

Noise Feasibility Study

Royal Windsor at Balmoral Village

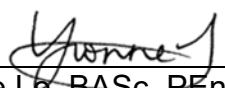
Block 2

West of Highway No. 26, Collingwood, Ontario

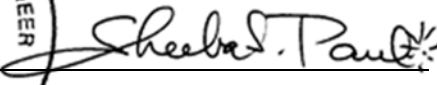
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HGC Project Number: 01900610

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1 Introduction & Summary

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by Reid's Heritage Homes to conduct a noise feasibility study for their proposed residential development (Balmoral Village Block 2) to be located south of Harbour Street, west of Block 3 and west of Highway No. 26 in the Town of Collingwood, Ontario. Areas surrounding the proposed development include existing residential and commercial/retail uses. The subject site will consist of a 5-storey residential building. The study is required by the municipality as part of their planning and approvals process. The Town requires a noise feasibility study is to be submitted to confirm that noise generation from Highway No. 26 and Harbour Street will not impact residential units in this proposed Block 2 building. Furthermore, the study will examine the probable noise generated by the proposed building's HVAC equipment on abutting dwelling units in Blocks 1, 3 & 4.

The primary noise source impacting the site was determined to be road traffic on Harbour Street West. A secondary noise source is Highway No. 26. Road traffic data for Highway No. 26 and Harbour Street were obtained from the Collingwood Transportation Study from 2019. The data was used to predict future traffic sound levels at the locations of the proposed building facades. The predicted sound levels were compared to the guidelines of the Ministry of Environment, Conservation and Parks (MECP) to develop noise control recommendations for the proposed development.

The sound level predictions indicate that the future road traffic sound levels will be within MECP guidelines at the proposed residential building. Building constructions meeting the minimum requirements of the Ontario Building Code will be sufficient for the entire building. A warning clause is recommended to inform future residents and the owner of the building of the proximity to existing and future commercial uses.

An analysis was also conducted to determine the potential impact of noise from rooftop units on the proposed building on existing residential buildings. Detailed information regarding the type or model of the proposed mechanical equipment was not known at the time of the study, but reasonable estimates of the sizes and tonnages have been used based on experience with similar projects. Manufacturer's sound power data was used to estimate sound levels associated with the rooftop



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equipment on the proposed building on existing dwelling units.

The results indicate that the sound emissions from the rooftop equipment associated with the proposed residential building on existing residential uses will be within MECP sound level criteria without additional mitigation. Physical mitigation measures are not required for mechanical equipment associated with the proposed building.

2 Site Description & Noise Sources

The site is situated on the south side of Harbour Street, west of Block 3 and west of Highway No. 26 in Collingwood, Ontario. Figure 1 shows an aerial photo illustrating the location of the proposed site. A site plan prepared by KNYMH Inc. dated November 19, 2019 is shown as Figure 2. The proposed development will consist of a 5-storey residential building with a total of 132 units. Block 3 to the east of the site is proposed to include future commercial/retail uses.

A site visit was made by HGC Engineering personnel in October 2019 to make observations of the acoustical environment. The surrounding area is considered to be Class 1 (Urban) in terms of its acoustical environment. Road traffic on Highway No. 26 was confirmed to be the dominant source of sound. Highway No. 26 is a 4-lane arterial roadway under the jurisdiction of the Town of Collingwood and is 2 lanes in each direction. In the vicinity of the subject site, Highway No. 26 has a north-south orientation, though overall, the highway is an east-west highway. To the south of Harbour Street, Highway No. 26 has a four-lane urban cross-section, which transitions north of Harbour Street to a three and then two-lane section. The roadway is urban through the four-lane cross-section, mixed urban and rural through the three-lane cross-section and rural through the two-lane cross-section. The posted speed limit is 50 km/h. Harbour Street is a two-lane east-west collector roadway under the jurisdiction of the Town of Collingwood. The roadway has a rural cross-section and the posted speed limit is 40 km/h.

There are existing 2-storey residences on the north side of Harbour Street and a commercial plaza at the northwest corner of Harbour Street and Highway No. 26. A 4-storey senior's apartment and 4-storey retirement residence are located in Block 4 to the east. South and west of the site is Block 1 which includes blocks of 1-storey and 2-storey semi-detached dwellings and townhouse units. There is a commercial plaza including a Canadian Tire to the south of the subject site and Black Ash Creek



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at approximately 240 m in distance. Noise from the commercial uses was not audible over road traffic noise and is not considered further.

3 Noise Level Criteria

3.1 Road Traffic Noise

Guidelines for acceptable levels of road traffic noise impacting residential developments are given in the MECP publication NPC-300, “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”, Part C release date October 21, 2013, and are listed in Table I below. The values in Table I are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels [dBA].

