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Noise Feasibility Study, Proposed Residential Development, 3111 and 3123 Cawthra Road Mississauga, Ontario

Prepared for:

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Janaury 6, 2016

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1 Introduction and Summary

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by Maple Valley Development Corporation to conduct a noise feasibility study for a proposed residential development to be located at 3111 and 3123 Cawthra Road in the City of Mississauga, Ontario. The development will consist of 13 blocks of 38 stacked townhouse units and four freehold townhouses at the rear of the property. The study is being conducted as part of the planning and approvals process required by the Municipality.

The primary source of transportation noise includes road traffic on Cawthra Road. Road traffic data was obtained from the Region of Peel. Secondary sources of noise are road traffic on Dundas Street East and rail traffic on Canadian Pacific (CP) railway line. The data was obtained from the City of Mississauga and from CP personnel and past HGC Engineering projects. The traffic data was used to predict future traffic sound levels around the proposed residential development. The predictions were evaluated with respect to the guidelines of the Ministry of the Environment and Climate Change (MOECC) and used to develop noise control recommendations.

The sound level predictions indicate that future road and rail traffic sound levels will exceed MOECC guidelines. Feasible means exist to reduce sound levels to ensure MOECC guidelines are satisfied inside the proposed dwellings. Central air conditioning systems are required for the dwellings fronting onto Cawthra Road and dwellings with some exposure to Cawthra Road, Dundas Street East and CP railway line. Forced-air ventilation with ducts sized to accommodate the future installation of central air conditioning by the occupant is required for the remaining dwellings with some exposure Cawthra Road, Dundas Street East and CP railway line. Upgraded glazing constructions are required for dwellings fronting onto Cawthra Road and units with some exposure to Cawthra Road, Dundas Street East and CP railway line. Warning clauses are also recommended in order to inform future owners/tenants of the sound level excesses.

2 Description of the Site and Significant Noise Sources

Figure 1 is an aerial photo showing the subject site and surrounding land uses. The site is located on the east side of Cawthra Road and north of Dundas Street East, specifically at 3111 and 3123 Cawthra Road in the City of Mississauga, Ontario. A site plan prepared by Chamberlain Architect Services Limited, dated December 4, 2015 is provided as Figure 2. The noise prediction locations are also shown on Figure 2 for reference purposes. The site is proposed to include 13 blocks of stacked townhouse units, four freehold townhouses and at grade parking.

HGC Engineering personnel visited the site on July 6, 2015 to investigate the site and the surrounding land uses. The acoustical environment surrounding the site is urban, comprised primarily of road traffic noise. Currently, there are two existing 1.5-storey houses at the subject site which are to be demolished. Most of the land surrounding the site are existing residences. To the north of the site is a Buddhist temple and to the southwest is a commercial plaza. Noise was not audible from the commercial plaza or the temple over traffic noise during the site visit. The primary source of noise impacting the site is traffic noise on Cawthra Road. Secondary sources of noise are traffic on Dundas Street East and CP railway line located at approximately 340 m and 480 m to the south of the site.

3 Criteria

3.1 Road and Rail Traffic Noise

Guidelines for acceptable levels of road and rail traffic noise impacting residential developments are given in the MOECC publication NPC-300 “Environment Noise Guideline Stationary and Transportation sources – Approval and Planning”, 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 I: MOECC Road and Rail Traffic Noise Criteria (dBA)

Area	Daytime L_{EQ} (16 hour) Road/Rail	Nighttime L_{EQ} (8 hour) Road/Rail
Outside Bedroom Windows	55 dBA / 50 dBA	50 dBA / 45 dBA
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 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 MOECC guidelines.

The guidelines in the MOECC publication allow the sound level in an Outdoor Living Area 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.

MOECC guidelines require central air conditioning or other ventilation system to be installed prior to occupancy as an alternative means of ventilation to open windows for dwellings where nighttime sound levels outside bedroom windows exceed 60 dBA or daytime sound levels exceed 65 dBA outside living room windows. Provision for air conditioning is required when nighttime sound levels at bedroom windows are in the range of 51 to 60 dBA or daytime sound levels at living/dining rooms are in the range of 56 dBA to 65 dBA. Sound attenuating building constructions are required when nighttime sound levels exceed 55 dBA at the plane of the bedroom windows due to rail noise and exceed 60 dBA due to road traffic noise. Warning clauses to notify future residents of possible sound level excesses are also required when nighttime sound levels exceed 50 dBA at the plane of a bedroom window due to road and rail traffic.

4 Traffic Noise Predictions

4.1 Road Traffic Data

Traffic data for Cawthra Road was obtained from the Region of Peel in the form of Ultimate Traffic Data, and is provided in the Appendix A. A commercial vehicle percentage of 5.9% was split into 2.8% medium trucks and 3.1% heavy trucks. A day/night split of 76%/24% was used in the analysis along with a posted speed of 50 km/h. Table III summarizes the traffic volume data used in this study.

Traffic data for Dundas Street East was obtained from the City of Mississauga in the form of Ultimate Traffic Data, and is provided in the Appendix A. A commercial vehicle percentage of 7% was split into 3.85% medium trucks and 3.15% heavy trucks. A day/night split of 90%/10% was used in the analysis along with a posted speed of 60 km/h. Table III summarizes the traffic volume data used in this study.

Table II: Ultimate Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Cawthra Road	Daytime	28 606	851	942	30 400
	Nighttime	9 034	269	298	9 600
	Total	**37 640**	**1 120**	**1 240**	**40 000**
Dundas Street West	Daytime	50 220	2 079	1 701	54 000
	Nighttime	5 580	231	189	6 000
	Total	**55 800**	**2 310**	**1 890**	**60 000**

4.2 Rail Traffic Data

Rail traffic data for the CP Galt Subdivision was originally obtained from CP railway personnel for other projects along the railway line and is attached in Appendix A. This line is used for GO and freight operations and is classified as a principle main track. The maximum permissible train speed in the area of the site is 80 kph (50 mph). In conformance with CP assessment requirements, the maximum speeds, maximum number of cars and locomotives per train were used in the traffic noise analysis to yield worse case estimate of train noise. The data was projected to the year 2026 using projections provided by CP personnel.

Table III: CP Rail Traffic Data Projected to Year 2026

Type of Train	Maximum Number of Cars	Maximum Speed (km/h)	Maximum Number of Locomotives	Volume Day/Night
Freight	144	80	4	17.9/9.6

Rail traffic data for GO Transit operations was obtained from GO Transit personnel and is provided in Appendix A. The data provided has been projected to the year 2021 (+/-). Table IV summarises the GO rail traffic data used in the analysis.

Table IV: GO Transit Rail Data Projected to Year 2021 (+/-)

Type of Train	Maximum Number of Cars	Maximum Speed (km/h)	Maximum Number of Locomotives	Volume Day/Night
GO Transit	12	80	1	57/13

4.3 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 MOECC. Sample STAMSON output is included in Appendix B. Predictions of the traffic sound levels were made at various locations around the proposed residential buildings as shown on Figure 2. The results of these predictions are summarized in Table V and VI.

