ENVIRONMENTAL NOISE IMPACT STUDY

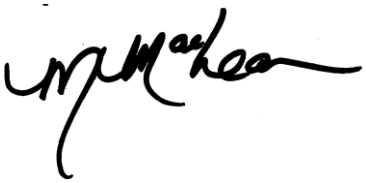
"2076 & 2086 MEADOWBROOK ROAD TOWNHOUSES"
Lots 33 & 34 Registered Plan 1319
City of Burlington ON
Regional Municipality of Halton

Prepared for:

1906452 Ontario Limited
&
1053052 Ontario Inc.
O/A Fresco Investments
2-2258 Mountainside Drive
Burlington ON
L7P 1B7

Prepared By:

Prepared By:



Melissa MacLean
Vice President

Reviewed By:



Frank Westaway
President/Owner

Our File No: 2018-1027

dBA Acoustical Consultants Inc.
P.O. Box 32059
1147 Upper Ottawa Street
Hamilton, On
L8W 3K0

TABLE OF CONTENTS

1.0 INTRODUCTION..... Page 3
2.0 SITE DESCRIPTION..... Page 3
3.0 NOISE IMPACT ASSESSMENT..... Page 3
3.1 Noise Criteria..... Page 3
3.2 Road Noise Levels…..... Page 4
4.0 RECOMMENDATIONS.....…… Page 5
4.1 Outdoor Living Areas.....…… Page 5
4.2 Indoor Noise levels…… Page 5
4.3 Ventilation/Warning Clauses……... Page 6
5.0 SUMMARY OF CONCLUSIONS.……..….. Page 6
6.0 CONCLUSIONS…….. Page 6

Figure 1 – SITE LOCATION
Figure 2 – SITE PLAN
Figure 3 - RECEPTOR LOCATIONS

APPENDIX "A"
Regional Traffic Data
Stamson Road Noise Calculating Data Sheets
Building Designs
407 Noise Monitoring Results
Email Correspondence

1.0 INTRODUCTION

dBA Acoustical Consultants Inc. has conducted a noise impact study for the proposed "2076 & 2086 Meadowbrook Road Townhouse" Development located at Lots 33 & 34, Registered Plan 1319, City of Burlington, Regional Municipality of Halton.

The purpose for this study is to determine the noise impact from Brant Street and Hwy 407 as required by the City of Burlington. There are two sites beside each other and known as 2076 & 2086 Meadowbrook Road Burlington ON. The proposed development is for 2076 Meadowbrook Road for the development of four (4) two (2) storey residential townhouse dwellings. 2086 Meadowbrook Road is proposed for three (3) two (2) storey residential dwellings. This study will detail noise impact relative to both proposed development and recommend noise control measures necessary (if applicable) to meet MOE Publication 300 "Stationary & Transportation Sources noise guidelines, while satisfying the planning requirements of City of Burlington and the Regional Municipality of Halton. Vibration was not considered as there are no CN\CP Rail lines or Heavy Industry in the area. Aircraft is not considered as there is no airport in the immediate vicinity of the development. Site Location is attached as Figure 1.

2.0 SITE DESCRIPTION

Proposed development of 2076 Meadowbrook is for four (4) two (2) storey residential townhouse dwellings. 2086 Meadowbrook Road is proposed for three (3) two (2) storey residential dwellings. To the north, and west are several two storey apartment style residential buildings. To the east and south are existing 2 storey single family residential homes. Site Plan is attached as Figure 2.

Brant Street is a 4-lane vehicular roadway with a posted speed of 60km/hr and is the main road noise source relative to both proposed developments. Brant Street has no noise impact on the proposed development as there is a 2. m noise barrier along the east portion of the rear yards of the residential properties on 2087 Meadowbrook Road. The noise barrier and shielding from established buildings provide ample noise mitigation from Brant Street vehicular traffic and confirmed using MOE Stamson traffic noise calculations attached in this report in Appendix A. The 407 is located approximately 180 meters northwest of the proposed development and has no traffic noise impact on the proposed developments. Several attempts to contact the owners of the 407 were made to no avail. Noise monitoring was conducted to confirm 407 traffic noise levels, and results are attached in Appendix "A". (See Figure 2, Site Plan)

