Appendix E
Report 2022-236

Noise Impact Study

Port Cares - Proposed Development at 9 Chestnut St
Port Colborne, Ontario
OAV2104A

Prepared for:

Port Cares

92 Charlotte Street, Port Colborne, ON L3K 3E1

June 2022

Noise Impact Study

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Prepared for:

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17 June 2022

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Executive Summary

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood) was retained by Port Cares to complete a Noise Impact Study (NIS) for the proposed development at 9 Chestnut Street in Port Colborne, Ontario (the "Site").

This NIS has been prepared in response to the Niagara Region's (the "Region") specific request for a detailed noise impact study in support of the zoning by-law amendment application being advanced to permit this project.

The Site is located southeast of the intersection of Main Street East and Welland Street. The area surrounding the Site is composed of a residential neighbourhood but is also adjacent to a yard with an existing Light Industrial use. The Site is shown in Figure 1.

The proposed development is a residential land-use in the form of a 5-storey, 40-unit, affordable housing apartment complex. The current land-use is Park Lands. The proposed use would replace the existing park currently located at the same site.

Since the separation distance for the adjacent industrial facility, as presented in Section 4.4, is less than required minimum distance outlined in the D-6 Guideline, a detailed noise and vibration study is recommended to be conducted for the adjacent facility and the affiliated yard in accordance with the requirements of the NPC-300 guidelines.

The noise level calculations were completed using the design information provided, which is included in Appendix B, and the traffic information presented in Section 3.0. The STAMSON software package developed by the MECP was utilized to calculate sound levels using the ORNAMENT methodology. The predicted noise levels due to the road and rail traffic noise sources are discussed in Sections 3.0 and 3.1, respectively, and presented in Table 5-1 and Table 5-2. The receptor locations assessed are illustrated on Figure 2. Sample output results from STAMSON are provided in Appendix D.

The noise impact assessment results based on road and rail traffic noise indicate that forced air heating with provision for adding central air conditioning in the future is required with a Type C warning clause for the assessed north, south and west POW receptors, and no ventilation and warning clause requirements are needed for the assessed east POW receptors. Detailed acoustical design of the north, south and west facades at a minimum is also required. Ventilation and warning clause requirements are summarized in Table 5-3, and building component requirements are summarized in Table 5-4.

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1.0 INTRODUCTION

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited ("Wood") was retained by Port Cares to complete a Noise Impact Study (NIS) for the proposed development at 9 Chestnut Street in Port Colborne, Ontario (the "Site").

This NIS has been prepared in response to the Niagara Region's (the "Region") specific request for a detailed noise impact study in support of the zoning by-law amendment application being advanced to permit this project.

2.0 BACKGROUND

The Site is located southeast of the intersection of Main Street East and Welland Street. The area surrounding the Site is composed of a residential neighbourhood but is also adjacent to an existing Light Industrial use (further discussed in Section 4.4) and railway along the Welland Canal. The Site is shown shaded in blue in Figure 1.

The proposed development is a residential land-use in the form of a 5-storey, 40-unit, affordable housing apartment complex. The current zoning at the Site address is Public and Park. The development will replace the existing park currently occupying the Site address. The building will cover approximately 7,560 square feet of ground area within the development zone. A conceptual plan of the development is shown in Appendix A, along with the latest publicly available zoning map[1]. Detailed building layout and elevation views are not available at the time of this assessment.

3.0 NOISE CRITERIA

The guidelines applicable to the project are discussed under this section:

3.1 Niagara Region Noise Impact and Vibration Study Terms of Reference (Draft)

The Niagara Region is currently in the process of developing a Terms of Reference related to noise and vibration impact studies conducted within the Region, titled "Niagara Region Noise Impact and Vibration Study Terms of Reference" (hereafter simply "the Region's Terms of Reference") [4]. The Region has provided a draft copy of the Terms of Reference and is provided in Appendix B. The Region's Terms of Reference document was used to determine the required contents of this study.

3.2 MECP Guideline D-6

The MECP Guideline D-6 "Compatibility Between Industrial Facilities and Sensitive Land Uses" [2] (hereafter simply "D-6 Guideline") presents tools and principles for early-stage land-use planning with respect to compatibility. The D-6 Guideline is used to assess risk related to land-use compatibility when the details regarding the source and/or receiving development are not known with enough specificity to complete meaningful detailed noise impact studies. The guideline provides the minimum separation distances between noise-sensitive land uses and industrial facilities based on the classification of the

[1] Obtained from https://www.portcolborne.ca/en/business-and-development/zoning.aspx#Zoning-Maps.

industries (e.g., heavy, medium, and light industries). Regardless of the recommended minimum separation distances per the D-6 Guideline, the developments are permitted if the noise, vibration, dust, and odour guideline limits are met.

The D-6 Guideline is referenced in the Region's Terms of Reference and was therefore utilized within this study.

3.3 MECP NPC-300

The Ministry of Environment, Conservation and Parks (MECP) NPC-300 guideline [1] addresses the assessment of stationary, aircraft, road and rail traffic generated noise. Ultimately the Planning Act provides the Ministry of Housing with authority to delegate land-use planning authority to local municipalities. These municipalities may then adopt the MECP guidance or develop their own standards at their choosing. Part C of the NPC-300 guideline is intended to assist municipalities in assessing applications under the Planning Act. NPC-300 is the closest applicable guideline which stipulates calculation methodology and sound level limits and therefore, the MECP NPC-300 guideline was utilized to complete this study.

The applicable indoor noise criteria for road traffic sources are presented in Table 4-1. Indoor noise levels are typically assessed only if the building component analysis is required and is discussed further below.

To mitigate indoor noise levels due to elevated exterior noise levels, means may be provided so that exterior windows can be kept closed for noise control purposes. This typically requires installation of central air conditioning. Table 4-2 outlines the noise criteria which determine the ventilation requirements for a noise sensitive receptor.

To mitigate indoor noise levels due to elevated exterior noise levels the building construction may need to be designed such that the façade elements (windows, exterior wall, etc.) provide adequate noise reduction. This typically requires the specification of sound transmission class (STC) ratings for the façade elements. Table 4-3 outlines the noise criteria which determine whether the building components must be designed to meet the indoor noise level criteria specified in Table 4-1.

Sound level limits related to outdoor living areas are not listed below as they are not relevant to the study (further discussed in Section 5.0).

Table 3-1: Noise Level Criteria – Indoors

Noise Source	Space	Daytime (07:00 – 23:00) $L_{Aeq\text{-}16hr}$ (dBA)	Nighttime (23:00 – 07:00) $L_{Aeq\text{-}8hr}$ (dBA)
Road Traffic	Living/dining[1]	$L_{Aeq\text{-}16hr} \leq 45$	$L_{Aeq\text{-}8hr} \leq 45$
	Schools[2]	$L_{Aeq\text{-}16hr} \leq 45$	-
	Sleeping quarters	$L_{Aeq\text{-}16hr} \leq 45$	$L_{Aeq\text{-}8hr} \leq 40$
Rail Traffic	Living/dining[1]	$L_{Aeq\text{-}16hr} \leq 40$	$L_{Aeq\text{-}8hr} \leq 40$
	Schools[2]	$L_{Aeq\text{-}16hr} \leq 40$	-
	Sleeping quarters	$L_{Aeq\text{-}16hr} \leq 40$	$L_{Aeq\text{-}8hr} \leq 35$

Notes:

1. Includes den areas of residences, hospitals, nursing homes, etc.
2. Includes schools, daycare centres, etc. Facilities typically utilized for daytime use only.

Table 3-2: Noise Level Criteria – Ventilation Requirements

Noise Source	Daytime (07:00 – 23:00) $L_{Aeq\text{-}16hr}$ (dBA)	Nighttime (23:00 – 07:00) $L_{Aeq\text{-}8hr}$ (dBA)	Ventilation Requirement[1,2]	Required Warning Clause[3]
Combined Road and Rail Traffic at Plane of Window (Excluding Whistle Noise)	$L_{Aeq\text{-}16hr} \leq 55$	$L_{Aeq\text{-}8hr} \leq 50$	None	None
	$55 < L_{Aeq\text{-}16hr} \leq 65$	$50 < L_{Aeq\text{-}8hr} \leq 60$	PA	Type C
	$L_{Aeq\text{-}16hr} > 65$	$L_{Aeq\text{-}8hr} > 60$	CA	Type D

Notes:

1. PA – Forced air heating with provision for adding central air conditioning.
2. CA – Central air conditioning.
3. Example warning clauses from NPC 300 to be included on agreements of purchase and sale, lease agreements and subdivision/site plan agreements are included in Appendix E.

Table 3-3: Noise Level Criteria – Building Component Requirements

Noise Source	Daytime (07:00 – 23:00) $L_{Aeq\text{-}16hr}$ (dBA)	Nighttime (23:00 – 07:00) $L_{Aeq\text{-}8hr}$ (dBA)	Building Component Requirement[1,2]
Road Traffic at Plane of Window	$L_{Aeq\text{-}16hr} \leq 65$	$L_{Aeq\text{-}8hr} \leq 60$	OBC
	$L_{Aeq\text{-}16hr} > 65$	$L_{Aeq\text{-}8hr} > 60$	Design
Rail Traffic at Plane of Window (Including Whistle Noise)	$L_{Aeq\text{-}16hr} \leq 60$	$L_{Aeq\text{-}8hr} \leq 55$	OBC
	$L_{Aeq\text{-}16hr} > 60$	$L_{Aeq\text{-}8hr} > 55$	Design

Notes:

1. OBC – Building compliant with the Ontario Building Code.
2. Design – Building Components (walls, windows, etc.) must be designed to achieve indoor noise level criteria.
3. Example warning clauses from NPC 300 to be included on agreements of purchase and sale, lease agreements and subdivision/site plan agreements are included in Appendix E.

4.0 NOISE SOURCES

This report considers road, rail, canal shipping traffic and industry noise impacts on the proposed Site in the context of the design information provided by Port Cares. Road and rail traffic noise impacts are discussed in Sections 4.1 and 4.2, respectively. Noise from the shipping traffic is discussed in Section 0. Industrial noise impacts are discussed in Section 4.4.

4.1 Road Traffic

The two arterial roads in proximity to the Site are Main Street East and Welland Street. Road traffic data provided by the Region were utilized as inputs to the noise level calculations. The traffic data obtained from the Region is provided in Appendix C.

The traffic data and associated Average Annual Daily Traffic (AADT) volume estimates were developed based on traffic counts completed in 2016 for Main Street East and 2019 for Welland Street. Traffic

volumes were predicted 10 years past current conditions as suggested in NPC-300. To estimate the 2032 traffic volumes, the data was forecasted at an annual growth rate of 2.5 percent. A summary of the provided data and forecasted 2032 traffic data is presented in Table 3-1.

Table 4-1: Road Traffic Data

Roadway	2016/2019 AADT[1]	2032 AADT[1]	Day / Night Percentage Split[2]	Posted Speed (kph)	Medium Truck Percent[3]	Heavy Truck Percent[4]
Main Street East	12314	17240	90 / 10	50	25%	3%
Welland Street	3553	4708	90 / 10	60	15%	11%

Notes:

4. AADT – Average Annual Daily Traffic Volume. AADT data provided for Main Street East was from 2016 and data provided for Welland Street was from 2019.
5. Represents the percentage of AADT in each time period:
   a. Day – 07:00 to 23:00; and,
   b. Night – 23:00 to 07:00.
6. Medium truck volume as percent of AADT. Medium trucks are defined as having 2 axles and includes buses.
7. Heavy truck volume as percentage of AADT. Heavy trucks are defined as having more than 2 axles.

Welland Street turns into Barber Drive north of the Main Street East/Welland Street intersection. Barber Drive is neither a provincial highway nor a regional road and is not considered a potential noise source according to the Region's Terms of Reference. The Region does not have traffic counts for Barber Drive, and it is further assumed that a negligible amount of traffic travels on Barber Drive in this area.

4.2 Rail Traffic

The main railway in proximity of the Site is the Canadian National Railway (CN) Humber Line SPUR (Freight) and is approximately 100 meters west of the boundary of the Site. Rail traffic data provided by CN was utilized as inputs to the noise level calculations. As done with the road traffic data, rail traffic volumes were predicted 10 years past current conditions as suggested in NPC-300. To estimate the 2032 traffic volumes, the data was forecasted at an annual growth rate of 2.5 percent as stipulated by CN in the train count data sheet (provided in Appendix C). A summary of the traffic data obtained from CN is presented in Table 4-2.

Table 4-2: Rail Traffic Data

Type of Train	Day/Night Volumes[1]	Max. Consist[2]	Max Speed (mph)[3]	Max. Power[4]
Way Freight	4	25	10	4

Notes:

1. Volumes for Day (07:00 to 23:00) and Night (23:00 to 07:00) were reported to be equal.
2. Represents number of carts.
3. Maximum train speed given in Miles per Hour.
4. Represents number of locomotives.

According to the train traffic count from CN, the rail crossing at Main Street East is excluded from crossings with anti-whistling bylaws. Whistling noise was therefore considered in the assessment. The train traffic count from CN mentions that single mainline track is considered continuously welded throughout the study area. However, inspection of the spur line's track in the study area through Google Street View (imagery date of April 2021) reveals a bolted configuration and was considered as such for the rail traffic noise calculations.

Vibration from the railway upon the Site is not considered for this assessment. According to the Guidelines for New Development in Proximity to Railway Operations, the standard recommended building setback for new residential development to a spur line is 15 metres [5]. The Region's Terms of Reference requires a vibration studies for proposed developments within 75 meters of a rail corridor. The distance from the Site's proposed building to the spur line is greater than 75 meters and is approximately 130 metres.

Another railway is located on the west side of the Welland Canal, the Port Colborne Harbour Railway (PCHR) – Harbour Spur (Freight). However, the PCHR is over 600 meters west of the Site. The Region's Terms of Reference only considers a railway within 500 m to be a potential noise source and therefore, the PCHR was not included in this assessment.

4.3 Shipping Traffic

In the interest of including all potential sources of noise in the NIS, Wood has also identified that the Welland Canal is approximately 150 meters west of the Site's boundary. According to NPC-300, marine shipping activities usually do not require MECP approval because most aspects of the facility are solely regulated by the federal government [1]. There is no specific direction under NPC-300 to address marine noise as part of an assessment prepared under Part C related to Land Use Planning.

Nonetheless, the Welland Canal is in close proximity to the Site and should be assessed. Wood attempted to gather information about shipping operations in effort to evaluate the potential severity of impact upon the Site with respect to noise but did not receive ample information. Further assessment, possibly including conducting noise monitoring at the Welland Canal, is recommended in order to determine the possible noise impact from the Welland Canal upon the Site.

