ENVIRONMENTAL NOISE IMPACT STUDY

"8 STOREY RESIDENTIAL DEVELOPMENT"
4063 UPPER MIDDLE ROAD
PART OF LOT 10, CONCESSION 1
SOUTH OF DUNDAS STREET
GEOGRAPHIC TOWNSHIP OF NELSON
CITY OF BURLINGTON
REGIONAL MUNICIPALITY OF HALTON

Prepared for:

Springfield Construction (Upper Middle)
240 Taylor Rd
Ancaster ON

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1.0 INTRODUCTION

dBA Acoustical Consultants has conducted a noise impact study on behalf of Springfield Construction (Upper Middle) for the proposed 8 storey development located at "4063 Upper Middle Road, Burlington ON. The purpose of the study is to determine the noise impact from Upper Middle Road vehicular traffic as required for site plan approval for the City of Burlington and Regional Municipality of Halton. Proposed for the development is an 8 storey residential condominium development with ground floor parking.

This study will detail traffic 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 noise was not considered in this report as the proposed subdivision development is not within the minimum 25 NEF area of influence.

2.0 SITE DESCRIPTION

The proposed development property is located on the north side of Upper Middle Road, east of Walkers Line, west of William O'Connell Drive, Burlington ON. The proposed site is situated in an existing residential area, surrounded by 3 storey residential townhouses to the west, to the east is vacant lands and to the north are vacant lands and townhouses. To the south are commercial properties and large high-rises. Site Location is attached as Figure 1.

Upper Middle Rd is a 4-lane roadway with a center median and is the main road noise source with posted speed limits of 60 km/hr. Walkers Lines is located approximately 285m to the west and has no noise impact due to extensive shielding by large residential high-rises and distance separation. Noise impact was not considered for area road traffic as traffic volumes are below MOE requirements. Site Plan is illustrated in Figure 2.

3.0 NOISE IMPACT ASSESSMENT

3.1 NOISE CRITERIA

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

TABLE 1 - Road Traffic Sound Levels Limits	
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. As this is considered a daytime use (07:00 - 23:00) 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)	>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)	>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/Rail Sound Levels Limits			
Indoor Location		**Leq(dBA)**	
		Road	**Rail**
Living/Dining	7:00 – 23:00	45	40
Living/Dining	23:00 – 07:00	45	40
Sleeping Quarters	7:00 – 23:00	45	40
	23:00 – 07:00	40	35

3.2 ROAD NOISE

Predicted road traffic noise levels were calculated for Upper Middle Road, the major road noise sources in the site area. Road traffic AADT volumes till year 2036, were sourced relative to Upper Middle Rd from Paradigm Transportation Solutions Limited dated December 2016. 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.

The daytime/nighttime volume ratio relative for Upper Middle Rd is calculated using an 85/15 split as required by the MOE. The maximum posted speeds for all vehicles are 60 km/h.

The percentage of annual growth for Upper Middle Rd was figured at 2.0% over 1 year from year 2036. The AADT (Annual Average Daily Traffic) volumes were used are reflective of the worst-case scenario. Truck volumes were factored at 2% medium and 2% heavy of the total vehicle volumes for Upper Middle Rd. Table 5, summarizes the "free field" traffic noise prediction results of Upper Middle Rd and modeled at three floor receptor locations representative of the building facades for throughout the proposed development. See Figure 3 for Receptor Locations.

TABLE 4 – Future Road Traffic Volumes Year 2037			
Upper Middle Rd	**32946 AADT - Vehicles**		
	Cars	**Medium Trucks**	**Heavy Trucks**
Day	**26884**	**560**	**560**
Night	**4742**	**99**	**99**

The future traffic noise levels were predicted using the data, and the MOE computer prediction program, Stamson 5.04.

The following Tables are the calculated traffic noise levels for 1st floor residential and 8th floor terrace outdoor living space. Table 5A represents traffic noise levels for receptor locations at front building façade and west and east building façade. First and seventh floors are considered the worst-case scenario for free traffic noise from Upper Middle Rd and 8th floor amenity space terrace.

TABLE 5A – Predicted Future Traffic Noise (dBA)		
Location	**07:00 – 23:00**	**23:00 – 07:00**
R1- 1st Floor Front Façade 7m	63	58
R2-8th Floor Front Façade 19m	65	61
R3- 8th Floor Terrace Front 1.3m Noise Wall (19m)	57	N/A
R4-8th Floor Terrace East Side 19m	55	N/A
R5- 1st Floor East and West Façade 7m	60	56
R6-8th Floor East and West Façade 19m	63	58

4.0 RECOMMENDATIONS - NOISE CONTROL

4.1 OUTDOOR LIVING AREAS

Calculated road noise levels exceed the 55 dBA daytime criteria outlined in Table 1. The draft plan includes standard balcony areas therefore; noise control measures are not required as the balconies are not defined as OLA's and are less than 4m in depth.

Proposed safety glass for the exterior limit areas of the Terrace will suffice and reduce the noise levels below MOE criteria.

4.2 INDOOR NOISE LEVELS

Calculated road noise levels at the Plane of Window (POW) exceed the 50 dBA criteria outlined in Table 1 for indoor space for residential units. Specific building components (walls, windows, doors etc.) are required and confirmed using the STC (Sound Transmission Class) method. Building design specifications were not made available at report time and STC calculations are summarized in Table 6 following with minimum window door and wall construction specified for all dwellings throughout the proposed development. The STC value 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 60%. A maximum of two components were factored per room.

It is recommended that all windows throughout the development have an STC-32 value as lesser STC values will not meet the minimum indoor noise ratings.