3.0 NOISE IMPACT ASSESSMENT

3.1 NOISE CRITERIA

The Ministry of Environment (MOE) Publication 300 "Stationary & Transportation Sources noise guidelines specifies limits for road noise relative to new residential developments and is summarized as follows:

TABLE1- Road Traffic Sound Levels Limits	
Time Period	**Leq (dBA)**
07:00 – 23:00 (16 hr.)	55 Outdoor Living area
07:00 – 23:00 (16 hr.)	55 Plane of Window
23:00 – 07:00 (8 hr.)	50 Plane of Bedroom window

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. As this is considered a daytime use (0:700 -23:00) noise levels are calculated at the upper stored 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:

TABLE 2 –Noise Control Requirements

Time Period	Noise Level Leq (dBA)	Action Required
07:00 - 23:00 Daytime (OLA)	56 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"
07:00 – 23:00 Daytime (POW)	>60	Central A/C, Warning Clause "D"
07:00 – 23:00 Daytime (POW)	>65	Building Component Specification
23:00 to 07:00 Nighttime (POW)	> 50	Provision for A/C and Warning Clause Type "C"
23:00 to 07:00 Nighttime (POW)	> 55	Building Component Specification
23:00 to 07:00 Nighttime (POW)	> 60	Central Air and Warning Clause Type "D"

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

TABLE 3 - Indoor Road Sound Levels Limits

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

3.2 ROAD NOISE LEVELS

Road traffic noise levels were calculated for Brant Street relative to both the proposed developments. The Annual Average Daily Traffic (AADT) for Brant Street road traffic volumes was obtained from the Region of Halton Traffic Department dated 2014. The 16/8-hour L_{eq} with 90/10 split, as required by the MOE, was calculated for Brant Street. The percentage of annual growth was figured based on 2.0% over 25 years and truck volumes were factored at 3% of the total vehicle volume with 1.5% classified as medium and 1.5% heavy.

The future traffic noise levels were predicted using the data, and the MOE computer prediction program Stamson version 5.4. Table 4 following summarizes the future calculated traffic volume for Brant Street at both proposed developments.

Table 4 summarizes the prediction results for Brant Street road noise levels at front facade receptor locations. It confirmed by noise monitoring that noise from the 407 has no noise impact on either proposed development due to distance separation, elevation of 407 roadway, berm/barrier requirement for noise mitigation, and extensive shielding from existing dwellings separating the 407 and both developments.

TABLE 4 – Predicted Road Traffic Noise Levels		
Location	**07:00 – 23:00**	**23:00 – 07:00**
Both Townhouse Developments - Front Facades	35 dBA	45 dBA

2.0m Receiver Height - 1st Floor *7.0M Receiver Height – 2nd Floor*

4.0 RECOMMENDATIONS - NOISE CONTROL

4.1 OUTDOOR LIVING AREAS

All proposed residential dwellings are provided with small rear yard outdoor living area (OLA). Traffic noise levels are below the minimum noise levels noted in Table 1 for outdoor amenity spaces and therefore; mitigation measures are not required.

4.2 INDOOR NOISE LEVELS

Predicted noise levels at the outside front façades of all townhouse units for both developments were used to determine the appropriate building components to satisfy MOE indoor sound level limits. The building components are specified using the STC method.

Indoor building design specifications were made available prior to report writing, therefore STC calculations summarized in Table 5 following with minimum window door and wall construction are specified for each room. The STC was calculated for each room type, based on typical window to floor ratios of 20% for bedrooms and 30% for living areas. A maximum of two components were factored per room. See Figure 3 for Receptor Locations for both developments.

Central air conditioners are not required for any units throughout either developments. Casement windows noted in the following Table 5 and required throughout the complete development.

TABLE 5 – Recommended Wall and Window Construction for All Lots			
LOCATION	**STC Value to be used**	**Wall Construction**	**Window Glazing***
All Lots			
Bedroom	**25**	**OBC**	3mm (16mm) 3mm
Living room	**21**	**OBC**	3mm (16mm) 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.*

4.3 VENTALATION/WARNING CLAUSES

In addition to the inclusion of the specified minimum building components, warning clauses are not required for this development as they are well below the minimum noise limits noted in Table 1.