4.4 Industrial

The only industrial facility identified in the vicinity of the Site is Algoma Ship Repair located at 1 Chestnut St, directly west of the Site across Lock Street. According to the information provided by Port Cares, the adjacent facility and the affiliated yard are currently utilized for light industrial uses by Dayson Industrial Services which specialize in descaling, special coatings, painting, and lining applicator offering protection systems for both concrete and steel surfaces. Also, according to communication with the owner of the yard and based on aerial imagery, the yard is used for storage as well. Detailed information about the facility was requested as well as a request for a site visit to conduct measurements at the facility but no information was received, nor was permission granted for access. Therefore, a detailed study of the facility was not possible due to an insufficient amount of data available.

However, the D-6 Guideline [2] applies to early land use planning purposes when noise sensitive land uses are being proposed in the vicinity of existing or proposed industrial land uses. In reference to the D-6 guideline, the facility at 1 Chestnut St is considered a Class II facility. This is due to its medium scale, the presence of outdoor storage of waste and materials and the outputs of noise which are expected to be occasional. A Class II facility has a recommended setback distance of 70 m. The actual separation distance

between the property lines of the facility and the Site is approximately 22 m. For reference, the actual separation distance between the property line of the facility and the Site's nearest building façade (west) is approximately 48 meters.

Since the actual separation distance is less than the recommended minimum setback distance for Class II facilities, a detailed noise and vibration study is recommended for the facility/facilities located at 1 Chestnut St as part of the land-use planning and approvals process for the Site. The study should be conducted in accordance with the requirements of the NPC-300 guideline and should consider all significant noise and vibration sources. As per the MECP's Access Environment database, the latest Environmental Compliance Approval (ECA) for 1 Chestnut St. was issued to Algoma Central Corporation, operating as Algoma Ship Repair on May 14, 2013 (ECA Number 2956-8QZPUV). Considering Dayson Industrial Services now operates at this address, the existing ECA and their supporting studies are expected to be outdated and an ECA amendment application is also suggested.

The locations of the above-mentioned sources of noise are labeled in Figure 3.

5.0 ROAD AND RAIL NOISE IMPACT ASSESSMENT

The noise level calculations were completed using the limited design information provided, which is included in Appendix B, and the traffic information presented in Section 3.0. The STAMSON software package developed by the MECP was utilized to calculate sound levels using the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) [3]. The predicted noise levels due to the road and rail traffic noise sources discussed in Section 3.0 are presented in Table 5-1 and Table 5-2.

Three receptor locations per façade were considered to capture the various possible exposure angles to road and rail and are illustrated on Figure 2. The receptor locations are representative of a 5th storey plane of window (13.5 m above grade), the worst-impacted floor level. Figure 2.

NPC-300 requires that noise from road and rail be combined at plane of window assessment locations when determining ventilation requirements. Whistle noise is excluded for determining ventilation requirements.

For determining building component requirements, noise from road and rail is assessed separately. Whistle noise is included for determining building component requirements.

According to NPC-300, balconies that have a minimum depth of 4 metres associated with a unit constitute an outdoor living area (OLA) and must be assessed for noise impact. There is no indication that the proposed residential units are provided with balconies, nor is any other form of outdoor amenity identified in the Site's drawing. Therefore, noise levels at OLAs have not been included in this assessment.

Sample output results from STAMSON are provided in Appendix D. Should the Site layout be modified in the future, updated calculations would be required.

Table 5-1: Predicted Road and Rail Traffic Noise Levels – Ventilation

Receptor Location (ID)	Receptor Description	Predicted Road Traffic Noise Level		Predicted Rail Traffic Noise Level (Excluding Whistle)[1]		Combined Road and Rail Noise Level (Excluding Whistle)	
		Daytime (07:00-23:00) $L_{Aeq\text{-}16h}$ (dBA)	Nighttime (23:00-07:00) $L_{Aeq\text{-}8h}$ (dBA)	Daytime (07:00-23:00) $L_{Aeq\text{-}16h}$ (dBA)	Nighttime (23:00-07:00) $L_{Aeq\text{-}8h}$ (dBA)	Daytime (07:00-23:00) $L_{Aeq\text{-}16h}$ (dBA)	Nighttime (23:00-07:00) $L_{Aeq\text{-}8h}$ (dBA)
E1	East Façade 1	54	47	-	-	54	47
E2	East Façade 2	54	48	-	-	54	48
E3	East Façade 3	55	48	-	-	55	48
N1	North Façade 1	59	53	51	54	60	57
N2	North Façade 2	58	53	50	53	59	56
N3	North Façade 3	59	53	50	53	59	56
S1	South Façade 1	52	48	50	53	54	54
S2	South Façade 2	52	47	49	52	53	53
S3	South Façade 3	51	46	48	51	53	53
W1	West Façade 1	57	51	53	56	59	57
W2	West Façade 2	57	51	53	56	59	57
W3	West Façade 3	58	51	53	56	59	57

Notes:

1. "-" represents where a calculation has not been done. An insignificant amount of exposure is expected due to the limited segment angle and perpendicular distance of greater than 500 m to the rail line.

Table 5-2: Predicted Rail Traffic Noise Levels – Building Component

Receptor Location (ID)	Receptor Description	Predicted Road Traffic Noise Level		Predicted Rail Traffic Noise Level (Including Whistle)[1]	
		Daytime (07:00-23:00) $L_{Aeq\text{-}16h}$ (dBA)	Nighttime (23:00-07:00) $L_{Aeq\text{-}8h}$ (dBA)	Daytime (07:00-23:00) $L_{Aeq\text{-}16h}$ (dBA)	Nighttime (23:00-07:00) $L_{Aeq\text{-}8h}$ (dBA)
E1	East Façade 1	54	47	-	-
E2	East Façade 2	54	48	-	-
E3	East Façade 3	55	48	-	-
N1	North Façade 1	59	53	61	65
N2	North Façade 2	58	53	61	64
N3	North Façade 3	59	53	60	63
S1	South Façade 1	52	48	59	62
S2	South Façade 2	52	47	59	62
S3	South Façade 3	51	46	58	61
W1	West Façade 1	57	51	64	67
W2	West Façade 2	57	51	64	67
W3	West Façade 3	58	51	64	67

Notes:

1. "-" represents where a calculation has not been done. An insignificant amount of exposure is expected due to the limited segment angle and perpendicular distance of greater than 500 m to the rail line.

Comparison of the predicted noise levels from Table 5-1 with the criteria in Table 3-2 indicates that forced air heating with provision for adding central air conditioning in the future is required with a Type C warning clause for the assessed north, south and west POW receptors, and no ventilation and warning clause requirements are needed for the assessed east POW receptors. Ventilation and warning clause requirements are summarized in Table 5-3.

Table 5-3: Ventilation and Warning Clause Requirements

Receptor Location (ID)	Receptor Description	Ventilation Requirements	Warning Clause
E1	East Façade 1	None	None
E2	East Façade 2	None	None
E3	East Façade 3	None	None
N1	North Façade 1	PA	Type C
N2	North Façade 2	PA	Type C
N3	North Façade 3	PA	Type C

Receptor Location (ID)	Receptor Description	Ventilation Requirements	Warning Clause
S1	South Façade 1	PA	Type C
S2	South Façade 2	PA	Type C
S3	South Façade 3	PA	Type C
W1	West Façade 1	PA	Type C
W2	West Façade 2	PA	Type C
W3	West Façade 3	PA	Type C

Comparison with the predicted noise levels from Table 5-2 with the criteria in Table 3-3 indicates that building components beyond those that meet the Ontario Building Code are not required for the east façade POW receptors. For the north, south and west POW receptors, detailed design of the building components are required to ensure the indoor noise level criteria specified in NPC-300 and summarized in Table 3-1 can be achieved. It is recommended that the detailed design be conducted once detailed building layouts, elevation drawings and floor plans are made available. Building component requirements are summarized in Table 5-4.

Table 5-4: Building Component Requirements

Receptor Location (ID)	Receptor Description	Building Component Requirement[1,2]
E1	East Façade 1	OBC
E2	East Façade 2	OBC
E3	East Façade 3	OBC
N1	North Façade 1	Design
N2	North Façade 2	Design
N3	North Façade 3	Design
S1	South Façade 1	Design
S2	South Façade 2	Design
S3	South Façade 3	Design
W1	West Façade 1	Design
W2	West Façade 2	Design
W3	West Façade 3	Design

Notes:

1. OBC – Building compliant with the Ontario Building Code.
2. Design – Building Components (walls, windows, etc.) must be designed to achieve indoor noise level criteria.

6.0 CONCLUSIONS

The noise impact assessment results based on road and rail traffic noise indicate that forced air heating with provision for adding central air conditioning in the future is required with a Type C warning clause for the assessed north, south and west POW receptors, and no ventilation and warning clause requirements are needed for the assessed east POW receptors. Detailed acoustical design of the north, south and west facades at a minimum is also required. Ventilation and warning clause requirements are summarized in Table 5-3, and building component requirements are summarized in Table 5-4.

Since the separation distance for the adjacent industrial facility (as presented in Section 4.4) is less than required minimum distance outlined in the D-6 Guideline, a detailed noise and vibration study is recommended to be conducted for the adjacent facility and the affiliated yard in accordance with the requirements of the NPC-300 guideline.

7.0 CLOSURE

This Noise Impact Assessment was prepared by Wood for the sole benefit of Port Cares for the specific application to the proposed development at 9 Chestnut Street, Port Colborne, ON. The quality of information, conclusions and estimates contained herein are consistent with the level of effort involved in Wood's services and based on: i) information available at the time of preparation, ii) data supplied by outside sources and iii) the assumptions, conditions and qualifications set forth in this document. This report is intended to be used by Port Cares only, and its nominated representatives, subject to the terms and conditions of its contract with Wood. Any other use of, or reliance on, this report by any third party is at that party's sole risk. This report has been prepared in accordance with generally accepted industry-standard. No other warranty, expressed or implied, is made.

If you require further information regarding the above or the project in general, please contact the undersigned at (905) 568-2929. Thank you for the opportunity to be of service to Port Cares.

Sincerely,

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8.0 REFERENCES

[1] Ontario Ministry of the Environment, Conservation and Parks (MECP), "Publication NPC-300, Noise Assessment Criteria for Stationary Sources and for Land Use Planning," August 2013.

[2] "Guideline D-6 Comptability Between Industrial Facilities and Sensitive Land Uses," 1995.

[3] Ontario Ministry of the Environment, "Ontario Road Noise Analysis Method for Environment and Transportation, ORNAMENT.," October 1989.

[4] Niagara Region, "Draft Noise Impact and Vibration Study Terms of Reference," 2022.

[5] The Federation of Canadian Municipalities and the Railway Association of Canada, "Guidelines for New Development in Proximity to Railway Operations," 2013.

Image obtained from the Niagara Region Navigator Map

Figure 1: Site Location

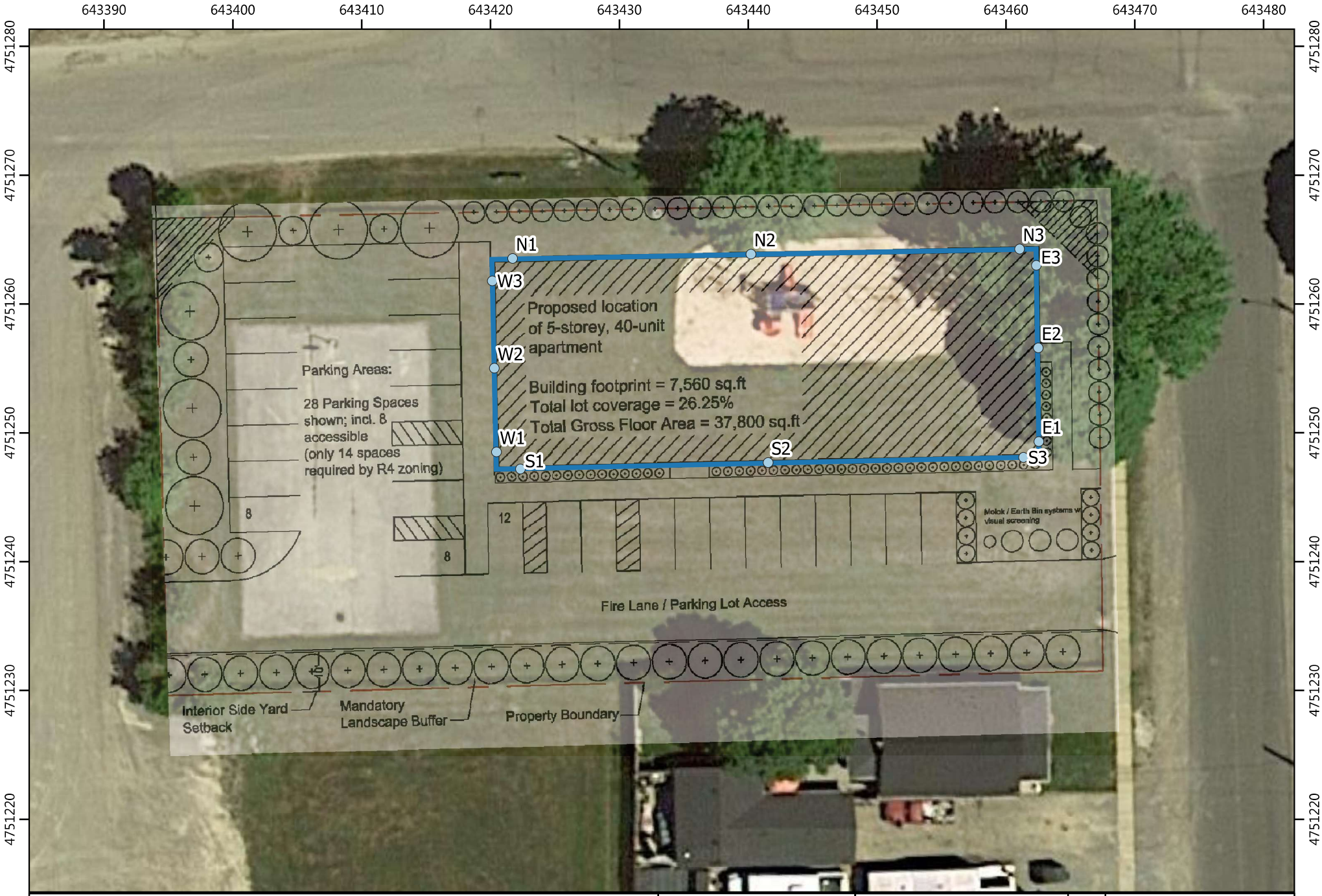


Figure 2: Facade Assessment Points for Road and Rail Noise

Noise Impact Study: Port Cares

9 Chestnut St, Port Colbourne, ON	P. No. OAV2104A	Date: 06/2022

Legend

- Facade Assessment Points

Notes:
- Imagery obtained from Google
- Site drawing obtained from Port Cares
- Coordinate system: WGS84 UTM 17
- Not to scale

N

wood.

