aercoustics

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NOISE IMPACT STUDY – **Project: 20085.00**

1518-1526 Stittsville Main Street

Stittsville, Ontario

Prepared for:

McIntosh Perry Consulting Engineers
115 Wallgreen Road, RR#3
Carp, ON
K0A 1L0

Prepared by:

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Kohl Clark, B.Eng

Derek Flake, M.Sc., P.Eng

April 27, 2021

Revision History

Version	Description	Author	Reviewed	Date
- -	Initial Report	SZ	DF	November 26, 2020
R1	Revisions addressing City of Ottawa comments	SZ	DF	April 27, 2021

Important Notice and Disclaimer

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Executive Summary

Aercoustics Engineering Limited has been retained by McIntosh Perry Consulting Engineers to prepare a Noise Impact Study in support of an application for a Site Plan Control approval to permit a mixed-use development in the City of Ottawa, located at 1518-1526 Stittsville Main Street in the community of Stittsville.

The purpose of this study is to examine the existing and future noise environment in the development area and evaluate its impact potential on future receptors. This report also investigates the noise control features that are required to meet the noise guidelines of the Ontario Ministry of the Environment, Conservation and Parks and to satisfy the requirements of the City of Ottawa.

The proposed development consists of one (1) four-storey residential building and one (1) two-storey restaurant building with external patio. Figure 1 provides a key plan showing the proposed development location. Figures 2A and 2B show the site plan of the proposed development, including critical noise sensitive receptors and calculation locations. The main environmental noise source in the subject study area is road traffic from Abbott Street and Stittsville Main Street.

The subject site is not significantly impacted by rail traffic, aircraft, or stationary noise sources.

Road noise level calculations were performed in accordance with the MECP guidelines and by the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT). The City of Ottawa's document "Environmental Noise Control Guidelines" (ENCG) has also been considered in this study. The highest predicted road traffic noise level is 63 dBA during daytime and 55 dBA during nighttime hours at the northeast residential façade. Based on these levels, standard exterior window and wall components that meet the requirements of the Ontario Building Code (OBC) are expected to be sufficient for meeting the MECP indoor sound level guidelines.

Sample warning clause wording to address noise issues has been provided as required.

The development is expected to have minimal impact on the surrounding environment; this should be confirmed at the once details of proposed noise generating mechanical equipment becomes available. As the aforementioned details become available, further analysis should be conducted to assess the impact of noise sources associated with the development on noise-sensitive locations within the development itself.

Table of Contents

1 Introduction

Aercoustics Engineering Limited (Aercoustics) has been retained by McIntosh Perry Consulting Engineers (McIntosh Perry) to prepare a Noise Impact Study (NIS) to support an application for Site Plan Approval (SPA) for a mixed-use development in the City of Ottawa, municipally located at 1518-1526 Stittsville Main Street in the community of Stittsville. This noise study is intended to support an application for a Site Plan Control approval.

The purpose of this study was to examine the existing and future noise environment in the development area and evaluate its impact potential on future receptors. This report also investigates the noise control features that are required for the development to meet the noise guidelines of the Ontario Ministry of the Environment, Conservation and Parks (MECP) and to satisfy the requirements of the City of Ottawa. This report considers the MECP guideline NPC-300 "Stationary and Transportation Sources – Approval and Planning" (August 2013) as well as the City of Ottawa guideline "Environmental Noise Control Guidelines" ("ENCG") (September 2016).

The proposed development consists of one (1) four-storey residential building and one (1) two-storey building which includes a restaurant with associated patio space as well as an office space. The site is located on the southwest side of Stittsville Main Street and approximately 40 m southeast of the Abbott Street intersection. Adjacent land uses include commercial and retail properties on Stittsville Main Street, a day care centre including a rear play area which backs on to the subject site, and residential properties on the surrounding local roads.

Figure 1 provides a key plan showing the proposed development location. Figures 2A and 2B show the site plan of the proposed development, including critical noise sensitive receptors and calculation locations. The main environmental noise source in the subject study area is road traffic from Abbott Street and Stittsville Main Street.

The subject site is not significantly impacted by rail traffic, aircraft, or stationary noise sources.

2 Guidelines and Criteria

2.1 Transportation Noise – Outdoor Living Area (OLA)

MECP Guidelines as well as the ENCG recommend that equivalent noise levels (L_{eq}-16hr) in outdoor living areas should not exceed 55 dBA. If it is not technically, economically, or administratively feasible to achieve a level of 55 dBA, predicted noise levels between 55 dBA and 60 dBA may be acceptable provided that the future occupants of the building are made aware of the potential noise problems through appropriate warning clauses. Noise levels above 60 dBA are generally not acceptable and will warrant noise control measures.

All unenclosed balconies that are less than 4 m in depth and outside the exterior of the building façade are exempt from meeting the MECP outdoor noise criteria with regards to transportation noise sources. Should the depth of the future balconies and terraces be greater than 4 m, they will be subject to the MECP noise level limit of 55 dBA.

2.2 Transportation Noise – Indoor Living Spaces

Bedrooms are required to meet an indoor noise level (L_{eq}-8hr) of 40 dBA from road traffic during nighttime hours. The indoor daytime noise level (L_{eq}-16hr) due to road traffic must not exceed 45 dBA for living or dining rooms. Lounges, lobbies, retail or general office spaces should meet a daytime indoor noise level of 50 dBA from road traffic. In order to achieve these levels, the MECP guidelines provide a basis for the types of windows, exterior walls, and doors that will be required based on projected outdoor noise levels.

