HGC ENGINEERING

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Noise Feasibility Study
Proposed Residential Development
Wealthy Place
City of Mississauga, Ontario

Prepared for:

City Park (Main St.) Inc.
950 Nashville Road
Kleinburg, Ontario, L0J 1C0

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Project Number: 01700353

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1 Introduction and Summary

HGC Engineering was retained by City Park (Main St.) Inc. to perform a noise feasibility study for a proposed residential development located at Wealthy Place, in the City of Mississauga, Ontario. The residential development is proposed to include 30 single detached dwellings, 2½ storey in height, along with associated roadways. The analysis includes an assessment of road traffic noise on the proposed residential dwellings in accordance with Ministry of the Environment, Conservation and Parks (MECP) guidelines. The study is required by the City of Mississauga as part of the planning and approvals process.

This report reflects the latest version of the site plan prepared by Flanagan Beresford & Patterson Architects last revised September 13, 2018 and grading plan prepared by Condeland Consulting Engineers & Project Managers dated September 2018; updates the noise predictions from the previous study dated January 24, 2018.

Road traffic data was obtained through correspondence with the City of Mississauga, the Region of Peel and Ministry of Transportation (MTO). The data from the City was provided in the form of ultimate road traffic data. The data from the Region and Ministry were provided in the form of current road traffic data. The data was used to predict future traffic sound levels at the façades of the proposed residential buildings and in rear yard outdoor living areas. The predicted sound levels were compared to the guidelines of the MECP and the City of Mississauga.

The sound level predictions indicate that the future road traffic sound levels will exceed MECP guidelines at the dwellings closest to Dixie Road. Acoustic barriers are required for the OLAs of the single detached dwellings flanking onto Dixie road. Central air conditioning is required for dwellings closest to Dixie Road. Forced air ventilation systems with ductwork sized for the future installation of central air conditioning by the occupant will be required for the dwellings further from Dixie Road. Upgraded building and glazing constructions are required for the dwellings closest to Dixie Road. For the remaining dwelling units in the development, building constructions meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation. Noise warning clauses are also recommended to inform future occupants of the traffic noise impacts.

2 Site Description and Sources of Sound

Figure 1 shows a key plan which identifies the location of the proposed residential development. The residential development is located at Wealthy Place in the City of Mississauga, Ontario. The proposed site plan prepared by Flanagan Beresford & Patterson Architects last revised September 13, 2018 is included as Figure 2. The residential development site is proposed to include 26 single detached dwellings along with associated roadways.

HGC Engineering personnel visited the site in June 2017. The surrounding lands are existing residential. The primary source of noise is road traffic on Dixie Road. Secondary sources of noise include road traffic on North Service Road and the Queen Elizabeth Way. Dixie Road is a five-lane roadway (2 lanes in each direction and a turning lane) in this area. There are no significant sources of stationary noise within 300 m of the subject site.

3 Criteria for Acceptable Sound Levels

3.1 Road Traffic Noise Criteria

Guidelines for acceptable levels of road traffic noise impacting residential developments are given in the MECP publication NPC-300, "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", Part C release date October 21, 2013 and are listed in Table 1 below. The values in Table 1 are energy equivalent (average) sound levels [L_{EQ}] in units of A weighted decibels [dBA].

Table 1: MECP Road Traffic Noise Criteria (dBA)

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

Daytime refers to the period between 07:00 and 23:00. Nighttime refers to the time period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, backyard, terrace, children's playground or other area where passive recreation is expected to occur.

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

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where future nighttime sound levels outside bedroom windows will exceed 60 dBA or future daytime sound levels outside living/dining room windows will 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 windows will be in the range of 51 to 60 dBA or when daytime sound levels at living/dining room windows will be 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 nighttime plane of window sound level will be greater than 60 dBA or the daytime plane of window sound level will be greater than 65 dBA. The use of warning clauses to notify future residents of possible excesses is also required.

4 Traffic Sound Level Assessment

4.1 Road Traffic Data

Ultimate road traffic information for Dixie Road was obtained from the Region of Peel personnel and is provided in Appendix A. A speed limit of 60 km/h was used for Dixie Road. A commercial vehicle percentage of 4.2% was used, split into 2.5% medium trucks and 1.7% heavy trucks, along with a day-night split of 78%/22%, also provided in the data.

Ultimate road traffic information for North Service Road was obtained from City of Mississauga personnel and is provided in Appendix A. A speed limit of 60 km/h was used for North Service Road. A commercial vehicle percentage of 3% was provided in the data, split into 1.65% medium trucks and 1.35% heavy trucks, along with a day-night split of 90%/10%.

Road traffic information for the Queen Elizabeth Way (QEW) was obtained from the Ministry of Transportation (MTO) for the year 2016 and is provided in Appendix A. The data was projected to the year 2028 with the use of a 2.5% growth rate. A speed limit of 100 km/h was used for the QEW. A commercial vehicle percentage of 13% was assumed, split into 5% medium trucks and 13% heavy trucks, along with a day-night split of 88%/12%. Table 2 summarizes the traffic volumes used in the analysis.

