ENVIRONMENTAL NOISE IMPACT STUDY

"COMMERCIAL/RESIDENTIAL CONDOMINIUM DEVELOPMENT"

Plan of Part of Lots 9 & 10 Block "L"
Registered Plan 92
Known as Municipal As 2085 Pine Street
Being in the City of Burlington,
Regional Municipality of Halton

Prepared for:

Pine Street Burlington Corp.
1039 Fourth Line
Milton, ON
L9T 6P9

Prepared By:



Melissa MacLean
Vice President

April 2019

Our File No: 2019-1117

dBA Acoustical Consultants Inc.
P.O Box 32059
1447 Upper Ottawa St
Hamilton ON
L8W 3K0

TABLE OF CONTENTS

1.0 INTRODUCTION..... Page 3
2.0 SITE DESCRIPTION..... Page 3
3.0 NOISE IMPACT ASSESSMENT..... Page 4
3.1 Noise Criteria..... Page 4
3.2 Road Noise……..... Page 5
4.0 RECOMMENDATIONS.....…… Page 5
4.1 Outdoor Living Areas.....…… Page 5
4.2 Indoor Noise levels…… Page 6
5.0 STATIONARY SOURCES……. Page 6
5.1 Regulatory Context…… Page 6

6.0 SUMMARY OF CONCLUSIONS..... Page 7

7.0 CONCLUSIONS…….. Page 7

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

APPENDIX "A"
City of Burlington Traffic Data
Stamson Traffic Data Calculations
Building Designs

1.0 INTRODUCTION

dBA Acoustical Consultants Inc. has prepared a noise impact study on behalf of Pine Street Burlington Corp., 1039 Fourth Line, Milton ON "Commercial/Residential Condominium Development" located at 2085 Pine Street, City of Burlington, Regional Municipality of Halton.

The purpose of the study is to determine the noise impact from Lakeshore Rd vehicular traffic, car ramp, Generator, and rooftop HVAC units, that may impact area residential properties as required for approval for the City of Burlington. Proposed for the development is a (11) ten storey commercial/residential building consisting of the (39) forty residential units.

This study will detail noise impact relative to the site plan and recommend noise control measures necessary (if applicable) to meet MOE guidelines while satisfying the planning requirements of the City of Burlington and Regional Municipality of Halton. Vibration is not considered as there are no heavy industry or railway lines within the required setback distances. Aircraft is not a concern as the development is located outside the NEF 25 contour of any area Airports.

2.0 SITE DESCRIPTION

The proposed development property is located on the north side of Pine Street west of Martha Street and east of Pearl Street, Burlington ON. The proposed site is situated in an existing commercial/residential area. Immediately to the west of the proposed development are existing commercial buildings and a church. To the immediate south and east of the proposed development are existing 3 storey family dwellings and commercial/residential properties. Key Plan attached as Figure 1.

Lakeshore Rd, a 3-lane roadway, is the major road noise source located approximately 127 metres running east and west to the proposed site. The proposed site is mostly shielded from Lakeshore Road vehicular traffic by several large high-rise apartment buildings located on Pearl Street at Lakeshore Rd and to the east on Martha Street. Proposed for the north-west corner of Martha Street and Lakeshore Rd is a large high-rise condo complex. That high-rise condo will further reduce traffic noise levels at the proposed site development.

Noise impact was not considered for area roadways as traffic volumes are below MOE requirements. Traffic angles were not considered in this report for the large high-rise condo buildings located on Lakeshore Road and will considerable reduce any traffic noise from the roadway. We consider this the ultimate worst-case scenario for this project from traffic noise impact from Lakeshore Road. See Figure 2 for Site Plan.

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 NPC-300 entitled "Stationary & Transportation Sources-Approval & Planning, specifies the criteria, 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. 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:

TABLE 2 –Noise Control Requirements		
Time Period	**Noise Level Leq (dBA)**	**Action Required**
07:00 - 23:00 Daytime (OLA)	56 to 60	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)	>65	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)	> 60 > 60	Building Component Specification 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
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 Lakeshore Road, the major road noise source in the site area. The 2016 AADT road traffic volumes were sourced from the *City of Burlington Traffic Department website.* The MOE computer program STAMSON version 5.04 was used to carry out prediction calculations (See Appendix "A").

