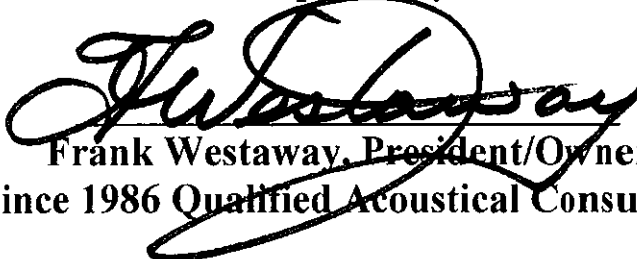


**ENVIRONMENTAL NOISE IMPACT STUDY
“607 DYNES ROAD RESIDENTIAL TOWNHOUSE
SUBDIVISION DEVELOPMENT”
607 DYNES ROAD
BURLINGTON ON**

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**October 2015
Our File No: 2015-915**

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1.0 INTRODUCTION

dBA Environmental Services Inc. has conducted a noise impact study for the proposed “607 Dynes Rd, Subdivision Development” known as 607 Dynes Road Burlington ON. See Figure 1 Key Plan.

The purpose of the study is to determine the noise impact from Woodward Ave and Dynes Rd, Burlington On.

This study will detail noise impact relative to the proposed site plan and recommend noise control measures necessary (if applicable) to meet MOE guidelines while satisfying the planning requirements of the City of Burlington. Vibration was not considered in this report as there are no CN/CP Rail lines or heavy industry in the immediate area. Aircraft noise was not considered in this report as the development is located outside the 25 NEF 2010 contour.

2.0 SITE DESCRIPTION

Proposed for the development are four blocks totaling twenty three two storey townhouse dwellings and two semi-detached dwellings. The proposed development is surrounded by two storey residential dwellings to the north, south and west. To the east of the proposed development is Assumption High School. To the west is Dynes Rd approximately 116m from the proposed development..

3.0 NOISE IMPACT ASSESSMENT

3.1 NOISE CRITERIA

The Ministry of Environment (MOE) specifies limits for road noise relative to new residential developments. The MOE Publication 300, Stationary & Transportation Sources-Approval & Planning, specifies the criteria, summarized as follows:

Time Period	L _{eq} (dBA)
07:00 – 23:00 (16 hr.)	55 Outdoor Living Area (OLA)
23:00 – 07:00 (8 hr.)	50 Plane of Bedroom Window (POW)

The OLA refers to an outdoor patio, a backyard, a terrace or other area where outdoor passive recreation is expected to occur on the residential property. Noise levels are calculated at the upper storey bedroom window to represent night time (23:00 - 07:00) periods.

Where noise levels estimated in the Outdoor Living Area (OLA) and at an upper storey window (POW) are equal to or less than the values listed in Table 1, no noise control measures are required. Where noise levels exceed Table 1 values, the following action is required:

Time Period	Noise Level Leq (dBA)	Action Required
07:00 - 23:00 Daytime (OLA)	55 to 60	Barrier or Warning Clause Type "A"
07:00 - 23:00 Daytime (OLA)	> 60	Barrier & Warning Clause Type "B"
07:00 - 23:00 Daytime (POW)	>55	Provision for A/C, Warning Clause "C"
	>65	Central A/C, Warning Clause "D"
	>65	Building Component Specification
23:00 to 07:00 Nighttime (POW)	> 50-60	Provision for A/C and Warning Clause Type "C"
23:00 to 07:00 Nighttime (POW)	> 60	Building Component Specification
	> 60	Central Air Conditioning and Warning Clause Type "D"

Where nighttime noise levels exceed 60 dBA, building components must be designed to meet the following Table 3 indoor sound level limits.

Indoor Location	Leq (dBA)
	Road
Living/Dining 7:00 – 23:00	45
Bedroom 23:00 - 07:00	40

3.2 ROAD NOISE

Predicted road traffic noise levels were calculated for Dynes Road and Woodward Ave, the major road noise sources in the site area. Road traffic volumes were sourced verbally from the *City of Burlington Traffic Engineering*, relative to both roadways. MOE computer program STAMSON version 5.04 was used to carry out prediction calculations. Traffic data is summarized in Table 4. See Appendix "A" for Stamson Traffic Data.

The daytime/nighttime volume ratio relative for Dynes Rd is calculated using a 90/10 split and a 16/8-hour assessment as required by the MOE. The maximum posted speeds for all vehicles is 40 klm/hr a two lane roadway. The percentage of annual growth for all roadways was figured at 2.0% over 17 years. The 2014 AADT (Annual Average Daily Traffic) volumes were used and are reflective of the worst-case scenario.