The MECP also requires that a central air conditioning system be installed for dwellings when the daytime or nighttime outdoor transportation noise levels at the plane of window of bedrooms or living/dining rooms are above 65 dBA or 60 dBA, respectively. The provision for the future installation of central air conditioning must be made if:

- the nighttime sound level is greater than 50 dBA and less than or equal to 60 dBA on the outside face of a bedroom window; or
- the daytime sound level is greater than 55 dBA and less than or equal to 65 dBA on the outside face of a bedroom or living/dining room window.

The above provision usually involves a central air conditioning system or a ducted heating system sized to accommodate the addition of central air conditioning by the occupant. It is to be noted that the current design anticipates the installation of either a central air conditioning system or a ducted heating system to service each residential unit.

The required limits as per NPC-300 are summarized in Table 1.

Table 1: Indoor Sound Level Limits Due to Road Traffic

Type of Space	Time Period	L_{eq} (dBA) Road Traffic
Living/dining, den areas of residences, hospitals, nursing homes, schools, day-care centres (Indoor)	07:00 – 23:00	45 dBA
Living/dining, den areas of residences, hospitals, nursing homes (Indoor)	23:00 – 07:00	45 dBA
Sleeping quarters (Indoor)	07:00 – 23:00	45 dBA
	23:00 – 07:00	40 dBA
Outdoor Living Areas (OLA)	07:00 – 23:00	55 dBA

3 Noise Level Predictions

3.1 Road Traffic Noise Calculations Procedure

The dominant road traffic noise sources in the subject study area are Abbott Street and Stittsville Main Street.

Road traffic noise level calculations were performed in accordance with the MECP Guidelines and the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT), as well as the City of Ottawa's ENCG. Sample copies of the traffic noise predictions from MECP's Road and Rail Traffic Noise Prediction Model STAMSON (Version 5.04) are included in Appendix B.

The equivalent sound levels (L_{eq}) due to road traffic were calculated at the worst-case noise sensitive residential receptors on the northwest, northeast and southeast façades of the residential component of the proposed development. It is understood that all residential balconies are to be less than 4 m in depth and are therefore exempt from the transportation noise MECP criteria. Noise levels were also calculated for an at-grade OLA location at ground level to the north of the residential buildings.

3.2 Road Traffic Data

Future sound levels have been based on the ENCG Appendix B: Table of Traffic and Road Parameters to be Used for Sound Level Predictions. These reflect the ultimate population and traffic capacity forecasts of the Official Plan of the City (Mature State of Development) and are summarized in Table 2. Where road traffic data was available, the counts used for calculations were those which resulted in the highest noise impact.

Table 2: Road Traffic Volumes

	Abbott Street West	Abbott Street East	Stittsville Main Street
Implied Roadway Class	2-Lane Urban Collector (2-UCU)	2-Lane Major Collector (2-UMCU)	2-Lane Rural Arterial (2-RAU)
AADT Vehicles/Day	8,000	12,000	15,000
Day/Night Split (%)	92/8	92/8	92/8
Percentage of Trucks (%)	12	12	12
Medium/Heavy Split (%)	7/5	7/5	7/5
Grade (%)	0	0	0
Road Pavement	1 (Typical asphalt)	1 (Typical asphalt)	1 (Typical asphalt)
Posted Speed (km/hr)	40	50	50

4 Transportation Noise Predictions

Table 3 lists the predicted 16-hour daytime and 8-hour nighttime L_{eq} noise levels due to road traffic at noise sensitive locations within the development, labelled on the site plan in Figures 2A and 2B. Sample calculations are provided in Appendix B.

Table 3: Calculated Noise Levels Due to Road Traffic

Location	Intermediate Surface	Height (m)	Distance (m)	Description	L_{eq} (dBA)	
					Day	Night
C01 NW Façade	1 (Absorptive)	10.5	55 (to Abbott) 40 (to Main)	4th floor residential; full exposure to Abbott, partial exposure to Main	61	53
C02 NE Façade	1 (Absorptive)	10.5	57 (to Abbott) 36 (to Main)	4th floor residential; partial exposure to Abbott, full exposure to Main	63	55
C03 SE Façade	1 (Absorptive)	10.5	40 (to Main)	4th floor residential unit; partial exposure to Main	59	51
OLA1 NW Amenity	1 (Absorptive)	1.5	53 (to Abbott) 45 (to Main)	Ground level OLA	58	-

5 Noise Control Recommendations

5.1 Transportation Noise – Outdoor Living Areas

Outdoor locations used by the restaurant and at balconies less than 4 m in depth are not subject the outdoor sound level limits for road traffic noise. Calculations for the amenity area patio located outside the northwest façade of the residential building have been included. Based on the predicted 16-hour daytime L_{eq} level of 58 dBA, no acoustic barriers would be required for an OLA at this location subject to Warning Clause A, as found in Section 7, being included in the purchase and sale/lease agreements of the affected suite(s).

Any other residential OLAs, including any terraces that are to be more than 4 m deep, should be analysed in further detail if introduced later in the design process.

5.2 Transportation Noise – Indoor Living Spaces

Indoor noise levels due to road traffic will depend on both the external road traffic noise level and the sound isolation performance of the building envelope. Based on the predicted noise levels shown in Table 3, standard exterior window and wall components that meet

the requirements of the Ontario Building Code (OBC) should be sufficient for meeting the MECP indoor sound level guidelines.

The daytime and nighttime noise levels dictate that residential suites should be provided with a provision for adding air conditioning at the discretion of future occupants. In this case Warning Clause C, as found in Section 7, should be included in the purchase and sale/lease agreements of all suites.

5.3 Stationary Noise Sources

Based on the review of aerial imagery of the proposed site, as well as a site visit conducted by Aercoustics personnel on August 28, 2020, no significant sources of stationary noise have been observed which would be expected to generate a significant noise impact on the proposed development.

