

ENVIRONMENTAL NOISE ASSESSMENT -REVISED-

**2055 BROCK ROAD
PROPOSED HIGH RISE TOWERS
AND TOWNHOUSES
PART OF LOT 18, CONCESSION 2
CITY OF PICKERING**

**PREPARED FOR:
BROCK ROAD DUFFINS FOREST INC.**

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1.0 INTRODUCTION

PURPOSE

A residential development has been proposed by Brock Road Duffins Forest Inc. in the City of Pickering. This report is an analysis of future sound levels within the proposed development and describes the types and locations of noise mitigation measures which will be required.

SITE DESCRIPTION AND LOCATION

The proposed residential development consists of three townhouse blocks with 3 storeys each and two residential Towers (20 storey each), a 4 storey podium between the two Towers and local roads located east of Brock Road, between Finch Avenue and Concession Road 3 in the City of Pickering.

The surrounding land uses are existing residential developments and community park to the west, an existing Mosque and residential development to the north, West Duffins creek to the south and east.

KEY PLAN

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



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 1 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 (0700-1900) or 45 dBA during night-time (1900-0700).

3.0 NOISE SOURCES

ROAD TRAFFIC

The proposed residential development is located east of Brock Road, at approximately 180m north of Finch Avenue, 300m north of Kingston Road and more than 1km south of Third Concession Road as indicated on Drawing Y1731A.

Due to distance separation, Kingston Road is considered acoustically insignificant. Therefore, noise generated by Brock Road and Finch Avenue have the potential to affect future townhouse development. All other roads within this site are local roadways.

Traffic volume information for Brock Road was obtained and confirmed September 2019 with the Region of Municipality of Durham and are summarized in Tables 1 and 2 below:

TABLE 1: BROCK ROAD TRAFFIC DATA	
Projected Annual Average Daily Traffic *	40,000
Percent Trucks	15%
Heavy and Medium trucks ratio	65:35
Speed (km/hr)	60
Number of Lanes	6

TABLE 2: FINCH AVENUE TRAFFIC DATA	
Projected Annual Average Daily Traffic *	26,000
Percent Trucks	8%
Heavy and Medium trucks ratio	65:35
Speed (km/hr)	60
Number of Lanes	4

* The projected traffic data provided by the Region of Durham.

EXISTING MOSQUE

The Pickering Islamic Centre is located east of Brock Road adjacent to the proposed townhouse development. Services and events occur several times a week at the mosque within the building during the daytimes and evenings. The parking area is located at the rear with approximately 100 spaces.

Due to the nature of the activities, the occasional noise activities may be audible at times. Therefore, a warning clause Type A will be required for the residential units exposed to the existing Mosque development.

COMMERCIAL DEVELOPMENTS

Existing Commercial Developments are located south of Finch Avenue and north along Brock Road at approximately 200m or more from the proposed townhouse development.

Due to distance separation and shielding from the existing residential developments along Finch Avenue, the noise impacts are considered insignificant.

PROPOSED STATIONARY NOISE SOURCES

Mechanical units are also expected for the proposed buildings and at the Mechanical Penthouse. The mechanical information is not available at this time.

The sound levels from the mechanical equipment are recommended to be investigated further once the details are available to ensure the sound level limits at the adjacent existing residential developments and the proposed residential development itself will be met.

4.0 NOISE ASSESSMENT

Drawing Y1731A is based on the latest Site Plan dated February 2020 prepared by Kohn Architects Inc. showing various noise analysis locations and noise mitigation measures within the proposed mixed use 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 3. Table 3 lists the unattenuated sound levels at various locations.

TABLE 3: UNATTENUATED SOUND LEVELS					
BLOCKS/LOCATIONS		DISTANCE TO CENTRELINE OF ROAD (m)	DAYTIME (16 Hr. Leq (dBA))		NIGHT-TIME (8 Hr. Leq (dBA))
			OUTDOOR AMENITY AREAS	DWELLING WALL	SECOND STOREY
Block A (North Tower)	West Face (20th Floor)	22.0* 224.0**	-	74.20 57.07 (74.28)	67.67 50.54 (67.75)
	North Face	22.0* 224.0**	-	71.19 50.08 (71.22)	64.66 43.55 (64.69)
4 Storey Podium	West Face (4th Floor)	22.0* 206.0**	-	72.85 51.33 (72.90)	66.32 44.80 (66.35)
	Roof Terrace	25.0* 210.0**	58.04 47.14 (58.38)	-	-
Block A (South Tower)	West Face (20th Floor)	24.0* 180.0**	-	73.82 58.02 (73.93)	67.29 51.49 (67.40)
	South Face	24.0* 180.0**	-	70.81 61.03 (71.24)	64.28 54.50 (64.71)
Block B (West Unit)	North Face	120.0* 230.0**	-	57.46 40.01 (57.54)	51.91 34.70 (51.99)
Block C (South Unit)	South Face	185.0* 190.0**	-	52.74 50.21 (54.67)	47.36 44.83 (49.29)
Block D (West Unit)	South Face	120.0* 190.0**	-	57.46 53.22 (58.85)	51.91 47.84 (53.35)
	Rear Yard	122.0* 187.0**	56.37 52.18 (57.77)	-	-
	Roof Terrace	122.0* 192.0**	56.37 51.99 (57.72)	-	-
Common Outdoor Amenity Area		105.0* 188.0**	55.87 52.15 (57.41)	-	-

* Brock Road

** Finch Avenue

() Combined sound level from multiple sources

Note: In accordance to the M.E.C.P. policy, a -10 dB correction is applied to the free-field sound level at the walls opposite to the directly exposed wall.

