YCA engineering Limited

Phone: 416-894-3213
hava@ycaengineering.com

9251 Yonge Street, Suite 8557
Richmond Hill, ON L4C 9T3

ENVIRONMENTAL NOISE ASSESSMENT

BROCK STREET DEVELOPMENT
PROPOSED 6 STOREY RESIDENTIAL CONDOMINIUM
BLOCK 8, EVENDALE DEVELOPMENTS
NORTH OF BROCK STREET AND HERREMA BOULEVARD
TOWNSHIP OF UXBRIDGE

PREPARED FOR:

EVENDALE DEVELOPMENTS LTD.

December 2020
Y1735A

EXECUTIVE SUMMARY

The proposed 6 storey residential condominium development is located north of Brock Street East (Highway No. 47) and approximately 750m east of Main Street North in the Township of Uxbridge.

The December 2020 Environmental Noise Assessment is issued to present the assessment of the proposed development and recommend any noise abatement features necessary to achieve sound levels acceptable to the Township of Uxbridge, the Region of Durham and the Ministry of Environment, Conservation and Parks.

The transportation noise sources having the potential to affect the living environment within the proposed development area include Brock Street East (Highway No. 47). The ultimate traffic volumes on this noise source is used as input to the Stamson's 5.04 to generate the resultant sound levels. Copies of the correspondence regarding traffic data is included in Appendix 2 in this report. The stationary noise sources having the potential to affect the proposed development is the existing hydro substation and the proposed commercial development to the east.

Recommended noise abatement measures are described in Sections 5.1, 5.2, 5.3 and 5.4 and summarized in Table 4 of this report and on the attached Figure 2. These measures include:

1. Mandatory air conditioning is required for the Residential Condominium Building (South, West and East Units).

2. Provision for air conditioning is required for the Residential Condominium Building (North Units).

3. Upgraded windows and exterior walls are required for the south units of the proposed residential condominium building. Standard windows and exterior wall constructions meeting the Ontario Building Code requirement are sufficient for all remaining residential units within the proposed development.

4. The details of the mechanical units at the Residential Condominium Building are not known at this time. Further investigation is recommended to ensure the sound levels meet the MECP sound levels limits at the adjacent receptor locations once this information becomes available.

5. All applicable warning clauses shall be listed in the Township's Development Agreement and also be inserted in the Agreements of Purchase and Sale or Lease and registered on title.

TABLE OF CONTENTS

PAGE

1.0 INTRODUCTION

PURPOSE

A 6 storey residential condominium building has been proposed by Evendale Developments Ltd. in the Township of Uxbridge. This report is an analysis of future sound levels within the development and describes the types and locations of noise mitigation measures which will be required.

SITE DESCRIPTION AND LOCATION

The proposed development will consist of a 6 storey residential condominium building located north of Brock Street East (Highway No. 47) and directly west of Harrema Boulevard and at approximately 750m east of Main Street North in the Township of Uxbridge.

The surrounding land uses are existing residential development to the north, south and proposed residential developments to the east, and an existing hydro substation to the west.

KEY PLAN

The location of the proposed development is further indicated by the Key Plan below.

FIGURE 1

2.0 SOUND LEVEL CRITERIA

The sound level descriptor (L_{eq} in dBA) are for 16 hours (daytime) and 8 hours (night-time) based on MECP Guideline NPC-300:

Outdoor Activity Areas (7 a.m. – 11 p.m.) – 16 Hr. Leq. = 55 dBA

If daytime outdoor sound levels at the backyards (outdoor activity areas) exceed 60 dBA, physical noise attenuation measures such as acoustical fences, increased building setbacks or reorientation of the buildings must be employed to reduce the sound levels. In some cases, outdoor sound levels may be allowed to exceed the above criteria by a maximum of 5 dBA. If such excesses occur, purchasers must be informed of the existence of potentially annoying sound levels by means of warning clauses registered on title.

Living and Dining Area and Bedroom (7 a.m.–11 p.m.) = 45 dBA Roads, 40 dBA Railways
Living and Dining Area (11 p.m.–7 a.m.) = 45 dBA Roads, 40 dBA Railways
Bedrooms (11 p.m. – 7 a.m.) = 40 dBA Roads, 35 dBA Railways

Appropriate building components such as walls, doors and windows are chosen with reference to the following. If daytime sound levels at the external dwelling walls are 65 dBA or less (roadways), and 60 dBA or less (railways), then the indoor sound level criteria described above will be achieved using standard (Ontario Building Code) construction methods and building components. If night-time sound levels are 60 dBA or less (roadways) and 55 dBA or less (railways), standard construction methods and building components can be utilized. If the external sound levels exceed the above criteria, then components having extra sound insulation properties may be required.

Ventilation requirements are determined with reference to the following. If night-time sound levels at the bedroom window of a dwelling unit are in the range of 50 to 60 dBA, the ventilation system must be designed to allow the optional installation of central air conditioning at the owner's discretion. If night-time sound levels are greater than 60 dBA, central air conditioning must be installed. If daytime sound levels at the living room/dining room windows are in the range of 55 to 65 dBA, the ventilation system must be designed to allow optional installation of central air conditioning. For daytime sound levels greater than 65 dBA, central air conditioning must be installed.

STATIONARY SOURCES

As per the M.E.C.P. guidelines (Publication NPC-300), this development is considered to be a Class 2 area. The noise produced by a stationary source at the plane of window for noise sensitive spaces is the energy equivalent sound level (L_{EQ}), 50 dBA during daytime and evening time (0700-2300) or 45 dBA during night-time (2300-0700). For outdoor receptors, the energy equivalent sound level (L_{EQ}) is 50 dBA during daytime (0700-2300) or 45 dBA during night-time (1900-2300).

