 m  
Barrier receiver distance : 5.70 / 5.70 m  
Source elevation                        : 98.00 m  
Receiver elevation                      : 97.90 m  
Barrier elevation                       : 97.90 m  
Reference angle                        : 0.00

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

-----  
Car traffic volume : 12144/1056 veh/TimePeriod \*  
Medium truck volume : 966/84 veh/TimePeriod \*  
Heavy truck volume : 690/60 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: TF House (day/night)

```

-----
Angle1   Angle2           : 45.00 deg   90.00 deg
Wood depth           :      0      (No woods.)
No of house rows     :      0 / 0
Surface              :      1      (Absorptive ground surface)
Receiver source distance : 27.10 / 27.10 m
Receiver height       :  1.50 / 4.50 m
Topography            :      4      (Elevated; with barrier)
Barrier angle1        : 45.00 deg   Angle2 : 90.00 deg
Barrier height        :  6.00 m
Elevation             :  1.20 m
Barrier receiver distance :  3.00 / 3.00 m
Source elevation       : 98.00 m
Receiver elevation     : 97.90 m
Barrier elevation      : 98.00 m
Reference angle        :  0.00

```

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

```

-----
Angle1   Angle2           : -90.00 deg   30.00 deg
Wood depth           :      0      (No woods.)
No of house rows     :      0 / 0
Surface              :      1      (Absorptive ground surface)
Receiver source distance : 18.40 / 18.40 m
Receiver height       :  1.50 / 4.50 m
Topography            :      2      (Flat/gentle slope; with
barrier)
Barrier angle1        : -90.00 deg   Angle2 : 30.00 deg
Barrier height        :  4.50 m
Barrier receiver distance :  5.60 / 5.60 m
Source elevation       : 97.70 m
Receiver elevation     : 97.90 m
Barrier elevation      : 97.80 m
Reference angle        :  0.00

```

Result summary (day)

|             | ! source ! | Road  | ! Total   |
|-------------|------------|-------|-----------|
|             | ! height ! | Leq   | ! Leq     |
|             | ! (m) !    | (dBA) | ! (dBA)   |
| 1.TF Barr   | ! 1.50 !   | 52.89 | ! 52.89   |
| 2.TF House  | ! 1.50 !   | 46.92 | ! 46.92   |
| 3.Cope Barr | ! 1.50 !   | 47.53 | ! 47.53   |
| Total       |            |       | 54.78 dBA |

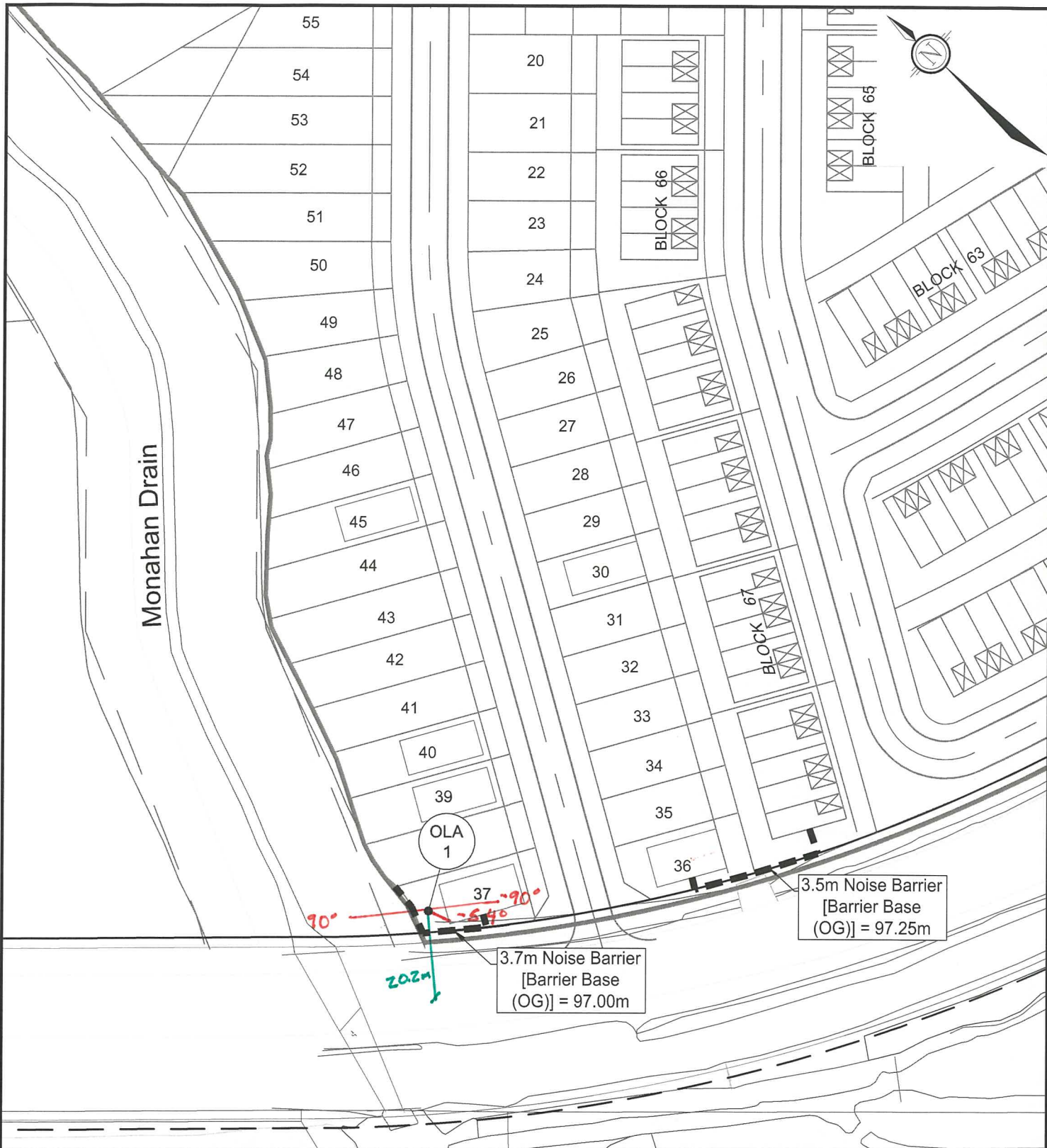
Result summary (night)

