

NOISE IMPACT STUDY

“HUMMEL DEVELOPMENT”
1570 NIAGARA STONE ROAD
NIAGARA-ON-THE-LAKE, ON
REGION OF NIAGARA

Prepared for:

Hummel Properties Inc.
329 Four Mile Creek Road
#333 St. Davids, ON
L0S 1P0

Prepared By:



Frank Westaway
Qualified Acoustical Consultant

September 2023
Our File No: 23-4075

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1.0 INTRODUCTION

dBA Acoustical Consultants Inc. has been retained by Hummel Properties Inc., to provide a noise impact study for the proposed “Hummel Development” located at 1570 Niagara Stone Road, Niagara-on-the-Lake, Region of Niagara.

The purpose of the study will determine the noise impact from Niagara Stone Road, Line 1 Road and Four Mile Creek Road traffic that may impact the proposed townhouse development, as required for application approval for the Town of Niagara-on-the-Lake, Region of Niagara.

This study will detail noise impact relative to the site plan and recommend noise control measures necessary (if applicable) to meet Ministry of Environment Conservation and Parks (MECP) Publication NPC-300 entitled “Stationary & Transportation Sources-Approval & Planning guidelines while satisfying the planning requirements of the Town of Niagara-on-the-Lake, Region of Niagara.

Vibration is not considered as there are no heavy industrial operations in the proposed development site area. Aircraft is not a concern as the development is located outside the NEF 25 contour of the area. See attached Figure 1 Site Location.

2.0 SITE DESCRIPTION

Proposed is a 4-storey Mid-Rise building with first floor parking, standard balconies are proposed, there is an outdoor rooftop terrace on the fourth floor. Also proposed are 2 blocks of 2-storey townhouses with 7 units per block, totaling 14 units. These units also have standard sized balconies.

The proposed development is located approximately 90m northwest of Niagara Stone Road, which is a two-lane roadway with a center turn lane and a speed limit of 50km/hr. Line 1 Road is approximately 100m north of the proposed development and is a 2-lane roadway and has a speed limit of 50 km/hr. Four Mile Creek Road is approximately 250m west of the proposed development and is a 2-lane roadway which has a speed limit of 50 km/hr. Other area local streets do not have an acoustical impact on the townhouse development due to low traffic volumes and speed limits. To the north and west are single family homes. To the east and south are small commercial buildings. These commercial properties are considered stationary noise sources and they will not have an acoustical impact on the proposed development See attached Figure 2 Site Plan.

3.0 NOISE IMPACT ASSESSMENT

3.1 NOISE CRITERIA

The MECP specifies limits for road noise relative to new residential developments. The MECP Publication NPC-300 entitled “Stationary & Transportation Sources-Approval & Planning, specifies the criteria, summarized as follows:

TABLE 2- Road Traffic Sound Levels Limits	
Time Period	Leq (dBA)
07:00 – 23:00 (16 hr.)	55 Outdoor Living area
07:00 – 23:00 (16 hr.)	55 Plane of Window
23:00 – 07:00 (8 hr.)	50 Plane of Bedroom window

The OLA refers to an outdoor patio, a backyard, a terrace or other area where outdoor passive recreation is expected. Noise levels are calculated at the upper storey bedroom window to represent nighttime (23:00-0700) periods.

TABLE 3 –Noise Control Requirements		
Time Period	Noise Level Leq (dBA)	Action Required
07:00 - 23:00 Daytime (OLA)	55 to 60	Warning Clause Type “A”
	> 60	Barrier & Warning Clause Type “B”
07:00 – 23:00 Daytime (POW)	>55	Provision for A/C, Warning Clause “C”
	>65	Central A/C, Warning Clause “D”
	>65	Building Component Specification
23:00 to 07:00 Nighttime (POW)	> 50	Provision for A/C and Warning Clause Type “C”
	> 60	Building Component Specification
	> 60	Central Air and Warning Clause Type “D”

Where nighttime noise levels exceed 60 dBA, building components must be designed to meet Table 3 indoor sound level limits.

TABLE 4 - Indoor Road Sound Levels Limits		
Indoor Location	Leq (dBA)	
	Road	Rail
Living/Dining 7:00 – 23:00	45	NA
Bedroom 23:00 - 07:00	40	NA

3.2 ROAD NOISE

Predicted road traffic noise levels were calculated for Niagara Stone Road which is considered the major road noise source in the proposed development area. The most current road traffic volumes for Niagara Stone Road are 2021 AADT (Annual Average Daily Traffic) and provided via email from the Region of Niagara, Transportation Department. See Appendix “A”.

Line 1 Road and Four Mile Creek Road AADT traffic volumes were provided via email by Marci Weston from the Town of Niagara-on-the-Lake. Due to low traffic volumes Stamson computer program 5.04 was unable to calculate the noise levels. Therefore, these two roads will not have an acoustical impact on the proposed development. See Appendix “A”.

The MECP computer program STAMSON version 5.04 was used to carry out prediction calculations and the traffic data is summarized in Table 5. The daytime/nighttime volume ratio relative to Niagara Stone Road is calculated using a 90/10 split. See Appendix “A”.

