Road Traffic and Stationary Noise Impact Study

858 Niagara Street, Welland, Ontario

JJ-00579 NIS1

November 2, 2023 Reference No. JJ-00579-NIS1

GOLDBRICKS GROUP
9300 Goreway Drive Suite #111
Brampton, ON, L6P 4N1

Care of: Harsimran Kaur, RPD Studio

Dear Ms. Kaur:

Re: Road Traffic and Stationary Noise Impact Study
858 Niagara Street, Welland, Ontario

1. Introduction

JJ Acoustic Engineering Ltd. (JJAE) was retained to complete a Road Traffic and Stationary Noise Impact Study (Study) for the residential development located at 858 Niagara Street in Welland, Ontario (Site). The Site will be developed into three 3-storey stacked townhouse buildings and a 3-storey stacked townhouse building. JJAE has provided a copy of the most up-to-date Site Plan in Attachment A.

The Study was prepared consistent with Ontario Ministry of the Environment, Conservation and Park (MOECP) NPC 300, "Environmental Noise Guideline, Stationary and Transportation Sources– Approval and Planning" dated August 2013.

This Study has determined that the potential environmental noise impact from road traffic and stationary noise is significant. The proposed development will need the following: a requirement for central air-conditioning, noise warning clauses, a new barrier built along the property line to the South which would either, replace, add onto or be built in front of, the existing fence separating the drive through from the Site into an acoustic barrier, with a minimum surface density of 20 kg/m^2, a minimum length of 41 meters and a minimum height of 1.75 meters. For barrier positioning refer to attachment C – Figure 1a. The barrier should extend from the last drive through window to the idling car before the drive through speaker. No glazing shall be placed on the second and third floor of the south facade of Block A, and no glazing shall be placed on the second and third floor of the first 7 meters from the southeast corner on the east façade of Block A. Road traffic noise control

requirements for the Site were determined based on road traffic volumes provided by the Region of Niagara (Region) and forecasted to 20 years from the date of this study.

The following attachments were included with this Study:

- Attachment A – Site Plan
- Attachment B – Traffic Data Summary Table & Sample Stamson Traffic Model Outputs
- Attachment C – Stationary Noise Impact Figures
- Attachment D – Stationary Noise Impact Source Table

2. Road Traffic Analysis

2.1 Road Traffic Noise Modeling Methodology

The road traffic noise impact was conducted using STAMSON, the MOECP's computerized model of ORNAMENT. The Application of the model for the site was consistent with the ORNAMENT technical documents. The computer model input parameters include, among other data, the number of road segments, number of house rows, the positional relationship of the receptor to a noise source or barrier in terms of distance, elevation and angle of exposure to the source, the basic site topography, the ground surface type, traffic volumes, traffic composition and speed limit.

The predicted sound level is based on the 1-hour equivalent sound level, designated as Leq, and is adjusted by the STAMSON program to the 16-hour daytime and the 8-hour nighttime equivalent sound level. The applicable noise criteria for noise sensitive spaces are specified in terms of the 16-hour daytime period (7:00 a.m. to 11:00 p.m.) and 8-hour nighttime period (11:00 p.m. to 7:00 a.m.) enabling a direct comparison between the STAMSON model output and the noise limits.

2.2 Road Traffic Model Input Parameters

This section describes the STAMSON model input parameters used to predict road traffic noise impact for the Site.

The Site has one significant roadway in the vicinity of the development: Niagara Street approximately 10 meters to the West of Block A. Where there are intervening and off-site structures that provide line-of-sight obstruction to the roads, JJAE did not include line-of-sight obstruction in our analysis as to calculate worst-case noise impact.

JJAE reviewed other surrounding roadways in the vicinity of the Site and only the significant roadways were used in our modeling, other roadways were considered to be insignificant or beyond our red flag zone.

2.2.1 Road Traffic Parameters

The traffic data provided by the Region has been summarized below:

Niagara Street:

- Current AADT (2023): 15,589
- Forecast AADT (2043): 23,164
- Commercial Vehicle Rates: 1% medium trucks and 1% heavy trucks
- Posted Speed Limit: 50 km/h
- Day Night Splits: 90% day and 10% night

The traffic data is the foundation of this analysis and the Study will be updated if the values change. JJAE assumed 2% annual growth to forecast AADT. Traffic data was supplied by the Region. The Region's AADT report for this Noise Studies report has been supplied in Attachment B.

Lancaster AADT was given but, as the traffic volumes were minimal, JJAE considered it to be insignificant. Traffic data was supplied by the Region. The Region's AADT report for this Noise Studies report has been supplied in Attachment B.

2.3 Road Traffic Noise Modeling Results

JJAE calculated the Plane of Window (POW) noise exposure for each floor at the Site for the separate daytime and nighttime periods.

The STAMSON road traffic model outputs are provided in Attachment B.

2.4 Road Traffic Modeling Discussion

Noise control requirements will be defined based on NPC 300.

Daytime Outdoor Living Area Assessment (NPC 300, Section C7.1.1)

NPC 300 section A5 (pages 13-14) defines an Outdoor Living Area (OLA). As part of this definition, a balcony or terrace is considered an OLA if it has a minimum depth of 4 meters. All balconies are less than 4 m in depth and therefore will not be considered as OLAs.

The OLA is located approximately 3 meters from the North façade of Block C and 15 meters from the East façade of Block B. JJAE has calculated the noise impact to the OLA to be 56dBA. The location of the OLA has been indicated on Attachment A – Site Plan.

Plane of a Window – Ventilation Requirements (NPC 300, Section C7.1.2)

The predicted daytime and nighttime Plane of Window (POW) noise impact assumes a worst-case and direct line of sight noise exposure to both roads, unless the building itself blocks line-of-sight (full or partial).

JJAE has used the following criteria, which is a summary of NPC 300 requirements, to evaluate the Site noise impacts from road traffic noise:

Daytime Level (dBA)	Nighttime Level (dBA)	Ventilation Requirements and Warning Clauses	Special Building Components
55	50	Not Required	Not Required
55 – 65	50 – 60	Yes, with Type C Warning Clause	Not Required
66 or more	60 or more	Yes, with Type D Warning Clause	Yes

Table B.1 summarizes the predicted worst-case sound levels and the requirements for the units. The following warning clause is required:

Warning Clause A: "Purchasers/tenants are advised that sound levels due to increasing (rail) traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks."

Warning Clause C: "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow 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 the Environment, Conservation and Parks."

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

Indoor Living Areas – Building Components (NPC 300, Section C7.1.3)

At minimum, the building must be constructed to standard Ontario Building Code requirements. Improved building components are required and summarized in Table B.1. JJAE has assumed 35% window to floor area coverage and that windows are thick and operable. JJAE also requires that the exterior wall have a minimum STC rating of 42.

3. Stationary Noise Impact Analysis

3.1 Stationary Noise Impact Sound Level Criteria

The general criteria for stationary noise sources are defined by NPC 300. The criteria defined in Table C-5 and C-6, "Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA) Outdoor Points of Reception" and "Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA) Plane of Window of Noise Sensitive Spaces" are used to evaluate the noise impact at the proposed development.

The criteria for a Class 1 area have been summarized below:

Receiver Category	Time Period	Stationary Noise Criteria
Outdoor Living Area (OLA)	Day = 7:00 to 23:00	Leq = 50 dBA
Plane of Window (POW)	Day = 7:00 to 23:00	Leq = 50 dBA
	Night = 23:00 to 7:00	Leq = 45 dBA

3.2 Modelling Methodology

The stationary noise impact was evaluated using the CADNA A acoustic modelling software that is based on the ISO 9613-2 standard. The data for all potential stationary noise sources was summarized in Attachment D.

Seaway Mall is beyond our red flag distance and has negligible impact so it will not be considered in this study. JJAE used the following assumptions in our Cadna A model:

- **Ground Absorption**: Default ground absorption coefficient of 0.7 was used.
- **Temperature**: 10°C
- **Humidity**: 70%
- **Building Reflection Coefficient**: Absorption Coefficient Alpha of 0.37 (Reflection Loss of 2dB, Structured Façade) was used.
- **Time-Weighted Adjustment:** where sources operate non-continuously JJAE has provided operating times and as shown in Sections 4 and 5.
- **Tonality**: A 5 dbA tonal penalty was applied to all tonal sources, where applicable. JJAE has provided a (T) for sources identified as tonal in Sections 4 and 5.
- **Reflection Order**: A maximum reflection order of 1 was used to evaluate indirect noise impact.

4. Noise Impact Summary – From Site

The noise from the Site to the neighboring buildings could not be accounted for because the site has not undergone mechanical design yet. An addendum to this report should be completed once a mechanical design is done to account for noise from the Site to the neighboring building.

5. Noise Impact Summary – From Environment to Site

There are several buildings near the site. JJAE has identified several potential stationary noise sources including:

- Medium HVAC Units
- Small HVAC Units
- 2 Fan HVAC Units

A summary of the noise sources used in our modelling is provided in Attachment D.

JJAE modelled the noise impact from all significant noise sources to the Site. JJAE designed for a new barrier built along the property line to the South which would either, replace, add onto or be built in front of, the existing fence separating the drive through from the Site into an acoustic barrier, with a minimum surface density of 20 kg/m^2, a minimum length of 41 meters and a minimum height of 1.75 meters. For barrier positioning refer to attachment C – Figure 1a. The barrier should extend from the last drive through window to the idling car before the drive through speaker. The results are summarized in the table below and illustrated on Figure 1a.

Block A	**Worst Case Daytime Sound Level (dBA)**	**Daytime Noise Limit (dBA)**	**Worst Case Nighttime Sound Level (dBA)**	**Nighttime Noise Limit (dBA)**	**Limits met**
North	47	50	42	45	Yes
East	51	50	47	45	No
South	51	50	47	45	No
West	48	50	43	45	Yes

From the table above it can be seen that façades East and South for Block A are above the noise limits. No glazing shall be placed on the second and third floors of the south façade of Block A, and no glazing shall be placed for the first 7 meters on the second and third floor of the southeast corner of the east façade of Block A. With the brick veneer implemented the indoor noise levels will meet the NPC 300 noise limits for indoor noise.