|             | ! source ! | Road  | ! Total   |
|-------------|------------|-------|-----------|
|             | ! height ! | Leq   | ! Leq     |
|             | ! (m) !    | (dBA) | ! (dBA)   |
| 1.TF Barr   | ! 1.50 !   | 53.55 | ! 53.55   |
| 2.TF House  | ! 1.50 !   | 44.50 | ! 44.50   |
| 3.Cope Barr | ! 1.50 !   | 47.06 | ! 47.06   |
| Total       |            |       | 54.85 dBA |

TOTAL Leq FROM ALL SOURCES (DAY): 54.78  
(NIGHT): 54.85

## **PART 4 (APPENDIX B)**

### Stamson Modelling Angles



M:\2017\117198\CAD\Design\117198-NC.dwg, OLA1, Sep 06, 2018 - 3:32pm, szorgel



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](http://www.novatech-eng.com)

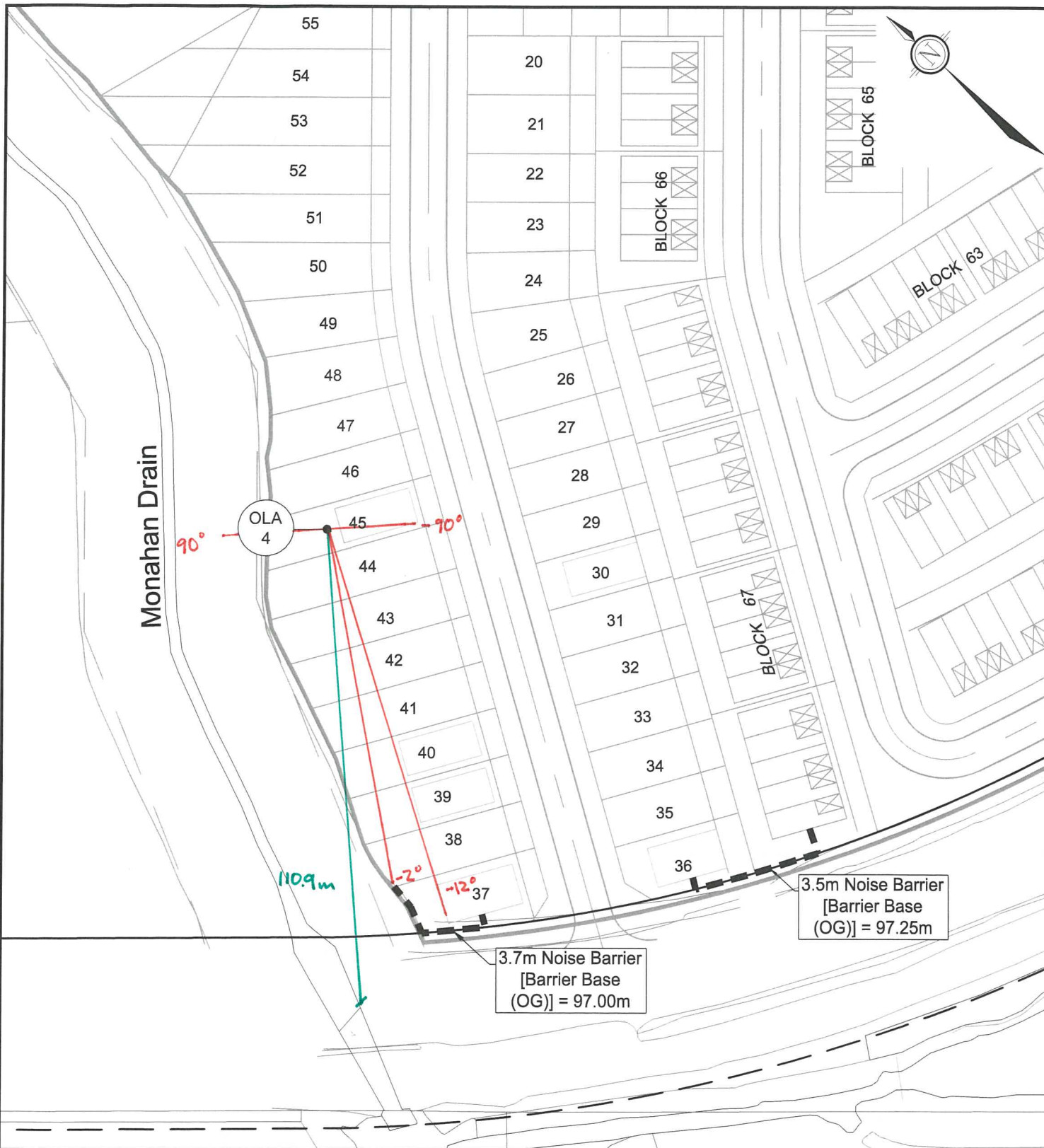
VAN GAAL LANDS  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## RECEIVER DISTANCE AND ANGLES

