Acoustic Assessment Report
Proposed Car Wash Facility
5646/5650 Manotick Main St, Ottawa, Ontario

NAPSCI Ref. No: 23-039
Report Date: June 9, 2023

PREPARED FOR:

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Executive Summary

Northern Applied Sciences Inc (NAPSCI) was retained by Tatham Engineering to prepare an acoustic assessment report for a proposed self-service car wash facility located at 5646/5650 Manotick Main St, Ottawa, Ontario. As the site has not yet been constructed, sound levels were estimated based on accepted engineering estimation techniques for comparable sources expected to be at the site. Sound levels were entered into Cadna-A acoustic modelling software to determine the noise impacts at sensitive receptors located near the facility. The worst-case noise impacts at the sensitive receptors generated by noise sources at the facility are summarized below:

Acoustic Assessment Summary Table – Proposed Stationary Sources with Mitigating Measures

Point of Reception	Description of Reception Point	Facility Leq (dBA)	Class 1 Performance Limit (dBA)	Compliance with Performance Limit
Day (0700 h to 1900 h)				
POR1a	Residence Yard (@ 1.5 m)	40	52	Yes
POR1b	Residence Window (@ 1.5 m)	40	52	Yes
POR2a	Residence Yard (@ 1.5 m)	49	55	Yes
POR2b	Residence Window (@ 4.5 m)	49	55	Yes
POR3a	Residence Yard (@ 1.5 m)	50	60	Yes
POR3b	Residence Window (@ 4.5 m)	49	58	Yes
POR4a	Residence Yard (@ 1.5 m)	53	62	Yes
POR4b	Residence Window (@ 4.5 m)	53	61	Yes
POR5a	Residence Yard (@ 1.5 m)	44	50	Yes
POR5b	Residence Window (@ 4.5 m)	43	50	Yes
Evening (1900 h to 2300 h)				
POR1a	Residence Yard (@ 1.5 m)	40	50	Yes
POR1b	Residence Window (@ 1.5 m)	40	50	Yes
POR2a	Residence Yard (@ 1.5 m)	49	52	Yes
POR2b	Residence Window (@ 4.5 m)	49	51	Yes
POR3a	Residence Yard (@ 1.5 m)	50	56	Yes
POR3b	Residence Window (@ 4.5 m)	49	55	Yes
POR4a	Residence Yard (@ 1.5 m)	53	58	Yes
POR4b	Residence Window (@ 4.5 m)	53	57	Yes
POR5a	Residence Yard (@ 1.5 m)	44	50	Yes
POR5b	Residence Window (@ 4.5 m)	43	50	Yes
Night (2300 h to 0700 h)				
POR1b	Residence Window (@ 1.5 m)	29	45	Yes

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POR2b	Residence Window (@ 4.5 m)	31	45	Yes
POR3b	Residence Window (@ 4.5 m)	37	45	Yes
POR4b	Residence Window (@ 4.5 m)	40	48	Yes
POR5b	Residence Window (@ 4.5 m)	33	45	Yes

As shown in the Acoustic Summary Table, the facility is compliant with the Ontario noise performance limit guidelines as outlined in NPC-300 assuming noise mitigating measures identified in this report are installed and operational.

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Appendices

1 Introduction

Northern Applied Sciences Inc (NAPSCI) was retained by Tatham Engineering to review the potential environmental noise impact from their client's proposed car wash facility located at 5646/5650 Manotick Main St, Ottawa, Ontario, on nearby sensitive points of reception. The acoustic assessment report was prepared in a manner that satisfies the requirements of Ministry of Environment, Conservation and Parks (MECP) Publications NPC-300 and NPC-233.

The proposed land-use for development is a self-service car wash facility. A noise study has been requested by the City of Ottawa in order to quantify community impacts and ensure no additional noise controls would be needed.

The scope of the acoustic assessment involved the following elements:

- Identified all significant sources of noise at the facility.
- Identified nearby sensitive noise receptors to the facility (houses, schools, hospitals, places of worship, etc).
- Estimated sound levels using manufacturer sound performance data or engineering calculations, or previous noise measurements at comparable facilities.
- Predicted the overall noise impact at sensitive points of reception during the worst-case operating scenarios.
- Assessed whether the 'worst-case' noise impacts at the points of reception met the applicable noise limit criteria.

The primary noise sources from this facility include five (5) wash bays each equipped with high-pressure spray wands, two (2) vacuum stations and vehicle traffic. Based on a review of operations, a vibration assessment was not warranted for the facility.

2 Facility Description

It is proposed that the existing car wash facility will be replaced with a new self-service car wash facility. The facility will include one (1) building that will contain five (5) wash bays, each equipped with high-pressure spray wands and two (2) vacuum stations. The site will be designed to allow vehicle traffic to enter and leave the site with minimal interference.

The North American Industry Classification System (NAICS) Code that applies to this facility is '811192 – Car Washes'. The car wash bays and vacuum stations will be coin operated thus the facility may operate 24 hours per day. Refer to Appendix C for site plans of the proposed facility.

3 Noise Source Summary

NAPSCI established noise sources for the proposed facility based on discussions with Tatham personnel and a review of the proposed design drawings.

Sources of noise that were deemed to be tonal in character (emitting a hum, whine, buzz) were penalized 5 dBA per MECP Publication NPC-104. Noise generating equipment operates either continuously or intermittently depending on process requirements. As a worst-case scenario, most

equipment was assumed to operate continuously and simultaneously. Refer to Table B1, Appendix B for worst-case operating times of individual equipment.

Table 1 (attached at end of text) presents a summary of noise sources identified at the site that have a significant impact on sensitive points of reception. Source locations are identified on Figure C3, Appendix C.

3.1 Self-Service Wash Bays

Five (5) self service wash bays are proposed for the site. Each wash bay will contain a high-pressure spray wand. Sound levels of a typical self-serve car wash high-pressure spray wand were estimated based on our experience with similar sources at other existing facilities.

3.2 Vacuum Stations

Two (2) vacuum stations are proposed for the site. Sound levels of a typical self-serve car wash vacuum station were estimated based on our experience with similar sources at other existing facilities.

3.3 Vehicle Sources

Vehicles noise will be generated from automobiles entering and leaving the site.

3.4 Insignificant Sources

Equipment used at the car wash facility to provide high-pressure water was assumed to be contained inside the proposed building in a mechanical room. Noise emissions from the mechanical room were assumed to be minimal based on site visits to other existing self-serve car wash facilities. Refer to Table A1, Appendix A for a table summarizing all significant and insignificant sources located on-site.

3.5 Impulse Sources

No impulse noise sources were identified on-site.

3.6 Noise Mitigating Measures

The following noise mitigating measures are proposed for the facility:

<u>Sources 6 & 7: Vacuum Stations</u>
Based on our experience with similar vacuum sources at other existing self-serve car wash facilities, they can generate sound power levels of approximately 94 dBA. The sound they generate may also be considered tonal in nature. According to NPC-104, tonal sources must be penalized +5 dB. Therefore, it is proposed that the vacuum sources be selected and/or designed to achieve a maximum sound power level of 74 dBA.

4 Point of Reception Noise Impact Analysis

4.1 Points of Reception List & Description

Five (5) sensitive points of reception (POR) were identified as the basis for the acoustic assessment. Refer to Figure C1, Appendix C for a scaled area plan identifying the location of the facility as well as the locations of the identified sensitive receptors in relation to the facility.

Point of Reception 1 (POR1):

POR1 was placed at a one-storey residence located approximately 64 m SE of the facility, on the south side of Mahogany Harbour Lane. Two (2) receptor points were placed in the model as follows:

- POR1a was assessed in the model in the yard of the residence at a height of 1.5 m above grade to represent an outdoor living area.
- POR1b was assessed in the model at the façade of the residence at a height of 3.0 m above grade to represent an open first floor window.

Ground cover between the facility and the receptors will consist of a mix of on-site paved areas, grass areas and Mahogany Harbour Lane.

Point of Reception 2 (POR2):

POR2 was placed at a two-storey residence located approximately 85 m SE of the facility, on the south corner of Mahogany Harbour Lane and Manotick Main St. Two (2) receptor points were placed in the model as follows:

- POR2a was assessed in the model in the yard of the residence at a height of 1.5 m above grade to represent an outdoor living area.
- POR2b was assessed in the model at the façade of the residence at a height of 4.5 m above grade to represent an open second floor window.

Ground cover between the facility and the receptors will consist of a mix of on-site paved areas, grass areas and Mahogany Harbour Lane.

Point of Reception 3 (POR3):

POR3 was placed at a two-storey residence located approximately 102 m E of the facility, on the opposite side of Manotick Main St. Two (2) receptor points were placed in the model as follows:

- POR3a was assessed in the model in the yard of the residence at a height of 1.5 m above grade to represent an outdoor living area.
- POR3b was assessed in the model at the façade of the residence at a height of 4.5 m above grade to represent an open second floor window.

Ground cover between the facility and the receptors will consist of a mix of on-site paved areas, grass areas and Manotick Main St.

Point of Reception 4 (POR4):

POR4 was placed at a one-storey residence located approximately 78 m E of the facility, on the opposite side of Manotick Main St. Two (2) receptor points were placed in the model as follows:

- POR4a was assessed in the model in the yard of the residence at a height of 1.5 m above grade to represent an outdoor living area.
- POR4b was assessed in the model at the façade of the residence at a height of 1.5 m above grade to represent an open first floor window.

Ground cover between the facility and the receptors will consist of a mix of on-site paved areas, grass areas and Manotick Main St.

Point of Reception 5 (POR5):

POR5 was placed at a one-storey residence located approximately 19 m SW of the facility. Two (2) receptor points were placed in the model as follows:

- POR5a was assessed in the model in the yard of the residence at a height of 1.5 m above grade to represent an outdoor living area.
- POR5b was assessed in the model at the façade of the residence at a height of 1.5 m above grade to represent an open first floor window.

Ground cover between the facility and the receptors will consist of grass areas.

4.2 Land-Use Zoning Plan

The facility is proposed for land currently zoned 'RC1 – Rural Commercial Zone'. Land located immediately north is also zoned 'RC1 – Rural Commercial Zone'. POR1, POR2, POR3 and POR4 are located on land zoned 'V1P – Village Residential First Density Zone'. POR5 is located on land zoned 'V3C – Village Residential Third Density Zone'. Refer to Figure C4, Appendix C for a partial zoning map of the proposed development site and surrounding area. The partial zoning plan was taken from: https://maps.ottawa.ca/geoottawa/. Refer to Attachment C5, Appendix C for the City of Ottawa zoning key.

