ENVIRONMENTAL NOISE IMPACT STUDY

"3-STOREY RESIDENTIAL TOWNHOUSE DEVELOPMENT"
PART OF LOT 44
CONCESSION 2
154 WILSON STREET EAST
GEOGRAPHICAL TOWNSHIP OF ANCASTER
NOW THE CITY OF HAMILTON

Prepared for:

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1.0 INTRODUCTION

dBA Acoustical Consultants Inc. has been retained by Valery Homes to provide a noise impact study for the proposed "3- Storey Townhouse Residential Development", known as 154 Wilson Street East, Part of Lot 44, Concession 2, Geographic Township of Ancaster, now in the City of Hamilton.

The purpose of the noise study is to determine the noise impact from Wilson Street East and area stationary noise sources (Hamilton Golf Course). This study will detail noise impacts at the proposed development and recommend noise control measures necessary (if applicable) to meet MOE Publication NPC-300, Stationary & Transportation Sources-Approval & Planning guidelines, while satisfying the planning requirements of the City of Hamilton. Vibration is not a concern as there are no railway lines in the vicinity.

2.0 SITE DESCRIPTION

Proposed for the site development are ten (10) 3-storey townhouse dwellings with rear yard outdoor amenity areas. The site property is located on the south side of Wilson Street East, approximately 650m east of Fiddlers Green Road and 610m west of Sulphur Springs Road, Ancaster ON. The proposed site is situated within a residential/commercial area. There are established 1-2 storey commercial properties located to the west and east of the proposed development. Located to the immediate south east are 2 storey residential dwellings. To the north and south of the proposed building are 2 storey residential dwellings.

To the south of the proposed development located approximately 40m from the southern limit of the property site is the Hamilton Golf and Country Club seasonal storage and maintenance buildings. Confirmed by an onsite inspection of the Hamilton Golf and Country Club, shielding the proposed property are storage sheds and mechanical maintenance sheds having an existing 2.0m wooden privacy fence. The maintenance shed contains lawn manicure equipment, and tools required to maintain and repair golf carts. Typical maintenance of golf carts and lawn care are conducted at low customer peak times during the warmer seasonal months. The Hamilton Golf and Country Club facility operations have no noise impact on the proposed development.

Located approximately 20m north of the proposed development is Wilson Street East and is considered the major noise source for vehicular traffic in this noise study. Wilson Street East is a 2-lane roadway with a centre-lane turn adjacent to the site with designated curb side bicycle paths and a posted speed limit of 50km/hr for all vehicles running east and west of the proposed site.

3.0 NOISE IMPACT ASSESSMENT

3.1 NOISE CRITERIA

The Ministry of Environment (MOE) specifies limits for road and rail noise relative to new residential developments. The MOE Publication 300 NPC-300, Stationary & Transportation Sources-Approval & Planning guidelines 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. As this is considered a daytime use (07:00 - 23:00) noise levels are calculated at the upper storey bedroom window to represent nighttime (23:00 - 07:00) periods.

Where noise levels estimated in the Outdoor Living Area (OLA) and at an upper storey window 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"
	> 60	Barrier & Warning Clause Type "B"
07:00 – 23:00 Daytime (POW)	>55	Provision for A/C, Warning Clause "C"
	>60	Central A/C, Warning Clause "D"
	>65	Building Component Specification
23:00 to 07:00 Nighttime (POW)	> 50	Provision for A/C & Warning Clause Type "C"
	> 55	Building Component Specification
	> 60	Central Air and Warning Clause Type "D"

Where nighttime noise levels exceed 55 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

Road traffic noise levels were calculated for Wilson Street East relative to the proposed development. Wilson Street East 2017 traffic data was sourced from the online City of Hamilton Transportation Data Management System for the Annual Average Daily Traffic (AADT) and is presented in Appendix "A". The traffic data was used to carry out prediction calculations using the MOE "Stamson - Version 5.4" computer program reflective of the worst-case scenario.

The daytime/nighttime volume ratio relative to Wilson Street East is typically calculated using a 90/10 split as required by the MOE and the City of Hamilton. The maximum posted speed for all vehicles is 50 km/hr.