Block B	**Worst Case Daytime Sound Level (dBA)**	**Daytime Noise Limit (dBA)**	**Worst Case Nighttime Sound Level (dBA)**	**Nighttime Noise Limit (dBA)**	**Limits met**
North	45	50	40	45	Yes
East	46	50	42	45	Yes
South	50	50	45	45	Yes
West	47	50	43	45	Yes

From the table above it can be seen that all façades for Block B are below the noise limits.

Block C	Worst Case Daytime Sound Level (dBA)	Daytime Noise Limit (dBA)	Worst Case Nighttime Sound Level (dBA)	Nighttime Noise Limit (dBA)	Limits met
North	41	50	37	45	Yes
East	40	50	36	45	Yes
South	49	50	44	45	Yes
West	47	50	42	45	Yes
OLA	40	50	N/A	N/A	Yes

From the table above it can be seen that all façades for Block C are below the noise limits.

Block D	Worst Case Daytime Sound Level (dBA)	Daytime Noise Limit (dBA)	Worst Case Nighttime Sound Level (dBA)	Nighttime Noise Limit (dBA)	Limits met
North	39	50	35	45	Yes
East	41	50	36	45	Yes
South	46	50	41	45	Yes
West	46	50	41	45	Yes

From the table above it can be seen that all façades for Block D are below the noise limits.

6. Recommendations

The road traffic noise impacts were above the NPC 300 requirements. Noise mitigation measures include:

Block #A:

- Warning Clause Type C for the North, East and South façades.
- Warning Clause Type D for the West façade.
- West Façade requires a minimum of STC 27 glazing installed with a maximum window to floor area ratio of 35%.
- West Façade requires a minimum of STC 42 exterior wall composition installed.
- JJAE and the client require air conditioning for all units.
- No glazing shall be placed on the second and third floors of the south façade of Block A, and no glazing shall be placed for the first 7 meters on the second and third floor, from the southeast corner of the east façade of Block A.

Block #B:

- Warning Clause Type C for the North, South and West façades.

- JJAE and the client require air conditioning for all units.

Block #C:

- Warning Clause Type C for the North and West façades.
- JJAE and the client require air conditioning for all units.

Block #D:

- Warning Clause Type C for the West façade.
- JJAE and the client require air conditioning for all units.

Outdoor Living Area:

- Warning Clause Type A

The stationary noise impacts from neighboring buildings to the site were evaluated and the sound level predictions were determined to be above noise limits for Block A. JJAE designed for a new barrier built along the property line to the South which would either, replace, add onto or be built in front of, the existing fence separating the drive through from the Site into an acoustic barrier, with a minimum surface density of 20 kg/m^2, a minimum length of 41 meters and a minimum height of 1.75 meters. For barrier positioning refer to attachment C – Figure 1a. The barrier should extend from the last drive through window to the idling car before the drive through speaker. No glazing shall be placed for the second and third floors of the south facade of Block A, and no glazing shall be placed on the first 7 meters from the southeast corner on the east façade for the second and third floor of Block A. For these locations, exterior wall compositions must be a minimum of STC 54, with brick veneer or masonry equivalent.

The noise from the Site to the neighboring buildings could not be accounted for because the site has not undergone mechanical design yet. An addendum to this report should be completed once a mechanical design is done to account for noise from the Site to the neighboring building.

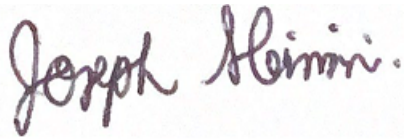
7. Conclusions

The results of this Study indicate that the potential environmental impact from road traffic and stationary noise sources are significant. Mitigation measures will be required including ventilation requirements and noise warning clauses for each unit. Block A will have additional requirements mentioned in section 6.

Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

Written By:



Nov. 2, 2023

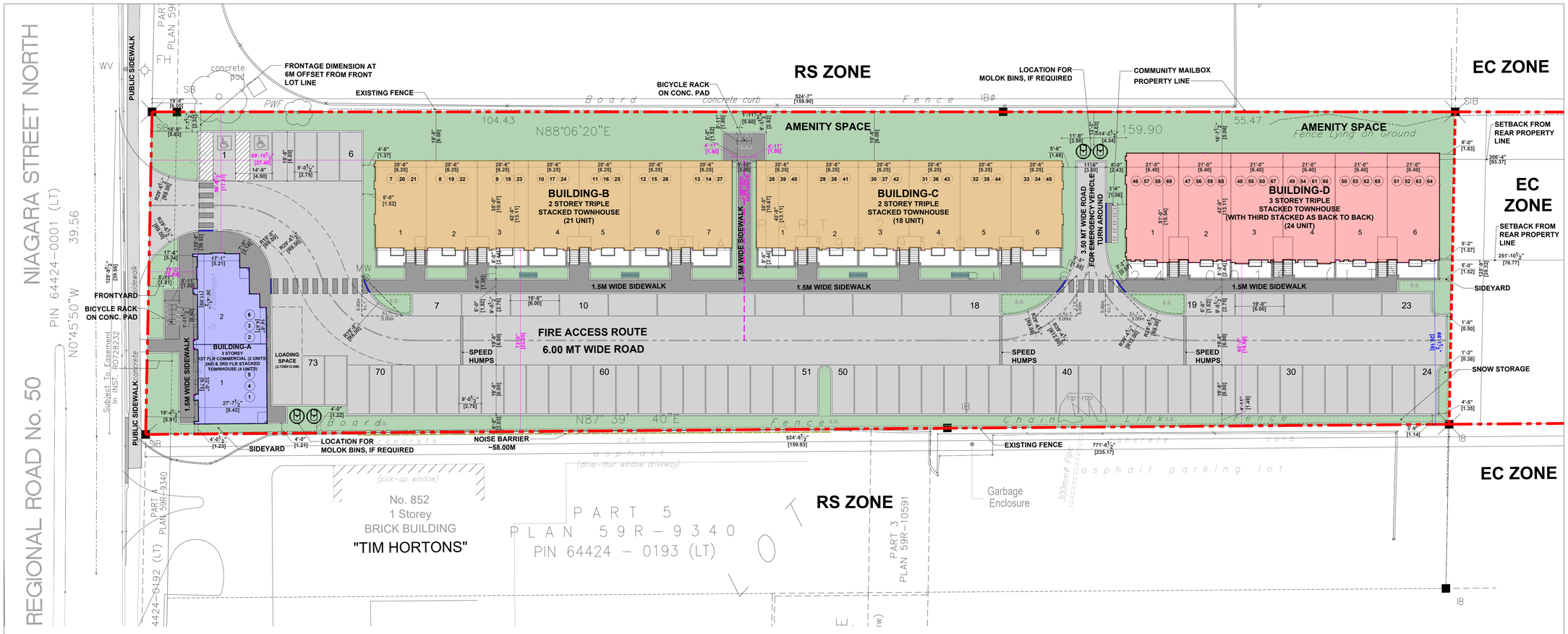
Reviewed by:

Joseph Sleiman
Acoustic Technician

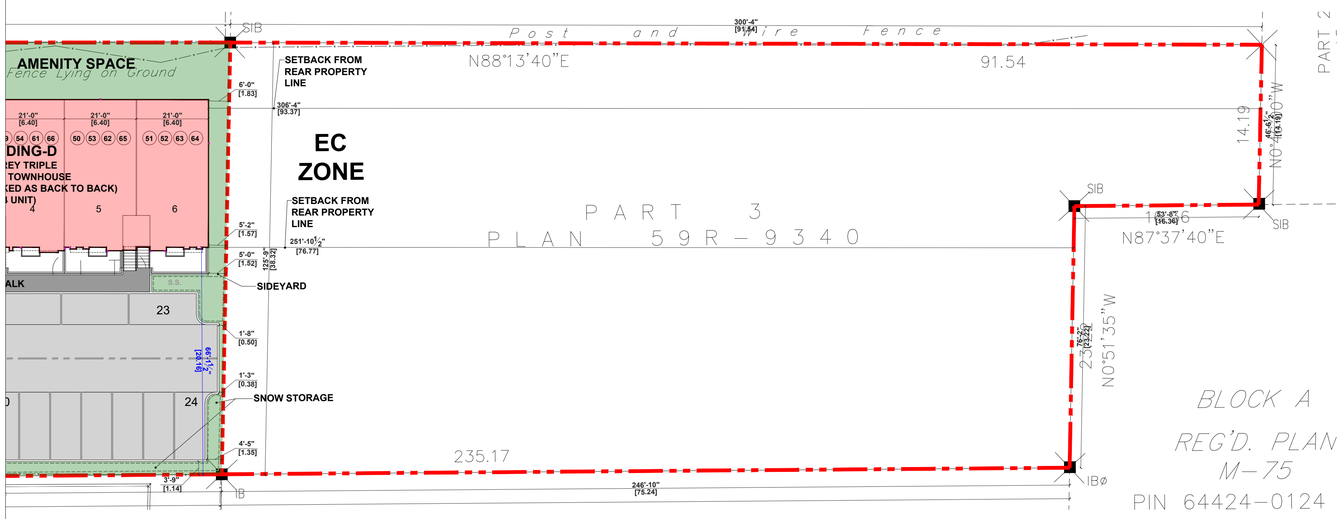
Joey Jraige, P.Eng., B.A.Sc.
President (Owner)

JJ Acoustic Engineering Ltd.
joey@jjae.ca
226-346-6473

ATTACHMENT A



ZOOM IN PLAN OF RS-95 ZONE AREA



ZOOM IN PLAN OF EC ZONE AREA

KEY PLAN- N.T.S

SURVEYOR DETAIL

THIS SITE PLAN IS BASED ON SURVEY PREPARED BY:

	NOV/29/16	INITIAL RELEASE
REVISION	DATE	REMARKS

KIRKUP ⊕ MASCOE ⊕ URE
SURVEYING LTD.
49 EASTCHESTER AVENUE, ST. CATHARINES, ONTARIO L2P-2Y6
TELEPHONE (905) 685-5931, FAX (905) 685-1972
E-MAIL info@niagarasurveyors.com
www.niagarasurveyors.com