4.3 Scaled Area Location Plan

Refer to Figure C1, Appendix C for a scaled area plan identifying the location of the facility as well as the locations of the identified sensitive receptors in relation to the facility. The area plan with the aerial photograph was generated with Google Maps.

4.4 Procedure used to Assess Noise Impacts at Each Receptor

Measured sound pressure levels, or sound power levels based on manufacturer data or accepted estimation techniques were used as input to the acoustic computer model Cadna-A (Computer Aided Noise Abatement, Version 4.4). The model is based on ISO Standard 9613-2 "Acoustics – Attenuation of Sound During Propagation Outdoors". The ISO based model accounts for reduction in sound level due to increased distance and geometrical spreading, air absorption, ground attenuation, and acoustical shielding by intervening structures, topography and brush. The model is

considered conservative since it represents atmospheric conditions that promote propagation of sound from source to receiver. Refer to Appendix B for calculations and Cadna-A model set-up data and output data.

4.5 List of Parameters/Assumptions Used in Calculations & Model

The following assumptions were used in the calculations:

- All noise sources operational.
- Tonal sources were increased 5 dBA per NPC-104 (where applicable).
- Sources were adjusted for intermittence per NPC-104 (where applicable).
- Vehicle traffic modelled using a moving point source in the Cadna-A software (not STAMSON) since infrequent movements.
- Lateral diffraction and second order reflection included in the model.
- Ground absorption set to 0.0 for reflective ground surfaces and 1.0 for absorptive ground surfaces.
- Model set to no subtraction of negative ground attenuation.
- Model set to no negative path difference.
- Tree foliage was not placed in the model.

4.6 Point of Reception Noise Impact Summary

Table 2 (attached at end of text) summarizes the noise impact of the facility at the identified sensitive receptors. Specifically, it lists the distance from each noise source to the points of reception and the sound pressure level generated by each noise source at each receptor based on the Cadna-A computer model output.

Refer to Figures 1 and 2 (attached at end of text) for contour plots generated by the Cadna-A acoustic software. These figures illustrate the sound levels generated by the facility's proposed stationary noise sources during the worst-case day/evening and night operating scenarios.

5 Acoustic Assessment Summary

5.1 Rationale for Selecting Applicable Noise Limits

Sensitive receptors located near the facility are located in a "Class 1" Area, which is defined per NPC-300 as "an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum."

NPC-300 specifies that the noise limit criteria at sensitive points of reception due to the operation of stationary sources are the greater of the following:

1. Exclusionary minima values specified in the applicable MECP NPC documents; or
2. The lowest energy-equivalent one-hour background sound level (L_{eq}) occurring at the sensitive point of reception occurring at the same time of day that the equipment is operating.

Background noise in the area near the receptors is at times heavily influenced by human activity. The AADT for Manotick Main St was obtained from the City of Ottawa Open Data website. Table 3 summarizes noise limits used in this assessment at the identified points of reception for stationary sources of noise.

Table 3: Summary of Noise Criteria – Stationary Noise Sources

	Day (0700 to 1900) Criteria (dBA)			Evening (1900 to 2300) Criteria (dBA)			Night (2300 to 0700) Criteria (dBA)		
POR	MECP Exclusionary Limit	Minimum Background Level	*Criteria Used in Assessment*	MECP Exclusionary Limit	Minimum Background Level	*Criteria Used in Assessment*	MECP Exclusionary Limit	Minimum Background Level	*Criteria Used in Assessment*
1a	50	52	***52***	50	50	***50***	--	--	**--**
1b	50	52	***52***	50	50	***50***	45	--	***45***
2a	50	55	***55***	50	52	***52***	--	--	**--**
2b	50	55	***55***	50	51	***51***	45	--	***45***
3a	50	60	***60***	50	56	***56***	--	--	**--**
3b	50	58	***58***	50	55	***55***	45	--	***45***
4a	50	62	***62***	50	58	***58***	--	--	**--**
4b	50	61	***61***	50	57	***57***	45	48	***48***
5a	50	50	***50***	50	50	***50***	--	--	**--**
5b	50	50	***50***	50	50	***50***	45	--	***45***

5.2 Predictable Worst-Case Impact Operating Scenarios

The facility may operate during the day, evening and night periods. Table 4 summarizes the worst-case operating scenarios assessed in the report:

Table 4: Worst-Case Operating Scenarios

Source ID	Source Description	Day Period	Evening Period	Night Period
		7 am to 7 pm	7 pm to 11 pm	11 pm to 7 am
1	Wash Bay 1 High Pressure Spray Wand	40 min/h	40 min/h	0 min/h
2	Wash Bay 2 High Pressure Spray Wand	40 min/h	40 min/h	10 min/h
3	Wash Bay 3 High Pressure Spray Wand	40 min/h	40 min/h	0 min/h
4	Wash Bay 4 High Pressure Spray Wand	40 min/h	40 min/h	0 min/h
5	Wash Bay 5 High Pressure Spray Wand	40 min/h	40 min/h	0 min/h
6	Vacuum Station 1	40 min/h	40 min/h	20 min/h
7	Vacuum Station 2	40 min/h	40 min/h	0 min/h
8	Vehicle Traffic	20 autos/h	20 autos/h	1 auto/h

The operating scenarios examined in this report are conservatively based on all potential equipment operating under maximum expected operating conditions during the specified time periods. These conservative operating scenarios will yield the maximum noise impacts at the sensitive receptors.

5.3 Acoustic Assessment Summary

Table 5 provides a summary of the noise impacts at the identified sensitive points of reception for worst-case day operating scenario from stationary non-impulsive noise sources at the facility:

Table 5: Acoustic Assessment Summary Table
Proposed Stationary Sources with Mitigating Measures

Point of Reception	Description of Reception Point	Facility Leq (dBA)	Class 1 Performance Limit (dBA)	Compliance with Performance Limit
Day (0700 h to 1900 h)				
POR1a	Residence Yard (@ 1.5 m)	40	52	Yes
POR1b	Residence Window (@ 1.5 m)	40	52	Yes
POR2a	Residence Yard (@ 1.5 m)	49	55	Yes
POR2b	Residence Window (@ 4.5 m)	49	55	Yes
POR3a	Residence Yard (@ 1.5 m)	50	60	Yes
POR3b	Residence Window (@ 4.5 m)	49	58	Yes
POR4a	Residence Yard (@ 1.5 m)	53	62	Yes
POR4b	Residence Window (@ 4.5 m)	53	61	Yes
POR5a	Residence Yard (@ 1.5 m)	44	50	Yes
POR5b	Residence Window (@ 4.5 m)	43	50	Yes
Evening (1900 h to 2300 h)				
POR1a	Residence Yard (@ 1.5 m)	40	50	Yes
POR1b	Residence Window (@ 1.5 m)	40	50	Yes
POR2a	Residence Yard (@ 1.5 m)	49	52	Yes
POR2b	Residence Window (@ 4.5 m)	49	51	Yes
POR3a	Residence Yard (@ 1.5 m)	50	56	Yes
POR3b	Residence Window (@ 4.5 m)	49	55	Yes
POR4a	Residence Yard (@ 1.5 m)	53	58	Yes
POR4b	Residence Window (@ 4.5 m)	53	57	Yes
POR5a	Residence Yard (@ 1.5 m)	44	50	Yes
POR5b	Residence Window (@ 4.5 m)	43	50	Yes
Night (2300 h to 0700 h)				
POR1b	Residence Window (@ 1.5 m)	29	45	Yes
POR2b	Residence Window (@ 4.5 m)	31	45	Yes
POR3b	Residence Window (@ 4.5 m)	37	45	Yes
POR4b	Residence Window (@ 4.5 m)	40	48	Yes
POR5b	Residence Window (@ 4.5 m)	33	45	Yes

6 Conclusions & Limitations

Based on the results of the acoustic assessment, it can be concluded that the noise impacts at the sensitive points of reception from stationary noise sources meet the applicable Ontario MECP noise criteria, as defined by NPC-300, during the worst-case operating scenario assuming noise mitigating measures identified in this report are installed and operational.

The operating scenarios examined in this report are conservatively based on all potential equipment operating under maximum expected operating conditions during the specified time periods. These conservative operating scenarios will yield the maximum noise impacts at the sensitive receptors. Actual noise impacts are expected to be below this theoretical maximum.

A potential limitation of the assessment is the night-time scenario as the facility does not have a means of limiting the maximum number of vehicles accessing the car wash facility during this time period. However, the usage of the facility during the night-time period is expected to be very low.

Based on a review of process operations, a vibration assessment is not warranted.

We trust the above is satisfactory. If you have any questions or comments, please do not hesitate to contact Northern Applied Sciences Inc. at your convenience.

Yours Truly,

Northern Applied Sciences Inc.

Stephen Kuchma P.Eng
Principal

Chris Scullion, B.E.Sc. (Civil Engineering)
Principal

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Table 1: Noise Source Summary

Source ID	Description	Sound Power Level (A) (dBA)	Data Source (B)	Quantity	Source Location	Sound Characteristics	Noise Control Measures
1	High Pressure Wash Station	94.7	Estimated 1c	1	Outside	Steady	Uncontrolled
2	High Pressure Wash Station	94.7	Estimated 1c	1	Outside	Steady	Uncontrolled
3	High Pressure Wash Station	94.7	Estimated 1c	1	Outside	Steady	Uncontrolled
4	High Pressure Wash Station	94.7	Estimated 1c	1	Outside	Steady	Uncontrolled
5	High Pressure Wash Station	94.7	Estimated 1c	1	Outside	Steady	Uncontrolled
6	Vacuum Station	74.0	Estimated 1c	1	Outside	Steady, Tonal	Max PWL Specified
7	Vacuum Station	74.0	Estimated 1c	1	Outside	Steady, Tonal	Max PWL Specified
8	Vehicle Traffic	81.7	Estimated 1d	1	Outside	Intermittent	Uncontrolled

Notes:

1a: Estimated based on physial characteristics of source (based on assumed size of unit that would be installed). Refer to Table B2, Appendix B for calculation estimate.