SCALE 1 : 1250

DATE SEPT 2018 JOB 117198 FIGURE FIG-OLA1

CHTRV11.DWG 246mm x 370mm



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](http://www.novatech-eng.com)

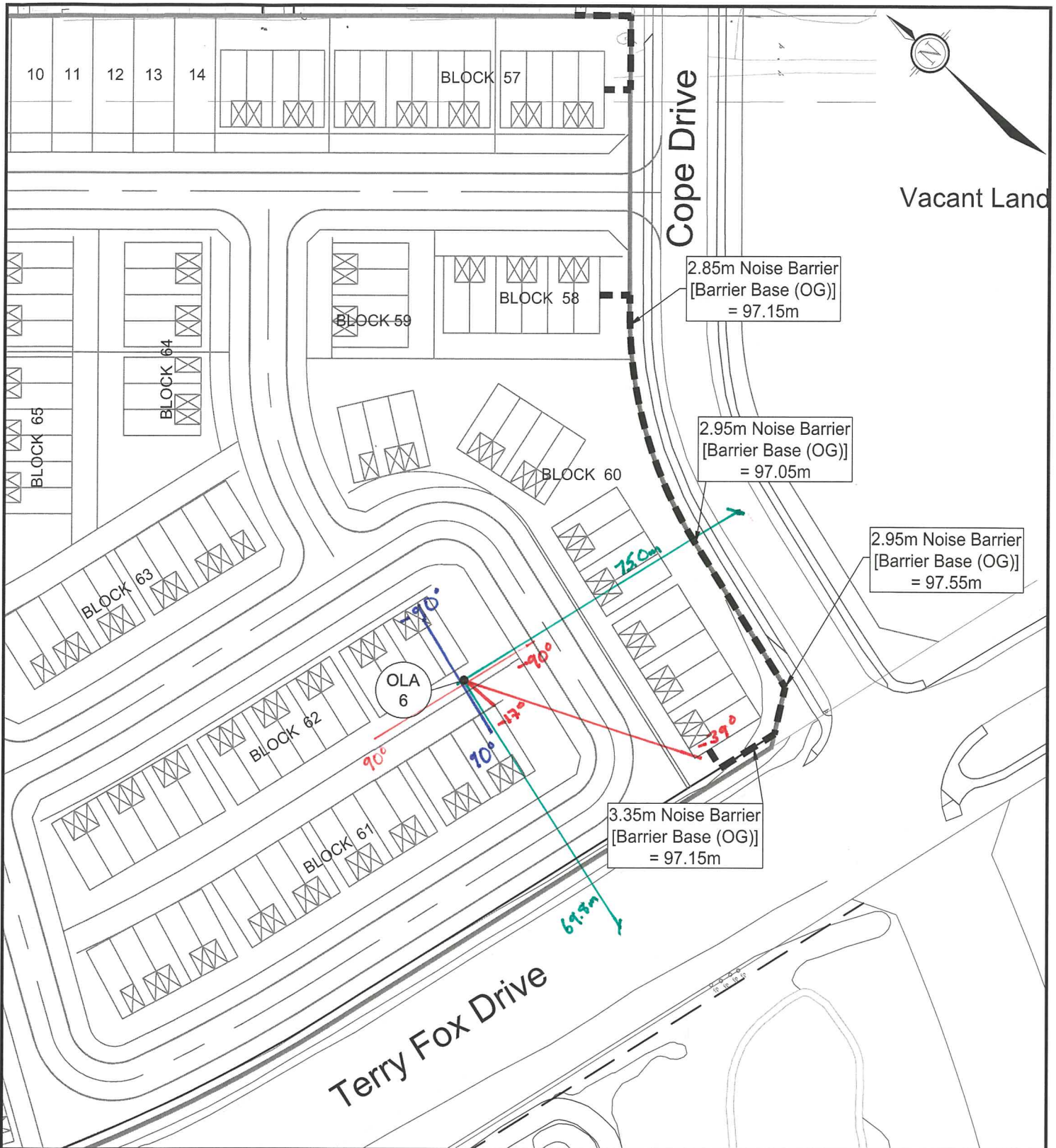
VAN GAAL LANDS  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## RECEIVER DISTANCE AND ANGLES

SCALE 1 : 1250

DATE SEPT 2018 JOB 117198 FIGURE FIG-OLA4





M:\2017\117198\CAD\Design\117198-NC.dwg, OLA6, Sep 06, 2018 - 3:32pm, szorgel



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](http://www.novatech-eng.com)