TABLE 6 – Recommended Wall and Window Construction			
LOCATION	**STC Acoustically Tested**	**Wall Construction**	**Window Glazing* Example**
R-1 Floors 2-4 All Windows			
Bedroom	**32**	OBC	3mm (50mm) 3mm
Living room	**32**	OBC	3mm (50mm) 3mm
R-2 Floors 4-8 All Windows			
Bedroom	**32**	OBC	3mm (50mm) 3mm
Living room	**32**	OBC	3mm (50mm) 3mm
All Other Units			
Bedroom	**32**	OBC	3mm (50mm) 3mm
Living room	**32**	OBC	3mm (50mm) 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. The windows recommended are minimum standard sizes supplied by window companies.*

5.0 VENTILATION / WARNING CLAUSES

Ventilation and warning clause requirements for all residential units, are presented in Table 7 following. It is recommended that the appropriate warning clauses be inserted into all Offers and Agreements of Purchase and Sale or Lease and Registered on Title. Specific building component requirements noted in Table 6 for all units will satisfy the MOE criterion for noise control relative to indoor living space. Central Air Conditioning units are located on individual units. No noise is associated with these types of units.

TABLE 7- Ventilation and Warning Clause Requirements		
LOCATION	VENTILATION	WARNING CLAUSE
All Units	A/C	Type "B" & Type "D"

TYPE "B": All Units

"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the buildings units, sound levels due to increasing road traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the Municipality's and the Ministry of the Environment's noise criteria."

TYPE "D": All Units

"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 Municipality's and the Ministry of the Environment's noise criteria."

6.0 SUMMARY OF RECOMMENDATIONS

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

- Type "B" and "D" warning clauses are inserted into all Offers and Agreements of Purchase and Sale or Lease for all units, (Table 7)
- Central Air Conditioning for all units, (Table 7)
- All Window, Door and Wall construction (Table 6)
- Qualified Acoustical Consultant certifies 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 or equivalent, it is recommended the Qualified Acoustical Consultant certify that the approved noise control measures have been properly installed.

7.0 CONCLUSIONS

dBA Acoustical Consultants has conducted a noise impact study on behalf of Springfield Construction (Upper Middle) for the proposed development located at "4063 Upper Middle Road, Burlington ON.

The purpose of the study determined the noise impact from Upper Middle Road vehicular traffic as required for site plan approval for the City of Burlington and Regional Municipality of Halton. Proposed for the development is an 8 storey residential condominium development with ground floor parking.

This study detailed traffic noise impact relative to the site plan and recommend noise control measures necessary to meet MOE guidelines while satisfying the planning requirements of the City of Burlington and Regional Municipality of Halton.