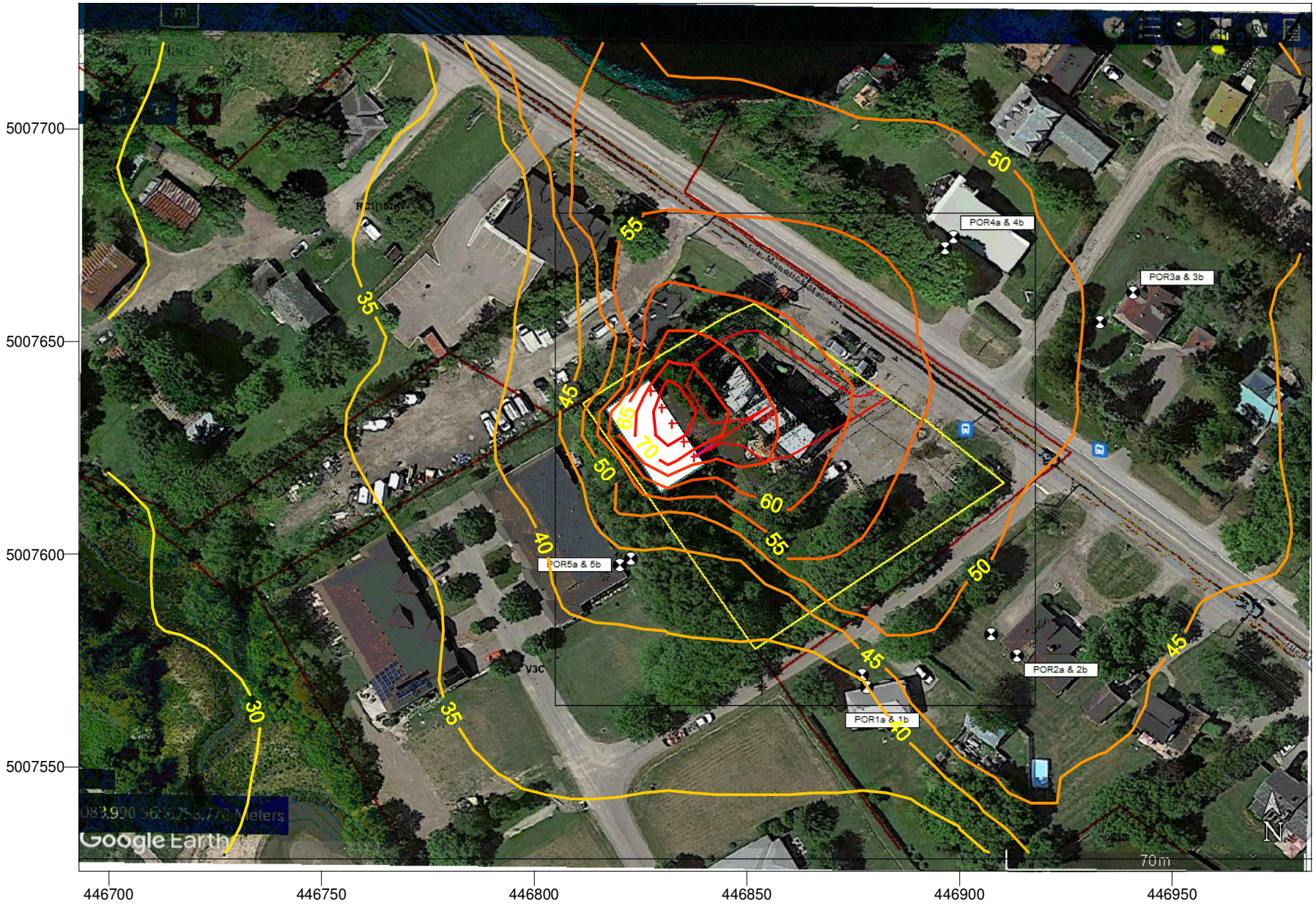
1b: Estimated with manufacturer sound performance data for typical exhaust fan. Refer to Table B2, App. B for calculation estimate.

1c: Data taken from database of similar measured source at different facility.

1d: Estimated using FHWA. Refer to Table B3, App. B for calculation estimate.

Table 2: Point of Reception Noise Impact Summary - Proposed Stationary Noise Sources with Mitigating Measures

Source ID	Description	Point of Reception 1a			Point of Reception 1b				Point of Reception 2a			Point of Reception 2b				Point of Reception 3a			Point of Reception 3b				Point of Reception 4a			Point of Reception 4b				Point of Reception 5a			Point of Reception 5b			
		Distance	Leq Day	Leq Evening	Distance	Leq Day	Leq Evening	Leq Night	Distance	Leq Day	Leq Evening	Distance	Leq Day	Leq Evening	Leq Night	Distance	Leq Day	Leq Evening	Distance	Leq Day	Leq Evening	Leq Night	Distance	Leq Day	Leq Evening	Distance	Leq Day	Leq Evening	Leq Night	Distance	Leq Day	Leq Evening	Distance	Leq Day	Leq Evening	Leq Night
		m	dBA	dBA	m	dBA	dBA	dBA	m	dBA	dBA	m	dBA	dBA	dBA	m	dBA	dBA	m	dBA	dBA	dBA	m	dBA	dBA	m	dBA	dBA	dBA	m	dBA	dBA	m	dBA	dBA	dBA
1	High Pressure Wash Station	64	33.9	33.9	67	33.6	33.6	0.0	81	44.7	44.7	88	44.0	44.0	0.0	100	44.0	44.0	109	43.1	43.1	0.0	76	46.4	46.4	79	44.6	44.6	0.0	28	38.7	38.7	31	38.0	38.0	0.0
2	High Pressure Wash Station	68	31.4	31.4	71	31.4	31.4	25.3	84	36.8	36.8	92	36.0	36.0	30.0	101	43.7	43.7	110	42.5	42.5	36.5	76	46.0	46.0	79	45.8	45.8	39.7	30	35.1	35.1	32	34.9	34.9	28.9
3	High Pressure Wash Station	73	30.5	30.5	76	30.7	30.7	0.0	89	42.2	42.2	97	41.7	41.7	0.0	103	41.7	41.7	112	42.5	42.5	0.0	76	46.2	46.2	79	45.8	45.8	0.0	33	33.1	33.1	35	33.6	33.6	0.0
4	High Pressure Wash Station	78	30.4	30.4	81	30.4	30.4	0.0	93	41.6	41.6	101	41.3	41.3	0.0	104	41.5	41.5	113	40.6	40.6	0.0	76	46.2	46.2	79	45.8	45.8	0.0	36	31.6	31.6	38	31.4	31.4	0.0
5	High Pressure Wash Station	82	29.7	29.7	85	29.9	29.9	0.0	98	41.1	41.1	105	40.9	40.9	0.0	106	41.4	41.4	115	40.7	40.7	0.0	76	45.0	45.0	79	46.0	46.0	0.0	39	30.7	30.7	41	30.4	30.4	0.0
6	Vacuum Station	64	29.1	29.1	67	29.2	29.2	26.2	73	28.1	28.1	80	27.6	27.6	24.6	80	29.0	29.0	89	27.6	27.6	24.6	56	31.4	31.4	59	30.9	30.9	27.8	47	33.7	33.7	50	33.0	33.0	30.0
7	Vacuum Station	64	29.2	29.2	67	29.3	29.3	0.0	73	28.0	28.0	81	27.5	27.5	0.0	82	28.8	28.8	91	28.4	28.4	0.0	58	31.7	31.7	61	30.5	30.5	0.0	45	34.1	34.1	48	33.4	33.4	0.0
8	Vehicle Traffic	54	30.8	30.8	57	31.1	31.1	18.1	61	29.9	29.9	69	29.7	29.7	16.7	53	31.9	31.9	62	31.3	31.3	18.2	35	35.2	35.2	38	34.5	34.5	21.5	37	34.4	34.4	40	33.6	33.6	20.6
Total Sound Pressure Level at POR [dBA]			40	40		40	40	29		49	49		49	49	31		50	50		49	49	37		53	53		53	53	40		44	44		43	43	33
MECP Criterion [dBA]			52	50		52	50	45		55	52		55	51	45		60	56		58	55	45		62	58		61	57	48		50	50		50	50	45
Excess [dBA]			**-12**	**-10**		**-12**	**-10**	**-16**		**-6**	**-3**		**-6**	**-3**	**-14**		**-10**	**-7**		**-9**	**-6**	**-8**		**-8**	**-5**		**-8**	**-5**	**-8**		**-6**	**-6**		**-7**	**-7**	**-12**