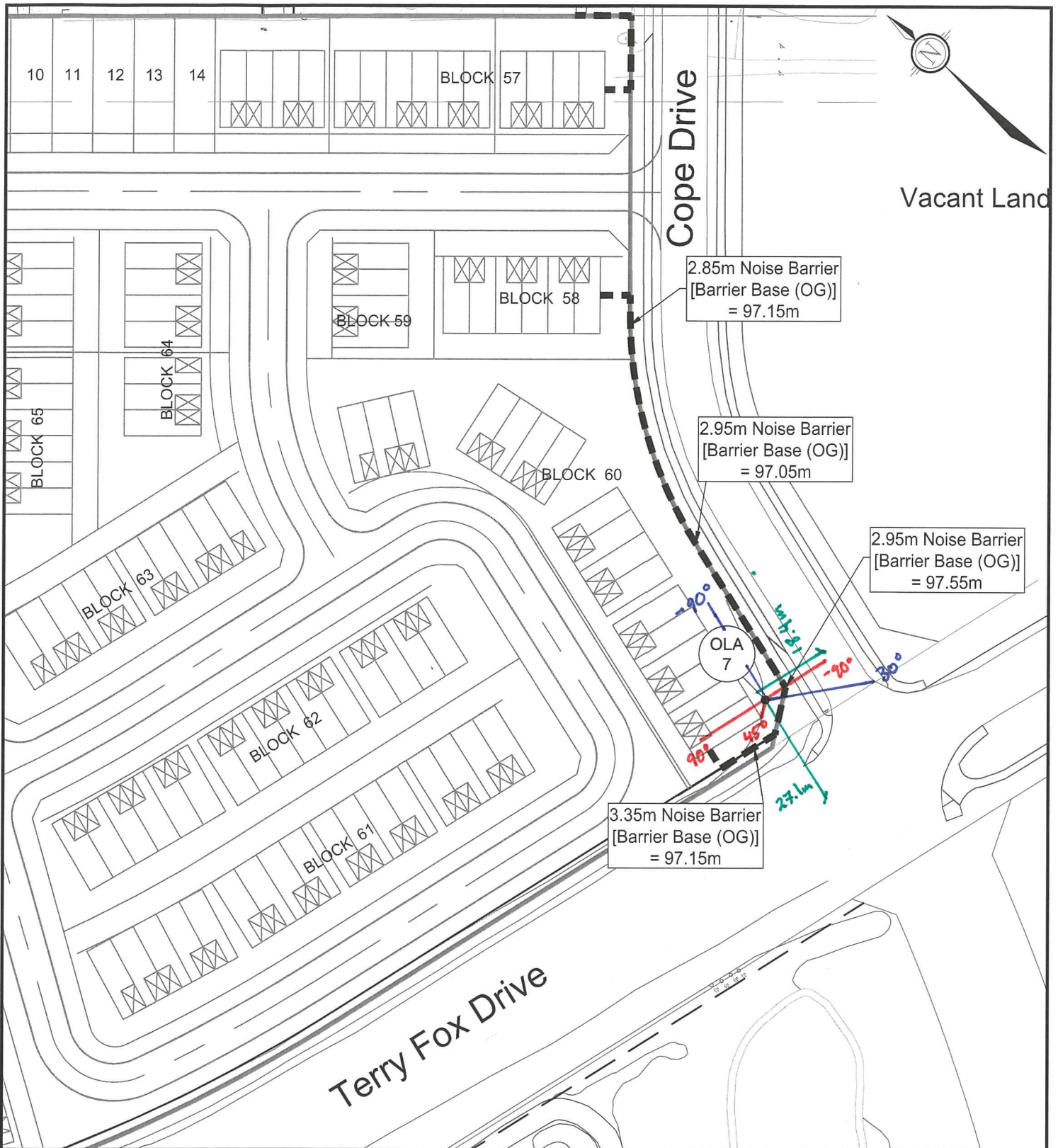
VAN GAAL LANDS  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## RECEIVER DISTANCE AND ANGLES

SCALE 1 : 1250

|           |        |          |
|-----------|--------|----------|
| DATE      | JOB    | FIGURE   |
| SEPT 2018 | 117198 | FIG-OLA6 |





**NOVATECH**

Engineers, Planners & Landscape Architects  
Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario, Canada K2M 1P6