Table V: Predicted Daytime Sound Levels, Without Mitigation, [dBA]

Prediction Location	Description	Daytime at Façade $L_{EQ-16\ hr}$		Daytime at Façade $L_{EQ-16\ hr}$
		Road	Rail	
[A]	Units fronting onto Cawthra Road with exposure to Dundas Street East and CP railway	67	56	68
[B]	Units fronting onto Cawthra Road with exposure to Dundas Street East and CP railway	67	53	67
[C]	Units with exposure to Cawthra Road, Dundas Street East and CP railway	60	56	62
	Tot Lot	<55	<55	55
[D]	Units with some exposure to Cawthra Road, Dundas Street East and CP railway	59	53	60
[E]	Units with exposure to Cawthra Road, Dundas Street East and CP railway	55	53	57
[F]	Units with exposure to Cawthra Road, Dundas Street East and CP railway	55	53	57
[G]	Units with exposure to Cawthra Road, Dundas Street East and CP railway	54	53	56

Table VI: Predicted Nighttime Sound Levels, [dBA], Without Mitigation

Prediction Location	Description	Nighttime at Façade $L_{EQ-16\ hr}$		Nighttime at Façade $L_{EQ-16\ hr}$
		Road	Rail	
[A]	Units fronting onto Cawthra Road with exposure to Dundas Street East and CP railway	65	57	66
[B]	Units fronting onto Cawthra Road with exposure to Dundas Street East and CP railway	65	54	66
[C]	Units with exposure to Cawthra Road, Dundas Street East and CP railway	59	57	61
[D]	Units with some exposure to Cawthra Road, Dundas Street East and CP railway	57	54	59
[E]	Units with exposure to Cawthra Road, Dundas Street East and CP railway	54	54	57
[F]	Units with exposure to Cawthra Road, Dundas Street East and CP railway	54	54	57
[G]	Units with exposure to Cawthra Road, Dundas Street East and CP railway	53	54	56

5 Discussion and Recommendations

The following discussion outlines preliminary recommendations for building façade constructions, ventilation requirements, and noise warning clauses to achieve the noise criteria stated in Table I. The predictions indicate that the future traffic sound levels will exceed MOECC guidelines at all facades of the future residential buildings.

5.1 Outdoor Living Areas

The majority of residential units may have balconies or ground level patios less than 4 metres in depth (which are exempt from the definition of OLA under MOECC guidelines).

There is a tot lot which is well shielded from road traffic and mitigation is not recommended.

There are no other common outdoor amenity areas indicated on the provided plan.

5.2 Indoor Living Areas

Central Air Conditioning

The predicted nighttime sound levels of the dwellings fronting onto Cawthra Road (prediction location [A] and [B]) and dwellings with some exposure to Cawthra Road, Dundas Street West and CP railway line (prediction location [C]) will be greater than 60 dBA. To address these excesses, the MOECC guidelines recommend that these units be equipped with central air conditioning to allow windows to remain closed. Associated warning clauses are also required. 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 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 the criteria outlined in MOECC publication NPC-300. These units are indicated in Figure 3.

Provision of Air Conditioning

The predicted nighttime sound levels of the dwellings with some exposure to Cawthra Road, Dundas Street East and CP railway (prediction location [D] – [G]) will be between 50 dBA and 60 dBA. To address these excesses, the MOECC guidelines recommend that these units be equipped with forced air ventilation systems with ducts sized to accommodate the future installation of air conditioning by the occupant. The guidelines also recommend warning clauses for these dwelling units. Window or through-the-wall air conditioning units are not recommended for any residential units 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 MOECC publication NPC-300 as applicable. These dwellings are shown in Figure 3.

5.3 Building Facade Constructions

Future traffic sound levels at the dwellings fronting onto Cawthra Road (prediction location [A] and [B]) and dwellings with some exposure to Cawthra Road, Dundas Street East and CP Railway (prediction location [C]) will exceed 60 dBA during the nighttime due to road traffic or 55 dBA due to rail traffic. MOECC guidelines recommend that the windows, walls and doors be designed so that the indoor sound levels comply with MOECC noise criteria.

Calculations have been performed to determine the building envelope constructions likely to be required to maintain indoor sound levels within MOECC 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 of the facade components (walls, windows and doors) relative to the floor area of the adjacent room.

The minimum necessary specification for the building envelope is Acoustical Insulation Factor, AIF-30 for bedrooms and AIF-27 for living/dining rooms for dwellings fronting onto Cawthra Road (prediction location [A] and [B]), based on the possibility of sound entering the dwellings through the walls and windows. As a general guideline, a glazing construction with two panes of 3 mm glass and 13 mm airspace will be sufficient for the dwelling unit as long as the window to floor area ratio does not exceed 25% for bedrooms and does not exceed 50% for living/dining room windows. If patio doors are to be used in the dwellings, they must be included in the window area.

The minimum necessary specification for the building envelope is Acoustical Insulation Factor, AIF-27 for bedrooms and AIF-21 for living/dining rooms for dwellings with exposure to Cawthra Road, Dundas Street East and CP Railway (prediction location [C]), based on the possibility of sound entering the dwellings through the walls and windows. As a general guideline, a glazing construction with two panes of 3 mm glass and 13 mm airspace will be sufficient for the dwelling unit as long as the window to floor area ratio does not exceed 50% for bedrooms and any glazing meeting the minimum requuiements of Ontario Building Code will provide adequate sound

insulations for living/dining room windows. If patio doors are to be used in the dwellings, they must be included in the window area.

When detailed floor plans and elevations are available, the glazing requirements should be verified based on actual window to floor area ratios.

All of the other dwelling units will have predicted sound level less than or equal to 60 dBA during the daytime and less than or equal to 55 dBA during the nighttime due to rail traffic, and less than 65 dBA during daytime and 60 dBA during nighttime due to road traffic. Thus, any exterior wall and double glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation.

5.4 Warning Clauses

The MOECC noise guidelines recommend that warning clauses be included in the property, tenancy and rental agreements for all units, to inform prospective occupants of the potential traffic sound level excesses.

A suitable wording for future dwellings with minor sound level excesses is given below.

Type A:

> Purchasers and tenants are advised that despite the inclusion of noise control feature in the development and within the building units, sound levels due to increasing road and rail traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the Municipality's and the Ministry of the Environment and Climate Change noise criteria.

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

Type B:

> This dwelling units 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 level are within the sound level limits of the Municipality and the Ministry of the Environment and Clime Change.

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 criteria of the Municipality and the Ministry of the Environment and Climate Change. (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 MOECC publication NPC-300 as applicable.)

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

6 Summary of Recommendations

The following list and Table VII below summarizes the recommendations made in this report.

1. Central air conditioning is required for the dwelling units fronting onto Cawthra Road (prediction location [A] and [B]) and dwellings with exposure to Cawthra Road, Dundas Street East and CP railway line (prediction location [C]). Forced air ventilation systems with ductwork sized for the future installation of central air conditioning by the occupant will be required for the reminaing dwellings with some exposure Cawthra Road, Dundas Street East and CP railway line (prediction locations [D] - [G]). The location, installation and sound ratings of the air conditioning devices should comply with NPC-300, as applicable.