5.0 SUMMARY OF RECOMMENDATIONS

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

- The proposed development outdoor living areas, mitigation measures for OLA's are not required.
- The window and wall construction of OBC is required throughout the developments.

6.0 CONCLUSIONS

dBA Acoustical Consultants Inc. has conducted a noise impact study for the proposed "2076 & 2086 Meadowbrook Road Townhouse" Development located at Lots 33 & 34, Registered Plan 1319, City of Burlington, Regional Municipality of Halton.

This study determined the noise impact from Brant Street and Hwy 407 as required by the City of Burlington. The two sites beside each other are known as 2076 & 2086 Meadowbrook Road Burlington ON. The proposed development is for 2076 Meadowbrook Road for the development of four (4) two (2) storey residential townhouse dwellings. 2086 Meadowbrook Road is proposed for three (3) two (2) storey residential dwellings. This study detailed noise impact relative to both proposed developments and recommend no noise control measures necessary to meet MOE Publication 300 "Stationary & Transportation Sources noise guidelines, while satisfying the planning requirements of City of Burlington and the Regional Municipality of Halton.

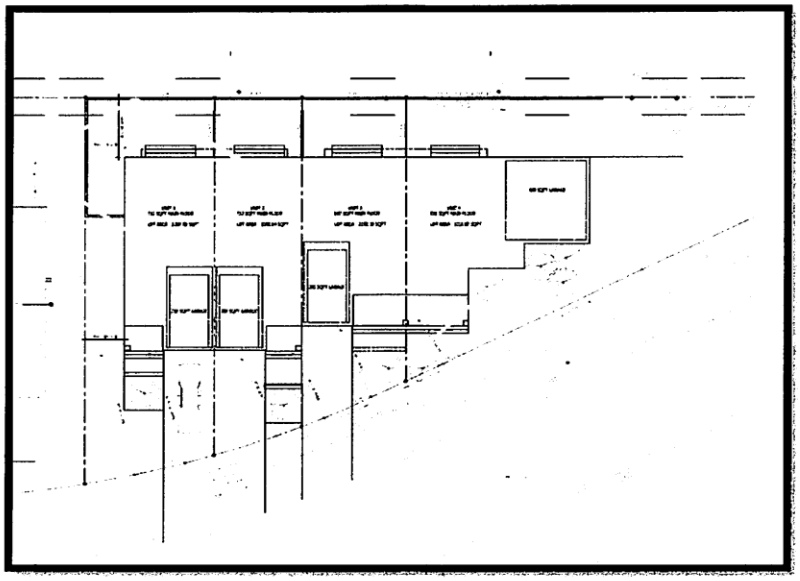
FIGURE 1
SITE PLAN



FIGURE 2

SITE PLANS

2076 Meadowbrook Dr



2086 Meadowbrook Dr

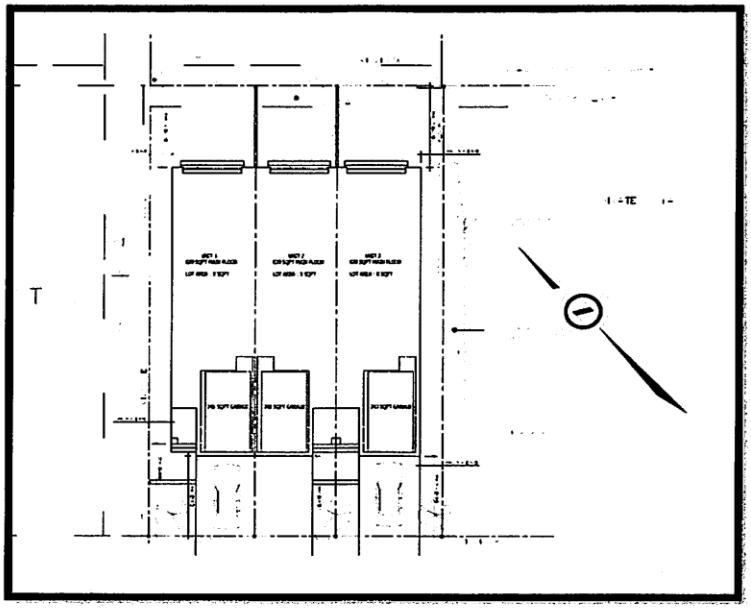
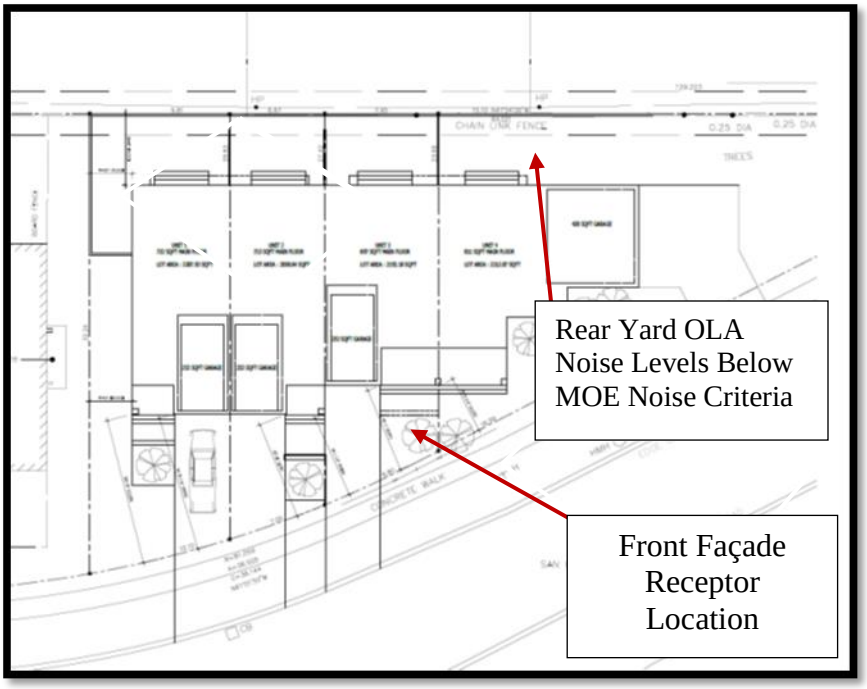
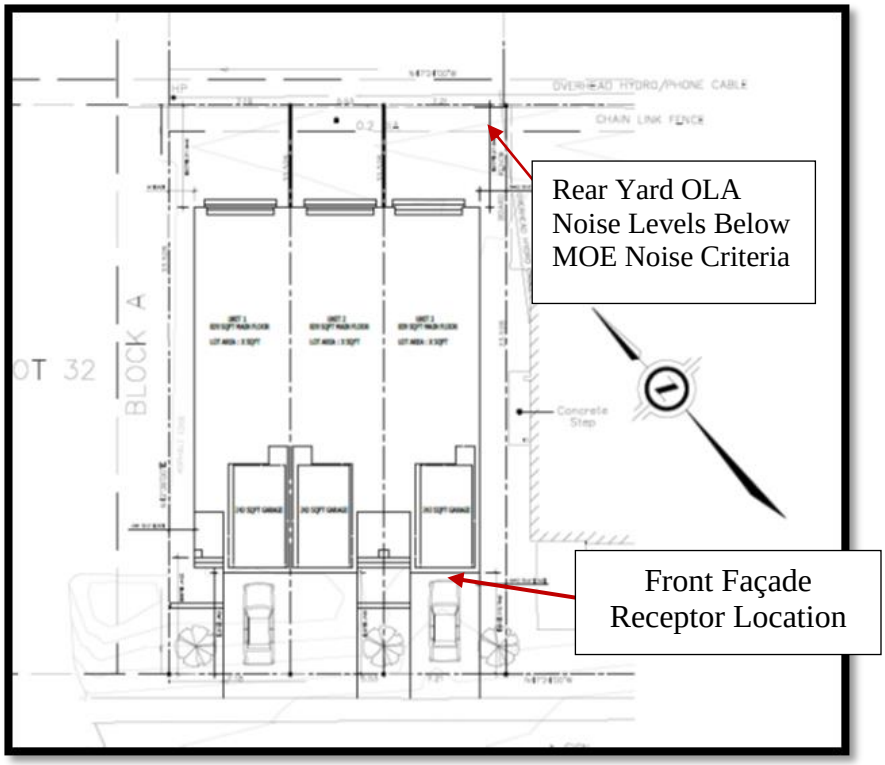