5.0 RECOMMENDED NOISE MITIGATION MEASURES

5.1 OUTDOOR MEASURES

Based on the preliminary architectural plans prepared by Kohn Architects. Inc., the designated outdoor amenity areas for Block A (High Rise Towers) are the Roof Terrace on top of the 4 storey Podium and the Common Outdoor Amenity Area east of the South Tower as indicated on the attached Drawing Y1731A.

For Townhouses within Blocks C and D, the designated outdoor amenity areas are the Roof Terraces and the back yards. For Townhouses within Block B, the designated outdoor amenity areas are the back yards.

As per the sound level results in Table 3, the sound level at the designated outdoor amenity areas for Blocks A, B and D are expected to be between 55dBA and 60 dBA and below 55 dBA for Block C due to road noise sources.

Therefore, outdoor noise mitigation measures are not required. However a warning clause Type A is recommended.

5.2 VENTILATION REQUIREMENTS

Ventilation requirements were determined using the sound levels at the building facades listed in Table 3.

MANDATORY CENTRAL AIR CONDITIONERS

Based on the information in Table 3, 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:

- Block A (All Units within the High Rise Towers and the Podium)

The following warning clause Type D 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 locations:

Warning Clause Type D:

“This unit was fitted with an air conditioner to allow the windows and exterior doors to remain closed, thereby achieving indoor sound levels within the limits recommended by the Ministry of Environment. (Note: care should be taken to ensure that the condenser unit is located in an area that is not sensitive to noise. The sound rating of air conditioning units must not exceed the sound emission standards established by the Ministry of Environment).”

PROVISION FOR CENTRAL AIR CONDITIONERS

The following units must be constructed with a forced air heating system with ducting sized to accommodate an air conditioning unit, in order to allow the occupants the option of installing central air conditioning should he or she wish to do so in the future as per Table 3 sound level results:

- Blocks B and D (All Units)

The following warning clause Type C 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 locations:

Warning Clause Type C:

“This unit was fitted with ducting sized to accommodate an air conditioning unit. The installation of air conditioning by the occupant will allow windows and exterior doors to be kept closed, thereby achieving indoor sound levels within the limits recommended by the Ministry of Environment. (Note: care should be taken to ensure that the condenser unit is located in an area that is not sensitive to noise. The sound rating of air conditioning units must not exceed the sound emission standards established by the Ministry of Environment).”

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. Preliminary building elevations and floor plans have been provided by Kohn Architects Inc.

DAYTIME SOUND LEVELS

For the worst case location during daytime, (Block A) the daytime dwelling wall sound level of 74 dBA was calculated at the fourth storey living/dining room. To ensure acceptable daytime indoor sound levels of 45dBA from road noise sources, the overall building components must provide an STC rating of 37 for windows and STC 44 for exterior wall construction.

NIGHT-TIME SOUND LEVELS

For the worst case location during night-time, (Block A) the night-time dwelling wall sound level of 68 dBA was calculated at the fourth storey bedroom. To ensure acceptable night-time indoor sound levels of 40dBA from road noise sources, the overall building components must provide an STC rating of 35 for windows and STC 42 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, the windows and exterior walls need to be upgraded for the High-Rise residential Towers within Block A (All Units). For all other Blocks standard building components meeting the Ontario Building Code (OBC) requirements are acoustically acceptable.

WINDOWS

The following are some window configurations meeting an STC rating of 37, assuming the ratio of window area to room floor area is 25%:

- double glazing 6mm x 6mm thickness with 20mm air space (Casement/Fixed) or
- double glazing 4mm x 4mm thickness with 25mm air space (Casement/Fixed) or
- any other window type yielding a similar or greater STC rating

EXTERIOR WALLS

The following exterior wall constructions meet the STC 44 rating:

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/concrete.

Sample window and exterior wall configurations are included in Appendix 4 for additional options.

5.4 WARNING CLAUSES

The following warning clause Type A must be incorporated into the Site Plan Agreement, which will be registered on title and included in all offers of purchase and sale or lease of the locations listed below.

- Blocks A, B, C and D (All Units)

Warning Clause Type A

"Occupants are advised that sound levels due to increasing road traffic, the existing Mosque and commercial developments may occasionally interfere with some activities of the occupants as the sound level will exceed the Ministry of Environment's noise criteria."

6.0 SUMMARY OF NOISE MITIGATION MEASURES

The summary of noise abatement measures are listed in the following Table 4 identifying mandatory air conditioners, provision for central air conditioners, building components and warning clauses.

TABLE 4: SUMMARY OF NOISE MITIGATION MEASURES				
BUILDINGS/UNITS	VENTILATION REQUIREMENTS	BUILDING COMPONENTS	SOUND BARRIERS	WARNING CLAUSES
Block A - High Rise Towers and Podium (West Facing Units)	Mandatory air conditioning	Windows: STC 37 Walls: STC 44	No	Type A and D
Block A - High Rise Towers (North and South Facing Units)	Mandatory air conditioning	Windows: STC 35 Walls: STC 42	No	Type A and D
Block A - High Rise Towers and Podium (East Facing Units)	Mandatory air conditioning	Windows: STC 33 Walls: STC 38	No	Type A and D
Blocks B and D (All Units)	Provision for air conditioning	Windows: OBC* Walls: OBC	No	Type A and C
Block C (All Units)	No Requirements			Type A

* OBC: Ontario Building Code Standard

7.0 RECOMMENDATIONS AND CONCLUSION

RECOMMENDATIONS

1. Mandatory air conditioning is required for residential High Rise Towers and the Podium within Block A (All Units).
2. Provision for adding air conditioning in the future for Blocks B and D (All Units).
3. For residential High Rise Towers and the Podium within Block A, the exterior wall and window construction need to be upgraded. See Table 4 for details. For all remaining residential units, Standard Ontario Building Construction will be acoustically acceptable for the exterior wall and window constructions.
4. All applicable warning clauses shall be listed in the City of Pickering's Site Plan Agreement and also be inserted in the Agreements of Purchase and Sale or Lease and registered on title.
5. The details of the mechanical units are not available at this time. Further investigation is recommended to ensure the sound levels at the adjacent existing receptor locations and the proposed receptors meet the MOE sound levels limits once this information becomes available.