2. Upgraded building constructions are required for the dwelling units fronting onto Cawthra Road and units with exposure to Cawthra Road, Dundas Street East and CP railway line (prediction location [A], [B] and [C]). When detailed floor plans and building elevations are available, an acoustical consultant should refine the recommendations for glazing construction based on actual window to floor area ratios.

3. Warning clauses are required in the property and tenancy agreements and offers of purchase and sale in order to inform future owners/tenants of the sound level excesses.

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

Prediction Location	Ventilation Requirements*	Type of Warning Clause	Acoustical Insulation Factor (LRDR/BR)
A	Central A/C	A, B	AIF-27/AIF-30
B	Central A/C	A, B	AIF-27/AIF-30
C	Central A/C	A, B	AIF-21/AIF-27
D	Forced Air	A, C	OBC
E	Forced Air	A, C	OBC
F	Forced Air	A, C	OBC
G	Forced Air	A, C	OBC

Note:
* The location, installation and sound rating of the air conditioning condensers must be compliant with MOECC Guideline NPC-300
LRDR – Living Room/Dining Room, BR – Bedroom, OBC – Ontario Building Code

6.1 Implementation

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

1) Prior to an application for a building permit, a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should review the architectural plans and specifications to certify that the required noise control measures and sound level specifications determined in the detailed noise studies have been included.

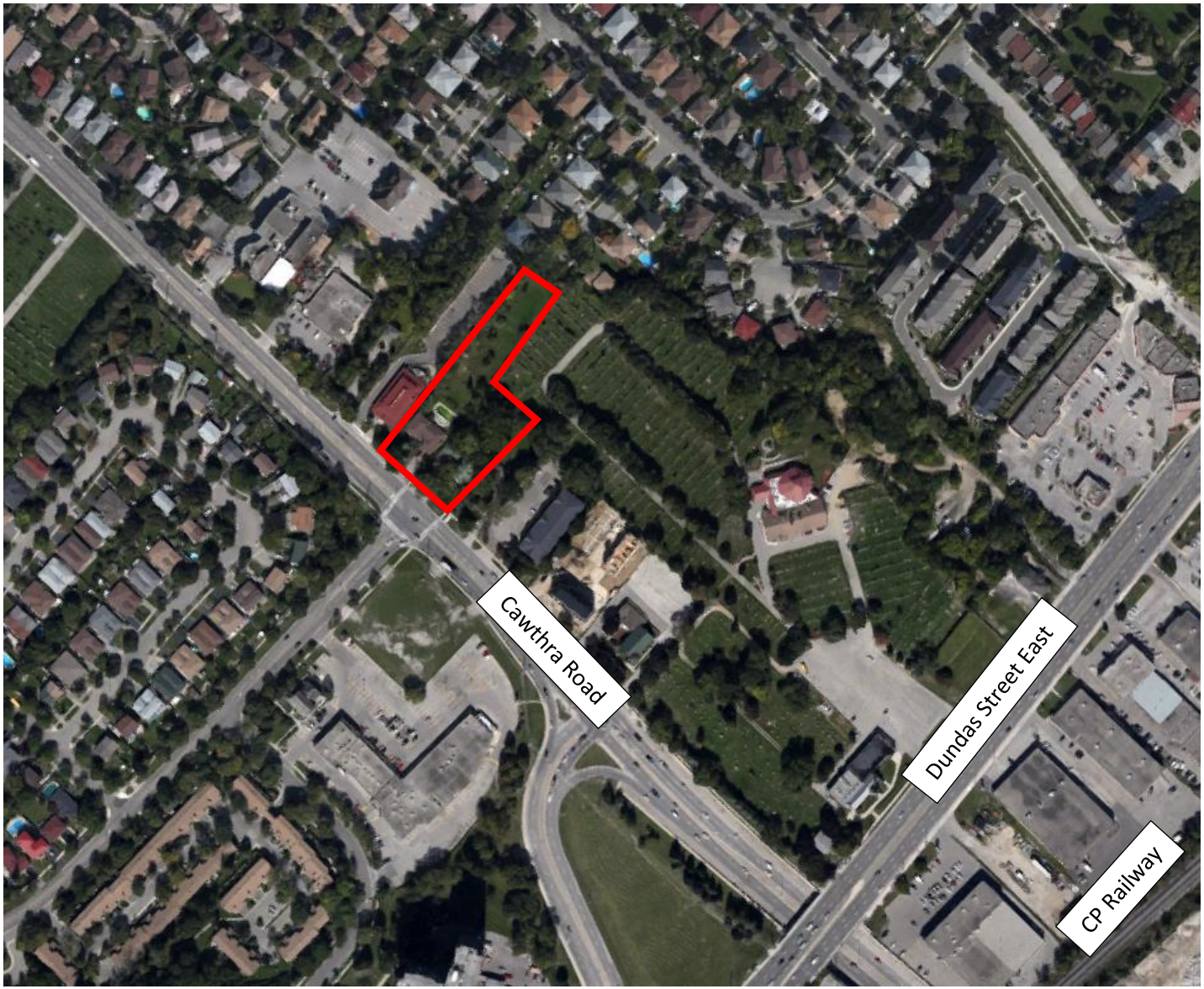
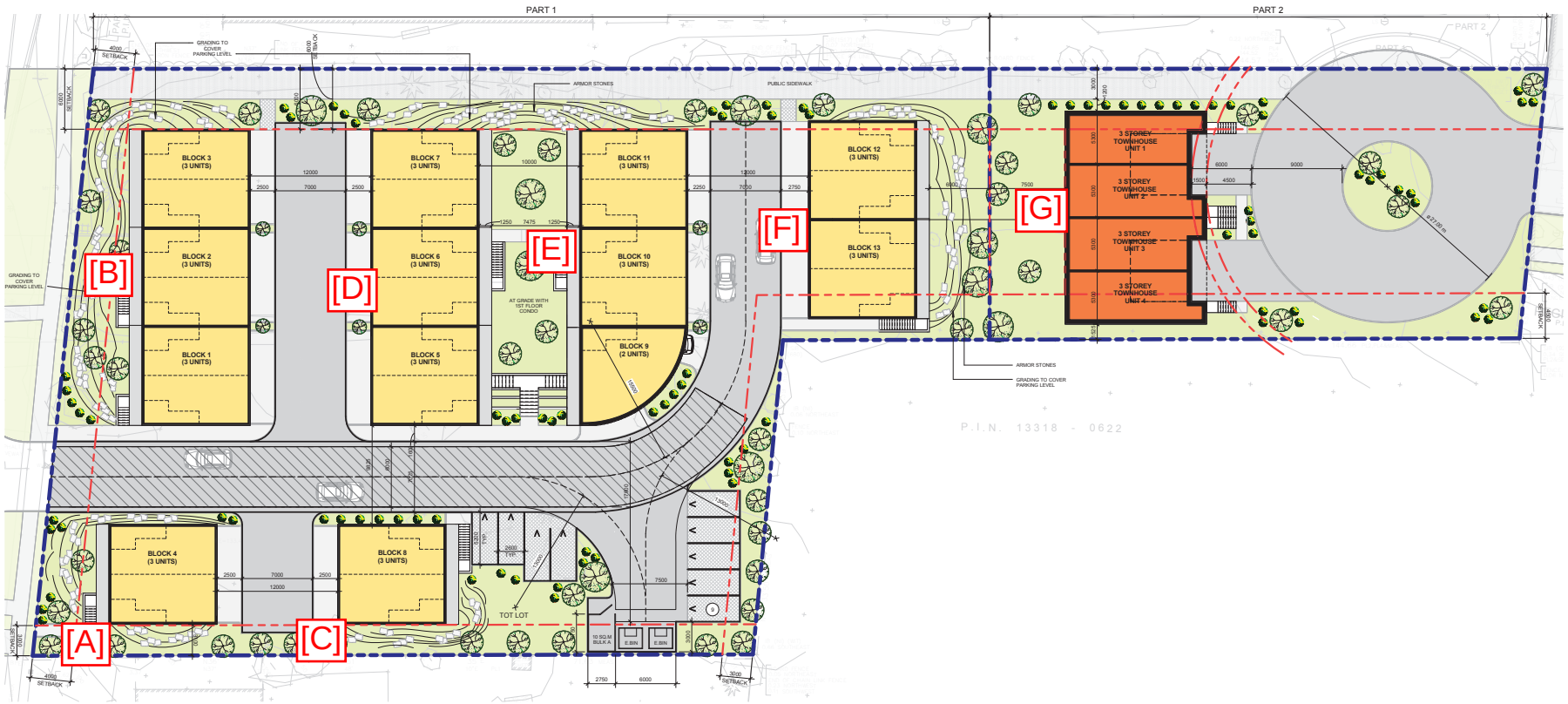