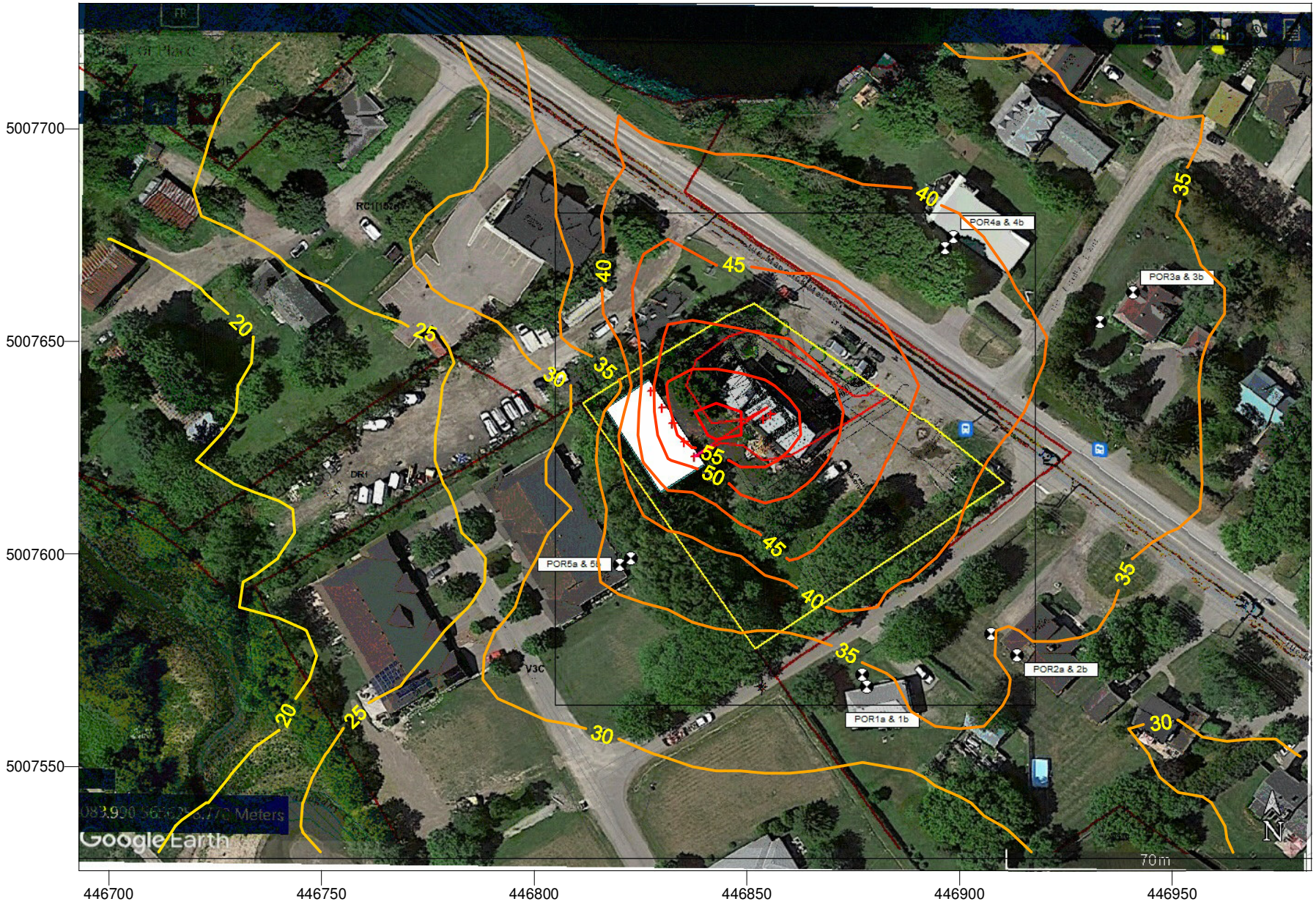


LEGEND:

Worst-case Operating Scenario
at 1.5 m above grade
Proposed Stationary Sources with Mitigation
Day/Evening Operating Condition

Figure 1

Proposed Car Wash Facility
5646/5650 Manotick Main St
Acoustic Assessment Report



LEGEND:

Worst-case Operating Scenario
at 1.5 m above grade
Proposed Stationary Sources with Mitigation
Night Operating Condition

Figure 2

Proposed Car Wash Facility
5646/5650 Manotick Main St
Acoustic Assessment Report

Appendix A

Supporting Information

Environmental Noise Study

Tatham Engineering - 5646/5650 Manotick Main St, Ottawa

NAPSCI 23-039

Table A1: Equipment Summary

Source ID	Source Description	Source Type	Significant?	Data Source	Manufacturer	Model	Comments
1	High Pressure Wash Station	Point	Yes	Estimated 1c			
2	High Pressure Wash Station	Point	Yes	Estimated 1c			
3	High Pressure Wash Station	Point	Yes	Estimated 1c			
4	High Pressure Wash Station	Point	Yes	Estimated 1c			
5	High Pressure Wash Station	Point	Yes	Estimated 1c			
6	Vacuum Station	Point	Yes	Estimated 1c			
7	Vacuum Station	Point	Yes	Estimated 1c			
8	Vehicle Traffic	Mvg-Pt	Yes	Estimated 1d			
9	Mechanical Room Equipment		No				Internal

Notes:

1a: Estimated based on physial characteristics of source (based on assumed size of unit that would be installed). Refer to Table B2, App. B for calculation estimat

1b: Estimated with manufacturer sound performance data for typical exhaust fan. Refer to Tab

1c: Data taken from database of similar measured source at different facility

1d: Estimated using FHWA. Refer to Table B3, App. B for calculation estimate

Appendix B

Noise Calculations & Cadna-A Model

Environmental Noise Study

Tatham Engineering - 5646/5650 Manotick Main St, Ottawa

NAPSCI 23-039

Table B1: Source Summary Calculations - No Mitigating Measures

Source ID	Description	Source Type	Sound Pressure Level [dB] - Raw Data									Data Source	Q	Distance to Source (r)		NPC-104 Correction Factor	Sound Power Level [dB] (4)								OverallPWL (4)		Max Operation Time Day	Max Operation Time Evening	Max Operation Time Night	NPC-104 Correction Factor Day	NPC-104 Correction Factor Evening	NPC-104 Correction Factor Night	Adjusted PWL (5) Day	Adjusted PWL (5) Evening	Adjusted PWL (5) Night
			63	125	250	500	1000	2000	4000	8000	Overall dBA			m	ft	(2) Tonality	63	125	250	500	1000	2000	4000	8000	dB	dBA	min/h	min/h	min/h	Intermittence	Intermittence	Intermittence	dBA	dBA	dBA
1	High Pressure Wash Station	Point	69.7	62.4	61.4	63.1	64.0	67.0	67.1	65.4	72.9	Estimated 1c	2	5.0	16.4	0	91.5	84.2	83.2	84.8	85.8	88.7	88.8	87.2	96.6	94.7	40	40	0	-2	-2	Not Op.	92.9	92.9	0.0
2	High Pressure Wash Station	Point	69.7	62.4	61.4	63.1	64.0	67.0	67.1	65.4	72.9	Estimated 1c	2	5.0	16.4	0	91.5	84.2	83.2	84.8	85.8	88.7	88.8	87.2	96.6	94.7	40	40	10	-2	-2	-8	92.9	92.9	86.9
3	High Pressure Wash Station	Point	69.7	62.4	61.4	63.1	64.0	67.0	67.1	65.4	72.9	Estimated 1c	2	5.0	16.4	0	91.5	84.2	83.2	84.8	85.8	88.7	88.8	87.2	96.6	94.7	40	40	0	-2	-2	Not Op.	92.9	92.9	0.0
4	High Pressure Wash Station	Point	69.7	62.4	61.4	63.1	64.0	67.0	67.1	65.4	72.9	Estimated 1c	2	5.0	16.4	0	91.5	84.2	83.2	84.8	85.8	88.7	88.8	87.2	96.6	94.7	40	40	0	-2	-2	Not Op.	92.9	92.9	0.0
5	High Pressure Wash Station	Point	69.7	62.4	61.4	63.1	64.0	67.0	67.1	65.4	72.9	Estimated 1c	2	5.0	16.4	0	91.5	84.2	83.2	84.8	85.8	88.7	88.8	87.2	96.6	94.7	40	40	0	-2	-2	Not Op.	92.9	92.9	0.0
6	Vacuum Station	Point	62.3	61.9	59.8	64.3	65.2	66.6	64.4	59.5	71.7	Estimated 1c	2	5.0	16.4	5	84.0	83.7	81.5	86.1	87.0	88.3	86.2	81.3	94.4	93.5	40	40	20	-2	-2	-5	91.8	91.8	88.7
7	Vacuum Station	Point	62.3	61.9	59.8	64.3	65.2	66.6	64.4	59.5	71.7	Estimated 1c	2	5.0	16.4	5	84.0	83.7	81.5	86.1	87.0	88.3	86.2	81.3	94.4	93.5	40	40	0	-2	-2	Not Op.	91.8	91.8	0.0
8	Vehicle Traffic	Mvg-Pt	--	--	--	--	--	--	--	--	50.0	Estimated 1d	2	15.0	49.2	0	81.3	82.3	79.3	78.3	78.3	73.3	64.3	57.3	87.4	81.7	37	37	2	-2	-2	-15	79.6	79.6	66.6

Note: 1a: Estimated based on physial characteristics of source (based on assumed size of unit that would be installed). Refer to Table B2, App. B for calculation estimat

1b: Estimated with manufacturer sound performance data for typical exhaust fan. Refer to Table B2, App. B for calculation estimate

1c: Data taken from database of similar measured source at different facility

1d: Estimated using FHWA. Refer to Table B3, App. B for calculation estimate

2: 0 = Not Tonal; 5 = Tonal

3: 0 = Not Quasi-steady; 10 = Quasi-steady

4: PWL values not adjusted for tonality or quasi-steady impulsive noise

5: PWL values adjusted for intermittence

Table B2: Noise Source Estimates for Vehicle Traffic (Automobiles)

Source ID	Description	Overall	Overall	Value to be subtracted from Overall SPL (dB) to Give SPL for each Octave Band (Note 1)							
		PWL	PWL	7	6	9	10	10	15	24	31
		dB	dBA	63	125	250	500	1000	2000	4000	8000
12/13/14	Vehicle Traffic 1/2/3	88.3	81.3	81.3	82.3	79.3	78.3	78.3	73.3	64.3	57.3

Note 1: Estimated using FHWA. Ocatve band corrections from Noise Control for Buildings & Manufacturing Plants; Hoover & Keith, 2005.

Environmental Noise Study

Tatham Engineering - 5646/5650 Manotick Main St, Ottawa

NAPSCI 23-039

	POR	E (m)	N (m)	Ht (m)
Residence OLA --->	1a	446877	5007572	1.5
Residence POW --->	1b	446878	5007569	3
Residence OLA --->	2a	446907	5007582	1.5
Residence POW --->	2b	446913	5007577	4.5
Residence OLA --->	3a	446932	5007654	1.5
Residence POW --->	3b	446940	5007661	4.5
Residence OLA --->	4a	446896	5007672	1.5
Residence POW --->	4b	446898	5007674	1.5
Residence OLA --->	5a	446823	5007599	1.5
Residence POW --->	5b	446820	5007598	1.5

Table C3: Cadna Set-up

Source Information								Distances to PORs									
Source ID	Source Description	Source Type	Site Location		Building Height	HAR	HAG	POR1a	POR1b	POR2a	POR2b	POR3a	POR3b	POR4a	POR4b	POR5a	POR5b
			Easting	Northing													
			m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
1	High Pressure Wash Station	Point	446837.6	5007622.9	--	--	1.5	64	67	81	88	100	109	76	79	28	31
2	High Pressure Wash Station	Point	446835.3	5007626.4	--	--	1.5	68	71	84	92	101	110	76	79	30	32
3	High Pressure Wash Station	Point	446832.3	5007630.6	--	--	1.5	73	76	89	97	103	112	76	79	33	35
4	High Pressure Wash Station	Point	446830.1	5007634.3	--	--	1.5	78	81	93	101	104	113	76	79	36	38
5	High Pressure Wash Station	Point	446827.4	5007638.2	--	--	1.5	82	85	98	105	106	115	76	79	39	41
6	Vacuum Station	Point	446855.5	5007632.9	--	--	2.0	64	67	73	80	80	89	56	59	47	50
7	Vacuum Station	Point	446853.8	5007631.7	--	--	2.0	64	67	73	81	82	91	58	61	45	48
8	Vehicle Traffic	Mvg-Pt	Varies	Varies	--	--	1.0	54	57	61	69	53	62	35	38	37	40