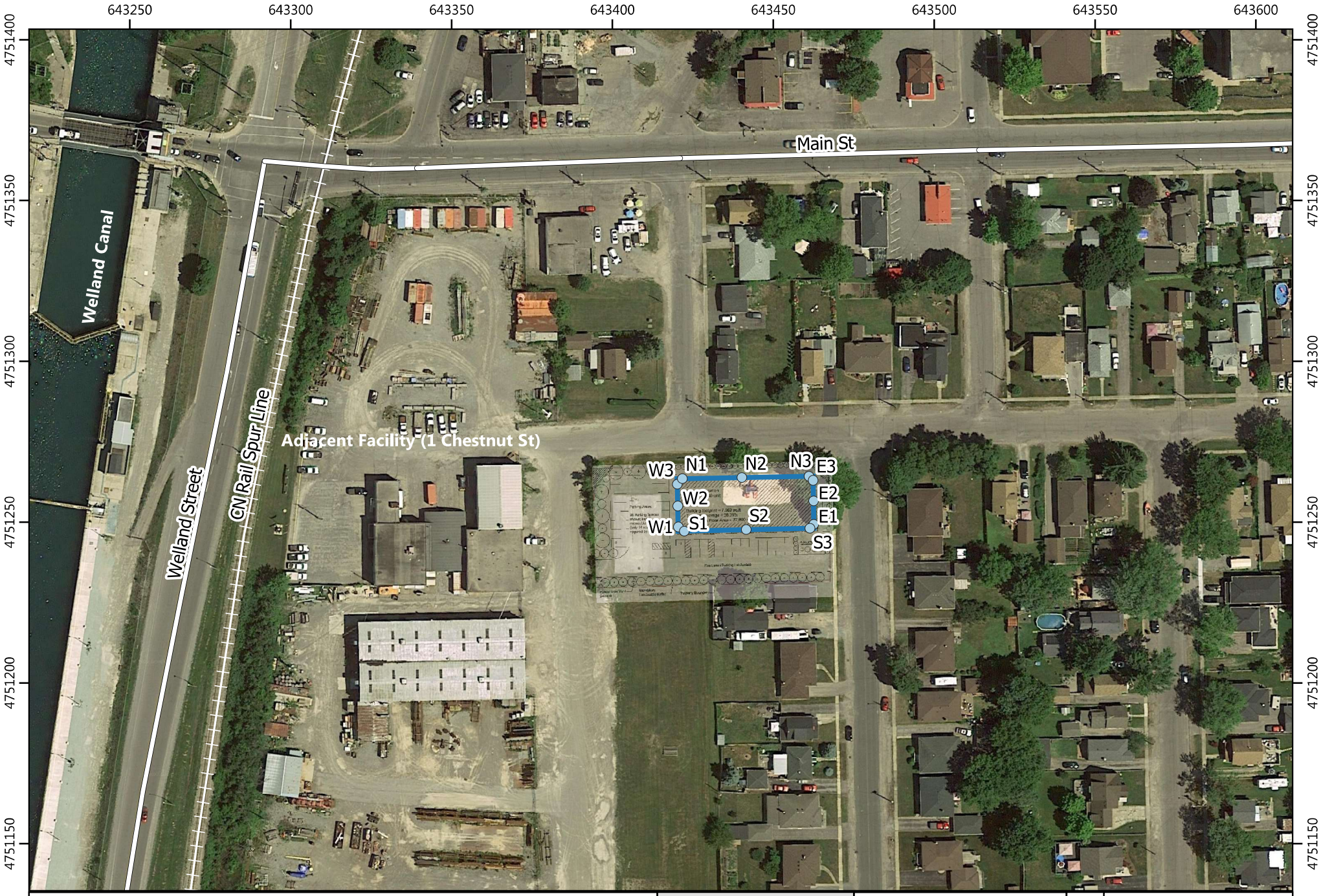


Figure 3: Locations of Noise Sources in Proximity to the Site

Noise Impact Study: Port Cares

9 Chestnut St, Port Colbourne, ON	P. No. OAV2104A	Date: 06/2022

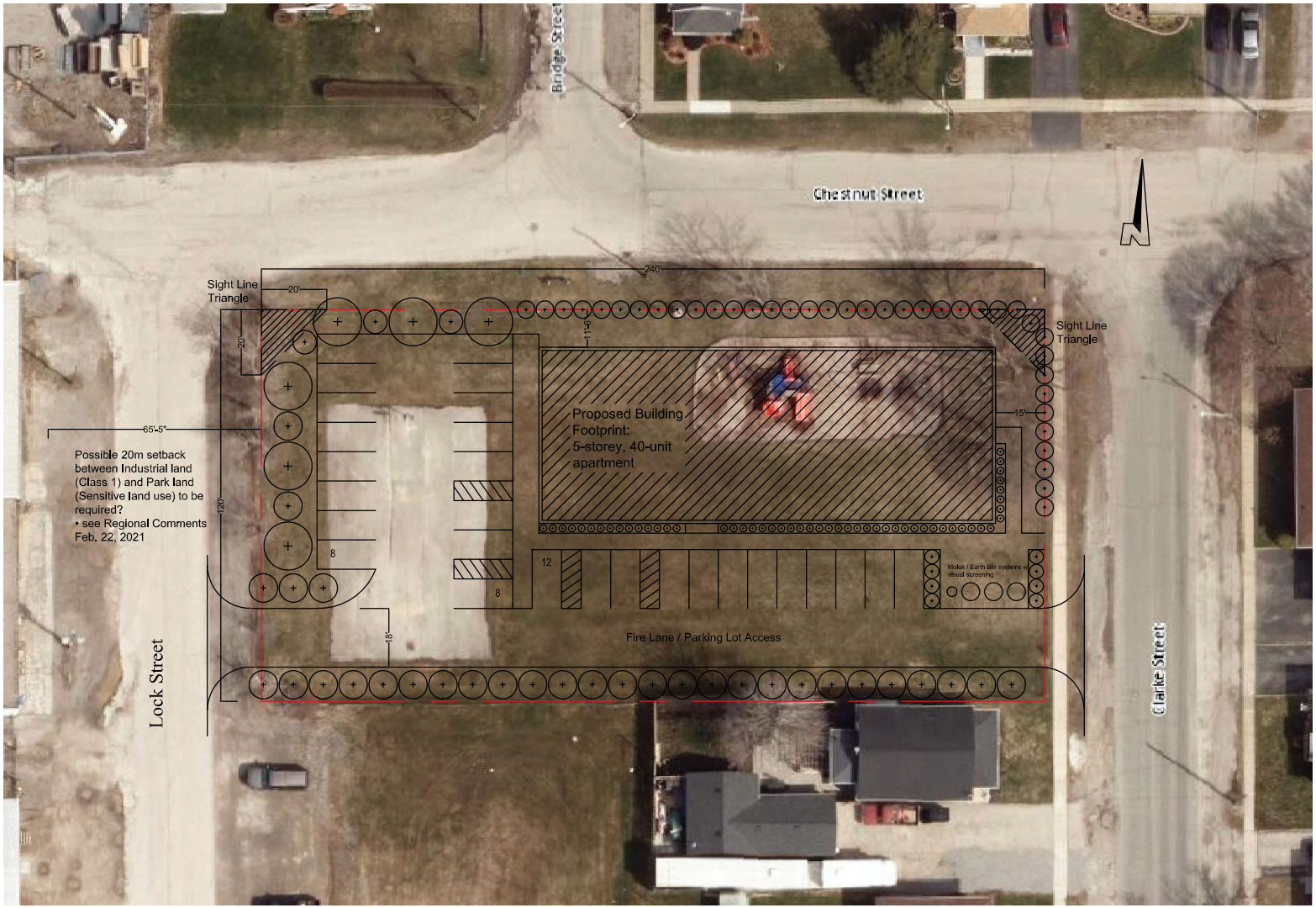
Legend
- Road
- Rail
- Facade Assessment Points

Notes:
- Imagery obtained from Google
- Site drawing obtained from Port Cares
- Coordinate system: WGS84 UTM 17
- Not to scale

N

wood.

Appendix A: Drawings and Zoning Map



R4 Residential 4th Density Zoning Requirements & Proposed Dimensions (Apartment, Public)		
	Required	Proposed
Lot Area - Existing	120 ft x 240 ft	28,800 sq.ft
Lot Coverage (Max.) 40%	11,520 sq.ft	7,560 sq.ft
Landscape Area (Min.) 25%	7,200 sq.ft	7,7675 sq.ft (plus potential 1800 sq.ft rooftop green space)
Building Height (Max.)	20.0m (65 ft)	60 Ft
Lot Frontage (Min.)	18.0m (60 ft)	120 Ft
Front Yard Setback	9.0m (30 ft)	85 Ft
Side Yard Interior Setback	3.0m (9.85 ft)	10 Ft
Corner Yard Exterior Setback	7.5m (25 ft)	11.50 Ft
Rear Yard	6.0m (20 ft)	15 Ft
Parking - Apartment, Public	14 spaces (1 space per 3 units)	28 spaces (8 accessible)

Current Unit Count & Rental Types:

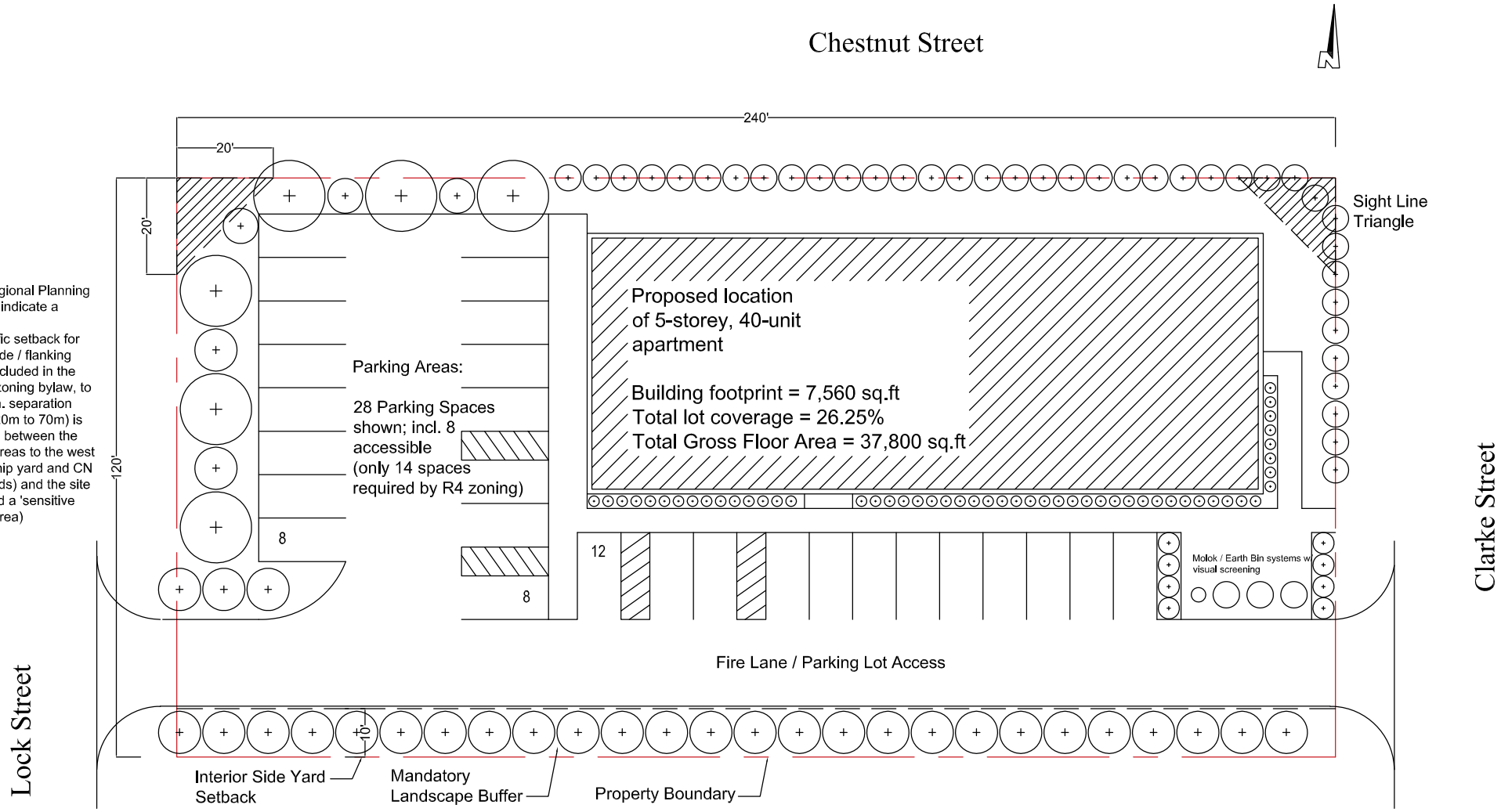
30 1-bed units
(15 afforable + 15 low-end market);
6 1-bed units to be fully accessible (BF)

10 2-bed units
(low-end market w. $300 subsidy per unit);
3 2-bed units to be fully accessible (BF)

Niagara Regional Housing

9 Chestnut Park Development - Conceptual Plan B

DRAWN BY	PROJECT No.	
GS	ND-PC-2020	A0.1
DATE	SCALE	
2021.03.28	NTS	



**Initial Regional Planning comments indicate a possible "site-specific setback for the west side / flanking yard" be included in the amended zoning bylaw, to ensure min. separation distance (20m to 70m) is maintained between the industrial areas to the west (Algoma ship yard and CN railway lands) and the site (considered a 'sensitive land use' area)

Niagara Regional Housing

9 Chestnut Park Development - Conceptual Plan B

DRAWN BY	PROJECT No.	
GS	ND-PC-2020	A0.2
DATE 2021.03.24	SCALE NTS	

City of Port Colborne

PORT COLBORNE

SCHEDULE "A6"

to By-law No. 6575/30/18

LEGEND

Symbol	Zone
A	AGRICULTURAL
AR	AGRICULTURAL RESIDENTIAL
RR	RURAL RESIDENTIAL
LR	LAKESHORE RESIDENTIAL
R1	FIRST DENSITY RESIDENTIAL
R2	SECOND DENSITY RESIDENTIAL
R3	THIRD DENSITY RESIDENTIAL
R4	FOURTH DENSITY RESIDENTIL
RD	RESIDENTIAL DEVELOPMENT
MU	MIXED USE
NC	NEIGHBOURHOOD COMMERCIAL
DC	DOWNTOWN COMMERCIAL
HC	HIGHWAY COMMERCIAL
I	INSTITUTIONAL
P	PUBLIC AND PARK
LI	LIGHT INDUSTRIAL
HI	HEAVY INDUSTRIAL
MAO	MINERAL AGGREGATE OPERATIONS
GI	GATEWAY INDUSTRIAL
ID	INDUSTRIAL DEVELOPMENT
	ENVIRONMENTAL PROTECTION
	HAZARD
	ENVIRONMENTAL CONSERVATION

This is Schedule "A6" to By-law No. 6575/30/18
Passed the 23rd Day of April 2018.