The current site plan and elevation drawings show an at-grade chiller on the southwest side of the site and a mechanical equipment location close to the centre of the residential building roof. As of the time of this report, detailed mechanical equipment specifications are unknown. Mechanical equipment which may be included in the design may include emergency generator(s), cooling tower(s), air handling equipment, restaurant exhaust equipment, or others. A detailed analysis should be conducted once equipment details become available and should include an assessment of the noise impact on the surrounding noise sensitive receptors, as well as on the residential development itself. This assessment should be performed in accordance with NPC-300 as well as the City of Ottawa By-law No.2017-255.

Similarly, the design and associated administrative controls of the restaurant patio should be considered to minimize the impact of noise from patrons on the surrounding area.

6 Conclusions

The results of this study indicate that standard exterior window and wall components that meet the requirements of the Ontario Building Code (OBC) should be sufficient for compliance with the MECP and ENCG criteria for indoor sound levels.

As indicated in the MECP implementation guidelines, where noise may be a concern, future occupants will be advised through warning clauses. Notes and sample wording for the warning clauses is provided in Section 7 of this report.

Further analysis should be conducted to confirm the noise impact of the development, including the restaurant area, both on itself and the surrounding environment when more detailed information is available for the proposed mechanical equipment and building construction.

7 Warning Clauses

Purchase, rental and lease agreements for all units in the proposed residential buildings are recommended to include the following warning clauses:

Warning Clause Type A:

"Purchasers/tenants are advised that sound levels due to increasing road traffic on Stittsville Main Street may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City of Ottawa and the Ministry of the Environment, Conservation and Parks."

Warning Clause Type C:

"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the City of Ottawa and the Ministry of the Environment, Conservation and Parks."

8 References

1. ORNAMENT – “Ontario Road Noise Analysis Method for Environmental and Transportation”, Ontario Ministry of the Environment, October, 1989.

2. “Building Practice Note No. 56: Controlling Sound Transmission into Buildings”, by J.D. Quirt, Division of Building Research, National Research Council of Canada, September, 1995.

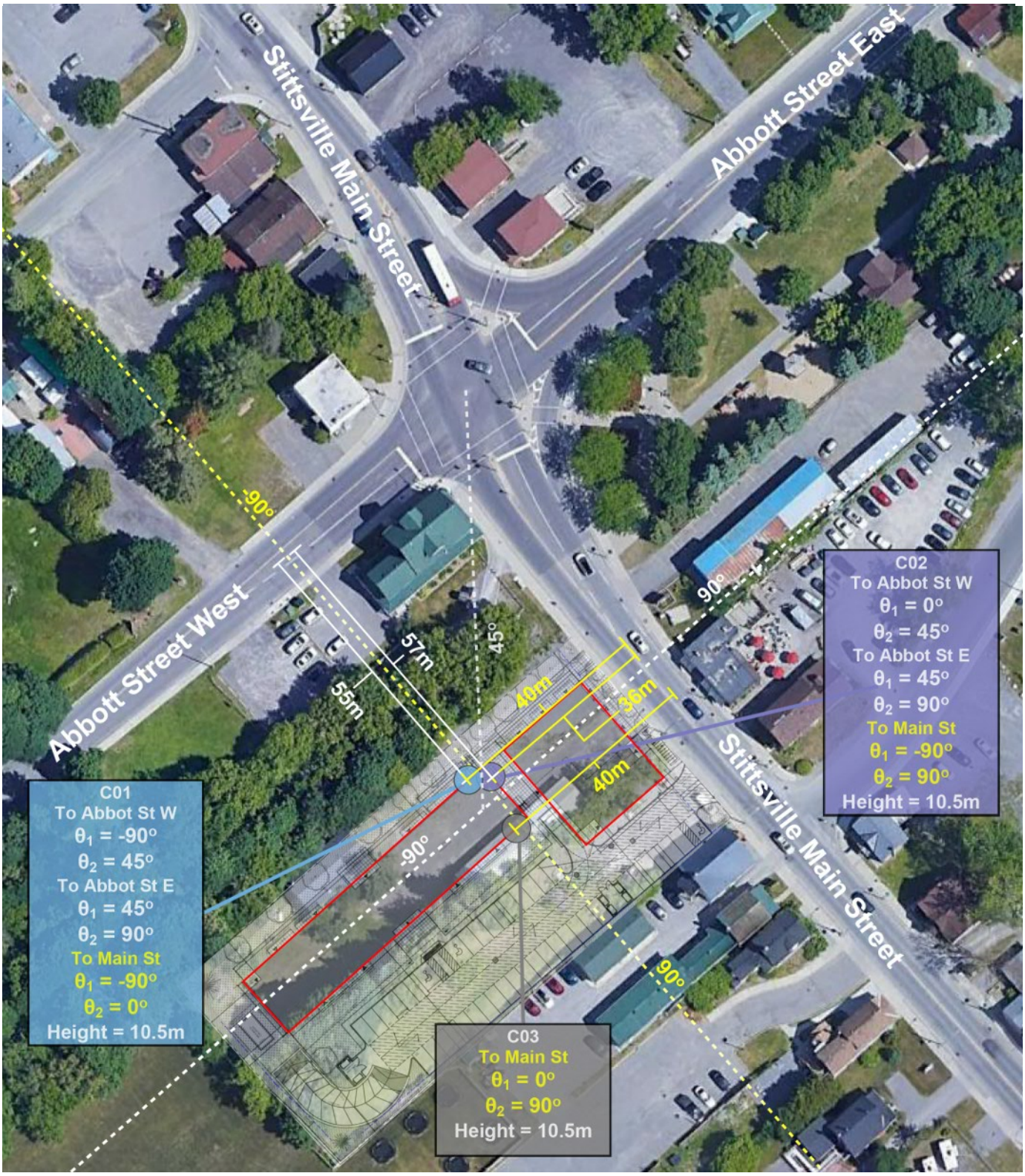
3. “Stationary and Transportation Sources – Approval and Planning”, Ontario Ministry of the Environment, Publication NPC-300, August, 2013.