The percentage of annual growth for Niagara Stone Road was figured at 2% over 13 years and is reflective as the worst-case scenario. Niagara Stone Road truck volumes were factored at 2% medium and 2% heavy of the total vehicle volumes. The AADT (Annual Average Daily Traffic) volumes were used and are reflective as the worst-case scenario. See Figure 3 Receptor Locations.

TABLE 5 – Future Road Traffic Volumes (2034)			
Niagara Stone Road	AADT 21288 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	18393	383	383
Night	2044	43	43

The following Table 6 summarizes the Niagara Stone Road “free field” traffic noise prediction results, modeled at 5 receptor locations representative of the east and south façades within the proposed development. See Figure 3 Receptor Locations.

TABLE 6A – Predicted Niagara Stone Road Future Traffic Noise (dBA)		
Niagara Stone Road	07:00 – 23:00	23:00 – 07:00
R1 – East Façade – 1 st Floor Residential (4.5m)	52 dBA	45 dBA
R2 – East Façade – 4 th Floor Residential (10.5m)	54 dBA	47 dBA
R3 – South Façade – 1 st Floor Residential (4.5m)	49 dBA	42 dBA
R4 – South Façade – 4 th Floor Residential (10.5m)	51 dBA	44 dBA
R5 – East Façade – Townhouse Unit 14 Rear Yard OLA (1.5m)	52 dBA	46 dBA

4.0 RECOMMENDATIONS - NOISE CONTROL

4.1 OUTDOOR NOISE LEVELS

Calculated daytime road noise levels at the Plane of Window (POW) does not exceed the 55 dBA criteria as outlined in Table 2. The proposed development includes terraces, that appear to be less than 4m in depth and are not considered as Outdoor Living Areas (OLA’s) as defined by MECP noise guidelines. Should the terraces be in excess of 4m in depth, noise levels are below the MECP noise limits and therefore noise mitigation is not required. The 4-storey building rooftop terrace does not exceed the 55 dBA and therefore no noise mitigation measures are required. However, the Ontario Building Code (OBC) requires a safety railing or equivalent for this area.

4.2 INDOOR NOISE LEVELS

Calculated nighttime road noise levels at the Plane of Window (POW) does not exceed the 50 dBA criteria outlined in Table 2 for indoor spaces. Noise mitigation measures are not required. Ontario Building Code (OBC) will suffice throughout the proposed development.

TABLE 7 – Recommended Door, Wall, and Window Construction			
LOCATION	Window STC To Be Used	Exterior Wall STC	Patio Door Construction STC
4-Storey Mid-Rise Building	Example	Example	Example
Bedroom	OBC	OBC	OBC
Living room	OBC	OBC	OBC
2-Storey Townhouses	Example	Example	Example
Bedroom	OBC	OBC	OBC
Living room	OBC	OBC	OBC

5.0 VENTILATION / WARNING CLAUSES

Ventilation and warning clause requirements are not required for this project.

6.0 SUMMARY OF RECOMMENDATIONS

The following noise control measures are required for this development:

- OBC for Window, Door, and Wall construction as recommended in Table 7
- It is recommended that a qualified acoustical consultant certify that the required noise control measures have been incorporated into the builder's plans prior to issuance of a building permit.
- It is recommended that a qualified acoustical consultant certify that the required control measures have been properly installed prior to an occupancy permit.

7.0 CONCLUSIONS

dBA Acoustical Consultants Inc. has been retained by Hummel Properties Inc., to provide a noise impact study for the proposed "Hummel Development" located at 1570 Niagara Stone Road, Niagara-on-the-Lake, Region of Niagara.

The study determined the noise impact from Niagara Stone Road, Line 1 Road and Four Mile Creek Road traffic that may impact the proposed townhouse development, as required for application approval for the Town of Niagara-on-the-Lake, Region of Niagara.

This study detailed noise impact relative to the site plan and recommended no noise control measures necessary to meet Ministry of Environment Conservation and Parks (MECP) Publication NPC-300 entitled "Stationary & Transportation Sources-Approval & Planning guidelines while satisfying the planning requirements of the Town of Niagara-on-the-Lake, Region of Niagara.