Prior to the issuance of occupancy permit for any unit for which ventilation has been specified in the Noise Study, it is recommend that a qualified engineer should submit a letter to the City indicating that the recommended measures or acceptable alternatives have been incorporated in the building which satisfy the M.E.C.P. criteria.

CONCLUSION

This report has determined that sound levels acceptable to the Ministry of Environment, Conservation and Parks, City of Pickering and the Region of Durham are expected to be achieved using the abatement measures in this report and as shown on the attached Drawing Y1731A.

Respectfully submitted,

YCA ENGINEERING Limited

Hava Jauharchi, P.Eng.
Senior Project Engineer





KEY PLAN
N.T.S.

- LEGEND:
- MANDATORY CENTRAL AIR CONDITIONING AND WARNING CLAUSE D
 - OPTIONAL CENTRAL AIR CONDITIONING AND WARNING CLAUSE C
 - * WARNING CLAUSE A
 - PROPOSED ACOUSTIC BARRIER AND WARNING CLAUSE B

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 Email: havo@ceengneering.com

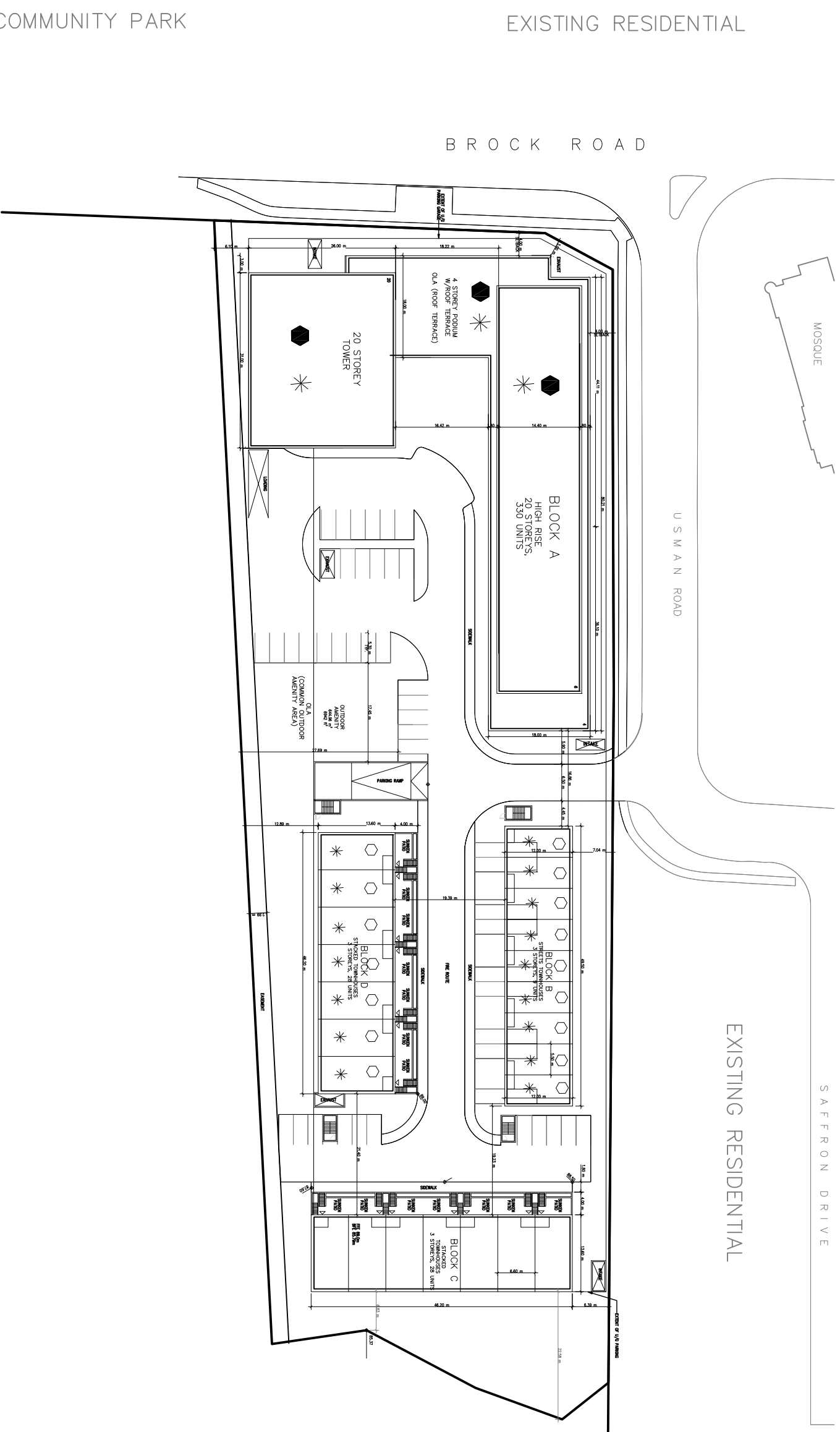
SITE PLAN
 NOISE
 MITIGATION MEASURES

2055 BROCK ROAD
 RESIDENTIAL HIGH RISE
 TOWERS AND TOWNHOUSES
 Part of Lot 18
 Concession 2
 CITY OF PICKERING

DRAWING: Y1731A

Scale: NTS

DATE: FEBRUARY 2020



COMMUNITY PARK

EXISTING RESIDENTIAL

BROCK ROAD

SAFFRON DRIVE

EXISTING RESIDENTIAL

U.S.M.A. ROAD

MOSQUE

BLOCK A
 HIGH RISE
 20 STOREYS,
 330 UNITS

BLOCK B
 3 STOREYS
 TOWNHOUSES

BLOCK C
 3 STOREYS
 TOWNHOUSES

BLOCK D
 3 STOREYS
 TOWNHOUSES

20 STOREY
 TOWER

4 STOREY EQUIM
 W/ ROOF TERRACE

OUTDOOR
 AMENITY
 AREA

COMMON OUTDOOR
 AMENITY AREA

PARKING RAMP

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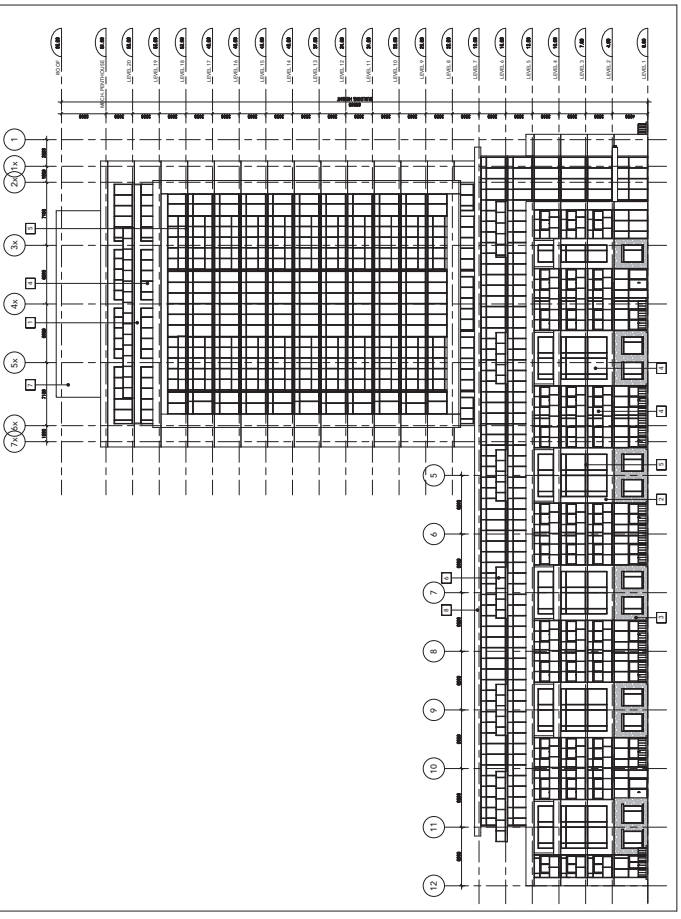
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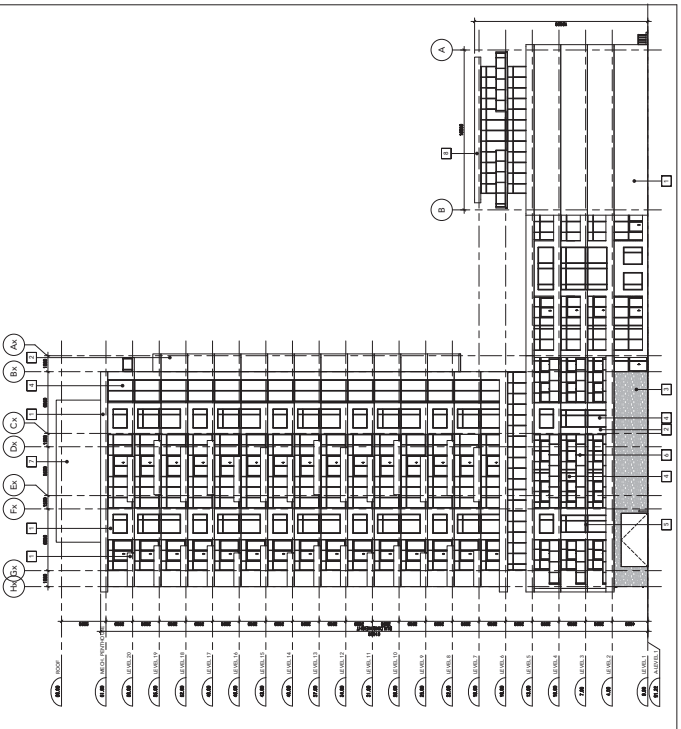
Kohn

Kohn Pedersen Fox Associates, Inc.
 500 Madison Avenue, New York, NY 10022
 140 West 57th Street, New York, NY 10019
 140 West 57th Street, New York, NY 10019