Table I: MECP Road Traffic Noise Criteria (dBA)

Area	Daytime L_{EQ} (16 hour) Road	Nighttime L_{EQ} (8 hour) Road
Outdoor Living Area	55 dBA	--
Inside Living/Dining Room	45 dBA	45 dBA
Inside Sleeping Quarters	45 dBA	40 dBA

Daytime refers to the period between 07:00 and 23:00, while nighttime refers to the period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace or other area where passive recreation is expected to occur. Balconies that are less than 4 m in depth are not considered to be outdoor living areas under MECP guidelines.

The guidelines in the MECP publication allow the sound level in an OLA to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed

60 dBA or daytime sound levels outside bedroom or living/dining room windows exceed 65 dBA. Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at bedroom or living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom or living/dining room windows are in the range of 56 to 65 dBA. The location and installation of the outdoor air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-300.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window nighttime sound level is greater than 60 dBA or the daytime sound level is greater than 65 dBA due to road traffic noise.

Warning clauses to notify future residents of possible excesses are also required when nighttime sound levels exceed 50 dBA at the plane of the bedroom or living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of the bedroom or living/dining room window due to road traffic.

4 Traffic Noise Assessment

4.1 Road Traffic

Road traffic data for Harbour Street and Highway No. 26 were obtained from the Collingwood Transportation Study prepared by R.J. Burnside & Associated Ltd., and is provided in Appendix A. The data was grown to the year 2030 using a 2.8% compound growth rate as indicated in the traffic study. Commercial vehicle percentages of 0.1% medium trucks and 0.1% heavy trucks for Harbour Street and 1.9% medium trucks and 0.4% heavy trucks for Highway 26 were used in the analysis. A posted speed limit of 40 km/h for Harbour Street and 60 km/h for Highway 26 were used in the analysis. A day/night split of 90/10% was also used. The resulting future traffic volumes are listed in Table II.

Table II: Projected Traffic Data to 2030

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Highway No. 26	Daytime	19 129	372	78	19 579
	Nighttime	2 125	41	9	2 175
	Total	21 254	413	87	21 754
Harbour Street	Daytime	2 051	2	2	2 055
	Nighttime	228	0	0	228
	Total	2 278	2	2	2 283

4.2 Road Traffic Noise Predictions

To assess the levels of road traffic noise which will impact the site in the future, predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B.

Prediction locations indicated in Figure 2 were chosen around the residential site to obtain a good representation of the future sound levels at the façades with exposure to Harbour Street and Highway No. 26. The worst case prediction locations were chosen to represent the top storey façades, to investigate ventilation requirements. The results of these predictions are summarized in Table III.

Table III: Predicted Road Traffic Sound Levels [dBA], Without Mitigation

Prediction Location	Description	Daytime – at Façade LEQ(16)	Nighttime – at Façade LEQ(8)
A	North façade facing Harbour Street	<55	<50
B	East façade with exposure to Highway 26 and Harbour Street	<55	<50
C	South façade with exposure to Highway 26	<55	<50
D	West façade with exposure to Harbour Street	<55	<50

4.3 Traffic Noise Recommendations

The predictions indicate that the future traffic sound levels will be within MECP guidelines at all façades of the proposed residential building.

4.3.1 Outdoor Living Areas

The residential units may have balconies less than 4 m in depth. These balconies are not considered as outdoor living areas under MECP guidelines, and therefore are exempt from traffic noise assessment.

There are no outdoor amenity areas shown on the site plan.

4.3.2 Indoor Living Areas & Ventilation Requirements

The predicted future sound levels at the façades of the proposed building will be less than 50 dBA and 55 dBA during nighttime and daytime, respectively. This is below the MECP limit and thus there are no specific ventilation requirements for the proposed building.

4.3.3 Building Facade Constructions

Since the future road traffic sound levels at the façades of the proposed building will be less than or equal to 65 dBA during daytime and 60 dBA during nighttime, any exterior wall, and double glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the proposed building.

4.3.4 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements for the proposed residential building.

Suitable wording for future dwellings adjacent to commercial facilities is given below.

Type A:

Tenants are advised that due to the proximity of the adjacent commercial facilities, noise from the facilities may at times be audible.

These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

4.3.5 Future Commercial Block

Block is proposed as a future 2-storey commercial building. When details regarding the tenancies of the building are known, a noise study should be undertaken by the developer of the commercial building in accordance with NPC-300 to determine the impact of rooftop equipment and any trucking activities on the existing residences and to determine appropriate mitigation as necessary.