The percentage of annual growth for Wilson Street East was figured at 2.0% over 11 years till 2031. Road traffic for area roadways has no noise impact due to minimal vehicular volumes. Truck volumes were factored at 2% medium and 3% heavy of the total vehicle volumes for Wilson Street East, with a road gradient and a topography elevation between the road and proposed development of 3m. Table 4 summarizes future traffic volumes and Table 5 represents the "free field" traffic noise prediction results, modeled at specified receptor locations representative of outdoor amenity spaces & building facades throughout the proposed development (See Figure 3 Receptor Locations).

First floor receptor noise levels are shielded due to existing residential and commercial dwellings surrounding the proposed development on Wilson Street East and the elevation difference between the proposed site and Wilson Street East. Wilson Street East was considered one segment east and westbound traffic from Fiddlers Green Road to Sulphur Springs Road.

TABLE 4 – Future Wilson Street East Traffic Volumes			
Wilson Street East	AADT 25069 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	21434	451	677
Night	2382	50	75

Free field predicted Wilson Street East noise levels at the east and west building facade is summarized in Table 5.

TABLE 5- Predicted Traffic Noise Levels-Free Field		
Location	L_{eq} (dBA)	
	07:00 - 23:00	23:00 - 07:00
R1- 1st Floor East & West Façade + OLA	51(1.5m)	46 (1.5m)
R2- 3rd Floor East Façade	54 (7.5m)	50 (7.5m)
R3- 1st Floor East & West Façade + OLA	53(1.5m)	45 (1.5m)
R4- 3rd Floor East & West Facade	53 (7.5m)	45 (7.5m)

4.0 RECOMMENDATIONS - NOISE CONTROL

4.1 OUTDOOR LIVING AREAS

For all receptors for the building, calculated road noise levels did not exceed the 55 dBA criteria outlined in Table 1 for rear yard outdoor amenity spaces for all townhouses and therefore noise mitigation measures are not required. Standard balconies are proposed and are not considered OLA's

4.2 INDOOR NOISE LEVELS

Specific building components (walls, windows etc.) are not required for this development project and Ontario Building Code (OBC) will suffice for all doors windows and exterior walls,

4.3 VENTILATION / WARNING CLAUSES

In addition to the inclusion of the specified minimum building components (OBC), for all townhouses as noted in Table 6 Warning Clauses are not required.

Prior to issuance of an occupancy permit, it is recommended the qualified acoustical consultant certify that the approved noise control measures have been properly installed.

5.0 SUMMARY OF RECOMMENDATIONS

The following noise control measures or equivalent are required to satisfy the indoor and outdoors noise level criterion:

- OBC throughout the development.

It is recommended that a qualified acoustical consultant certify that the required noise control measures have been incorporated into the builder's plans prior to issuance of a building permit.

Prior to issuance of an occupancy permit, it is recommended the qualified acoustical consultant certify that the approved noise control measures have been properly installed.

6.0 CONCLUSIONS

dBA Acoustical Consultants Inc. has been retained by Valery Homes to provide a noise impact study for the proposed "3- Storey Townhouse Residential Development", known as 154 Wilson Street East, Part of Lot 44, Concession 2, Geographic Township of Ancaster, now in the City of Hamilton.

The purpose of the noise study determined the noise impact from Wilson Street East and area stationary noise sources (Hamilton Golf and Country Club). This study detailed noise impacts at the proposed development and recommend no noise control measures are necessary to meet MOE Publication NPC-300, Stationary & Transportation Sources-Approval & Planning guidelines, while satisfying the planning requirements of the City of Hamilton.