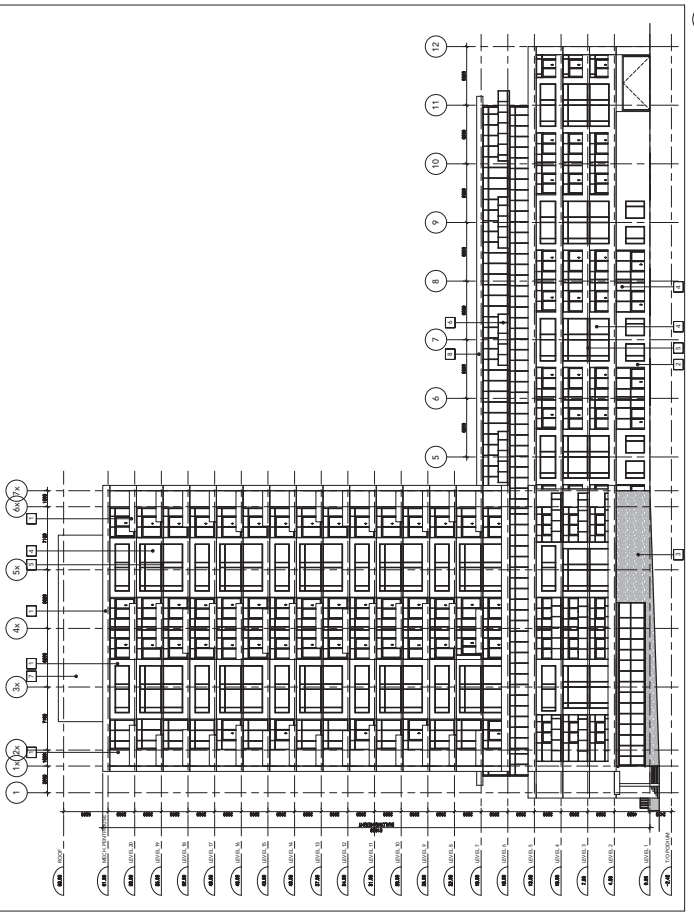
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 PROJECT: BRIDGES ASSOCIATION
 ARCHITECT: Kohn Pedersen Fox Associates, Inc.
 DATE: 2020.02.21.10.59.08 AM
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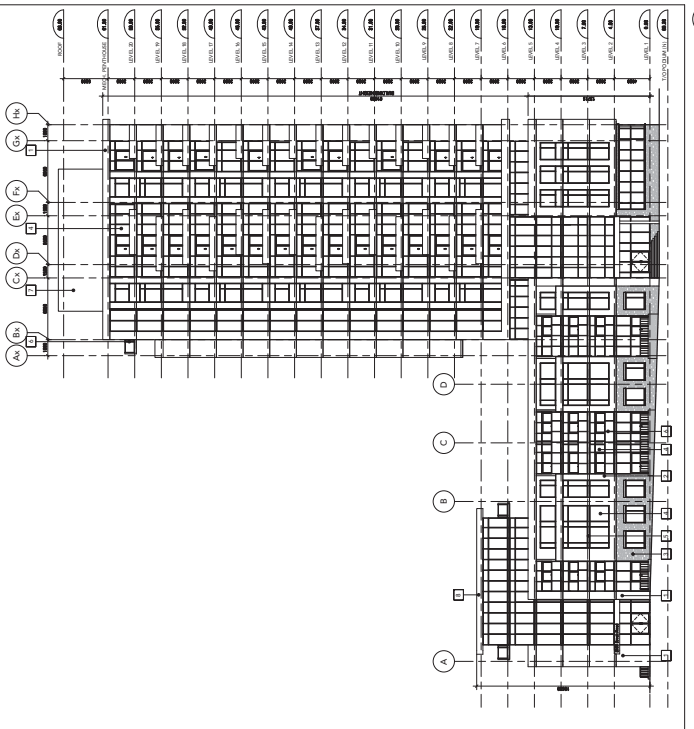
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EAST ELEVATION
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SOUTH ELEVATION
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WEST ELEVATION
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WALL FINISHES	
□	CONCRETE
□	INSULATION
□	INTERIOR FINISH
□	EXTERIOR FINISH
□	WINDOW WALL
□	SPANDREL
□	GLASS
□	METAL STUD
□	PERFORATED METAL
□	BRICK



2055 BROCK ROAD
 BRIDGES ASSOCIATION
 BLOCK A - ELEVATIONS

DATE: 2020.02.21.10.59.08 AM
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A400

Kohn

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CONTRACT NO. 2020-02-21-1022-59 AM
 PROJECT NO. 177-119
 DESIGN NO. 2020-02-21-1022-59 AM
 SHEET NO. B A4 01

DATE: 02/21/2020
 BY: []
 CHECKED BY: []