FIGURE 1
SITE LOCATION



FIGURE 2
SITE PLAN

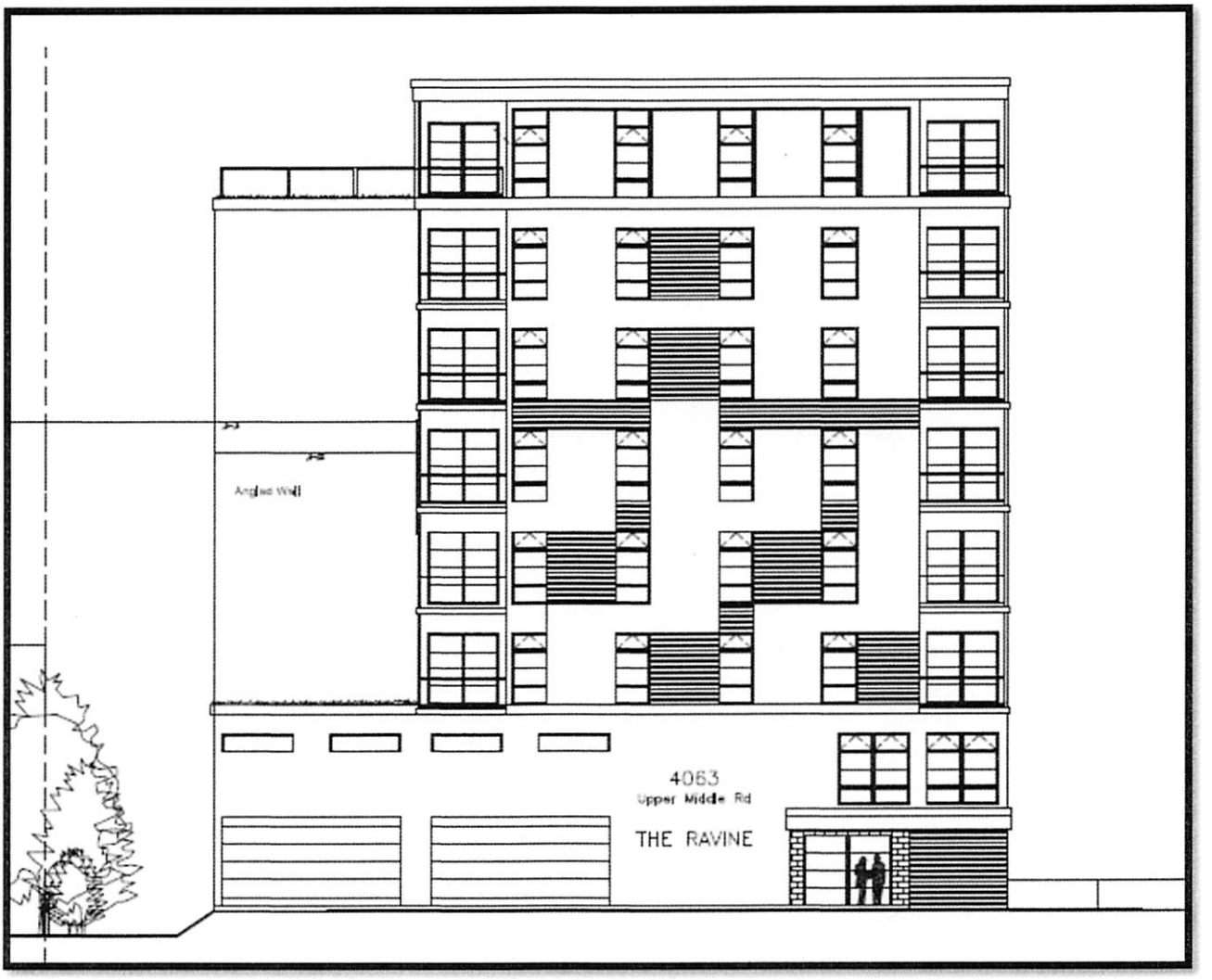
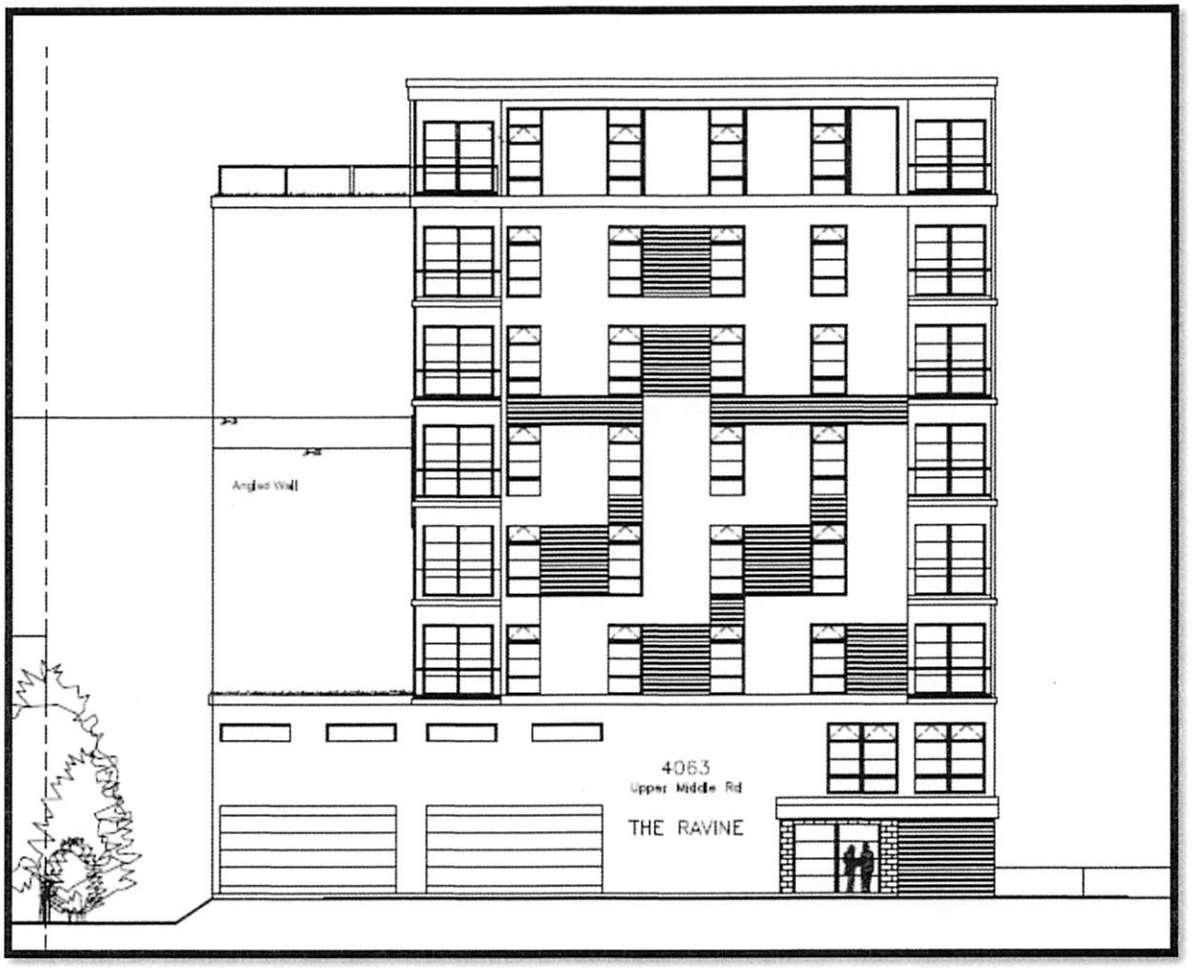


FIGURE 3
RECEPTOR LOCATION



R1 – 1st Floor Front Façade
R2 – 8th Floor Front Façade
R3 – 8th Floor Terrace 1.3m Safety Glass
R4- 8th Floor Terrace East Side
R5 – 1st Floor East End West Façade
R6 – 8th Floor Terrace East Side

APPENDIX "A"

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300, Waterloo ON N2J 1N8
p: 905.381.2229 x103 or 519.896.3163 x103
c: 519.500.9178
e: selkins@ptsl.com
w: www.ptsl.com

From: Frank Westaway [mailto:frank@dbaservices.ca]
Sent: February-01-17 4:37 PM
To: Stew Elkins <selkins@ptsl.com>; 'Marina Fensham' <thinkgiraffe@bellnet.ca>
Cc: mdmaclean@bell.net
Subject: AADT Traffic Counts

Stuart..... Further to our telephone conversation I have reviewed the traffic report for 4063 Upper Middle Rd Burlington ON. Could you please email me the AADT for a typical day traffic along with the percentage of medium and heavy trucks for this segment. Thank you and greatly appreciated.