3.0 NOISE SOURCES

ROAD TRAFFIC

As indicated on Figures 1 and 2, the proposed residential development will be located north of Brock Street (Highway No. 47) and at approximately 750m east of Main Street in the Township of Uxbridge. Noise generated by Brock Street (Highway No. 47) has the potential to affect future development. All other roads within or near this site are considered acoustically insignificant due to low traffic volumes and distance separation.

Traffic volume information for Brock Street East (Highway No. 47) was obtained from the Regional Municipality of Durham dated October 19, 2017. The traffic data obtained is summarized in Table 1 below:

TABLE 1: BROCK STREET EAST (HIGHWAY NO. 47) TRAFFIC DATA

Projected Annual Average Daily Traffic*	11,000
Percent Trucks	15%
Heavy to Medium trucks ratio	80/20
Speed (km/hr)	50
Number of Lanes	4
Day/Night Traffic split	90/10

* Projected traffic provided by the Region of Durham.

EXISTING STATIONARY NOISE SOURCES

An existing hydro substation is located west of the proposed development at approximately 30m from the nearest receptors R1 and R2 located west of the 6 Storey Residential Building. Based on a site visit conducted, the hydro substation resulted in a tonal sound level lower than the background traffic noise. However, a warning clause should advise the future residents of possible noise levels during low ambient times.

Retail commercial units are proposed at the first floor of the future commercial building to the east. The details of retail commercial units and hours of operation are unknown at this time. Further investigation is recommended to ensure the sound levels at the proposed Residential Condominium Building meet the MECP sound levels limits once the commercial development information becomes available.

PROPOSED STATIONARY NOISE SOURCES

The details of the mechanical units at the Condominium Building are not known at this time. Further investigation is recommended to ensure the sound levels meet the MECP sound levels limits at the adjacent receptor locations once this information becomes available.

4.0 NOISE ASSESSMENT

4.1 ROAD TRAFFIC NOISE ASSESSMENT

Figure 2 is based on the latest Site Plan dated December 2020 showing various noise analysis locations and noise mitigation measures within the proposed development. Sound levels were calculated using the Ministry of Environment's Stamson 5.04 computer based noise prediction model. The noise criteria and warning clauses are listed in Appendix 4.

Table 2 lists the unattenuated sound levels at various locations.

TABLE 2: UNATTENUATED SOUND LEVELS

LOCATIONS	DISTANCE TO CENTRELINE OF ROAD (m)	DAYTIME 16 Hr. Leq dBA	NIGHT-TIME 8 Hr. Leq dBA
Residential Condominium Building (South Face, 6th Floor)	18.0[1]	69.51	62.98
Residential Condominium Building (West and East Face, 6th Floor)	18.0[1]	66.50	59.97
Residential Condominium Building (North Face, 6th Floor)	85.0[1]	59.51	52.98
Common Outdoor Amenity Area	92.0[1]	<55	-

[1] Brock Street East (Highway No. 47 Road)

4.2 STATIONARY NOISE SOURCES ASSESSMENT

The noise impact from the existing hydro substation and the proposed commercial developments with mechanical units and occasional truck activities have the potential to exceed the sound level limits at the proposed residential development.

Based on a site visit conducted, the existing hydro substation resulted in a tonal sound level lower than the background traffic noise. However, a sound level of 81 dBA $_{(PWL)}$ or less was taken into account for noise analysis based on similar sound measurements.

All mechanical units are assumed to be operating 100% of the time during the daytime/evening and operating 50% of the time during the night-time. Analysis is included in Appendix 3.

The sound levels were calculated using the CadnaA Version 2020 computer program using the International Standard ISO 9613-2.

TABLE 3 - STATIONARY SOURCES SOUND LEVELS (UMITIGATED)

RECEPTOR	SOUND LEVEL RESULTS (dBA)		EXCEEDANCE (dBA)
	DAYTIME/ EVENING (0700 - 2300)	NIGHTTIME (2300 -0700)	
R1 Residential Condo, West Face (2nd Floor)	44.5	44.5	No
R2 Residential Condo, West Face (6th Floor)	43.4	43.3	No
R3 Residential Condo, North Face (6th Floor)	41.9	41.7	No
R4 Residential Condo, East Face (6th Floor)	42.9	39.9	No
R5 Residential Condo (Common OLA)	39.7	38.0	No

The total sound level results from the existing hydro substation and proposed mechanical units are expected to meet the sound level limit during the daytime and night-time at all receptor locations.

Therefore, noise mitigation measures are not required. However, a warning clause Type E should advise the future residents of possible noise levels during low ambient times.

5.0 RECOMMENDED NOISE MITIGATION MEASURES

5.1 OUTDOOR MEASURES

5.1.1 TRAFFIC NOISE OUTDOOR MEASURES

Please note that the designated outdoor amenity areas for the Residential Condominium Building is the Common Outdoor Amenity Area north of the proposed building as shown on the attached plan.

Based on the sound level results in Table 2, the daytime sound level at the Common Outdoor Amenity Area is expected to be below 55 dBA in the absence of mitigative measures.

Therefore, outdoor noise mitigation measure is not required due to road traffic noise. However a warning clause Type A is recommended for:

- Residential Condominium Building (All Units)

5.1.2 STATIONARY NOISE OUTDOOR MEASURES

As per the sound level results in Table 3, the noise activities from the existing hydro substation and the proposed commercial development are expected to meet the sound level limits at the proposed Common Outdoor Amenity Area.

Therefore, outdoor noise mitigation measure is not required due to stationary noise sources.