Truck volumes were factored at 2% medium and 1% heavy of the total vehicle volumes. Table 5 summarizes the "free field" traffic noise prediction results, modeled at one receptor location (Lot 1, 18-23) representative of outdoor amenity space and building facades throughout the proposed development (See

Figure 3 Receptor Locations).

The daytime/nighttime volume ratio relative for Dynes Rd roadway is calculated using a 90/10 split and a 16/8-hour assessment as required by the MOE. The maximum posted speeds for all vehicles is 50 km/hr on Dynes Rd a two lane roadway.

Truck volumes were factored at 2% medium and 1% heavy of the total vehicle volumes for Dynes Rd. Table 5 summarizes the “free field” traffic noise prediction results, modeled at one receptor location representative of outdoor amenity space and building facades throughout the proposed development (See Figure 3 Receptor Locations).

TABLE 5: AADT on Dynes Road at the 50th Ave			
Dynes Rd	AADT 7386 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	6454	133	67
Night	717	15	7

Table 5 summarizes the “free field” traffic noise prediction results, modeled at one receptor location representative of OLA’s and facades of specific units (R1) within the proposed development (See Figure 3 Receptor Locations).

TABLE 6: Predicted unmitigated traffic noise (dB(A))		
Location	07:00 – 23:00	23:00 – 07:00
R1- Lots 1, 18-23	43 ⁽¹⁾	37 ⁽²⁾

⁽¹⁾ 1.5m receiver height ⁽²⁾ 4.5m receiver height

4.0 RECOMMENDATIONS - NOISE CONTROL

4.1 OUTDOOR LIVING AREAS

Calculated road noise levels do not exceed the 55 dBA daytime criteria outlined in Table 1 for outdoor amenity space for R1. Predicted unmitigated daytime noise levels, as calculated and assessed in accordance with MOE guidelines and procedures, indicate no exceedance with the criterion for outdoor amenity space and therefore, no mitigation measures are required. The draft plan for the proposed development includes outdoor living areas for all units throughout the development.

Orientation of the proposed structures will provide significant shielding for the associated amenity spaces for all interior dwellings throughout the development.

4.2 INDOOR NOISE LEVELS

Calculated road noise levels at the Plane of Window (POW) do not exceed the 50 dBA criteria outlined in Table 1 for indoor space for any lots.

Specific building components (walls, windows, doors etc.) are not required and confirmed using the AIF (Acoustic Insulation Factor) and STC (Sound Transmission Class) methods outlined in the MOE Publication 300, Stationary & Transportation Sources-Approval & Planning

Building design specifications were not made available at report time and AIF calculations (Acoustic Insulation Factor) and STC (Sound Transmission Class) method outlined in the MOE Publication 300, Stationary & Transportation Sources-Approval & Planning, are summarized in Table 6 following with minimum window door and wall construction specified for all units throughout the development.

The AIF was calculated for each room type, based on typical window to floor ratios of 20% for bedrooms and 30% for living room areas. Wall to floor ratio was factored at 80%. A maximum of two components were factored per room.

Room Type	AIF/STC	Wall	Door Construction	Window Glazing Example
R1 & All Units				
Bedroom	21/23	OBC	OBC	3mm (16 mm) 3mm
Living room	20/22	OBC	OBC	3mm (16 mm) 3mm

* Double pane windows - first number denotes glass thickness, followed by spacing, and thickness of second pane, OBC denotes minimum requirements of the Ontario Building Code will suffice. Recommendations assume windows are well-fitted, weather-stripped units that can be opened.

5.0 VENTILATION / WARNING CLAUSES

Ventilation and warning clause requirements for specific units are not required for this development. Minimum building component requirements of the Ontario Building Code for all lots will satisfy the MOE criterion for noise control relative to indoor living space.

LOCATION	VENTILATION	WARNING CLAUSE
All Units	OBC	N/A

6.0 SUMMARY OF RECOMMENDATIONS

The following noise control measures are required to satisfy the indoor and outdoor noise level criterion:

- Ventilation of OBC for all units as recommended in Table 7.
- Window, Door, and Wall construction as recommended in Table 6.

7.0 CONCLUSIONS

dBA Environmental Services Inc. has conducted a noise impact study for the proposed “607 Dynes Rd, Subdivision Development” known as 607 Dynes Road Burlington ON. See Figure 1 Key Plan.

