HGC ENGINEERING

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Noise Feasibility Study
Proposed Mixed-Use Development
1012 Yonge Street
Barrie, Ontario

Prepared for:

Crown (Barrie) Developments Inc.
400 Creditstone Road, Unit 37
Concord, ON L4K 3Z3

Prepared by:

Mandy Chan, PEng

Revised January 15, 2021

HGC Project File: 02000072

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1 Introduction and Summary

HGC Engineering was retained by Crown Communities Developments Inc. to conduct a noise feasibility study for a proposed mixed-use development to be located on the west side of Yonge Street, north of Lockhart Road, specifically at 1012 Yonge Street, in the City of Barrie, Ontario. The proposed development consists of three 6-storey condos, two 3-storey condos and one block of 3-storey townhouses. The study is required by the municipality as part of their planning and approvals process.

Road traffic for Yonge Street was obtained from City of Barrie personnel. Rail traffic was obtained from Metrolinx personnel for the GO Newmarket Subdivision. This data was used to predict future traffic sound levels at the proposed dwellings and common amenity spaces. The predicted sound levels were evaluated in accordance with the Ministry of the Environment, Conservation and Parks' (MECP) noise guidelines.

Predicted sound levels exceed MECP guideline limits at the dwelling units closest to Yonge Street. Central air conditioning and upgraded building façade constructions are required for the dwellings adjacent to Yonge Street. Forced air ventilation systems with ductwork sized for the future installation of central air conditioning by the occupant or an alternative means of ventilation to open windows will be required for the dwelling units with some exposure to Yonge Street. The MECP guidelines require that warning clauses be used to inform future residents of the traffic noise impacts.

2 Site Description and Noise Sources

Figure 1 is an aerial photo showing the location of the proposed development and the surrounding land uses. The site is located on the west side of Yonge Street and north of Lockhart Road, specifically at 1012 Yonge Street in the City of Barrie, Ontario. Figure 2 shows the proposed site plan dated December 14, 2020. The proposed development will consist of three 6-storey condos, two 3-storey condos and one block of 3-storey townhouses. Commercial units are proposed for the building adjacent to Yonge Street.

The primary source of sound is vehicular traffic on Yonge Street and rail traffic on the GO Newmarket Subdivision. There are existing and future residential uses surrounding the site. To north of the site are lands for a future community centre. There are no significant sources of stationary noise observed within 500 m of the subject site.

3 Sound Level Criteria

Guidelines for acceptable levels of road and rail 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 1 below. The values in Table 1 are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels [dBA].

Table 1: Road and Rail Traffic Noise Criteria (dBA)

Area	Daytime L_{EQ} (16 hour) Road/Rail	Night-time L_{EQ} (8 hour) Road/Rail
Outdoor living areas	55 dBA	--
Inside Living/Dining Rooms	45 dBA / 40 dBA	45 dBA / 40 dBA
Inside Bedrooms	45 dBA / 40 dBA	40 dBA / 35 dBA

Daytime refers to the period between 07:00 and 23:00, while night-time 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 MECP guidelines allow the daytime sound levels 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 recommended to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible. Note that not all OLA's necessarily require protection, if there are other protected outdoor areas accessible to future residents.

Indoor guidelines are 5 dBA more stringent for rail noise than for road noise, to account for the low frequency (rumbling) character of locomotive sound, and its greater potential to transmit through exterior wall/window assemblies.

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 or office windows exceed 65 dBA. Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning by the occupant 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.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window daytime sound level is greater than 60 dBA due to rail traffic noise or greater than 65 dBA due to road traffic noise, or when the nighttime sound level is greater than 55 dBA due rail traffic noise or greater than 60 dBA due to road traffic noise.

Warning clauses to notify future residents of possible noise excesses are also required when night-time 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 and rail traffic.

4 Traffic Noise Assessment

4.1 Road Traffic Data

Road traffic data for Yonge Street was obtained from City of Barrie personnel. Data was provided in the form of current Annual Average Daily Traffic (AADT) volumes, and are provided in Appendix A. The traffic volumes were grown to the year 2041 using a growth rate of 4.0% per year per City's requirement. A commercial vehicle percentage of 3% was obtained and split into 1.2% medium trucks and 1.8% heavy trucks. A day/night split of 90%/10% and a speed limit of 60 km/h was used in the analysis. Table 2 summarizes the road traffic data used in the analysis.

Table 2: Projected Road Traffic Data to 2041

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Yonge Street	**Daytime**	25 595	347	720	26 662
	Nighttime	2 844	39	80	2 962
	Total	**28 439**	**385**	**800**	**29 624**

4.2 Rail Traffic Data

Rail traffic data for typical operations of the GO Newmarket Subdivision was obtained from Metrolinx personnel is provided in Appendix A. The maximum permissible train speed is 97 km/h (60 mph) for GO Transit passenger trains in the area of the site. In conformance with GO Transit assessment requirements, these maximum speeds, maximum number of cars and locomotives per train were used in the traffic noise analysis to yield a worst-case estimate of train noise. Table 3 summarises the rail traffic data used in the analysis.

Table 3: Rail Traffic Data

Type of Train	Number of Trains Day/Night	Maximum Number of locomotives	Average Number of cars	Max Speed (mph/kph)
GO *(forecasted)*	36 / 6	1	12	60 / 97

Note:

- All passenger trains are predicted using diesel train sound levels in STAMSON

4.3 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.

Predictions of the traffic sound levels were made at various dwellings in the proposed development. The results of these predictions are summarized in Tables 4 and 5. The acoustic requirements may be subject to modifications if the site plan is changed significantly.

Sound levels were predicted at the plane of the windows of the proposed dwelling units during the daytime and nighttime to investigate ventilation and building façade construction requirements. Sound levels were also predicted in the common outdoor amenity spaces to investigate the need for acoustic barriers.