FIGURE 3
RECEPTORS LOCATIONS
2076 Meadowbrook Dr

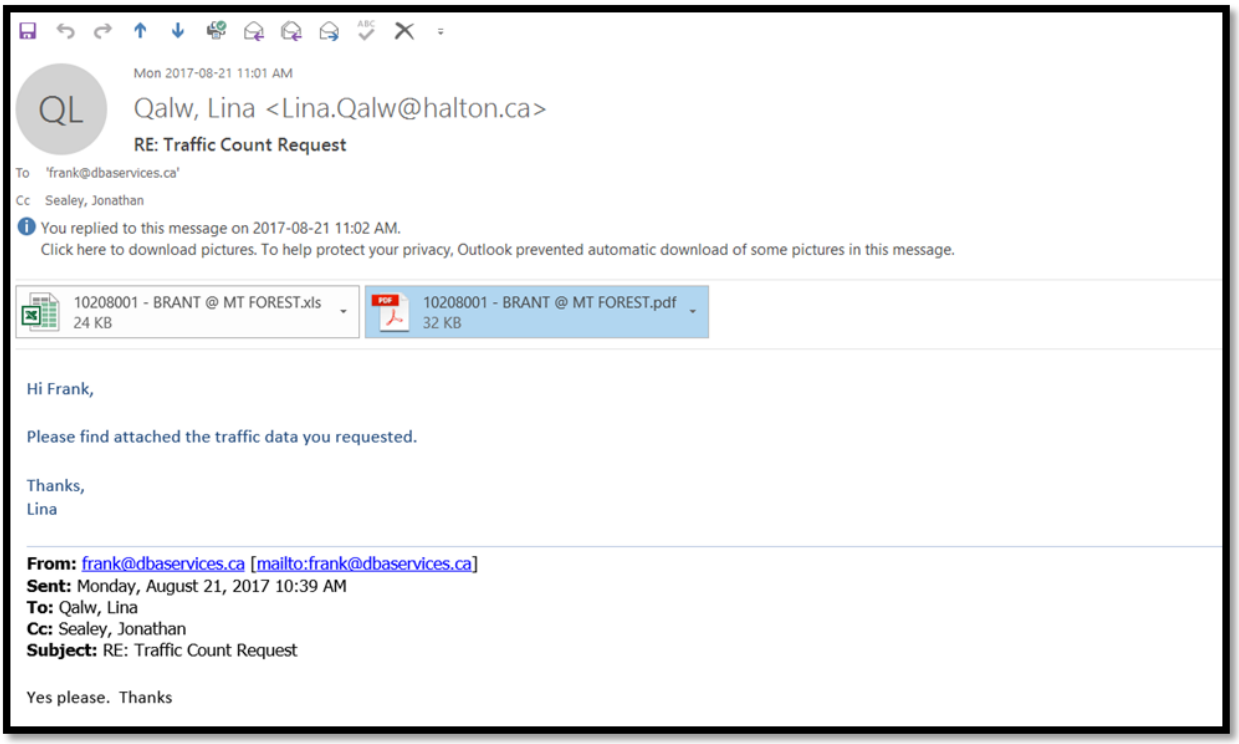


2086 Meadowbrook Dr



APPENDIX "A"

HALTON REGION EMAIL TRAFFIC DATA



Mon 2017-08-21 11:01 AM

QL Qalw, Lina <Lina.Qalw@halton.ca>

RE: Traffic Count Request

To 'frank@dbaservices.ca'

Cc Sealey, Jonathan

You replied to this message on 2017-08-21 11:02 AM.
Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.

10208001 - BRANT @ MT FOREST.xls 24 KB

10208001 - BRANT @ MT FOREST.pdf 32 KB

Hi Frank,

Please find attached the traffic data you requested.