FIGURE 1 SITE LOCATION



FIGURE 2 SITE PLAN

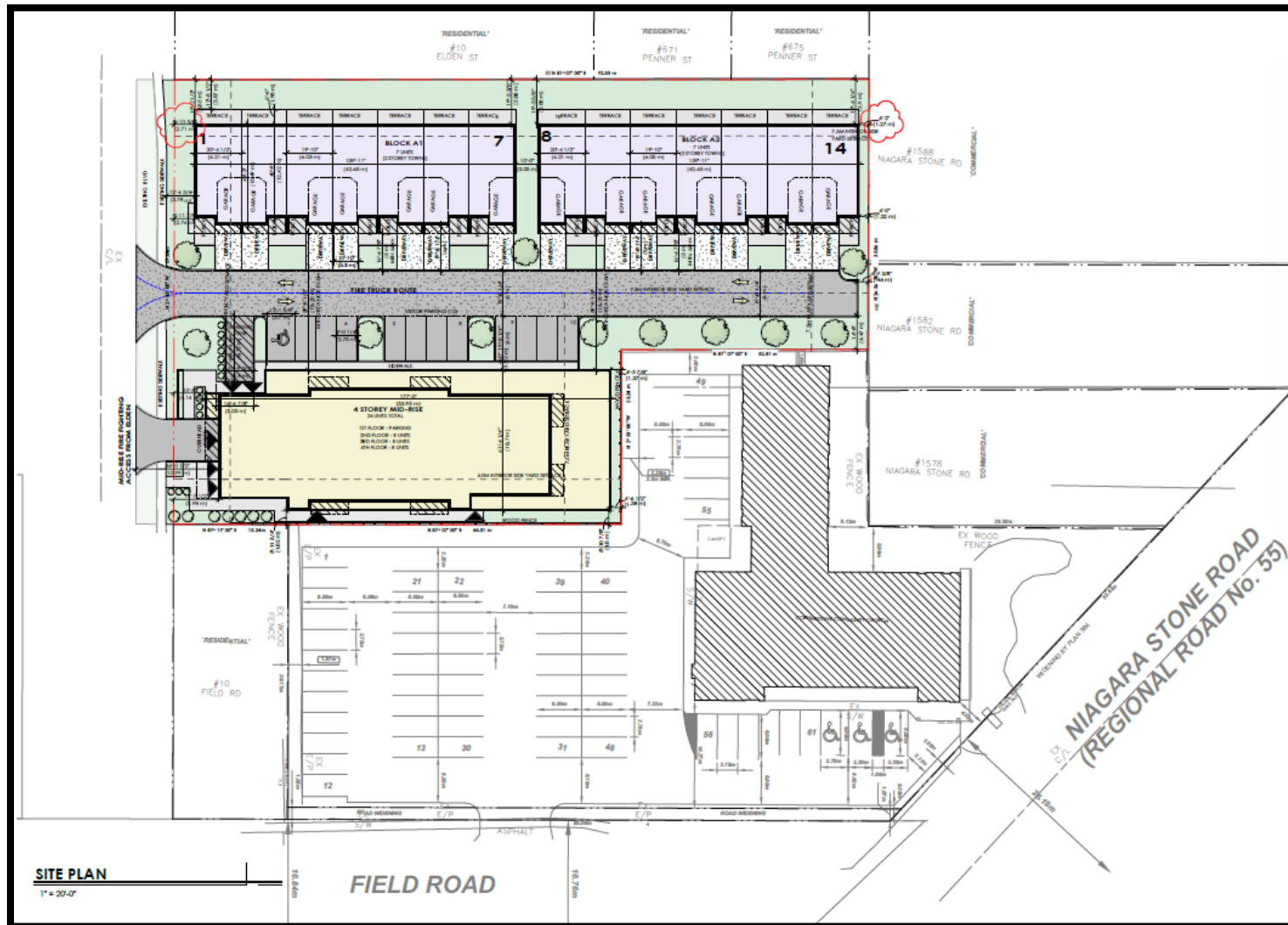
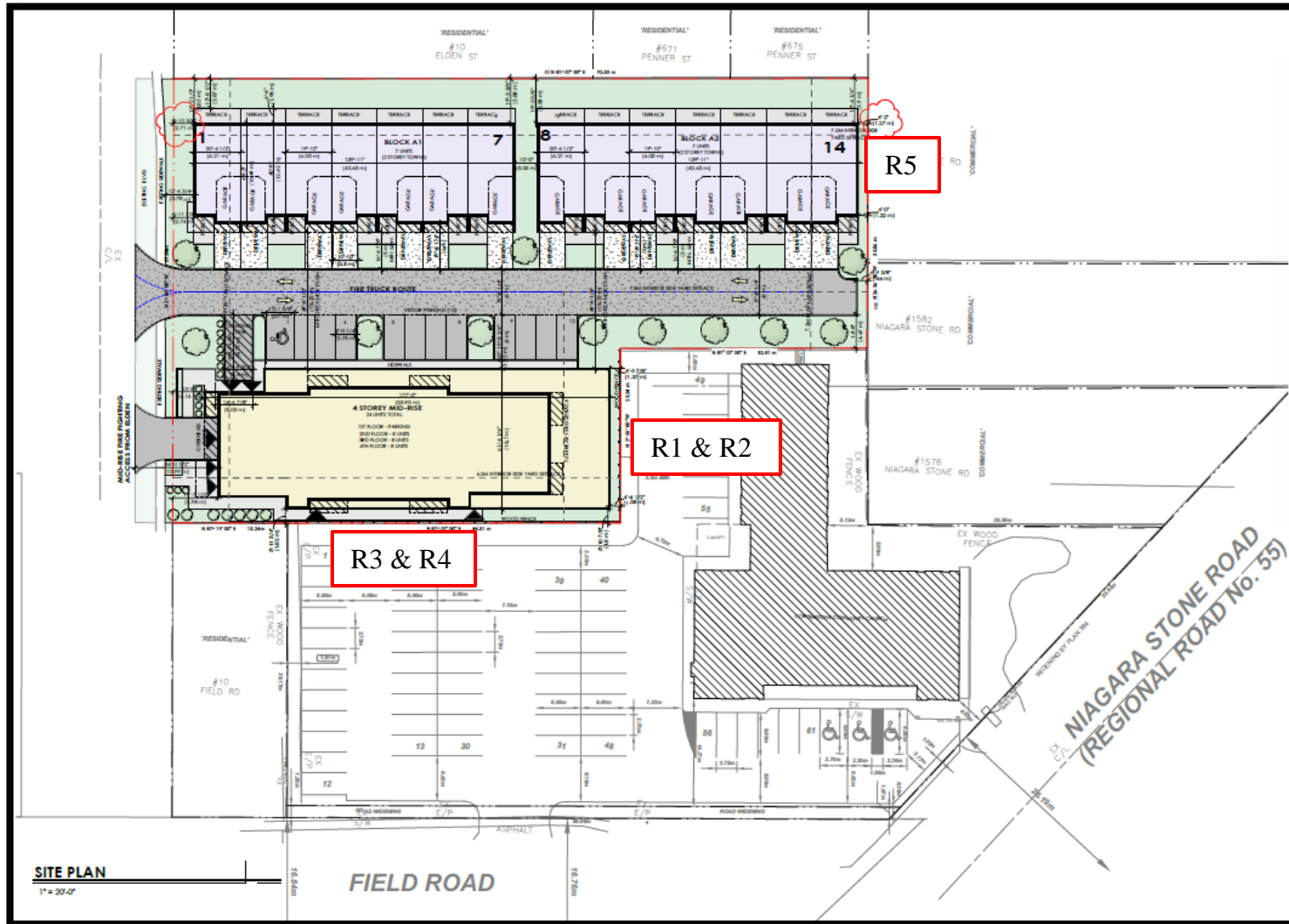