Table 4: Predicted Daytime Traffic Sound Levels, Combined Road & Rail Traffic, Without Mitigation [dBA]

Prediction Location		Description	Road	Rail	Overall $L_{EQ-16\ hr}$
A	Building A	East Façade, 6th Floor	67	59	68
B	Building A	South Facade, 6th Floor	58	56	60
C	Building B	East Facade, 6th Floor	57	55	59
D	Building C	North Façade, 6th Floor	56	54	58
E	Building E	South Façade, 3rd Floor	49	47	51
F	--	Common Outdoor Amenity	<55	<50	<55

Table 5: Predicted Nighttime Traffic Sound Levels, Combined Road & Rail Traffic, Without Mitigation [dBA]

Prediction Location		Description	Road	Rail	Overall $L_{EQ-8\ hr}$
A	Building A	East Façade, 6th Floor	60	54	61
B	Building A	South Facade, 6th Floor	52	51	54
C	Building B	East Facade, 6th Floor	<50	50	51
D	Building C	North Façade, 6th Floor	49	49	52
E	Building E	South Façade, 3rd Floor	<50	<50	<50

5 Discussion and Recommendations

The predictions indicate that the future traffic sound levels during the daytime and nighttime at the proposed dwellings closest to Yonge Street will exceed MECP guidelines. The following discussion outlines recommendations for ventilation requirements, building façade constructions, and warning clauses to achieve the noise criteria stated in Table 1.

5.1 Outdoor Living Areas

There are three common outdoor amenity spaces proposed. The predicted daytime sound levels in these amenity spaces will be less than 55 dBA. Further physical mitigation will not be required.

5.2 Indoor Living Areas and Ventilation Requirements

Central Air Conditioning

The future road traffic sound levels at the plane of windows facing Yonge Street (Building A) will be greater than 65 dBA during daytime and 60 dBA during the night-time hours. To address these excesses, the MECP guidelines recommend that all units be equipped with central air conditioning systems, so that the windows can be closed. Window or through-the-wall air conditioning units are not recommended because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall sound insulating properties of the envelope. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300.

Alternative Means of Ventilation

The predicted sound levels at the façades of the proposed dwelling units with exposure to Yonge Street (Buildings B and C) will be between 56 and 65 dBA during the daytime hours and between 51 and 60 dBA during the nighttime hours. These dwelling units require the provision for the future installation of central air conditioning systems or an alternative means of ventilation to open windows. The installation of central air conditioning would exceed the ventilation requirement.

Figure 3 shows the ventilation requirements for the development. Window or through-the-wall air conditioning units are not recommended for any residential unit because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall noise insulating

properties of the envelope. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300. There are no ventilation requirements for Buildings D and E.

5.3 Building Façade Constructions

Building A

The future road traffic sound levels at the plane of windows facing Yonge Street will be greater than 65 dBA during daytime and 60 dBA during night-time. MECP recommend that sound attenuating building constructions need to be specified for all the units with exposure to the roadway.

The required building components are selected based on the AIF value for road and rail traffic. To do so, calculations were performed to determine the acoustical insulation factors to maintain indoor sound levels within MECP guidelines. The calculation methods were developed by the National Research Council (NRC). They are based on the predicted future sound levels at the building facades, and the anticipated area ratios of the facade components (walls, windows and doors) and the floor area of the adjacent room.

The minimum necessary specification for the building envelope is Acoustical Insulation Factor, AIF-29 for living/dining and family rooms and AIF-28 for bedrooms, based on the possibility of sound entering the buildings through walls and windows only. Building components must be designed to achieve indoor sound level criteria. As an example, glazing constructions with an STC rating of 30 will provide sufficient sound insulation for the indoor spaces as long as the window to floor area ratio does not exceed 32% for living/dining and family rooms and does not exceed 40% for bedrooms.

Remaining Buildings

The remaining dwelling units in the development will have daytime and night-time sound levels at the top storey façade that are less than 65 dBA and 60 dBA due to road traffic noise and less than 60 dBA and 55 dBA due to rail traffic noise, respectively. 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 dwelling units. Any insulated metal exterior door meeting OBC requirements will be sufficient to provide noise insulation.

5.4 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements for all units/lots with anticipated traffic sound level excesses. Examples are provided below.

Type A:

> Purchasers/tenants are advised that sound levels due to increasing road and rail traffic may occasionally interfere with some activities of the dwelling unit occupants as the sound levels exceed the Municipality's and the Ministry of the Environment, Conservation and Parks noise criteria.

Suggested wording for future dwellings with daytime OLA sound levels exceeding the MECP criteria for which physical mitigation has been provided is given below.

Type B:

> Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the Municipality's and the Ministry of the Environment, Conservation and Parks noise criteria.

Suitable wording for future dwellings requiring forced air ventilation systems is given below.

Type C:

> This dwelling unit has been fitted with a forced air heating system and the ducting etc., was sized to accommodate central air conditioning. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality's and the Ministry of the Environment, Conservation and Parks noise criteria. (Note: 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.)

Suitable wording for future dwellings requiring central air conditioning systems is given below.

Type D:

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

An additional warning clause should be included in the offers of purchase and sale and tenancy agreements to inform the future residents of the presence of the future community centre, if required by the City.

Type E:

> "Purchasers are advised that due to the proximity of the community centre, sound levels from the facility may at times be audible."

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

Metrolinx's standard warning clause which is required for all residential developments located within 300 m of their main line is given below.

Type F:

> Warning: Metrolinx, carrying on business as GO Transit, and its assigns and successors in interest are the owners of lands within 300 metres from the land which is the subject hereof. In addition to the current use of the lands owned by Metrolinx, there may be alterations to or expansions of the rail and other facilities on such lands in the future including the possibility that GO Transit or any railway entering into an agreement with GO Transit to use the Metrolinx lands or Metrolinx and their respective assigns or successors as aforesaid may expand their operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwellings. Metrolinx will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under its lands. These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

6 Summary of Recommendations

In summary, HGC Engineering has reviewed the site plan and performed calculations to determine the potential road and rail traffic noise impact on the proposed residential properties with respect to MECP guidelines. The following are the recommendations.

1. Central air conditioning will be required for the units directly adjacent to Yonge Street. An alternative means of ventilation to open windows are required for the proposed dwelling units with exposure to Yonge Street. The location, installation and sound ratings of the air conditioning devices should comply with NPC-300, as applicable.

2. Upgraded glazing constructions are required for Building A for facades with exposure to Yonge Street and the railway line. For the remaining dwellings in the development, any building construction meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for the proposed dwelling units.

3. A detailed noise study should be conducted when details of the rooftop mechanical units associated with the commercial units are available to ensure the MECP sound level limits are met at the residences.

4. Warning clauses should be used to inform future residents of the traffic noise excesses and the proximity to nearby commercial and institutional uses.

5. 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.