Please note my new company name and address.

Frank Westaway - Noise & Vibration Consultants
Owner of dBA Acoustical Consulting Inc.
76 Chamomile Drive
Hamilton ON
L8W 0C1

Cell- 905-741-7623

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Frank Westaway

From: Peter Kelly <pkelly@ptsl.com>
Sent: February 2, 2017 6:59 PM
To: frank@dbaservices.ca
Cc: Stew Elkins
Subject: RE: 162390: AADT Traffic Counts

Hi Frank,
Here is the information you require. If

Two way AM peak hour traffic 2016 = 1,615 (1,650) [3% trucks] *Our traffic counts did not differentiate between heavies and mediums.
Two way PM peak hour traffic 2016 = 2,067 (2,100) [1% trucks]

Estimated 2016 AADT = 21,000 [2% trucks – assumed 40% mediums, 60% heavies]
Forecast 2036 AADT = 32,300 [2% trucks – assumed 40% mediums, 60% heavies]

All volumes and assumptions should be confirmed with the local municipality.

Regards,

From: Stew Elkins
Sent: Thursday, 2 February 2017 3:14 PM
To: Peter Kelly <pkelly@ptsl.com>
Subject: 162390: AADT Traffic Counts

Hi Peter,

Can you help Frank.

Can you take our pm peak hour volumes and factor by 10 to give him a daily volume.

He also needs the Medium and Heavy truck percentages which you can find in the raw count data or our synchro files.

He also needs a 20 year future volume estimate on Upper Middle. Take our 5 year and then compound by 2% per annum for another 15 years.

Thanks

Stew

Stew Elkins, BES, MITE.
Vice-President

1

```
STAMSON 5.04          SUMMARY REPORT          Date: 10-08-2018 14:24:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: uppermR1.te              Time Period: Day/Night 16/8 hours
Description: R1-Free Field First Floor Residential Front Facade
             TOTAL Leq FROM ALL SOURCES          (DAY): 63.49
                                                 (NIGHT): 58.44
Road data, segment # 1: Upper Middle (day/night)
-----------------------------------------------
Car traffic volume  : 26884/4742  veh/TimePeriod  *
Medium truck volume :   560/99    veh/TimePeriod  *
Heavy truck volume  :   560/99    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):  32300
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :   1.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  85.00

Data for Segment # 1: Upper Middle (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  30.00 / 30.00  m
Receiver height           :   7.00 / 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.Upper Middle     !     1.00 !    63.49 !    63.49
--------------------+---------+---------+---------
                      Total                  63.49 dBA
Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Upper Middle     !     1.00 !    58.44 !    58.44
--------------------+---------+---------+---------
```

```
STAMSON 5.04          SUMMARY REPORT          Date: 10-08-2018 14:27:40
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: uppermR2.te              Time Period: Day/Night 16/8 hours
Description: R2-Free Field 6th Floor Front Facade
                     TOTAL Leq FROM ALL SOURCE          (DAY): 65.29
                                                        (NIGHT): 61.18
Road data, segment # 1: Upper Middle (day/night)
-----------------------------------------------
Car traffic volume  : 26884/4742  veh/TimePeriod  *
Medium truck volume :   560/99    veh/TimePeriod  *
Heavy truck volume  :   560/99    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):  32300
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :   1.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  85.00
Data for Segment # 1: Upper Middle (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  30.00 / 30.00  m
Receiver height           :  19.00 / 19.00  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.Upper Middle      !     1.00 !    65.29 !    65.29
--------------------+---------+---------+---------
                       Total                  65.29 dBA

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

                     !  source  !   Road   !  Total
                     !  height  !   Leq    !   Leq
                     !    (m)   !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Upper Middle      !     1.00 !    61.18 !    61.18
--------------------+---------+---------+---------
                       Total                  61.18 dBA
```

```
STAMSON 5.04          SUMMARY REPORT          Date: 10-08-2018 16:38:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: uppermR3.te              Time Period: Day/Night 16/8 hours
Description: R3-7th Floor Terrace with 1.3m (3.9ft)
                    TOTAL Leq FROM ALL SOURCES              (DAY): 57.46

Road data, segment # 1: Upper Middle (day/night)
-----------------------------------------------
Car traffic volume  : 26884/4742  veh/TimePeriod  *
Medium truck volume :   560/99    veh/TimePeriod  *
Heavy truck volume  :   560/99    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):  32300
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :   1.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  85.00
Data for Segment # 1: Upper Middle (day/night)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  30.00
Receiver height           :  19.00
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.30 m
Barrier receiver distance :   3.00 m
Source elevation          :   0.00 m
Receiver elevation        :   19.00 m
Barrier elevation         :   19.00 m
Reference angle           :   0.00
Result summary (day)
--------------------

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Upper Middle     !     1.00 !    57.46 !    57.46
--------------------+---------+---------+---------
                      Total                  57.46 dBA
```

```
STAMSON 5.04          SUMMARY REPORT          Date: 14-08-2018 17:13:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: uppermR4.te              Time Period: Day/Night 16/8 hours
Description: R4-7th East Side Floor Terrace with 1.30m at front
                    TOTAL Leq FROM ALL SOURCES              (DAY): 55.39
Road data, segment # 1: Upper Middle (day/night)
-----------------------------------------------
Car traffic volume  : 26884/4742  veh/TimePeriod  *
Medium truck volume :   560/99    veh/TimePeriod  *
Heavy truck volume  :   560/99    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):  32300
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :   1.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  85.00
Data for Segment # 1: Upper Middle (day/night)
-----------------------------------------------
Angle1   Angle2           :  -0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  30.00 / m
Receiver height           :  19.00 / m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  -0.00 deg   Angle2 : 90.00 deg
Barrier height            :   1.30 m
Barrier receiver distance :   3.00 m
Source elevation          :   0.00 m
Receiver elevation        :   19.00 m
Barrier elevation         :   19.00 m
Reference angle           :   0.00

Result summary (day)
--------------------

                    !  source  !   Road    !  Total
                    !  height  !   Leq     !   Leq
                    !   (m)    !  (dBA)    !  (dBA)
--------------------+---------+---------+---------
 1.Upper Middle     !     1.00 !    55.39 !    55.39
--------------------+---------+---------+---------
                      Total                  55.39 dBA
```

```
STAMSON 5.04          SUMMARY REPORT          Date: 10-08-2018 17:33:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: uppermR5.te              Time Period: Day/Night 16/8 hours
Description: R5-1st East and West Side
             TOTAL Leq FROM ALL SOURCES                (DAY): 60.11
                                                       (NIGHT): 55.68
Road data, segment # 1: Upper Middle (day/night)
-----------------------------------------------
Car traffic volume  : 26884/4742  veh/TimePeriod  *
Medium truck volume :   560/99    veh/TimePeriod  *
Heavy truck volume  :   560/99    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):  32300
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :   1.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  85.00
Data for Segment # 1: Upper Middle (day/night)
-----------------------------------------------
Angle1   Angle2           :  -0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  40.00 / 40.00  m
Receiver height           :   7.00 / 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.Upper Middle     !     1.00 !    60.11 !    60.11
--------------------+---------+---------+---------
                      Total                  60.11 dBA

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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !    (m)   !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Upper Middle     !     1.00 !    55.68 !    55.68
--------------------+---------+---------+---------
                      Total                  55.68 dBA
```

```
STAMSON 5.04          NORMAL REPORT          Date: 14-08-2018 17:49:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: uppermR6.te              Time Period: Day/Night 16/8 hours
Description: R6-8th East and West Side
                        TOTAL Leq FROM ALL SOURCES   (DAY): 62.54
                                                     (NIGHT): 57.85
Road data, segment # 1: Upper Middle (day/night)
-----------------------------------------------
Car traffic volume  : 26884/4742  veh/TimePeriod  *
Medium truck volume :   560/99    veh/TimePeriod  *
Heavy truck volume  :   560/99    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):  32300
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :   1.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  85.00
Data for Segment # 1: Upper Middle (day/night)
-----------------------------------------------
Angle1   Angle2           :  -0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  40.00 / 40.00  m
Receiver height           :  19.00 / 19.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
Results segment # 1: Upper Middle (day)
---------------------------------------
Source height = 1.00 m
ROAD (0.00 + 60.49 + 0.00) = 60.49 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
-0     90    0.15  68.81   0.00  -2.90  -3.42   0.00   0.00   0.00  62.54
-------------------------------------------------------------------------------
Total Leq All Segments: 62.54 dBA

Results segment # 1: Upper Middle (night)
-----------------------------------------
Source height = 1.00 m
ROAD (0.00 + 55.95 + 0.00) = 55.95 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------------
-0     90    0.15  64.28   0.00  -2.90  -3.42   0.00   0.00   0.00  57.85
-------------------------------------------------------------------------------
```