4. “Environmental Noise Control Guidelines”, City of Ottawa, September 2016

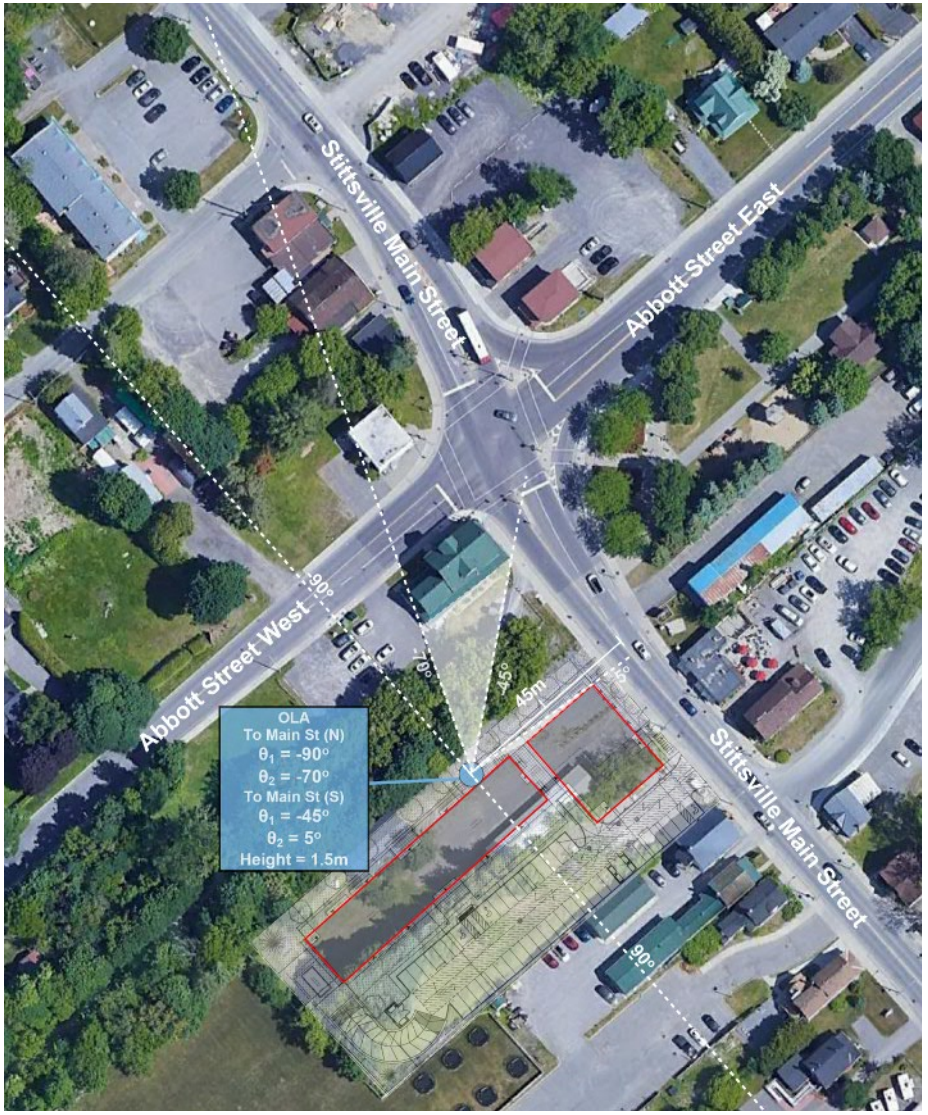
5. “By-law No. 2017-255”, City of Ottawa, May, 2017.

aercoustics	Project ID: 20085.00 Scale: NTS Drawn by: SZ Reviewed by: KC Date: Oct 13, 2020 Revision: 1	**Project Name** 1518-1526 Stittsville Main Street - Noise Impact Study **Figure Title** Key Plan showing site location and surrounding area

Figure 1



aercoustics	Project ID: 20085.00	**Project Name** 1518-1526 Stittsville Main Street	
	Scale: NTS Drawn by: SZ Reviewed by: KC Date: Feb 5, 2021 Revision: 1	**Figure Title** Site Plan & Road Traffic Noise Calc Locations (Facade Receptors)	**Figure 2A**



aercoustics	Project ID: 20085.00 Scale: NTS Drawn by: SZ Reviewed by: KC Date: Feb 5, 2021 Revision: 1	**Project Name** 1518-1526 Stittsville Main Street	
		Figure Title Site Plan & Road Traffic Noise Calculation Locations (OLA)	**Figure 2B**

Appendix A
Site Plan & Drawings

LOCATION PLAN

50m

SUBJECT PROPERTY AT 1518-1524-1526 STITTSVILLE MAIN STREET CONSISTS OF PARCELS:
PIN 04446-1658, PIN 04446-0338 and 04446-0240.

Zoning Regulations
Site Zoning: TM9[2272] H(15), consolidation date: August 26, 2015
Proposed Use: Apartment dwelling, Restaurant and Office.