5 Stationary Noise Assessment

5.1 Criteria Governing Stationary (Industrial) Noise Sources

An industrial or commercial facility is classified in MECP guidelines as a stationary source of sound (as compared to sources such as traffic or construction, for example) for noise assessment purposes. The rooftop mechanical equipment to be located on the roof of the proposed building can be classified as stationary sources of sound. The stationary noise source locations and receptor locations (R1 to R5) are shown in Figure 3.

The Ministry of the Environment, Conservation and Parks (MECP) provides guidelines for the assessment of stationary noise sources. NPC-300 “Environment Noise Guideline Stationary and Transportation Sources – Approval and Planning” referenced with regard to traffic noise is also intended for use in the planning of noise sensitive land uses adjacent to residential buildings.

The criteria is based on the background sound level at sensitive points of reception (which are typically residences) in the quietest hour that the source can be in operation. Background sound includes sound from road traffic and natural sounds, but excludes the sources under assessment. For relatively quiet areas where background sound may fall to low levels during some hours, NPC-300 stipulates various minimum limits. As per NPC-300, this area is considered a Class 1 area since the background sound level is dominated by the activities of people and road traffic. In class 1 areas, these limits are 50 dBA for daytime periods (07:00 to 23:00) and 45 dBA at night (23:00 to 07:00).

Commercial activities such as the occasional movement of customer/employee vehicles, deliveries to conveniences stores and restaurants and garbage collection are not of themselves considered to be significant noise sources in the MECP guidelines. Accordingly, these sources have not been considered in this study. Truck movements at a warehouse or busy shipping/receiving docks at an industry must generally be assessed. Frequent truck movements are not anticipated at this site and therefore have not been included in the analysis.

5.2 Assessment of Stationary Noise Sources Associated with the Proposed Building at Existing Sensitive Receptors

Predictive noise modelling was used to assess the potential noise impact of the proposed rooftop equipment at the closest residential receptors. The noise prediction model was based on sound emission levels for rooftop equipment, assumed operational profiles (during the daytime and nighttime), and established engineering methods for the prediction of outdoor sound propagation. These methods include the effects of distance, air absorption, and acoustical screening by barrier obstacles.

Detailed mechanical rooftop plans are currently not available as the proposed development is still in the early stages of planning. Typical rooftop equipment was obtained from a rooftop mechanical plan for a similar residential building and was used in the analysis. Two makeup air units on the roof of the proposed residential building with sound power ratings of 90 dBA were assumed in the analysis.

In accordance with establishing the predictable worst-case conditions, the proposed rooftop equipment was assumed to operate at 100% capacity during daytime and 50% during night-time hours.

The sound levels were used as input to a predictive computer model. The software used for this purpose (*Cadna-A version 2019 MR2 (32 bit) build: 173.4905*) is a computer implementation of ISO Standard 9613-2.2 “Acoustics - Attenuation of Sound During Propagation Outdoors.” The ISO method accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as barriers. The calculations consider the acoustical effects of distance and shielding by the building. The



unmitigated sound levels due to the rooftop mechanical equipment at the closest neighbouring residences are summarized in the following table. Sound level contours are shown in Figures 3 and 4. The resultant sound levels due to the rooftop mechanical equipment at the closest neighbouring residences (R1 to R5) are summarized in the following table.

Table IV: Predicted Sound Levels at Existing Residential Receptors [dBA], Without Mitigation

Receptor	Criteria Day/ Night	Predicted Daytime – at Façade	Predicted Night-time – at Façade
R1 (existing townhouse unit to the west)	50 / 45	37	34
R2 (existing townhouse unit to the west)	50 / 45	38	35
R3 (existing townhouse unit to the south)	50 / 45	<35	<30
R4 (existing townhouse unit to the southeast)	50 / 45	39	36
R5 (existing seniors apartment to the east)	50 / 45	46	43

The results from the preliminary stationary source noise assessment indicate that noise from proposed rooftop mechanical equipment will be below MECP guidelines at the existing sensitive receptors and noise mitigation measures are not required.

6 Impact of the Development on Itself

Section 5.9.1 of the Ontario Building Code (OBC) specifies the minimum required sound insulation characteristics for demising partitions, in terms of Sound Transmission Class (STC) values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls must meet or exceed STC-50. Walls separating a suite from a noisy space such as a refuse chute, or elevator shaft, must meet or exceed STC-55. In addition, it is recommended that the floor/ceiling constructions separating suites from any amenity or commercial spaces also meet or exceed STC-55. Tables 1 and 2 in Section SB-3 of the Supplementary Guideline to the OBC provide a comprehensive list of constructions that will meet the above requirements.

Tarion's Builder Bulletin B19R requires the internal design of condominium projects to integrate suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of

the buildings on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself is maintained within acceptable levels.