Thanks,
Lina

From: frank@dbaservices.ca [mailto:frank@dbaservices.ca]
Sent: Monday, August 21, 2017 10:39 AM
To: Qalw, Lina
Cc: Sealey, Jonathan
Subject: RE: Traffic Count Request

Yes please. Thanks

Brant St @ Mt Forest Dr

Total Count Diagram

Municipality: Halton Region
Site #: 0000002186
Intersection: Brant St & Mt Forest Dr
TFR File #: 6
Count date: 6-Oct-2014

Weather conditions:
Partly Cloudy/Dry
Person(s) who counted:
Bronek

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total: 16375
North Entering: 8477
North Peds: 76
Peds Cross: ⋈

Heavys	0	124	13	137
Trucks	0	174	10	184
Cars	10	7593	553	8156
Totals	10	7891	576	

Heavys	112
Trucks	178
Cars	7608
Totals	7898

East Leg Total: 4233
East Entering: 2388
East Peds: 53
Peds Cross: ⧖

Heavys	Trucks	Cars	Totals
0	0	68	68

Driveway

Brant St

Cars	Trucks	Heavys	Totals
610	12	9	631
9	0	0	9
1696	27	25	1748
2315	39	34	

N
W E
S

Heavys	Trucks	Cars	Totals
0	1	13	14
0	0	7	7
0	2	38	40
0	3	58	

Mt Forest Dr

Cars	Trucks	Heavys	Totals
1769	35	41	1845

Brant St

Peds Cross: ⧖
West Peds: 53
West Entering: 61
West Leg Total: 129

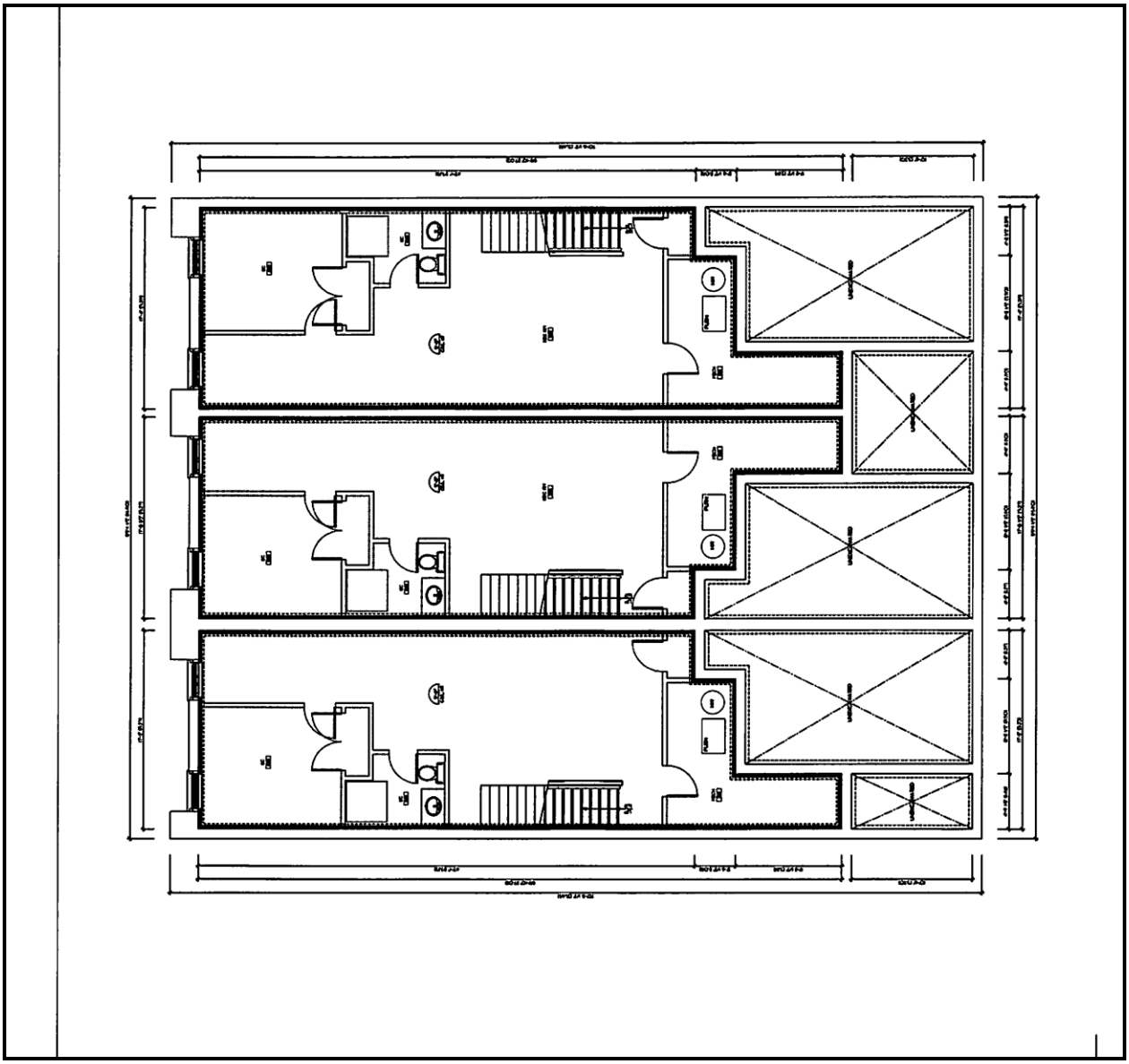
Cars	9327
Trucks	203
Heavys	149
Totals	9679