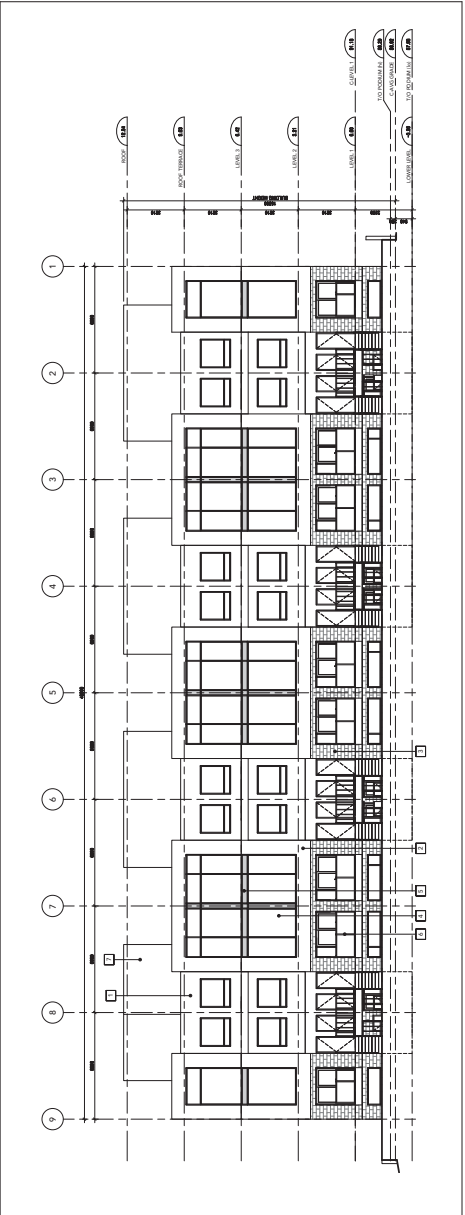


2055 BROCK ROAD
 BROCK RD DUPONS FOREST INC.
 PIERING
 BLOCK B, C, D -
 ELEVATIONS

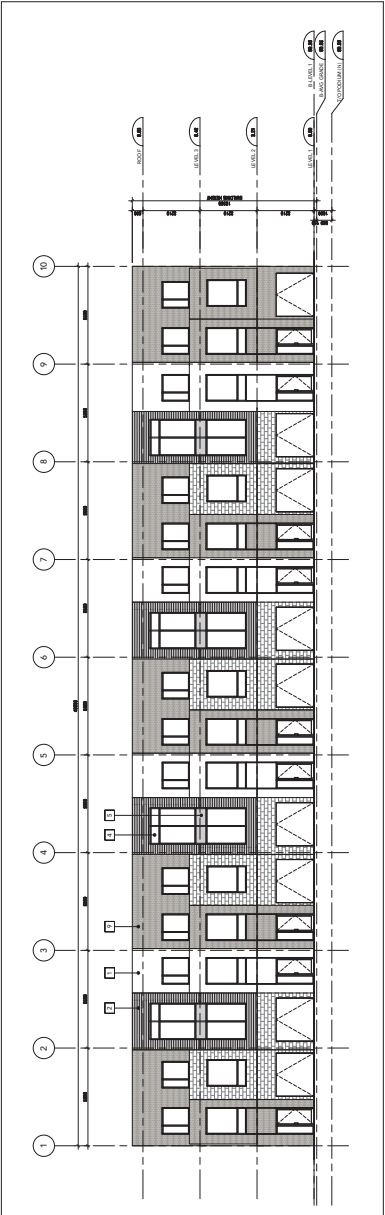
2055 BROCK ROAD
 DUPONS FOREST INC.
 PIERING
 BLOCK B, C, D -
 ELEVATIONS

DATE: 02/21/2020
 BY: []
 CHECKED BY: []

2055 BROCK ROAD
 DUPONS FOREST INC.
 PIERING
 BLOCK B, C, D -
 ELEVATIONS



1
 BLOCK C - WEST ELEVATION
 SCALE 1/8\"/>



1
 BLOCK B - SOUTH ELEVATION
 SCALE 1/8\"/>

APPENDIX 1

TRAFFIC DATA

From: Sandra McEleney [Sandra.McEleney@Durham.ca]
Sent: Tuesday, September 10, 2019 3:17 PM
To: Hava Jouharchi

Subject: RE: Traffic Data Request, Pickering (Sept22,17) Confirmation (Sept10,19)

Dear Hava,

Data is accurate. Yes.



Sandra McEleney MCIP, RPP, MPPAL | Transit Planner

Regional Municipality of Durham | Planning and Economic
Development

605 Rossland Road East, 4th Floor | Whitby, ON L1N 6A3 |
905.668.7711 ext. 2550 | 1.800.372.1102

Corporate Values: • Ethical Leadership • Accountability • Service Excellence •
Continuous Learning and Improvement • Inclusion

From: Hava Jouharchi <hava@ycaengineering.com>

Sent: Tuesday, September 10, 2019 10:18 AM

To: Sandra McEleney <Sandra.McEleney@Durham.ca>

Subject: RE: Traffic Data Request, Pickering (Sept22,17) Confirmation
(Sept10,19)

Good Morning Sandra,

Could you please confirm that the attached traffic data from 2017 is still valid for Brock Road and
Finch Avenue?

Thanks in advance

Hava

*Hava Jouharchi, P.Eng.
Senior Project Engineer*

YCA Engineering Ltd.

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The Regional Municipality of Durham

Planning and Economic Development Department

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

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) 894-3213 Fax:

Location of Proposal:

Brock Road North, (N. of Finch) and Finch Ave. (WEST of Brock Rd)* Please note that we do not have data for east of Brock as that section is a local road.

Municipality: Pickering Lot(s): Concession:
Durham Region File No. (if available):
Name of Property Owner (if available):

Date Request Received: September-25-17 Received By: Sandra McEleney

Date Forecast Sent: September-25-17

Table with 7 columns: Name of Road Segment, Forecasted AADT*, No. of Lanes, % of Trucks, Heavy : Medium Truck Ratio, Speed (km/h). Rows include Brock Road N. (n. of Finch), Finch Ave. (WEST. of Brock), and two empty rows with zeros.

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

APPENDIX 2

STAMSON 5.04

SOUND LEVEL CALCULATIONS

STAMSON 5.04 SUMMARY REPORT Date: 11-09-2019 16:30:23
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: ntwest.te Time Period: Day/Night 16/8 hours
 Description: North Tower (West)

Road data, segment # 1: Brock Road (day/night)

 Car traffic volume : 30600/3400 veh/TimePeriod *
 Medium truck volume : 1890/210 veh/TimePeriod *
 Heavy truck volume : 3510/390 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 40000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 5.25
 Heavy Truck % of Total Volume : 9.75
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Brock Road (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 22.00 / 22.00 m
 Receiver height : 60.00 / 60.00 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 : 10.00 / 10.00 m
 Source elevation : 0.50 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m

Road data, segment # 2: Finch Av (day/night)

 Car traffic volume : 21528/2392 veh/TimePeriod *
 Medium truck volume : 655/73 veh/TimePeriod *
 Heavy truck volume : 1217/135 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 26000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 2.80
 Heavy Truck % of Total Volume : 5.20
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Finch Av (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 : 224.00 / 224.00 m
 Receiver height : 60.00 / 60.00 m
 Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.Brock Road	! 1.77 !	74.20 !	74.20 *
2.Finch Av	! 1.51 !	57.07 !	57.07
	-----+-----+-----+-----		
	Total		74.28 dBA

Result summary (night)

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.Brock Road	! 1.77 !	67.67 !	67.67 *
2.Finch Av	! 1.51 !	50.54 !	50.54
	Total		67.75 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 74.28
(NIGHT): 67.75

Road data, segment # 1: Brock Road (day/night)