Traffic data is summarized in Table 4 with Lakeshore Road surface as absorptive. The daytime/nighttime volume ratios relative to roadways are typically calculated using a 90/10 split and a 16/8hr assessment as required by the MOE.

The maximum posted speed for all vehicles on Lakeshore Road is 50 km/hr. The percentage of annual growth was figured at 2.0% over 12 years. The AADT (Annual Average Daily Traffic) volumes used are reflective of the worst-case scenario. Lakeshore Road is not a designated truck route.

Truck volumes were factored at 1.0% medium and 1.0% heavy of the total vehicle volumes for each roadway segment.

TABLE 4 – Future Road Traffic Volumes (Lakeshore Rd)			
Location	**AADT - 20874 Vehicles**		
	Cars	**Medium Trucks**	**Heavy Trucks**
Day	**18411**	**188**	**188**
Night	**2046**	**21**	**21**

Table 5 summarizes the "free field" traffic noise prediction results, modeled at 2 receptor locations representative of balconies and south building facades for the first floor residential and top residential floors. (See Figure 3 Receptor Locations).

TABLE 5 – Predicted Future Traffic Noise (dBA) Lakeshore Rd		
Location	**07:00 – 23:00**	**23:00 – 07:00**
R1- 1st Floor (Residential) (4.5m) South Side	42	43
R2- Top Floor (Residential) (26m) South Side	49	49

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. The draft plan for the proposed development includes unit's standard apartment style balconies which are not considered an outdoor amenity space for any residential units as the balconies does not exceed 4m in depth. As a result, no noise mitigation measures are required.

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 residential units located on any residential floors. Specific building components (walls, windows, doors etc.) are not required for this development. Ontario Building Code (OBC) will suffice.

5.0 STATIONARY SOURCES

5.1 REGULATORY CONTEXT

The MOEE Publication NPC-300 entitled "Stationary and Transportation Sources-Approval & Planning defines a point of reception/receptor as *"any point_on the premises of a person where the sound or vibration originating from other than those premises is received."* The point of reception may be located on any of the following, or zoned for future use, premises including but not limited to the following: residential homes, hospitals, nursing/retirement homes, etc.

The areas surrounding of the proposed residential development are indicative of a "Class 1 Area" (Urban). The applicable sound limits are the higher of:

- The existing ambient sound level; or
- The minimum values of Table 6.

No restrictions apply to stationary sources if the one-hour equivalent sound exposure (Leq) is lower than the levels in the following Table 6.

TABLE 6
Minimum Sound Levels Limits (Class 1)

Time Period	L_{eq} (dBA)
07:00 - 19:00	50
19:00 - 23:00	47
23:00 – 07:00	45

HVAC units are proposed for this site development and will be located within a rooftop mechanical building and have no noise impact on area residential properties. A ground floor Generator is considered and will be addressed for noise compliance once the specific location and size of Generator is confirmed.

6.0 SUMMARY OF RECOMMENDATIONS

Noise control measures are not required to meet indoor and outdoor noise level levels as noted in Table 1 or Table 6.

7.0 CONCLUSIONS

dBA Acoustical Consultants Inc. has prepared a noise impact study on behalf of Pine Street Burlington Corp., 1039 Fourth Line, Milton ON "Commercial/Residential Condominium Development" located at 2085 Pine Street, City of Burlington, Regional Municipality of Halton.

The purpose of the study determined the noise impact from Lakeshore Rd vehicular traffic and rooftop HVAC units, have no noise impact on area residential properties and no recommended noise control measures are required for this development.