7 Summary and Recommendations

The following list and Table V summarize the recommendations made in this report. The reader is referred to the previous sections of the report where these recommendations are discussed in more detail.

For transportation noise sources

1. Any building construction meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for the indoor spaces.
2. Warning clauses should be included in the property and tenancy agreements and offers of purchase or sale to inform future owners/occupants of the presence of nearby commercial uses, as indicated in Section 4.3.4.
3. Demising assemblies should be selected to meet the minimum requirements of the Ontario Building Code (OBC). If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself are maintained within acceptable levels.
4. Tarion Builder's Bulletin B19R requires that the internal design of condominium projects integrates suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the buildings on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself are maintained within acceptable levels.

The reader is referred to the previous sections of the report where these recommendations are discussed in more detail.

Table V: Summary of Noise Control Requirements and Noise Warning Clauses

Prediction Location	Location	Acoustic Barrier	Ventilation Requirements	Warning Clause	Upgraded Building Constructions
A	North Façade	--	--	A	OBC
B	East Façade				
C	South Façade				
D	West Façade				

Notes:

-- no specific requirement

OBC – Ontario Building Code

For stationary noise sources

1. Two make-up air units were assumed on the roof of the proposed residential building. This rooftop equipment should be selected to have a sound power level rating of 90 dBA or less.
2. If alternate rooftop units are chosen or the location of the mechanical units are modified, an acoustical engineer should verify that with the selected HVAC equipment and locations, acceptable sound levels will result at all offsite residential receptors.

7.1 Implementation

To ensure that the sound control recommendations outlined above are properly implemented in the site design, it is recommended that:

- 1) Prior to the issuance of building permits for this development, a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should review the mechanical drawings and specifications for the mechanical equipment to certify that the MECP sound levels will be met at all offsite noise sensitive receptors.