Figure 1: Key Plan



1 SITE PLAN
P0 1 : 200

FLOOR AREAS (GROSS/SELLABLE)

GROSS BUILDING AREAS

COUNT	AREA TYPE	AREA (SM)	AREA (SF)
PART 1			
T/O GROUND FLOOR			
5	COMMON SPACE	234.33 m²	2522 ft²
T/O SECOND FLOOR			
24	2 STOREY TOWNHOUSE (TYPICAL)	142.52 m²	1534 ft²
12	BUNGALOW (TYPICAL)	1114.97 m²	12001 ft²
1	2 STOREY TOWNHOUSE (CURVED)	5.73 m²	62 ft²
1	BUNGALOW (CURVED)	77.39 m²	833 ft²
T/O THIRD FLOOR			
24	2 STOREY TOWNHOUSE (TYPICAL)	1272.18 m²	13694 ft²
1	2 STOREY TOWNHOUSE (CURVED)	83.41 m²	898 ft²
T/O FOURTH FLOOR			
24	2 STOREY TOWNHOUSE (TYPICAL)	1272.18 m²	13694 ft²
1	2 STOREY TOWNHOUSE (CURVED)	83.41 m²	898 ft²
		4286.12 m²	46135 ft²
PART 2			
T/O GROUND FLOOR			
4	3 STOREY TOWN HOUSE	206.04 m²	2218 ft²
4	PARKING GARAGE	74.20 m²	799 ft²
4	EXTERIOR STAIRS	13.07 m²	141 ft²
T/O SECOND FLOOR			
4	3 STOREY TOWN HOUSE	298.50 m²	3213 ft²
T/O THIRD FLOOR			
4	3 STOREY TOWN HOUSE	298.50 m²	3213 ft²
		890.32 m²	9583 ft²
GROSS BUILDING AREA (PART 1 & PART 2)		5176.43 m²	55719 ft²

SELLABLE BUILDING AREAS

UNIT COUNT	AREA TYPE	AREA (SM)	AREA (SF)
PART 1			
24	2 STOREY TOWNHOUSE (TYPICAL)	2686.88 m²	28921 ft²
12	BUNGALOW (TYPICAL)	1114.97 m²	12001 ft²
1	2 STOREY TOWNHOUSE (CURVED)	172.54 m²	1857 ft²
1	BUNGALOW (CURVED)	77.39 m²	833 ft²
		4051.79 m²	43613 ft²
PART 2			
4	3 STOREY TOWN HOUSE	803.04 m²	8644 ft²
		803.04 m²	8644 ft²

SITE STATISTICS

SITE STATISTICS (ENTIRE SITE)

	AREA (SM)	AREA (SF)	AREA (ACRES)	PERCENT
BUILDING				
BUILDING FOOTPRINT	1796.70 m²	19340 ft²	0.44 acres	29.2%
STAIRS	74.78 m²	805 ft²	0.02 acres	1.2%
	1871.48 m²	20144 ft²	0.46 acres	30.5%
HARD LANDCAPE				
ASPHALT PAVING	1225.82 m²	13192 ft²	0.30 acres	20.0%
ASPHALT PAVING (MUNICIPAL)	509.12 m²	5480 ft²	0.13 acres	8.3%
CURB / SIDEWALK	7.41 m²	80 ft²	0.00 acres	0.1%
CURBS / SIDEWALKS	410.32 m²	4417 ft²	0.10 acres	6.7%
	2152.47 m²	23169 ft²	0.53 acres	35.0%
SOFT LANDSCAPE				
LANDSCAPE	1622.84 m²	17468 ft²	0.40 acres	26.4%
LANDSCAPE (MUNICIPAL SIDEWALK)	360.28 m²	3878 ft²	0.09 acres	5.9%
LANDSCAPE - PERMEABLE PAVERS	135.92 m²	1463 ft²	0.03 acres	2.2%
	2119.04 m²	22809 ft²	0.52 acres	34.5%
	6143.00 m²	66123 ft²	1.52 acres	100.0%

FLOOR AREA RATIO (ENTIRE SITE)

TOTAL FLOOR AREA	5176.43 m²	55719 ft²
TOTAL SITE AREA	6143.00 m²	66123 ft²
FLOOR AREA RATIO:	0.842	

SITE STATISTICS (SEVERED SITE - PART 1)

	AREA (SM)	AREA (SF)	AREA (ACRES)	PERCENT
BUILDING				
BUILDING FOOTPRINT	1516.49 m²	16323 ft²	0.37 acres	32.3%
STAIRS	61.71 m²	664 ft²	0.02 acres	1.3%
	1578.20 m²	16988 ft²	0.39 acres	33.6%
HARD LANDCAPE				
ASPHALT PAVING	1131.69 m²	12181 ft²	0.28 acres	24.1%
CURBS / SIDEWALKS	410.32 m²	4417 ft²	0.10 acres	8.7%
	1542.01 m²	16598 ft²	0.38 acres	32.9%
SOFT LANDSCAPE				
LANDSCAPE	1166.53 m²	12556 ft²	0.29 acres	24.9%
LANDSCAPE (MUNICIPAL SIDEWALK)	267.96 m²	2884 ft²	0.07 acres	5.7%
LANDSCAPE - PERMEABLE PAVERS	135.92 m²	1463 ft²	0.03 acres	2.9%
	1570.38 m²	16903 ft²	0.39 acres	33.5%
	4690.59 m²	50489 ft²	1.16 acres	100.0%

FLOOR AREA RATIO (PART 1)

TOTAL FLOOR AREA (PART 1)	4286.12 m²	46135 ft²
TOTAL SITE AREA (PART 1)	4690.59 m²	50489 ft²
FLOOR AREA RATIO:	0.913	

SITE STATISTICS (SEVERED SITE - PART 2)