JOB No. : 2019-0197 | DWG FILE : 19-0197-1siteplan

LEGEND

	3 STOREY 1ST FLOOR : COMMERCIAL UNITS 2ND & 3RD FLOOR : RESIDENTIAL UNITS
	3-STOREY TRIPLE STACKED RESIDENTIAL
	3-STOREY TRIPLE STACKED RESIDENTIAL (WITH THIRD STACKED AS BACK TO BACK)
	DOWNSPOUT
S.S.	SNOW STORAGE
S.L.T.	SIGHT LIGHT TRIANGLE
	CONCRETE SIDEWALK
	PAINTED LINES
	PROPERTY LINE
	SOD
	ACCESSIBLE PARKING SPACE
	EXISTING FENCE
	MOUNTABLE CURB / CURB CUT/ DEPRESSED SIDE WALK
	NOISE BARRIER
	BIKE RACK (BICYCLES)
	COMMUNITY MAILBOX

PRIMARY CONSULTANT & PROJECT MANAGER

RPDS
INTEGRATED DESIGN FIRM
SUITE 203, 7895 TRANMERE DR., MISSISSAUGA, ON L5S 1V9
MAIL: PROJECT@RPDSTUDIO.CA, CALL: 647-556-2596
WEBSITE: WWW.RPDSTUDIO.CA

ELECTRICAL CONSULTANT

CONSULTING CIVIL ENGINEERS

N

FOR INFORMATION ONLY

No.	Date	Version	Dwn.
1.	06/02/2024	ISSUED FOR ZONING BY LAW AMENDMENT	

PROJECT:

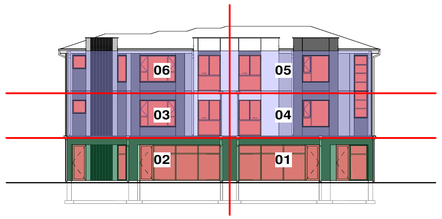
STACKED TOWNHOMES DEVELOPMENT

858 NIAGARA STREET,
ON L3C 1M4
CITY OF WELLAND

DRAWING TITLE:

SITE PLAN

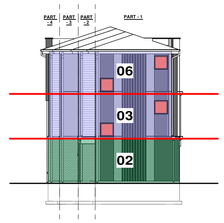
DRAWN BY: | DATE:
CHECKED BY: | SCALE: 1:250
PROJECT NO.: | DRAWING NO.: SP-1.0



WEST SIDE OPENING CALCULATION

%UNPROTECTED OPENING

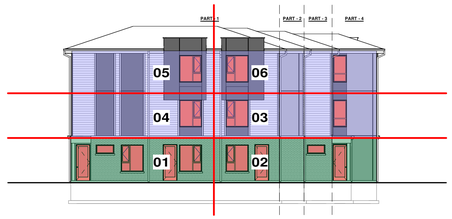
UNIT NO.	WALL AREA	LIMITING DISTANCE	ALLOWABLE OPENINGS	PROVIDED OPENINGS
01	28.24 SQMT	5.87 MT	24.85 SQMT (88.00%)	18.58 SQMT (65.79%)
02	32.10 SQMT	5.87 MT	25.20 SQMT (78.50%)	17.09 SQMT (53.25%)
03	33.79 SQMT	5.87 MT	26.53 SQMT (78.50%)	9.01 SQMT (26.67%)
04	29.47 SQMT	5.87 MT	25.94 SQMT (88.00%)	8.73 SQMT (29.63%)
05	27.99 SQMT	5.87 MT	24.63 SQMT (88.00%)	9.29 SQMT (33.20%)
06	32.10 SQMT	5.87 MT	25.20 SQMT (78.50%)	10.13 SQMT (31.54%)



NORTH SIDE OPENING CALCULATION

%UNPROTECTED OPENING

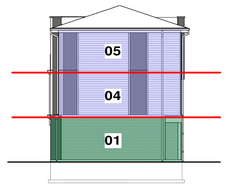
PART	UNIT NO.	WALL AREA	LIMITING DISTANCE	ALLOWABLE OPENINGS	PROVIDED OPENINGS
1	02	17.54 SQMT	17.44 MT	17.54 SQMT (100%)	0.00 SQMT (0.00%)
	03	15.95 SQMT	17.44 MT	15.95 SQMT (100%)	1.67 SQMT (10.48%)
	06	15.08 SQMT	17.44 MT	15.08 SQMT (100%)	1.67 SQMT (11.09%)
2	02	3.52 SQMT	20.43 MT	3.52 SQMT (100%)	0.00 SQMT (0.00%)
	03	3.52 SQMT	20.43 MT	3.52 SQMT (100%)	0.00 SQMT (0.00%)
	06	3.35 SQMT	20.43 MT	3.35 SQMT (100%)	0.00 SQMT (0.00%)
3	02	3.87 SQMT	22.33 MT	3.87 SQMT (100%)	0.00 SQMT (0.00%)
	03	3.87 SQMT	22.33 MT	3.87 SQMT (100%)	0.00 SQMT (0.00%)
	06	3.68 SQMT	22.33 MT	3.68 SQMT (100%)	0.00 SQMT (0.00%)
4	02	2.40 SQMT	24.00 MT	2.40 SQMT (100%)	0.00 SQMT (0.00%)
	03	2.18 SQMT	24.00 MT	2.18 SQMT (100%)	0.00 SQMT (0.00%)
	06	2.06 SQMT	24.00 MT	2.06 SQMT (100%)	0.00 SQMT (0.00%)



EAST SIDE OPENING CALCULATION

%UNPROTECTED OPENING

PART	UNIT NO.	WALL AREA	LIMITING DISTANCE	ALLOWABLE OPENINGS	PROVIDED OPENINGS
1	01	29.73 SQMT	MORE THAN 6.00 MT	29.73 SQMT (100%)	10.78 SQMT (36.25%)
	02	13.63 SQMT		13.63 SQMT (100%)	5.02 SQMT (36.82%)
	03	13.63 SQMT		13.63 SQMT (100%)	2.79 SQMT (20.45%)
	04	29.51 SQMT		29.51 SQMT (100%)	2.79 SQMT (9.44%)
	05	28.02 SQMT		28.02 SQMT (100%)	2.79 SQMT (9.95%)
	06	12.94 SQMT		12.94 SQMT (100%)	2.79 SQMT (21.53%)
2	02	5.11 SQMT		5.11 SQMT (100%)	0.00 SQMT (0.00%)
	03	5.11 SQMT		5.11 SQMT (100%)	0.00 SQMT (0.00%)
	06	4.85 SQMT		4.85 SQMT (100%)	0.00 SQMT (0.00%)
3	02	5.83 SQMT		5.83 SQMT (100%)	0.74 SQMT (12.75%)
	03	5.83 SQMT		5.83 SQMT (100%)	0.00 SQMT (0.00%)
	06	5.54 SQMT		5.54 SQMT (100%)	0.00 SQMT (0.00%)
4	02	9.23 SQMT		9.23 SQMT (100%)	2.23 SQMT (24.16%)
	03	9.23 SQMT		9.23 SQMT (100%)	1.67 SQMT (18.11%)
	06	8.77 SQMT		8.77 SQMT (100%)	1.67 SQMT (19.06%)



SOUTH SIDE OPENING CALCULATION

%UNPROTECTED OPENING

UNIT NO.	WALL AREA	LIMITING DISTANCE	ALLOWABLE OPENINGS	PROVIDED OPENINGS
01	27.33 SQMT	1.22 MT	2.05 SQMT (7.50%)	0.00 SQMT (0.00%)
04	25.53 SQMT	1.22 MT	2.04 SQMT (8.00%)	0.00 SQMT (0.00%)
05	24.16 SQMT	1.22 MT	1.93 SQMT (8.00%)	0.00 SQMT (0.00%)

RESIDENTIAL

COMMERCIAL

WALL OPENNINGS

PRIMARY CONSULTANT & PROJECT MANAGER

RPDS
INTEGRATED DESIGN FIRM
SUITE 203, 7895 TRANMERE DR., MISSISSAUGA, ON L5S 1V9
MAIL: PROJECT@RPDSTUDIO.CA, CALL: 647-556-2596
WEBSITE: WWW.RPDSTUDIO.CA

ELECTRICAL CONSULTANT

CONSULTING CIVIL ENGINEERS

FOR INFORMATION ONLY

No.	Date	Version	Dwn.
1.	29/01/2024	ISSUED FOR ZONING BY LAW AMENDMENT	

PROJECT:

STACKED TOWNHOMES DEVELOPMENT

858 NIAGARA STREET,
WELLAND, ON L3C 1M4
CANADA

DRAWING TITLE:

ELEVATIONS BUILDING-A (STACKED TOWNHOUSE)

UNIT 1 TO 6

DRAWN BY: DR

DATE:

CHECKED BY:

SCALE: AS NOTED

PROJECT NO.:

DRAWING NO.:

A-2.0

1 WEST ELEVATION
1:75

2 EAST ELEVATION
1 : 75

PRIMARY CONSULTANT & PROJECT MANAGER

RPDS
INTEGRATED DESIGN FIRM
SUITE 203, 7895 TRANMERE DR., MISSISSAUGA, ON L5S 1V9
MAIL: PROJECT@RPDSTUDIO.CA, CALL: 647-556-2596
WEBSITE: WWW.RPDSTUDIO.CA

ELECTRICAL CONSULTANT

CONSULTING CIVIL ENGINEERS

FOR INFORMATION ONLY

No.	Date	Version	Dwn.
1.	29/01/2024	ISSUED FOR ZONING BY LAW AMENDMENT	

PROJECT:

STACKED TOWNHOMES DEVELOPMENT

858 NIAGARA STREET,
WELLAND, ON L3C 1M4
CANADA

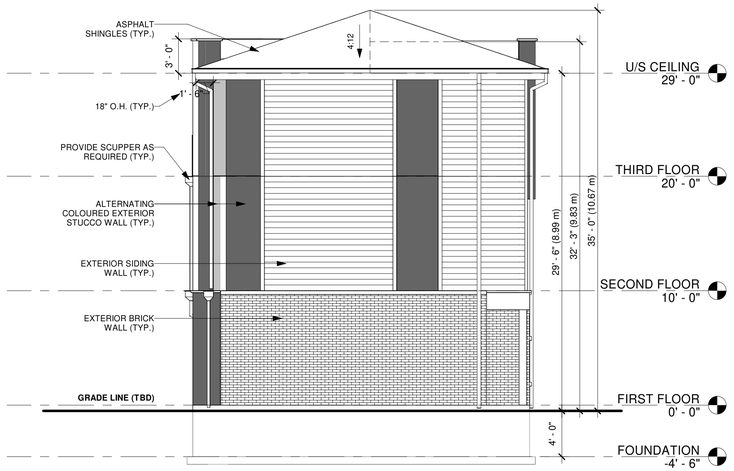
DRAWING TITLE:

ELEVATIONS BUILDING-A (STACKED TOWNHOUSE)

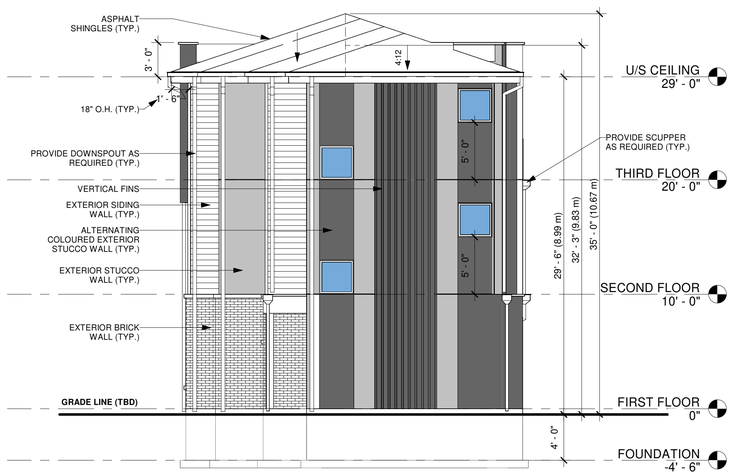
UNIT 1 TO 6

DRAWN BY: DR
DATE:
CHECKED BY:
SCALE: AS NOTED
PROJECT NO.:
DRAWING NO.:

A-2.1



1 SOUTH ELEVATION
1 : 75



2 NORTH ELEVATION
1 : 75

PRIMARY CONSULTANT & PROJECT MANAGER

RPDS
INTEGRATED DESIGN FIRM
SUITE 203, 7895 TRANMERE DR., MISSISSAUGA, ON L5S 1V9
MAIL: PROJECT@RPDSTUDIO.CA, CALL: 647-556-2596
WEBSITE: WWW.RPDSTUDIO.CA

ELECTRICAL CONSULTANT

CONSULTING CIVIL ENGINEERS

FOR INFORMATION ONLY

No.	Date	Version	Dwn.
1.	29/01/2024	ISSUED FOR ZONING BY LAW AMENDMENT	

PROJECT:

STACKED TOWNHOMES DEVELOPMENT

858 NIAGARA STREET,
WELLAND, ON L3C 1M4
CANADA

DRAWING TITLE:

ELEVATIONS BUILDING-A (STACKED TOWNHOUSE)

UNIT 1 TO 6

DRAWN BY: DR
DATE:
CHECKED BY:
SCALE: AS NOTED
PROJECT NO.:
DRAWING NO.:

A-2.2

ATTACHMENT B

Table B1

Road Traffic Noise Levels and Mitigation Measures Summary
858 Niagara Street Block A, Welland, Ontario

Point of Reception	Road Sound Level Daytime (dBA)	Road Sound Level Nighttime (dBA)	Ventilation Requirements NPC 300	Warning Clauses From NPC 300	Special Building Components
North Façade					
Plane of Window Level 1	63 (dBA)	56 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	62 (dBA)	56 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	62 (dBA)	56 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
East Façade					
Plane of Window Level 1	56 (dBA)	49 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	55 (dBA)	49 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	55 (dBA)	49 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
South Façade					
Plane of Window Level 1	61 (dBA)	55 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	61 (dBA)	55 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	61 (dBA)	55 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade					
Plane of Window Level 1	66 (dBA)	59 (dBA)	Requirement for Air Conditioning	Type D	Minimum Window STC Rating of 27
Plane of Window Level 2	65 (dBA)	59 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	65 (dBA)	59 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code

Notes:
(1) The East Façade of Block A is shielded by the building. JJAE has assumed a conservative 10 dBA reduction in sound level from the West Façade for the East Façade

Table B2

Road Traffic Noise Levels and Mitigation Measures Summary
858 Niagara Street Block B, Welland, Ontario

Point of Reception	Road Sound Level Daytime (dBA)	Road Sound Level Nighttime (dBA)	Ventilation Requirements NPC 300	Warning Clauses From NPC 300	Special Building Components
North Façade					
Plane of Window Level 1	60 (dBA)	54 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	60 (dBA)	54 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	60 (dBA)	54 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
East Façade					
Plane of Window Level 1	53 (dBA)	47 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 2	53 (dBA)	47 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 3	53 (dBA)	47 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
South Façade					
Plane of Window Level 1	56 (dBA)	50 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	56 (dBA)	50 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	56 (dBA)	49 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
West Façade					
Plane of Window Level 1	63 (dBA)	57 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	63 (dBA)	57 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	63 (dBA)	57 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code

Notes:
(1) The East Façade of Block B is shielded by the building. JJAE has assumed a conservative 10 dBA reduction in sound level from the West Façade for the East Façade

Table B3

Road Traffic Noise Levels and Mitigation Measures Summary
858 Niagara Street Block C, Welland, Ontario

Point of Reception	Road Sound Level Daytime (dBA)	Road Sound Level Nighttime (dBA)	Ventilation Requirements NPC 300	Warning Clauses From NPC 300	Special Building Components
North Façade					
Plane of Window Level 1	56 (dBA)	49 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	56 (dBA)	49 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	56 (dBA)	49 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
East Façade (1)					
Plane of Window Level 1	49 (dBA)	42 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 2	49 (dBA)	42 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 3	49 (dBA)	42 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
South Façade					
Plane of Window Level 1	54 (dBA)	48 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 2	54 (dBA)	48 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 3	54 (dBA)	48 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
West Façade					
Plane of Window Level 1	59 (dBA)	52 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	59 (dBA)	52 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	59 (dBA)	52 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Outdoor Living Area					
OLA	56 (dBA)	49 (dBA)	N/A	Type A	N/A

Notes:
(1) The East Façade of Block C is shielded by the building. JJAE has assumed a conservative 10 dBA reduction in sound level from the West Façade for the East Façade

Table B4

Road Traffic Noise Levels and Mitigation Measures Summary
858 Niagara Street Block D, Welland, Ontario

Point of Reception	Road Sound Level Daytime (dBA)	Road Sound Level Nighttime (dBA)	Ventilation Requirements NPC 300	Warning Clauses From NPC 300	Special Building Components
North Façade					
Plane of Window Level 1	53 (dBA)	47 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 2	53 (dBA)	47 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 3	53 (dBA)	47 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
East Façade					
Plane of Window Level 1	46 (dBA)	40 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 2	46 (dBA)	40 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 3	46 (dBA)	40 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
South Façade					
Plane of Window Level 1	52 (dBA)	46 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 2	52 (dBA)	46 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
Plane of Window Level 3	52 (dBA)	46 (dBA)	Not Required	Not Required	Compliance with Ontario Building Code
West Façade					
Plane of Window Level 1	56 (dBA)	50 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 2	56 (dBA)	50 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code
Plane of Window Level 3	56 (dBA)	50 (dBA)	Requirement for Air Conditioning	Type C	Compliance with Ontario Building Code

Notes:
(1) The East Façade of Block D is shielded by the building. JJAE has assumed a conservative 10 dBA reduction in sound level from the West Façade for the East Façade

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Niagara Region
Street: 610479 - NB
Location: 610479

A study of vehicle traffic was conducted with the device having serial number 403753. The study was done in the NB lane at 610479 - NB in Niagara Region, ON in county. The study began on 2023-06-27 at 12:00 AM and concluded on 2023-06-28 at 12:00 AM, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 8,057 vehicles passed through the location with a peak volume of 170 on 2023-06-27 at [05:00 PM-05:15 PM] and a minimum volume of 2 on 2023-06-27 at [02:00 AM-02:15 AM]. The AADT count for this study was 8,057.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 55 - 60 KM/H range or lower. The average speed for all classifed vehicles was 58 KM/H with 82.11% vehicles exceeding the posted speed of 50 KM/H. 0.97% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 55KM/H and the 85th percentile was 67.90 KM/H.

< to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 to 129	130 to >
161	246	1025	1516	1859	1500	856	503	185	75	37	19	22	0	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.
Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 7799 which represents 97 percent of the total classified vehicles. The number of Small Trucks in the study was 67 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 94 which represents 1 percent of the total classified vehicles. The number of Tractor Trailers in the study was 44 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 7.9	8.0 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 24.9	25.0 to >							
3484	4315	67	94	30	8	6	0							

CHART 2

HEADWAY

During the peak traffic period, on 2023-06-27 at [05:00 PM-05:15 PM] the average headway between vehicles was 5.263 seconds. During the slowest traffic period, on 2023-06-27 at [02:00 AM-02:15 AM] the average headway between vehicles was 300 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 21.00 and 28.00 degrees C.

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Niagara Region
Street: 610479 - SB
Location: 610479

A study of vehicle traffic was conducted with the device having serial number 406316. The study was done in the SB lane at 610479 - SB in Niagara Region, ON in county. The study began on 2023-06-27 at 12:00 AM and concluded on 2023-06-28 at 12:00 AM, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 8,004 vehicles passed through the location with a peak volume of 220 on 2023-06-27 at [04:45 PM-05:00 PM] and a minimum volume of 1 on 2023-06-27 at [02:15 AM-02:30 AM]. The AADT count for this study was 8,004.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 55 - 60 KM/H range or lower. The average speed for all classifed vehicles was 56 KM/H with 77.33% vehicles exceeding the posted speed of 50 KM/H. 0.33% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 55KM/H and the 85th percentile was 64.88 KM/H.

< to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 to 129	130 to >
293	339	1171	1655	1927	1409	686	306	105	37	20	5	1	0	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.
Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 7790 which represents 98 percent of the total classified vehicles. The number of Small Trucks in the study was 47 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 73 which represents 1 percent of the total classified vehicles. The number of Tractor Trailers in the study was 44 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 7.9	8.0 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 24.9	25.0 to >						
4317	3473	47	73	28	8	7	1						

CHART 2

HEADWAY

During the peak traffic period, on 2023-06-27 at [04:45 PM-05:00 PM] the average headway between vehicles was 4.072 seconds. During the slowest traffic period, on 2023-06-27 at [02:15 AM-02:30 AM] the average headway between vehicles was 450 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 21.00 and 27.00 degrees C.