Table B4: Traffic Distribution

Start Hour	End Hour	Time Period	Typical Distribution[1] %	AADT 7786	Min Hour	Distribution		
						Auto 90%	MD 5%	HD 5%
23	24	Night	1.67%	130				
0	1	Night	0.87%	68				
1	2	Night	0.49%	38				
2	3	Night	0.36%	28				
3	4	Night	0.30%	23	23	21	1	1
4	5	Night	0.36%	28				
5	6	Night	0.95%	74				
6	7	Night	2.75%	214				
7	8	Day	5.05%	393	393	354	20	20
8	9	Day	6.55%	510				
9	10	Day	5.62%	438				
10	11	Day	5.50%	428				
11	12	Day	6.04%	470				
12	13	Day	6.48%	504				
13	14	Day	6.26%	487				
14	15	Day	6.60%	514				
15	16	Day	7.41%	577				
16	17	Day	7.82%	609				
17	18	Day	7.65%	595				
18	19	Day	6.27%	488				
19	20	Evening	5.12%	399				
20	21	Evening	4.09%	318				
21	22	Evening	3.41%	266				
22	23	Evening	2.41%	188	188	169	9	9
			100.00%	7786				

Note 1: Reference - Typical Hourly Traffic Distribution for Noise Modelling; VanDelden, Penton, Haniff; Canadian Acoustics; Vol.36, No. 3, 2008.

Table B5: Transportation Noise Model Summary

Model	Receptor ID	Description	Assessment Location	Time Period	Number of Vehicles			Speed Limit	Road Gradient	Road Pavement	Topography	Wood Depth	# Rows Houses	Density 1st Row	Intermediate Surface	Road Viewable Angle		Source-Receiver Distance	Receptor Height	Mitigation	Total Leq	MECP Exclus Limit	Applicable Limit
					Auto	Medium	Heavy									L1 Deg.	L2 Deg.						
								km/h	%									m		Y/N	dBA	dBA	dBA
1aD	POR1a	1 storey house	OLA	Day	354	20	20	60	0	1	1	0	0	20%	1	-65	32	68	1.5	N	52.31	50	52
1aE	POR1a	1 storey house	OLA	Evening	169	9	9	60	0	1	1	0	0	20%	1	-65	32	68	1.5	N	48.90	50	50
1bD	POR1b	1 storey house	POW	Day	354	20	20	60	0	1	1	0	0	20%	1	-64	28	70	3	N	52.21	50	52
1bE	POR1b	1 storey house	POW	Evening	169	9	9	60	0	1	1	0	0	20%	1	-64	28	70	3	N	48.80	50	50
1bN	POR1b	1 storey house	POW	Night	21	1	1	60	0	1	1	0	0	20%	1	-64	28	70	3	N	NA	45	45
2aD	POR2a	2 storey house	OLA	Day	354	20	20	60	0	1	1	0	0	20%	1	-80	20	43	1.5	N	55.38	50	55
2aE	POR2a	2 storey house	OLA	Evening	169	9	9	60	0	1	1	0	0	20%	1	-80	20	43	1.5	N	51.97	50	52
2bD	POR2b	2 storey house	POW	Day	354	20	20	60	0	1	1	0	0	20%	1	-78	0	43	4.5	N	54.68	50	55
2bE	POR2b	2 storey house	POW	Evening	169	9	9	60	0	1	1	0	0	20%	1	-78	0	43	4.5	N	51.26	50	51
2bN	POR2b	2 storey house	POW	Night	21	1	1	60	0	1	1	0	0	20%	1	-78	0	43	4.5	N	NA	45	45
3aD	POR3a	2 storey house	OLA	Day	354	20	20	60	0	1	1	0	0	20%	1	-90	90	31	1.5	N	59.69	50	60
3aE	POR3a	2 storey house	OLA	Evening	169	9	9	60	0	1	1	0	0	20%	1	-90	90	31	1.5	N	56.28	50	56
3bD	POR3b	2 storey house	POW	Day	354	20	20	60	0	1	1	0	0	20%	1	-90	90	41	4.5	N	58.22	50	58
3bE	POR3b	2 storey house	POW	Evening	169	9	9	60	0	1	1	0	0	20%	1	-90	90	41	4.5	N	54.81	50	55
3bN	POR3b	2 storey house	POW	Night	21	1	1	60	0	1	1	0	0	20%	1	-90	90	41	4.5	N	45.38	45	45
4aD	POR4a	1 storey house	OLA	Day	354	20	20	60	0	1	1	0	0	20%	1	-90	90	24	1.5	N	61.53	50	62
4aE	POR4a	1 storey house	OLA	Evening	169	9	9	60	0	1	1	0	0	20%	1	-90	90	24	1.5	N	58.12	50	58
4bD	POR4b	1 storey house	POW	Day	354	20	20	60	0	1	1	0	0	20%	1	-90	90	27	1.5	N	60.69	50	61
4bE	POR4b	1 storey house	POW	Evening	169	9	9	60	0	1	1	0	0	20%	1	-90	90	27	1.5	N	57.28	50	57
4bN	POR4b	1 storey house	POW	Night	21	1	1	60	0	1	1	0	0	20%	1	-90	90	27	1.5	N	47.85	45	48
5aD	POR5a	1 storey house	OLA	Day	354	20	20	60	0	1	1	0	0	20%	1	2	60	77	1.5	N	49.09	50	50
5aE	POR5a	1 storey house	OLA	Evening	169	9	9	60	0	1	1	0	0	20%	1	2	60	77	1.5	N	45.68	50	50
5bD	POR5b	1 storey house	POW	Day	354	20	20	60	0	1	1	0	0	20%	1	4	60	80	1.5	N	48.64	50	50
5bE	POR5b	1 storey house	POW	Evening	169	9	9	60	0	1	1	0	0	20%	1	4	60	80	1.5	N	45.23	50	50
5bN	POR5b	1 storey house	POW	Night	21	1	1	60	0	1	1	0	0	20%	1	4	60	80	1.5	N	NA	45	45

Model Settings:
Road Pavement = 1 - Typical asphalt or concrete.
Topography = 1 - Flat/gentle slope; no barrier.
Wood Depth = 0 - No woods or < 30 m.
Rows Houses = 1 through 7
Intermediate Surface = 1 - Absorptive; 2 - Reflective

Report (CarWash NAAP.cna)

Group Table, Day/Night

Name	Expression	Partial Sum Level																																				
		POR1a			POR1a & 1b			POR2a			POR2a & 2b			POR3a			POR3a & 3b			POR4a			POR4a & 4b			POR5a			POR5a & 5b			sdk1			sdk6_7		
		Day	Even	Night	Day	Even	Night	Day	Even	Night	Day	Even	Night	Day	Even	Night	Day	Even	Night	Day	Even	Night	Day	Even	Night	Day	Even	Night	Day	Even	Night	Day	Even	Night	Day	Even	Night		

Sound Sources

Point Sources

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
1			94.9	94.9	94.9	Lw	s1_5		0.0	0.0	0.0				40.00	40.00	0.00	0.0		(none)	1.50	r	446837.57	5007622.89	1.50
2			94.9	94.9	94.9	Lw	s1_5		0.0	0.0	0.0				40.00	40.00	10.00	0.0		(none)	1.50	r	446835.30	5007626.38	1.50
3			94.9	94.9	94.9	Lw	s1_5		0.0	0.0	0.0				40.00	40.00	0.00	0.0		(none)	1.50	r	446832.33	5007630.62	1.50
4			94.9	94.9	94.9	Lw	s1_5		0.0	0.0	0.0				40.00	40.00	0.00	0.0		(none)	1.50	r	446830.05	5007634.29	1.50
5			94.9	94.9	94.9	Lw	s1_5		0.0	0.0	0.0				40.00	40.00	0.00	0.0		(none)	1.50	r	446827.43	5007638.17	1.50
6			78.7	78.7	78.7	Lw	s6_7		5.0	5.0	5.0			20	40.00	40.00	20.00	0.0		(none)	2.00	r	446855.50	5007632.86	2.00
7			78.7	78.7	78.7	Lw	s6_7		5.0	5.0	5.0			20				0.0		(none)	2.00	r	446853.79	5007631.71	2.00

Line Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Speed
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(km/h)
12			79.6	79.6	66.6	57.7	57.7	44.7	PWL-Pt	s12_13_14		0.0	0.0	0.0							0.0		(none)	20.0	20.0	1.0	5.0

Area Sources

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night

Area Sources vertical

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night			
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)	

Railway Tracks

Name	M.	ID	Lm,E		Train Class	Add.Level				Vmax
			Day	Night		Dfb	Dbr	Dbü	Dra	
			(dBA)	(dBA)		(dB)	(dB)	(dB)	(dB)	(km/h)

Railway Classes

Name	M.	ID	Lm,E		Train Class											Add.Level				Vmax
			Day	Night	Type	p	Number of Trains			v	l	Dfz	Dae	Lm,E,i (dB)		Dfb	Dbr	Dbü	Dra	
			(dBA)	(dBA)		(%)	Day	Evening	Night	(km/h)	(m)	(dB)	(dB)	Day	Night	(dB)	(dB)	(dB)	(dB)	(km/h)

Parking Lots

Name	M.	ID	Type	Lwa			Event Data						Penalty Type		Penalty Surface		According to	Operating Time		
				Day	Special	Night	Ref. Quantity	Number B	No. Spaces/RefQ	Events/h/RefQ			Kpa	Type	Kstro	Surface		Day	Special	Night
				(dBA)	(dBA)	(dBA)				Day	Special	Night	(dB)		(dB)			(min)	(min)	(min)

Roads

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)

Crossing

Name	M.	ID	Active			Height	Coordinates		
			Day	Evening	Night	Begin	X	Y	Z
						(m)	(m)	(m)	(m)