Table 6: Summary of Noise Control Requirements and Noise Warning Clauses

Building No.	Acoustic Barrier	Ventilation Requirements*	Type of Warning Clause	Required AIF
A	--	Central A/C	A, D, F	LR/DR: AIF-29 BR: AIF-28
B, C	--	Forced Air	A, C, F	OBC
All Units	--	--	E[1]	OBC

Notes:
-- no specific requirement
OBC – meeting the minimum requirements of the Ontario Building Code
*The location, installation and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-300, as applicable.
1 – If required by the City

6.1 Implementation

To ensure that the noise recommendations outlined above are fully implemented, it is recommended that:

1. When floor plans and building elevations are available for Building A, they shall be reviewed to confirm window requirements such that the MECP indoor sound level limits are met.

2. A detailed noise study should be conducted when details of the rooftop mechanical units associated with the commercial units are available to ensure the MECP sound level limits are met at the residences.

3. Prior to the issuance of building permits for this development, the Municipality's building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures have been properly incorporated, where required.

4. Prior to assumption, the Municipality's building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures have been properly installed and constructed, where required.

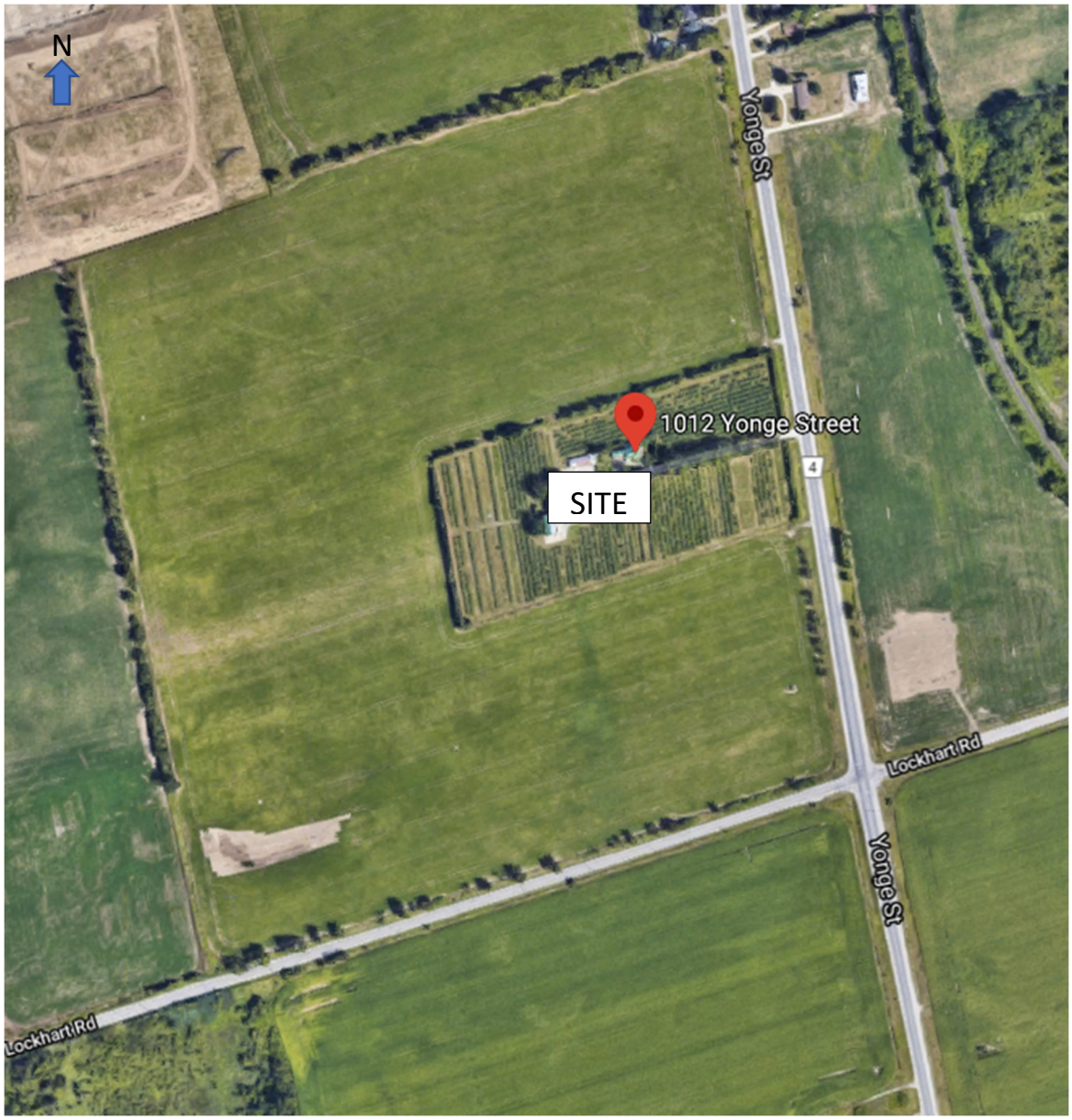


Figure 1: Aerial Photo

NO:	DATE:	ISSUED FOR:
1	23/04/20	CLIENT REVIEW
2	02/05/20	CLIENT REVIEW
3	09/05/20	CLIENT REVIEW
4	23/05/20	CLIENT REVIEW
5	22/11/20	CLIENT REVIEW
6	14/12/20	CLIENT REVIEW
7	19/01/21	CLIENT REVIEW

ADDITIONAL NOTES:

BARRIER FREE PARKING STALLS TO BE SIGNED (Rb-93) AND MARKED IN ACCORDANCE WITH ONTARION TRAFFIC MANUAL BOOK 5 - REGULATORY SIGNS

1,029 RESIDENTIAL UNITS (10 TOWNHOUSE UNITS AND 1,019 CONDO UNITS)
80,906.5 SQ.M. (870,875 SQ.FT.) OF RESIDENTIAL GFA
1,281.6 SQ.M. (13,795 SQ.FT.) OF COMMERCIAL GFA