FIGURE 1
KEY PLAN

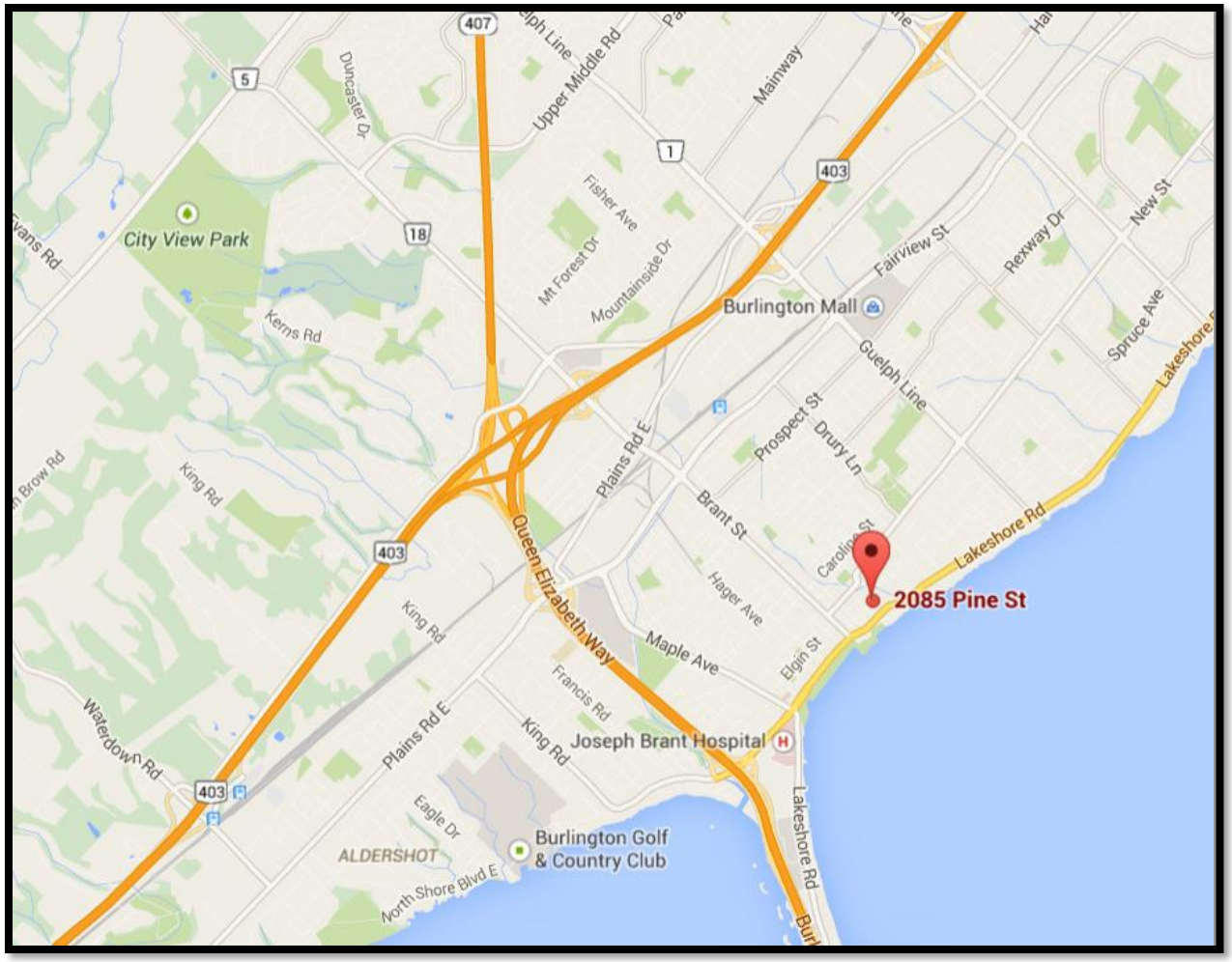