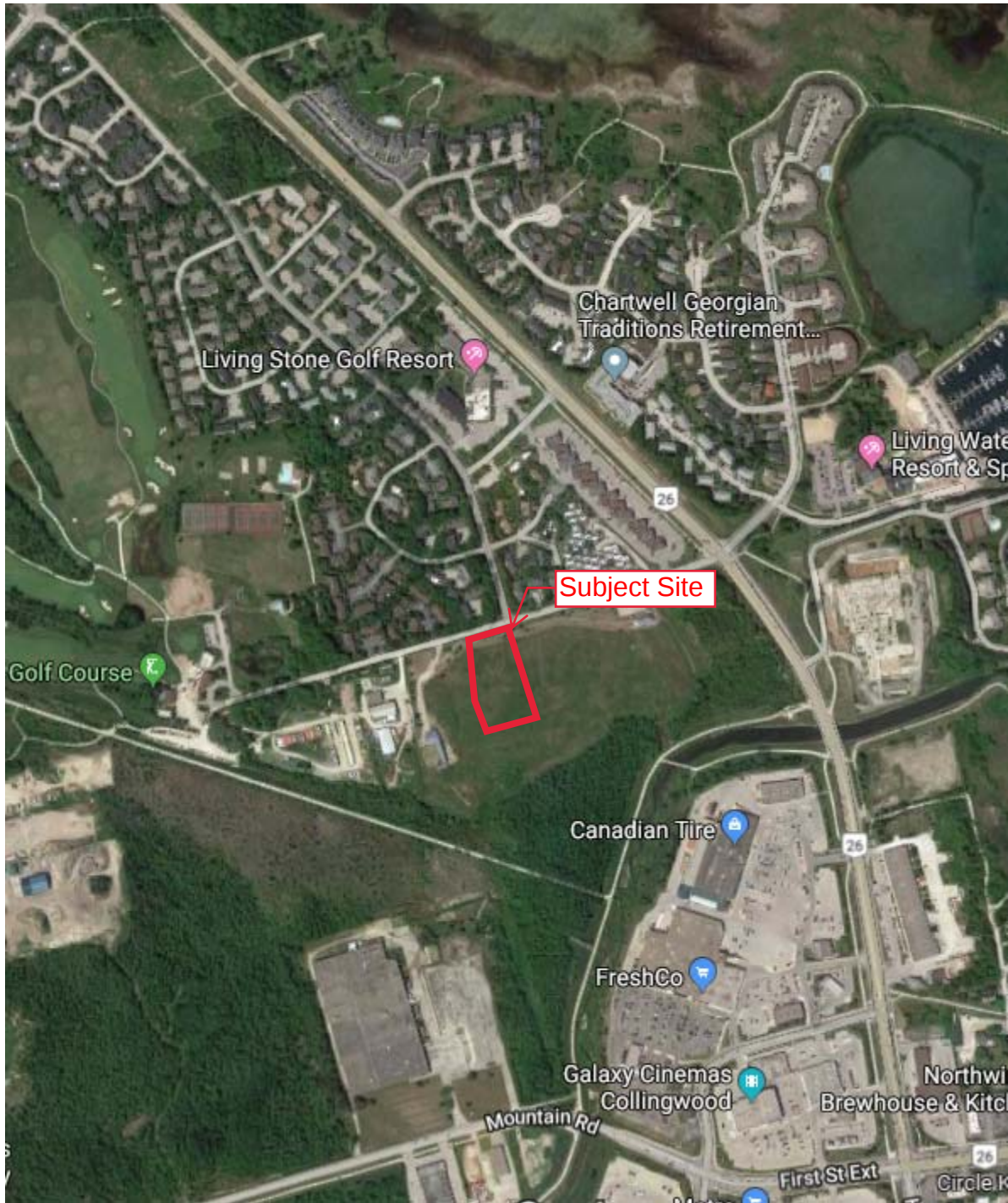


Figure 1: Key Plan

NOTES:
THE OWNER IS REQUIRED TO REMOVE SNOW OFF SITE AND MAINTAIN REQUIRED PARKING UNENCUMBERED BY SNOW DURING MAJOR SNOW EVENTS.
THE OWNER IS REQUIRED TO REMOVE SNOW AND ICE FROM ALL EXIT PATHS AND STAIRS.
SNOW WILL BE REMOVED FROM SITE BY PRIVATE COMPANY.
DRIVEWAYS ARE TO BE 1.2 CLEAR OF UTILITY STRUCTURES AND HYDRANTS.
BUILDER TO VERIFY LOCATION OF ALL HYDRANTS, STREET LIGHTS, TRANSFORMERS, AND OTHER SERVICES.
IF MINIMUM DIMENSION IS NOT MAINTAINED, BUILDER IS TO RELOCATE AT HIS OWN EXPENSE.
BUILDER TO VERIFY SERVICE CONNECTION ELEVATIONS PRIOR TO CONSTRUCTING FOUNDATIONS.

PRIOR TO THE COMMENCEMENT OF ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE, THE OWNER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE ENGINEERING SERVICE DEPARTMENT, TOWN OF COLLINGWOOD, FOR THE PURPOSE OF VEHICULAR ACCESS TO THE PROPERTY, (ENTRANCE PERMIT), AND SERVICING EXCAVATIONS (ROAD ALLOWANCE PERMIT) WITHIN THE THE PROPERTY, (ENTRANCE PERMIT), AND SERVICING.

PARKING STALL DELINEATION TO BE 100MM WIDE WHITE OR YELLOW MARKINGS.
VISITOR PARKING TO BE MARKED WITH A PAINTED V.
RESIDENT PARKING TO BE MARKED WITH PAINTED NUMBERS.

ALL REFUSE WILL BE STORED INTERNALLY.
WASTE TO BE COLLECTED BY PRIVATE SERVICE.

132 UNITS TOTAL
122 UG SPACES +27 TANDEM
42 SURFACE SPACES
164 TOTAL SPACES (164 REQ'D)
19 PARALLEL STREET SPACES (BONUS)
T = SURFACE TENANT SPACE

R4-4 (H-18) ZONE AS AMENDED

ZONING BY-LAW SUMMARY

TOWN OF COLLINGWOOD ZONING BYLAW 2010-040
OFFICIAL PLAN DESIGNATION "RESIDENTIAL MIXED USE"