1/A100 SITE PLAN
SCALE: 1:400

ZONING TABLE

PROVISION	REQUIRED (MNU)	PROVIDED
Developable Area (Net Area)		4.14ha
Lot Frontage (min).	N.A.	128.5m (Yonge St.) 122.5m (Municipal R.O.W.) 318.1m (Street 'A')
Front Yard Setback (min.)	0.0m (Max. of 50% of the frontage shall have bldgs. within 5.0m of the lot line)	2.5m (21%)
Min. Side or Rear Yard Setback abutting a Street or Laneway	1.5m	3.1m (Rear - Municipal R.O.W.)
Min. side or Rear Yard Setback	5.0m	3.1m
Min. Side or Rear Yard setback Residential Buildings 4 Storeys and less abutting a Residential, Open space or Environmental Protection Zone	1.2m	3.1m
Front, Side (interior & exterior) and Rear	Not Required (no step-back is required for five and up to six storeys if the bldg. is setback 3.0m or more from the property line)	Not Required
Min. Street Level Floor Height for Commercial Uses	4.5m	4.5m
Min. Bldg. Height Residential	3 storeys	3 storeys
Max. Bldg. Height Residential	12 storeys	6 storeys
Min. - Max. General Floor Space Index	0.3 - 2.5	2.08 incl. commercial
Residential Parking	1,029 spaces incl. 32 Type 'A' and 24 Type 'B' B.F. spaces (1 space / unit)	1,167 spaces (1.13 space / unit)
Commercial Parking	52 spaces incl. 1 Type 'A' and 2 Type 'B' B.F. spaces (1 parking space / 24.0m^2 of GFA)	53 spaces
Bicycle Parking	206 spaces (0.2 space / unit)	206 spaces
Min. Residential Density	50 units / ha	Gross: 210 units / ha
Min. General Amenity Area	---	7,938.9m^2

INNOVATIVE PLANNING SOLUTIONS
PLANNERS • PROJECT MANAGERS • LAND DEVELOPERS
647 WELHAM RD., UNIT 9A, BARRIE, ONTARIO, L4N 0B7
tel: 705 • 812 • 3281 fax: 705 • 812 • 3434 e: info@ipsconsultinginc.com www.ipsconsultinginc.com

	TYPE		AREA	UNITS
PARKING	UNDERGROUND GARAGE		35,283.5 SQ.M. (379,790 SQ.FT.)	1,033 SPACES
	SITE LEVEL PARKING			187 SPACES
	TOTAL PARKING (53 COMMERCIAL SPACES REQUIRED)			1,220 SPACES
	PARKING RATIO OF 1.13 SPACES PER UNIT			
	COMMERCIAL SPACE (OFF YONGE) (REQUIRES 53 PARKING SPACES)		1,281.6 SQ.M. (13,795 SQ.FT.)	N/A
BLOCK A (MIXED-USE) 6 STOREY CONDO		GROUND (RESIDENTIAL)	4,657.0 SQ.M. (50,125 SQ.FT.)	46 UNITS
		GROUND (COMMERCIAL)	1,281.6 SQ.M. (13,795 SQ.FT.)	
		TYPICAL (2ND TO 6TH)	6,116.3 SQ.M. (65,835 SQ.FT.)	83 UNITS
		TOTAL (GROUND TO 6TH)	36,520.1 SQ.M. (393,100 SQ.FT.)	461 UNITS
BLOCK B 6 STOREY CONDO		GROUND	2,884.1 SQ.M. (31,045 SQ.FT.)	31 UNITS
		TYPICAL (2ND TO 6TH)	2,884.1 SQ.M. (31,045 SQ.FT.)	39 UNITS
		TOTAL	17,304.6 SQ.M. (186,265 SQ.FT.)	226 UNITS
BLOCK C 6 STOREY CONDO		GROUND	2,715.7 SQ.M. (29,230 SQ.FT.)	29 UNITS
		TYPICAL (2ND TO 6TH)	2,884.1 SQ.M. (31,045 SQ.FT.)	39 UNITS
		TOTAL	17,136.2 SQ.M. (184,455 SQ.FT.)	224 UNITS
BLOCK D 3 STOREY CONDO		GROUND	1,688.7 SQ.M. (18,175 SQ.FT.)	16 UNITS
		TYPICAL (2ND TO 3RD)	1,688.7 SQ.M. (18,175 SQ.FT.)	19 UNITS
		TOTAL	5,066.1 SQ.M. (54,530 SQ.FT.)	54 UNITS
BLOCK E 3 STOREY CONDO		GROUND	1,688.7 SQ.M. (18,175 SQ.FT.)	16 UNITS
		TYPICAL (2ND TO 3RD)	1,688.7 SQ.M. (18,175 SQ.FT.)	19 UNITS
		TOTAL	5,066.1 SQ.M. (54,530 SQ.FT.)	54 UNITS
BLOCK F 3 STOREY TOWNS		GROUND	365.0 SQ.M. (3,930 SQ.FT.)	
		TYPICAL (2ND TO 3RD)	365.0 SQ.M. (3,930 SQ.FT.)	
		TOTAL	1,095.0 SQ.M. (11,785 SQ.FT.)	10 UNITS
TOTAL		RESIDENTIAL GFA	80,906.5 SQ.M. (870,875 SQ.FT.)	1,029 UNITS
		COMMERCIAL GFA	1,281.6 SQ.M. (13,795 SQ.FT.)	
		TOTAL GFA	82,188.1 SQ.M. (884,670 SQ.FT.)	

SITE STATISTICS:

SITE AREA	39,606.3 SQ.M. (426,320 SQ.FT.)
BUILDING COVERAGE	15,626.9 SQ.M. (168,205 SQ.FT.) OR 39.46%
FSI	2.08 (INCLUDING COMMERCIAL)
	2.04 (EXCLUDING COMMERCIAL)
UNDERGROUND GARAGE	35,283.5 SQ.M. (379,790 SQ.FT.)