	AREA (SM)	AREA (SF)	AREA (ACRES)	PERCENT
BUILDING				
BUILDING FOOTPRINT	280.21 m²	3016 ft²	0.07 acres	19.3%
STAIRS	13.07 m²	141 ft²	0.00 acres	0.9%
	293.29 m²	3157 ft²	0.07 acres	20.2%
HARD LANDCAPE				
ASPHALT PAVING	93.93 m²	1011 ft²	0.02 acres	6.5%
ASPHALT PAVING (MUNICIPAL)	509.12 m²	5480 ft²	0.13 acres	35.1%
CURB / SIDEWALK	7.41 m²	80 ft²	0.00 acres	0.5%
	610.46 m²	6571 ft²	0.15 acres	42.0%
SOFT LANDSCAPE				
LANDSCAPE	456.34 m²	4912 ft²	0.11 acres	31.4%
LANDSCAPE (MUNICIPAL SIDEWALK)	92.32 m²	994 ft²	0.02 acres	6.4%
	548.65 m²	5906 ft²	0.14 acres	37.8%
	1452.40 m²	15634 ft²	0.36 acres	100.0%

FLOOR AREA RATIO (PART 2)

TOTAL FLOOR AREA (PART 2)	890.32 m²	9583 ft²
TOTAL SITE AREA (PART 2)	1452.40 m²	15634 ft²
FLOOR AREA RATIO:	0.612	

DEVELOPMENT DATA - PART 1

LEGAL DESCRIPTION

3123 CAWTHRA ROAD CON. 1 NDS PT LOT 10
RP43R23991 PART 1 & PART 2
3111 CAWTHRA ROAD CON. 1 NDS PT LOT 10

DEVELOPMENT DATA

PART 1 - 3 STOREY STACKED TOWNHOUSES (38 UNITS)
PART 2 - 3 STOREY TOWNHOUSES (4 UNITS)

42 TOTAL UNITS

TYPICAL UNIT TYPES

TYPICAL UNIT	AREA (SM)	AREA (SF)
PART 1		
BUNGALOW (TYPICAL)	92.35 m²	994 ft²
2 STOREY TOWNHOUSE (TYPICAL)	110.75 m²	1192 ft²
BUNGALOW (CURVED)	77.39 m²	833 ft²
2 STOREY TOWNHOUSE (CURVED)	172.54 m²	1857 ft²
PART 2		
3 STOREY TOWN HOUSE	200.72 m²	2161 ft²

PARKING STATISTICS (TYP. 2 PER UNIT)

PARKING TYPE	COUNT
PART 1	
TYPICAL PARKING SPACES (2600x5200)	76
VISITOR PARKING (2600x5200)	9
	85
PART 2	
TYPICAL PARKING SPACES (2600x5200)	8
	8

Chamberlain
Architects
Constructors
Managers

Chamberlain Architect Services Limited
5096 South Service Road
Suite 103
Burlington, Ontario L7L 5H4
CANADA

Tel: 905.631.7777
Fax: 905.631.7717

www.chamberlain-online.com

NO.	ISSUED	DATE
1	REVISED SITE PLAN	04 DEC 2015

SEAL

CONSTRUCTION NORTH | TRUE NORTH

CAWTHRA TOWNHOUSE COMPLEX

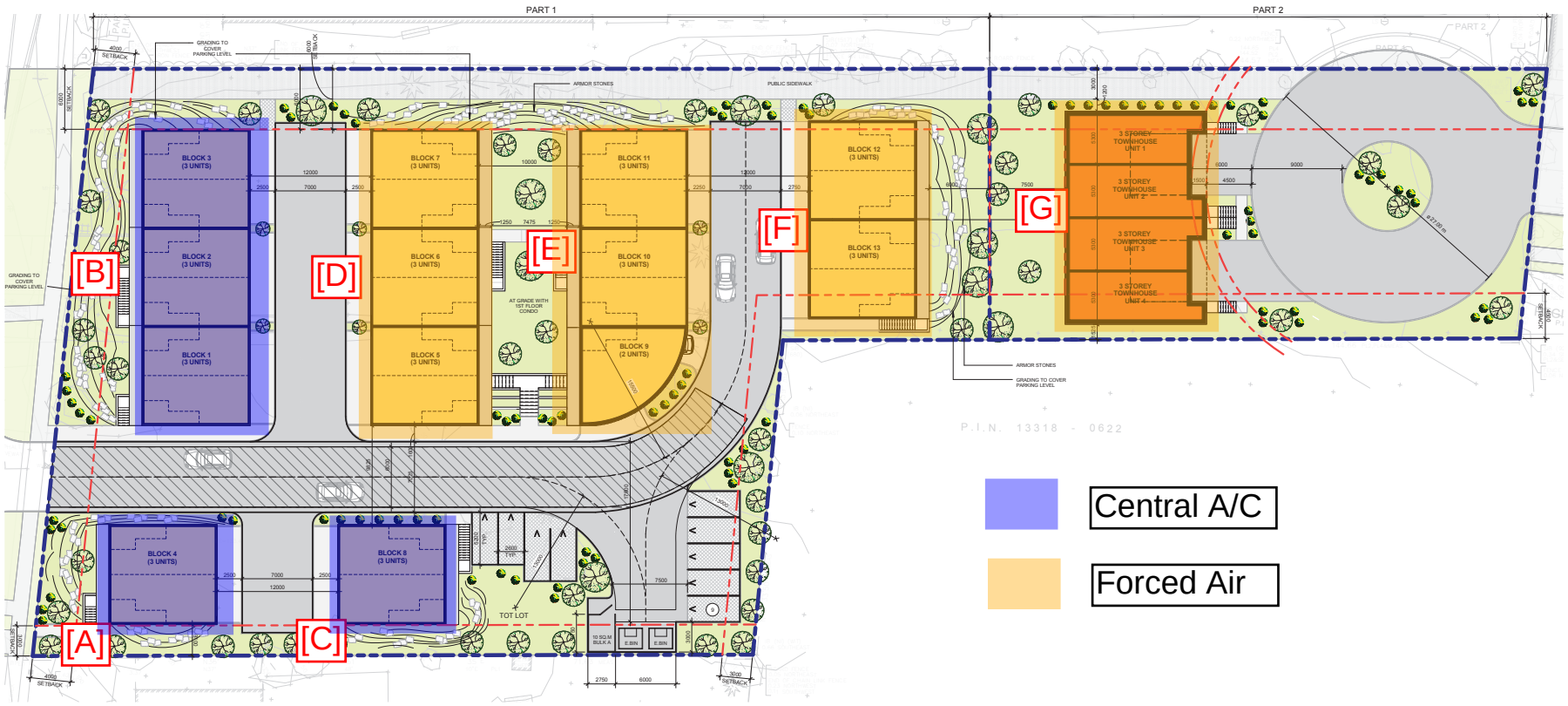
3111 & 3123 Cawthra Road,
Mississauga, ON