FIGURE 3
RECEPTOR LOCATIONS



APPENDIX “A”

2021 AADT REGION OF NIAGARA NIAGARA STONE ROAD

Hello Nicole,

Here are the AADTs Requested:

Niagara Stone Road - between Line 1 Road and Four Mile Creek Road – **13,500 (2021)**

Four Mile Creek Road - between Niagara Stone Road & Line 1 Road - **NOT REGIONAL JURISDICTION NO COUNTS**

Line 1 Road - between Four Mile Creek Road and Niagara Stone Road – **NOT REGIONAL JURISDICTION NO COUNTS**

Regards,
Manny Rataul, C.E.T., rcji
Road Safety Technician
Transportation Services Division, Niagara Region

Phone: 905-980-6000 Ext. 3711

Email: Manny.Rataul@niagararegion.ca

Address: 1815 Sir Isaac Brock Way St., Thorold ON, L2V4T7

www.niagararegion.ca

2020 AADT TOWN OF NIAGARA-ON-THE-LAKE LINE 1 ROAD & FOUR MILE CREEK ROAD

Apologies Nicole, here are the most recent valid counts from 2018 and 2020. We do have 2023 counts but the results are skewed because that section of Four Mile Creek Road and Penner Street (Line 1 Road in your request) are carrying a season of heavy bypass traffic due to the construction on Niagara Stone Road between Four Mile Creek Road and Penner-Line 1 Road.

Four Mile Creek Road between Niagara Stone Road and Line 1-Penner the AADT is 2,500 based on 2020 estimates on counts taken on adjacent sections.

Penner-Line 1 between Four Mile Creek Road and Niagara Stone Road is 2,463 based on an actual count on that section in 2020.

We estimate an annual growth rate of 1% for that area.

Please contact me should you have any questions or require further information.

Sincerely,
Marci

Marci Weston
Engineering Technologist – Traffic and Transit
Phone: 905-468-3061 ext.270 Fax: 905-468-1722
1593 Four Mile Creek Road, PO Box 100,
Virgil ON L0S 1T0

STAMSON CALCULATIONS

STAMSON 5.04 SUMMARY REPORT Date: 13-09-2023 11:14:55
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3stone.te Time Period: Day/Night 16/8 hours

Description: R3 South Facade 4 Storey 1st floor residential
TOTAL Leq FROM ALL SOURCES (DAY): 48.88 (NIGHT): 42.37

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

```
-----
Car traffic volume : 18393/2044 veh/TimePeriod *
Medium truck volume : 383/43 veh/TimePeriod *
Heavy truck volume : 383/43 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): 13500
Percentage of Annual Growth : 2.00
Number of Years of Growth : 23.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00
```

Data for Segment # 1: Niagara Ston (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 : 110.00 / 110.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----
1.Niagara Ston ! 1.19 ! 48.88 ! 48.88
-----+-----+-----
Total 48.88 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----
1.Niagara Ston ! 1.19 ! 42.37 ! 42.37
-----+-----+-----
Total 42.37 dBA
```

STAMSON 5.04 SUMMARY REPORT Date: 13-09-2023 11:17:05
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4stone.te Time Period: Day/Night 16/8 hours

Description: R4 South Facade 4 Storey 4th floor residential
TOTAL Leq FROM ALL SOURCES (DAY): 50.77
(NIGHT): 44.27

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