5.2 VENTILATION REQUIREMENTS

5.2.1 VENTILATION REQUIREMENTS DUE TO ROAD TRAFFIC

Ventilation requirements were determined using the sound levels at the building facades listed in Table 2 due to road traffic noise sources.

MANDATORY CENTRAL AIR CONDITIONERS

The following locations are expected to be above 65dBA during the daytime and/or above 60dBA during the nighttime. Therefore, mandatory air conditioning is required for the following locations:

- Residential Condominium Building (South, West and East Units)

The following warning clause Type D must be incorporated into the Development Agreement, which will be registered on title and should be included in all offers of purchase, sale and lease of the above location:

Warning Clause Type D:

"This Suit/Unit has been supplied with a central air conditioning system which will allow the windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of Environment."

PROVISION FOR AIR CONDITIONERS

Based on the information in Table 2, the following locations must be constructed with a forced air heating system with ducting sized to accommodate a central air conditioning unit, in order to allow the homeowner the option of installing central air conditioning should he or she wish to do so in the future.

- Residential Condominium Building (North Units)

In addition, the following warning clause must be incorporated into the Site Plan Agreement, which will be registered on title and should be included in all offers of purchase, sale and lease of the above suites:

Warning Clause Type C:

"This Suite/Unit was fitted with the option to accommodate a ventilation system to allow windows and exterior doors to be kept closed, thereby achieving indoor sound levels within the limits recommended by the Ministry of Environment."

5.2.2 VENTILATION REQUIREMENTS DUE TO STATIONARY NOISE SOURCE

As per Table 3 sound level results, the sound level from the existing hydro substation and the proposed commercial development are expected to be below the daytime and night-time sound level limits of 50dBA and 45dBA. However, possible noise activities may exceed the sound level limit at times.

Based on the MECP Noise Guideline, the use of air conditioning is not acceptable for noise mitigation in the context of controlling the noise from a stationary source. However, if a building is designed with air conditioning due to transportation noise sources, then air conditioning may provide further noise mitigation for stationary noise sources given that the windows are kept closed if the stationary noise sources are audible at times.

5.3 BUILDING COMPONENTS

Building components within the proposed development were analyzed using the STC (Sound Transmission Class) method recommended by the M.E.C.P. Detailed floor plans of the proposed dwelling units are required in order to best determine the required building components. Although this information is not yet available for the proposed development, the result is based on the assumption that a living, dining or recreation room is located at the side of the house closest to the roadway and contains three components (two exterior walls and a set of windows). The windows are assumed to be 30% of the floor area and the same side exterior walls are assumed to be 70% of the floor area.

DAYTIME SOUND LEVELS

For the worst case location during daytime, (South Units) a daytime sound level of 70 dBA was calculated due to road traffic. To ensure acceptable daytime indoor sound levels of 45 dBA from road noise source, the building components must provide an STC rating of 33 for windows, STC 40 for exterior wall construction.

NIGHT-TIME SOUND LEVELS

For the worst case location during night-time, (South Units) night-time sound level of 63 dBA was calculated. To ensure acceptable nighttime indoor sound levels of 40 dBA from road noise source, the building components must provide an STC rating of 29 for windows, STC 36 for exterior wall construction

BUILDING COMPONENT REQUIREMENTS

The minimum standard window and exterior wall construction of the Ontario Building Code meets STC 30 and STC 38, respectively.

Therefore, upgraded windows and exterior walls are required for the south units of the proposed residential condominium building. Standard windows and exterior wall constructions meeting the Ontario Building Code requirement are sufficient for all remaining residential units.

WINDOWS

The following are some window configurations meeting an STC rating of 33, assuming the ratio of window area to room floor area is 30%:

- double glazing 3mm x 3mm thickness with 25mm air space (Sliders) or
- double glazing 3mm x 6mm thickness with 16mm air space (Sliders) or
- double glazing 3mm x 3mm thickness with 13mm air space (Casement or fixed) or
- any other window type yielding a similar or greater STC rating

EXTERIOR WALLS

The following exterior wall construction EW5 meets the STC 40 rating, assuming a ratio of wall area to room floor area of 70%:

EW5 12.7mm gypsum board, vapour barrier and 38 x 89mm studs with 50mm (or thicker) mineral wool or fiberglass batts in interstud cavities, plus sheathing, 25mm air space and brick veneer.

Sample window and exterior wall configurations are included in Appendix 5 for additional options.

5.4 WARNING CLAUSES

We recommend the following warning clauses to be incorporated into the Development Agreement, which will be registered on title and included in all offers of purchase and sale or lease of suites/units noted below.

- Residential Condominium Building (All Units)

Warning Clause Type A:

"Purchasers/tenants are advised that despite the inclusion of noise control features, the sound levels due to increasing road traffic, the existing hydro substation and proposed commercial development may continue to be of concern, occasionally interfering with the activities of the occupants as the noise levels may exceed the noise criteria of the Ministry of the Environment."

Warning Clause Type E:

"Purchasers/tenants are advised that due to the proximity of the existing hydro substation and proposed commercial developments, noise from these facilities may at times be audible

6.0 SUMMARY OF NOISE MITIGATION MEASURES

The summary of all noise abatement measures are listed in the following Table 4 identifying ventilation requirements, building components and warning clauses.

TABLE 4: SUMMARY OF NOISE MITIGATION MEASURES

LOCATIONS	VENTILATION REQUIREMENTS	BUILDING COMPONENTS	SOUND BARRIERS	WARNING CLAUSES
Residential Condominium Building (South Units)	Mandatory air conditioning	Windows: STC 32 Walls: STC 40	-	Type A, D and E
Residential Condominium Building (West and East Units)	Mandatory air conditioning	Windows: OBC* Walls: OBC	-	Type A, D and E
Residential Condominium Building (North Units)	Provision for air conditioning	Windows: OBC* Walls: OBC	-	Type A, C and E

* OBC: Ontario Building Code Standard.