132 UNITS

GENERAL INFORMATION:		
ZONING	R4-4 (H-18) AS AMENDED	MINOR VARIANCE NO D13118
LOT AREA	8595.75M	0.8609HA
TABLE 6.3.1.3 - RESIDENTIAL FOURTH DENSITY (R4) PROVISIONS		
USE	REQUIRED FOR APARTMENT	PROVIDED
MIN LOT AREA	NIL	8595.7 m2 (0.859 HA)
MIN LOT FRONTAGE	30.0M	59.91M
MIN FRONT YARD	7.5M	7.5M
MIN EXTERIOR SIDE YARD	7.5M	7.5M
MIN INTERIOR SIDE YARD	7.5M	7.5M
MIN REAR YARD	7.5M	9.7M
MAX HEIGHT	18M (SUPERCEDED BELOW BY VARIANCE) HEIGHT IS VERTICAL DISTANCE MEASURED FROM GRADE TO HIGHEST POINT OF ROOF DECK SURFACE OR TOP OF RIDGE OF SLOPED ROOF (GRADE IS AVERAGE LEVEL OF PROPOSED OR FINISHED GROUND AT ALL WALLS)	19M (PER VARIANCE) 5 STORIES
MAX LOT COVERAGE	40% (SUPERCEDED BELOW BY VARIANCE)	36% (3088M2)
MIN LANDSCAPED OPEN SPACE	40%	41% (3550M2)
DENSITY	133 UNITS	132 UNITS
UNDERGROUND PARKING SETBACK	FRONT YARD - HALF OF THAT REQUIRED FOR THE MAIN BUILDING OR MAIN USE SUPERCEDED BELOW BY VARIANCE EXTERIOR SIDE YARD - HALF OF THAT REQUIRED FOR THE MAIN BUILDING OR MAIN USE INTERIOR SIDE YARD - NIL REAR YARD - NIL	7.5M
UNDERGROUND PARKING DEPTH	ANY PORTION MUST BE 0.6M BELOW EXISTING GRADE	0.6M
ENTRANCE WIDTH GC 5.3	ENTRANCE WIDTH FOR GROUP OR CLUSTER DWELLINGS = 7.5M	7.5M
RESIDENTIAL FOURTH DENSITY EXCEPTION FOUR - R4-4 ZONE THE FOLLOWING EXEMPTIONS SHALL APPLY		
PARKING	1 SPACE PER UNIT PLUS AN ADDITIONAL 0.25 SPACES PER UNIT FOR VISITOR PARKING (SUPERCEDED BELOW BY VARIANCE)	122 UG 183 TOTAL 42 SURFACE 165 SPACES (1.25 PER)
PARKING	THE REQUIRED PARKING MAY BE LOCATED ON AN ABUTTING LOT	19 STREET (OFF PROPERTY)
PARKING	THE MINIMUM FRONT YARD SETBACK FOR AN UNDERGROUND PARKING GARAGE IS NIL.	19 STREET (OFF PROPERTY)
MINOR VARIANCE NOP D13118		
MAX COVERAGE	42%	
MAX HEIGHT	19.0M	
PARKING	DECREASE THE PARKING FROM 162 SPACES TO 153 SPACES, THUS A DECREASE OF 9 SPACES.	
GENERAL CONDITIONS EXEMPTIONS		
ENCROACHMENTS	ARCHITECTURAL FEATURES 0.6M UNENCLOSED PORCH 1.5M BUT NOT CLOSER THAN 1.2M TO LOT LINE, UP TO 3.0M SETBACK IN REAR YARD ENCLOSED BALCONY 1.5M BUT NOT CLOSER THAN 1.2M TO LOT LINE CANOPY MAY PROJECT HALFWAY INTO A REQUIRED YARD	
PARKING AISLE SIZE GREATER THAN 7 0DEGREES	6.0M	6.0M
PARKING SPACE SIZE (PERPENDICULAR)	6.0M X 2.8M	6.0M X 2.8M
PARKING SPACE SIZE (PARALLEL)	7.0M X 2.8M	7.0M X 2.8M
BF PARKING SPACE SIZE (PERPENDICULAR)	6.0M X 4.5M	AODA SUPERCEDES
BF PARKING SPACE SIZE (PARALLEL)	7.0M X 4.5M	
BF PARKING QUANTITY	1-25 -1 26-50 -2 51-100 -3 OVER 100 -2% = 3.4 REQ'D	4 SPACES
LOADING SPACE REQUIRED	NONE	NONE
BICYCLE SPACES	ANY GROUP OR CLUSTER RESIDENTIAL 0.5SPACES PER UNIT TO A MAX OF 20 SPACES	20