	REQUIRED	PROVIDED
Minimum Lot Area (m²)	No minimum	4,759
Minimum Lot Width (m)	No minimum	47.93
Front Yard Setback (m)		5.78
i) minimum	*No minimum*	
ii) maximum	*3*	
Interior Side Yard Setback (m)		7.5
i) minimum	*7.5*	
ii) maximum	*N/A*	
Rear Yard Setback (m)		10.04
2) all other cases	*10*	
Building Height (m)		15.0
i) minimum	*6.7*	4 storeys
ii) maximum	*20m / 4 storeys*	
Minimum width of landscape (m)	*No minimum*	1.5

Site Statistics

Building Area/Footprint	1,261 m²
Gross Floor Area (G.F.A.)	
G.F.A. - Restaurant Only	338 m²
G.F.A. - Kitchen Only	95 m²
G.F.A. - Office Only	170 m²
Dwelling Units:	33

Parking Requirements
Table 101 - Min. Parking Space Rates

Area C (on Schedule 1A)	
Restaurant and Kitchen (Ground Floor)	10 per 100 m² of G.F.A.
Parking - required(*)	28.3 spaces
Office (Second Floor)	2.4 per 100 m² of G.F.A.
Parking - required	4.1 spaces
Dwelling, Low-Rise or Mid-Rise	1.2 per dwelling
Parking - required	39.6 spaces

Visitor Parking Requirements
Table 102 - Minimum Visitor Parking

Dwelling, Low-Rise and Mid-Rise	0.2 per dwelling
Parking - required	6.6 spaces

(*) per Zoning By-Law Provision 197(14).

	Required	Provided
Total Parking(**)	75 spaces	76 spaces
...underground		35 spaces
...at grade		41 spaces
Min. Number of Spaces for Persons with Disabilities	4 (for 20-99)	4 spaces
...underground		1 space
...at grade		3 spaces
Required Type A (Van)	2 spaces	2 spaces
Required Type B	2 spaces	2 spaces

(**) per Zoning By-Law Provisions 100(8)(b) and 104(1).

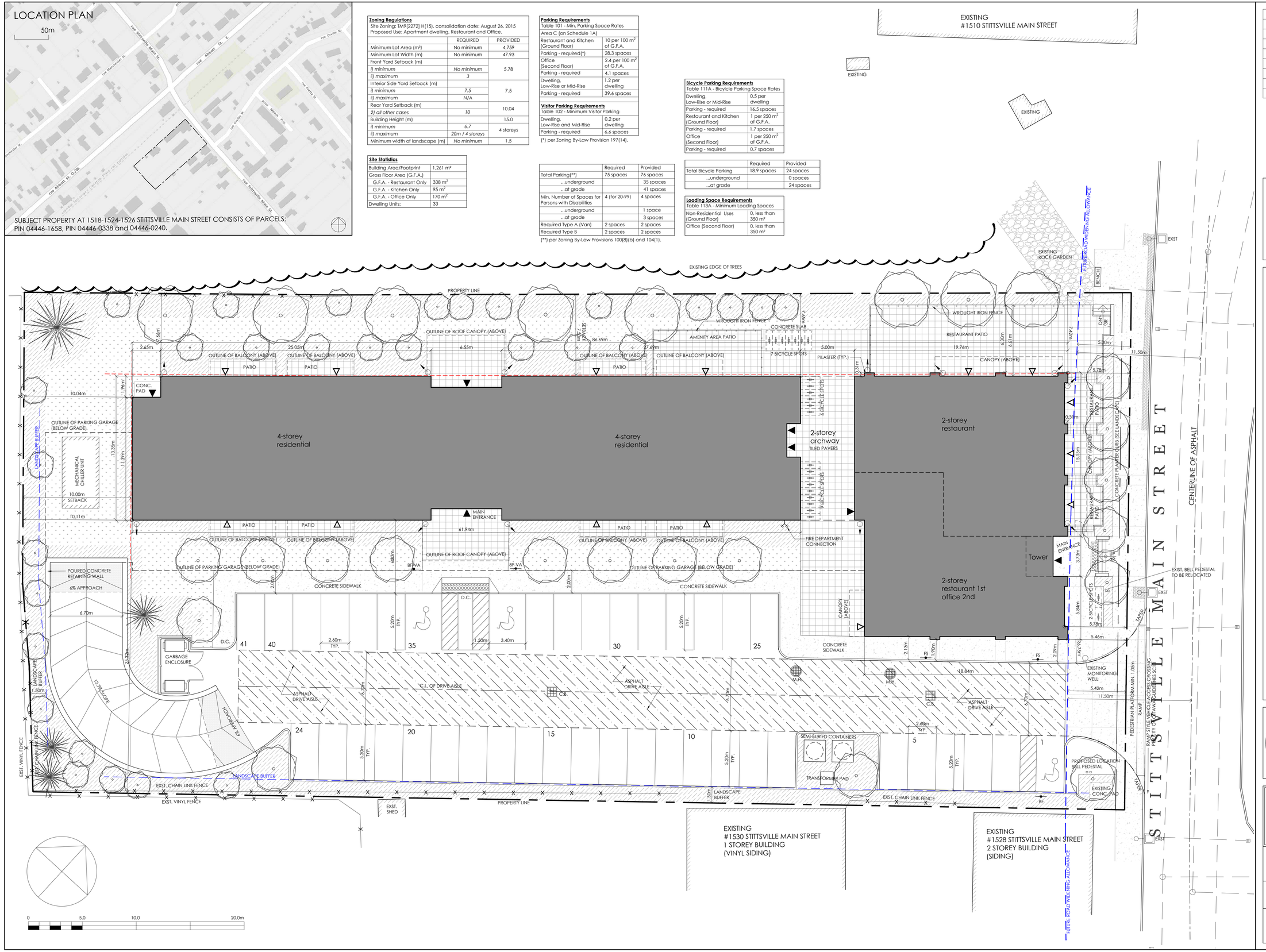
Bicycle Parking Requirements
Table 111A - Bicycle Parking Space Rates