SELLABLE AREA STATISTICS:		AREA (GFA)	SERVICE AREA	SELLABLE AREA (TSA)
BLOCK A (MIXED-USE) 6 STOREY CONDO	GROUND (RESIDENTIAL)	4,657.0 SQ.M.	1,668.4 SQ.M.	2,988.6 SQ.M.
	TYPICAL (2ND TO 6TH)	6,116.3 SQ.M.	532.3 SQ.M.	5,584.0 SQ.M.
	TOTAL (GROUND TO 6TH)	35,238.5 SQ.M.	4,329.9 SQ.M.	30,908.6 SQ.M. (87.7%)
*DOES NOT INCLUDE 1,281.6 SQ.M. (13,795 SQ.FT.) OF GROUND FLOOR COMMERCIAL				
BLOCK B 6 STOREY CONDO	GROUND	2,884.1 SQ.M.	829.5 SQ.M.	2,054.6 SQ.M.
	TYPICAL (2ND TO 6TH)	2,884.1 SQ.M.	245.6 SQ.M.	2,638.5 SQ.M.
	TOTAL	17,304.6 SQ.M.	2,057.5 SQ.M.	15,247.1 SQ.M. (88.1%)
BLOCK C 6 STOREY CONDO	GROUND	2,715.7 SQ.M.	808.1 SQ.M.	1,907.6 SQ.M.
	TYPICAL (2ND TO 6TH)	2,884.1 SQ.M.	245.6 SQ.M.	2,638.5 SQ.M.
	TOTAL	17,136.2 SQ.M.	2,036.1 SQ.M.	15,100.1 SQ.M. (88.1%)
BLOCK D 3 STOREY CONDO	GROUND	1,688.7 SQ.M.	405.9 SQ.M.	1,282.8 SQ.M.
	TYPICAL (2ND TO 3RD)	1,688.7 SQ.M.	159.9 SQ.M.	1,528.8 SQ.M.
	TOTAL	5,066.1 SQ.M.	725.7 SQ.M.	4,340.4 SQ.M. (85.7%)
BLOCK E 3 STOREY CONDO	GROUND	1,688.7 SQ.M.	405.9 SQ.M.	1,282.8 SQ.M.
	TYPICAL (2ND TO 3RD)	1,688.7 SQ.M.	159.9 SQ.M.	1,528.8 SQ.M.
	TOTAL	5,066.1 SQ.M.	725.7 SQ.M.	4,340.4 SQ.M. (85.7%)
BLOCK F 3 STOREY TOWNS	GROUND	365.0 SQ.M.	0 SQ.M.	365.0 SQ.M.
	TYPICAL (2ND TO 3RD)	365.0 SQ.M.	0 SQ.M.	730.0 SQ.M.
	TOTAL	1,095.0 SQ.M.	0 SQ.M.	1,095.0 SQ.M. (100%)
PROJECT TOTAL		80,906.5 SQ.M.	9,874.9 SQ.M.	71,031.6 SQ.M. (87.8%)

2/A100 BUILDING AND PROJECT STATISTCS
SCALE: 1:400

PRELIMINARY, NOT FOR CONSTRUCTION
ALL AREAS CALCULATIONS ARE PRELIMINARY

REVISION COMMENT:

NO:	DATE:	

SRN ARCHITECTS
8395 JANE STREET, SUITE 203
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

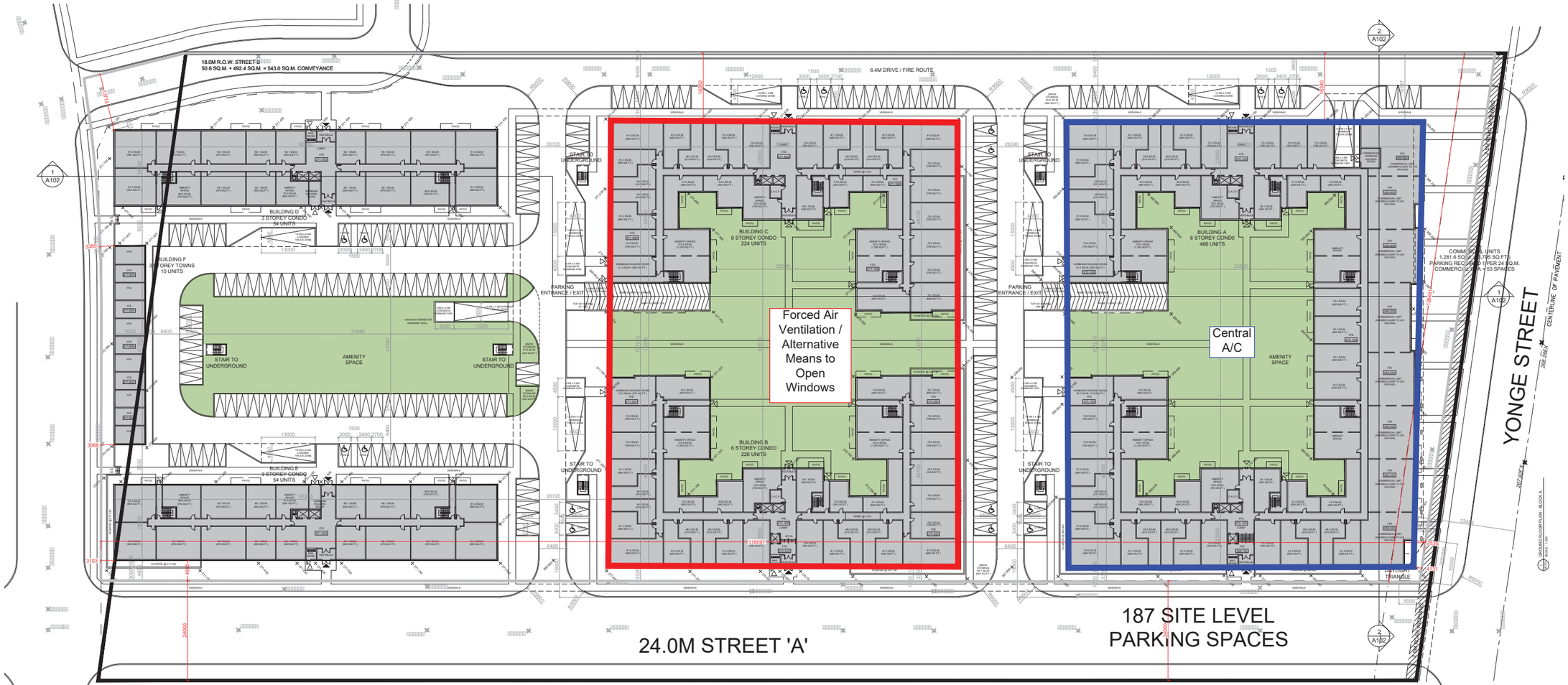
CLIENT:

PROJECT: BARRIE MIXED-USE
1012 YONGE STREET
BARRIE, ONTARIO.

DRAWING TITTLE: SITE PLAN, STATS AND OBC MATRIX
SCALE: 1:400

DATE: 14/12/20
CHECKED BY: G.P.R.
DRAWN BY: G.P.R.
DRAWING NUMBER:
PROJECT NUMBER: S19013
A100

Figure 2: Site Plan Showing Prediction Locations



1,029 RESIDENTIAL UNITS (10 TOWNHOUSE UNITS AND 1,019 CONDO UNITS)

80,906.5 SQ.M. (870,875 SQ.FT.) OF RESIDENTIAL GFA

1,281.6 SQ.M. (13,795 SQ.FT.) OF COMMERCIAL GFA

1 A100 SITE PLAN
SCALE: 1:400

BARRIER FREE PARKING STALLS TO BE SIGNED (Rb-93) AND MARKED IN ACCORDANCE WITH ONTARION TRAFFIC MANUAL BOOK 5 - REGULATORY SIGNS