FIGURE 1
KEY PLAN

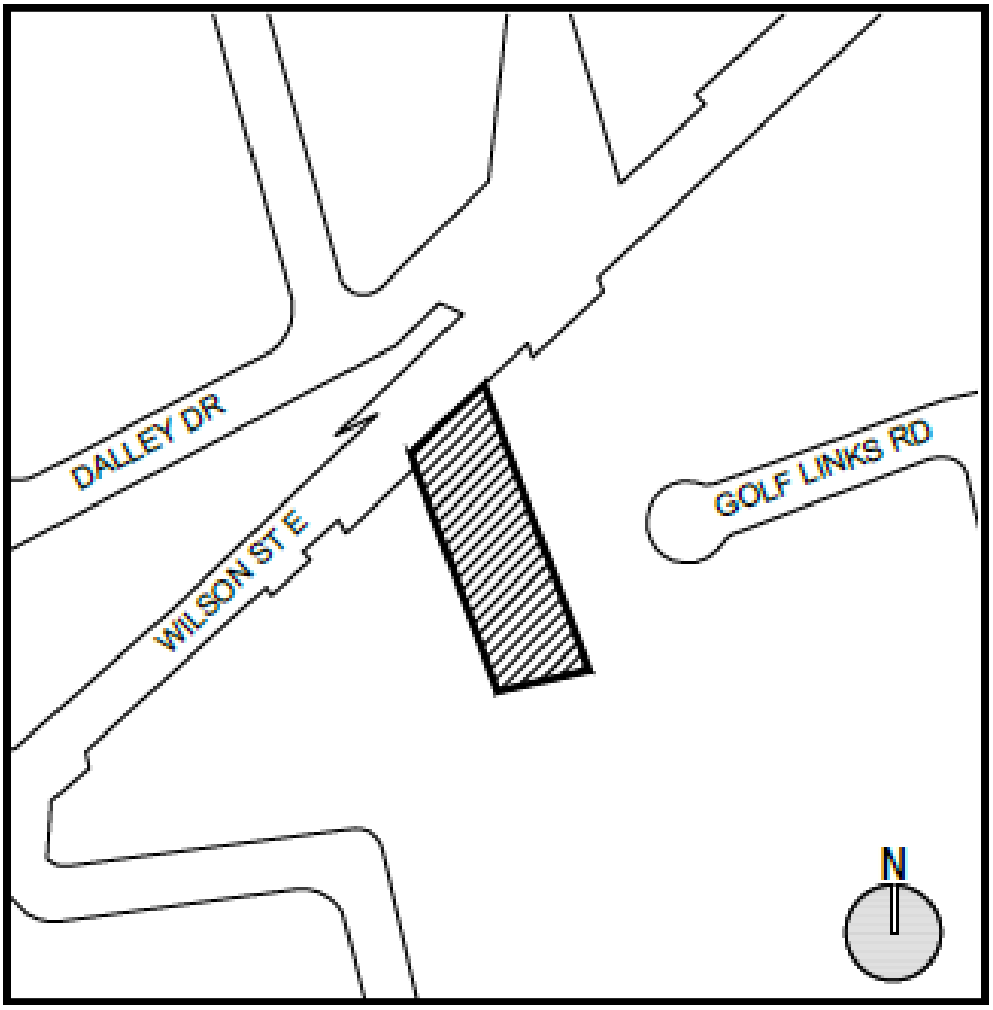


FIGURE 2