 Car traffic volume : 30600/3400 veh/TimePeriod *
 Medium truck volume : 1890/210 veh/TimePeriod *
 Heavy truck volume : 3510/390 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 40000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 5.25
 Heavy Truck % of Total Volume : 9.75
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Brock Road (day/night)

 Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 24.00 / 24.00 m
 Receiver height : 60.00 / 60.00 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -90.00 deg Angle2 : 0.00 deg
 Barrier height : 0.00 m
 Barrier receiver distance : 10.00 / 10.00 m
 Source elevation : 0.50 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m

Road data, segment # 2: Finch Av (day/night)

 Car traffic volume : 21528/2392 veh/TimePeriod *
 Medium truck volume : 655/73 veh/TimePeriod *
 Heavy truck volume : 1217/135 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 26000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 2.80
 Heavy Truck % of Total Volume : 5.20
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Finch Av (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 180.00 / 180.00 m
 Receiver height : 60.00 / 60.00 m
 Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.Brock Road	! 1.77 !	70.81 !	70.81 *
2.Finch Av	! 1.51 !	61.03 !	61.03
	Total		71.24 dBA

Result summary (night)

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.Brock Road	! 1.77 !	64.28 !	64.28 *
2.Finch Av	! 1.51 !	54.50 !	54.50
	Total		64.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.24
(NIGHT): 64.71

STAMSON 5.04 SUMMARY REPORT Date: 11-09-2019 16:32:27
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: poter.te Time Period: Day/Night 16/8 hours
 Description: Podium (Roof Terrace)

Road data, segment # 1: Brock Road (day/night)

 Car traffic volume : 30600/3400 veh/TimePeriod *
 Medium truck volume : 1890/210 veh/TimePeriod *
 Heavy truck volume : 3510/390 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 40000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 5.25
 Heavy Truck % of Total Volume : 9.75
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Brock Road (day/night)

 Angle1 Angle2 : -80.00 deg 80.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 25.00 / 25.00 m
 Receiver height : 1.50 / 12.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -80.00 deg Angle2 : 80.00 deg
 Barrier height : 1.20 m
 Barrier receiver distance : 5.00 / 5.00 m
 Source elevation : 0.00 m
 Receiver elevation : 13.50 m
 Barrier elevation : 13.50 m

Road data, segment # 2: Finch Av (day/night)

 Car traffic volume : 21528/2392 veh/TimePeriod *
 Medium truck volume : 655/73 veh/TimePeriod *
 Heavy truck volume : 1217/135 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 26000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 2.80
 Heavy Truck % of Total Volume : 5.20
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Finch Av (day/night)

 Angle1 Angle2 : -80.00 deg 80.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 1 / 1
 House density : 40 %
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 210.00 / 210.00 m
 Receiver height : 1.50 / 13.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -80.00 deg Angle2 : 80.00 deg
 Barrier height : 1.20 m
 Barrier receiver distance : 5.00 / 5.00 m
 Source elevation : 0.00 m
 Receiver elevation : 13.50 m
 Barrier elevation : 13.50 m

Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1. Brock Road	! 1.77 !	58.04 !	58.04
2. Finch Av	! 1.51 !	47.14 !	47.14
Total			58.38 dBA

STAMSON 5.04 SUMMARY REPORT Date: 11-09-2019 16:34:11
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: ablkcs.w.te Time Period: Day/Night 16/8 hours
 Description: Block C (Side Wall)

Road data, segment # 1: Brock Road (day/night)

 Car traffic volume : 30600/3400 veh/TimePeriod *
 Medium truck volume : 1890/210 veh/TimePeriod *
 Heavy truck volume : 3510/390 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 40000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 5.25
 Heavy Truck % of Total Volume : 9.75
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Brock Road (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 2 / 2
 House density : 60 %
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 185.00 / 185.00 m
 Receiver height : 4.50 / 7.50 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 : 10.00 / 10.00 m
 Source elevation : 0.50 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m

Road data, segment # 2: Finch Av (day/night)

 Car traffic volume : 21528/2392 veh/TimePeriod *
 Medium truck volume : 655/73 veh/TimePeriod *
 Heavy truck volume : 1217/135 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 26000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 2.80
 Heavy Truck % of Total Volume : 5.20
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Finch Av (day/night)

 Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 190.00 / 190.00 m
 Receiver height : 4.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1. Brock Road	! 1.77 !	52.74 !	52.74 *
2. Finch Av	! 1.51 !	50.21 !	50.21

Total 54.67 dBA

Result summary (night)

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.Brock Road	! 1.77 !	47.36 !	47.36 *
2.Finch Av	! 1.51 !	44.83 !	44.83
	Total		49.29 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.67
(NIGHT): 49.29

STAMSON 5.04 SUMMARY REPORT Date: 11-09-2019 16:33:09
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: ablkdrw.te Time Period: Day/Night 16/8 hours
 Description: Block D (Rear Wall)

Road data, segment # 1: Brock Road (day/night)

 Car traffic volume : 30600/3400 veh/TimePeriod *
 Medium truck volume : 1890/210 veh/TimePeriod *
 Heavy truck volume : 3510/390 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 40000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 5.25
 Heavy Truck % of Total Volume : 9.75
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Brock Road (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 : 120.00 / 120.00 m
 Receiver height : 4.50 / 7.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 0.00 deg Angle2 : 90.00 deg
 Barrier height : 0.00 m
 Barrier receiver distance : 10.00 / 10.00 m
 Source elevation : 0.50 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m

Road data, segment # 2: Finch Av (day/night)

 Car traffic volume : 21528/2392 veh/TimePeriod *
 Medium truck volume : 655/73 veh/TimePeriod *
 Heavy truck volume : 1217/135 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 26000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 2.80
 Heavy Truck % of Total Volume : 5.20
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Finch Av (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 190.00 / 190.00 m
 Receiver height : 4.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1. Brock Road	! 1.77 !	57.46 !	57.46 *
2. Finch Av	! 1.51 !	53.22 !	53.22