Dwelling, Low-Rise or Mid-Rise	0.5 per dwelling
Parking - required	16.5 spaces
Restaurant and Kitchen (Ground Floor)	1 per 250 m² of G.F.A.
Parking - required	1.7 spaces
Office (Second Floor)	1 per 250 m² of G.F.A.
Parking - required	0.7 spaces

	Required	Provided
Total Bicycle Parking	18.9 spaces	24 spaces
...underground		0 spaces
...at grade		24 spaces

Loading Space Requirements
Table 113A - Minimum Loading Spaces

Non-Residential Uses (Ground Floor)	0, less than 350 m²
Office (Second Floor)	0, less than 350 m²



NO.	REVISION	DATE
1	ISSUED FOR REVIEW	JULY 09/2020
2	ISSUED FOR REVIEW	SEPT. 15/2020
3	ISSUED FOR REVIEW	SEPT. 18/2020
4	ISSUED FOR REVIEW	SEPT. 24/2020
5	PARKING GARAGE ACCESS REVIEW	OCT. 08/2020
6	ISSUED FOR SITE PLAN APPROVAL	NOV. 18/2020
7	ISSUED FOR REVISION	MAR. 29/2021
8	ISSUED FOR CITY REVIEW	APR. 23/2021

General Notes
1. Site plan is based on the plan of survey (REF. No. 326-10-GOULBOURN, JOB No. AA15600) prepared by Fairhall, Moffatt & Woodland Limited dated April 16, 2020. Refer to legal survey for site specific legal information.
2. Refer to civil and landscape drawings for all services and landscape related items.
3. Refer to civil for complete grade information.
4. Garbage and recycling will be handled and stored in dedicated garbage enclosure areas (2 total). It will be collected by a private waste & recycling operations facility.
5. Snow storage: accumulated snow will be trucked off-site.

LEGEND

- PROPERTY LINE
- SETBACK / LANDSCAPE BUFFER (AS NOTED)
- CURB (REFER: CITY OF OTTAWA STANDARDS, CITY SPECIFICATION: SC 1.4.)
- DEPRESSED CURB (PEDESTRIAN CURB RAMP) (REFER: CITY OF OTTAWA STANDARDS, CITY SPECIFICATION: SC 1.4. AND SC6)
- TYPICAL CURB RAMP SEE SECTION 3.4 OF THE CITY OF OTTAWA ACCESSIBILITY DESIGN STANDARDS FOR ADDITIONAL INFORMATION
- DESIGNATED BARRIER FREE PARKING SPACE
- BF — BARRIER FREE PARKING SIGN
- BF-VA — BARRIER FREE PARKING - VAN ACCESSIBLE
- FS — FIRE ROUTE SIGN
- BOLLARD
- DENOTES BUILDING EXIT
- DENOTES BUILDING ENTRY (NON DESIGNATED EXIT)
- FH — FIRE HYDRANT
- U/P — UTILITY POLE
- PROPOSED DOWNSPOUT LOCATION
- PROPOSED GAP AND GRATE IN CONCRETE SIDEWALK AT DOWNSPOUT LOCATION (REFER TO CIVIL)
- CATCH BASIN (C.B.) (REFER TO CIVIL)
- STORM (STM) / MAN HOLE (M.H.) COVER (REFER TO CIVIL)
- LIGHT STANDARD W/POLE BASE
- LIGHT FIXTURE
- TURF
- SOFT LANDSCAPING
- CONCRETE
- DENOTES FIRE ROUTE
- LANDSCAPE PAVERS

CONSTRUCTION

ONTARIO ASSOCIATION OF ARCHITECTS
MALCOLM WILDEBOER
LICENCE
6685

Vandenberg & Wildeboer
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• THE OLD STONE LODGE • 160 FLAMBOROUGH WAY • OTTAWA (KANATA) • ONTARIO • K2K 3B8 •