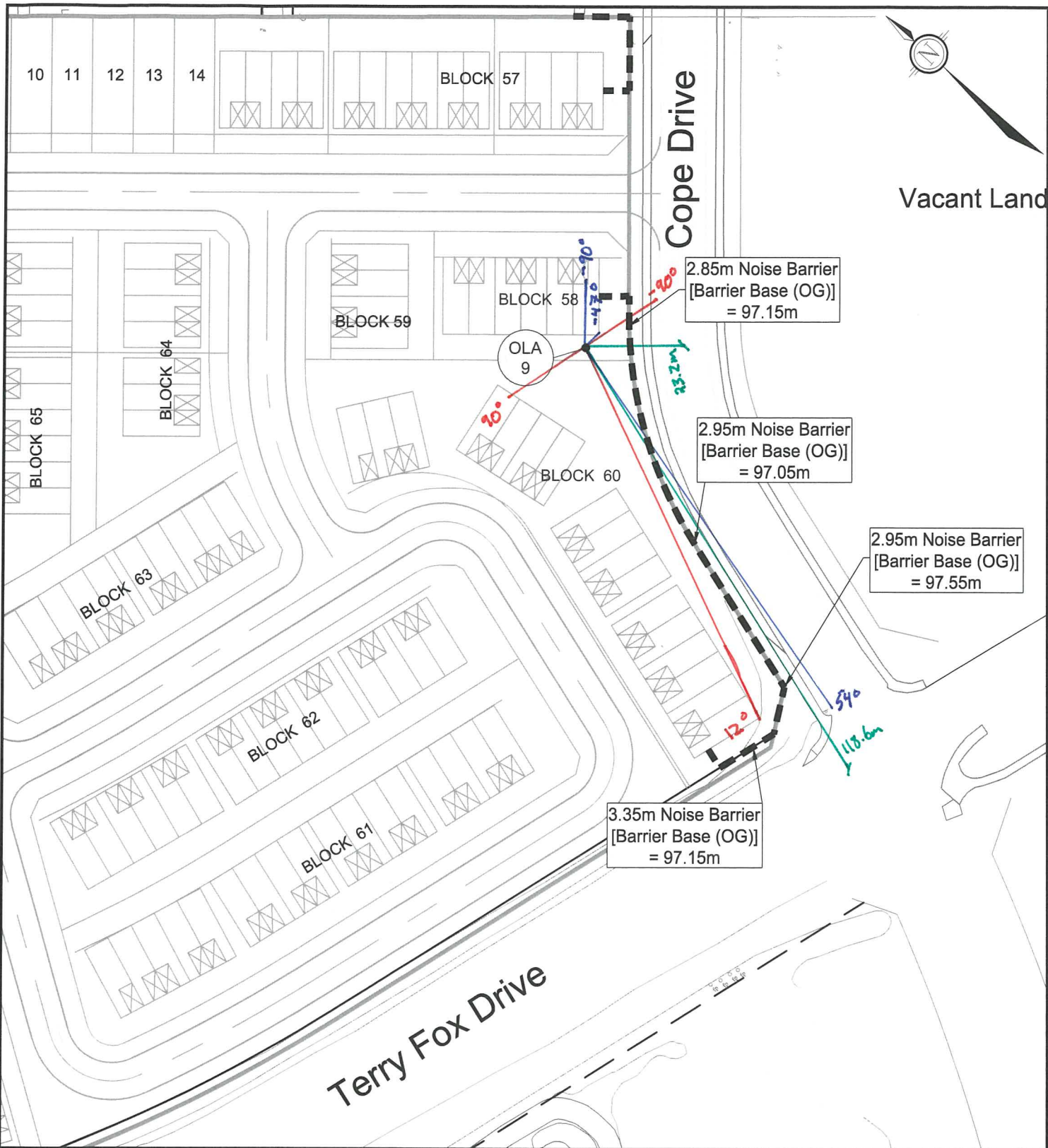
Telephone (613) 254-9643  
Facsimile (613) 254-5867  
Website [www.novatech-eng.com](http://www.novatech-eng.com)

VAN GAAL LANDS  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## RECEIVER DISTANCE AND ANGLES

SCALE 1 : 1250

DATE SEPT 2018 JOB 117198 FIGURE FIG-OLA7



M:\2017\117198\CAD\Design\117198-NC.dwg, OLA9, Sep 06, 2018 - 3:32pm, szorgel



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](http://www.novatech-eng.com)