SITE PLAN

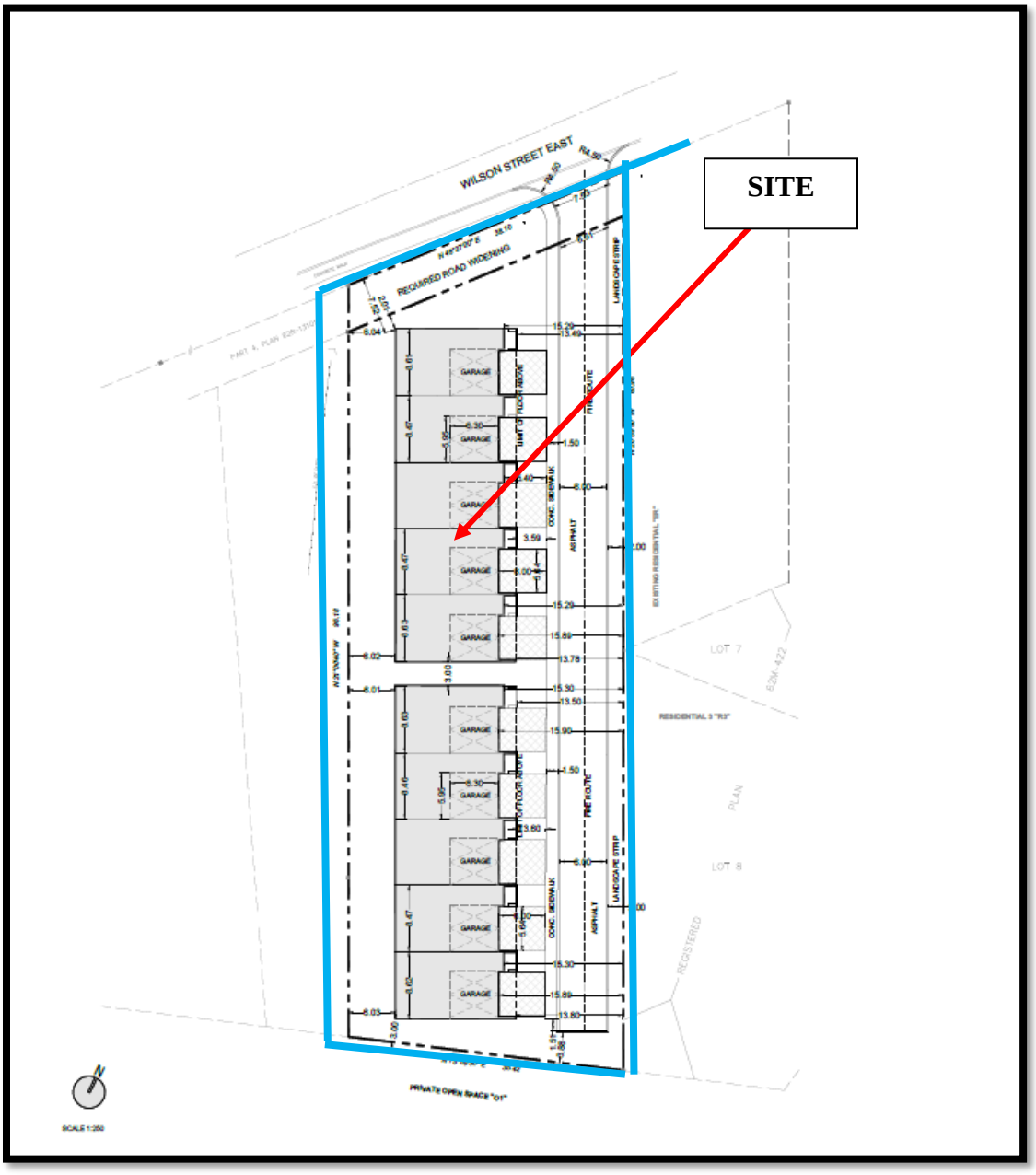