```
-----
Car traffic volume : 18393/2044 veh/TimePeriod *
Medium truck volume : 383/43 veh/TimePeriod *
Heavy truck volume : 383/43 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): 13500
Percentage of Annual Growth : 2.00
Number of Years of Growth : 23.00
Medium Truck % of Total Volume : 2.00
Heavy Truck % of Total Volume : 2.00
Day (16 hrs) % of Total Volume : 90.00
```

Data for Segment # 1: Niagara Ston (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 : 110.00 / 110.00 m
Receiver height : 10.50 / 10.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+
1.Niagara Ston ! 1.19 ! 50.77 ! 50.77
-----+-----+-----+
Total 50.77 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+
1.Niagara Ston ! 1.19 ! 44.27 ! 44.27
-----+-----+-----+
Total 44.27 dBA
```

STAMSON 5.04 SUMMARY REPORT Date: 19-09-2023 14:00:02
 MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5stone.te Time Period: Day/Night 16/8 hours

Description: R5 East Facade Unit 14 Rear Yard OLA

TOTAL Leq FROM ALL SOURCES

(DAY): 51.74
(NIGHT): 46.04

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

```
-----
Car traffic volume   : 18393/2044   veh/TimePeriod   *
Medium truck volume :   383/43     veh/TimePeriod   *
Heavy truck volume  :   383/43     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): 13500
Percentage of Annual Growth       : 2.00
Number of Years of Growth         : 23.00
Medium Truck % of Total Volume    : 2.00
Heavy Truck % of Total Volume     : 2.00
Day (16 hrs) % of Total Volume    : 90.00
```

Data for Segment # 1: Niagara Ston (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 : 100.00 / 100.00 m
Receiver height  : 1.50 / 4.50 m
Topography      : 1 (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

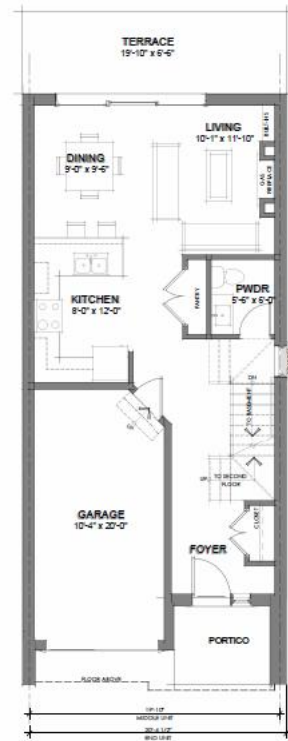
Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+
1.Niagara Ston ! 1.19 ! 51.74 ! 51.74
-----+-----+-----+
Total 51.74 dBA
```

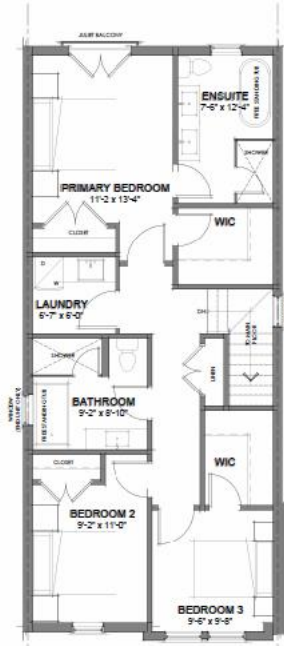
Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----+
1.Niagara Ston ! 1.19 ! 46.04 ! 46.04
-----+-----+-----+
Total 46.04 dBA
```