Time/Class Report

Device ID: 403753	**Location:** 610479			**Raw Count:** 8,057	
Operator: MD	**Lane:** NB			**AADT Count:** 8,057	
Begin: 06-27-2023 12:00 AM	**Street:** 610479 - NB			**AADT Factor:** 1	
End: 06-28-2023 12:00 AM	**City:** Niagara Region			**Speed Limit:** 31	
Hours: 24.00	**County:**				
Period (min): 15	**State:** ON				

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 81	82 to >	Total
Tue,06-27-2023									
[00:00-00:15]	4	4	0	0	0	0	0	0	8
[00:15-00:30]	8	5	0	0	0	0	0	0	13
[00:30-00:45]	2	4	0	0	0	0	0	0	6
[00:45-01:00]	5	3	0	1	0	0	0	0	9
	19	16	0	1	0	0	0	0	36
[01:00-01:15]	3	3	0	0	0	0	0	0	6
[01:15-01:30]	0	6	1	0	0	0	0	0	7
[01:30-01:45]	2	2	0	0	0	0	0	0	4
[01:45-02:00]	2	2	0	0	0	0	0	0	4
	7	13	1	0	0	0	0	0	21
[02:00-02:15]	1	1	0	0	0	0	0	0	2
[02:15-02:30]	2	4	0	0	0	0	0	0	6
[02:30-02:45]	2	0	0	0	0	0	0	0	2
[02:45-03:00]	4	1	0	0	0	0	0	0	5
	9	6	0	0	0	0	0	0	15
[03:00-03:15]	4	2	0	0	0	0	0	0	6
[03:15-03:30]	3	1	1	0	0	0	0	0	5
[03:30-03:45]	1	4	0	0	0	0	0	0	5
[03:45-04:00]	2	5	0	0	0	0	0	0	7
	10	12	1	0	0	0	0	0	23
[04:00-04:15]	5	3	0	0	0	0	0	0	8
[04:15-04:30]	4	6	0	0	0	0	0	0	10
[04:30-04:45]	9	4	0	0	1	0	0	0	14
[04:45-05:00]	7	11	0	0	0	0	0	0	18
	25	24	0	0	1	0	0	0	50
[05:00-05:15]	7	11	0	0	0	0	0	0	18
[05:15-05:30]	7	20	1	1	0	0	0	0	29
[05:30-05:45]	13	23	0	0	0	0	0	0	36
[05:45-06:00]	10	26	0	0	0	0	0	0	36
	37	80	1	1	0	0	0	0	119
[06:00-06:15]	18	21	0	1	0	1	0	0	41
[06:15-06:30]	23	28	0	0	0	0	0	0	51
[06:30-06:45]	28	35	0	0	0	0	0	0	63
[06:45-07:00]	23	45	0	2	0	0	0	0	70
	92	129	0	3	0	1	0	0	225
[07:00-07:15]	25	51	1	2	0	0	1	0	80
[07:15-07:30]	37	41	0	1	0	0	0	0	79
[07:30-07:45]	62	62	2	2	1	0	0	0	129

Time/Class Report

Device ID: 403753	**Location:** 610479			**Raw Count:** 8,057	
Operator: MD	**Lane:** NB			**AADT Count:** 8,057	
Begin: 06-27-2023 12:00 AM	**Street:** 610479 - NB			**AADT Factor:** 1	
End: 06-28-2023 12:00 AM	**City:** Niagara Region			**Speed Limit:** 31	
Hours: 24.00	**County:**				
Period (min): 15	**State:** ON				

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 81	82 to >	Total
Tue,06-27-2023									
[07:45-08:00]	60	68	0	0	1	0	0	0	129
	184	222	3	5	2	0	1	0	417
[08:00-08:15]	66	61	2	5	1	0	0	0	135
[08:15-08:30]	49	59	1	1	2	0	0	0	112
[08:30-08:45]	43	86	1	3	1	0	0	0	134
[08:45-09:00]	62	68	1	2	3	0	0	0	136
	220	274	5	11	7	0	0	0	517
[09:00-09:15]	46	54	4	2	1	0	0	0	107
[09:15-09:30]	50	61	0	3	0	1	0	0	115
[09:30-09:45]	51	72	2	1	0	0	0	0	126
[09:45-10:00]	40	59	2	2	0	0	0	0	103
	187	246	8	8	1	1	0	0	451
[10:00-10:15]	51	59	0	2	2	0	0	0	114
[10:15-10:30]	49	65	1	0	1	1	0	0	117
[10:30-10:45]	46	70	0	4	1	1	0	0	122
[10:45-11:00]	49	65	1	3	0	0	1	0	119
	195	259	2	9	4	2	1	0	472
[11:00-11:15]	51	57	3	1	0	0	0	0	112
[11:15-11:30]	66	68	0	1	0	1	0	0	136
[11:30-11:45]	60	81	4	5	0	2	0	0	152
[11:45-12:00]	64	77	0	3	0	0	0	0	144
	241	283	7	10	0	3	0	0	544
[12:00-12:15]	64	61	0	1	1	0	0	0	127
[12:15-12:30]	73	80	0	1	1	0	0	0	155
[12:30-12:45]	53	90	1	0	1	0	0	0	145
[12:45-13:00]	50	87	4	2	0	0	0	0	143
	240	318	5	4	3	0	0	0	570
[13:00-13:15]	62	94	4	0	0	0	1	0	161
[13:15-13:30]	64	74	1	1	0	1	0	0	141
[13:30-13:45]	58	73	4	3	0	0	0	0	138
[13:45-14:00]	59	79	3	1	0	0	0	0	142
	243	320	12	5	0	1	1	0	582
[14:00-14:15]	52	66	4	3	1	0	0	0	126
[14:15-14:30]	59	70	1	3	0	0	0	0	133
[14:30-14:45]	59	91	1	3	0	0	0	0	154
[14:45-15:00]	64	90	2	1	1	0	0	0	158
	234	317	8	10	2	0	0	0	571

Time/Class Report

Device ID: 403753	**Location:** 610479			**Raw Count:** 8,057	
Operator: MD	**Lane:** NB			**AADT Count:** 8,057	
Begin: 06-27-2023 12:00 AM	**Street:** 610479 - NB			**AADT Factor:** 1	
End: 06-28-2023 12:00 AM	**City:** Niagara Region			**Speed Limit:** 31	
Hours: 24.00	**County:**				
Period (min): 15	**State:** ON				

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 81	82 to >	Total
Tue,06-27-2023									
[15:00-15:15]	60	70	0	2	1	0	0	0	133
[15:15-15:30]	59	84	0	4	2	0	0	0	149
[15:30-15:45]	60	72	0	3	1	0	0	0	136
[15:45-16:00]	57	66	0	2	1	0	0	0	126
	236	292	0	11	5	0	0	0	544
[16:00-16:15]	62	98	3	1	0	0	0	0	164
[16:15-16:30]	58	73	0	2	0	0	0	0	133
[16:30-16:45]	79	71	1	1	1	0	0	0	153
[16:45-17:00]	74	83	0	0	0	0	0	0	157
	273	325	4	4	1	0	0	0	607
[17:00-17:15]	70	99	0	0	1	0	0	0	170
[17:15-17:30]	83	80	2	2	0	0	0	0	167
[17:30-17:45]	61	73	2	1	1	0	0	0	138
[17:45-18:00]	60	62	0	0	0	0	0	0	122
	274	314	4	3	2	0	0	0	597
[18:00-18:15]	57	64	0	1	0	0	0	0	122
[18:15-18:30]	37	57	0	0	0	0	0	0	94
[18:30-18:45]	53	60	0	1	0	0	0	0	114
[18:45-19:00]	48	63	1	0	0	0	0	0	112
	195	244	1	2	0	0	0	0	442
[19:00-19:15]	49	46	2	1	0	0	0	0	98
[19:15-19:30]	52	45	1	1	0	0	0	0	99
[19:30-19:45]	34	59	0	0	0	0	0	0	93
[19:45-20:00]	40	45	0	0	0	0	0	0	85
	175	195	3	2	0	0	0	0	375
[20:00-20:15]	41	43	0	2	0	0	0	0	86
[20:15-20:30]	32	41	1	1	0	0	0	0	75
[20:30-20:45]	32	33	0	0	0	0	1	0	66
[20:45-21:00]	42	26	0	0	0	0	0	0	68
	147	143	1	3	0	0	1	0	295
[21:00-21:15]	30	51	0	1	1	0	0	0	83
[21:15-21:30]	28	33	1	0	0	0	0	0	62
[21:30-21:45]	31	31	0	0	0	0	0	0	62
[21:45-22:00]	29	31	0	0	0	0	0	0	60
	118	146	1	1	1	0	0	0	267
[22:00-22:15]	24	27	0	0	1	0	0	0	52
[22:15-22:30]	25	30	0	1	0	0	0	0	56
[22:30-22:45]	19	26	0	0	0	0	0	0	45

Time/Class Report

Device ID: 403753	**Location:** 610479			**Raw Count:** 8,057	
Operator: MD	**Lane:** NB			**AADT Count:** 8,057	
Begin: 06-27-2023 12:00 AM	**Street:** 610479 - NB			**AADT Factor:** 1	
End: 06-28-2023 12:00 AM	**City:** Niagara Region			**Speed Limit:** 31	
Hours: 24.00	**County:**				
Period (min): 15	**State:** ON				

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 81	82 to >	Total
Tue,06-27-2023									
[22:45-23:00]	15	15	0	0	0	0	0	0	30
	83	98	0	1	1	0	0	0	183
[23:00-23:15]	16	14	0	0	0	0	0	0	30
[23:15-23:30]	10	10	0	0	0	0	1	0	21
[23:30-23:45]	8	8	0	0	0	0	0	0	16
[23:45-00:00]	6	7	0	0	0	0	1	0	14
	40	39	0	0	0	0	2	0	81
06-27-2023 12:00 AM									
06-28-2023 12:00 AM	3484	4315	67	94	30	8	6	0	8004

Time/Class Report

Device ID: 406316	**Location:** 610479			**Raw Count:** 8,004	
Operator: MD	**Lane:** SB			**AADT Count:** 8,004	
Begin: 06-27-2023 12:00 AM	**Street:** 610479 - SB			**AADT Factor:** 1	
End: 06-28-2023 12:00 AM	**City:** Niagara Region			**Speed Limit:** 31	
Hours: 24.00	**County:**				
Period (min): 15	**State:** ON				