FIGURE 2
SITE PLAN

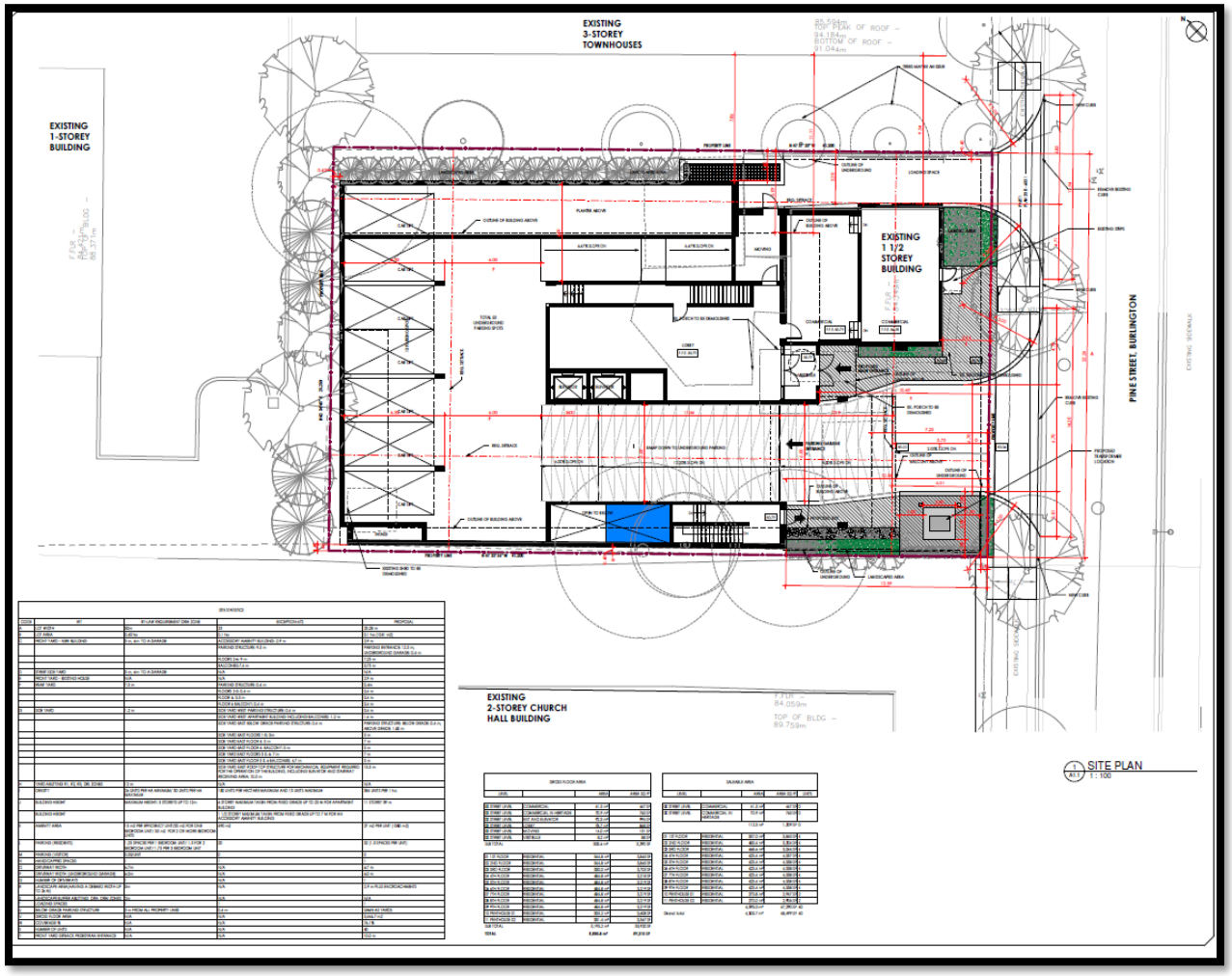