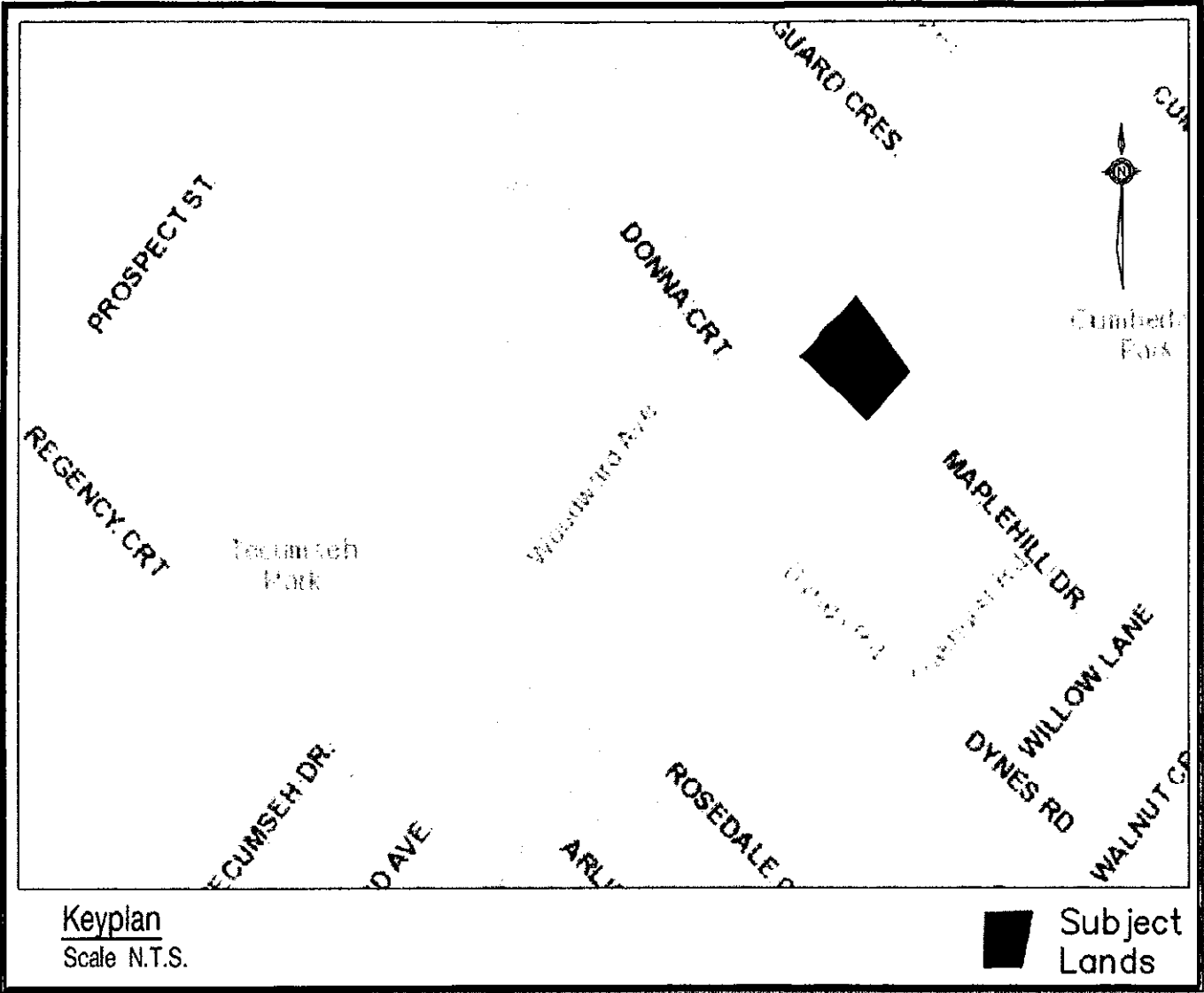
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This study detailed noise impact relative to the proposed site plan and recommend noise control measures necessary (if applicable) to meet MOE guidelines while satisfying the planning requirements of the City of Burlington. Vibration was not considered in this report as there are no CN/CP Rail lines or heavy industry in the immediate area. Aircraft noise was not considered in this report as the development is located outside the 25 NEF 2010 contour.

Section 6 of this report provides recommendations required for this development.

FIGURE 1

KEY PLAN



Keyplan
Scale N.T.S.