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 81	82 to >	Total
Tue,06-27-2023									
[00:00-00:15]	12	3	0	0	0	0	0	0	15
[00:15-00:30]	9	4	0	0	0	0	0	0	13
[00:30-00:45]	5	4	0	0	1	0	0	0	10
[00:45-01:00]	0	5	0	0	0	0	0	0	5
	26	16	0	0	1	0	0	0	43
[01:00-01:15]	4	3	0	0	0	0	0	0	7
[01:15-01:30]	3	3	0	0	0	0	0	0	6
[01:30-01:45]	5	5	0	0	0	0	0	0	10
[01:45-02:00]	4	2	0	0	0	0	0	0	6
	16	13	0	0	0	0	0	0	29
[02:00-02:15]	1	1	0	0	0	0	0	0	2
[02:15-02:30]	0	0	0	1	0	0	0	0	1
[02:30-02:45]	2	1	0	0	0	0	0	0	3
[02:45-03:00]	3	2	0	1	0	0	0	0	6
	6	4	0	2	0	0	0	0	12
[03:00-03:15]	1	2	0	0	0	0	0	0	3
[03:15-03:30]	0	1	0	0	0	0	0	0	1
[03:30-03:45]	5	3	0	0	0	0	0	0	8
[03:45-04:00]	3	1	0	0	0	0	0	0	4
	9	7	0	0	0	0	0	0	16
[04:00-04:15]	2	2	0	0	0	0	0	0	4
[04:15-04:30]	1	1	0	0	0	0	0	0	2
[04:30-04:45]	1	2	0	0	0	0	0	0	3
[04:45-05:00]	3	5	0	0	0	0	0	0	8
	7	10	0	0	0	0	0	0	17
[05:00-05:15]	1	2	0	0	0	0	0	0	3
[05:15-05:30]	5	5	0	1	0	0	0	0	11
[05:30-05:45]	6	8	0	0	0	0	1	0	15
[05:45-06:00]	10	9	0	0	0	0	0	0	19
	22	24	0	1	0	0	1	0	48
[06:00-06:15]	4	7	0	0	0	0	1	0	12
[06:15-06:30]	10	6	0	0	0	0	0	0	16
[06:30-06:45]	24	14	0	1	0	0	0	0	39
[06:45-07:00]	24	25	2	0	0	0	0	0	51
	62	52	2	1	0	0	1	0	118
[07:00-07:15]	23	18	0	2	0	0	0	0	43
[07:15-07:30]	28	30	1	1	0	0	0	0	60
[07:30-07:45]	41	35	1	4	1	0	0	0	82

Time/Class Report

Device ID: 406316	**Location:** 610479			**Raw Count:** 8,004	
Operator: MD	**Lane:** SB			**AADT Count:** 8,004	
Begin: 06-27-2023 12:00 AM	**Street:** 610479 - SB			**AADT Factor:** 1	
End: 06-28-2023 12:00 AM	**City:** Niagara Region			**Speed Limit:** 31	
Hours: 24.00	**County:**				
Period (min): 15	**State:** ON				

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 81	82 to >	Total
Tue,06-27-2023									
[07:45-08:00]	42	30	0	3	0	1	0	0	76
	134	113	2	10	1	1	0	0	261
[08:00-08:15]	49	41	0	0	0	0	0	0	90
[08:15-08:30]	47	39	0	0	4	0	0	0	90
[08:30-08:45]	44	40	2	0	1	0	0	0	87
[08:45-09:00]	45	48	2	2	1	0	0	0	98
	185	168	4	2	6	0	0	0	365
[09:00-09:15]	64	44	1	6	0	0	0	0	115
[09:15-09:30]	56	41	2	0	2	0	0	0	101
[09:30-09:45]	67	45	1	0	0	0	0	0	113
[09:45-10:00]	74	39	1	1	0	0	0	0	115
	261	169	5	7	2	0	0	0	444
[10:00-10:15]	60	65	1	3	1	1	0	0	131
[10:15-10:30]	61	63	1	1	0	0	0	0	126
[10:30-10:45]	62	64	1	0	3	0	0	0	130
[10:45-11:00]	87	61	1	2	0	1	0	0	152
	270	253	4	6	4	2	0	0	539
[11:00-11:15]	90	40	1	0	1	2	1	0	135
[11:15-11:30]	45	44	1	2	1	0	0	0	93
[11:30-11:45]	87	60	1	1	3	0	1	0	153
[11:45-12:00]	84	67	0	0	0	0	0	1	152
	306	211	3	3	5	2	2	1	533
[12:00-12:15]	81	70	3	2	0	0	0	0	156
[12:15-12:30]	75	71	1	1	0	0	0	0	148
[12:30-12:45]	73	60	2	0	0	0	0	0	135
[12:45-13:00]	74	52	1	1	0	0	0	0	128
	303	253	7	4	0	0	0	0	567
[13:00-13:15]	68	60	3	0	0	0	1	0	132
[13:15-13:30]	53	68	1	1	0	0	0	0	123
[13:30-13:45]	67	46	1	4	0	1	1	0	120
[13:45-14:00]	61	60	3	5	0	0	0	0	129
	249	234	8	10	0	1	2	0	504
[14:00-14:15]	75	73	0	0	0	0	1	0	149
[14:15-14:30]	92	60	2	3	0	0	0	0	157
[14:30-14:45]	64	63	0	1	0	1	0	0	129
[14:45-15:00]	97	62	1	1	0	0	0	0	161
	328	258	3	5	0	1	1	0	596

Time/Class Report

Device ID: 406316	**Location:** 610479			**Raw Count:** 8,004	
Operator: MD	**Lane:** SB			**AADT Count:** 8,004	
Begin: 06-27-2023 12:00 AM	**Street:** 610479 - SB			**AADT Factor:** 1	
End: 06-28-2023 12:00 AM	**City:** Niagara Region			**Speed Limit:** 31	
Hours: 24.00	**County:**				
Period (min): 15	**State:** ON				

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 81	82 to >	Total
Tue,06-27-2023									
[15:00-15:15]	90	48	1	2	0	0	0	0	141
[15:15-15:30]	93	59	1	2	0	1	0	0	156
[15:30-15:45]	88	72	0	0	1	0	0	0	161
[15:45-16:00]	109	77	1	5	3	0	0	0	195
	380	256	3	9	4	1	0	0	653
[16:00-16:15]	104	84	1	3	0	0	0	0	192
[16:15-16:30]	85	97	1	1	0	0	0	0	184
[16:30-16:45]	123	79	0	1	0	0	0	0	203
[16:45-17:00]	115	101	1	0	1	0	0	0	218
	427	361	3	5	1	0	0	0	797
[17:00-17:15]	111	90	1	1	0	0	0	0	203
[17:15-17:30]	105	87	2	3	1	0	0	0	198
[17:30-17:45]	123	71	0	2	0	0	0	0	196
[17:45-18:00]	91	76	0	0	0	0	0	0	167
	430	324	3	6	1	0	0	0	764
[18:00-18:15]	76	59	0	0	0	0	0	0	135
[18:15-18:30]	64	64	0	0	0	0	0	0	128
[18:30-18:45]	71	43	0	1	1	0	0	0	116
[18:45-19:00]	59	51	0	0	0	0	0	0	110
	270	217	0	1	1	0	0	0	489
[19:00-19:15]	53	45	0	0	0	0	0	0	98
[19:15-19:30]	50	53	0	1	0	0	0	0	104
[19:30-19:45]	42	45	0	0	0	0	0	0	87
[19:45-20:00]	55	34	0	0	0	0	0	0	89
	200	177	0	1	0	0	0	0	378
[20:00-20:15]	36	36	0	0	1	0	0	0	73
[20:15-20:30]	35	28	0	0	0	0	0	0	63
[20:30-20:45]	41	34	0	0	0	0	0	0	75
[20:45-21:00]	20	24	0	0	0	0	0	0	44
	132	122	0	0	1	0	0	0	255
[21:00-21:15]	33	33	0	0	0	0	0	0	66
[21:15-21:30]	25	22	0	0	0	0	0	0	47
[21:30-21:45]	37	26	0	0	0	0	0	0	63
[21:45-22:00]	27	20	0	0	0	0	0	0	47
	122	101	0	0	0	0	0	0	223
[22:00-22:15]	39	25	0	0	0	0	0	0	64
[22:15-22:30]	32	24	0	0	0	0	0	0	56
[22:30-22:45]	20	22	0	0	1	0	0	0	43

Time/Class Report

Device ID: 406316	**Location:** 610479			**Raw Count:** 8,004	
Operator: MD	**Lane:** SB			**AADT Count:** 8,004	
Begin: 06-27-2023 12:00 AM	**Street:** 610479 - SB			**AADT Factor:** 1	
End: 06-28-2023 12:00 AM	**City:** Niagara Region			**Speed Limit:** 31	
Hours: 24.00	**County:**				
Period (min): 15	**State:** ON				

Date And Time Range	< to 15	16 to 25	26 to 32	33 to 42	43 to 51	52 to 61	62 to 81	82 to >	Total
Tue,06-27-2023									
[22:45-23:00]	19	13	0	0	0	0	0	0	32
	110	84	0	0	1	0	0	0	195
[23:00-23:15]	20	7	0	0	0	0	0	0	27
[23:15-23:30]	14	19	0	0	0	0	0	0	33
[23:30-23:45]	14	10	0	0	0	0	0	0	24
[23:45-00:00]	14	10	0	0	0	0	0	0	24
	62	46	0	0	0	0	0	0	108
06-27-2023 12:00 AM									
06-28-2023 12:00 AM	4317	3473	47	73	28	8	7	1	7954

From: Ali Khan <ali.khan@welland.ca>
Sent: May 26, 2021 8:39 AM
To: Emmanuel
Subject: RE: Traffic Data Request - 800 Niagara Street, Welland

Emmanuel,

Please see below data that's available.