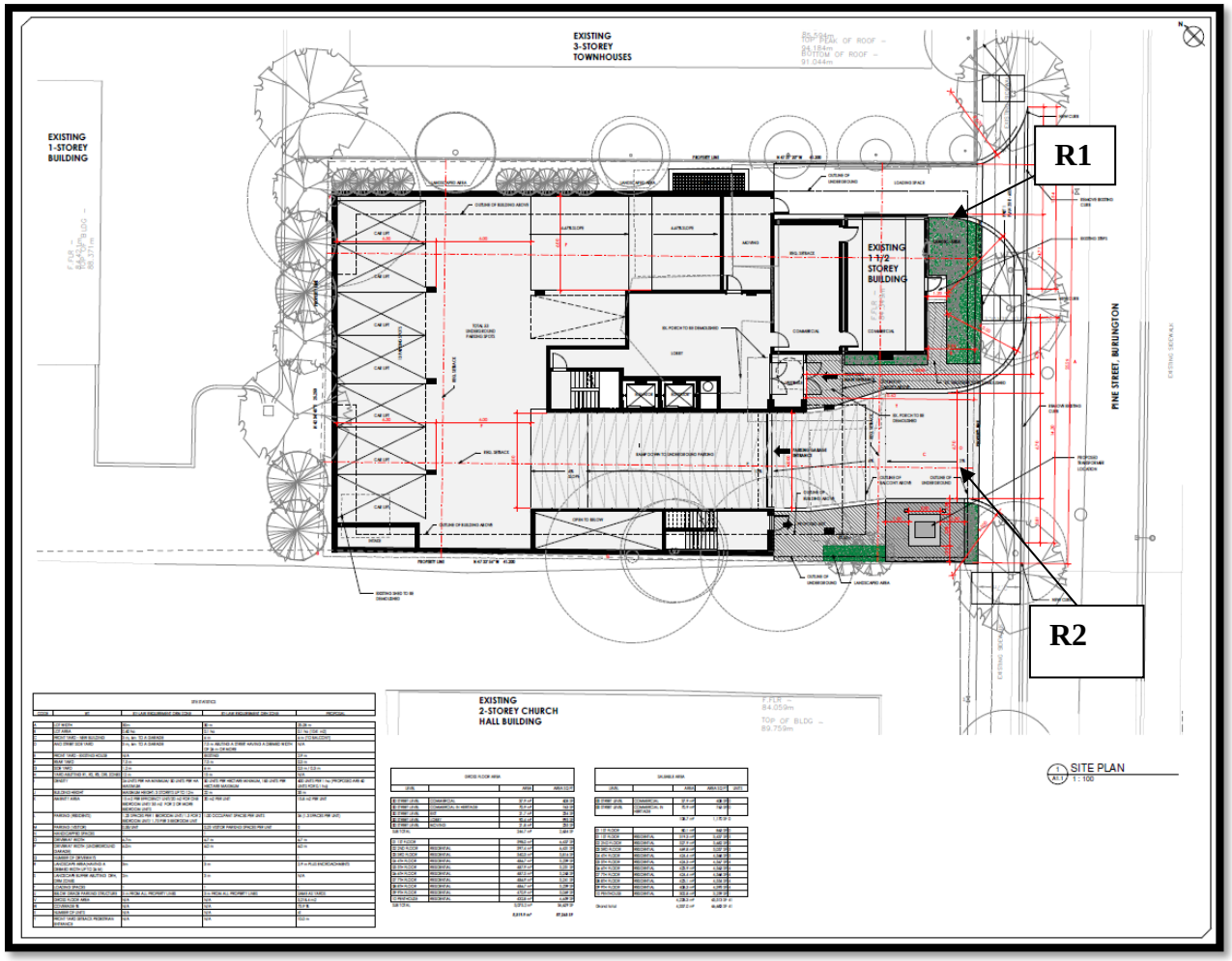