Subject Lands

FIGURE 2 SITE PLAN

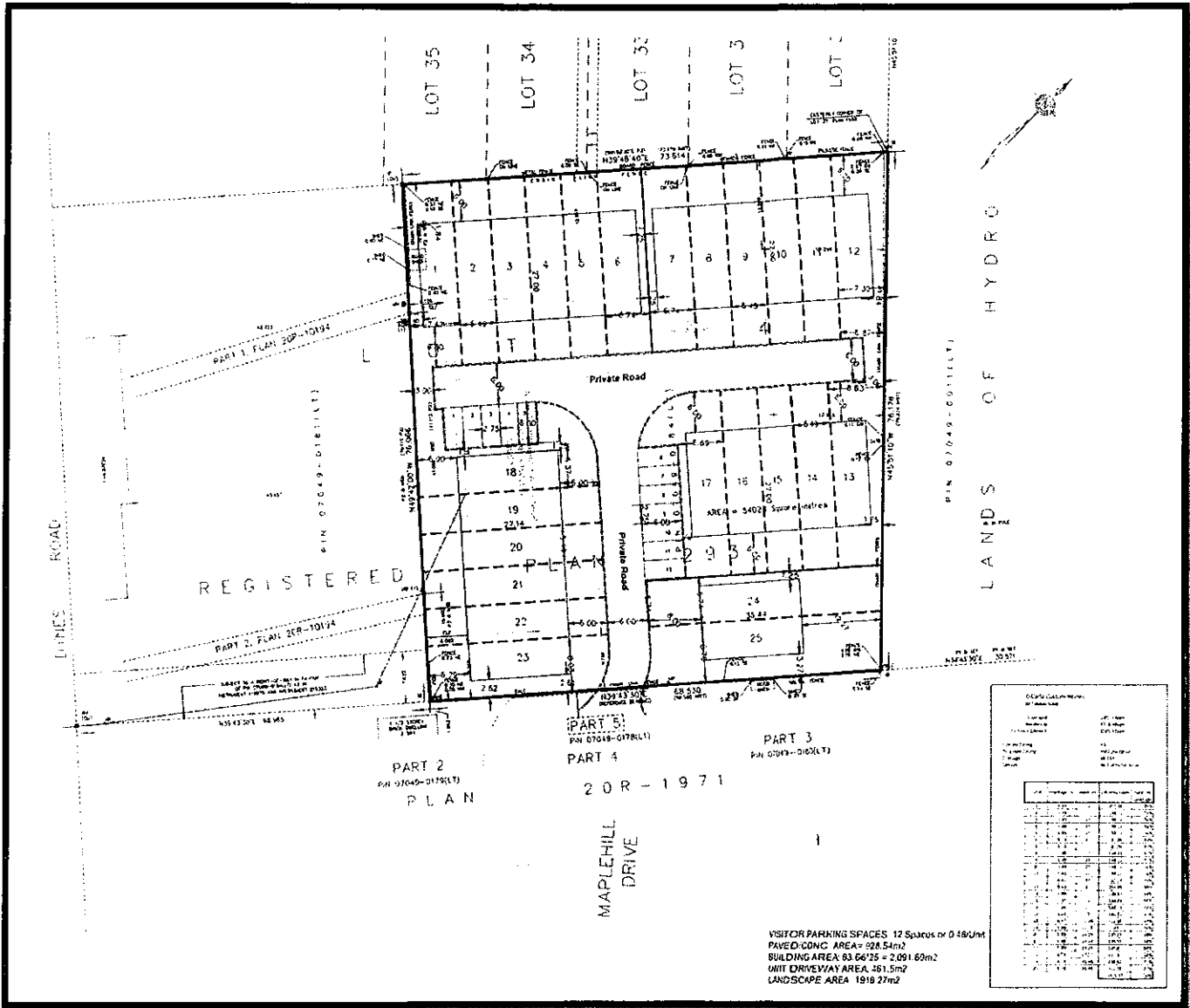
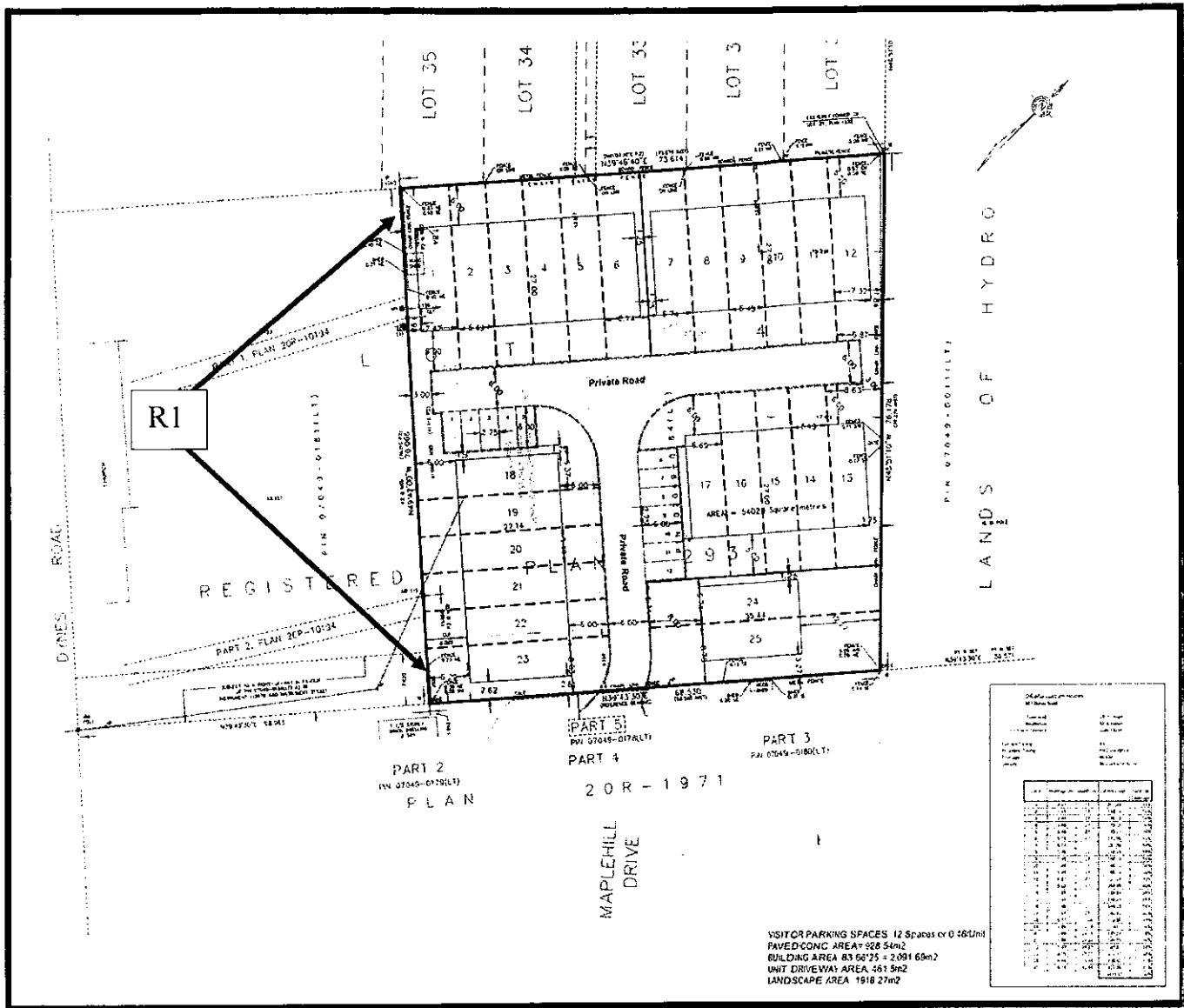