Not to Scale

John Maloney, Mayor

Amber LaPointe, City Clerk

Site Location

Appendix B: Niagara Region Noise Impact and Vibration Study Terms of Reference (Draft)

Noise Impact and Vibration Study Terms of Reference

Description

A technical report that provides a written description of the impact of noise generated by a proposed development on the surrounding environment, the impact of noise and/or vibration from the surrounding environment on the proposed development, both stationary and mobile sources, and the impact of noise from the proposed development on itself as well as mitigation measures to reduce any negative impacts.

In addition to a Noise Study there maybe a requirement for a Vibration Study. The Vibration Study would be combined with the Noise Study.

The Noise Impact Study or Noise and Vibration Study is to be prepared by a Consultant that is either an accredited Acoustic expert or a qualified Professional Engineer.

When Required

Noise Impact (Feasibility and/or Detailed Assessment) Studies may be required to support the following applications for developments:

- Zoning By-law Amendment
- Site Plan Control
- Plans of Subdivision
- Consent to Sever

A Noise Study is normally required, when a noise-sensitive development is proposed adjacent or in close proximity to the following potential noise sources:

- Within 500 m of a Provincial Highway/Freeway;
- Within 250 m of a Regional Road whose future traffic volume may be greater than 10,000 vehicles/day;
- Within 500 m of a railway ROW;
- Within the 25 NEF contours of an Airport;
- Within the potential zone of influence, as defined in MOE documents D-1 and D-6, of a Stationary Source of noise (industrial/commercial/institutional); a detailed noise study is required for developments within the potential influence area of stationary sources;
- Within 500 m of extensive commercial operations (loading docks of supermarkets, large commercial buildings with prominent ventilation and air conditioning equipment, automatic car washes, etc.);
- Within 500 m of aggregate operations (pits, quarries, etc.); or
- Any other noise sources not mentioned above.

A vibration study is required for all proposed developments within 75 metres of a rail corridor.

DRAFT

The requirement for a Noise Impact Study may be a condition of initial approval of the proposed development.

Rationale

A Noise Impact Study or Noise and Vibration Impact Study will help in assessing the compatibility of the proposed development with the existing and/or future land uses in the surrounding area as it relates to transportation and stationary noise both on site and off site.

Required Contents

During pre-application consultation, it will be determined if a report is required and, if so, the specific requirements of the Study, based on the nature of the proposed application and the context of the study area. Ultimate traffic data must be obtained from the Region and/or Local Municipality when analyzing transportation noise from Regional and Local roads. The Noise or the Noise and Vibration Study should include the following components, but is not necessarily limited to:

Introduction

- Description of the subject site and the proposed development;
- Location/context map;
- Identification of the noise source(s); and
- Description of the sound level guidelines/standards applied (methods).

Environmental Noise (and Vibration) Assessment

- Identify all stationary and transportation (road, rail, air) noise sources, including data collection and methods;
- Assessment procedure and methodology should clearly be outlined;
- Provide predicted noise level forecasts without mitigation;
- Environmental noise guidelines;
- Noise impact assessment (including low frequency noise impacts); and
- Vibration assessment, if applicable

Noise (and Vibration) Mitigation Recommendations

- Indoors: architectural requirements, ventilation requirements;
- Outdoors: at source requirements, sound barrier requirements;
- Provide tables and figures to support the recommendations of the report; and
- Warning clauses;
- Proposed mitigation measures will need to adhere to any engineering or policy guidelines that a municipality may have; and
- If a Class 4 designation is recommended the report shall discuss the mitigation measures that would be required to satisfy Class 1 or 2 standards and why the required mitigation is not feasible. Rationale must be provided for recommending a Class 4 designation.

DRAFT

Conclusions

Appendix A – Base Noise Level Calculations (Noise Source Data)
Appendix B – Ministry of Environment Noise Guidelines
Appendix C – Sample Sound Exposure Calculation

DRAFT

Appendix C: Traffic Data

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Niagara Region
Street: 699322 - NB
Location: 7467

A study of vehicle traffic was conducted with the device having serial number 400207. The study was done in the NB lane at 699322 - NB in Niagara Region, ON in county. The study began on 2019-03-26 at 12:00 AM and concluded on 2019-03-27 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 2,056 vehicles passed through the location with a peak volume of 54 on 2019-03-26 at [03:30 PM-03:45 PM] and a minimum volume of 0 on 2019-03-26 at [12:15 AM-12:30 AM]. The AADT count for this study was 2,056.

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 70 - 75 KM/H range or lower. The average speed for all classifed vehicles was 72 KM/H with 86.43% vehicles exceeding the posted speed of 60 KM/H. 12.64% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 70KM/H and the 85th percentile was 84.06 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 104	105 to >
29	7	25	66	122	184	256	379	300	235	154	78	0	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 1120 which represents 61 percent of the total classified vehicles. The number of Small Trucks in the study was 188 which represents 10 percent of the total classified vehicles. The number of Trucks/Buses in the study was 235 which represents 13 percent of the total classified vehicles. The number of Tractor Trailers in the study was 292 which represents 16 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 21.9	22.0 to >							
215	905	188	235	153	49	11	79							

CHART 2

HEADWAY

During the peak traffic period, on 2019-03-26 at [03:30 PM-03:45 PM] the average headway between vehicles was 16.364 seconds. During the slowest traffic period, on 2019-03-26 at [12:15 AM-12:30 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 0.00 and 254.00 degrees C.

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Niagara Region
Street: 699322 - SB
Location: 7467

A study of vehicle traffic was conducted with the device having serial number 402525. The study was done in the SB lane at 699322 - SB in Niagara Region, ON in county. The study began on 2019-03-26 at 12:00 AM and concluded on 2019-03-27 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 1,497 vehicles passed through the location with a peak volume of 54 on 2019-03-26 at [06:00 PM-06:15 PM] and a minimum volume of 0 on 2019-03-26 at [12:30 AM-12:45 AM]. The AADT count for this study was 1,497.

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 60 - 65 KM/H range or lower. The average speed for all classifed vehicles was 63 KM/H with 64.65% vehicles exceeding the posted speed of 60 KM/H. 1.77% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 60KM/H and the 85th percentile was 72.64 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 104	105 to >
13	21	24	164	298	352	285	176	82	30	14	12	0	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 1375 which represents 93 percent of the total classified vehicles. The number of Small Trucks in the study was 21 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 23 which represents 2 percent of the total classified vehicles. The number of Tractor Trailers in the study was 52 which represents 4 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 21.9	22.0 to >							
751	624	21	23	11	11	21	9							

CHART 2

HEADWAY

During the peak traffic period, on 2019-03-26 at [06:00 PM-06:15 PM] the average headway between vehicles was 16.364 seconds. During the slowest traffic period, on 2019-03-26 at [12:30 AM-12:45 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 0.00 and 25.00 degrees C.

Time/Class Report

Device ID: 402525	**Location:** 7467	**Raw Count:** 1,497
Operator: MD	**Lane:** SB	**AADT Count:** 1,497
Begin: 03-26-2019 12:00 AM	**Street:** 699322 - SB	**AADT Factor:** 1
End: 03-27-2019 12:00 AM	**City:** Niagara Region	**Speed Limit:** 60
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 71	72 to >	Total
Tue,03-26-2019									
[00:00-00:15]	2	0	0	0	0	0	0	0	2
[00:15-00:30]	4	0	0	0	0	0	0	0	4
[00:30-00:45]	0	0	0	0	0	0	0	0	0
[00:45-01:00]	0	1	0	0	0	0	0	0	1
	6	1	0	0	0	0	0	0	7
[01:00-01:15]	1	0	0	0	0	0	0	0	1
[01:15-01:30]	0	0	0	0	0	0	0	0	0
[01:30-01:45]	1	0	0	0	0	0	0	0	1
[01:45-02:00]	1	0	0	0	0	0	0	0	1
	3	0	0	0	0	0	0	0	3
[02:00-02:15]	0	0	0	0	0	0	0	0	0
[02:15-02:30]	0	1	0	0	0	0	0	0	1
[02:30-02:45]	0	0	0	0	0	0	0	0	0
[02:45-03:00]	0	0	0	0	0	0	0	0	0
	0	1	0	0	0	0	0	0	1
[03:00-03:15]	0	0	0	0	0	0	0	0	0
[03:15-03:30]	1	0	0	0	0	0	0	0	1
[03:30-03:45]	0	2	0	0	0	0	0	0	2
[03:45-04:00]	0	0	0	0	0	0	0	0	0
	1	2	0	0	0	0	0	0	3
[04:00-04:15]	0	0	0	0	0	0	0	0	0
[04:15-04:30]	0	1	0	0	0	0	0	0	1
[04:30-04:45]	2	1	0	0	0	0	0	0	3
[04:45-05:00]	0	2	0	0	0	0	0	0	2
	2	4	0	0	0	0	0	0	6
[05:00-05:15]	0	1	0	0	1	0	0	0	2
[05:15-05:30]	2	2	0	0	0	0	0	0	4
[05:30-05:45]	3	6	0	0	0	0	1	0	10
[05:45-06:00]	1	3	0	0	0	0	0	0	4
	6	12	0	0	1	0	1	0	20
[06:00-06:15]	3	3	0	0	0	0	0	0	6
[06:15-06:30]	9	6	0	0	0	0	0	0	15
[06:30-06:45]	11	17	0	0	1	0	0	0	29
[06:45-07:00]	5	11	1	0	0	1	0	1	19
	28	37	1	0	1	1	0	1	69
[07:00-07:15]	4	5	0	1	0	0	0	0	10
[07:15-07:30]	5	3	0	0	0	1	2	1	12
[07:30-07:45]	6	1	0	0	1	1	0	0	9

Time/Class Report

Device ID: 402525	**Location:** 7467	**Raw Count:** 1,497
Operator: MD	**Lane:** SB	**AADT Count:** 1,497
Begin: 03-26-2019 12:00 AM	**Street:** 699322 - SB	**AADT Factor:** 1
End: 03-27-2019 12:00 AM	**City:** Niagara Region	**Speed Limit:** 60
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 71	72 to >	Total
Tue,03-26-2019									
[07:45-08:00]	7	11	0	0	0	0	2	1	21
	22	20	0	1	1	2	4	2	52
[08:00-08:15]	9	5	0	0	0	0	0	1	15
[08:15-08:30]	17	11	0	0	0	0	0	0	28
[08:30-08:45]	9	15	0	0	0	0	1	0	25
[08:45-09:00]	14	18	0	1	1	1	1	0	36
	49	49	0	1	1	1	2	1	104
[09:00-09:15]	6	7	1	0	1	0	0	0	15
[09:15-09:30]	8	10	0	0	0	0	1	0	19
[09:30-09:45]	11	7	1	1	0	1	0	0	21
[09:45-10:00]	8	5	0	2	0	0	0	0	15
	33	29	2	3	1	1	1	0	70
[10:00-10:15]	8	4	0	0	0	0	0	0	12
[10:15-10:30]	14	4	1	0	0	0	0	0	19
[10:30-10:45]	10	12	1	0	0	0	0	1	24
[10:45-11:00]	10	12	1	3	0	0	1	0	27
	42	32	3	3	0	0	1	1	82
[11:00-11:15]	6	9	0	0	0	0	0	1	16
[11:15-11:30]	10	16	1	3	0	0	0	0	30
[11:30-11:45]	11	8	2	0	0	0	0	0	21
[11:45-12:00]	12	7	0	3	2	0	1	0	25
	39	40	3	6	2	0	1	1	92
[12:00-12:15]	12	12	1	1	1	0	0	0	27
[12:15-12:30]	14	5	0	1	0	0	2	0	22
[12:30-12:45]	11	11	1	0	0	0	2	1	26
[12:45-13:00]	12	13	1	2	0	0	1	0	29
	49	41	3	4	1	0	5	1	104
[13:00-13:15]	10	9	2	0	1	0	1	0	23
[13:15-13:30]	8	8	1	0	0	1	1	0	19
[13:30-13:45]	12	8	0	0	0	0	0	0	20
[13:45-14:00]	16	7	1	0	0	0	0	0	24
	46	32	4	0	1	1	2	0	86
[14:00-14:15]	10	3	0	1	0	0	1	0	15
[14:15-14:30]	10	9	0	0	0	0	0	0	19
[14:30-14:45]	14	10	0	0	0	0	0	0	24
[14:45-15:00]	11	15	0	0	1	0	0	0	27
	45	37	0	1	1	0	1	0	85

Time/Class Report

Device ID: 402525	**Location:** 7467			**Raw Count:** 1,497	
Operator: MD	**Lane:** SB			**AADT Count:** 1,497	
Begin: 03-26-2019 12:00 AM	**Street:** 699322 - SB			**AADT Factor:** 1	
End: 03-27-2019 12:00 AM	**City:** Niagara Region			**Speed Limit:** 60	
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 71	72 to >	Total
Tue,03-26-2019									
[15:00-15:15]	17	14	1	2	0	0	1	0	35
[15:15-15:30]	10	9	0	0	0	0	0	0	19
[15:30-15:45]	26	7	0	0	0	0	0	0	33
[15:45-16:00]	15	18	0	0	0	0	0	0	33
	68	48	1	2	0	0	1	0	120
[16:00-16:15]	13	11	0	0	0	0	0	0	24
[16:15-16:30]	24	14	0	0	0	0	0	0	38
[16:30-16:45]	22	15	1	0	0	0	0	0	38
[16:45-17:00]	26	17	1	0	0	0	0	0	44
	85	57	2	0	0	0	0	0	144
[17:00-17:15]	26	19	0	0	0	1	0	0	46
[17:15-17:30]	18	11	0	0	0	1	0	0	30
[17:30-17:45]	9	5	0	0	0	0	0	1	15
[17:45-18:00]	17	12	0	0	0	0	0	0	29
	70	47	0	0	0	2	0	1	120
[18:00-18:15]	26	26	0	1	0	1	0	0	54
[18:15-18:30]	15	18	1	0	0	0	0	0	34
[18:30-18:45]	11	11	0	0	0	0	0	0	22
[18:45-19:00]	8	8	0	0	0	0	0	0	16
	60	63	1	1	0	1	0	0	126
[19:00-19:15]	10	6	0	0	0	0	0	0	16
[19:15-19:30]	6	7	0	0	0	0	0	0	13
[19:30-19:45]	5	3	0	0	0	0	0	0	8
[19:45-20:00]	10	8	0	0	1	1	0	0	20
	31	24	0	0	1	1	0	0	57
[20:00-20:15]	5	4	0	0	0	0	0	0	9
[20:15-20:30]	4	6	0	0	0	0	0	0	10
[20:30-20:45]	4	5	0	0	0	0	0	0	9
[20:45-21:00]	10	6	0	0	0	1	0	0	17
	23	21	0	0	0	1	0	0	45
[21:00-21:15]	5	1	0	0	0	0	0	0	6
[21:15-21:30]	8	3	0	0	0	0	0	0	11
[21:30-21:45]	3	3	0	0	0	0	1	0	7
[21:45-22:00]	4	5	0	0	0	0	0	0	9
	20	12	0	0	0	0	1	0	33
[22:00-22:15]	1	2	0	0	0	0	0	0	3
[22:15-22:30]	6	3	0	0	0	0	0	0	9
[22:30-22:45]	3	3	0	1	0	0	0	0	7