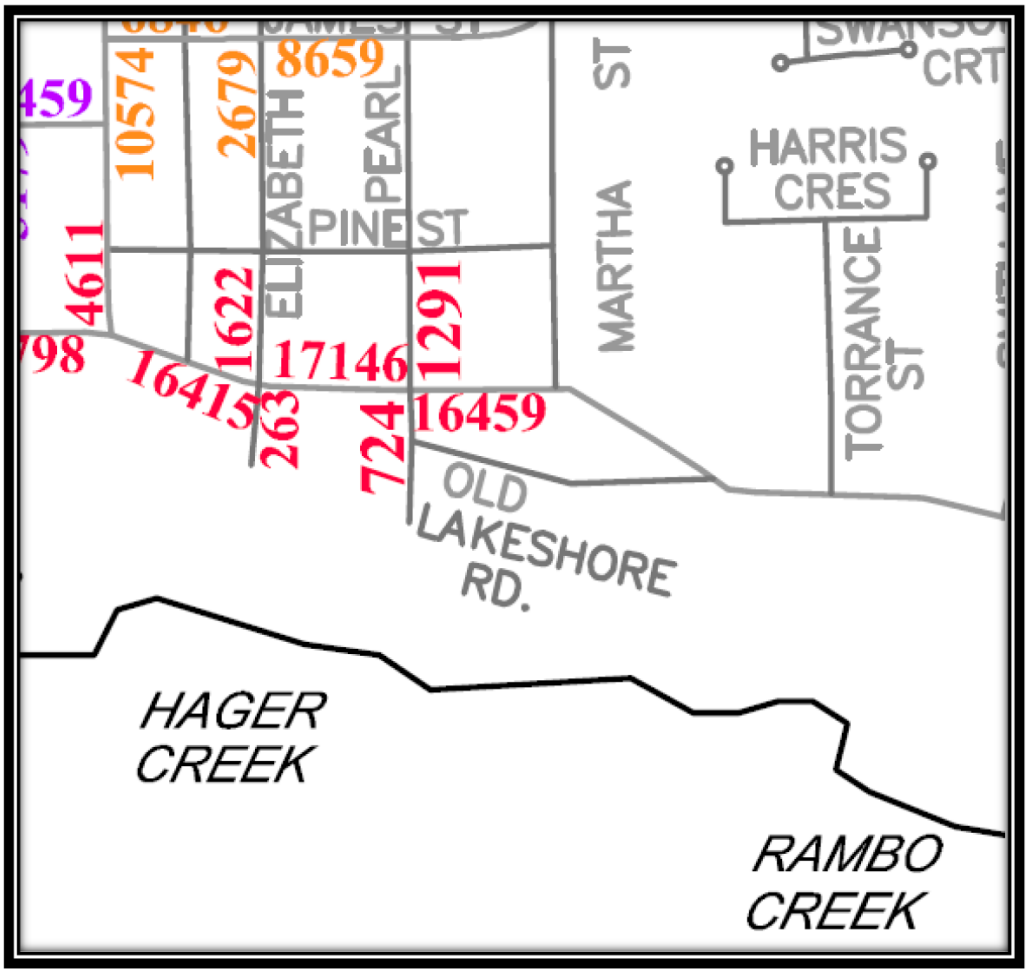
FIGURE 3
RECEPTOR LOCATIONS



R1-First Floor Residential
R2- Top Floor Residential

2016 CITY OF BURLINGTON

PINE STREET TRAFFIC DATA



LEGEND

2016 AADT
2015 AADT
2014 AADT
2013 AADT
2012 AADT

2016 AADT MAP

LAST REVISION: JULY 2017

City of Burlington

NOT TO SCALE

Reproduction of this map is prohibited without express permission of the Burlington Transportation Services Department.

Note: The volumes shown are the two-way annual average daily traffic (24 hour period).

© 1999 The Corporation of the City of Burlington All Rights Reserved

STAMSON CALCULATIONS

```
STAMSON 5.04        SUMMARY REPORT        Date: 07-09-2018 13:43:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: pine1.te              Time Period: Day/Night 16/8 hours
Description: R1- Second Floor Residential South Side Facade
             TOTAL Leq FROM ALL SOURCES        (DAY): 42.12
                                               (NIGHT): 42.68
Road data, segment # 1: Lakeshore Rd (day/night)
-----------------------------------------------
Car traffic volume  : 18411/2046  veh/TimePeriod  *
Medium truck volume :   188/21    veh/TimePeriod  *
Heavy truck volume  :   188/21    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  16459
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  12.00
    Medium Truck % of Total Volume     :   1.00
    Heavy Truck  % of Total Volume     :   1.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Lakeshore Rd (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 127.00 / 127.00 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.Lakeshore Rd     !     1.00 !    42.12 !    42.12
--------------------+---------+---------+---------
                      Total                  42.12 dBA

Result summary (night)
----------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Lakeshore Rd     !     1.00 !    42.68 !    42.68
--------------------+---------+---------+---------
                      Total                  42.68 dBA
```

```
STAMSON 5.04        SUMMARY REPORT        Date: 07-09-2018 13:45:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: pine2.te              Time Period: Day/Night 16/8 hours
Description: R2- Top Floor Residential South Side Facade
                 TOTAL Leq FROM ALL SOURCES              (DAY): 48.88
                                                        (NIGHT): 49.44
Road data, segment # 1: Lakeshore Rd (day/night)
----------------------------------------------
Car traffic volume  : 18411/2046  veh/TimePeriod  *
Medium truck volume :   188/21    veh/TimePeriod  *
Heavy truck volume  :   188/21    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  16459
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  12.00
    Medium Truck % of Total Volume     :   1.00
    Heavy Truck  % of Total Volume     :   1.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Lakeshore Rd (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 127.00 / 127.00 m
Receiver height           :  26.00 / 26.00  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.Lakeshore Rd      !     1.00 !    48.88 !    48.88
--------------------+---------+---------+---------
                       Total                  48.88 dBA

Result summary (night)
----------------------

                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !    (m)   !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Lakeshore Rd      !     1.00 !    49.44 !    49.44
--------------------+---------+---------+---------
                       Total                  49.44 dBA
```

Building Designs