Receiver Points

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Even	Night	Day	Even	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
POR1a			39.9	39.9	29.1	52.0	50.0	0.0				1.50	r	446876.66	5007572.09	1.50
POR1a & 1b			40.0	40.0	29.1	52.0	50.0	45.0				3.00	r	446877.78	5007569.35	3.00
POR2a			49.1	49.1	32.0	55.0	52.0	0.0				1.50	r	446906.93	5007581.71	1.50
POR2a & 2b			48.6	48.6	31.3	55.0	51.0	45.0				4.50	r	446912.84	5007576.75	4.50
POR3a			49.8	49.8	38.1	60.0	56.0	0.0				1.50	r	446932.34	5007654.44	1.50
POR3a & 3b			49.1	49.1	36.8	58.0	55.0	45.0				4.50	r	446939.99	5007661.28	4.50
POR4a			53.1	53.1	40.4	62.0	58.0	0.0				1.50	r	446896.19	5007671.63	1.50
POR4a & 4b			52.7	52.7	40.1	61.0	57.0	48.0				1.50	r	446897.97	5007674.10	1.50
POR5a			43.6	43.6	33.3	50.0	50.0	0.0				1.50	r	446822.67	5007599.27	1.50
POR5a & 5b			43.1	43.1	32.7	50.0	50.0	45.0				1.50	r	446820.08	5007597.82	1.50
sdk1			74.3	74.3	62.9	0.0	0.0	0.0				1.50	r	446841.68	5007625.72	1.50
sdk6_7			67.5	67.5	56.8	0.0	0.0	0.0				2.00	r	446850.57	5007633.76	2.00

Designated Land Use

Name	M.	ID	Type	Persons
				(1/km²)

Obstacles

Barriers

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			
			left	right		horz.	vert.	Begin		End	
					(m)	(m)	(m)	(m)		(m)	
			0.21	0.21				5.00	r		
			0.21	0.21				5.00	r		
			0.21	0.21				5.00	r		
			0.21	0.21				5.00	r		
			0.21	0.21				5.00	r		

Buildings

Name	M.	ID	RB	Residents	Absorption	Height
						Begin
						(m)

Foilage

Name	M.	ID	Height
			(m)

Built-Up Area

Name	M.	ID	Type	Attenuation	B	m	Height
				dB/100m	%	1/m	(m)

Geometry Data

Geometry Line Sources

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)
12	1.00	r			446880.61	5007639.84	1.00	0.00
					446879.50	5007638.52	1.00	0.00
					446878.04	5007637.45	1.00	0.00
					446875.05	5007636.94	1.00	0.00
					446852.73	5007652.33	1.00	0.00
					446850.08	5007652.50	1.00	0.00
					446845.47	5007650.87	1.00	0.00
					446838.11	5007645.66	1.00	0.00
					446835.55	5007639.50	1.00	0.00
					446841.62	5007630.82	1.00	0.00
					446849.53	5007631.72	1.00	0.00
					446854.79	5007634.58	1.00	0.00
					446837.73	5007623.17	1.00	0.00
					446843.84	5007626.12	1.00	0.00
					446849.06	5007625.65	1.00	0.00
					446853.67	5007622.06	1.00	0.00
					446859.87	5007623.08	1.00	0.00
					446873.94	5007631.46	1.00	0.00
					446882.83	5007637.02	1.00	0.00

Geometry Area Sources

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)

Geometry Parkking Lots

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)

Geometry Roads

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(m)	(%)
	(m)		(m)		(m)	(m)	(m)	(m)		

Geometry Railway Tracks

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)

Geometry Barriers

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height				Coordinates			
			left	right		horz.	vert.	Begin		End		x	y	z	Ground
					(m)	(m)	(m)	(m)		(m)		(m)	(m)	(m)	(m)
			0.21	0.21				5.00	r			446827.02	5007640.89	5.00	0.00
												446816.89	5007634.22	5.00	0.00
												446829.67	5007614.81	5.00	0.00

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height				Coordinates			
			left	right		horz.	vert.	Begin		End		x	y	z	Ground
					(m)	(m)	(m)	(m)		(m)		(m)	(m)	(m)	(m)
												446839.89	5007621.31	5.00	0.00
			0.21	0.21				5.00	r			446819.52	5007630.29	5.00	0.00
												446829.61	5007636.99	5.00	0.00
			0.21	0.21				5.00	r			446821.99	5007626.47	5.00	0.00
												446832.08	5007633.17	5.00	0.00
			0.21	0.21				5.00	r			446824.59	5007622.54	5.00	0.00
												446834.68	5007629.24	5.00	0.00
			0.21	0.21				5.00	r			446827.19	5007618.58	5.00	0.00
												446837.29	5007625.28	5.00	0.00

Geometry Buildings

Name	M.	ID	RB	Residents	Absorption	Height	Coordinates			
						Begin	x	y	z	Ground
						(m)	(m)	(m)	(m)	(m)

Geometry Contour Lines

Name	M.	ID	OnlyPts	Height		Coordinates		
				Begin	End	x	y	z
				(m)	(m)	(m)	(m)	(m)

Geometry Lines of Fault

Name	M.	ID	Coordinates	
			x	y
			(m)	(m)

Appendix C

Plans & Drawings

Figure C1

Area Plan

Proposed Car Wash Facility

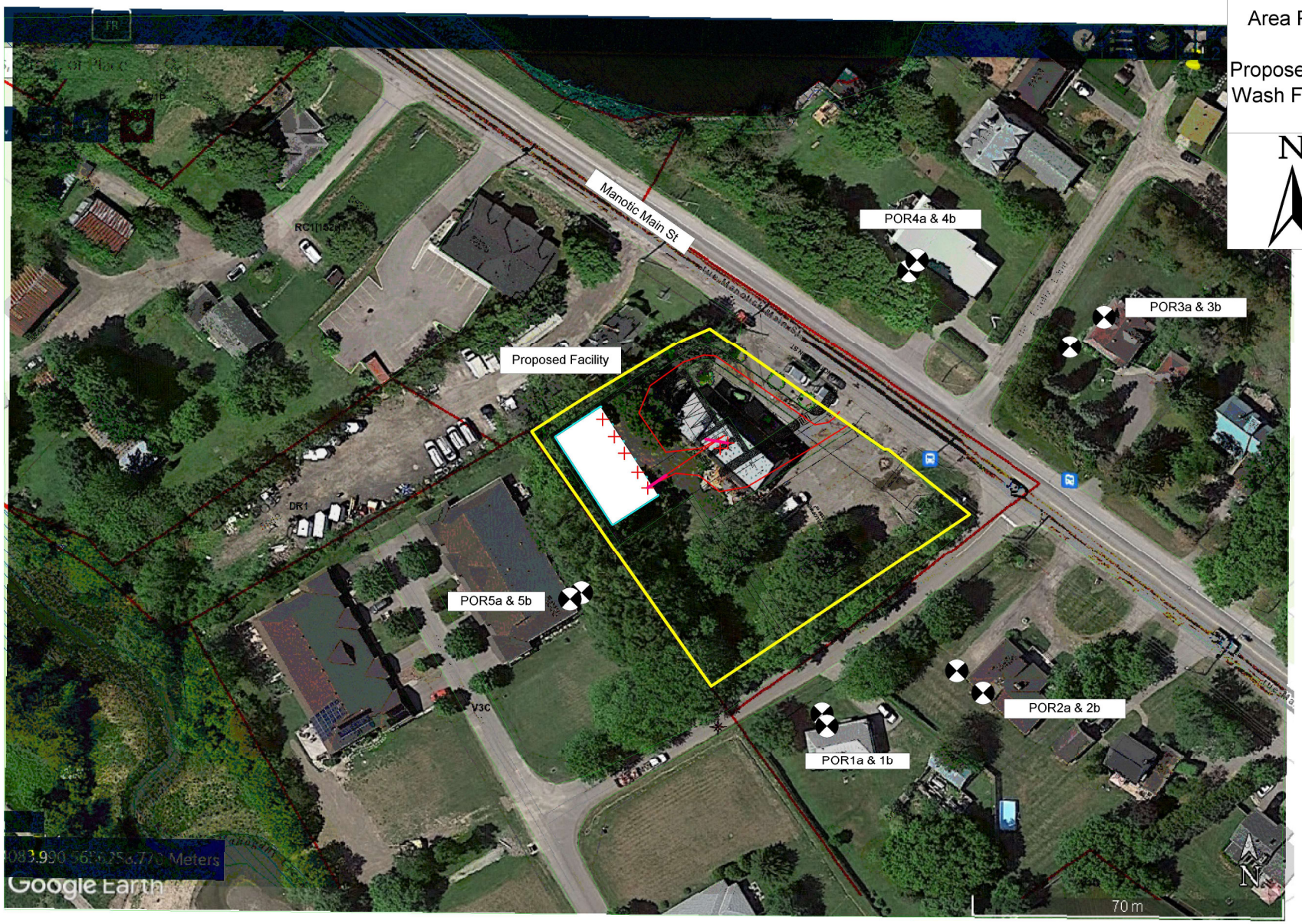
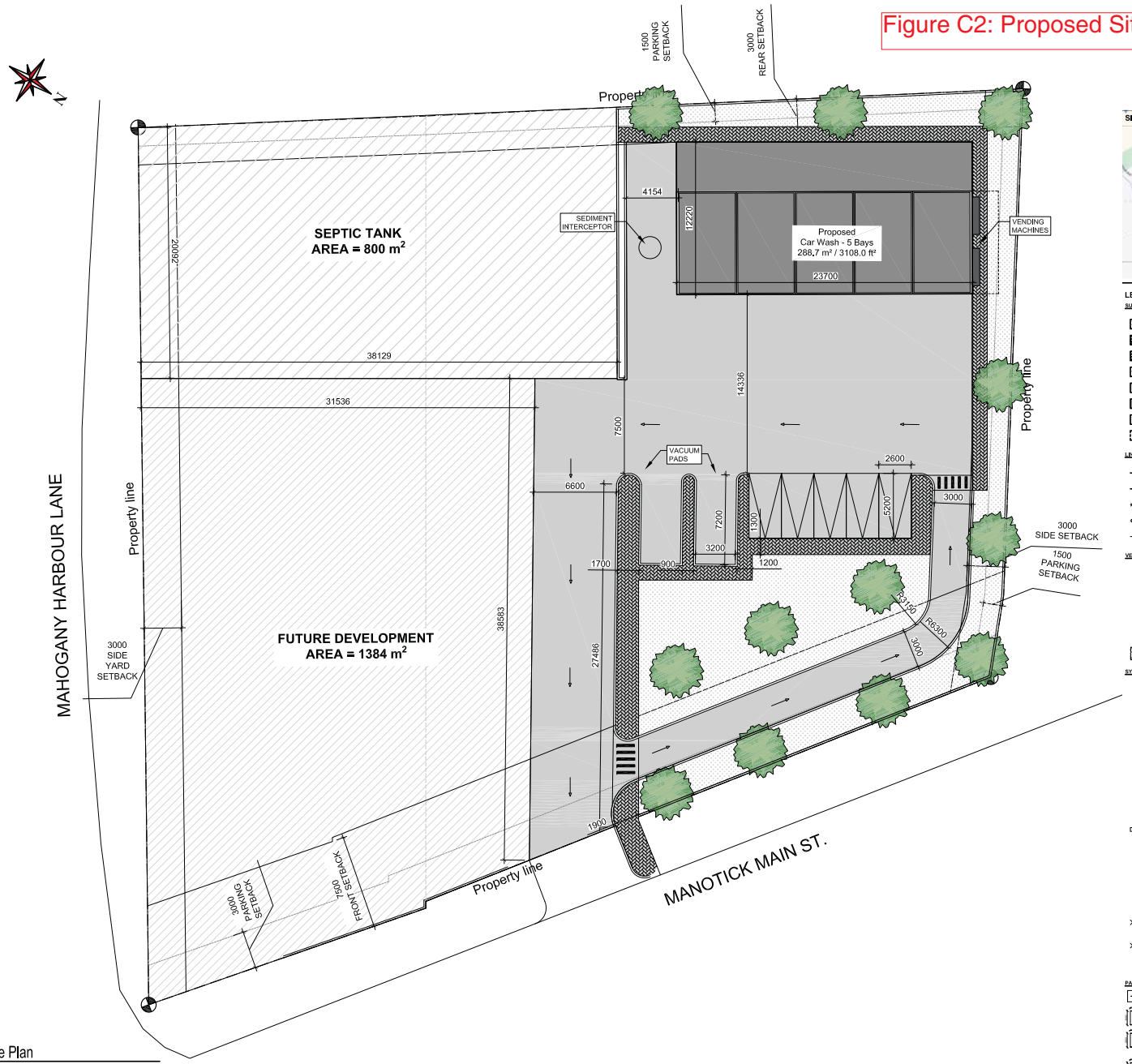