ADVANTAGE LINE - PREMIUM VINYL WINDOWS
PERFORMANCE DATA

POLLARD WINDOWS & DOORS

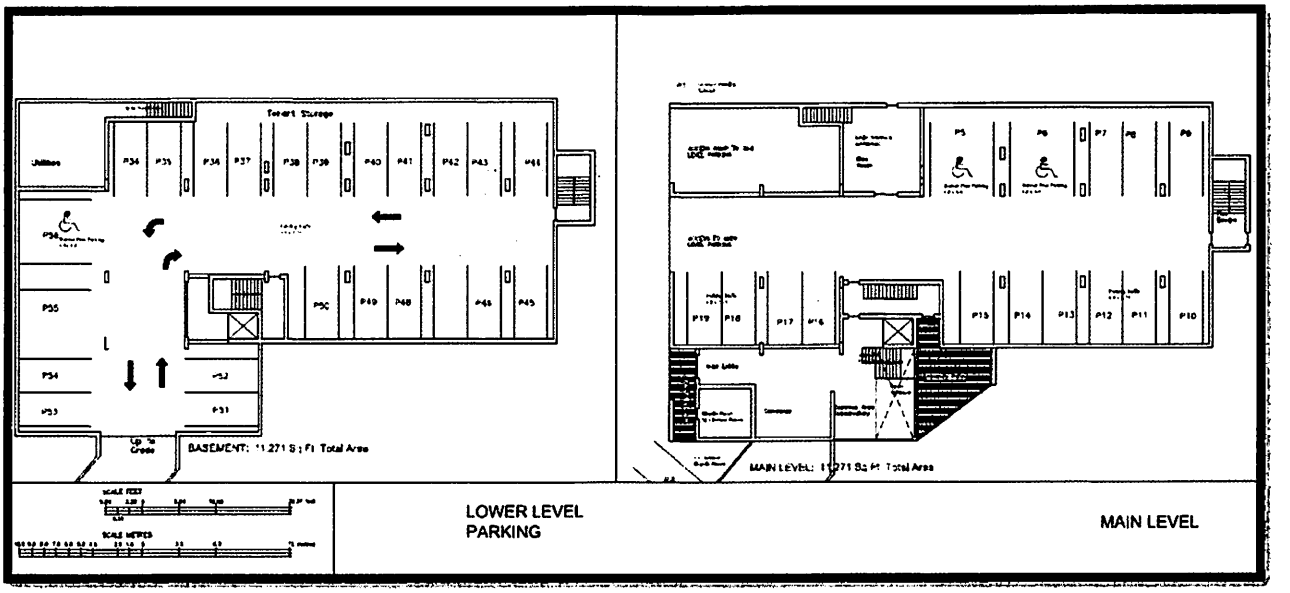
WINDOW	GLAZING	U-FACTOR btu (imp)	SHGC	CR	STC	ER	NAFS	EXFILTRATION AIR LEAKAGE cfm/ft² (L/s m²)	EXFILTRATION AIR LEAKAGE cfm/ft² (L/s m²)	ENERGY STAR (CANADA)	ENERGY STAR (USA)	NRCan CODE
AWNING	3/4" NO	0.31 (1.76)	0.47	66		26				1	-	ACA-A1
(ACA)	3/4" NO w/grids	0.31 (1.76)	0.43	60		29				1	-	ACA-A2
	3/4" SO	0.27 (1.53)	0.19	61		17				1	N, NC, SC, S	ACA-B1
	3/4" SO w/grids	0.27 (1.53)	0.18	61		16				1	N, NC, SC, S	ACA-B2
*EXTERMAX FOAM	3/4" NO2	0.25 (1.42)	0.40	43	34	31	R-PG56-AP	0.088 (0.437)	0.072 (0.367)	1.2	N, NO	ACA-C1
*EXTERMAX FOAM	3/4" NO2 w/grids	0.25 (1.42)	0.38	45		29				1.2	N, NO	ACA-C2
	3/4" SB-10	0.24 (1.36)	0.18	49		50				1.2	N, NC, SC, S	ACA-D1
	3/4" SD-10 w/grids	0.24 (1.33)	0.17	49		19				1	N, NC, SC, S	ACA-D2
	3/4" NO Plus	0.23 (1.66)	0.40	66		31				1.2	N	ACA-E1
	3/4" NO Plus w/grids	0.26 (1.66)	0.44	70		28				1	N	ACA-E2
CASEMENT	3/4" NO	0.30 (1.70)	0.47	67		30				1.2	N	ATU-A1
(ATU)	3/4" NO w/grids	0.30 (1.70)	0.43	67		27				1	N	ATU-A2
	3/4" SO	0.28 (1.42)	0.19	62		18				1	N, NC, SC, S	ATU-B1
	3/4" SO w/grids	0.28 (1.42)	0.18	62		18				1	N, NC, SC, S	ATU-B2
*EXTERMAX FOAM	3/4" NO2	0.24 (1.36)	0.40	46	34	33	R-PG70-C	0.031 (0.158)	0.030 (0.150)	1.2	N, NO	ATU-C1
*EXTERMAX FOAM	3/4" NO2 w/grids	0.24 (1.36)	0.38	46		31				1.2	N, NO	ATU-C2
	3/4" SB-10	0.23 (1.31)	0.18	48		53				1.2	N, NC, SC, S	ATU-D1
	3/4" SD-10 w/grids	0.23 (1.31)	0.17	48		21				1.2	N, NC, SC, S	ATU-D2
	3/4" NO Plus	0.29 (1.65)	0.48	65		33				1.2	N	ATU-E1
	3/4" NO Plus w/grids	0.28 (1.59)	0.44	69		29				1.2	N	ATU-E2
SINGLE HUNG	3/4" NO	0.34 (1.93)	0.58	64		29				1.2	-	ASH-A1
(ASH)	3/4" NO w/grids	0.34 (1.93)	0.53	64		27				1	-	ASH-A2
	3/4" SO	0.30 (1.70)	0.23	69		15				-	NO, SC, S	ASH-B1
	3/4" SO w/grids	0.30 (1.70)	0.21	69		14				-	NC, SC, S	ASH-B2
	3/4" NO2	0.28 (1.59)	0.40	44	37	32	R-PG40-H	0.234 (1.234)	0.148 (0.781)	1.2	N	ASH-C1
	3/4" NO2 w/grids	0.28 (1.59)	0.43	44		29				1.2	N	ASH-C2
*FOAM IN HEAD	3/4" SD-10	0.25 (1.42)	0.21	47		20				1.2	N, NO, SC, S	ASH-D1
*FOAM IN HEAD	3/4" SB-10 w/grids	0.25 (1.42)	0.20	47		18				1	N, NC, SC, S	ASH-D2
	3/4" NO Plus	0.32 (1.82)	0.58	65		32				1.2	-	ASH-E1
	3/4" NO Plus w/grids	0.32 (1.82)	0.53	69		29				1.2	-	ASH-E2
DOUBLE HUNG	3/4" NO	0.33 (1.87)	0.58	64		29				1.2	-	ATW-A1
(ATW)	3/4" NO w/grids	0.33 (1.87)	0.50	64		25				1	-	ATW-A2
	3/4" SO	0.29 (1.65)	0.23	68		14				-	NC, SC, S	ATW-B1
	3/4" SO w/grids	0.29 (1.65)	0.20	68		13				-	NO, SC, S	ATW-B2
	3/4" NO2	0.27 (1.53)	0.47	44		31	R-PG40-H	0.230 (1.15)	0.220 (1.256)	1.2	N	ATW-C1
	3/4" NO2 w/grids	0.27 (1.53)	0.43	44		29				1.2	N	ATW-C2
	3/4" SD-10	0.25 (1.42)	0.21	47		19				1	N, NO, SC, S	ATW-D1