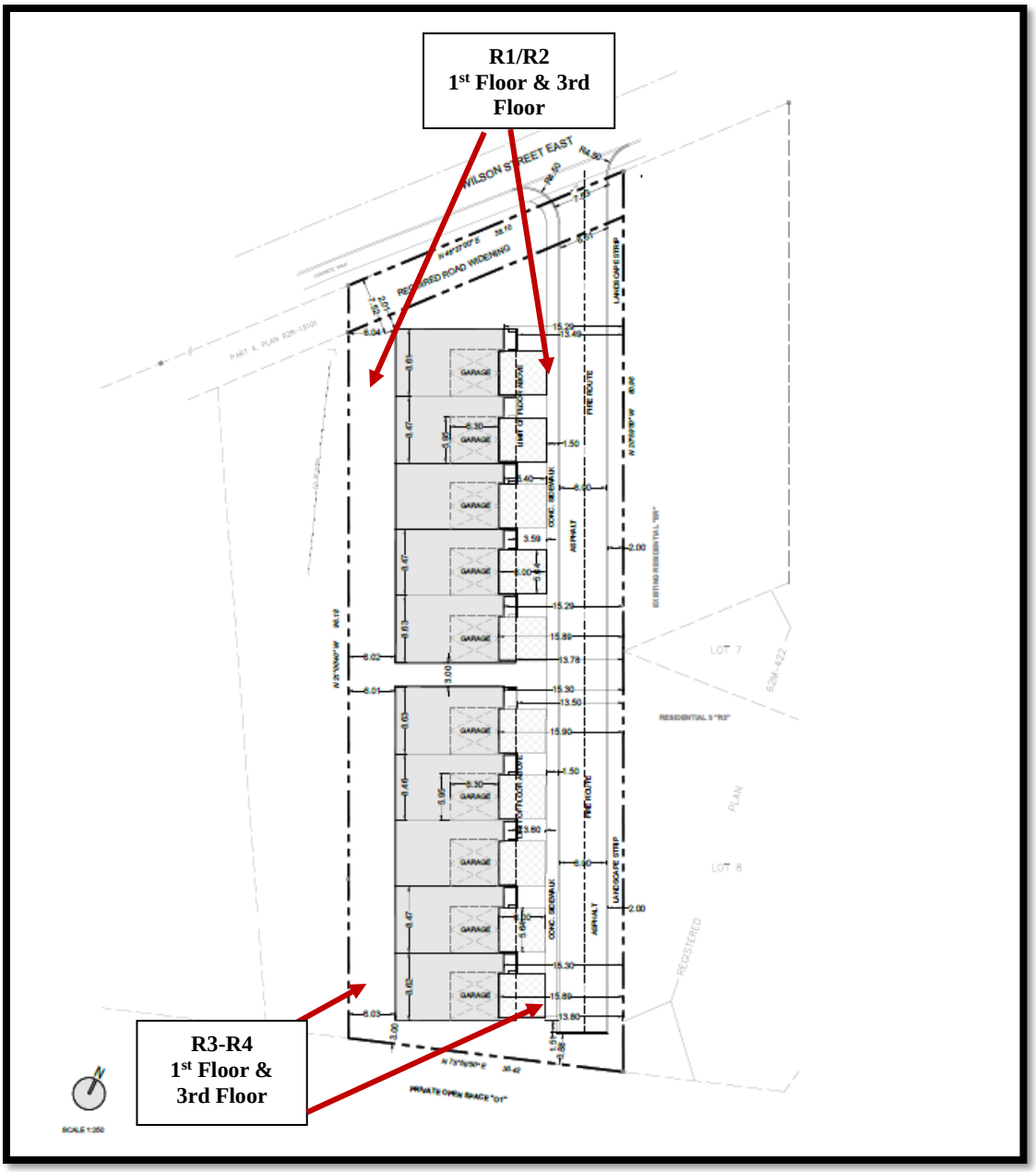
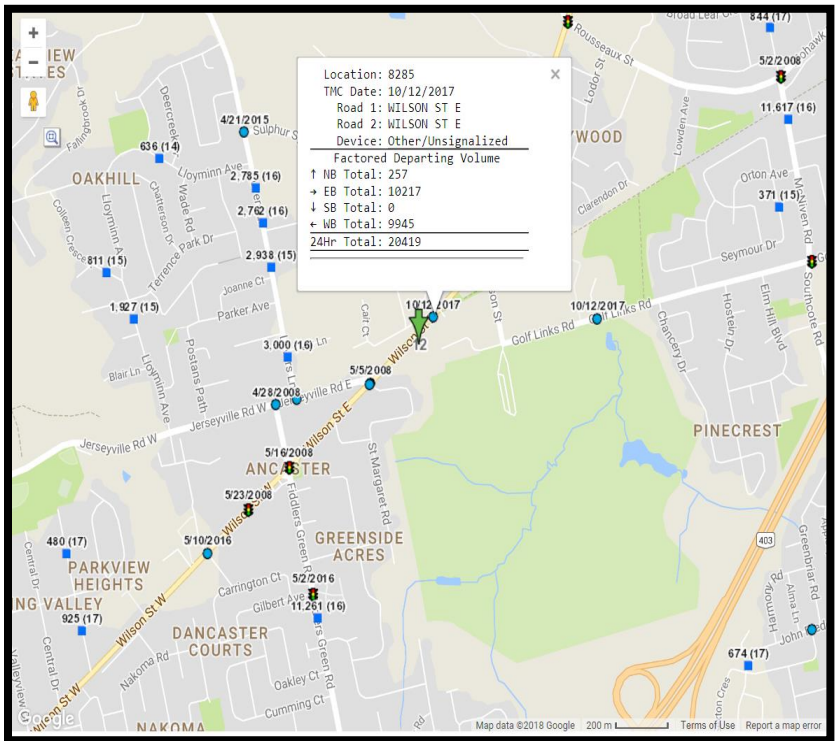