FIGURE 3 RECEPTOR LOCATION



APPENDIX “A”

Filename: Dynes.te Time Period: Day/Night 16/8 hours
 Description: **R1- Dynes Rd Free Field No Shielding**
TOTAL Leq FROM ALL SOURCES (DAY): 42.68 (OLA)
(NIGHT): 36.84

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

 Car traffic volume : 6454/717 veh/TimePeriod *
 Medium truck volume : 133/15 veh/TimePeriod *
 Heavy truck volume : 67/7 veh/TimePeriod *
 Posted speed limit : 40 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): 5280
 Percentage of Annual Growth : 2.00
 Number of Years of Growth : 17.00
 Medium Truck % of Total Volume : 2.00
 Heavy Truck % of Total Volume : 1.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Dynes Rd (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 : 116.00 / 116.00 m
 Receiver height : 1.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Dynes Rd (day)

 Source height = 1.00 m

ROAD (0.00 + 42.68 + 0.00) = 42.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	58.88	0.00	-14.75	-1.46	0.00	0.00	0.00	42.68

 Segment Leq : 42.68 dBA

Total Leq All Segments: 42.68 dBA

Results segment # 1: Dynes Rd (night)

 Source height = 0.99 m

ROAD (0.00 + 36.84 + 0.00) = 36.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.59	52.25	0.00	-14.08	-1.33	0.00	0.00	0.00	36.84

 Segment Leq : 36.84 dBA

Total Leq All Segments: 36.84 dBA