Figure C2: Proposed Site Plan



1 / A01 Site Plan
ECH: 1:150

OPT 1

1 Restaurants & 1 Car Wash (Part 9)

SITE CONTEXT

LEGEND

SURFACES
- GRASS
- RIVERSTONE
- CONCRETE PAVERS
- POURED CONCRETE
- ASPHALT PAVING
- PROPOSED NEW BÂTIMENT
- EXISTING BUILDING TO REMAIN
- EXISTING BUILDING TO BE DEMOLISHED

LINES
- PROPERTY LINE
- SETBACK LINE
- EXISTING FENCE
- NEW FENCE
- OVERHEAD WIRES

VEGETATION
- TREE: EXISTING TO REMAIN
- TREE: EXISTING TO BE REMOVED
- TREE: NEW PROPOSED (SEE MARKED)
- SHRUB: NEW PROPOSED (SEE MARKED)

SYMBOLS
- BUILDING ACCESS
- BUILDING EGRESS
- SIAMESE CONNECTION
- UTILITY POLE
- FIRE HYDRANT
- CATCH BASIN / MANHOLE
- DEPRESSED CURB
- LANDSCAPE LIGHT
- LIGHT POLE
- WALL MOUNTED LIGHT
- XX.XXm EXISTING GRADE ELEVATION
- XX.XXm PROPOSED GRADE ELEVATION
- LOT CORNERS

PARKING
- BIKE PARKING H: HORIZONTAL 0,6M x 1,8M V: VERTICAL 0,5M x 1,5M
- CAR PARKING R: RESIDENTIAL V: VISITOR
- BARRIER FREE PARKING (TYPE A) R: RESIDENTIAL V: VISITOR
- BARRIER FREE PARKING (TYPE B) R: RESIDENTIAL V: VISITOR

GENERAL NOTES

NOTE#1:
- ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS, INCLUDING OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS. ANY DISCREPANCIES BETWEEN DRAWINGS WILL BE REPORTED TO THE PROJECT LEAD IMMEDIATELY FOR CLARIFICATION PRIOR TO COMMENCING ANY CONSTRUCTION.

NOTE#2:
- ALL GENERAL SITE INFORMATION AND CONDITIONS HAVE BEEN COMPILED FROM EXISTING PLANS AND SURVEYS.

NOTE#3:
- CONTRACTOR IS RESPONSIBLE TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ALL ERRORS AND / OR OMISSIONS TO THE ARCHITECT.

NOTE#4:
- REFER TO LANDSCAPE PLAN FOR ALL EXTERIOR LANDSCAPING.

NOTE#5:
- DO NOT SCALE DRAWINGS.

NOTE#6:
- ALL CONTRACTORS MUST COMPLY WITH ALL APPLICABLE CODES AND REGULATIONS.

SURVEY INFO

TOPOGRAPHIC SURVEY OF :
5646 Manotick Main Street

GRAPHIC SCALE

N

PROJECT INFORMATION

SITE SUMMARY

ADDRESS	5646 Manotick Main Street
CURRENT ZONING	RC1
SITE AREA	4078,48 m²
PROPOSED USE	RC1
BUILDING AREA	446,4 / 4805

ZONING SUMMARY

		REQUIRED	PROPOSED
LOT AREA		450m² / 4843,76ft²	1413,2 m²
LOT WIDTH		20m / 65,61ft	20m / 65,61ft
MIN. LOT DEPTH		- m / - ft	m / -ft
MAX. BUILDING HEIGHT		11m	11m
MAX. PARAPET HEIGHT		- m / - ft	0,9m / 1,9ft
Abbrev. key: BUILDING SET BACKS :			
- FRONT YARD	(min.)	7,5m / 24,6ft	7,5m / 24,6ft
	(max.)	n/a	
- CORNER SIDE YARD	(min.)	n/a	n/a
	(max.)	n/a	
- INT. SIDE YARD 1	(min.)	4,5m / 14,76ft	4,5m / 14,76ft
- INT. SIDE YARD 2	(min.)	1,5m / 4,9ft	1,5m / 4,9ft
- REAR YARD	(min.)	7,5m / 24,6ft	7,5m / 24,6ft
	(max.)	n/a	
- 2 BED UNIT COUNT	(min.)	n/a	n/a%
- 3 BED UNIT COUNT			0%
MIN LANDSCAPED AREA		n/a	n/a
COVERAGE	(min.)	n/a	11%
	(max.)	30%	

VEHICULAR PARKING

	REQUIRED	PROPOSED
RESIDENT SPACES	10 per 100m2 - 20%	22
VISITOR SPACES	n/a	n/a
ACCESSIBLE SPACES	1	1
incl. in total parking count		

BICYCLE PARKING

	REQUIRED	PROPOSED
MIN PARKING SPACES	0,5 Per unit	0,5 Per unit

WASTE MANAGEMENT CONTAINERS

	REQUIRED	PROPOSED
GARBAGE (0,11 y³ unit)	TBD	TBD
RECYCLING (0,036 y³ unit)	TBD	TBD
ORGANICS	TBD	TBD

AMENITY AREA

	REQUIRED	PROPOSED
PER SECTION 137	none	TBD

BUILDING SUMMARY

Option	Units	Gross Area*	PARKING Required	PARKING Provided
1	n/a	288,7 m2	5	5

*including semi-basements

ZONING SPECIFIC NOTES

1- LANDSCAPING OF YARDS ADJOINED FRONT AND CORNER SIDE YARDS TO BE LANDSCAPED, EXCEPT FOR DRIVEWAYS CROSSING THE FRONT OR CORNER SIDE YARD LEADING TO A PARKING AREA

2- OUTDOOR STORAGE OUTDOOR STORAGE PERMITTED in FRONT OR SIDE AND REAR YARD ONLY MUST BE SCREENED AND CONCEALED FROM VIEW FROM ABUTTING STREETS AND FROM ABUTTING NON-COMMERCIAL OR NON-INDUSTRIAL ZONES

3- IN THE CASE OF A DRIVE-THROUGH FACILITY:
- WHERE A RESTAURANT USE OPERATED IN COMBINATION WITH A DRIVE-THROUGH FACILITY, the PARKING REQUIRED BY TABLE 101 FOR THE RESTAURANT MAY BE REDUCED BY 25 PER CENT
- WHERE ANY USE OTHER THAN A RESTAURANT OPERATED IN COMBINATION WITH A DRIVE-THROUGH FACILITY, THE PARKING REQUIRED BY TABLE 101 FOR THAT LAND USE MAY BE REDUCED BY 10 PER CENT.

4- THROAT DIMENSION TO BE 40 METERS FROM MANOTICK MAIN STREET

ROSSMANN ARCHITECTURE

88 BOULEVARD SAINT-JOSEPH, GATINEAU, QC
Tel : 819-600-1555 | www.rossmannarchitecture.ca

NOT FOR CONSTRUCTION / PAS POUR CONSTRUCTION

PROJECT TEAM / EQUIPE DU PROJET :

PLANNING

CIVIL

STRUCTURAL ENG.

MECHANICAL / ELECTRICAL ENG.