FIGURE 3
RECEPTOR LOCATIONS



APPENDIX "A"

2017 CITY OF HAMILTON TRAFFIC DATA



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STAMSON 5.04        SUMMARY REPORT        Date: 17-08-2021 12:18:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: wilsonr1.te          Time Period: Day/Night 16/8 hours
Description: R1-East & West Side Facade OLA
                 TOTAL Leq FROM ALL SOURCES        (DAY): 50.59 (OLA)
                                                   (NIGHT): 46.45
Road data, segment # 1: Wilson St E (day/night)
-----------------------------------------------
Car traffic volume  : 21434/2382  veh/TimePeriod  *
Medium truck volume :   451/50    veh/TimePeriod  *
Heavy truck volume  :   677/75    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):  20162
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  11.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   3.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Wilson St E (day/night)
---------------------------------------------
Angle1   Angle2           : -35.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   2.79 m
Reference angle           :   0.00

Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Wilson St E      !     1.32 !    50.59 !    50.59
--------------------+---------+---------+---------
                      Total                  50.59 dBA
Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Wilson St E      !     1.32 !    46.45 !    46.45
--------------------+---------+---------+---------
                      Total                  46.45 dBA
```

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STAMSON 5.04        SUMMARY REPORT        Date: 17-08-2021 12:19:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: wilsonr2.te          Time Period: Day/Night 16/8 hours
Description: R2- 3rd Floor East Side Facade OLA
                 TOTAL Leq FROM ALL SOURCES        (DAY): 53.80
                                                   (NIGHT): 49.66
Road data, segment # 1: Wilson St E (day/night)
-----------------------------------------------
Car traffic volume  : 21434/2382  veh/TimePeriod  *
Medium truck volume :   451/50    veh/TimePeriod  *