SHEET NAME
SITE PLAN

START DATE	12/2015
DRAWN BY	Author
CHECKED BY	Checker
SCALE	1 : 200
PROJECT NO.	115006
DRAWING	P0

C:\Users\Author\Documents\115006 - Cawthra Townhouses_2015-11-30_detached.rvt
12/04/15 10:44:05 AM

Figure 2: Site Plan Showing Prediction Locations



1 SITE PLAN
P0 1 : 200

FLOOR AREAS (GROSS/SELLABLE)

GROSS BUILDING AREAS

COUNT	AREA TYPE	AREA (SM)	AREA (SF)
PART 1			
T/O GROUND FLOOR			
5	COMMON SPACE	234.33 m²	2522 ft²
T/O SECOND FLOOR			
24	2 STOREY TOWNHOUSE (TYPICAL)	142.52 m²	1534 ft²
12	BUNGALOW (TYPICAL)	1114.97 m²	12001 ft²
1	2 STOREY TOWNHOUSE (CURVED)	5.73 m²	62 ft²
1	BUNGALOW (CURVED)	77.39 m²	833 ft²
T/O THIRD FLOOR			
24	2 STOREY TOWNHOUSE (TYPICAL)	1272.18 m²	13694 ft²
1	2 STOREY TOWNHOUSE (CURVED)	83.41 m²	898 ft²
T/O FOURTH FLOOR			
24	2 STOREY TOWNHOUSE (TYPICAL)	1272.18 m²	13694 ft²
1	2 STOREY TOWNHOUSE (CURVED)	83.41 m²	898 ft²
		4286.12 m²	46135 ft²
PART 2			
T/O GROUND FLOOR			
4	3 STOREY TOWN HOUSE	206.04 m²	2218 ft²
4	PARKING GARAGE	74.20 m²	799 ft²
4	EXTERIOR STAIRS	13.07 m²	141 ft²
T/O SECOND FLOOR			
4	3 STOREY TOWN HOUSE	298.50 m²	3213 ft²
T/O THIRD FLOOR			
4	3 STOREY TOWN HOUSE	298.50 m²	3213 ft²
		890.32 m²	9583 ft²
GROSS BUILDING AREA (PART 1 & PART 2)		5176.43 m²	55719 ft²

SELLABLE BUILDING AREAS

UNIT COUNT	AREA TYPE	AREA (SM)	AREA (SF)
PART 1			
24	2 STOREY TOWNHOUSE (TYPICAL)	2686.88 m²	28921 ft²
12	BUNGALOW (TYPICAL)	1114.97 m²	12001 ft²
1	2 STOREY TOWNHOUSE (CURVED)	172.54 m²	1857 ft²
1	BUNGALOW (CURVED)	77.39 m²	833 ft²
		4051.79 m²	43613 ft²
PART 2			
4	3 STOREY TOWN HOUSE	803.04 m²	8644 ft²
		803.04 m²	8644 ft²

SITE STATISTICS

SITE STATISTICS (ENTIRE SITE)

	AREA (SM)	AREA (SF)	AREA (ACRES)	PERCENT
BUILDING				
BUILDING FOOTPRINT	1796.70 m²	19340 ft²	0.44 acres	29.2%
STAIRS	74.78 m²	805 ft²	0.02 acres	1.2%
	1871.48 m²	20144 ft²	0.46 acres	30.5%
HARD LANDCAPE				
ASPHALT PAVING	1225.82 m²	13192 ft²	0.30 acres	20.0%
ASPHALT PAVING (MUNICIPAL)	509.12 m²	5480 ft²	0.13 acres	8.3%
CURB / SIDEWALK	7.41 m²	80 ft²	0.00 acres	0.1%
CURBS / SIDEWALKS	410.32 m²	4417 ft²	0.10 acres	6.7%
	2152.47 m²	23169 ft²	0.53 acres	35.0%
SOFT LANDSCAPE				
LANDSCAPE	1622.84 m²	17468 ft²	0.40 acres	26.4%
LANDSCAPE (MUNICIPAL SIDEWALK)	360.28 m²	3878 ft²	0.09 acres	5.9%
LANDSCAPE - PERMEABLE PAVERS	135.92 m²	1463 ft²	0.03 acres	2.2%
	2119.04 m²	22809 ft²	0.52 acres	34.5%
	6143.00 m²	66123 ft²	1.52 acres	100.0%

FLOOR AREA RATIO (ENTIRE SITE)

TOTAL FLOOR AREA	5176.43 m²	55719 ft²
TOTAL SITE AREA	6143.00 m²	66123 ft²
FLOOR AREA RATIO:	0.842	

SITE STATISTICS (SEVERED SITE - PART 1)

	AREA (SM)	AREA (SF)	AREA (ACRES)	PERCENT
BUILDING				
BUILDING FOOTPRINT	1516.49 m²	16323 ft²	0.37 acres	32.3%
STAIRS	61.71 m²	664 ft²	0.02 acres	1.3%
	1578.20 m²	16988 ft²	0.39 acres	33.6%
HARD LANDCAPE				
ASPHALT PAVING	1131.69 m²	12181 ft²	0.28 acres	24.1%
CURBS / SIDEWALKS	410.32 m²	4417 ft²	0.10 acres	8.7%
	1542.01 m²	16598 ft²	0.38 acres	32.9%
SOFT LANDSCAPE				
LANDSCAPE	1166.53 m²	12556 ft²	0.29 acres	24.9%
LANDSCAPE (MUNICIPAL SIDEWALK)	267.96 m²	2884 ft²	0.07 acres	5.7%
LANDSCAPE - PERMEABLE PAVERS	135.92 m²	1463 ft²	0.03 acres	2.9%
	1570.38 m²	16903 ft²	0.39 acres	33.5%
	4690.59 m²	50489 ft²	1.16 acres	100.0%

FLOOR AREA RATIO (PART 1)

TOTAL FLOOR AREA (PART 1)	4286.12 m²	46135 ft²
TOTAL SITE AREA (PART 1)	4690.59 m²	50489 ft²
FLOOR AREA RATIO:	0.913	

SITE STATISTICS (SEVERED SITE - PART 2)

	AREA (SM)	AREA (SF)	AREA (ACRES)	PERCENT
BUILDING				
BUILDING FOOTPRINT	280.21 m²	3016 ft²	0.07 acres	19.3%
STAIRS	13.07 m²	141 ft²	0.00 acres	0.9%
	293.29 m²	3157 ft²	0.07 acres	20.2%
HARD LANDCAPE				
ASPHALT PAVING	93.93 m²	1011 ft²	0.02 acres	6.5%
ASPHALT PAVING (MUNICIPAL)	509.12 m²	5480 ft²	0.13 acres	35.1%
CURB / SIDEWALK	7.41 m²	80 ft²	0.00 acres	0.5%
	610.46 m²	6571 ft²	0.15 acres	42.0%
SOFT LANDSCAPE				
LANDSCAPE	456.34 m²	4912 ft²	0.11 acres	31.4%
LANDSCAPE (MUNICIPAL SIDEWALK)	92.32 m²	994 ft²	0.02 acres	6.4%
	548.65 m²	5906 ft²	0.14 acres	37.8%
	1452.40 m²	15634 ft²	0.36 acres	100.0%

FLOOR AREA RATIO (PART 2)