7.0 RECOMMENDATIONS AND CONCLUSION

RECOMMENDATIONS

1. Mandatory air conditioning is required for the Residential Condominium Building (South, West and East Units).

2. Provision for air conditioning is required for the Residential Condominium Building (North Units).

3. Upgraded windows and exterior walls are required for the south units of the proposed residential condominium building. Standard windows and exterior wall constructions meeting the Ontario Building Code requirement are sufficient for all remaining residential units within the proposed building.

4. The details of the mechanical units at the Condominium Building are not known at this time. Further investigation is recommended to ensure the sound levels meet the MECP sound levels limits at the adjacent receptor locations once this information becomes available.

5. All applicable warning clauses shall be listed in the Township's Development Agreement and also be inserted in the Agreements of Purchase and Sale or Lease and registered on title.

CONCLUSION

This report has determined that sound levels acceptable to the Ministry of Environment, Conservation and Parks, Township of Uxbridge and the Region of Durham are expected to be achieved using the abatement measures in this report and as shown on the attached Figure 2.

Respectfully submitted,

YCA ENGINEERING Limited

Hava Jouharchi, P.Eng.
Senior Project Engineer

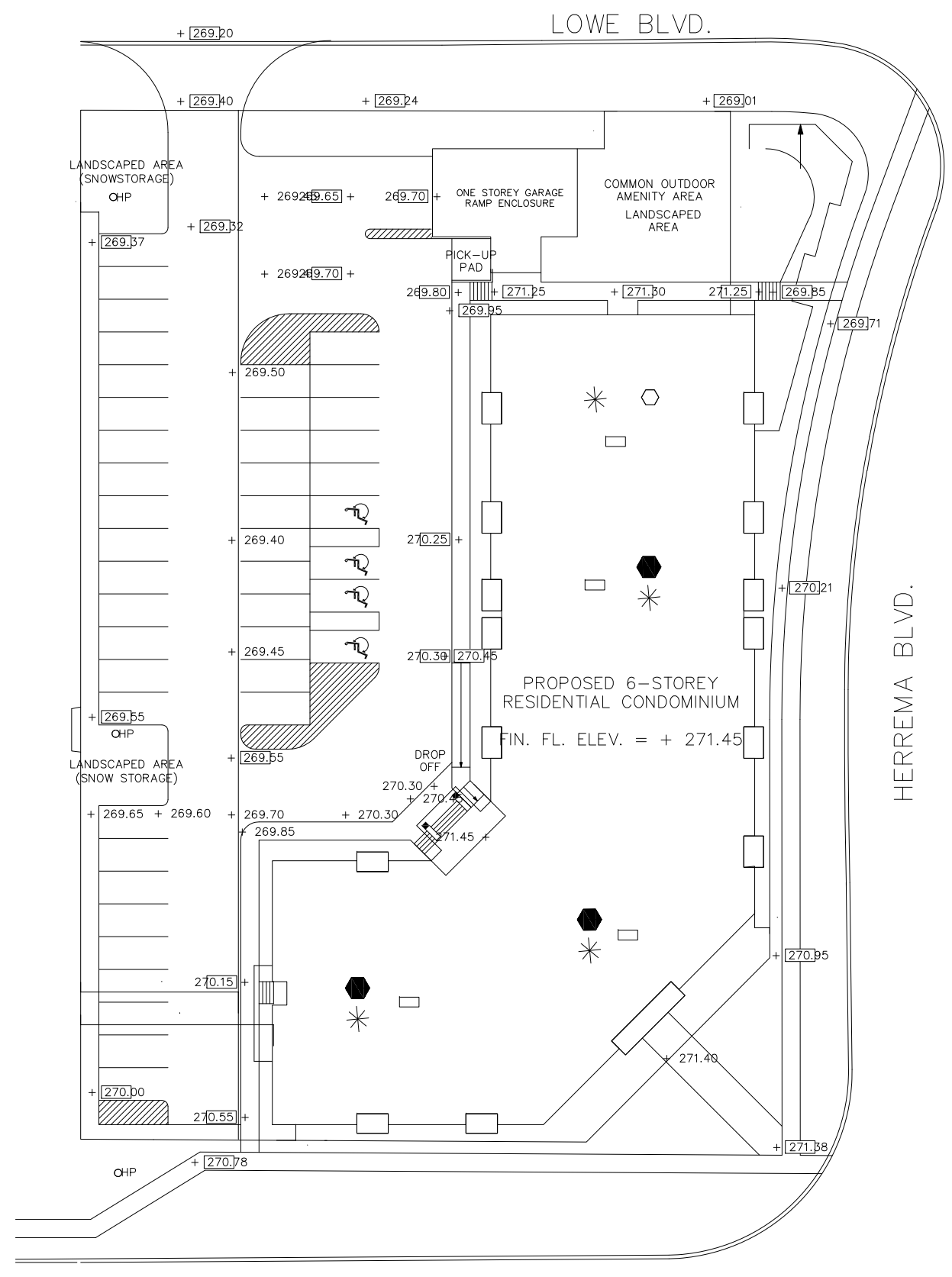
APPENDIX 1

FIGURES

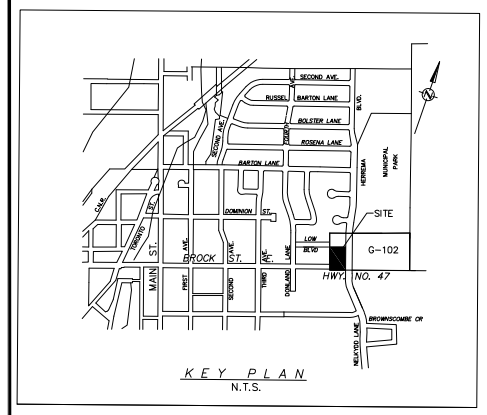
EXISTING
RESIDENTIAL

EXISTING
RESIDENTIAL

#163
VERIDIAN
HYDRO SUBSTA~



PROPOSED
RESIDENTIAL



LEGEND:

- MANDATORY AIR CONDITIONING AND WARNING CLAUSE D
- PROVISION FOR AIR CONDITIONING AND WARNING CLAUSE C
- WARNING CLAUSE A
- WARNING CLAUSE E

YCA ENGINEERING Limited
9251 Yonge Street, Suite 8557
Richmond Hill, ON, L4C 9T3
Tel: 416-894-3213
Email: hava@ycaengineering.com

PLAN – NOISE MITIGATION MEASURES

BROCK STREET
6 STOREY RESIDENTIAL CONDOMINIUM

TOWNSHIP OF UXBRIDGE

EVENDALE DEVELOPMENTS LTD

FIGURE 2

Scale: NTS

DATE: DECEMBER 2020

KEITH LOFFLER MCALPINE ARCHITECTS
10 ST. MARY STREET
SUITE #402
TORONTO, ONTARIO
M4Y 1P9

ONTARIO ASSOCIATION OF ARCHITECTS
JOHN WILLIAM MCALPINE
LICENCE 4597

klma
A PARTNERSHIP OF CORPORATIONS
KEITH LOFFLER DESIGN INC
MCALPINE ARCHITECT INC

PROPOSED RESIDENTIAL DEVELOPMENT
BROCK STREET EAST
UXBRIDGE, ONTARIO
EVENDALE DEVELOPMENTS

2ND TO 6TH PLAN

A4

SCALE: 1 : 400
DECEMBER 07, 2020

KEITH LOFFLER MCALPINE ARCHITECTS
10 ST. MARY STREET
SUITE #402
TORONTO, ONTARIO
M4Y 1P9

ONTARIO ASSOCIATION OF ARCHITECTS
JOHN WILLIAM MCALPINE
LICENCE 4597

klma
A PARTNERSHIP OF CORPORATIONS
KEITH LOFFLER DESIGN INC
MCALPINE ARCHITECT INC

PROPOSED RESIDENTIAL DEVELOPMENT
BROCK STREET EAST
UXBRIDGE, ONTARIO
EVENDALE DEVELOPMENTS

GROUND PLAN

A3

SCALE: 1 : 400
DECEMBER 07, 2020

SOUTH ELEVATION (BROCK STREET WEST)

EAST ELEVATION (HERREMA BOULEVARD)

KEITH LOFFLER MCALPINE ARCHITECTS
10 ST. MARY STREET
SUITE #402
TORONTO, ONTARIO
M4Y 1P9

ONTARIO ASSOCIATION OF ARCHITECTS
JOHN WILLIAM McALPINE
LICENCE 4397

klma
A PARTNERSHIP OF CORPORATIONS
KEITH LOFFLER DESIGN INC
MCALPINE ARCHITECT INC

PROPOSED RESIDENTIAL DEVELOPMENT
BROCK STREET EAST
UXBRIDGE, ONTARIO
EVENDALE DEVELOPMENTS

SOUTH ELEVATION
EAST ELEVATION

A5

SCALE: 1 : 250
DECEMBER 07, 2020

NORTH ELEVATION

KEITH LOFFLER MCALPINE ARCHITECTS
10 ST. MARY STREET
SUITE #402
TORONTO, ONTARIO
M4Y 1P9

ONTARIO ASSOCIATION OF ARCHITECTS
JOHN WILLIAM McALPINE
LICENCE 4397

WEST ELEVATION

klma
A PARTNERSHIP OF CORPORATIONS
KEITH LOFFLER DESIGN INC
MCALPINE ARCHITECT INC

PROPOSED RESIDENTIAL DEVELOPMENT
BROCK STREET EAST
UXBRIDGE, ONTARIO
EVENDALE DEVELOPMENTS

NORTH ELEVATION
WEST ELEVATION

A6

SCALE: 1 : 250
DECEMBER 07, 2020

FIGURE 3

DISTANCES FROM THE STATIONARY NOISE SOURCES

APPENDIX 2

TRAFFIC DATA

Planning and Economic
Development Department

Planning Division

605 ROSSLAND RD. E.
4TH FLOOR
P.O. BOX 623
WHITBY, ON L1N 6A3
CANADA
905-668-7711
1-800-372-1102
Fax: 905-666-6208
E-Mail: planning@durham.ca

www.durham.ca

Brian Bridgeman, MCIP, RPP
Commissioner of Planning and
Economic Development

The Regional Municipality of Durham

ROAD SEGMENT TRAFFIC FORECASTS FOR NOISE ANALYSES

This information is to be used as the basis for assessing the potential impacts of noise, generated by traffic on Provincial Highways and arterial roads, on proposed land uses that are sensitive (e.g., residential subdivisions). Arterial roads include existing and future Type A, B and C, as designated in the Durham Regional Official Plan.

Noise assessment reports recommend specific measures to be integrated into the design of sensitive developments to reduce road noise impacts to acceptable levels.