PROJECT TITLE
THE STATION
1518-1524-1526 STITTSVILLE MAIN STREET

DRAWING TITLE
OVERALL SITE PLAN

DESIGNED BY: MW
DRAWN BY: SC
START DATE: JULY 2020
SCALE: AS SHOWN
PROJECT NO. 1932

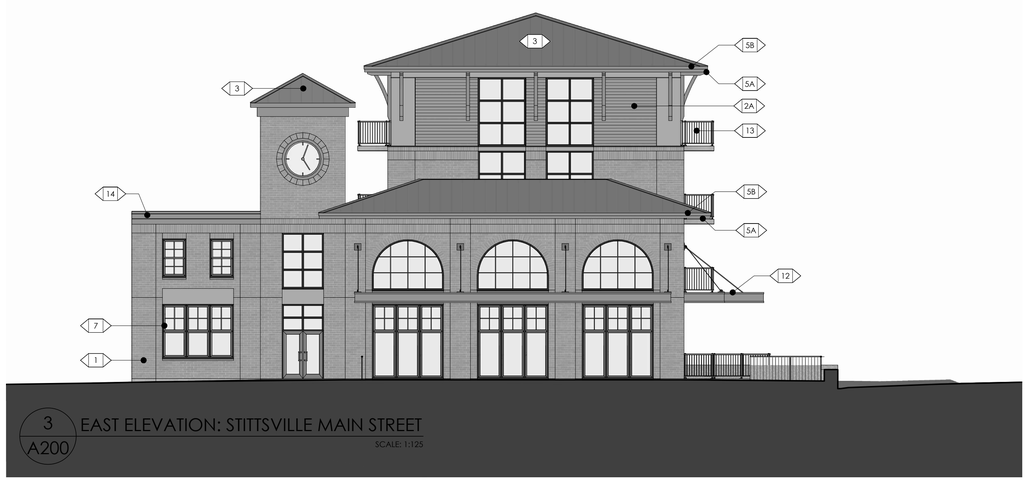
DRAWING No. A001

D07-12-20-0167

PLOT DATE: April 23, 2021

1 A200 NORTH ELEVATION
SCALE: 1:125

2 A200 SOUTH ELEVATION: PARKING DRIVE AISLE
SCALE: 1:125



3 A200 EAST ELEVATION: STITTSVILLE MAIN STREET
SCALE: 1:125

4 A200 WEST ELEVATION
SCALE: 1:125

NO.	REVISION	DATE
1	ISSUED FOR SITE PLAN APPROVAL	NOV. 18/2020
2	ISSUED FOR REVIEW	MAR. 29/2021
3	ISSUED FOR CITY REVIEW	APR. 23/2021

LEGEND

1. MASONRY VENEER
HANSEN WILLIAMSBURG MK2 MAX SIZE OR APPROVED EQ.
2A. PREFINISHED FIBER CEMENT SHAKE & SHINGLE SIDING
JAMES HARDIE OR APPROVED EQ.
2B. PREFINISHED VERTICAL SIDING
JAMES HARDIE OR APPROVED EQ.
2C. PREFINISHED TRIM BOARD
JAMES HARDIE OR APPROVED EQ.
3. PREFINISHED HERITAGE RIB METAL ROOFING
20" SPACING, MARITIME GREY BY IDEAL ROOFING OR EQ.
4. RIDGE VENT
5A. PREFINISHED METAL FASCIA
5B. PREFINISHED ALUMINUM EAVESTROUGH
COLOUR TO MATCH STEPPED FASCIA
6. PVC TRIM BOARD (SMOOTH FINISH)
AZEK OR APPROVED EQ.
7. ALUMINUM CLAD WINDOW
8. CEMENTITIOUS PARGING ON CONCRETE FOUNDATION
9. MECHANICAL EQUIPMENT
10. SCREEN WALL SYSTEM
AZEK OR APPROVED EQ.
11. ROOF BRACKET
12. ROOF CANOPY
13. PREFINISHED METAL RAILING
14. PVC PARAPET MOULDING (SMOOTH FINISH)
AZEK OR APPROVED EQ.

CONSTRUCTION

ONTARIO ASSOCIATION OF ARCHITECTS
MALCOLM WILDEBOER
LICENCE
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Vandenberg & Wildeboer
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PROJECT TITLE
THE STATION
1518-1524-1526 STITTSVILLE MAIN STREET

DRAWING TITLE
BUILDING ELEVATIONS

DESIGNED BY:	MW
DRAWN BY:	SC
START DATE:	JULY 2020
SCALE:	AS SHOWN
PROJECT NO.	1932

DRAWING No. A200

PLOT DATE: April 23, 2021

Appendix B
Sample Calculations

```
STAMSON 5.0        NORMAL REPORT        Date: 05-02-2021 17:16:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c01.te               Time Period: Day/Night 16/8 hours
Description: C01 - NW Facade Receptor

Road data, segment # 1: Abbott W (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Abbott W (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  :  55.00 / 55.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Road data, segment # 2: Abbott E (day/night)

```
-----------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00
```

Data for Segment # 2: Abbott E (day/night)

```
-----------------------------------------
Angle1   Angle2           :  45.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  55.00 / 55.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 3: Main (day/night)
----------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Main (day/night)
--------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  40.00 / 40.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Abbott W (day)

Source height = 1.50 m

ROAD (0.00 + 54.18 + 0.00) = 54.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.39	63.96	0.00	-7.84	-1.94	0.00	0.00	0.00	54.18

Segment Leq : 54.18 dBA

Results segment # 2: Abbott E (day)

Source height = 1.50 m

ROAD (0.00 + 51.74 + 0.00) = 51.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
45	90	0.39	67.51	0.00	-7.84	-7.93	0.00	0.00	0.00	51.74

Segment Leq : 51.74 dBA

Results segment # 3: Main (day)

Source height = 1.50 m

ROAD (0.00 + 58.59 + 0.00) = 58.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.39	68.48	0.00	-5.92	-3.97	0.00	0.00	0.00	58.59

Segment Leq : 58.59 dBA

Total Leq All Segments: 60.55 dBA

Results segment # 1: Abbott W (night)

Source height = 1.50 m

ROAD (0.00 + 46.58 + 0.00) = 46.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.39	56.36	0.00	-7.84	-1.94	0.00	0.00	0.00	46.58

Segment Leq : 46.58 dBA

Results segment # 2: Abbott E (night)

Source height = 1.50 m

ROAD (0.00 + 44.14 + 0.00) = 44.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
45	90	0.39	59.91	0.00	-7.84	-7.93	0.00	0.00	0.00	44.14

Segment Leq : 44.14 dBA

Results segment # 3: Main (night)

Source height = 1.50 m

ROAD (0.00 + 50.99 + 0.00) = 50.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.39	60.88	0.00	-5.92	-3.97	0.00	0.00	0.00	50.99