TOTAL FLOOR AREA (PART 2)	890.32 m²	9583 ft²
TOTAL SITE AREA (PART 2)	1452.40 m²	15634 ft²
FLOOR AREA RATIO:	0.612	

DEVELOPMENT DATA - PART 1

LEGAL DESCRIPTION

3123 CAWTHRA ROAD CON. 1 NDS PT LOT 10
RP43R23991 PART 1 & PART 2
3111 CAWTHRA ROAD CON. 1 NDS PT LOT 10

DEVELOPMENT DATA

PART 1 - 3 STOREY STACKED TOWNHOUSES (38 UNITS)
PART 2 - 3 STOREY TOWNHOUSES (4 UNITS)

42 TOTAL UNITS

TYPICAL UNIT TYPES

TYPICAL UNIT	AREA (SM)	AREA (SF)
PART 1		
BUNGALOW (TYPICAL)	92.35 m²	994 ft²
2 STOREY TOWNHOUSE (TYPICAL)	110.75 m²	1192 ft²
BUNGALOW (CURVED)	77.39 m²	833 ft²
2 STOREY TOWNHOUSE (CURVED)	172.54 m²	1857 ft²
PART 2		
3 STOREY TOWN HOUSE	200.72 m²	2161 ft²

PARKING STATISTICS (TYP. 2 PER UNIT)

PARKING TYPE	COUNT
PART 1	
TYPICAL PARKING SPACES (2600x5200)	76
VISITOR PARKING (2600x5200)	9
	85
PART 2	
TYPICAL PARKING SPACES (2600x5200)	8
	8

Chamberlain
Architects
Constructors
Managers

Chamberlain Architect Services Limited
5096 South Service Road
Suite 103
Burlington, Ontario L7L 5H4
CANADA

Tel: 905.631.7777
Fax: 905.631.7717

www.chamberlain-online.com

NO.	ISSUED	DATE
1	REVISED SITE PLAN	04 DEC 2015

SEAL

CONSTRUCTION NORTH
TRUE NORTH

CAWTHRA TOWNHOUSE COMPLEX

3111 & 3123 Cawthra Road, Mississauga, ON

SHEET NAME
SITE PLAN

START DATE: 12/2015
DRAWN BY: Author
CHECKED BY: Checker
SCALE: 1 : 200
PROJECT NO.: 115006
DRAWING: P0

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Figure 3: Site Plan Showing Ventilation Requirements

APPENDIX A

Road and Rail Traffic Data

NOISE REPORT FOR PROPOSED DEVELOPMENT

CITY OF MISSISSAUGA

Date:	15-Jul-02

REQUESTED BY:

Name:	Sheeba Paul
Company	HGC Engineering
Fax#:	( ) - 0

PREPARED BY:

Name:	Michael Long x3016
Tel#:	(905) 615-3200

Location:	Dundas Street East @ Cawthra Road
Look Up ID#:	343

ON SITE TRAFFIC DATA

Specific	Street Names				
[redacted]	Dundas Street East				
AADT:	60000				
# of Lanes:	7 lanes				
% Trucks:	7%				
Medium/Heavy Trucks Ratio:	55/45				
Day/Night Traffic Split:	90/10				
Posted Speed Limit:	60kph				
Gradient of Road:	<2%				
Ultimate R O W:	35m				

Comments:	Ultimate Traffic Data Only

June 29, 2015

Sheeba Paul, M.Eng., P.Eng.
HGC Engineering
Re: Ultimate road traffic data request
Cawthra Rd 0.5KM North of Silvercreek Blvd
City of Mississauga

Sheeba:

Per your request, we are providing the following traffic data.

	Existing	Planned
24 Hour Traffic Volume[1]	35,480	40,000
# of Lanes	4	4
Day/Night Split	76%	24%
Day Trucks (% of Total Volume)	2.8% Medium 3.1% Heavy	2.8% Medium 3.1% Heavy
Night Trucks (% of Total Volume)	5.1% Medium 3.5% Heavy	5.1% Medium 3.5% Heavy
Right-of-Way Width	36 metres	
Posted Speed Limit	50 km/h	

[1] At this location, the existing traffic already exceeds the ultimate AADT projection of 32,400. So, we have set the ultimate as a 10% increase over the existing AADT.

If you require further assistance, please contact me at (905) 791-7800 ext. 8594.

Regards,

Sabrina Khan, P. Eng.
Planner | Transportation System Planning
Region of Peel
10 Peel Centre Drive, Suite B - 4th Floor
Brampton ON, L6T 4B9
(905) 791-7800 x 8594
sabrina.khan@peelregion.ca

Sheeba Paul

From: Deepiga Vigneswaran <Deepiga.Vigneswaran@gotransit.com>
Sent: August-23-13 12:38 PM
To: Sheeba Paul
Cc: Adam Snow
Subject: RE: rail data verification for Streetsville

Good afternoon Sheeba – Further to your request below, the preliminary midterm (2021 +/-) weekday commuter train volumes at this location have not changed from the previous email sent in December 2011. Future volumes are 70 trains (57 day, 13 night). The site of interest is in close proximity to the GO Milton Line.

Trains will be comprised of a single locomotive with up to 12 passenger cars.

The maximum design speed for passenger trains at this location is 80.47 kph (50 mph).

Anti-whistling (noise) bylaws are applied at all public at grade crossings in your location.

Feel free to contact me should you have any additional questions.

Regards,
Deepiga

--

Deepiga Vigneswaran
Co-op Student, Third Party Projects
GO Transit – Rail Corridor Management Office
335 Judson Street|Toronto|Ontario|M8Z 1B2
T. 416.354.7738
F. 416.354.7731
E. Deepiga.Vigneswaran@gotransit.com
www.gotransit.com

From: Sheeba Paul [mailto:spaul@hgcengineering.com]
Sent: Friday, August 09, 2013 10:32 AM
To: Adam Snow; Adam Snow; Adam Snow; Deepiga Vigneswaran
Subject: re: rail data verification for Streetsville

Hi

HGC Engineering is performing a noise study for a proposed redevelopment at Barbertown Road in Streetsville, ON. The site is located to the south of the railway line.

https://maps.google.ca/maps?q=Barbertown+Road,+Mississauga,+ON&hl=en&ll=43.575852,-79.696133&spn=0.011612,0.01929&sll=49.303974,-84.738438&sspn=21.441968,39.506836&oq=barbertown&t=h&hnear=Barbertown+Rd,+Mississauga,+Peel+Regional+Municipality,+Ontario&z=16

Typically we need daytime volumes, night-time volumes, number of locomotives, number of cars, speed of trains, speed and whistle information.

We have some rail data in our files. The data is attached.

Thank you.

Ms. Sheeba Paul, MEng, 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 **e**: spaul@hgcengineering.com
Visit our new website! www.hgcengineering.com **Follow Us** – LinkedIn | Twitter | YouTube

Sheeba Paul

From: Orest Rojik <Orest_Rojik@cpr.ca>
Sent: August-09-13 11:55 AM
To: Sheeba Paul
Subject: RE: Train Traffic Data Milton

The data from Milton is valid for Mississauga with one exception: please add 2 trains per day for a switcher that serves the area of your study.