Cars	49	6985	1209	8243
Trucks	0	165	25	190
Heavys	0	103	28	131
Totals	49	7253	1262	

Peds Cross: ⋈
South Peds: 28
South Entering: 8564
South Leg Total: 18243

Comments

```
STAMSON 5.04        SUMMARY REPORT        Date: 26-02-2018 14:41:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename:  Brant & 407 Combined  Time Period: Day/Night 16/8 hours
Description: Brant Street Free Field
                      TOTAL Leq FROM ALL SOURCES       (DAY): 35.26
                                                       (NIGHT): 42.14
Noise Levels Combined with 407 Noise Monitoring Results Total
                                                       (DAY): 36.56
                                                       (NIGHT): 45.14
Road data, segment # 1: Brant St (day/night)
-----------------------------------------
Car traffic volume  : 22614/2513  veh/TimePeriod  *
Medium truck volume :   350/39    veh/TimePeriod  *
Heavy truck volume  :   350/39    veh/TimePeriod  *
Posted speed limit  :    60 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):  15789
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  25.00
    Medium Truck % of Total Volume     :   1.50
    Heavy Truck  % of Total Volume     :   1.50
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 1: Brant St (day/night)
-----------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      4 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 270.00 / 270.00 m
Receiver height           :   1.50 / 7.00   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.Brant St          !     1.11 !    35.26 !    35.26
--------------------+---------+---------+---------
                       Total                  35.26 dBA
Result summary (night)
----------------------
                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Brant St          !     1.11 !    42.14 !    42.14
```