VAN GAAL LANDS  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

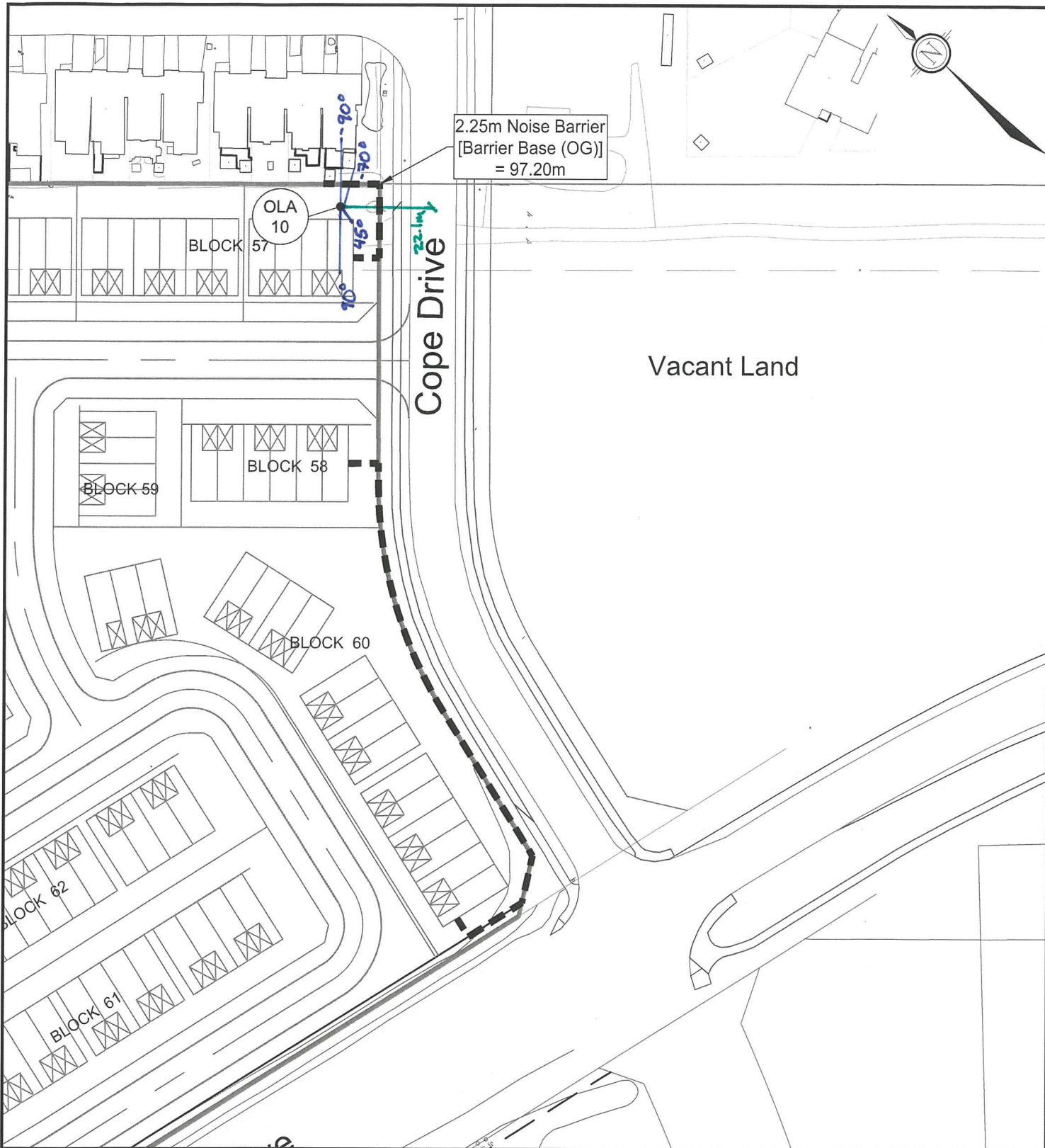
## RECEIVER DISTANCE AND ANGLES

SCALE 1 : 1250

DATE SEPT 2018 JOB 117198 FIGURE FIG-OLA9

SHT&X11.DWG - 216mmx279mm





Engineers, Planners & Landscape Architects  
Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario, Canada K2M 1P6

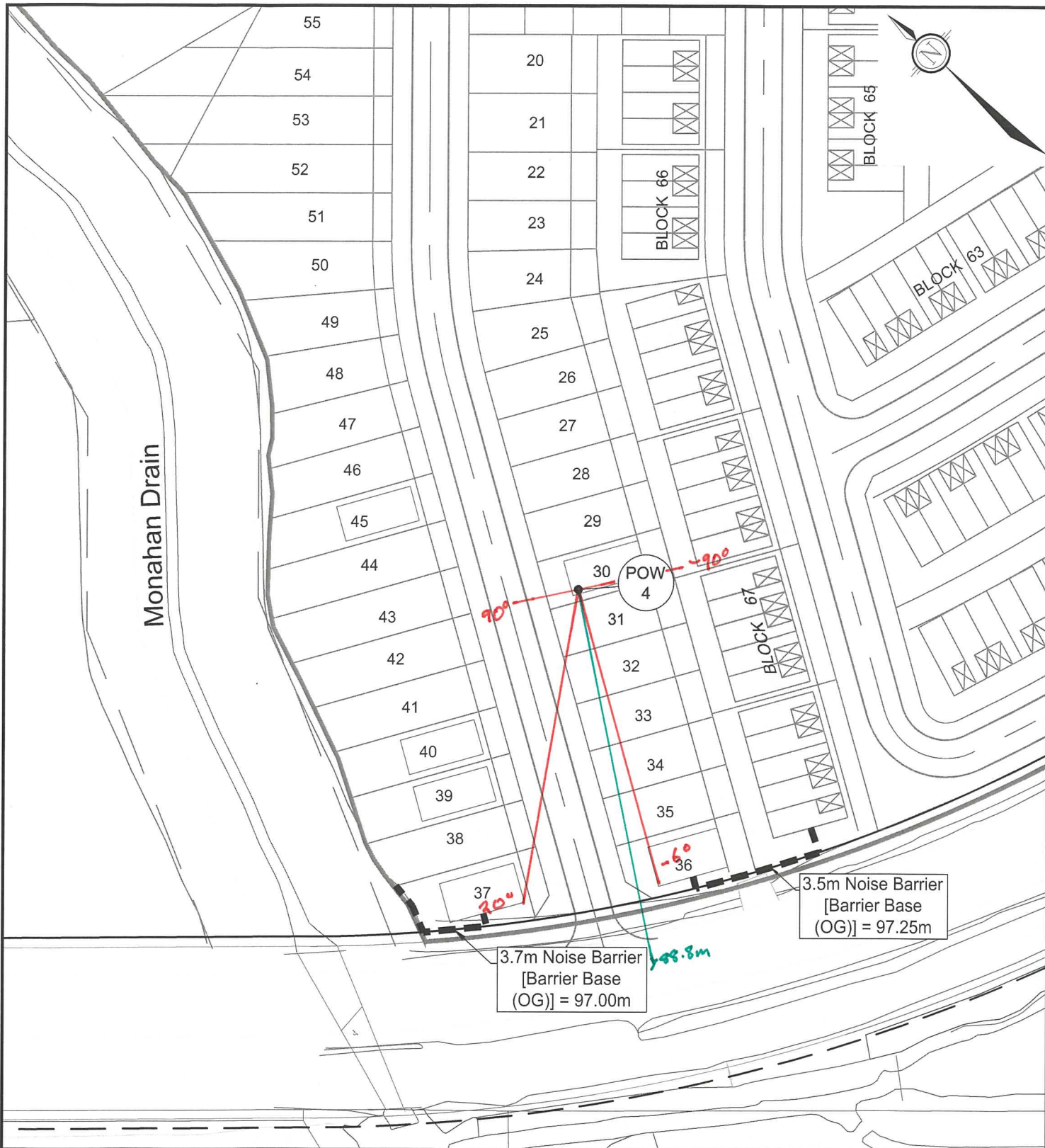
Telephone (613) 254-9643  
Facsimile (613) 254-5867  
Website [www.novatech-eng.com](http://www.novatech-eng.com)