Orest Rojik SR/WA | Right-of-Way Representative Ontario | 800-1290 Central Parkway West, Mississauga, ON L5C 4R3 | **905-803-3425** **Canadian Pacific**

From: Sheeba Paul [mailto:spaul@hgcengineering.com]
Sent: Friday, August 09, 2013 10:35 AM
To: Orest Rojik
Subject: re: Train Traffic Data Milton

Hi Orest,

HGC Engineering is performing a noise study for a proposed redevelopment at Barbertown Road in Streetsville, ON. The site is located to the south of the railway line.

https://maps.google.ca/maps?q=Barbertown+Road,+Mississauga,+ON&hl=en&ll=43.575852,-79.696133&spn=0.011612,0.01929&sll=49.303974,-84.738438&sspn=21.441968,39.506836&oq=barbertown&t=h&hnear=Barbertown+Rd,+Mississauga,+Peel+Regional+Municipality,+Ontario&z=16

Typically we need daytime volumes, night-time volumes, number of locomotives, number of cars, speed of trains, speed and whistle information.

We have some rail data in our files for the site in Milton. The data is attached.

Thank you.

Ms. Sheeba Paul, MEng, PEng
HGC Engineering **NOISE | VIBRATION | ACOUSTICS**
Howe Gastmeier Chapnik Limited
t: 905.826.4044

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CANADIAN PACIFIC

Real Estate

Suite 800
1290 Central Parkway West
Mississauga ON
L5C 4R3

Fax 905 803 3228

July 31, 2013

HGC Engineering
2000 Argentia Road
Plaza 1, Suite 203
Mississauga, Ontario
L5N 1P7

Attention: Sheeba Paul

Dear Madam:

RE: CPR RAIL TRAFFIC INFORMATION – MILTON, ONTARIO

This has reference to your request for rail traffic data between Thompson Road and Main Street in the Town of Milton. The study area is located near mile 31.4 of our Galt Subdivision, which is classified as a principle main line.

The information requested is as follows:

1. Number of freight trains (0700 to 2300): 12 trains
   Number of freight trains (2300 to 0700): 7 trains
   Number of passenger trains (GO Transit*): 16 trains
   *GO Transit passenger service runs on weekdays between 0620 & 0810 and then between 1700 & 2000
2. Number of locomotives per train: 2 freight average (4 maximum), 1 passenger
3. Average number of cars per train: 72 freight average (144 maximum), 12 passenger
4. Maximum permissible speed: 50 mph freight and passenger
5. Whistle signal is sounded approaching the James Snow Parkway crossing. They are however prohibited west of that crossing through the rest of the Town of Milton but may be sounded if deemed necessary by the train crew for safety reasons.

The information provided is based on existing traffic and approximately represents rail traffic for the average day. Variations of the above may exist on a day-to-day basis. Specific measurements may also vary significantly depending on customer demands.

Yours truly,

Orest Rojik
Area Manager Support

(416) 595-3116
e-mail: orest_rojik@cpr.ca

By e-mail

APPENDIX B

Sample STAMSON 5.04 Output

STAMSON 5.0 NORMAL REPORT Date: 05-01-2016 16:27:31
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: loca.te Time Period: Day/Night 16/8 hours
Description: Units fronting onto Cawthra Road with exposure to Dundas Street East and CP Railway (prediction location [A])
Rail data, segment # 1: (day/night)

Train Type	Trains	Speed (km/h)	# loc/Train	# Cars/Train	Eng type	Cont weld
* 1. Freight	17.9/9.6	80.0	4.0	144.0	Diesel	No
* 2. GO	57.0/13.0	80.0	1.0	12.0	Diesel	No

* The identified number of trains have been adjusted for future growth using the following parameters:

No	Train type: Name	Unadj. Trains	Annual % Increase	Years of Growth
1.	Freight	13.0/7.0	2.50	13.00
2.	GO	57.0/13.0	0.00	10.00

Data for Segment # 1: (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 : 500.00 / 500.00 m
Receiver height : 7.50 / 10.50 m
Topography : 1 (Flat/gentle slope; no barrier)
No Whistle
Reference angle : 0.00
Results segment # 1: (day)

LOCOMOTIVE (0.00 + 54.51 + 0.00) = 54.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.41	76.90	-21.40	-0.99	0.00	0.00	0.00	54.51

WHEEL (0.00 + 48.85 + 0.00) = 48.85 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.51	73.04	-23.00	-1.19	0.00	0.00	0.00	48.85

Segment Leq : 55.55 dBA
Total Leq All Segments: 55.55 dBA
Results segment # 1: (night)

LOCOMOTIVE (0.00 + 55.68 + 0.00) = 55.68 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.31	76.50	-20.03	-0.80	0.00	0.00	0.00	55.68

WHEEL (0.00 + 50.12 + 0.00) = 50.12 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.42	72.76	-21.62	-1.02	0.00	0.00	0.00	50.12

Segment Leq : 56.75 dBA
Total Leq All Segments: 56.75 dBA
Road data, segment # 1: Cawthra (day/night)

Car traffic volume : 28606/9034 veh/TimePeriod *
Medium truck volume : 851/269 veh/TimePeriod *
Heavy truck volume : 942/298 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): 40000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 16.00
Medium Truck % of Total Volume : 2.80
Heavy Truck % of Total Volume : 3.10
Day (16 hrs) % of Total Volume : 76.00
Data for Segment # 1: Cawthra (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 : 20.00 / 20.00 m
Receiver height : 7.50 / 10.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
Road data, segment # 2: Dundas (day/night)

Car traffic volume : 50220/5580 veh/TimePeriod *
Medium truck volume : 2079/231 veh/TimePeriod *
Heavy truck volume : 1701/189 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): 60000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 3.85
Heavy Truck % of Total Volume : 3.15
Day (16 hrs) % of Total Volume : 90.00
Data for Segment # 2: Dundas (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 : 360.00 / 360.00 m
Receiver height : 7.50 / 10.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
Results segment # 1: Cawthra (day)

Source height = 1.33 m
ROAD (0.00 + 67.06 + 0.00) = 67.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.49	70.06	0.00	-1.86	-1.15	0.00	0.00	0.00	67.06

Segment Leq : 67.06 dBA
Results segment # 2: Dundas (day)

Source height = 1.33 m
ROAD (0.00 + 52.73 + 0.00) = 52.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.49	74.37	0.00	-20.50	-1.15	0.00	0.00	0.00	52.73

Segment Leq : 52.73 dBA
Total Leq All Segments: 67.22 dBA
Results segment # 1: Cawthra (night)

Source height = 1.33 m
ROAD (0.00 + 65.36 + 0.00) = 65.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.40	68.07	0.00	-1.74	-0.97	0.00	0.00	0.00	65.36

Segment Leq : 65.36 dBA
Results segment # 2: Dundas (night)

Source height = 1.33 m
ROAD (0.00 + 47.62 + 0.00) = 47.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.40	67.84	0.00	-19.25	-0.97	0.00	0.00	0.00	47.62

Segment Leq : 47.62 dBA
Total Leq All Segments: 65.43 dBA
TOTAL Leq FROM ALL SOURCES (DAY): 67.50
(NIGHT): 65.98