407 MONITORING LOCATION

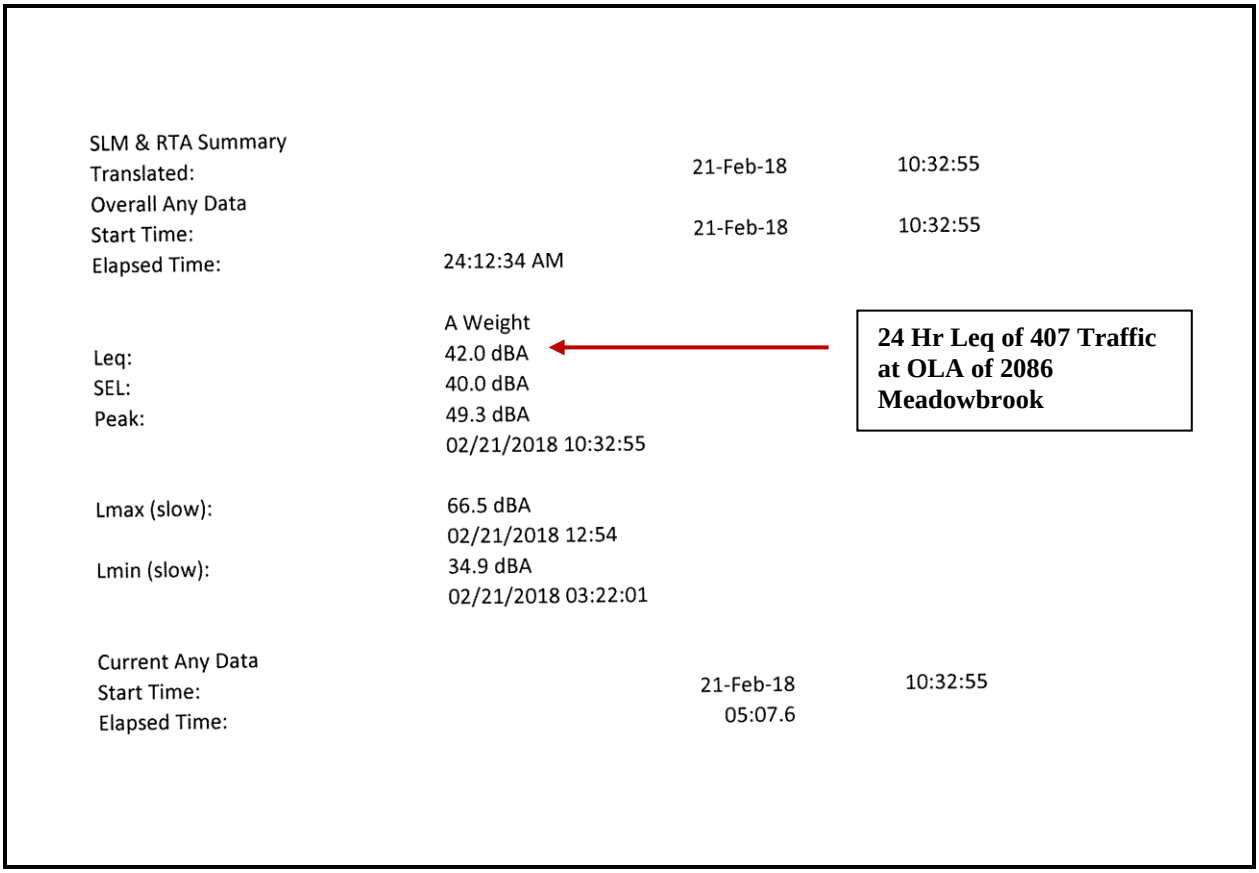


270m from Front Façade to Brant St
187m from 407 Hwy to Rear Yard OLA
NOTE: 407 Elevation – 123
407 TOW (Top of Wall) Elevation 130
Site Elevation – 122

Total Difference in Elevation of the 407 is 8m overall. The total berm/barrier height from the rear yards of the Residential Properties Abutting the 407 is 4m. The 407 Berm/Barrier and the Shielding from the Residential Buildings Provides Significant Noise Reduction From Both the 407 Hwy and Brant St as confirmed in Noise Monitoring February 21-22, 2018 Attached.

NOISE MONITORING RESULTS
FEBRUARY 21 & 22, 2018

Sound Level Meter / RTA Settings			
Translated:		21-Feb-18	10:32:55
File Translated:			
Model Number:		824	
Serial Number:	A0283		
Firmware Rev:		4.05	
Software Version:		3.12	
Name:	Meadowbrook Dr		
Descr1:	407 Traffic Noise		
Descr2:	30m From 407 on Meadowbrook		
Setup:	SLM&RTA.ssa		
Setup Descr:	SLM & Real-Time Analyzer		
Sound Level Meter / RTA Settings			
Bandwidth:		1	
Detector:	Slow		
Weighting:	A		
Peak-1 Weighting:	Flat		
Second Display:	TWA		
Gain:		0	
RTA Detector:	Fast		
RTA Weighting:	A		
AC Output Control:	AC-1 AC-2		
Intervals			
Intervals:	Enabled		
Interval Period:		1:00:00	
Time History			
Time History:	Disabled		
Time History Period:		8	
Time History Units:	1/32 seconds		
Resolution:		0.1 dB	
Timer			
Timer Mode:	On		
Start Date:		21-Feb-18	10:32:55
Stop Date:		22-Feb-18	10:45:21
Start Time 1:		10:32:55	
Stop Time 1:		10:45:21	
824 System Settings			
Translated:		21-Feb-18	10:32:55
Calibration		21-Feb-18	
Calibrator S/N:	not set		
Calibrator Level:		114 dB	
Auto. Calibration:	No		
Calibration Time:		10:30:11	



Note:
Noise monitoring of the 407 Hwy was conducted at a representative of the OLA's of 2086 Meadowbrook Rd. Noise monitoring was conducted over a 24hr period.

The daytime/nighttime volume ratio relative to highways is typically calculated using a 67/33 split, however for the 407, a 24-hour assessment is required by the MOE. The maximum posted speeds for all vehicles are 100 km/hr.