Total 58.85 dBA

Result summary (night)

	! source !	Road !	Total !
	! height !	Leq !	Leq !
	! (m) !	(dBA) !	(dBA) !
1.Brock Road	! 1.77 !	51.91 !	51.91 *
2.Finch Av	! 1.51 !	47.84 !	47.84
	Total		53.35 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.85
(NIGHT): 53.35

STAMSON 5.04 SUMMARY REPORT Date: 11-09-2019 16:33:43
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: ablkdr.t.e Time Period: Day/Night 16/8 hours
 Description: Block D (Roof Terrace)

Road data, segment # 1: Brock Road (day/night)

 Car traffic volume : 30600/3400 veh/TimePeriod *
 Medium truck volume : 1890/210 veh/TimePeriod *
 Heavy truck volume : 3510/390 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 40000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 5.25
 Heavy Truck % of Total Volume : 9.75
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Brock Road (day/night)

 Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 122.00 / 122.00 m
 Receiver height : 1.50 / 7.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -90.00 deg Angle2 : 0.00 deg
 Barrier height : 0.00 m
 Barrier receiver distance : 10.00 / 10.00 m
 Source elevation : 0.50 m
 Receiver elevation : 10.00 m
 Barrier elevation : 10.00 m

Road data, segment # 2: Finch Av (day/night)

 Car traffic volume : 21528/2392 veh/TimePeriod *
 Medium truck volume : 655/73 veh/TimePeriod *
 Heavy truck volume : 1217/135 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 26000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 2.80
 Heavy Truck % of Total Volume : 5.20
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Finch Av (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 192.00 / 190.00 m
 Receiver height : 1.50 / 7.50 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 : 10.00 / 10.00 m
 Source elevation : 0.00 m
 Receiver elevation : 10.00 m
 Barrier elevation : 10.00 m

Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Brock Road	! 1.77 !	56.37 !	56.37 *
2.Finch Av	! 1.51 !	51.99 !	51.99 *
Total			57.72 dBA

STAMSON 5.04 SUMMARY REPORT Date: 11-09-2019 16:34:38
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
 Filename: aola.te Time Period: Day/Night 16/8 hours
 Description: Common Outdoor Amenity

Road data, segment # 1: Brock Road (day/night)

 Car traffic volume : 30600/3400 veh/TimePeriod *
 Medium truck volume : 1890/210 veh/TimePeriod *
 Heavy truck volume : 3510/390 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 40000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 5.25
 Heavy Truck % of Total Volume : 9.75
 Day (16 hrs) % of Total Volume : 90.00
 Data for Segment # 1: Brock Road (day/night)

 Angle1 Angle2 : -90.00 deg -20.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 105.00 / 105.00 m
 Receiver height : 1.50 / 7.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -90.00 deg Angle2 : -20.00 deg
 Barrier height : 0.00 m
 Barrier receiver distance : 10.00 / 10.00 m
 Source elevation : 0.50 m
 Receiver elevation : 0.00 m
 Barrier elevation : 0.00 m

Road data, segment # 2: Finch Av (day/night)

 Car traffic volume : 21528/2392 veh/TimePeriod *
 Medium truck volume : 655/73 veh/TimePeriod *
 Heavy truck volume : 1217/135 veh/TimePeriod *
 Posted speed limit : 60 km/h
 Road gradient : 1 %
 Road pavement : 1 (Typical asphalt or concrete)
 * Refers to calculated road volumes based on the following input:
 24 hr Traffic Volume (AADT or SADT): 26000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 2.80
 Heavy Truck % of Total Volume : 5.20
 Day (16 hrs) % of Total Volume : 90.00
 Data for Segment # 2: Finch Av (day/night)

 Angle1 Angle2 : -90.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 188.00 / 190.00 m
 Receiver height : 1.50 / 7.50 m
 Topography : 1 (Flat/gentle slope; no barrier)

Result summary (day)

	! source !	Road !	Total
	! height !	Leq !	Leq
	! (m) !	(dBA) !	(dBA)
1.Brock Road	! 1.77 !	55.87 !	55.87 *
2.Finch Av	! 1.51 !	52.15 !	52.15
Total			57.41 dBA

APPENDIX 3

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	R	Less than or equal to 65 dBA	Building compliant with the Ontario Building Code
	O	Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	A	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
	D	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	R	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
	O	Greater than 65 dBA	Building components (walls, windows, etc.) must be designed to achieve indoor sound level criteria
	A	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code
	D	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:

“Occupants are advised that sound levels due to increasing road traffic, the existing Mosque and commercial developments may occasionally interfere with some activities of the occupants as the sound level will exceed the Ministry of Environment’s noise criteria.”

TYPE B:

“Purchasers/tenants are advised that despite the inclusion of noise control features within the development and within the building units, sound levels due to road traffic, existing Mosque and existing commercial developments may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of Environment.”

TYPE C:

“This unit was fitted with ducting sized to accommodate an air conditioning unit. The installation of air conditioning by the occupant will allow windows and exterior doors to be kept closed, thereby achieving indoor sound levels within the limits recommended by the Ministry of Environment. (Note: care should be taken to ensure that the condenser unit is located in an area that is not sensitive to noise. The sound rating of air conditioning units must not exceed the sound emission standards established by the Ministry of Environment).”

TYPE D:

“This unit was fitted with an air conditioner to allow the windows and exterior doors to remain closed, thereby achieving indoor sound levels within the limits recommended by the Ministry of Environment. (Note: care should be taken to ensure that the condenser unit is located in an area that is not sensitive to noise. The sound rating of air conditioning units must not exceed the sound emission standards established by the Ministry of Environment).”

APPENDIX 4

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.