Time/Class Report

Device ID:	402525	**Location:**	7467	**Raw Count:**	1,497
Operator:	MD	**Lane:**	SB	**AADT Count:**	1,497
Begin:	03-26-2019 12:00 AM	**Street:**	699322 - SB	**AADT Factor:**	1
End:	03-27-2019 12:00 AM	**City:**	Niagara Region	**Speed Limit:**	60
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 71	72 to >	Total
Tue,03-26-2019									
[22:45-23:00]	4	1	0	0	0	0	0	0	5
	14	9	0	1	0	0	0	0	24
[23:00-23:15]	2	3	0	0	0	0	0	0	5
[23:15-23:30]	3	1	0	0	0	0	0	0	4
[23:30-23:45]	3	1	0	0	0	0	1	1	6
[23:45-00:00]	1	1	1	0	0	0	0	0	3
	9	6	1	0	0	0	1	1	18
03-26-2019 12:00 AM 03-27-2019 12:00 AM	751	624	21	23	11	11	21	9	1471

Time/Class Report

Device ID: 400207	**Location:** 7467	**Raw Count:** 2,056
Operator: MD	**Lane:** NB	**AADT Count:** 2,056
Begin: 03-26-2019 12:00 AM	**Street:** 699322 - NB	**AADT Factor:** 1
End: 03-27-2019 12:00 AM	**City:** Niagara Region	**Speed Limit:** 60
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 71	72 to >	Total
Tue,03-26-2019									
[00:00-00:15]	2	0	0	0	0	0	0	0	2
[00:15-00:30]	0	0	0	0	0	0	0	0	0
[00:30-00:45]	0	1	1	0	1	0	0	0	3
[00:45-01:00]	0	1	1	0	0	0	0	0	2
	2	2	2	0	1	0	0	0	7
[01:00-01:15]	0	1	0	0	0	0	0	0	1
[01:15-01:30]	0	1	0	0	0	0	0	0	1
[01:30-01:45]	0	1	0	0	0	0	0	0	1
[01:45-02:00]	0	0	0	0	0	0	0	0	0
	0	3	0	0	0	0	0	0	3
[02:00-02:15]	0	2	0	0	0	0	0	0	2
[02:15-02:30]	0	0	0	0	0	0	0	0	0
[02:30-02:45]	0	1	0	0	0	0	0	0	1
[02:45-03:00]	0	1	0	0	0	0	0	0	1
	0	4	0	0	0	0	0	0	4
[03:00-03:15]	1	2	1	0	0	0	0	0	4
[03:15-03:30]	0	0	0	0	0	0	0	0	0
[03:30-03:45]	0	0	0	0	0	1	0	0	1
[03:45-04:00]	0	2	0	1	0	0	0	0	3
	1	4	1	1	0	1	0	0	8
[04:00-04:15]	0	0	0	0	0	0	0	0	0
[04:15-04:30]	0	0	1	0	0	0	0	0	1
[04:30-04:45]	0	2	1	0	0	0	0	1	4
[04:45-05:00]	0	6	0	0	0	1	0	0	7
	0	8	2	0	0	1	0	1	12
[05:00-05:15]	1	0	2	0	0	0	0	0	3
[05:15-05:30]	0	1	0	2	0	0	0	0	3
[05:30-05:45]	1	6	1	1	1	1	0	0	11
[05:45-06:00]	1	5	2	0	2	0	0	0	10
	3	12	5	3	3	1	0	0	27
[06:00-06:15]	1	10	2	2	1	2	0	1	19
[06:15-06:30]	2	8	2	3	2	1	0	0	18
[06:30-06:45]	3	6	3	0	1	0	0	0	13
[06:45-07:00]	4	6	1	5	0	1	0	1	18
	10	30	8	10	4	4	0	2	68
[07:00-07:15]	3	9	3	2	3	0	0	0	20
[07:15-07:30]	6	17	0	5	1	0	0	2	31
[07:30-07:45]	1	15	2	4	2	3	1	2	30

Time/Class Report

Device ID: 400207	**Location:** 7467	**Raw Count:** 2,056
Operator: MD	**Lane:** NB	**AADT Count:** 2,056
Begin: 03-26-2019 12:00 AM	**Street:** 699322 - NB	**AADT Factor:** 1
End: 03-27-2019 12:00 AM	**City:** Niagara Region	**Speed Limit:** 60
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 71	72 to >	Total
Tue,03-26-2019									
[07:45-08:00]	5	10	8	4	4	0	0	1	32
	15	51	13	15	10	3	1	5	113
[08:00-08:15]	1	11	5	7	5	1	1	3	34
[08:15-08:30]	3	10	2	4	3	1	1	2	26
[08:30-08:45]	3	23	4	4	4	1	0	1	40
[08:45-09:00]	2	12	6	3	1	4	1	3	32
	9	56	17	18	13	7	3	9	132
[09:00-09:15]	0	11	3	4	1	2	0	1	22
[09:15-09:30]	1	11	6	2	1	0	1	2	24
[09:30-09:45]	2	13	6	1	4	1	0	2	29
[09:45-10:00]	2	12	3	5	2	2	0	1	27
	5	47	18	12	8	5	1	6	102
[10:00-10:15]	2	15	1	5	0	0	1	0	24
[10:15-10:30]	2	10	2	2	4	0	0	1	21
[10:30-10:45]	5	19	1	3	1	0	0	2	31
[10:45-11:00]	2	14	1	4	1	1	0	2	25
	11	58	5	14	6	1	1	5	101
[11:00-11:15]	3	11	6	6	4	1	0	1	32
[11:15-11:30]	9	12	3	4	2	1	0	2	33
[11:30-11:45]	3	13	4	1	2	1	0	5	29
[11:45-12:00]	3	13	3	5	3	0	0	1	28
	18	49	16	16	11	3	0	9	122
[12:00-12:15]	4	14	1	6	3	3	0	2	33
[12:15-12:30]	1	18	3	3	1	0	0	6	32
[12:30-12:45]	6	16	3	5	4	0	0	2	36
[12:45-13:00]	5	16	5	8	5	0	0	3	42
	16	64	12	22	13	3	0	13	143
[13:00-13:15]	3	13	2	2	2	1	0	1	24
[13:15-13:30]	4	16	2	2	0	0	0	1	25
[13:30-13:45]	3	10	5	2	6	0	1	4	31
[13:45-14:00]	4	15	1	1	2	0	0	1	24
	14	54	10	7	10	1	1	7	104
[14:00-14:15]	2	15	1	5	4	0	0	0	27
[14:15-14:30]	4	15	1	3	2	1	1	1	28
[14:30-14:45]	7	24	5	3	2	1	0	3	45
[14:45-15:00]	3	11	4	3	2	0	0	1	24
	16	65	11	14	10	2	1	5	124

Time/Class Report

Device ID: 400207	**Location:** 7467	**Raw Count:** 2,056
Operator: MD	**Lane:** NB	**AADT Count:** 2,056
Begin: 03-26-2019 12:00 AM	**Street:** 699322 - NB	**AADT Factor:** 1
End: 03-27-2019 12:00 AM	**City:** Niagara Region	**Speed Limit:** 60
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 71	72 to >	Total
Tue,03-26-2019									
[15:00-15:15]	6	21	3	8	2	1	0	0	41
[15:15-15:30]	4	19	6	6	3	0	0	1	39
[15:30-15:45]	6	23	6	7	1	1	0	1	45
[15:45-16:00]	2	16	4	3	5	1	2	1	34
	18	79	19	24	11	3	2	3	159
[16:00-16:15]	4	26	4	7	4	0	0	1	46
[16:15-16:30]	6	18	3	5	0	0	0	0	32
[16:30-16:45]	4	9	2	10	1	0	0	1	27
[16:45-17:00]	4	18	3	4	7	0	0	1	37
	18	71	12	26	12	0	0	3	142
[17:00-17:15]	5	19	0	0	2	1	0	0	27
[17:15-17:30]	1	14	3	4	2	0	1	0	25
[17:30-17:45]	1	15	2	3	2	0	0	2	25
[17:45-18:00]	5	20	1	2	3	3	0	0	34
	12	68	6	9	9	4	1	2	111
[18:00-18:15]	4	24	6	6	3	2	0	2	47
[18:15-18:30]	1	13	2	1	3	2	0	0	22
[18:30-18:45]	6	16	2	2	0	0	0	1	27
[18:45-19:00]	2	14	2	5	2	0	0	1	26
	13	67	12	14	8	4	0	4	122
[19:00-19:15]	2	13	1	2	3	0	0	0	21
[19:15-19:30]	4	10	0	4	3	2	0	1	24
[19:30-19:45]	4	8	2	3	2	0	0	0	19
[19:45-20:00]	4	11	7	2	0	0	0	0	24
	14	42	10	11	8	2	0	1	88
[20:00-20:15]	4	8	0	1	4	2	0	2	21
[20:15-20:30]	0	5	1	1	2	0	0	0	9
[20:30-20:45]	4	4	0	0	0	0	0	0	8
[20:45-21:00]	0	5	1	4	1	1	0	0	12
	8	22	2	6	7	3	0	2	50
[21:00-21:15]	2	8	0	0	0	0	0	1	11
[21:15-21:30]	2	4	2	2	1	0	0	0	11
[21:30-21:45]	1	3	0	4	3	0	0	0	11
[21:45-22:00]	3	4	0	2	0	0	0	1	10
	8	19	2	8	4	0	0	2	43
[22:00-22:15]	2	5	3	0	1	1	0	0	12
[22:15-22:30]	1	5	0	1	2	0	0	0	9
[22:30-22:45]	0	4	1	2	1	0	0	0	8

Time/Class Report

Device ID:	400207	**Location:**	7467	**Raw Count:**	2,056
Operator:	MD	**Lane:**	NB	**AADT Count:**	2,056
Begin:	03-26-2019 12:00 AM	**Street:**	699322 - NB	**AADT Factor:**	1
End:	03-27-2019 12:00 AM	**City:**	Niagara Region	**Speed Limit:**	60
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 71	72 to >	Total
Tue,03-26-2019									
[22:45-23:00]	0	4	0	0	0	0	0	0	4
	3	18	4	3	4	1	0	0	33
[23:00-23:15]	0	3	0	1	0	0	0	0	4
[23:15-23:30]	0	4	1	1	1	0	0	0	7
[23:30-23:45]	1	3	0	0	0	0	0	0	4
[23:45-00:00]	0	2	0	0	0	0	0	0	2
	1	12	1	2	1	0	0	0	17
03-26-2019 12:00 AM 03-27-2019 12:00 AM	215	905	188	235	153	49	11	79	1835

Basic Axle Classification Report: 610342

Station ID : 610342
Info Line 1 : Main St East
Info Line 2 : Btwn Barber Dr & Chippawa Rd
GPS Lat/Lon :
DB File : 610342.DB

Last Connected Device Type : RoadRunner3
Version Number : 1.12
Serial Number : 140025
Number of Lanes : 2
Posted Speed Limit : 50.0 kph

Lane #1 Configuration

#	Dir.	Information	Vehicle Sensors	Sensor Spacing	Loop Length	Comment
1.		East	Ax-Ax	121 cm	183 cm	

Lane #1 Basic Axle Classification Data From: 00:00 - 11/16/2016 To: 23:59 - 11/16/2016

Date	(DEFAULTC) Time	#1 Cycle	#2 Cars	#3 2A-4T	#4 Buses	#5 2A-SU	#6 3A-SU	#7 4A-SU	#8 4A-ST	#9 5A-ST	#10 6A-ST	#11 5A-MT	#12 6A-MT	#13 Other	Total
11/16/16	00:00	0	14	2	0	1	2	0	0	0	0	0	0	0	19
Wed	01:00	0	6	4	0	0	0	0	0	0	2	0	0	0	12
	02:00	0	7	3	0	0	3	0	0	3	0	0	0	0	16
	03:00	0	8	5	0	0	0	0	0	1	3	0	0	1	18
	04:00	1	23	7	0	0	0	0	0	0	0	0	0	0	31
	05:00	3	65	22	0	0	4	0	0	0	4	0	0	0	98
	06:00	0	133	72	0	4	2	0	1	0	2	0	0	0	214
	07:00	5	249	81	2	9	5	0	2	3	4	0	1	0	361
	08:00	10	252	80	1	11	3	0	5	4	6	3	0	0	375
	09:00	5	238	96	5	7	4	0	5	3	4	1	0	0	368
	10:00	4	255	96	4	10	4	0	7	2	7	0	0	2	391
	11:00	6	254	74	2	7	8	0	10	3	3	1	0	0	368
	12:00	7	247	73	0	7	7	0	8	3	8	1	2	0	363
	13:00	15	221	87	1	4	6	1	7	2	6	0	1	3	354
	14:00	5	292	103	3	8	5	1	6	5	6	3	1	0	438
	15:00	10	338	90	8	15	5	1	6	2	5	1	0	2	483
	16:00	3	330	116	1	9	2	0	6	1	3	0	2	1	474
	17:00	6	272	84	4	3	4	0	4	2	2	0	0	0	381
	18:00	10	284	66	0	2	2	0	3	1	1	0	1	0	370
	19:00	4	155	44	1	2	3	0	2	1	4	0	0	0	216
	20:00	3	120	44	1	0	2	0	2	0	0	0	0	0	172
	21:00	2	129	19	0	0	1	0	0	0	0	0	0	0	151
	22:00	0	54	17	0	0	0	0	1	0	0	0	0	0	72
	23:00	1	36	6	0	0	5	0	0	0	0	0	0	0	48
Daily Total :		100	3982	1291	33	99	77	3	75	36	70	10	8	9	5793
Percent :		2%	69%	22%	1%	2%	1%	0%	1%	1%	1%	0%	0%	0%	
Average :		4	166	54	1	4	3	0	3	2	3	0	0	0	240