FLOOR PLANS



GROUND FLOOR
 1/4" = 1'-0"
585 SQ. FT.
ENCLOSURE DRAWING
 WED 04/21/23 11:30 AM



SECOND FLOOR
 1/4" = 1'-0"
889 SQ. FT.
ENCLOSURE DRAWING
 WED 04/21/23 11:30 AM

* DISCLAIMER: ISSUED FOR PRELIMINARY DESIGN DISCUSSION ONLY

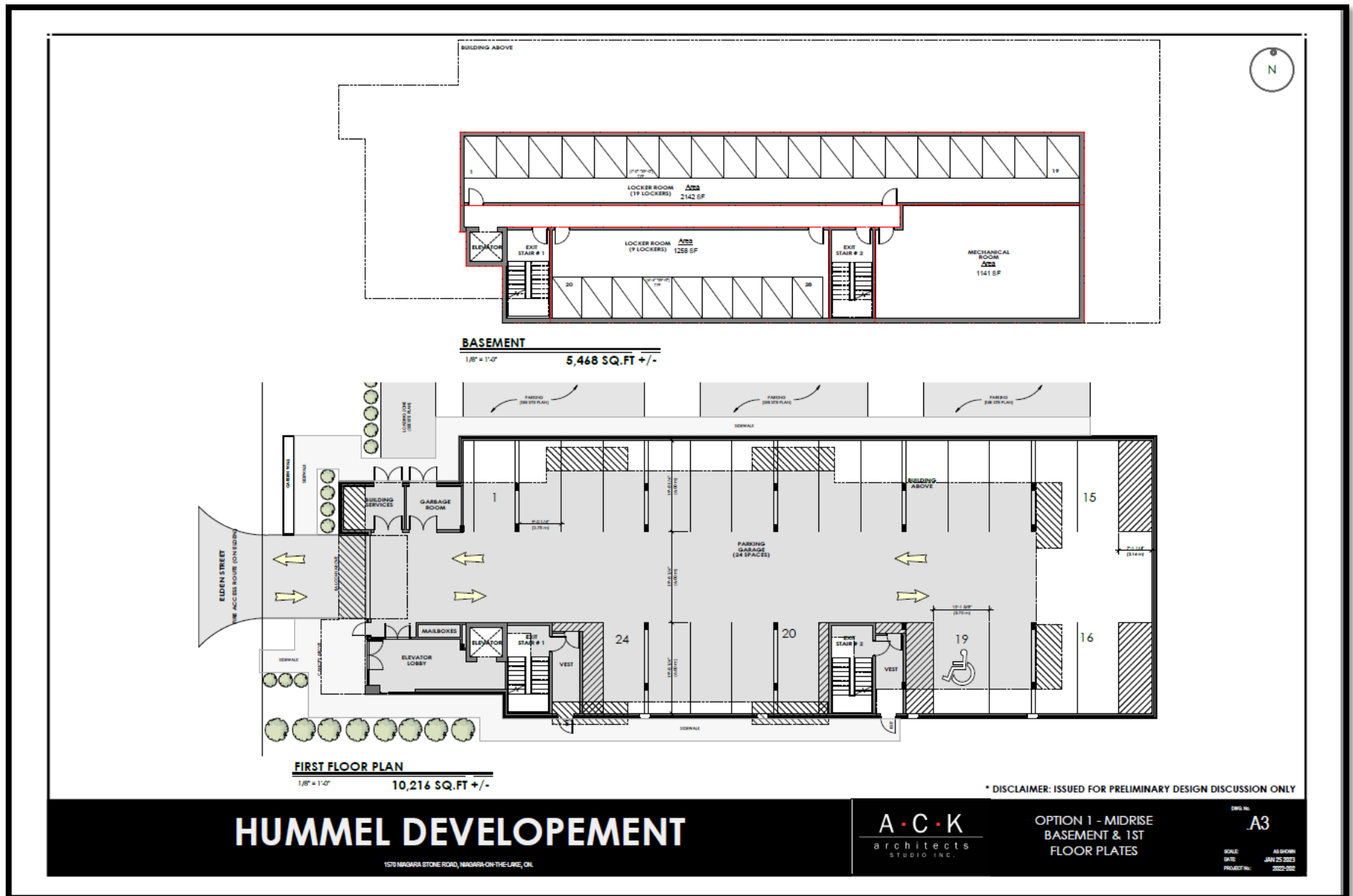
HUMMEL DEVELOPMENT

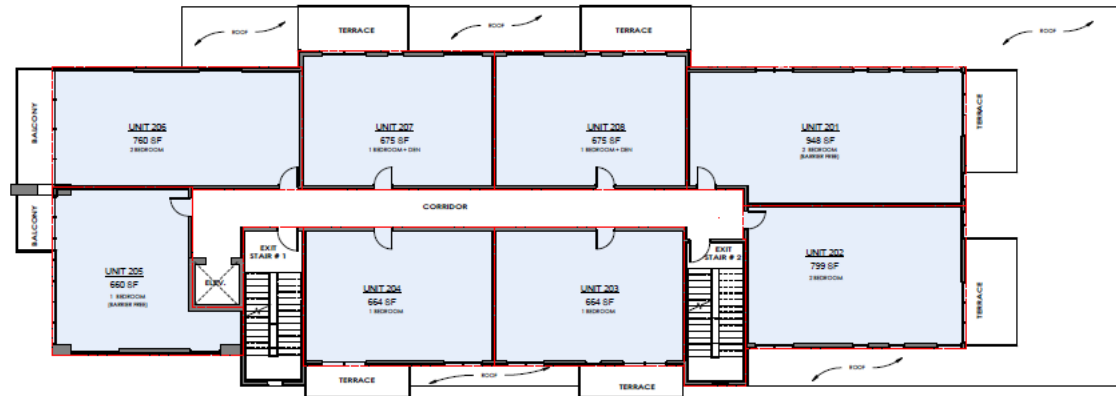
A · C · K
 architects
 STUDIO INC.