LANDSCAPE

KEY PLAN / PLAN CLÉ :

CLIENT:

JADE HAWKINS - HAWKINS PROPERTIES

revisions	description	date
0.3	Feasibility_R02	2023-03-23
0.2	Feasibility_R01	2023-03-10
0.1	Initial Feasibility	2022-10-19

PROJECT NAME / NOM DU PROJET :

5646 MANOTICK MAIN STREET

DRAWING NAME / NOM DU DESSIN:

SITE PLAN

PROJECT NO. / NO. DE PROJET :	22-199
DATE :	2023-03-10
DRAWN BY / DESSINÉ PAR :	M.S.
REVIEWED BY / VERIFIÉ PAR :	P.P.
SCALE / ECHELLE :	VOIR PLAN
PROJECT PHASE / PHASE DU PROJET :	F.S.
DWG NO. / NO. DESSIN:	A01
REVISION NO. / NO. DE RÉVISION :	0.1

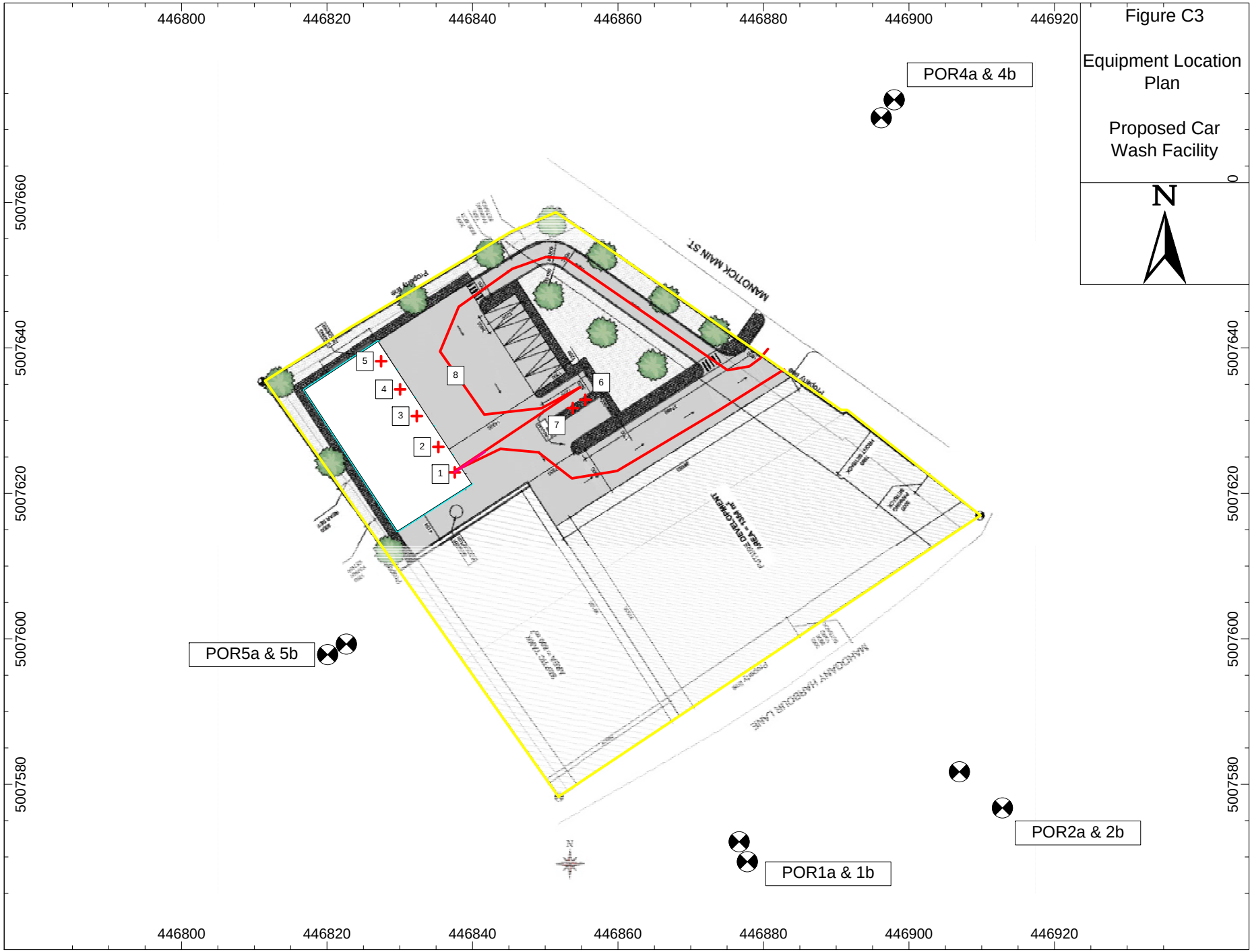
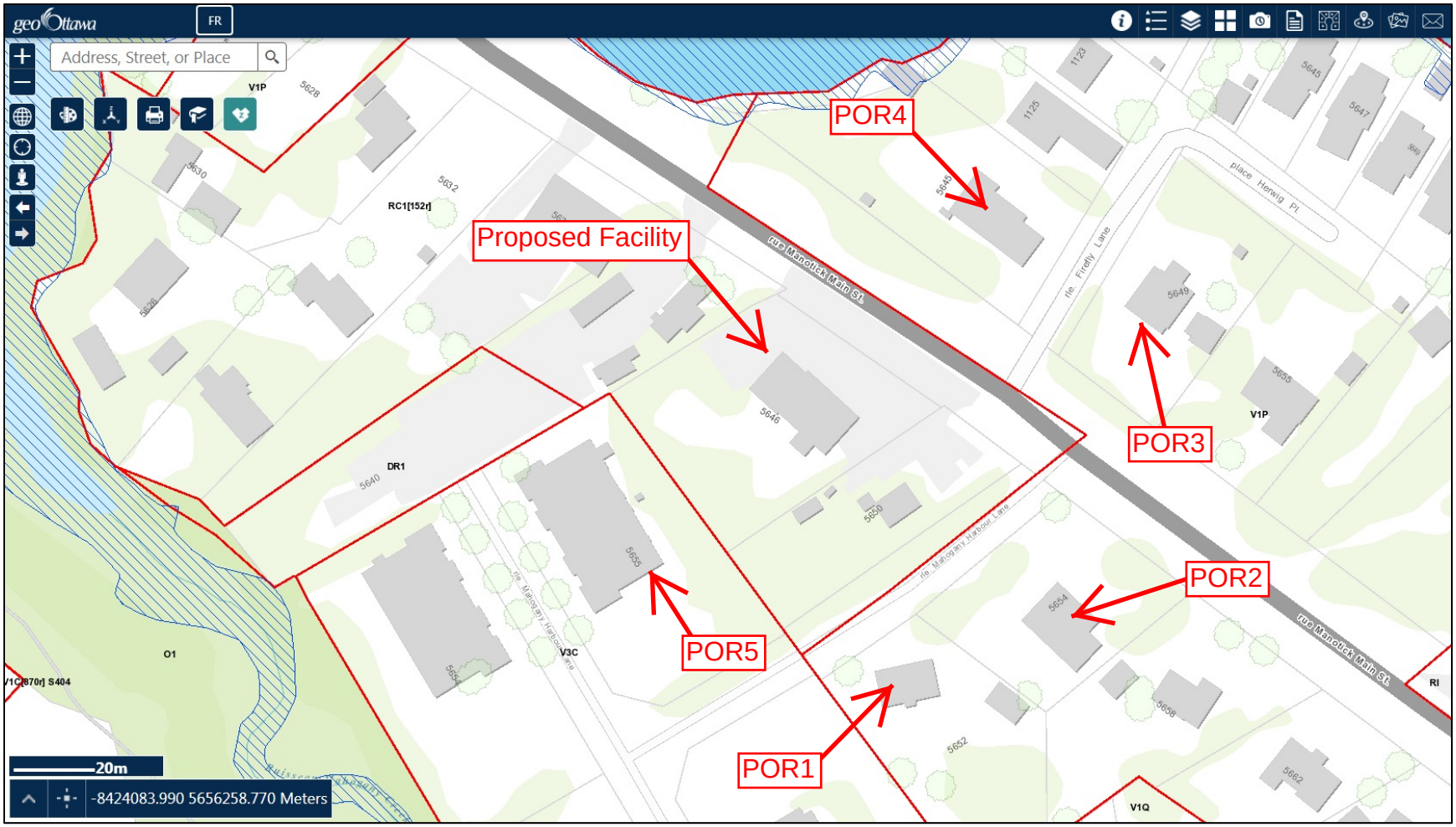


Figure C3
Equipment Location Plan
Proposed Car Wash Facility
N
446800
446820
446840
446860
446880
446900
446920
5007660
5007640
5007620
5007600
5007580
POR4a & 4b
POR5a & 5b
POR2a & 2b
POR1a & 1b
MANOTICK MAIN ST
1
2
3
4
5
6
7
8

Figure C4: Partial Zoning Plan



Reference: https://maps.ottawa.ca/geoottawa/

Attachment C5: Zoning Codes

	(I) Zone Name	(II) Zone Code
Residential Zones	(1) Residential First Density Zone	R1
	(2) Residential Second Density Zone	R2
	(3) Residential Third Density Zone	R3
	(4) Residential Fourth Density Zone	R4
	(5) Residential Fifth Density Zone	R5
	(6) Mobile Home Park Zone	RM
Institutional zones	(7) Minor Institutional Zone	I1
	(8) Major Institutional Zone	I2
Open space and leisure zones	(9) Parks and Open Space Zone	O1
	(10) Community Leisure Facility Zone	L1
	(11) Major Leisure Facility Zone	L2
	(12) Central Experimental Farm Zone	L3
Environmental zone	(13) Environmental Protection Zone	EP
Commercial/Mixed use zones	(14) Local Commercial Zone	LC
	(15) General Mixed Use Zone	GM
	(16) Traditional Mainstreet Zone	TM
	(17) Arterial Mainstreet Zone	AM
	(18) Mixed Use Centre Zone	MC
	(19) Mixed Use Downtown Zone	MD
Industrial zones	(20) Business Park Industrial Zone	IP
	(21) Light Industrial Zone	IL
	(22) General Industrial Zone	IG
	(23) Heavy Industrial Zone	IH

	(I) Zone Name	(II) Zone Code
Transportation zones	(24) Air Transportation Facility Zone	T1
	(25) Ground Transportation Facility Zone	T2
Rural zones	(26) Agricultural Zone	AG
	(27) Mineral Extraction Zone	ME
	(28) Mineral Aggregate Reserve Zone	MR
	(29) Rural Commercial Zone	RC
	(30) Rural General Industrial Zone	RG
	(31) Rural Heavy Industrial Zone	RH
	(32) Rural Institutional Zone	RI
	(33) Rural Residential Zone	RR
	(34) Rural Countryside Zone	RU
	(35) Village Mixed Use Zone	VM
	(36) Village Residential First Density Zone	V1
	(37) Village Residential Second Density Zone	V2
	(38) Village Residential Third Density Zone	V3
Other zones	(39) Development Reserve Zone	DR

Section 36

Subzones are created by adding a number or a capital letter to the primary zone code, and have the effect of modifying the uses or the regulations of the primary zone to the extent set out in the text of the provisions for that subzone.

Section 37

Exception zones are created by adding a number in square brackets, e.g. [1], to the zone code on the zoning maps, and that have the effect of:

(1) allowing a use that would not be permitted otherwise;

(2) prohibiting a use that would be permitted otherwise; or

(3) incorporating other modifications to the zoning by-law as are set out in the table for that exception, while retaining the un-modified provisions of the primary zone or subzone, as the case may be.

Section 38

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