ZONING TABLE		
PROVISION	REQUIRED (MNU)	PROVIDED
Developable Area (Net Area)		4.14ha
Lot Frontage (min).	N.A.	128.5m (Yonge St.) 122.3m (Municipal R.O.W.) 318.1m (Street 'A')
Front Yard Setback (min.)	0.0m (Max. of 50% of the frontage shall have bldgs. within 5.0m of the lot line)	2.5m (21%)
Min. Side or Rear Yard Setback abutting a Street or Laneway	1.5m	3.1m (Rear - Municipal R.O.W.)
Min. side or Rear Yard Setback	5.0m	3.1m
Min. Side or Rear Yard setback Residential Buildings 4 Storeys and less abutting a Residential, Open space or Environmental Protection Zone	1.2m	3.1m
Front, Side (interior & exterior) and Rear	Not Required (no step-back is required for five and up to six storeys if the bldg. is setback 3.0m or more from the property line)	Not Required
Min. Street Level Floor Height for Commercial Uses	4.5m	4.5m
Min. Bldg. Height Residential	3 storeys	3 storeys
Max. Bldg. Height Residential	12 storeys	6 storeys
Min. - Max. General Floor Space Index	0.3 - 2.5	2.08 incl. commercial
Residential Parking	1,029 spaces incl. 32 Type 'A' and 24 Type 'B' B.F. spaces (1 space / unit)	1,167 spaces (1.13 space / unit)
Commercial Parking	52 spaces incl. 1 Type 'A' and 2 Type 'B' B.F. spaces (1 parking space / 24.0m² of GFA).	53 spaces
Bicycle Parking	206 spaces (0.2 space / unit)	206 spaces
Min. Residential Density	50 units / ha	Gross: 210 units / ha
Min. General Amenity Area	---	7,938.9m²

	TYPE	AREA	UNITS
PARKING	UNDERGROUND GARAGE	35,283.5 SQ.M. (379,790 SQ.FT.)	1,033 SPACES
	SITE LEVEL PARKING		187 SPACES
	TOTAL PARKING (53 COMMERCIAL SPACES REQUIRED)		1,220 SPACES
	PARKING RATIO OF 1.13 SPACES PER UNIT		
	COMMERCIAL SPACE (OFF YONGE) (REQUIRES 53 PARKING SPACES)	1,281.6 SQ.M. (13,795 SQ.FT.)	N/A
BLOCK A (MIXED-USE) 6 STOREY CONDO	GROUND (RESIDENTIAL)	4,657.0 SQ.M. (50,125 SQ.FT.)	46 UNITS
	GROUND (COMMERCIAL)	1,281.6 SQ.M. (13,795 SQ.FT.)	
	TYPICAL (2ND TO 6TH)	6,116.3 SQ.M. (65,835 SQ.FT.)	83 UNITS
	TOTAL (GROUND TO 6TH)	36,320.1 SQ.M. (393,100 SQ.FT.)	461 UNITS
BLOCK B 6 STOREY CONDO	GROUND	2,884.1 SQ.M. (31,045 SQ.FT.)	31 UNITS
	TYPICAL (2ND TO 6TH)	2,884.1 SQ.M. (31,045 SQ.FT.)	39 UNITS
	TOTAL	17,304.6 SQ.M. (186,265 SQ.FT.)	226 UNITS
BLOCK C 6 STOREY CONDO	GROUND	2,715.7 SQ.M. (29,230 SQ.FT.)	29 UNITS
	TYPICAL (2ND TO 6TH)	2,884.1 SQ.M. (31,045 SQ.FT.)	39 UNITS
	TOTAL	17,136.2 SQ.M. (184,459 SQ.FT.)	224 UNITS
BLOCK D 3 STOREY CONDO	GROUND	1,688.7 SQ.M. (18,175 SQ.FT.)	16 UNITS
	TYPICAL (2ND TO 3RD)	1,688.7 SQ.M. (18,175 SQ.FT.)	19 UNITS
	TOTAL	5,066.1 SQ.M. (54,530 SQ.FT.)	54 UNITS
BLOCK E 3 STOREY CONDO	GROUND	1,688.7 SQ.M. (18,175 SQ.FT.)	16 UNITS
	TYPICAL (2ND TO 3RD)	1,688.7 SQ.M. (18,175 SQ.FT.)	19 UNITS
	TOTAL	5,066.1 SQ.M. (54,530 SQ.FT.)	54 UNITS
BLOCK F 3 STOREY TOWNS	GROUND	365.0 SQ.M. (3,930 SQ.FT.)	
	TYPICAL (2ND TO 3RD)	365.0 SQ.M. (3,930 SQ.FT.)	
	TOTAL	1,095.0 SQ.M. (11,785 SQ.FT.)	10 UNITS
TOTAL	RESIDENTIAL GFA	80,906.5 SQ.M. (870,875 SQ.FT.)	1,029 UNITS
	COMMERCIAL GFA	1,281.6 SQ.M. (13,795 SQ.FT.)	
	TOTAL GFA	82,188.1 SQ.M. (884,670 SQ.FT.)	

2 A100 BUILDING AND PROJECT STATISTCS
SCALE: 1:400

SITE STATISTICS:

SITE AREA	39,606.3 SQ.M. (426,320 SQ.FT.)
BUILDING COVERAGE	15,626.9 SQ.M. (168,205 SQ.FT.) OR 39.46%
FSI	2.08 (INCLUDING COMMERCIAL)
	2.04 (EXCLUDING COMMERCIAL)
UNDERGROUND GARAGE	35,283.5 SQ.M. (379,790 SQ.FT.)