TOWNHOUSE FLOOR
 PLANS

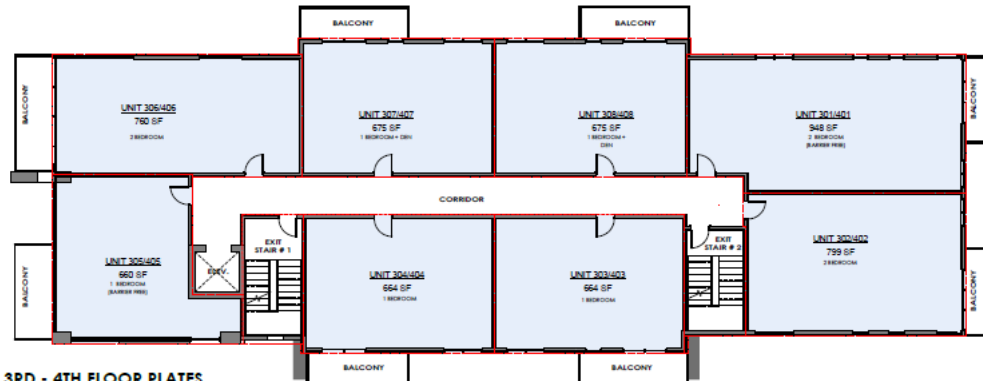
DWG No. **A1**

SCALE: AS SHOWN
 DATE: JAN 23 2023
 PROJECT No.: 2023-002





2ND FLOOR PLATE
 1/8" = 1'-0" 6,963 SQ. FT +/-



3RD - 4TH FLOOR PLATES
 1/8" = 1'-0" 6,837 SQ. FT +/-

* DISCLAIMER: ISSUED FOR PRELIMINARY DESIGN DISCUSSION ONLY

HUMMEL DEVELOPEMENT

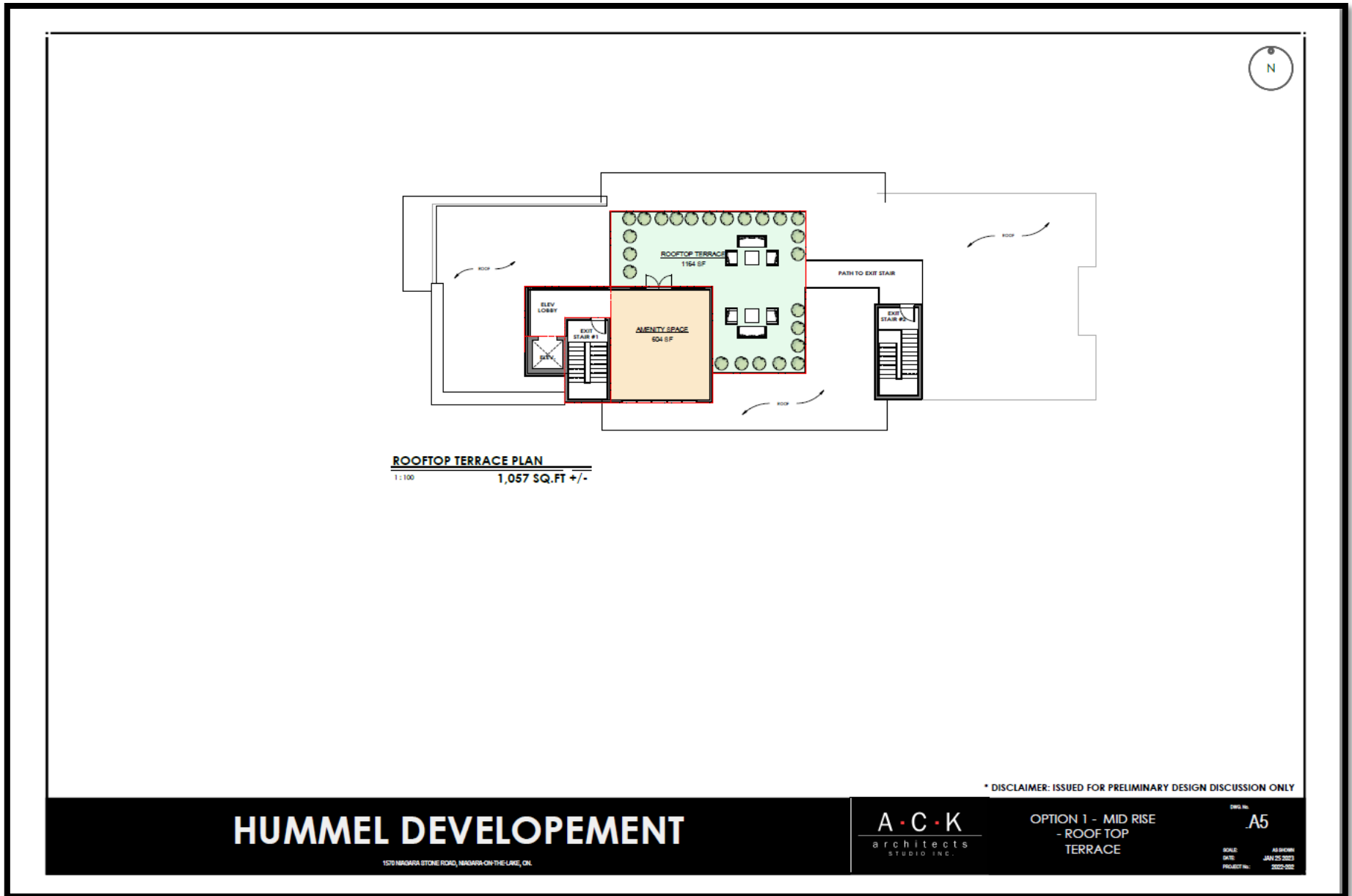
1570 NIAGARA STONE ROAD, NIAGARA ON THE LAKE, ON

A · C · K
 architects
 STUDIO INC.