	3/4" SD-10 w/grids	0.25 (1.42)	0.19	47		18				1	N, NO, SC, S	ATW-D2
	3/4" NO Plus	0.31 (1.76)	0.57	67		32				1.2	-	ATW-E1
	3/4" NO Plus w/grids	0.31 (1.76)	0.53	67		28				1.2	-	ATW-E2
GLIDER	3/4" NO	0.34 (1.93)	0.57	64		29				1.2	-	AGL-A1
(AGL)	3/4" NO w/grids	0.34 (1.93)	0.51	64		28				1	-	AGL-A2
	3/4" SO	0.29 (1.65)	0.23	69		15				-	NO, SC, S	AGL-B1
	3/4" SO w/grids	0.29 (1.65)	0.21	69		14				-	NO, SC, S	AGL-B2
	3/4" NO2	0.28 (1.59)	0.49	44	33	31	LO-PG32-HS	0.27 (1.33)	0.12 (0.62)	1.2	N	AGL-C1
	3/4" NO2 w/grids	0.28 (1.59)	0.43	44		28				1	N	AGL-C2
	3/4" SB-10	0.25 (1.42)	0.22	47		20				1.2	N, NO, SC, S	AGL-D1
	3/4" SB-10 w/grids	0.25 (1.42)	0.20	47		18				1	N, NO, SC, S	AGL-D2
	3/4" NO Plus	0.32 (1.82)	0.69	67		33				1.2	-	AGL-E1
	3/4" NO Plus w/grids	0.32 (1.82)	0.63	67		29				1.2	-	AGL-E2
FIXED LITE IN SASH	3/4" NO	0.31 (1.76)	0.60	67		64				1, 2, 3	-	AFL-A1
(AFL)	3/4" NO w/grids	0.31 (1.76)	0.60	67		60				1, 2	-	AFL-A2
	3/4" SO	0.27 (1.53)	0.22	62		19				1	N, NO, SC, S	AFL-B1
	3/4" SO w/grids	0.27 (1.53)	0.20	62		18				1	N, NO, SC, S	AFL-B2
*EXTERMAX FOAM	3/4" NO2	0.23 (1.31)	0.47	45	31	39	R-PG70-FW	0.018 (0.092)	0.018 (0.092)	1, 2, 3	N	AFL-C1
*EXTERMAX FOAM	3/4" NO2 w/grids	0.23 (1.31)	0.42	45		35				1, 2, 3	N	AFL-C2
	3/4" SB-10	0.23 (1.31)	0.21	48		23				1, 2	N, NO, SC, S	AFL-D1
	3/4" SB-10 w/grids	0.23 (1.31)	0.19	48		22				1, 2	N, NO, SC, S	AFL-D2
	3/4" NO Plus	0.30 (1.70)	0.57	69		35				1, 2, 3	N	AFL-E1
	3/4" NO Plus w/grids	0.30 (1.70)	0.51	69		32				1, 2	N	AFL-E2
FIXED LITE IN FRAME	3/4" NO	0.31 (1.76)	0.61	67		60				1, 2, 3	-	AFF-A1
(AFF)	3/4" NO w/grids	0.31 (1.76)	0.53	67		33				1, 2	-	AFF-A2
	3/4" SO	0.28 (1.48)	0.24	63		21				1	N, NO, SC, S	AFF-B1
	3/4" SO w/grids	0.28 (1.48)	0.22	63		20				1	N, NO, SC, S	AFF-B2
*EXTERMAX FOAM	3/4" NO2	0.24 (1.36)	0.61	46		39	R-PG55-FW	0.011 (0.054)	0.008 (0.040)	1, 2, 3	N	AFF-C1
*EXTERMAX FOAM	3/4" NO2 w/grids	0.24 (1.36)	0.48	46		37				1, 2, 3	N	AFF-C2
	3/4" SB-10	0.22 (1.23)	0.33	49		28				1, 2	N, NO, SC, S	AFF-D1
	3/4" SD-10 w/grids	0.22 (1.23)	0.31	49		25				1, 2	N, NO, SC, S	AFF-D2
	3/4" NO Plus	0.29 (1.65)	0.63	69		40				1, 2, 3	N	AFF-E1
	3/4" NO Plus w/grids	0.29 (1.65)	0.58	69		36				1, 2, 3	N	AFF-E2
SLIDING DOOR												
SLIDING PATIO DOOR	3/4" NO	0.31 (1.76)	0.61	66		29				1, 2	-	AWDR-A1
(AWDR)	3/4" NO w/grids	0.31 (1.76)	0.43	66		25				1	-	AWDR-A2
	15/16" SC	0.30 (1.70)	0.22	59		14				-	N, NO, SC, S	AWDR-B1
	15/16" SC w/grids	0.30 (1.70)	0.19	59	28/23	13	R-PG40-SD	0.130 (0.661)	0.152 (0.770)	-	N, NC, SC, S	AWDR-B2
	1" Internal Grids	0.27 (2.10)	0.20	52		8/6				-	-	-
*FOAM IN HEAD	3/4" SD-10	0.25 (1.42)	0.20	47		19				1	N, NO, SC, S	AWDR-D1
*FOAM IN HEAD	3/4" SD-10 w/grids	0.25 (1.42)	0.18	47		18				1	N, NC, SC, S	AWDR-D2