SELLABLE AREA STATISTICS:		AREA (GFA)	SERVICE AREA	SELLABLE AREA (TSA)
BLOCK A (MIXED-USE) 6 STOREY CONDO	GROUND (RESIDENTIAL)	4,657.0 SQ.M.	1,668.4 SQ.M.	2,988.6 SQ.M.
	TYPICAL (2ND TO 6TH)	6,116.3 SQ.M.	532.3 SQ.M.	5,584.0 SQ.M.
	TOTAL (GROUND TO 6TH)	36,238.5 SQ.M.	4,329.9 SQ.M.	30,908.6 SQ.M. (87.7%)
DOES NOT INCLUDE 1,281.6 SQ.M. (13,795 SQ.FT.) OF GROUND FLOOR COMMERCIAL				
BLOCK B 6 STOREY CONDO	GROUND	2,884.1 SQ.M.	829.5 SQ.M.	2,054.6 SQ.M.
	TYPICAL (2ND TO 6TH)	2,884.1 SQ.M.	245.6 SQ.M.	2,638.5 SQ.M.
	TOTAL	17,304.6 SQ.M.	2,057.5 SQ.M.	15,247.1 SQ.M. (88.1%)
BLOCK C 6 STOREY CONDO	GROUND	2,715.7 SQ.M.	808.1 SQ.M.	1,907.6 SQ.M.
	TYPICAL (2ND TO 6TH)	2,884.1 SQ.M.	245.6 SQ.M.	2,638.5 SQ.M.
	TOTAL	17,136.2 SQ.M.	2,036.1 SQ.M.	15,100.1 SQ.M. (88.1%)
BLOCK D 3 STOREY CONDO	GROUND	1,688.7 SQ.M.	405.9 SQ.M.	1,282.8 SQ.M.
	TYPICAL (2ND TO 3RD)	1,688.7 SQ.M.	159.9 SQ.M.	1,528.8 SQ.M.
	TOTAL	5,066.1 SQ.M.	725.7 SQ.M.	4,340.4 SQ.M. (85.7%)
BLOCK E 3 STOREY CONDO	GROUND	1,688.7 SQ.M.	405.9 SQ.M.	1,282.8 SQ.M.
	TYPICAL (2ND TO 3RD)	1,688.7 SQ.M.	159.9 SQ.M.	1,528.8 SQ.M.
	TOTAL	5,066.1 SQ.M.	725.7 SQ.M.	4,340.4 SQ.M. (85.7%)
BLOCK F 3 STOREY TOWNS	GROUND	365.0 SQ.M.	0 SQ.M.	365.0 SQ.M.
	TYPICAL (2ND TO 3RD)	365.0 SQ.M.	0 SQ.M.	730.0 SQ.M.
	TOTAL	1,095.0 SQ.M.	0 SQ.M.	1,095.0 SQ.M. (100%)
PROJECT TOTAL		80,906.5 SQ.M.	9,874.9 SQ.M.	71,031.6 SQ.M. (87.8%)

Figure 3: Site Plan Showing Ventilation Requirements

IPS INNOVATIVE PLANNING SOLUTIONS
PLANNERS • PROJECT MANAGERS • LAND DEVELOPERS
607 WELHAM RD., UNIT 9A, BARRIE, ONTARIO, L4N 0B7
tel: 705 - 812 - 1381 fax: 705 - 812 - 1436 e: info@ipsconsulting.com www.ipsconsulting.com

THESE DRAWINGS ARE NOT TO BE SCALED;
ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES MUST BE REPORTED DIRECTLY TO SRN ARCHITECTS INC.

NO:	DATE:	ISSUED FOR:
1	23/04/20	CLIENT REVIEW
2	02/05/20	CLIENT REVIEW
3	09/05/20	CLIENT REVIEW
4	23/05/20	CLIENT REVIEW
5	22/11/20	CLIENT REVIEW
6	14/12/20	CLIENT REVIEW
7	19/01/21	CLIENT REVIEW

ADDITIONAL NOTES:

PRELIMINARY, NOT FOR CONSTRUCTION
ALL AREAS CALCULATIONS ARE PRELIMINARY

REVISION COMMENT:

NO:	DATE:	

SRN ARCHITECTS
8395 JANE STREET, SUITE 203
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

CLIENT:

PROJECT:
BARRIE MIXED-USE
1012 YONGE STREET
BARRIE, ONTARIO.

DRAWING TITTLE: SITE PLAN, STATS AND OBC MATRIX
SCALE: 1:400

DATE: 14/12/20 | CHECKED BY: G.P.R.
DRAWN BY: G.P.R. | DRAWING NUMBER:
PROJECT NUMBER: S19013 | A100

APPENDIX A

Road & Rail Traffic Data

Mandy Chan

From: Justin MacDonald <Justin.MacDonald@barrie.ca>
Sent: June 17, 2020 2:34 PM
To: Mandy Chan
Subject: Re: Road Traffic Data Request - Yonge Street

Good afternoon Mandy,

Sorry I missed this email from February.

The current AADT on Yonge Street is 13,000 vehicles per day with a 3% commercial and heavy volume. I do not have an exact split between the two. Please apply a growth rate 4% compounded yearly to a horizon year of 2041.

Should you have any questions please let me know.

Thanks,

Justin

From: Mandy Chan
Sent: Wednesday, February 26, 2020 9:44 AM
To: Justin MacDonald <Justin.MacDonald@barrie.ca>
Subject: Road Traffic Data Request - Yonge Street

Hi Justin,

HGC Engineering is conducting a noise feasibility study for a proposed residential development on the west side of Yonge Street, north of Lockhart Road. My understanding is that this part of Yonge Street is under the jurisdiction of the City. The location is indicated in the link below:

https://goo.gl/maps/byJSwBia7D1pZpJ86

We are requesting road traffic information for Yonge Street including AADT volumes (existing and/or ultimate), commercial truck percentages and growth rate (if available). Can you please let me know if this information is available.

Thanks,

Mandy Chan, PEng
Senior Engineer, Associate

HGC Engineering NOISE | VIBRATION | ACOUSTICS
Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044 x239 **e**: machan@hgcengineering.com
Visit our website: www.hgcengineering.com **Follow Us** – LinkedIn | Twitter | YouTube

Mandy Chan

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: January 31, 2020 10:48 AM
To: Mandy Chan
Subject: RE: 1012 Yonge Street Barrie - Rail Data Request

Good Afternoon Mandy,

Further to your request dated January 30th, 2020 the subject property at 1012 Yonge Street in Barrie is located within 300m of Metrolinx's Newmarket Subdivision which carries Barrie GO Train service.

It's anticipated that GO service on this line will be comprised of electric trains within (at least) a 10-year time horizon. The preliminary midterm weekday train volume forecast at this location, including both revenue and equipment trips is in the order of 42 trains - (36 day, 6 night). Trains will be comprised of a single locomotive and up to 12 passenger cars.

The maximum track design speed at this location on this corridor is 60 mph (97 km/h).

There is an anti-whistling by-laws in place at Mapleview Drive East.

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO and UP Express rail network and we are currently working towards the next phase. Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. We can, however, provide the following interim information which may be helpful;

1. At lower speeds, train noise is dominated by the powertrain. At higher speeds, train noise is dominated by the wheel- track interaction. Hence, at higher speeds, the noise level and spectrum of electric trains is expected to be very similar, if not identical, to those of equivalent diesel trains.

2. Along with electrification, Metrolinx will intensify service levels along all of its corridors to deliver the promised GO Expansion service. Everything else being equal, this will likely result in an overall increase in train noise emissions.