Heavy truck volume  :   677/75    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):  20162
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  11.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   3.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Wilson St E (day/night)
-----------------------------------------------
Angle1   Angle2           : -35.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   2.79 m
Reference angle           :   0.00

Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Wilson St E      !     1.32 !    53.80 !    53.80
--------------------+---------+---------+---------
                      Total                  53.80 dBA
Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Wilson St E      !     1.32 !    49.66 !    49.66
--------------------+---------+---------+---------
                      Total                  49.66 dBA
```
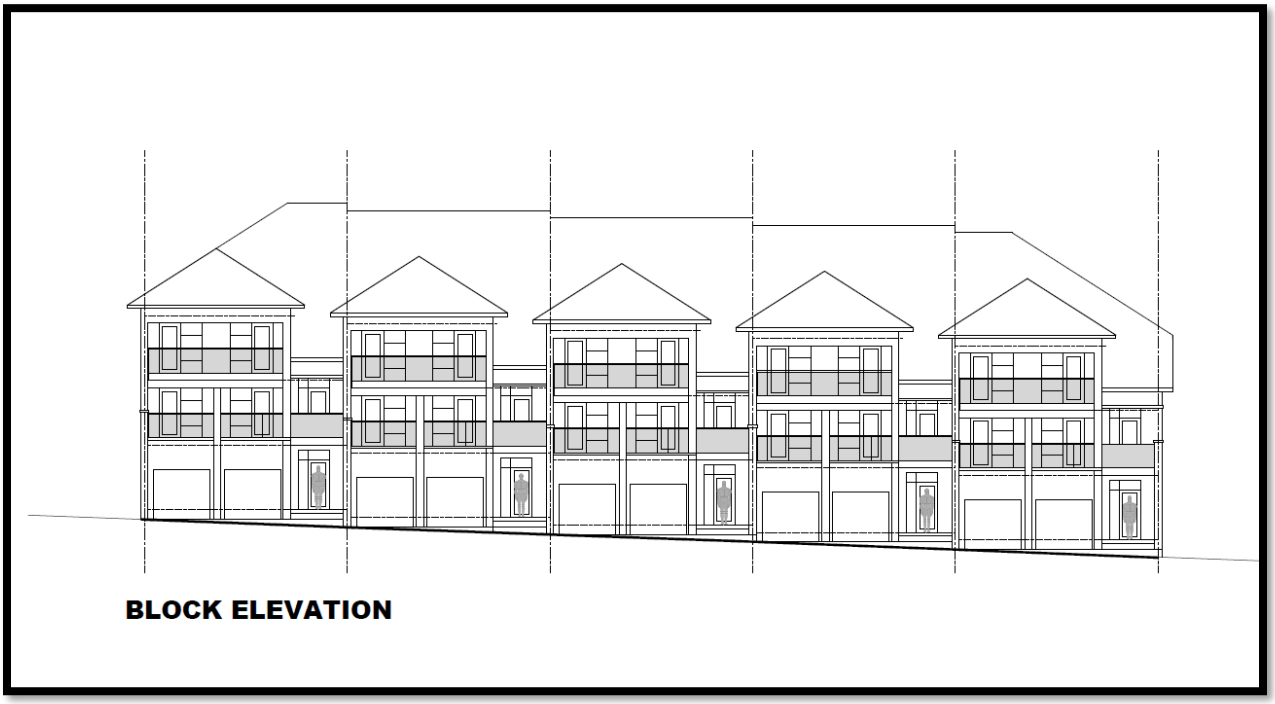
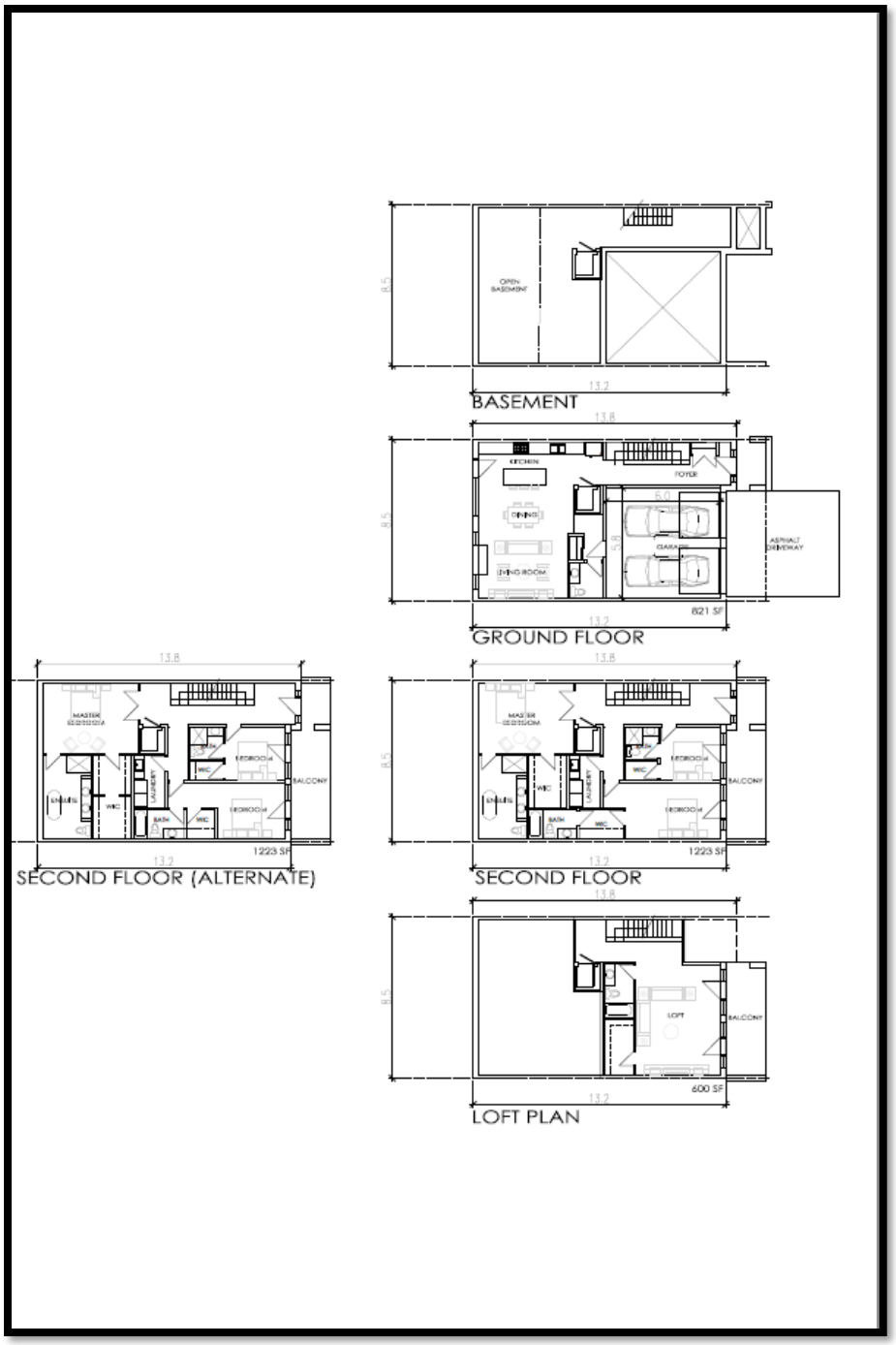

```
STAMSON 5.04        SUMMARY REPORT        Date: 17-08-2021 12:27:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: wilsonr3.te          Time Period: Day/Night 16/8 hours
Description: R3- 1st Floor East & West Side Facade OLA
                      TOTAL Leq FROM ALL SOURCES   (DAY): 53.19 (OLA)
                                                   (NIGHT): 46.65
Road data, segment # 1: Wilson St E (day/night)
-----------------------------------------------
Car traffic volume  : 21434/2382  veh/TimePeriod  *
Medium truck volume :   451/50    veh/TimePeriod  *
Heavy truck volume  :   677/75    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):  20162
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  11.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   3.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Wilson St E (day/night)
-----------------------------------------------
Angle1   Angle2           : -35.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 100.00 / 100.00 m
Receiver height           :   1.50 / 1.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   3.77 m
Reference angle           :   0.00

Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Wilson St E      !     1.32 !    53.19 !    53.19