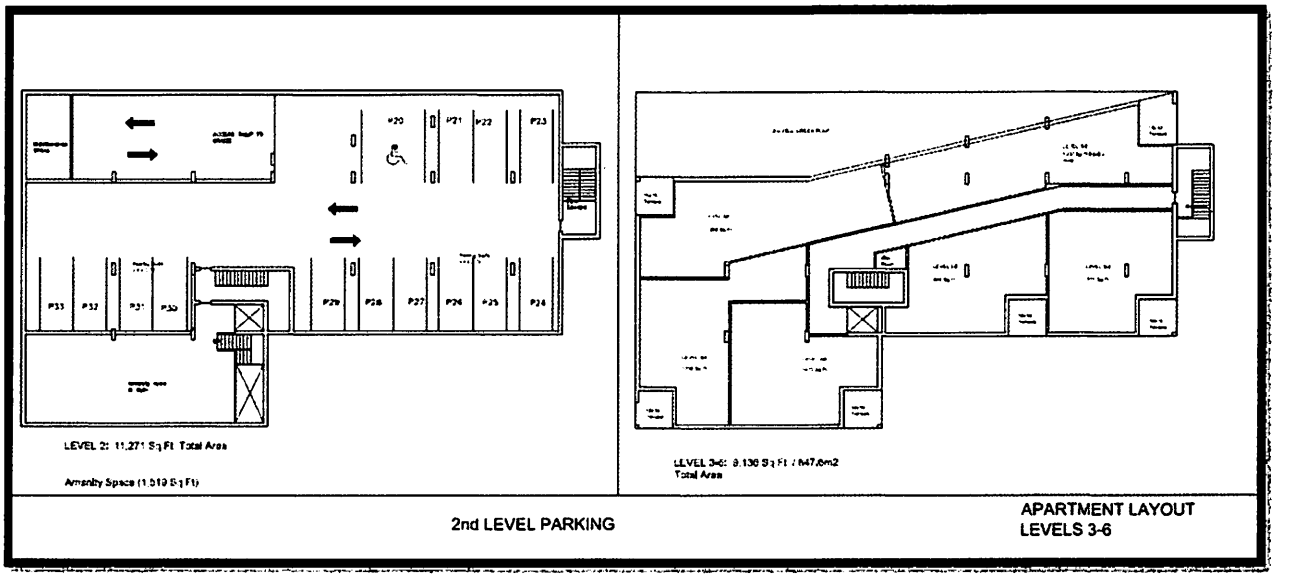
Standards
AAMA (North American Fenestration Standard) - This combined US and Canadian standard outlines residential performance grades that give an overall performance value of a window. AAMA/NWWDA 101/I.S.2/A440