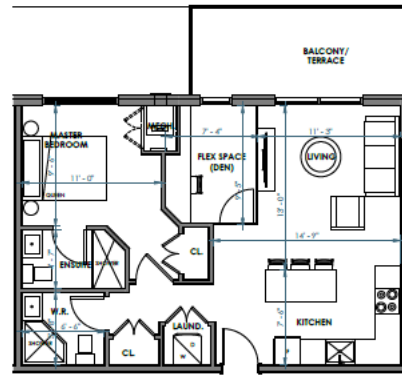
OPTION 1 - MIDRISE
 2ND - 4TH FLOOR
 PLATES

DWG No. **A4**

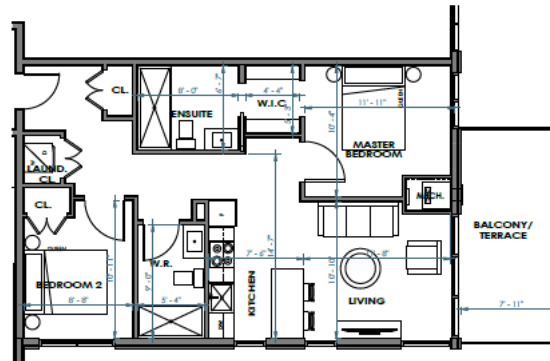
SCALE: AS SHOWN
 DATE: JAN 25 2023
 PROJECT No.: 2022-002



SUITE LAYOUTS



TYPICAL 1 BEDROOM UNIT (UNITS 207, 208, 307, 308, 407, 408)
1/4" = 1'-0" **675 SQ. FT.**



TYPICAL 2 BEDROOM UNIT (UNITS 202, 302, 402)
1/4" = 1'-0" **799 SQ. FT.**

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HUMMEL DEVELOPEMENT

1570 NIAGARA STONE ROAD, NIAGARA-ON-THE-LAKE, ON

A · C · K
architects
STUDIO INC.

OPTION 1 - TYPICAL
SUITE LAYOUTS

DWG No. **A6**

SCALE: AS SHOWN
DATE: JAN 25 2023
PROJECT No.: 2022-002

ELEVATIONS



FRONT (WEST) ELEVATION

1 : 100



FRONT PERSPECTIVE



LEFT SIDE (NORTH) ELEVATION

1 : 100

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HUMMEL DEVELOPEMENT

1570 NIAGARA STONE ROAD, NIAGARA-ON-THE-LAKE, ON

A · C · K
architects
STUDIO INC.

OPTION 1 - FRONT
AND LEFT SIDE
ELEVATIONS

DWG No. **A7**

SCALE: AS SHOWN
DATE: JAN 25 2023
PROJECT No.: 2022-002



REAR (EAST) ELEVATION

1:100



REAR PERSPECTIVE



RIGHT SIDE (SOUTH) ELEVATION

1:100

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HUMMEL DEVELOPEMENT

1570 NIAGARA STONE ROAD, NIAGARA-ON-THE-LAKE, ON

A · C · K
architects
STUDIO INC.

OPTION 1 - REAR
AND RIGHT SIDE
ELEVATIONS

DWG No. **A8**

SCALE: AS SHOWN
DATE: JAN 25 2023
PROJECT No.: 2022-002

SITE STATISTICS

PRELIMINARY SITE STATS		PROPOSED RM1 / RM2 ZONING		
	HECTARES	ft ²	m ²	%
LOT AREA				
Lot	0.4692	50500.31	4,691.6	100.0%
<i>(Not Including Road Widening)</i>				
LOT FRONTAGE				
	Existing	59.07 m		
LOT COVERAGE				
Permitted				
Lot Coverage	Maximum	17675.1	1,642.1	35.0%
Proposed				
Mid-Rise Building (Includes Projections)		10525.3	977.8	20.8%
Townhouse - Block A1		6647.1	617.5	13.2%
Townhouse - Block A2		6647.1	617.5	13.2%
	Total	23819.6	2212.9	47.2%
LANDSCAPE COVERAGE (INCLUDES SIDEWALKS/PATIOS)				
	Minimum	15150.1	1,407.5	30.0%
	Proposed	15305.9	1,422.0	30.3%
PAVED/PARKING AREA (NOT COVERED BY BUILDING)				
	Proposed	11374.8	1,056.8	22.5%
BUILDING HEIGHT				
Townhouses	Permitted		10.0 m	32.8 ft
	Proposed	2 Storey	6.70 m	21.9 ft
Mid-Rise	Permitted		10.5 m	34.43 ft
	Proposed	4 Storey	15.85 m	52.0 ft
PARKING STATS				
PARKING REQUIRED				
	Townhouses	2 per unit		28
	Apartment	1 per unit		24
	Total			52.0
	BF Required	(req'd for mid rise)		1 Spaces
	Loading Required			0 spaces
PARKING PROVIDED				
	Townhouse Driveways			14
	Townhouse Garage			14
	Surface			12
	1st Floor Mid-Rise			24
	Total			64
	BF Provided	(req'd for mid rise)		2 Spaces
	Loading Provided			1 Spaces
BUILDING STATS				
	Mid-Rise Units	1 BED	1 BED +	2 BED
	1st FLOOR	0	0	0
	2nd FLOOR	8	3	2
	3rd FLOOR	8	3	2
	4th FLOOR	8	3	2
	Total Units	24	9	6
	Townhouses			
	Block A1	7		
	Block A2	7		
	Total Towns	14		