Segment Leq : 50.99 dBA

Total Leq All Segments: 52.95 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.55
(NIGHT): 52.95

```
STAMSON 5.0        NORMAL REPORT        Date: 05-02-2021 17:26:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c02.te               Time Period: Day/Night 16/8 hours
Description: C02 - NE Facade Receptor

Road data, segment # 1: Abbott W (day/night)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Abbott W (day/night)
-----------------------------------------------
Angle1   Angle2           :   0.00 deg   45.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  57.00 / 57.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Road data, segment # 2: Abbott E (day/night)

```
-----------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00
```

Data for Segment # 2: Abbott E (day/night)

```
-----------------------------------------
Angle1   Angle2           :  45.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  57.00 / 57.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Road data, segment # 3: Main (day/night)
----------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 3: Main (day/night)
--------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  36.00 / 36.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Abbott W (day)

Source height = 1.50 m

ROAD (0.00 + 49.69 + 0.00) = 49.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	45	0.39	63.96	0.00	-8.06	-6.20	0.00	0.00	0.00	49.69

Segment Leq : 49.69 dBA

Results segment # 2: Abbott E (day)

Source height = 1.50 m

ROAD (0.00 + 51.52 + 0.00) = 51.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
45	90	0.39	67.51	0.00	-8.06	-7.93	0.00	0.00	0.00	51.52

Segment Leq : 51.52 dBA

Results segment # 3: Main (day)

Source height = 1.50 m

ROAD (0.00 + 62.23 + 0.00) = 62.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.39	68.48	0.00	-5.29	-0.96	0.00	0.00	0.00	62.23

Segment Leq : 62.23 dBA

Total Leq All Segments: 62.80 dBA

Results segment # 1: Abbott W (night)

Source height = 1.50 m

ROAD (0.00 + 42.10 + 0.00) = 42.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	45	0.39	56.36	0.00	-8.06	-6.20	0.00	0.00	0.00	42.10

Segment Leq : 42.10 dBA

Results segment # 2: Abbott E (night)

Source height = 1.50 m

ROAD (0.00 + 43.92 + 0.00) = 43.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
45	90	0.39	59.91	0.00	-8.06	-7.93	0.00	0.00	0.00	43.92

Segment Leq : 43.92 dBA

Results segment # 3: Main (night)

Source height = 1.50 m

ROAD (0.00 + 54.64 + 0.00) = 54.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.39	60.88	0.00	-5.29	-0.96	0.00	0.00	0.00	54.64

Segment Leq : 54.64 dBA

Total Leq All Segments: 55.21 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.80
(NIGHT): 55.21

```
STAMSON 5.0        NORMAL REPORT        Date: 05-02-2021 17:35:41
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c03.te               Time Period: Day/Night 16/8 hours
Description: C03 - SE Facade Receptor

Road data, segment # 1: Main (day/night)
----------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Main (day/night)
----------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  40.00 / 40.00  m
Receiver height           :  10.50 / 10.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.50 m

ROAD (0.00 + 58.59 + 0.00) = 58.59 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.39  68.48   0.00  -5.92  -3.97   0.00   0.00   0.00  58.59
-------------------------------------------------------------------------------

Segment Leq : 58.59 dBA

Total Leq All Segments: 58.59 dBA
```

Results segment # 1: Main (night)

Source height = 1.50 m

ROAD (0.00 + 50.99 + 0.00) = 50.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.39	60.88	0.00	-5.92	-3.97	0.00	0.00	0.00	50.99

Segment Leq : 50.99 dBA

Total Leq All Segments: 50.99 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.59
(NIGHT): 50.99

```
STAMSON 5.0        NORMAL REPORT        Date: 05-02-2021 17:38:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ola.te               Time Period: Day 16 hours
Description: OLA Receptor

Road data, segment # 1: Abbott W (day)
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    40 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):   8000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 1: Abbott W (day)
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   20.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  53.00 / 53.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Road data, segment # 2: Abbott E (day)

```
-------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  12000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00
```

Data for Segment # 2: Abbott E (day)

```
-----------------------------------------
Angle1   Angle2           :  45.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  53.00 / 53.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Road data, segment # 3: Main N (day)

```
------------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00
```

Data for Segment # 3: Main N (day)

```
------------------------------------
Angle1   Angle2           : -90.00 deg   -70.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Road data, segment # 4: Main S (day)

```
-----------------------------------------
Car traffic volume  : 12144/1056  veh/TimePeriod  *
Medium truck volume :   966/84    veh/TimePeriod  *
Heavy truck volume  :   690/60    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  15000
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00
```

Data for Segment # 4: Main S (day)

```
-----------------------------------------
Angle1   Angle2           : -45.00 deg   5.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :   1.50 / 1.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Abbott W (day)

Source height = 1.50 m

ROAD (0.00 + 51.55 + 0.00) = 51.55 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	20	0.66	63.96	0.00	-9.10	-3.31	0.00	0.00	0.00	51.55

Segment Leq : 51.55 dBA

Results segment # 2: Abbott E (day)

Source height = 1.50 m

ROAD (0.00 + 49.36 + 0.00) = 49.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
45	90	0.66	67.51	0.00	-9.10	-9.05	0.00	0.00	0.00	49.36

Segment Leq : 49.36 dBA

Results segment # 3: Main N (day)

Source height = 1.50 m

ROAD (0.00 + 45.77 + 0.00) = 45.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-70	0.66	68.48	0.00	-7.92	-14.79	0.00	0.00	0.00	45.77

Segment Leq : 45.77 dBA

Results segment # 4: Main S (day)

Source height = 1.50 m

ROAD (0.00 + 54.72 + 0.00) = 54.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	5	0.66	68.48	0.00	-7.92	-5.84	0.00	0.00	0.00	54.72

Segment Leq : 54.72 dBA

```
Total Leq All Segments: 57.51 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.51
```

End of Report