--------------------+---------+---------+---------
                      Total                  53.19 dBA
Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Wilson St E      !     1.32 !    46.65 !    46.65
--------------------+---------+---------+---------
                      Total                  46.65 dBA
```

```
STAMSON 5.04        SUMMARY REPORT        Date: 17-08-2021  12:25:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: wilsonr4.te          Time Period: Day/Night 16/8 hours
Description: R4- top Floor East & West Side Facade OLA
                     TOTAL Leq FROM ALL SOURCES        (DAY): 53.19
                                                       (NIGHT): 46.65
Road data, segment # 1: Wilson St E (day/night)
-----------------------------------------------
Car traffic volume  : 21434/2382  veh/TimePeriod  *
Medium truck volume :   451/50    veh/TimePeriod  *
Heavy truck volume  :   677/75    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):  20162
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  11.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   3.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Wilson St E (day/night)
-----------------------------------------------
Angle1   Angle2           : -35.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  : 100.00 / 100.00 m
Receiver height           :   7.50 / 7.50   m
Topography                :      3       (Elevated; no barrier)
Elevation                 :   3.37 m
Reference angle           :   0.00

Result summary (day)
--------------------
                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Wilson St E       !     1.32 !    53.19 !    53.19
--------------------+---------+---------+---------
                       Total                  53.19 dBA
Result summary (night)
----------------------
                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Wilson St E       !     1.32 !    46.65 !    46.65
--------------------+---------+---------+---------
                       Total                  46.65 dBA
```

BLOCK ELEVATIONS



FLOOR PLANS


BASEMENT
GROUND FLOOR
SECOND FLOOR (ALTERNATE)
SECOND FLOOR
LOFT PLAN