1 SITE PLAN
SP1
SITE PLAN
1/4" = 1'-0"

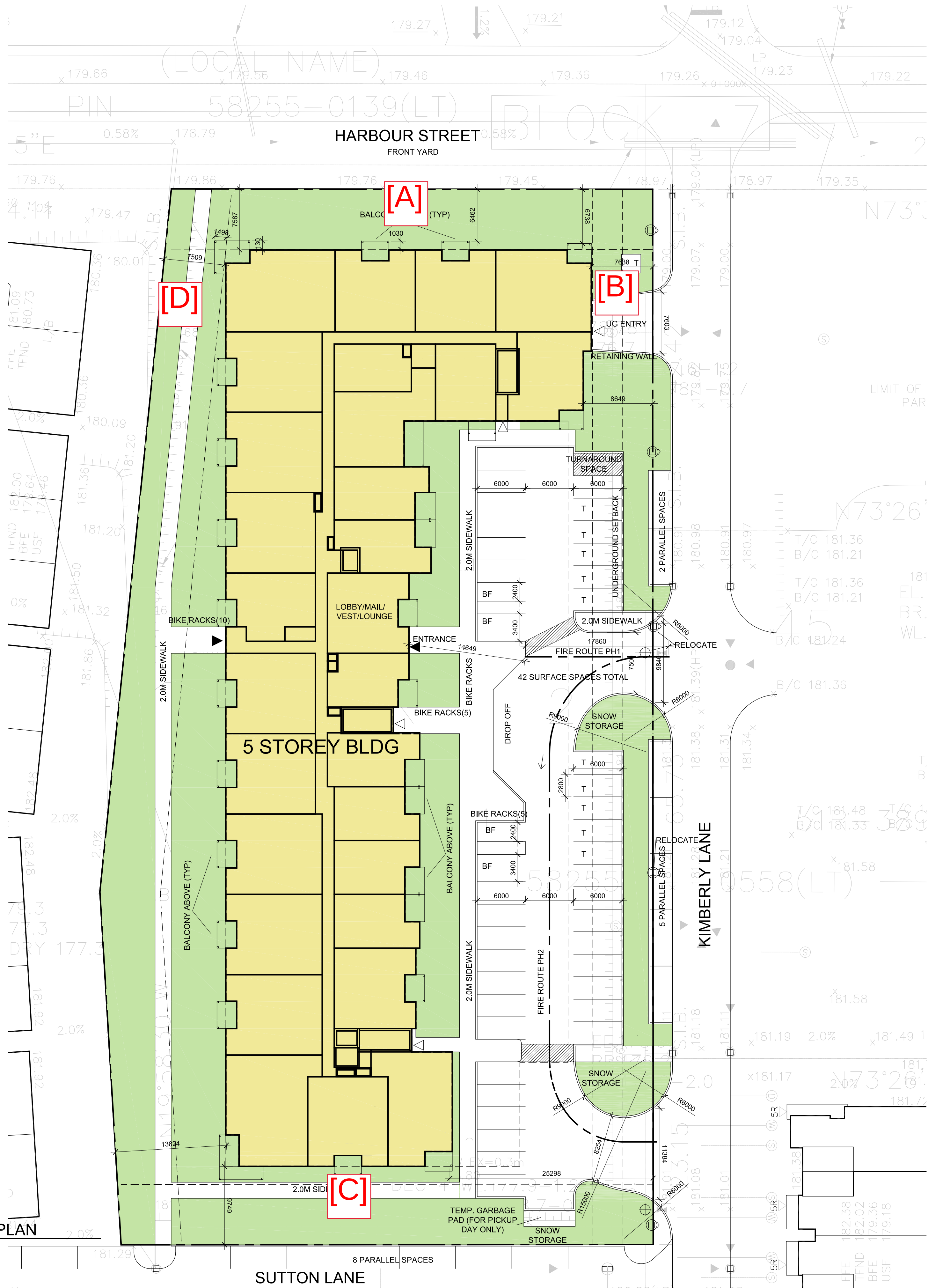


Figure 2: Proposed Site Plan

CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS AND JOB CONDITIONS BEFORE PROCEEDING WITH WORK.
ALL DRAWINGS MAY BE SUBJECT TO CHANGE DUE TO COMMENTS FROM MUNICIPAL DEPARTMENTS AND OTHER AGENCIES WITH AUTHORITY.
ALL DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE ARCHITECTS AND MUST BE RETURNED AT THE COMPLETION OF THE WORK.
THE CONTRACTOR WORKING FROM DRAWINGS NOT SPECIFICALLY MARKED FOR CONSTRUCTION MUST ASSUME FULL RESPONSIBILITY AND BEAR COSTS FOR ANY CORRECTIONS OR DAMAGES RESULTING FROM HIS OR HER WORK.

KEY TO DETAIL LOCATION
No. DETAIL NUMBER
Drawing Sheet Number

DRAWING SETS ISSUED
No. DATE (DD,MM,YY) BY
CONCEPT 1 - 133 UNITS 1. 13.06.19 MB
CONCEPT 2 - 132 UNITS 2. 27.06.19 MB
PRE-CONSULTATION 3. 09.07.19 MB

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

REVISIONS TO DRAWING No. DATE (DD,MM,YY) BY
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BUILDING PERMIT NUMBER:
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KNYMH INC.
1006 SKYVIEW DRIVE • SUITE 101
BURLINGTON, ONTARIO • L7P 0V1
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ROYAL WINDSOR AT BALMORAL VILLAGE
KIMBERLY LANE
COLLINGWOOD, ONTARIO