VAN GAAL LANDS  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## RECEIVER DISTANCE AND ANGLES

SCALE 1 : 1250

|           |        |           |
|-----------|--------|-----------|
| DATE      | JOB    | FIGURE    |
| SEPT 2018 | 117198 | FIG-OLA10 |



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](http://www.novatech-eng.com)

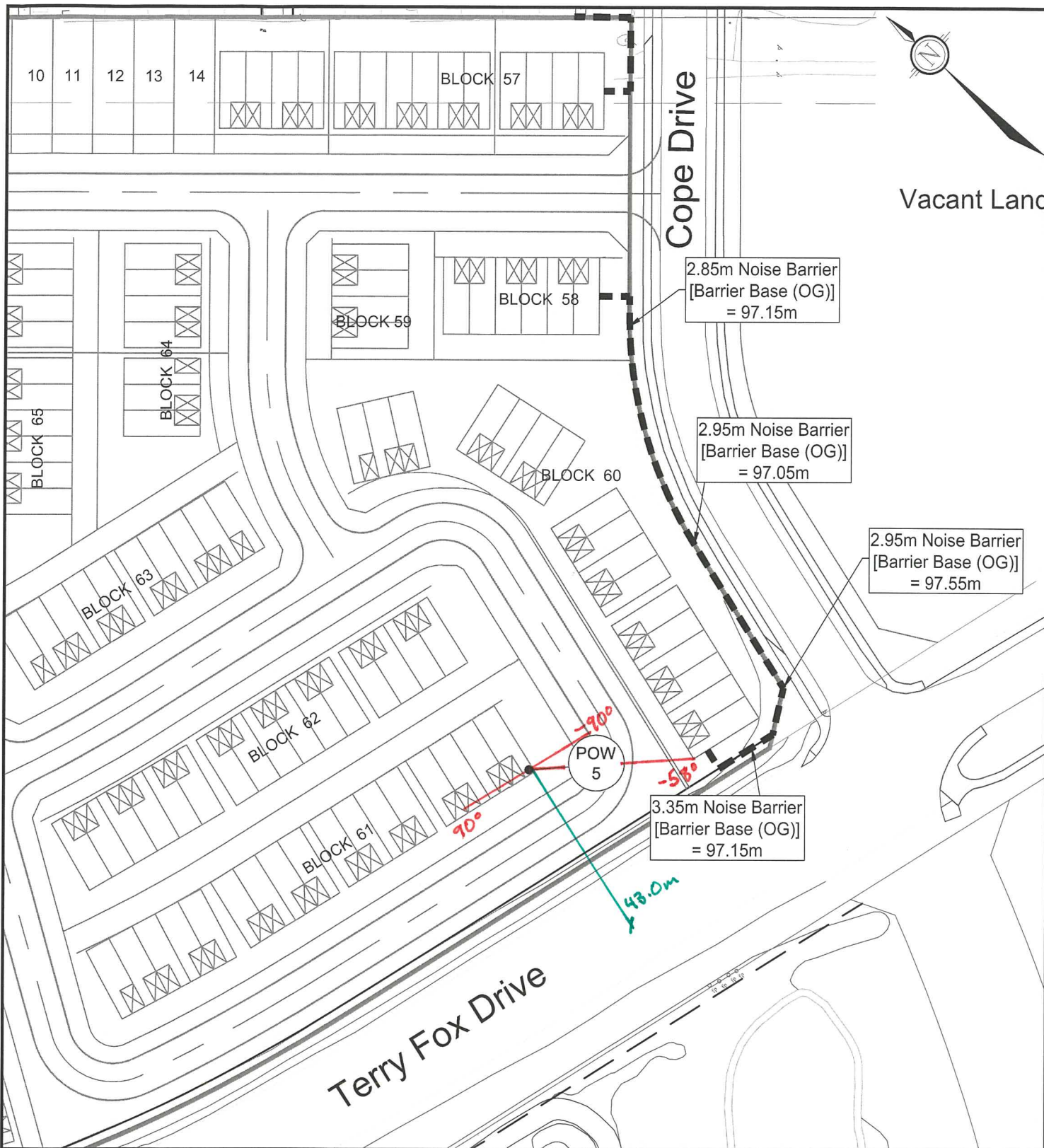
VAN GAAL LANDS  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## RECEIVER DISTANCE AND ANGLES