Lane #2 Configuration

#	Dir.	Information	Vehicle Sensors	Sensor Spacing	Loop Length	Comment
2.		West	Ax-Ax	121 cm	183 cm	

Lane #2 Basic Axle Classification Data From: 00:00 - 11/16/2016 To: 23:59 - 11/16/2016

Date	(DEFAULTC) Time	#1 Cycle	#2 Cars	#3 2A-4T	#4 Buses	#5 2A-SU	#6 3A-SU	#7 4A-SU	#8 4A-ST	#9 5A-ST	#10 6A-ST	#11 5A-MT	#12 6A-MT	#13 Other	Total
11/16/16	00:00	0	38	12	0	0	0	0	0	0	0	0	0	0	50
Wed	01:00	0	15	3	0	0	0	0	0	2	0	0	0	0	20
	02:00	0	7	2	0	0	1	0	0	1	0	0	0	0	11
	03:00	0	13	4	0	1	0	1	2	1	0	0	0	1	23
	04:00	2	11	6	0	2	2	0	1	0	0	2	0	0	26
	05:00	0	63	15	0	0	0	0	1	0	0	0	0	1	80
	06:00	0	138	74	0	2	2	1	3	3	2	0	0	0	225
	07:00	6	188	89	4	5	5	0	2	1	5	0	0	0	305
	08:00	17	285	93	5	6	6	2	7	1	0	2	2	0	426
	09:00	8	290	83	2	7	6	2	8	3	3	0	1	2	415
	10:00	10	252	98	3	5	6	3	3	4	2	0	0	0	386
	11:00	9	270	96	1	18	7	1	3	4	3	1	2	1	416
	12:00	5	243	92	3	3	4	1	10	2	2	0	0	2	367
	13:00	20	261	128	2	10	8	2	15	3	1	3	6	4	463
	14:00	6	282	93	3	6	4	0	12	1	2	4	0	2	415
	15:00	12	321	108	6	12	4	1	17	0	1	1	1	6	490
	16:00	16	360	112	11	9	3	3	13	1	0	4	1	2	535
	17:00	4	362	108	0	1	6	0	8	1	0	4	0	1	495
	18:00	2	259	63	5	1	0	0	3	1	0	1	0	1	336
	19:00	2	218	71	2	3	0	0	4	0	0	0	0	0	300
	20:00	2	166	46	2	0	0	0	7	0	1	0	1	0	225
	21:00	3	189	49	1	0	0	0	3	0	1	1	0	0	247
	22:00	0	122	33	0	1	0	0	0	1	0	0	0	0	157
	23:00	1	90	14	1	0	0	0	2	0	0	0	0	0	108
Daily Total :		125	4443	1492	51	92	64	17	124	30	23	23	14	23	6521
Percent :		2%	68%	23%	1%	1%	1%	0%	2%	0%	0%	0%	0%	0%	
Average :		5	185	62	2	4	3	1	5	1	1	1	1	1	272

Basic Axle Class Summary: 610342

(DEFAULTC) Description	Lane	#1 Cycle	#2 Cars	#3 2A-4T	#4 Buses	#5 2A-SU	#6 3A-SU	#7 4A-SU	#8 4A-ST	#9 5A-ST	#10 6A-ST	#11 5A-MT	#12 6A-MT	#13 Other	Total
TOTAL COUNT :	#1.	100	3982	1291	33	99	77	3	75	36	70	10	8	9	5793
	#2.	125	4443	1492	51	92	64	17	124	30	23	23	14	23	6521
		225	8425	2783	84	191	141	20	199	66	93	33	22	32	12314
Percents :	#1.	2%	69%	22%	1%	2%	1%	0%	1%	1%	1%	0%	0%	0%	47%
	#2.	2%	68%	23%	1%	1%	1%	0%	2%	0%	0%	0%	0%	0%	53%
		2%	68%	23%	1%	2%	1%	0%	2%	1%	1%	0%	0%	0%	
Average :	#1.	4	166	54	1	4	3	0	3	2	3	0	0	0	240
	#2.	5	185	62	2	4	3	1	5	1	1	1	1	1	272
		9	351	116	3	8	6	1	8	3	4	1	1	1	512
Days & ADT :	#1.	1.0	5793												
	#2.	1.0	6521												
		1.0	12314												

Basic Speed Classification Report: 610342

Lane #1 Configuration

#	Dir.	Information	Vehicle Sensors	Sensor Spacing	Loop Length	Comment
1.		East	Ax-Ax	121 cm	183 cm	

Lane #1 Basic Speed Classification Data From: 00:00 - 11/16/2016 To: 23:59 - 11/16/2016

(NIAGAR~1)		#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	
Date	Time	0.0 - 39.9	40.0 - 44.9	45.0 - 49.9	50.0 - 54.9	55.0 - 59.9	60.0 - 64.9	65.0 - 69.9	70.0 - 74.9	75.0 - 79.9	80.0 - 84.9	85.0 - 89.9	90.0 - 94.9	95.0 - 99.9	100.0 - 104.9	Other	Total
11/16/16	00:00	7	6	4	0	2	0	0	0	0	0	0	0	0	0	0	19
Wed	01:00	5	2	4	1	0	0	0	0	0	0	0	0	0	0	0	12
	02:00	8	3	2	2	0	1	0	0	0	0	0	0	0	0	0	16
	03:00	16	0	1	0	1	0	0	0	0	0	0	0	0	0	0	18
	04:00	8	5	7	10	0	0	0	1	0	0	0	0	0	0	0	31
	05:00	53	11	15	10	6	3	0	0	0	0	0	0	0	0	0	98
	06:00	109	38	34	24	9	0	0	0	0	0	0	0	0	0	0	214
	07:00	209	81	56	12	3	0	0	0	0	0	0	0	0	0	0	361
	08:00	241	72	43	10	6	2	0	0	0	1	0	0	0	0	0	375
	09:00	231	68	45	16	5	1	0	0	0	0	0	0	2	0	0	368
	10:00	268	64	44	12	2	0	0	0	0	1	0	0	0	0	0	391
	11:00	228	73	54	10	2	0	0	1	0	0	0	0	0	0	0	368
	12:00	207	94	53	8	1	0	0	0	0	0	0	0	0	0	0	363
	13:00	257	50	22	17	2	1	0	0	1	1	2	0	1	0	0	354
	14:00	279	99	41	11	5	1	1	0	0	0	0	0	1	0	0	438
	15:00	398	48	26	9	0	0	0	0	1	1	0	0	0	0	0	483
	16:00	295	93	71	12	1	0	0	1	1	0	0	0	0	0	0	474
	17:00	263	52	50	12	3	0	1	0	0	0	0	0	0	0	0	381
	18:00	189	89	61	21	6	2	2	0	0	0	0	0	0	0	0	370
	19:00	150	30	22	8	5	0	0	0	0	0	0	1	0	0	0	216
	20:00	121	22	21	6	2	0	0	0	0	0	0	0	0	0	0	172
	21:00	96	25	22	6	2	0	0	0	0	0	0	0	0	0	0	151
	22:00	30	13	19	8	1	0	1	0	0	0	0	0	0	0	0	72
	23:00	21	6	8	5	3	4	0	1	0	0	0	0	0	0	0	48
Daily Total :		3689	1044	725	230	67	15	5	4	3	4	2	1	4	0	0	5793
Percent :		64%	18%	13%	4%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Average :		154	44	30	10	3	1	0	0	0	0	0	0	0	0	0	272

Speeds - Average: 29.5 50% : 31.2 67% : 41.1 85% : 46.5 20kph Pace: 30.0 - 49.9 (46.1%)

Lane #2 Configuration

#	Dir.	Information	Vehicle Sensors	Sensor Spacing	Loop Length	Comment
2.		West	Ax-Ax	121 cm	183 cm	

Lane #2 Basic Speed Classification Data From: 00:00 - 11/16/2016 To: 23:59 - 11/16/2016

(NIAGAR~1)		#1 0.0 - 39.9	#2 40.0 - 44.9	#3 45.0 - 49.9	#4 50.0 - 54.9	#5 55.0 - 59.9	#6 60.0 - 64.9	#7 65.0 - 69.9	#8 70.0 - 74.9	#9 75.0 - 79.9	#10 80.0 - 84.9	#11 85.0 - 89.9	#12 90.0 - 94.9	#13 95.0 - 99.9	#14 100.0 - 104.9	#15 Other	Total
Date	Time																
11/16/16	00:00	16	7	9	12	3	2	1	0	0	0	0	0	0	0	0	50
Wed	01:00	5	2	9	2	2	0	0	0	0	0	0	0	0	0	0	20
	02:00	1	8	1	1	0	0	0	0	0	0	0	0	0	0	0	11
	03:00	21	1	0	0	0	1	0	0	0	0	0	0	0	0	0	23
	04:00	4	10	2	5	4	0	1	0	0	0	0	0	0	0	0	26
	05:00	38	15	13	9	4	1	0	0	0	0	0	0	0	0	0	80
	06:00	74	58	47	31	10	5	0	0	0	0	0	0	0	0	0	225
	07:00	147	50	63	31	10	4	0	0	0	0	0	0	0	0	0	305
	08:00	272	70	48	27	7	1	0	0	0	0	1	0	0	0	0	426
	09:00	235	78	80	18	4	0	0	0	0	0	0	0	0	0	0	415
	10:00	206	89	65	24	2	0	0	0	0	0	0	0	0	0	0	386
	11:00	245	80	56	31	2	1	0	0	0	1	0	0	0	0	0	416
	12:00	186	80	59	31	8	2	1	0	0	0	0	0	0	0	0	367
	13:00	378	56	24	5	0	0	0	0	0	0	0	0	0	0	0	463
	14:00	221	85	75	25	5	4	0	0	0	0	0	0	0	0	0	415
	15:00	375	55	47	12	1	0	0	0	0	0	0	0	0	0	0	490
	16:00	327	82	88	29	8	1	0	0	0	0	0	0	0	0	0	535
	17:00	336	78	59	15	3	4	0	0	0	0	0	0	0	0	0	495
	18:00	120	62	95	49	7	2	1	0	0	0	0	0	0	0	0	336
	19:00	186	46	39	23	5	1	0	0	0	0	0	0	0	0	0	300
	20:00	139	38	24	17	5	1	1	0	0	0	0	0	0	0	0	225
	21:00	161	40	28	15	2	0	1	0	0	0	0	0	0	0	0	247
	22:00	39	50	44	19	4	1	0	0	0	0	0	0	0	0	0	157
	23:00	39	19	21	20	5	3	1	0	0	0	0	0	0	0	0	108
Daily Total :		3771	1159	996	451	101	34	7	0	0	1	1	0	0	0	0	6521
Percent :		58%	18%	15%	7%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Average :		157	48	42	19	4	1	0	0	0	0	0	0	0	0	0	242

Speeds - Average: 31.3 50% : 34.4 67% : 42.7 85% : 48.1 20kph Pace: 35.0 - 54.9 (46.9%)

Basic Speed Class Summary: 610342

(NIAGAR~1)		#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	#14	#15	
Description	Lane	0.0 - 39.9	40.0 - 44.9	45.0 - 49.9	50.0 - 54.9	55.0 - 59.9	60.0 - 64.9	65.0 - 69.9	70.0 - 74.9	75.0 - 79.9	80.0 - 84.9	85.0 - 89.9	90.0 - 94.9	95.0 - 99.9	100.0 - 104.9	Other	Total
TOTAL COUNT :	#1.	3689	1044	725	230	67	15	5	4	3	4	2	1	4	0	0	5793
	#2.	3771	1159	996	451	101	34	7	0	0	1	1	0	0	0	0	6521
		7460	2203	1721	681	168	49	12	4	3	5	3	1	4	0	0	12314
Percents :	#1.	64%	18%	13%	4%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%
	#2.	58%	18%	15%	7%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%
		61%	18%	14%	6%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Average :	#1.	154	44	30	10	3	1	0	0	0	0	0	0	0	0	0	242
	#2.	157	48	42	19	4	1	0	0	0	0	0	0	0	0	0	271
		311	92	72	29	7	2	0	0	0	0	0	0	0	0	0	513
Days & ADT :	#1.	1.0	5793														
	#2.	1.0	6521														
		1.0	12314														
Avg,50,67,85%:	#1.	29.5	31.2	41.1	46.5	30.0	- 49.9	46%									
Pace (pace %)	#2.	31.3	34.4	42.7	48.1	35.0	- 54.9	47%									
		30.4	32.9	41.9	47.4	30.0	- 49.9	47%									

System Engineering
Engineering Services

1 Administration Road
Concord, ON, L4K 1B9
T: 905.669.3264
F: 905.760.3406

Train Count Data

TRANSMITTAL

To: *Destinataire :*	Wood PLC 2020 Winston Park Drive, Suite #600 Oakville ON L6H 6X7	*Project :*	SFD – 16.06 (1.08) – Main St., Port Colborne, ON
Att'n:	Mohammad Abushanab	*Routing:*	mohammad.abushanab@woodplc.com
From: *Expéditeur :*	Umair Naveed	*Date:*	2022/01/14
Cc:	Adjacent Development CN via e-mail		

☐ Urgent ☐ For Your Use ☐ For Review ☐ For Your Information ☐ Confidential

Re: Train Traffic Data – CN Stamford Subdivision near Main Street in Port Colborne, ON

Please find attached the requested Train Traffic Data. The application fee in the amount of **$500.00** +HST will be invoiced.

Should you have any questions, please do not hesitate to contact the undersigned at permits.gld@cn.ca.

Sincerely,

Umair Naveed

Umair Naveed
Project Officer Public Works – Eastern Canada
Permits.gld@cn.ca

Date: 2022/01/14 Project Number: SFD – 16.06 (1.08) – Main Street, Port Colborne, ON

Dear Mohammad:

Re: Train Traffic Data – CN Stamford Subdivision near Main Street in Port Colborne, ON

The following is provided in response to Mohammad's 2021/11/16 request for information regarding rail traffic in the vicinity of Main Street in Port Colborne at approximately Mile 16.06 (1.08) on CN's Humber Line SPUR, Connecting to CN's Stamford Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	140	10	4
Way Freight	4	25	10	4
Passenger	0	10	10	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	140	10	4
Way Freight	4	25	10	4
Passenger	0	10	10	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Humber Line SPUR, Connecting to CN's Stamford Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are seven (7) at-grade crossings in the immediate vicinity of the study area at Mile 16.06(0.09) Fraser Street, Mile 16.06(0.16) Alma Street, Mile 16.06 (0.20) Welland Street, Mile 16.06(0.25) Belle Street, Mile 16.06(0.48) Welland Street, Mile 16.06(1.08) Main Street and Mile 16.06(1.75) Barrick Road. . Anti-whistling bylaws are in effect on the crossings between Mile 16.06(0) and Mile 16.06(0.41) inclusive. Please note that engine-warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs.