Given the above considerations, it would be prudent, for the purposes of acoustical analyses, to assume that the acoustical characteristics of electrified and diesel trains are equivalent. In light of the aforementioned information, acoustical models should employ diesel train parameters as the basis for analyses. We anticipate that additional information regarding specific operational parameters for electrified trains will become available in the future.

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability, and passenger demand.

It should be noted that this information is only as it pertains to Metrolinx trains. It would be prudent to contact other rail operators in the area directly for their rail traffic information.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

Best Regards,
Terri Cowan
Third Party Projects Officer
Third Party Projects Review| Capital Projects Group
Metrolinx | 20 Bay Street, Suite 600 |Toronto, Ontario|M5J 2W3
T: 416-202-3903 C: 416-358-1595

METROLINX

APPENDIX B

Sample STAMSON 5.04 Outputs

```
STAMSON 5.0        NORMAL REPORT        Date: 30-06-2020 14:38:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: a.te                  Time Period: Day/Night 16/8 hours
Description: Predicted daytime and nighttime sound levels at the upper storey
windows of Building A

Rail data, segment # 1: GO (day/night)
---------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
  1.             !  36.0/6.0   !  97.0 !  1.0 ! 12.0 !Diesel!  No

Data for Segment # 1: GO (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  : 210.00 / 210.00 m
Receiver height           :  19.50 / 19.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

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

LOCOMOTIVE (0.00 + 58.04 + 0.00) = 58.04 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.05  70.15 -11.98  -0.13   0.00   0.00   0.00  58.04
-------------------------------------------------------------------------

WHEEL (0.00 + 52.16 + 0.00) = 52.16 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.15  65.76 -13.18  -0.41   0.00   0.00   0.00  52.16
-------------------------------------------------------------------------

Segment Leq : 59.04 dBA

Total Leq All Segments: 59.04 dBA

Results segment # 1: GO (night)
-------------------------------

LOCOMOTIVE (0.00 + 53.27 + 0.00) = 53.27 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.05  65.37 -11.98  -0.13   0.00   0.00   0.00  53.27
-------------------------------------------------------------------------

WHEEL (0.00 + 47.39 + 0.00) = 47.39 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.15  60.98 -13.18  -0.41   0.00   0.00   0.00  47.39
-------------------------------------------------------------------------

Segment Leq : 54.27 dBA

Total Leq All Segments: 54.27 dBA
```

```
Road data, segment # 1: Yonge (day/night)
-----------------------------------------
Car traffic volume  : 25595/2844  veh/TimePeriod  *
Medium truck volume :   347/39    veh/TimePeriod  *
Heavy truck volume  :   720/80    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):  13000
    Percentage of Annual Growth        :   4.00
    Number of Years of Growth          :  21.00
    Medium Truck % of Total Volume     :   1.30
    Heavy Truck  % of Total Volume     :   2.70
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Yonge (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  :  29.00 / 29.00  m
Receiver height           :  19.50 / 19.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.28 m

ROAD (0.00 + 66.87 + 0.00) = 66.87 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.13  70.45   0.00  -3.23  -0.35   0.00   0.00   0.00  66.87
-------------------------------------------------------------------------------

Segment Leq : 66.87 dBA

Total Leq All Segments: 66.87 dBA

Results segment # 1: Yonge (night)
----------------------------------

Source height = 1.28 m

ROAD (0.00 + 60.34 + 0.00) = 60.34 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.13  63.92   0.00  -3.23  -0.35   0.00   0.00   0.00  60.34
-------------------------------------------------------------------------------

Segment Leq : 60.34 dBA

Total Leq All Segments: 60.34 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.53
                           (NIGHT): 61.30
```

```
STAMSON 5.0        NORMAL REPORT        Date: 15-01-2021 15:39:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: d.te                  Time Period: Day/Night 16/8 hours
Description: Predicted daytime and nighttime sound levels at the upper storey
windows of Building C

Rail data, segment # 1: GO (day/night)
---------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
  1.             !  36.0/6.0   !  97.0 !  1.0 ! 12.0 !Diesel!  No

Data for Segment # 1: GO (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  : 320.00 / 320.00 m
Receiver height           :  19.50 / 19.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

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

LOCOMOTIVE (0.00 + 53.12 + 0.00) = 53.12 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     90   0.05  70.15 -13.89  -3.14   0.00   0.00   0.00  53.12
-------------------------------------------------------------------------

WHEEL (0.00 + 47.05 + 0.00) = 47.05 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     90   0.15  65.76 -15.28  -3.42   0.00   0.00   0.00  47.05
-------------------------------------------------------------------------

Segment Leq : 54.08 dBA

Total Leq All Segments: 54.08 dBA

Results segment # 1: GO (night)
-------------------------------

LOCOMOTIVE (0.00 + 48.34 + 0.00) = 48.34 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     90   0.05  65.37 -13.89  -3.14   0.00   0.00   0.00  48.34
-------------------------------------------------------------------------

WHEEL (0.00 + 42.28 + 0.00) = 42.28 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     0     90   0.15  60.98 -15.28  -3.42   0.00   0.00   0.00  42.28
-------------------------------------------------------------------------

Segment Leq : 49.30 dBA

Total Leq All Segments: 49.30 dBA
```

```
Road data, segment # 1: Yonge (day/night)
-----------------------------------------
Car traffic volume  : 25595/2844  veh/TimePeriod  *
Medium truck volume :   347/39    veh/TimePeriod  *
Heavy truck volume  :   720/80    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):  13000
    Percentage of Annual Growth        :   4.00
    Number of Years of Growth          :  21.00
    Medium Truck % of Total Volume     :   1.30
    Heavy Truck  % of Total Volume     :   2.70
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Yonge (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  : 150.00 / 150.00 m
Receiver height           :  19.50 / 19.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.28 m

ROAD (0.00 + 55.82 + 0.00) = 55.82 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.13  70.45   0.00 -11.27  -3.36   0.00   0.00   0.00  55.82
-------------------------------------------------------------------------------

Segment Leq : 55.82 dBA

Total Leq All Segments: 55.82 dBA

Results segment # 1: Yonge (night)
----------------------------------

Source height = 1.28 m

ROAD (0.00 + 49.29 + 0.00) = 49.29 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.13  63.92   0.00 -11.27  -3.36   0.00   0.00   0.00  49.29
-------------------------------------------------------------------------------

Segment Leq : 49.29 dBA

Total Leq All Segments: 49.29 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.05
                           (NIGHT): 52.31
```