AADT :1750
% heavy trucks: 1%
speed limit : 50 km/hr

Muhammad Ali Khan, M.A.Sc; P.Eng.
Manager, Traffic/Parking/ Bylaws
Infrastructure and Development Services
Corporation of the City of Welland
60 East Main Street, Welland, Ontario L3B 3X4
Phone: (905)735-1700 Ext. 2202 **Fax:** (905)735-7184
www.welland.ca
YourChannel

From: Grant Munday <grant.munday@welland.ca>
Sent: May 25, 2021 5:44 PM
To: Emmanuel <emmanuel@jjae.ca>; devserv <devserv@welland.ca>; Ali Khan <ali.khan@welland.ca>
Subject: RE: Traffic Data Request - 800 Niagara Street, Welland

Ali,

Can you respond to the request below and also provide a Region of Niagara contact for this information.

Sincerely,

Grant Munday
Director of Development and Building Services
Development and Building Services
Corporation of the City of Welland
60 East Main Street, Welland, Ontario L3B 3X4
Phone: (905)735-1700 Ext. 2240 **Fax:** (905)735-8772
www.welland.ca
YourChannel

From: Emmanuel <emmanuel@jjae.ca>
Sent: May 25, 2021 5:37 PM
To: devserv <devserv@welland.ca>
Subject: Traffic Data Request - 800 Niagara Street, Welland

Hi,

We are conducting a noise study for a development at 800 Niagara Street (Seaway Mall). I am seeking traffic information for Lancaster Drive AADTs, % heavy trucks, % medium trucks, speed limit and day night split. Thank you and have a great day.

Regards,

Emmanuel (Manny) Ghiorghis
JJ Acoustic Engineering Ltd.
Acoustic Technician

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:12:58
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b1northf.te Time Period: Day/Night 16/8 hours
Description: Building #1 North Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 62.67 + 0.00) = 62.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	0	0.00	65.68	0.00	0.00	- 3.01	0.00	0.00	0.00	62.67

Segment Leq : 62.67 dBA

Total Leq All Segments: 62.67 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 56.13 + 0.00) = 56.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	0	0.00	59.14	0.00	0.00	- 3.01	0.00	0.00	0.00	56.13

Segment Leq : 56.13 dBA

Total Leq All Segments: 56.13 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.67
(NIGHT): 56.13

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:14:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b1southf.te Time Period: Day/Night 16/8 hours
Description: Building #1 South Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (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 : 20.00 / 20.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 61.42 + 0.00) = 61.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	65.68	0.00	-1.25	-3.01	0.00	0.00	0.00	61.42

Segment Leq : 61.42 dBA

Total Leq All Segments: 61.42 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 54.88 + 0.00) = 54.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	59.14	0.00	- 1.25	- 3.01	0.00	0.00	0.00	54.88

Segment Leq : 54.88 dBA

Total Leq All Segments: 54.88 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.42
(NIGHT): 54.88

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:15:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b1westf.te Time Period: Day/Night 16/8 hours
Description: Building #1 West Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (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 : 15.00 / 15.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 65.68 + 0.00) = 65.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	90	0.00	65.68	0.00	0.00	0.00	0.00	0.00	0.00	65.68

Segment Leq : 65.68 dBA

Total Leq All Segments: 65.68 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 59.14 + 0.00) = 59.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	90	0.00	59.14	0.00	0.00	0.00	0.00	0.00	0.00	59.14

Segment Leq : 59.14 dBA

Total Leq All Segments: 59.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.68
(NIGHT): 59.14

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:13:15
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b2northf.te Time Period: Day/Night 16/8 hours
Description: Building #2 North Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 25.00 / 25.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 60.45 + 0.00) = 60.45 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	0	0.00	65.68	0.00	- 2.22	- 3.01	0.00	0.00	0.00	60.45

Segment Leq : 60.45 dBA

Total Leq All Segments: 60.45 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 53.91 + 0.00) = 53.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	0	0.00	59.14	0.00	- 2.22	- 3.01	0.00	0.00	0.00	53.91

Segment Leq : 53.91 dBA

Total Leq All Segments: 53.91 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.45
(NIGHT): 53.91

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:14:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b2southf.te Time Period: Day/Night 16/8 hours
Description: Building #2 South Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (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 : 69.00 / 69.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 56.05 + 0.00) = 56.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	65.68	0.00	-6.63	-3.01	0.00	0.00	0.00	56.05

Segment Leq : 56.05 dBA

Total Leq All Segments: 56.05 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 49.50 + 0.00) = 49.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	59.14	0.00	- 6.63	- 3.01	0.00	0.00	0.00	49.50

Segment Leq : 49.50 dBA

Total Leq All Segments: 49.50 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.05
(NIGHT): 49.50

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:16:11
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b2westf.te Time Period: Day/Night 16/8 hours
Description: Building #2 West Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (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 : 25.00 / 25.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 63.46 + 0.00) = 63.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	90	0.00	65.68	0.00	- 2.22	0.00	0.00	0.00	0.00	63.46

Segment Leq : 63.46 dBA

Total Leq All Segments: 63.46 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 56.92 + 0.00) = 56.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	90	0.00	59.14	0.00	- 2.22	0.00	0.00	0.00	0.00	56.92

Segment Leq : 56.92 dBA

Total Leq All Segments: 56.92 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 63.46
(NIGHT): 56.92

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:13:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b3northf.te Time Period: Day/Night 16/8 hours
Description: Building #3 North Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 72.00 / 72.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 55.86 + 0.00) = 55.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	0	0.00	65.68	0.00	- 6.81	- 3.01	0.00	0.00	0.00	55.86

Segment Leq : 55.86 dBA

Total Leq All Segments: 55.86 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 49.32 + 0.00) = 49.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	0	0.00	59.14	0.00	- 6.81	- 3.01	0.00	0.00	0.00	49.32

Segment Leq : 49.32 dBA

Total Leq All Segments: 49.32 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.86
(NIGHT): 49.32

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:14:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b3southf.te Time Period: Day/Night 16/8 hours
Description: Building #3 South Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (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 : 109.00 / 109.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 54.06 + 0.00) = 54.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	65.68	0.00	-8.61	-3.01	0.00	0.00	0.00	54.06

Segment Leq : 54.06 dBA

Total Leq All Segments: 54.06 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 47.52 + 0.00) = 47.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	59.14	0.00	- 8.61	- 3.01	0.00	0.00	0.00	47.52

Segment Leq : 47.52 dBA

Total Leq All Segments: 47.52 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.06
(NIGHT): 47.52

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:16:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b3westf.te Time Period: Day/Night 16/8 hours
Description: Building #3 West Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (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 : 72.00 / 72.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 58.87 + 0.00) = 58.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	90	0.00	65.68	0.00	- 6.81	0.00	0.00	0.00	0.00	58.87

Segment Leq : 58.87 dBA

Total Leq All Segments: 58.87 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 52.33 + 0.00) = 52.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	90	0.00	59.14	0.00	- 6.81	0.00	0.00	0.00	0.00	52.33

Segment Leq : 52.33 dBA

Total Leq All Segments: 52.33 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.87
(NIGHT): 52.33

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:13:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b4northf.te Time Period: Day/Night 16/8 hours
Description: Building #4 North Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 125.00 / 125.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 53.46 + 0.00) = 53.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	0	0.00	65.68	0.00	- 9.21	- 3.01	0.00	0.00	0.00	53.46

Segment Leq : 53.46 dBA

Total Leq All Segments: 53.46 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 46.92 + 0.00) = 46.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	0	0.00	59.14	0.00	- 9.21	- 3.01	0.00	0.00	0.00	46.92

Segment Leq : 46.92 dBA

Total Leq All Segments: 46.92 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.46
(NIGHT): 46.92

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:15:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b4southf.te Time Period: Day/Night 16/8 hours
Description: Building #4 South Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (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 : 163.00 / 163.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 52.31 + 0.00) = 52.31 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	65.68	0.00	-10.36	- 3.01	0.00	0.00	0.00	52.31

Segment Leq : 52.31 dBA

Total Leq All Segments: 52.31 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 45.77 + 0.00) = 45.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	59.14	0.00	-10.36	- 3.01	0.00	0.00	0.00	45.77

Segment Leq : 45.77 dBA

Total Leq All Segments: 45.77 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.31
(NIGHT): 45.77

STAMSON 5.0 NORMAL REPORT Date: 03-11-2023 12:16:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b4westf.te Time Period: Day/Night 16/8 hours
Description: Building #4 West Facade Floor 1

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (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 : 125.00 / 125.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 56.48 + 0.00) = 56.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	90	0.00	65.68	0.00	- 9.21	0.00	0.00	0.00	0.00	56.48

Segment Leq : 56.48 dBA

Total Leq All Segments: 56.48 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 49.93 + 0.00) = 49.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	90	0.00	59.14	0.00	- 9.21	0.00	0.00	0.00	0.00	49.93

Segment Leq : 49.93 dBA

Total Leq All Segments: 49.93 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.48
(NIGHT): 49.93

STAMSON 5.0 NORMAL REPORT Date: 01-12-2023 10:47:56
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: OLA.te Time Period: Day/Night 16/8 hours
Description: Outdoor Living Area

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

Car traffic volume : 20431/2270 veh/TimePeriod *
Medium truck volume : 208/23 veh/TimePeriod *
Heavy truck volume : 208/23 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15589
Percentage of Annual Growth : 2.00
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 1.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: NiagaraSt (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 72.00 / 72.00 m
Receiver height : 2.00 / 2.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: NiagaraSt (day)

Source height = 1.00 m

ROAD (0.00 + 55.86 + 0.00) = 55.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	0	0.00	65.68	0.00	- 6.81	- 3.01	0.00	0.00	0.00	55.86

Segment Leq : 55.86 dBA

Total Leq All Segments: 55.86 dBA

Results segment # 1: NiagaraSt (night)