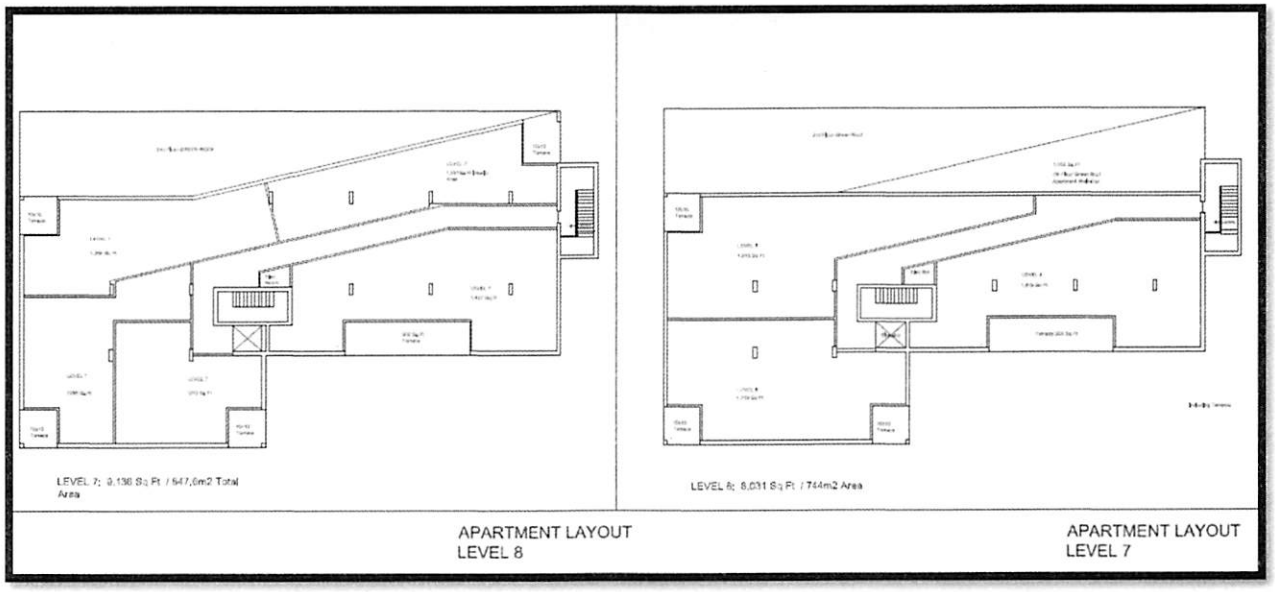
Definitions
U-Factor - a measurement of rate of heat flow through a building component. A lower number means better thermal performance.
SHGC (Solar Heat Gain Coefficient) - is the fraction of incident solar radiation admitted through a window
CR (Condensation Resistance) - is a measure of how well a window resists the formation of condensation
STC (Sound Transmission Class) - is a rating of how well a building partition attenuates sound according to ASTM E90
ER (Energy Rating) - a rating based on a Natural Resources Canada formula that combines air leakage, solar heat gain coefficient, and U-factor

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BUILDING DESIGNS






LEVEL 7; 9,136 Sq Ft / 847.6m2 Total Area
LEVEL 8; 8,031 Sq Ft / 744m2 Area
APARTMENT LAYOUT
LEVEL 8
APARTMENT LAYOUT
LEVEL 7


Angled Wall
4063
Upper Middle Rd
THE RAVINE