The single mainline track is considered continuously welded rail throughout the study area.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

Umair Naveed

Umair Naveed
Project Officer Public Works – Eastern Canada
Permits.gld@cn.ca

Appendix D: Sample Calculations

```
STAMSON 5.0        NORMAL REPORT        Date: 06-06-2022
16:00:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: n1road~1.te          Time Period: Day/Night 16/8
hours
Description: North 1 - Main/Welland St Road Only



Road data, segment # 1: Main St (day/night)
-------------------------------------------
Car traffic volume  : 11265/1252  veh/TimePeriod
Medium truck volume :  4113/457   veh/TimePeriod
Heavy truck volume  :   571/63    veh/TimePeriod
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Main St (day/night)
-----------------------------------------
Angle1   Angle2           : -50.00 deg   70.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground
surface)
Receiver source distance  : 100.00 / 100.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Reference angle           :   0.00

♀
Road data, segment # 2: Welland St (day/night)
----------------------------------------------
Car traffic volume  : 11265/1252  veh/TimePeriod
Medium truck volume :  4113/452   veh/TimePeriod
Heavy truck volume  :   571/63    veh/TimePeriod
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Welland St (day/night)
--------------------------------------------
```

```
Angle1   Angle2           : -16.00 deg   26.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 0
Surface                   :      2       (Reflective ground
surface)
Receiver source distance  : 145.00 / 145.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Reference angle           :   0.00

♀
Results segment # 1: Main St (day)
----------------------------------

Source height = 1.38 m

ROAD (0.00 + 57.57 + 0.00) = 57.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
----------------------------------------------------------------
----------------
   -50     70   0.30  70.37   0.00 -10.74  -2.06   0.00
0.00   0.00  57.57
----------------------------------------------------------------
----------------

Segment Leq : 57.57 dBA

♀
Results segment # 2: Welland St (day)
-------------------------------------

Source height = 1.38 m

ROAD (0.00 + 53.51 + 0.00) = 53.51 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
----------------------------------------------------------------
----------------
   -16     26   0.00  72.07   0.00  -9.85  -6.32   0.00
-2.38   0.00  53.51
----------------------------------------------------------------
----------------
```

Segment Leq : 53.51 dBA

Total Leq All Segments: 59.01 dBA

♀
Results segment # 1: Main St (night)

Source height = 1.37 m

ROAD (0.00 + 51.03 + 0.00) = 51.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-50	70	0.30	63.83	0.00	-10.74	-2.06	0.00	0.00	0.00	51.03

Segment Leq : 51.03 dBA

♀
Results segment # 2: Welland St (night)

Source height = 1.37 m

ROAD (0.00 + 49.33 + 0.00) = 49.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-16	26	0.00	65.50	0.00	-9.85	-6.32	0.00	0.00	0.00	49.33

Segment Leq : 49.33 dBA

Total Leq All Segments: 53.27 dBA

♀

```
TOTAL Leq FROM ALL SOURCES (DAY): 59.01
                          (NIGHT): 53.27
♀
♀
```

```
STAMSON 5.0        NORMAL REPORT        Date: 06-06-2022
16:01:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: n1rail.te            Time Period: Day/Night 16/8
hours
Description: North 1 - Rail Only - No Whistle



Rail data, segment # 1: CN (day/night)
--------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng
!Cont
Type             !             !(km/h) !/Train!/Train! type
!weld
-----------------+-------------+-------+------+------+------
+----
  1.             !   5.0/5.0   !  16.0 !  4.0 ! 25.0
!Diesel!  No

Data for Segment # 1: CN (day/night)
------------------------------------
Angle1   Angle2           : -13.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground
surface)
Receiver source distance  : 130.00 / 130.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
No Whistle
Reference angle           :   0.00

♀
Results segment # 1: CN (day)
-----------------------------

LOCOMOTIVE (0.00 + 50.76 + 0.00) = 50.76 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
```

```
   -13     90   0.00  62.57  -9.38  -2.42   0.00   0.00
0.00  50.76
-------------------------------------------------------------
----------

WHEEL (0.00 + 36.58 + 0.00) = 36.58 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
   -13     90   0.00  48.38  -9.38  -2.42   0.00   0.00
0.00  36.58
-------------------------------------------------------------
----------

Segment Leq : 50.92 dBA

Total Leq All Segments: 50.92 dBA

♀
Results segment # 1: CN (night)
--------------------------------

LOCOMOTIVE (0.00 + 53.77 + 0.00) = 53.77 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
   -13     90   0.00  65.58  -9.38  -2.42   0.00   0.00
0.00  53.77
-------------------------------------------------------------
----------

WHEEL (0.00 + 39.59 + 0.00) = 39.59 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
   -13     90   0.00  51.39  -9.38  -2.42   0.00   0.00
0.00  39.59
-------------------------------------------------------------
----------

Segment Leq : 53.93 dBA
```

Total Leq All Segments: 53.93 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 50.92
(NIGHT): 53.93

♀
♀

```
STAMSON 5.0        NORMAL REPORT        Date: 06-06-2022
16:02:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: n1rail.te            Time Period: Day/Night 16/8
hours
Description: North 1 - Rail Only - With Whistle



Rail data, segment # 1: CN (day/night)
--------------------------------------
Train            ! Trains      ! Trains      ! Speed !# loc
!# Cars! Eng  !Cont
Type             ! (Left)      ! (Right)     !(km/h)
!/Train!/Train! type !weld
-----------------+-------------+-------------+-------+------
+------+------+----
  1.             !   2.5/2.5   !   2.5/2.5   !  16.0 !  4.0
! 25.0 !Diesel!  No

Data for Segment # 1: CN (day/night)
------------------------------------
Angle1   Angle2           : -13.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground
surface)
Receiver source distance  : 130.00 / 130.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Whistle Angle             :     30 deg   Track 1
Reference angle           :   0.00

♀
Results segment # 1: CN (day)
-----------------------------

LOCOMOTIVE (0.00 + 50.76 + 0.00) = 50.76 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
```

```
   -13     90   0.00  62.57  -9.38  -2.42   0.00   0.00
0.00  50.76
----------------------------------------------------------------
----------

WHEEL (0.00 + 36.58 + 0.00) = 36.58 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
----------------------------------------------------------------
----------
   -13     90   0.00  48.38  -9.38  -2.42   0.00   0.00
0.00  36.58
----------------------------------------------------------------
----------

LEFT WHISTLE (0.00 + 58.00 + 0.00) = 58.00 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
----------------------------------------------------------------
----------
   -13     30   0.00  73.60  -9.38  -6.22   0.00   0.00
0.00  58.00
----------------------------------------------------------------
----------

RIGHT WHISTLE (0.00 + 58.17 + 0.00) = 58.17 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
----------------------------------------------------------------
----------
    30     75   0.00  73.60  -9.38  -6.05   0.00   0.00
0.00  58.17
----------------------------------------------------------------
----------

Segment Leq : 61.49 dBA

Total Leq All Segments: 61.49 dBA

♀
Results segment # 1: CN (night)
--------------------------------

LOCOMOTIVE (0.00 + 53.77 + 0.00) = 53.77 dBA
```

```
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
   -13     90   0.00  65.58  -9.38  -2.42   0.00   0.00
0.00  53.77
------------------------------------------------------------
----------

WHEEL (0.00 + 39.59 + 0.00) = 39.59 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
   -13     90   0.00  51.39  -9.38  -2.42   0.00   0.00
0.00  39.59
------------------------------------------------------------
----------

LEFT WHISTLE (0.00 + 61.01 + 0.00) = 61.01 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
   -13     30   0.00  76.61  -9.38  -6.22   0.00   0.00
0.00  61.01
------------------------------------------------------------
----------

RIGHT WHISTLE (0.00 + 61.18 + 0.00) = 61.18 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
    30     75   0.00  76.61  -9.38  -6.05   0.00   0.00
0.00  61.18
------------------------------------------------------------
----------

Segment Leq : 64.50 dBA

Total Leq All Segments: 64.50 dBA
```

♀

```
TOTAL Leq FROM ALL SOURCES (DAY): 61.49
                         (NIGHT): 64.50
♀
♀
```

```
STAMSON 5.0        NORMAL REPORT        Date: 16-06-2022
17:21:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: e3road~1.te          Time Period: Day/Night 16/8
hours
Description: East 3 - Main St Road Only



Road data, segment # 1: Main St (day/night)
-------------------------------------------
Car traffic volume  : 11265/1252  veh/TimePeriod
Medium truck volume :  4113/457   veh/TimePeriod
Heavy truck volume  :   571/63    veh/TimePeriod
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Main St (day/night)
-----------------------------------------
Angle1   Angle2           :   0.00 deg   63.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground
surface)
Receiver source distance  : 101.00 / 101.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Reference angle           :   0.00

♀
Results segment # 1: Main St (day)
----------------------------------

Source height = 1.38 m

ROAD (0.00 + 54.71 + 0.00) = 54.71 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
------------------------------------------------------------
----------------
     0     63   0.30  70.37   0.00 -10.80  -4.86   0.00
```

```
0.00   0.00  54.71
-------------------------------------------------------------
----------------

Segment Leq : 54.71 dBA

Total Leq All Segments: 54.71 dBA

♀
Results segment # 1: Main St (night)
-------------------------------------

Source height = 1.37 m

ROAD (0.00 + 48.17 + 0.00) = 48.17 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
-------------------------------------------------------------
----------------
     0     63   0.30  63.83   0.00 -10.80  -4.86   0.00
0.00   0.00  48.17
-------------------------------------------------------------
----------------

Segment Leq : 48.17 dBA

Total Leq All Segments: 48.17 dBA

♀



TOTAL Leq FROM ALL SOURCES (DAY): 54.71
                          (NIGHT): 48.17
♀
♀
```

```
STAMSON 5.0        NORMAL REPORT        Date: 16-06-2022
17:20:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: s1road~1.te          Time Period: Day/Night 16/8
hours
Description: South 1 - Welland St Road Only



Road data, segment # 1: Welland St 1 (day/night)
------------------------------------------------
Car traffic volume  :  3283/1252  veh/TimePeriod
Medium truck volume :   642/457   veh/TimePeriod
Heavy truck volume  :   482/63    veh/TimePeriod
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Welland St 1 (day/night)
----------------------------------------------
Angle1   Angle2           : -90.00 deg   -41.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground
surface)
Receiver source distance  : 157.00 / 157.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Reference angle           :   0.00

♀
Road data, segment # 2: Welland St 2 (day/night)
------------------------------------------------
Car traffic volume  :  3283/365   veh/TimePeriod
Medium truck volume :   642/71    veh/TimePeriod
Heavy truck volume  :   482/54    veh/TimePeriod
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Welland St 2 (day/night)
----------------------------------------------
```

```
Angle1   Angle2           : -45.00 deg   -13.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground
surface)
Receiver source distance  : 149.00 / 149.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Reference angle           :   0.00

♀
Results segment # 1: Welland St 1 (day)
----------------------------------------

Source height = 1.82 m

ROAD (0.00 + 47.62 + 0.00) = 47.62 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
----------------------------------------------------------------
----------------
   -90    -41   0.29  67.80   0.00 -13.16  -7.02   0.00
0.00   0.00  47.62
----------------------------------------------------------------
----------------

Segment Leq : 47.62 dBA

♀
Results segment # 2: Welland St 2 (day)
----------------------------------------

Source height = 1.82 m

ROAD (0.00 + 50.33 + 0.00) = 50.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
----------------------------------------------------------------
----------------
   -45    -13   0.00  67.80   0.00  -9.97  -7.50   0.00
0.00   0.00  50.33
----------------------------------------------------------------
----------------
```

```
Segment Leq : 50.33 dBA

Total Leq All Segments: 52.19 dBA

♀
Results segment # 1: Welland St 1 (night)
------------------------------------------

Source height = 1.37 m

ROAD (0.00 + 45.16 + 0.00) = 45.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
----------------------------------------------------------------
----------------
   -90    -41   0.30  65.53   0.00 -13.30  -7.07   0.00
0.00   0.00  45.16
----------------------------------------------------------------
----------------

Segment Leq : 45.16 dBA

♀
Results segment # 2: Welland St 2 (night)
------------------------------------------

Source height = 1.82 m

ROAD (0.00 + 43.81 + 0.00) = 43.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
----------------------------------------------------------------
----------------
   -45    -13   0.00  61.29   0.00  -9.97  -7.50   0.00
0.00   0.00  43.81
----------------------------------------------------------------
----------------

Segment Leq : 43.81 dBA

Total Leq All Segments: 47.55 dBA

♀
```

```
TOTAL Leq FROM ALL SOURCES (DAY): 52.19
                         (NIGHT): 47.55
♀
♀
```

```
STAMSON 5.0        NORMAL REPORT        Date: 16-06-2022
17:22:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: s1rail.te            Time Period: Day/Night 16/8
hours
Description: South 1 - Rail Only Without Whistle



Rail data, segment # 1: CN (day/night)
--------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng
!Cont
Type             !             !(km/h) !/Train!/Train! type
!weld
-----------------+-------------+-------+------+------+------
+----
  1.             !   5.0/5.0   !  16.0 !  4.0 ! 25.0
!Diesel!  No

Data for Segment # 1: CN (day/night)
------------------------------------
Angle1   Angle2           : -90.00 deg   -13.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground
surface)
Receiver source distance  : 134.00 / 134.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
No Whistle
Reference angle           :   0.00

♀
Results segment # 1: CN (day)
-----------------------------

LOCOMOTIVE (0.00 + 49.37 + 0.00) = 49.37 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
```

```
   -90    -13   0.00  62.57  -9.51  -3.69   0.00   0.00
0.00  49.37
----------------------------------------------------------------
----------

WHEEL (0.00 + 35.18 + 0.00) = 35.18 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
----------------------------------------------------------------
----------
   -90    -13   0.00  48.38  -9.51  -3.69   0.00   0.00
0.00  35.18
----------------------------------------------------------------
----------

Segment Leq : 49.53 dBA

Total Leq All Segments: 49.53 dBA

♀
Results segment # 1: CN (night)
--------------------------------

LOCOMOTIVE (0.00 + 52.38 + 0.00) = 52.38 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
----------------------------------------------------------------
----------
   -90    -13   0.00  65.58  -9.51  -3.69   0.00   0.00
0.00  52.38
----------------------------------------------------------------
----------

WHEEL (0.00 + 38.19 + 0.00) = 38.19 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
----------------------------------------------------------------
----------
   -90    -13   0.00  51.39  -9.51  -3.69   0.00   0.00
0.00  38.19
----------------------------------------------------------------
----------

Segment Leq : 52.54 dBA
```