Provided For:

Name / Name of Firm: Hava Jouharchi

Address: YCA

Telephone: (416) 894-4213 Fax:

Location of Proposal:

Brock Street East (Reg. Hwy 47), east of Main Street, Uxbridge

Municipality: Uxbridge Lot(s): Concession:

Durham Region File No. (if available):

Name of Property Owner (if available):

Date Request Received: October-18-17 Received By: Sandra McEleney

Date Forecast Sent: October-19-17

Name of Road Segment	Forecasted AADT*	No. of Lanes	% of Trucks	Heavy : Medium Truck Ratio		Speed (km/h)
Brock Street E. (Reg. Hwy 47)	11,000	4	15	80	20	50
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0

* Average Annual Daily Traffic. Forecast based on ultimate development according to the Durham Regional Official Plan.

APPENDIX 3

SOUND LEVEL CALCULATIONS

```
STAMSON 5.0        SUMMARY REPORT        Date: 08-12-2020 16:53:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: acondos.te           Time Period: Day/Night 16/8 hours
Description: Condo, South Face

Road data, segment # 1: Brock Street (day/night)
-----------------------------------------------
Car traffic volume  :  8415/935   veh/TimePeriod  *
Medium truck volume :   297/33    veh/TimePeriod  *
Heavy truck volume  :  1188/132   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  11000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   3.00
    Heavy Truck  % of Total Volume     :  12.00
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 1: Brock Street (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  :  18.00 / 18.00  m
Receiver height           :  17.50 / 17.50  m
Topography                :      1       (Flat/gentle slope; no barrier)

Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Brock Street     !     1.86 !    69.51 !    69.51
--------------------+---------+---------+---------
                      Total                 69.51 dBA

Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Brock Street     !     1.86 !    62.98 !    62.98
--------------------+---------+---------+---------
                      Total                 62.98 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 69.51
                           (NIGHT): 62.98
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 08-12-2020 16:54:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: acondow.te           Time Period: Day/Night 16/8 hours
Description: Condo, West Face

Road data, segment # 1: Brock Street (day/night)
----------------------------------------------
Car traffic volume  :  8415/935   veh/TimePeriod  *
Medium truck volume :   297/33    veh/TimePeriod  *
Heavy truck volume  :  1188/132   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  11000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   3.00
    Heavy Truck  % of Total Volume     :  12.00
    Day (16 hrs) % of Total Volume     :  90.00
Data for Segment # 1: Brock Street (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  :  18.00 / 18.00  m
Receiver height           :  17.50 / 17.50  m
Topography                :      1       (Flat/gentle slope; no barrier)

Result summary (day)
--------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Brock Street     !     1.86 !    66.50 !    66.50
--------------------+---------+---------+---------
                      Total                  66.50 dBA

Result summary (night)
----------------------
                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Brock Street     !     1.86 !    59.97 !    59.97
--------------------+---------+---------+---------
                      Total                  59.97 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 66.50
                           (NIGHT): 59.97
```

```
STAMSON 5.0        SUMMARY REPORT        Date: 08-12-2020 16:54:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: aconola1.te          Time Period: Day/Night 16/8 hours
Description: Condo, OLA

Road data, segment # 1: Brock Street (day/night)
----------------------------------------------
Car traffic volume  :  8415/935   veh/TimePeriod  *
Medium truck volume :   297/33    veh/TimePeriod  *
Heavy truck volume  :  1188/132   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT):  11000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   3.00
    Heavy Truck  % of Total Volume     :  12.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Brock Street (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  92.00 / 26.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :   3.00 / 10.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m

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

                    !  source  !   Road   !  Total
                    !  height  !   Leq    !   Leq
                    !   (m)    !  (dBA)   !  (dBA)
--------------------+---------+---------+---------
 1.Brock Street     !     1.86 !    53.87 !    53.87 *
--------------------+---------+---------+---------
                      Total                  53.87 dBA
```

Project No.: Y1735A
Project Name: Brock Street Condo
Date: September 2020

Receiver Table

Name	Level Lr		Limit. Value		Height		Coordinates		
	Day	Night	Day	Night			X	Y	Z
	(dBA)	(dBA)	(dBA)	(dBA)	(m)		(m)	(m)	(m)
R1	44.5	44.5	50.0	45.0	4.50	r	112.96	876.96	4.50
R2	43.4	43.3	50.0	45.0	17.50	r	113.05	883.58	17.50
R3	41.9	41.7	50.0	45.0	17.50	r	114.31	900.01	17.50
R4	42.9	39.9	50.0	45.0	17.50	r	133.96	872.30	17.50
R5	39.7	38.0	50.0	45.0	1.50	r	124.52	905.11	1.50

Source Table

Name	Result. PWL			Lw / Li		Operating Time			Freq.	Height		Coordinates		
	Day	Evening	Night	Type	Value	Day	Special	Night				X	Y	Z
	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(Hz)	(m)		(m)	(m)	(m)
T1	80.8	80.8	80.8	Lw	T2					1.50	r	86.00	874.30	1.50
T2	77.4	77.4	77.4	Lw	T1					2.00	r	78.00	889.22	2.00
RTU1	80.3	80.3	80.3	Lw	RTU	720.00	240.00	240.00		1.00	g	190.36	869.03	6.50
RTU2	80.3	80.3	80.3	Lw	RTU	720.00	240.00	240.00		1.00	g	190.76	864.66	6.50
RTU3	80.3	80.3	80.3	Lw	RTU	720.00	240.00	240.00		1.00	g	190.82	859.34	6.50
RTU4	80.3	80.3	80.3	Lw	RTU	720.00	240.00	240.00		1.00	g	203.20	860.83	6.50
RTU5	80.3	80.3	80.3	Lw	RTU	720.00	240.00	240.00		1.00	g	210.08	860.04	6.50
RTU6	80.3	80.3	80.3	Lw	RTU	720.00	240.00	240.00		1.00	g	216.76	860.59	6.50