Source height = 1.00 m

ROAD (0.00 + 49.32 + 0.00) = 49.32 dBA

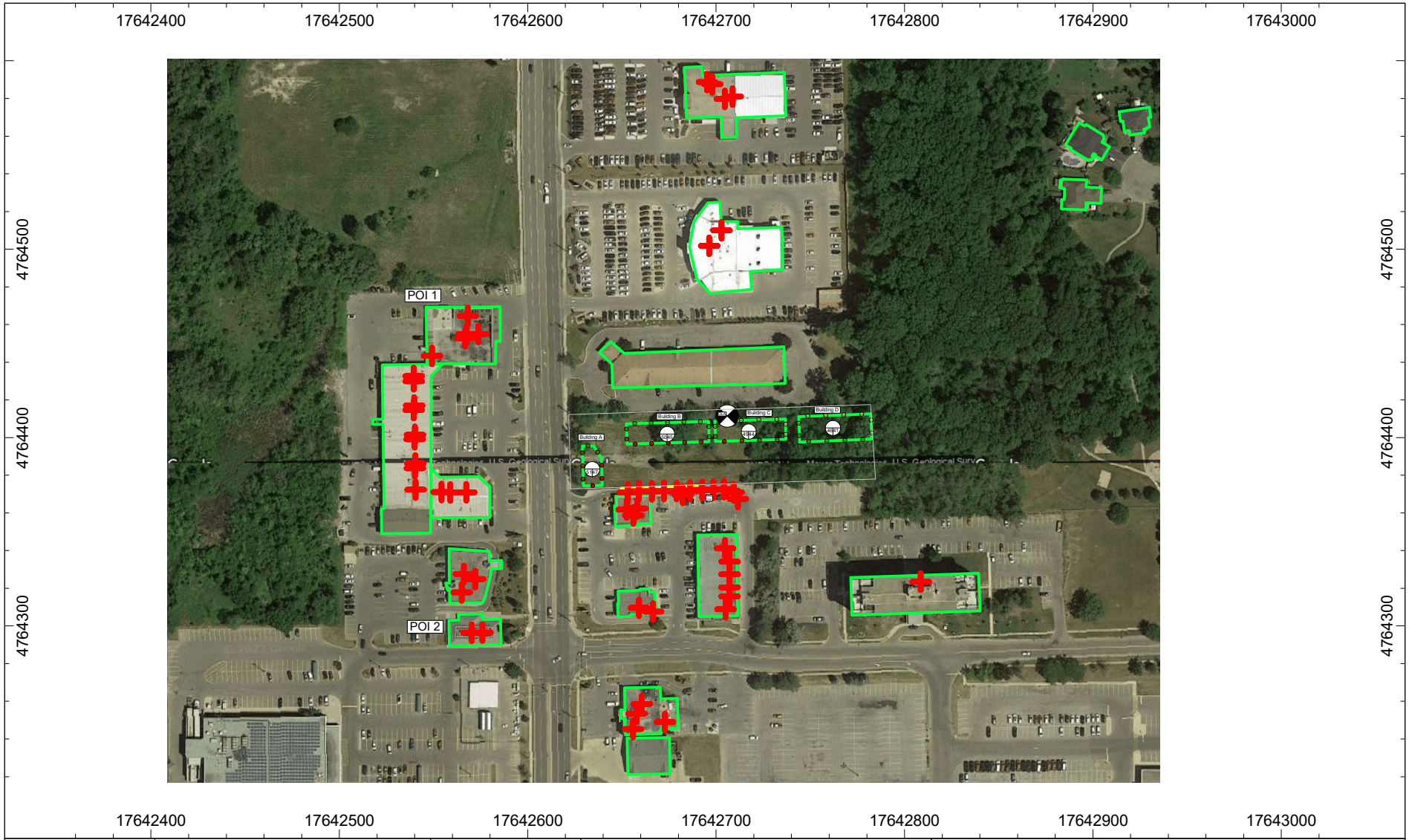
Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
- 90	0	0.00	59.14	0.00	- 6.81	- 3.01	0.00	0.00	0.00	49.32

Segment Leq : 49.32 dBA

Total Leq All Segments: 49.32 dBA

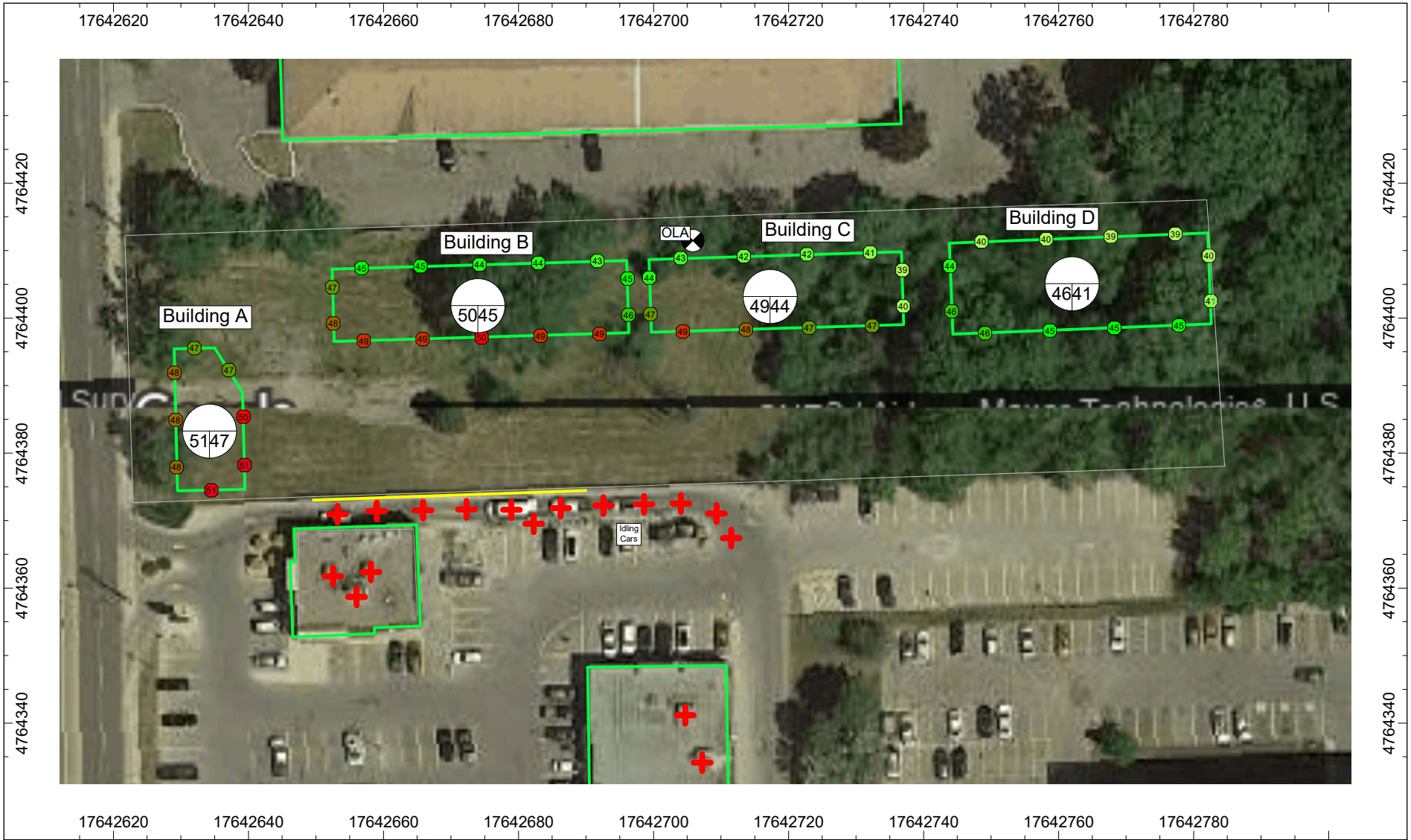
TOTAL Leq FROM ALL SOURCES (DAY): 55.86
(NIGHT): 49.32

ATTACHMENT C



STATIONARY NOISE IMPACT
858 Niagara Street, Welland, ONTARIO

FIGURE 1
NOISE IMPACT
FROM ENVIRONMENT TO SITE



30 <= ... < 40
40 <= ... < 45
45 <= ... < 50
50 <= ... < 60
60 <= ... < 70
70 <= ...

ACOUSTIC ENGINEERING Ltd.

Point Source
Building
Barrier
Receiver
Building Evaluation

STATIONARY NOISE IMPACT
858 Niagara Street, Welland, ONTARIO

FIGURE 1a
NOISE IMPACT
FROM ENVIRONMENT TO SITE
ZOOMED IN TO SITE

ATTACHMENT D

Table D1
Stationary Noise Impact Source Data
858 Niagara Street, Welland, Ontario

Noise Source Description	Cadna ID	Total SWL (dBA)	Data Source or Representative Data	Height Absolute (m)	Above Roof (m)	x	y
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642539	4764430
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642540	4764417
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642540	4764415
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642540	4764402
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642540	4764399
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642540	4764386
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642540	4764384
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642540	4764372
Small HVAC	Small_HVAC	81.9	Small HVAC	7.5	1.5	17642567	4764371
Small HVAC	Small_HVAC	81.9	Small HVAC	7.5	1.5	17642559	4764371
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642566	4764328
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642572	4764325
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642565	4764318
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642570	4764296
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642653	4764362
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642658	4764362
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642666	4764308
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642707	4764335
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642707	4764328
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642707	4764321
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642707	4764316
HVAC 2Fan	HVAC_2Fan	82.8	HVAC 2Fan	5.5	1.5	17642568	4764455
Medium HVAC	Medium_HVAC	90.9	Medium HVAC	9.5	1.5	17642696	4764502
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642705	4764580
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642709	4764581
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642695	4764589
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642660	4764259
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642658	4764253
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642673	4764249
HVAC 2Fan	HVAC_2Fan	82.8	HVAC 2Fan	5.5	1.5	17642574	4764455
HVAC 2Fan	HVAC_2Fan	82.8	HVAC 2Fan	7.5	1.5	17642554	4764371
HVAC 2Fan	HVAC_2Fan	82.8	HVAC 2Fan	6.5	1.5	17642656	4764359
HVAC 2Fan	HVAC_2Fan	82.8	HVAC 2Fan	6.5	1.5	17642705	4764342
HVAC 2Fan	HVAC_2Fan	82.8	HVAC 2Fan	6.5	1.5	17642705	4764310
HVAC 2Fan	HVAC_2Fan	82.8	HVAC 2Fan	6.5	1.5	17642659	4764310
HVAC 2Fan	HVAC_2Fan	82.8	HVAC 2Fan	6.5	1.5	17642656	4764245
HVAC 2Fan	HVAC_2Fan	82.8	HVAC 2Fan	9.5	1.5	17642703	4764510
HVAC 2Fan	HVAC_2Fan	82.8	HVAC 2Fan	6.5	1.5	17642698	4764588
Small HVAC	Small_HVAC	81.9	Small HVAC	6.5	1.5	17642576	4764297