SCALE 1 : 1250

|           |        |          |
|-----------|--------|----------|
| DATE      | JOB    | FIGURE   |
| SEPT 2018 | 117198 | FIG-POW4 |





Engineers, Planners & Landscape Architects  
Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario, Canada K2M 1P6

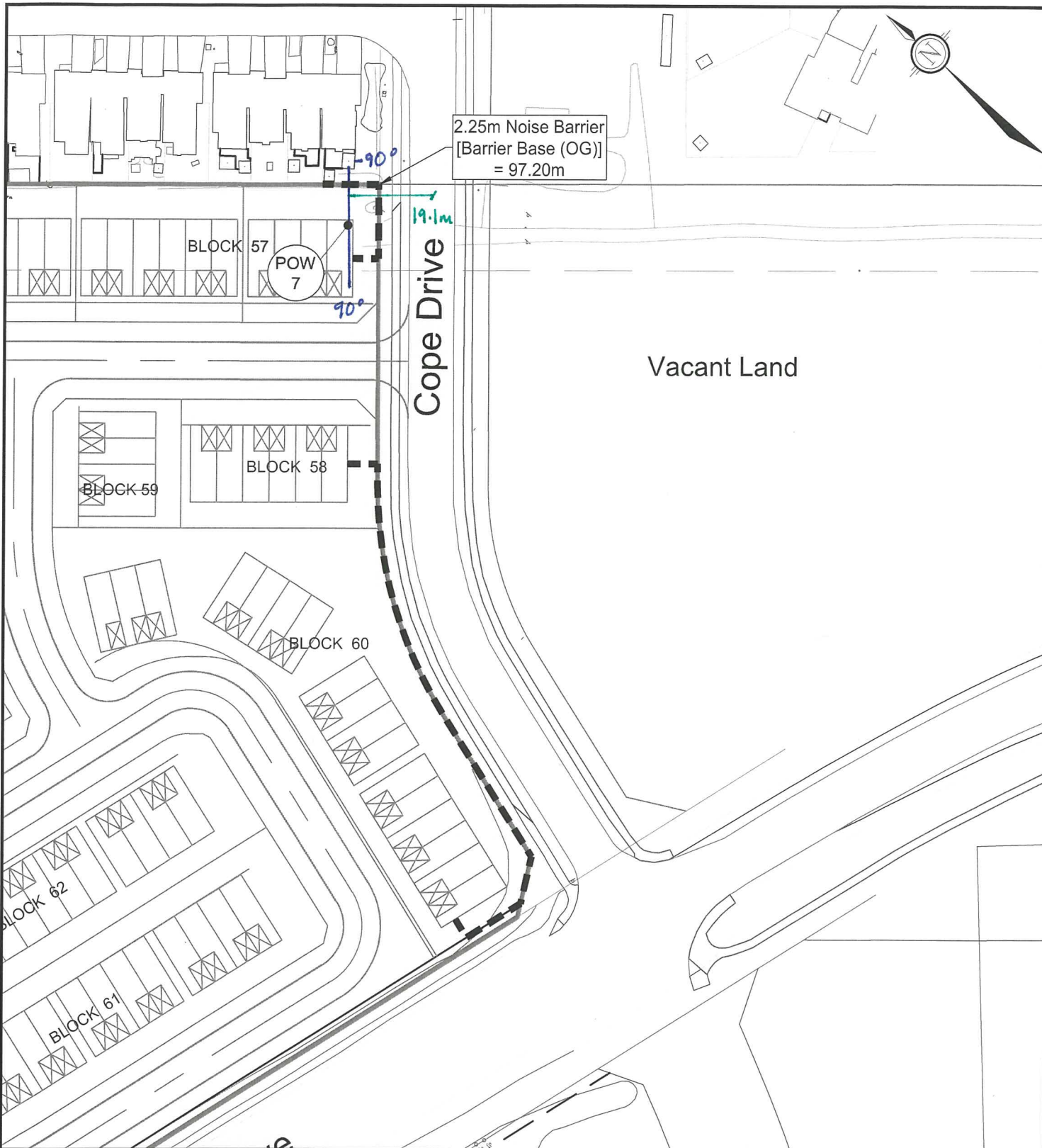
Telephone (613) 254-9643  
Facsimile (613) 254-5867  
Website [www.novatech-eng.com](http://www.novatech-eng.com)

VAN GAAL LANDS  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## RECEIVER DISTANCE AND ANGLES

SCALE 1 : 1250

DATE SEPT 2018 JOB 117198 FIGURE FIG-POW5



**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](http://www.novatech-eng.com)

VAN GAAL LANDS  
1039 TERRY FOX DRIVE AND  
5331 FERNBANK ROAD

## RECEIVER DISTANCE AND ANGLES

SCALE 1 : 1250

DATE SEPT 2018 JOB 117198 FIGURE FIG-POW7

## **APPENDIX C**

### **GRADING PLAN – 117198-GR**