Total Leq All Segments: 52.54 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 49.53
(NIGHT): 52.54

♀
♀

```
STAMSON 5.0        NORMAL REPORT        Date: 16-06-2022
17:22:42
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: s1rail.te            Time Period: Day/Night 16/8
hours
Description: South 1 - Rail Only With Whistle



Rail data, segment # 1: CN (day/night)
--------------------------------------
Train            ! Trains      ! Trains      ! Speed !# loc
!# Cars! Eng  !Cont
Type             ! (Left)      ! (Right)     !(km/h)
!/Train!/Train! type !weld
-----------------+-------------+-------------+-------+------
+------+------+----
  1.             !   2.5/2.5   !   2.5/2.5   !  16.0 !  4.0
! 25.0 !Diesel!  No

Data for Segment # 1: CN (day/night)
------------------------------------
Angle1   Angle2           : -90.00 deg   -13.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground
surface)
Receiver source distance  : 134.00 / 134.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Whistle Angle             :     34 deg   Track 1
Reference angle           :   0.00

♀
Results segment # 1: CN (day)
-----------------------------

LOCOMOTIVE (0.00 + 49.37 + 0.00) = 49.37 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
```

```
   -90    -13   0.00  62.57  -9.51  -3.69   0.00   0.00
0.00  49.37
----------------------------------------------------------------
----------

WHEEL (0.00 + 35.18 + 0.00) = 35.18 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
----------------------------------------------------------------
----------
   -90    -13   0.00  48.38  -9.51  -3.69   0.00   0.00
0.00  35.18
----------------------------------------------------------------
----------

LEFT WHISTLE (0.00 + 58.83 + 0.00) = 58.83 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
----------------------------------------------------------------
----------
   -67    -13   0.00  73.60   0.00  -5.26   0.00   0.00
0.00  58.83
----------------------------------------------------------------
----------

Segment Leq : 59.31 dBA

Total Leq All Segments: 59.31 dBA

♀
Results segment # 1: CN (night)
--------------------------------

LOCOMOTIVE (0.00 + 52.38 + 0.00) = 52.38 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
----------------------------------------------------------------
----------
   -90    -13   0.00  65.58  -9.51  -3.69   0.00   0.00
0.00  52.38
----------------------------------------------------------------
----------

WHEEL (0.00 + 38.19 + 0.00) = 38.19 dBA
```

```
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
   -90    -13   0.00  51.39  -9.51  -3.69   0.00   0.00
0.00  38.19
-------------------------------------------------------------
----------

LEFT WHISTLE (0.00 + 61.84 + 0.00) = 61.84 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
   -67    -13   0.00  76.61   0.00  -5.26   0.00   0.00
0.00  61.84
-------------------------------------------------------------
----------

Segment Leq : 62.32 dBA

Total Leq All Segments: 62.32 dBA

♀



TOTAL Leq FROM ALL SOURCES (DAY): 59.31
                         (NIGHT): 62.32
♀
♀
```

```
STAMSON 5.0        NORMAL REPORT        Date: 06-06-2022
16:04:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: w3road~1.te          Time Period: Day/Night 16/8
hours
Description: West 3 - Main/Welland St Road Noise Only



Road data, segment # 1: Main St (day/night)
-------------------------------------------
Car traffic volume  : 11265/1252  veh/TimePeriod
Medium truck volume :  4113/457   veh/TimePeriod
Heavy truck volume  :   571/63    veh/TimePeriod
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Main St (day/night)
-----------------------------------------
Angle1   Angle2           : -51.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground
surface)
Receiver source distance  : 101.00 / 101.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Reference angle           :   0.00

♀
Road data, segment # 2: Welland St 1 (day/night)
------------------------------------------------
Car traffic volume  :  3283/365   veh/TimePeriod
Medium truck volume :   642/71    veh/TimePeriod
Heavy truck volume  :   482/54    veh/TimePeriod
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Welland St 1 (day/night)
----------------------------------------------
```

```
Angle1   Angle2           : -90.00 deg   -45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground
surface)
Receiver source distance  : 152.00 / 152.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Reference angle           :   0.00

♀
Road data, segment # 3: Welland St 2 (day/night)
------------------------------------------------
Car traffic volume  :  3283/365   veh/TimePeriod
Medium truck volume :   642/71    veh/TimePeriod
Heavy truck volume  :   482/54    veh/TimePeriod
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: Welland St 2 (day/night)
----------------------------------------------
Angle1   Angle2           : -49.00 deg   27.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground
surface)
Receiver source distance  : 144.00 / 144.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Reference angle           :   0.00

♀
Results segment # 1: Main St (day)
----------------------------------

Source height = 1.38 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
----------------------------------------------------------------
```

```
----------------
   -51      0   0.30  70.37   0.00 -10.80  -5.66   0.00
0.00   0.00  53.91
-------------------------------------------------------------
----------------

Segment Leq : 53.91 dBA

♀
Results segment # 2: Welland St 1 (day)
----------------------------------------

Source height = 1.82 m

ROAD (0.00 + 47.34 + 0.00) = 47.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
-------------------------------------------------------------
----------------
   -90    -45   0.29  67.80   0.00 -12.98  -7.48   0.00
0.00   0.00  47.34
-------------------------------------------------------------
----------------

Segment Leq : 47.34 dBA

♀
Results segment # 3: Welland St 2 (day)
----------------------------------------

Source height = 1.82 m

ROAD (0.00 + 54.23 + 0.00) = 54.23 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
-------------------------------------------------------------
----------------
   -49     27   0.00  67.80   0.00  -9.82  -3.74   0.00
0.00   0.00  54.23
-------------------------------------------------------------
----------------

Segment Leq : 54.23 dBA
```

Total Leq All Segments: 57.52 dBA

♀
Results segment # 1: Main St (night)

Source height = 1.37 m

ROAD (0.00 + 47.36 + 0.00) = 47.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-51	0	0.30	63.83	0.00	-10.80	-5.66	0.00	0.00	0.00	47.36

Segment Leq : 47.36 dBA

♀
Results segment # 2: Welland St 1 (night)

Source height = 1.82 m

ROAD (0.00 + 40.83 + 0.00) = 40.83 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.29	61.29	0.00	-12.98	-7.48	0.00	0.00	0.00	40.83

Segment Leq : 40.83 dBA

♀
Results segment # 3: Welland St 2 (night)

Source height = 1.82 m

```
ROAD (0.00 + 47.72 + 0.00) = 47.72 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj
H.Adj  B.Adj SubLeq
--------------------------------------------------------------
----------------
   -49     27   0.00  61.29   0.00  -9.82  -3.74   0.00
0.00   0.00  47.72
--------------------------------------------------------------
----------------

Segment Leq : 47.72 dBA

Total Leq All Segments: 50.99 dBA

♀



TOTAL Leq FROM ALL SOURCES (DAY): 57.52
                         (NIGHT): 50.99
♀
♀
```

```
STAMSON 5.0        NORMAL REPORT        Date: 06-06-2022
16:05:12
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: w3rail.te            Time Period: Day/Night 16/8
hours
Description: West 3 - Rail Only Without Whistle



Rail data, segment # 1: CN (day/night)
--------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng
!Cont
Type             !             !(km/h) !/Train!/Train! type
!weld
-----------------+-------------+-------+------+------+------
+----
  1.             !   5.0/5.0   !  16.0 !  4.0 ! 25.0
!Diesel!  No

Data for Segment # 1: CN (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  : 129.00 / 129.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
No Whistle
Reference angle           :   0.00

♀
Results segment # 1: CN (day)
-----------------------------

LOCOMOTIVE (0.00 + 53.22 + 0.00) = 53.22 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
```

```
   -90     90   0.00  62.57  -9.34   0.00   0.00   0.00
0.00  53.22
-------------------------------------------------------------
----------

WHEEL (0.00 + 39.03 + 0.00) = 39.03 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
   -90     90   0.00  48.38  -9.34   0.00   0.00   0.00
0.00  39.03
-------------------------------------------------------------
----------

Segment Leq : 53.38 dBA

Total Leq All Segments: 53.38 dBA

♀
Results segment # 1: CN (night)
--------------------------------

LOCOMOTIVE (0.00 + 56.23 + 0.00) = 56.23 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
   -90     90   0.00  65.58  -9.34   0.00   0.00   0.00
0.00  56.23
-------------------------------------------------------------
----------

WHEEL (0.00 + 42.04 + 0.00) = 42.04 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
   -90     90   0.00  51.39  -9.34   0.00   0.00   0.00
0.00  42.04
-------------------------------------------------------------
----------

Segment Leq : 56.39 dBA
```

Total Leq All Segments: 56.39 dBA

♀

TOTAL Leq FROM ALL SOURCES (DAY): 53.38
(NIGHT): 56.39

♀
♀

```
STAMSON 5.0        NORMAL REPORT        Date: 06-06-2022
16:05:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: w3rail.te            Time Period: Day/Night 16/8
hours
Description: West 3 - Rail Only With Whistle



Rail data, segment # 1: CN (day/night)
--------------------------------------
Train            ! Trains      ! Trains      ! Speed !# loc
!# Cars! Eng  !Cont
Type             ! (Left)      ! (Right)     !(km/h)
!/Train!/Train! type !weld
-----------------+-------------+-------------+-------+------
+------+------+----
  1.             !   2.5/2.5   !   2.5/2.5   !  16.0 !  4.0
! 25.0 !Diesel!  No

Data for Segment # 1: CN (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  : 129.00 / 129.00 m
Receiver height           :  13.50 / 13.50  m
Topography                :      1       (Flat/gentle slope;
no barrier)
Whistle Angle             :     30 deg   Track 1
Reference angle           :   0.00

♀
Results segment # 1: CN (day)
-----------------------------

LOCOMOTIVE (0.00 + 53.22 + 0.00) = 53.22 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
```

```
   -90     90   0.00  62.57  -9.34   0.00   0.00   0.00
0.00  53.22
-------------------------------------------------------------
----------

WHEEL (0.00 + 39.03 + 0.00) = 39.03 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
   -90     90   0.00  48.38  -9.34   0.00   0.00   0.00
0.00  39.03
-------------------------------------------------------------
----------

LEFT WHISTLE (0.00 + 61.63 + 0.00) = 61.63 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
   -68     30   0.00  73.60  -9.34  -2.62   0.00   0.00
0.00  61.63
-------------------------------------------------------------
----------

RIGHT WHISTLE (0.00 + 58.21 + 0.00) = 58.21 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
-------------------------------------------------------------
----------
    30     75   0.00  73.60  -9.34  -6.04   0.00   0.00
0.00  58.21
-------------------------------------------------------------
----------

Segment Leq : 63.68 dBA

Total Leq All Segments: 63.68 dBA

♀
Results segment # 1: CN (night)
--------------------------------

LOCOMOTIVE (0.00 + 56.23 + 0.00) = 56.23 dBA
```

```
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
   -90     90   0.00  65.58  -9.34   0.00   0.00   0.00
0.00  56.23
------------------------------------------------------------
----------

WHEEL (0.00 + 42.04 + 0.00) = 42.04 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
   -90     90   0.00  51.39  -9.34   0.00   0.00   0.00
0.00  42.04
------------------------------------------------------------
----------

LEFT WHISTLE (0.00 + 64.64 + 0.00) = 64.64 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
   -68     30   0.00  76.61  -9.34  -2.62   0.00   0.00
0.00  64.64
------------------------------------------------------------
----------

RIGHT WHISTLE (0.00 + 61.22 + 0.00) = 61.22 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj
B.Adj SubLeq
------------------------------------------------------------
----------
    30     75   0.00  76.61  -9.34  -6.04   0.00   0.00
0.00  61.22
------------------------------------------------------------
----------

Segment Leq : 66.69 dBA

Total Leq All Segments: 66.69 dBA
```

♀

```
TOTAL Leq FROM ALL SOURCES (DAY): 63.68
                         (NIGHT): 66.69
♀
♀
```

Appendix E: Example Warning Clauses

EXAMPLE WARNING CLAUSES FROM NPC-300

Type A: "Purchasers/tenants are advised that noise levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the noise levels exceed the Municipality's and the Ministry of the Environment's noise criteria."

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

Type C: "This dwelling unit has been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor noise levels are within the Municipality's and the Ministry of the Environment's noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.)"

Type D: "This dwelling unit has been supplied with a central air conditioning which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor noise levels are within the Municipality's and the Ministry of the Environment's noise criteria.

Limitations

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1. The work performed in the preparation of this report and the conclusions presented are subject to the following:
    a. The Standard Terms and Conditions which form a part of our Professional Services Contract;
    b. The Scope of Services;
    c. Time and Budgetary limitations as described in our Contract; and
    d. The Limitations stated herein.
2. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
3. The conclusions presented in this report were based, in part, on visual observations of the Site and attendant structures. Our conclusions cannot and are not extended to include those portions of the Site or structures, which are not reasonably available, in Wood's opinion, for direct observation.
4. The environmental conditions at the Site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the Site with any applicable local, provincial, or federal bylaws, orders-in-council, legislative enactments, and regulations was not performed.
5. The Site history research included obtaining information from third parties and employees or agents of the owner. No attempt has been made to verify the accuracy of any information provided, unless specifically noted in our report.
6. Where testing was performed, it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, may be present on-site and may be revealed by different or other testing not provided for in our contract.
7. Because of the limitations referred to above, different environmental conditions from those stated in our report may exist. Should such different conditions be encountered, Wood must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
8. The utilization of Wood's services during the implementation of any remedial measures will allow Wood to observe compliance with the conclusions and recommendations contained in the report. Wood's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.
9. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or the part, or any reliance thereon or decisions made based on any information or conclusions in the report is the sole responsibility of such third party. Wood accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report, or anything set out therein.
10. This report is not to be given over to any third party for any purpose whatsoever without the written permission of Wood.
11. Provided that the report is still reliable, and less than 12 months old, Wood will issue a third-party reliance letter to parties that the client identifies in writing, upon payment of the then current fee for such letters. All third parties relying on Wood's report, by such reliance agree to be bound by our proposal and Wood's standard reliance letter. Wood's standard reliance letter indicates that in no event shall Wood be liable for any damages, howsoever arising, relating to third-party reliance on Wood's report. No reliance by any party is permitted without such agreement.