DRAWING SHEET TITLE:
SITE PLAN

DRAWING SCALE:
1:200
PROJECT NUMBER:
19029

DRAWN BY: CHECKED BY:
DRAWING VERSION:
001
PLOT DATE:
November 19, 2019
DRAWING SHEET NUMBER:
SP1



Figure 3: Predicted Daytime Sound Contours



Figure 4: Predicted Nighttime Sound Contours

APPENDIX A

Road Traffic Information

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 8:00:00

To: 9:00:00

Municipality: Collingwood

Site #: 1842000002

Intersection: Hwy 26 W & Harbour St W-Balsam

TFR File #: 1

Count date: 12-Dec-18

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Hwy 26 W runs N/S

North Leg Total: 1097

North Entering: 582

North Peds: 0

Peds Cross: $\times$

Heavys	0	6	0	6
Trucks	0	12	0	12
Cars	1	558	5	564
Totals	1	576	5	



Heavys 4

Trucks 15

Cars 496

Totals 515

East Leg Total: 129

East Entering: 59

East Peds: 0

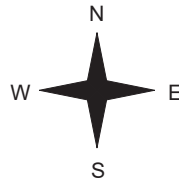
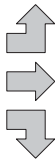
Peds Cross: $\times$

Heavys	Trucks	Cars	Totals
2	2	59	63



Balsam St

Heavys	Trucks	Cars	Totals
0	0	1	1
0	0	2	2
2	1	75	78
2	1	78	



Hwy 26 W



Cars	Trucks	Heavys	Totals
12	0	0	12
2	0	1	3
43	0	1	44
57	0	2	

Harbour St W



Cars	Trucks	Heavys	Totals
70	0	0	70

Peds Cross: $\times$

West Peds: 0

West Entering: 81

West Leg Total: 144

Cars	676	Cars	56	483	63	602
Trucks	13	Trucks	2	15	0	17
Heavys	9	Heavys	1	4	0	5
Totals	698	Totals	59	502	63	



Peds Cross: $\times$

South Peds: 1

South Entering: 624

South Leg Total: 1322

Comments

APPENDIX B

Sample Stanson 5.04 Output

STAMSON 5.0 NORMAL REPORT Date: 07-01-2020 12:35:24
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: a.te Time Period: Day/Night 16/8 hours
 Description: **Daytime and nighttime sound levels at prediction location [A], North façade facing Harbour Street**

Road data, segment # 1: HWY 26 (day/night)

```
-----
Car traffic volume : 19129/2125   veh/TimePeriod  *
Medium truck volume : 372/41     veh/TimePeriod  *
Heavy truck volume : 78/9        veh/TimePeriod  *
Posted speed limit : 60 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): 16580
Percentage of Annual Growth       : 2.50
Number of Years of Growth         : 11.00
Medium Truck % of Total Volume    : 1.90
Heavy Truck % of Total Volume     : 0.40
Day (16 hrs) % of Total Volume    : 90.00
```

Data for Segment # 1: HWY 26 (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 : 300.00 / 300.00 m
Receiver height     : 1.50 / 1.50 m
Topography          : 3        (Elevated; no barrier)
Elevation           : 12.00 m
Reference angle      : 0.00
```

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

```
-----
Car traffic volume : 2051/320   veh/TimePeriod
Medium truck volume : 2/1       veh/TimePeriod
Heavy truck volume : 2/1       veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient      : 0 %
Road pavement      : 1 (Typical asphalt or concrete)
```

Data for Segment # 2: Harbour (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 : 15.00 / 15.00 m
Receiver height     : 1.50 / 1.50 m
```



Topography : 3 (Elevated; no barrier)
 Elevation : 12.00 m
 Reference angle : 0.00

Results segment # 1: HWY 26 (day)

Source height = 0.79 m

ROAD (0.00 + 45.74 + 0.00) = 45.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

0	90	0.32	66.76	0.00	-17.19	-3.83	0.00	0.00	0.00
45.74									

Segment Leq : 45.74 dBA

Results segment # 2: Harbour (day)

Source height = 0.56 m

ROAD (0.00 + 52.67 + 0.00) = 52.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.33	53.50	0.00	0.00	-0.83	0.00	0.00	0.00
52.67									

Segment Leq : 52.67 dBA

Total Leq All Segments: 53.47 dBA

Results segment # 1: HWY 26 (night)

Source height = 0.80 m

ROAD (0.00 + 39.23 + 0.00) = 39.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

0	90	0.32	60.24	0.00	-17.19	-3.83	0.00	0.00	0.00
39.23									



Segment Leq : 39.23 dBA

Results segment # 2: Harbour (night)

Source height = 0.75 m

ROAD (0.00 + 48.24 + 0.00) = 48.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj
SubLeq									

-90	90	0.32	49.06	0.00	0.00	-0.82	0.00	0.00	0.00
48.24									

Segment Leq : 48.24 dBA

Total Leq All Segments: 48.75 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.47
(NIGHT): 48.75