Result Table

Receiver	Limiting Value		Lr w/o Noise Control		dL req.		Lr w/ Noise Control		Exceeding	
Name	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
R1	50	45	44.5	44.5	-	-	0.0	0.0	-	-
R2	50	45	43.4	43.3	-	-	0.0	0.0	-	-
R3	50	45	41.9	41.7	-	-	0.0	0.0	-	-
R4	50	45	42.9	39.9	-	-	0.0	0.0	-	-
R5	50	45	39.7	38.0	-	-	0.0	0.0	-	-

APPENDIX 4

SOUND LEVEL CRITERIA

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS

ENVIRONMENTAL NOISE GUIDELINE
Stationary and Transportation Sources - Approval and Planning
Publication NPC-300

August 2013

Day-time Outdoor Sound Level Limit

Table C-1 gives the equivalent sound level (L_{eq}) limit for designated Outdoor Living Areas. The limit applies to the entire day-time period from 07:00 to 23:00.

TABLE C-1
Sound Level Limit for Outdoor Living Areas
Road and Rail

Time Period	*L_{eq}(16) (dBA)*
16 hr, 07:00 - 23:00	*55*

Indoor Sound Level Limit

Table C-2 gives the equivalent sound level (L_{eq}) limits and the applicable time periods for the indicated types of indoor space. The specified sound level criteria are minimum requirements and apply to the indicated indoor spaces with the windows and doors closed.

TABLE C- 2
Indoor Sound Level Limits (Road and Rail)

Type of Space	*Time Period*	*L_{eq} (Time Period) (dBA)*	
		Road	*Rail*
Living/dining, den areas of residences, nursing/retirement homes, hospitals, schools, day-care centers, etc.	*07:00-23:00*	*45*	*40*
Living/dining areas of residences, nursing/retirement homes, hospitals, etc. (except schools or daycare centres)	*23:00 - 07:00*	*45*	*40*
Sleeping quarters	*07:00-23:00*	*45*	*40*
Sleeping quarters	*23:00 - 07:00*	*40*	*35*

SUPPLEMENTARY NOISE LIMITS

Indoor limits for transportation sources applicable to noise sensitive land uses are specified in Table C-2 and Table C-9.

TABLE C-9

Indoor Sound Level Limits (Road and Rail)

Type of Space	*Time Period*	*L_{eq} (Time Period) (dBA)*	
		Road	*Rail*
General offices, reception areas, retail stores, etc.	*16 hours between 07:00-23:00*	*50*	*45*
Living/dining areas of residences, hospitals, schools, nursing/retirement, homes day-care centers, theatres, place of worship, libraries, individual or semi-private offices, conference rooms, reading rooms etc.	*16 hours between 07:00-23:00*	*45*	*40*
Sleeping quarters of hotels/motels	*8 hours between 23:00 - 07:00*	*45*	*40*
Sleeping quarters of residences, hospitals, nursing/retirement homes etc	*8 hours between 23:00 - 07:00*	*40*	*35*

SUMMARY OF MINIMUM NOISE CONTROL AND VENTILATION REQUIREMENTS FOR ROAD AND RAIL NOISE

TABLE 1

COMBINATION OF ROAD AND RAIL NOISE, DAY-TIME (0700 - 2300)

OUTDOOR, VENTILATION AND WARNING CLAUSE REQUIREMENTS

ASSESSMENT LOCATION	*L_{eq} (16 hr) (dBA)*	*VENTILATION REQUIREMENTS*	*OUTDOOR CONTROL MEASURES*	*WARNING CLAUSE*
OUTDOOR LIVING AREA (OLA)	*Less than or equal to 55 dBA*	*N/A*	*None required*	*Not required*
	Greater than 55 dBA to less than or equal to 60 dBA	*N/A*	*Control measures (barriers) not required but should be considered*	*Required if resultant L_{eq} exceeds 55 dBA Type A*
	Greater than 60 dBA	*N/A*	*Control measures (barriers) required to reduce the L_{eq} below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible*	*Required if resultant L_{eq} exceeds 55 dBA Type B*
PLANE OF LIVING ROOM WINDOW	*Greater than 50 dBA to less than or equal to 55 dBA*	*None required*	*N/A*	*Not required*
	Greater than 55 dBA to less than or equal to 65 dBA	*Forced air heating with provision for central air conditioning*	*N/A*	*Required Type C*
	Greater than 65 dBA	*Central air conditioning*	*N/A*	*Required Type D*

TABLE 2

COMBINATION OF ROAD AND RAIL NOISE, NIGHT-TIME (2300 - 0700)

VENTILATION AND WARNING CLAUSE REQUIREMENTS

ASSESSMENT LOCATION	*L_{eq}(8hr) (dBA)*	*VENTILATION REQUIREMENTS*	*WARNING CLAUSE*
PLANE OF BEDROOM WINDOW	*Greater than 50 dBA to less or equal to 60 dBA*	*Forced air heating with provision for central air conditioning*	*Required Type C*
	Greater than 60 dBA	*Central air conditioning*	*Required Type D*

TABLE 3
ROAD AND RAIL NOISE, DAY-TIME (0700 - 2300)
BUILDING COMPONENT REQUIREMENTS

ASSESSMENT LOCATION		L_{eq} (16 hr)	BUILDING COMPONENT REQUIREMENTS
PLANE OF LIVING ROOM WINDOW	ROAD	Less than or equal to 65 dBA	Building compliant with the Ontario Building Code
		Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	RAIL	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
		Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria

TABLE 4
ROAD AND RAIL NOISE, NIGHT-TIME (2300-0700)
BUILDING COMPONENT REQUIREMENTS

ASSESSMENT LOCATION		L_{eq} (8 hr)	BUILDING COMPONENT REQUIREMENTS
PLANE OF BEDROOM WINDOW	ROAD	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
		Greater than 65 dBA	Building components (walls, windows, etc.) must bed designed to achieve indoor sound level criteria
	RAIL	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
		Greater than 60 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria

TABLE 5
FACADE REQUIREMENT FOR RAIL NOISE ONLY - 24 HOURS

ASSESSMENT LOCATION	DISTANCE TO RAILWAY (m)	L_{eq} (24 hr) (dBA)	NOISE CONTROL REQUIREMENT
PLANE OF BEDROOM WINDOW	Less than 100 m	Less than or equal to 60 dBA	No additional requirement
		Greater than 60 dBA	Brick veneer or acoustically equivalent
	Greater than 100 m	Less than or equal to 60 dBA	No additional requirement
		Greater than 60 dBA	No additional requirement

TABLE B- 1
Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq dBA)
Outdoor Points of Reception

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00-19:00	50	50	45	55
19:00 -23:00	50	45	40	55

TABLE B- 2
Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq dBA)
Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00-19:00	50	50	45	60
19:00 -23:00	50	50	40	60
23:00-07:00	45	45	40	55

WARNING CLAUSES

The following warning clauses may be used individually or in combination:

TYPE A:

"Purchasers/tenants are advised that despite the inclusion of noise control features, sound levels due to increasing road traffic, the existing hydro substation and proposed commercial development may occasionally interfere with some activities of the occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of Environment."

TYPE C:

"This Suite/Unit was fitted with the option to accommodate a ventilation system to allow windows and exterior doors to be kept closed, thereby achieving indoor sound levels within the limits recommended by the Ministry of Environment."

TYPE D:

"This unit has been supplied with a central air conditioning system which will allow the windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of Environment."

TYPE E:

"Purchasers/tenants are advised that due to the proximity of the existing hydro substation and proposed commercial developments, noise from these facilities may at times be audible

APPENDIX 5

SAMPLE WINDOW AND EXTERIOR WALL CONFIGURATIONS

WINDOW STC RATINGS

STC	Double Glazing of indicated glass thickness					Triple Glazing	
	2mm and 2mm glass	**3mm and 3mm glass**	**4mm and 4mm glass**	**3mm and 6mm glass**	**6mm and 6mm glass**	**3mm 3mm and 3mm glass**	**3mm 3mm and 6mm glass**
	Interpane Spacing (mm)					Interpane Spacing (mm)	
27	6						
28	13						
29	15	6					
30	18	13	6				
31	22	16	13	6	6	6,6	
32	28	20	16	13	13	6,10	6,6
33	35	25	20	16	16	6,15	6,10
34	42	32	25	20	20	6,20	6,15
35	50	40	32	25	24	6,30	6,20
36	63	50	40	32	30	6,40	6,30
37	80	63	50	40	37	6,50	6,40
38	100	80	63	55	50	6,65	6,50
39	125	100	80	75	70	6,80	6,65
40	150	125	100	95	90	6,100	6,80
41		150	125	110	100		6,100
42			150	135	125		

Source: National Research Council, Division of Building Research

EXPLANATORY NOTES:

1. STC data listed in the table are for the well-fitted weather-stripped units that can be opened. The STC values apply only when the windows are closed. For windows fixed and sealed to the frame, add three to the STC given in the table.

2. If the interpane spacing or glass thickness for a specific double-glazed window is not listed in the table, the nearest listed values should be used.

3. If the interpane spacing for a specific triple-glazed window are not listed in the table, use the listed case whose combined spacing are nearest the actual combined spacing.

4. The STC data listed in the table are for typical windows, but details of glass mounting, window seals, etc., may result in slightly different performance for some manufacturer's products. If the laboratory sound transmission loss data (conforming to ASTM test method E-90) are available, these should be used.

EXTERIOR WALL STC RATINGS

Wall Configuration	EW1	EW2	EW3	EW4	EW1R	EW2R	EW3R	EW5	EW4R	EW6	EW7 EW5R	EW8
STC Rating	**38**	**40**	**43**	**46**	**47**	**48**	**49**	**54**	**55**	**57**	**58**	**62**

Source: National Research Council, Division of Building Research

NOTES:

1 The common structure of walls EW1 to EW5 is composed of 12.7mm gypsum board, vapour barrier and 38x89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in inter-stud cavities.

- EW1 denotes the common structure, plus sheathing, plus wood siding or metal siding and fibre backer board
- EW2 denotes the common structure, plus rigid insulation (25 to 30 mm), and wood siding or metal siding and fibre backer board.
- EW3 denotes simulated mansard with the common structure, plus sheathing, 28 X89 mm framing, sheathing and asphalt roofing material
- EW4 denotes the common structure, plus sheathing and 20 mm stucco.
- EW5 denotes the common structure, plus sheathing, 25 mm air space, 100mm brick veneer.
- EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 100 mm back-up block 100 mm face brick.
- EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 140mm back-up block, 100 mm face brick.
- EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25 to 50 mm), 200 mm concrete.

2 R signifies the mounting of the interior gypsum board on resilient clips.

3 An exterior wall conforming to rainscreen design principles and composed of 12.7 mm gypsum board, 100 mm concrete block, rigid insulation (25 to 50 mm), 25 mm air space, and 100 mm brick veneer has the same STC as EW6.

4 An exterior wall described in EW1 with the addition of rigid insulation (25 to 50 mm) between the sheathing and the external finish has the same STC as EW2.