Table 2: Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Dixie Road *Ultimate*	Daytime	35 942	938	638	37 518
	Nighttime	10 138	264	180	10 582
	Total	**46 080**	**1 202**	**818**	**48 100**
North Service Road *2028 Projected*	Daytime	17 105	291	238	17 634
	Nighttime	1 901	32	26	1 959
	Total	**19 006**	**323**	**264**	**19 593**
QEW *2028 Projected*	Daytime	174 114	10 006	16 010	200 130
	Nighttime	23 742	1 364	2 184	27 290
	Total	**197 856**	**11 370**	**18 194**	**227 420**

4.2 Road Traffic Noise Predictions

Future traffic sound levels were predicted using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B.

Sound levels were predicted at the plane of the living/dining room windows during the daytime and at the plane of the bedroom windows during nighttime hours to investigate ventilation requirements. Sound levels were also predicted in the rear yard outdoor living areas to investigate acoustic barrier requirements. The results of these predictions, without mitigation, are summarized in Table 3.

Table 3: Predicted Sound Levels, Without Mitigation, [dBA]

Prediction Location	Description	Daytime – in OLA $L_{EQ-16\ hr}$	Daytime – at the Façade $L_{EQ-16\ hr}$	Nighttime – at the Facade $L_{EQ-8\ hr}$
[A]	Lot 1, proposed 2 ½ storey dwelling	63	66	64
[B]	Lot 2, proposed 2 ½ storey dwelling	<55	56	53
[C]	Lot 8, proposed 2 ½ storey dwelling	60	64	62
[D]	Lot 7, proposed 2 ½ storey dwelling	<55	56	53
[E]	Lot 9, proposed 2 ½ storey dwelling	60	64	64

5 Traffic Noise Recommendations

The predictions indicate that the future traffic sound levels will exceed MECP guidelines at the dwellings closest to Dixie Road. Recommendations to address these excesses are discussed below.

5.1 Outdoor Living Areas

The predicted daytime sound level in the OLA of Lot 1 with flanking exposure to Dixie Road (prediction location [A]) will be up to 63 dBA, which is 8 dBA in excess of the MECP's limit of 55 dBA. Physical mitigation in the form of an acoustic barrier is required. A 2.0 m high acoustic barrier will reduce the sound level in Lot 1 to 58 dBA based on the grading plan shown in Figure 3. The 3 dBA sound level excess is acceptable to the MECP when an appropriate noise warning clause is used, if it is acceptable to the Municipality.

The predicted daytime sound levels in the OLA's of lots backing onto Dixie Road (prediction locations [C] and [E]) will be up to 60 dBA, which is 5 dBA in excess of the MECP's limit of 55 dBA. A 2.0 m acoustic barrier will reduce sound levels to 55 dBA, based on the proposed grading.

Figure 4 indicates the approximate location and extent of the required acoustic barriers. As a general note, an acoustic barrier may be a combination of an acoustic wall and an earth berm. The wall component of the barrier should be of a solid construction with a surface density of no less than 20 kg/m^2. The walls may be constructed from a variety of materials such as wood, brick, pre-cast concrete or other concrete/wood composite systems provided that it is free of gaps or cracks. The heights and extents of the barriers should be chosen to reduce the sound levels in the OLA's to below

60 dBA and as close to 55 dBA as is technically, administratively and economically feasible, subject to the approval of the municipality respecting any applicable fence height by-laws.

The barrier heights required to meet 55 to 59 dBA for the rear yards, are summarized in Table 4.

Table 4: Summary of Barrier Heights Required to Meet Various Sound Levels

Prediction Location	Resultant Sound Level (dBA)				
	55	56	57	58	59
A	2.8	2.5	2.2	2.0	--
B	No acoustic barrier required				
C	2.0	--	--	--	--
D	No acoustic barrier required				
E	2.0	--	--	--	--

The predicted daytime sound levels in the OLA's of the remainder of the lots are less than 55 dBA, thus physical mitigation will not be required.

5.2 Indoor Living Areas

Central Air Conditioning

The predicted sound levels outside the top storey bedroom windows of the dwellings with direct exposure to Dixie Road will be greater than 65 dBA during the daytime hours and 60 dBA during the nighttime hours. To address these excesses, the MECP guidelines recommend that the dwelling units be equipped with central air conditioning systems, so that the windows can be closed.

Provision for the Future Installation of Air Conditioning

The predicted sound levels at the plane of the top storey bedroom windows of the future dwellings in the second row from Dixie Road, will be between 56 and 65 dBA during the daytime hours and between 51 and 60 dBA during the nighttime hours. To address these excesses, the MECP guidelines recommend that these dwelling units be equipped with forced air ventilation systems with ducts sized to accommodate the future installation of air conditioning by the occupant.

Figure 4 shows the ventilation requirements for the development. Window or through-the-wall air conditioning units are not recommended for any commercial or 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 remaining lots have no specific ventilation requirements.

5.3 Building Façade Constructions

Future sound levels at the facades of the dwellings with direct exposure to Dixie Road will exceed 65 dBA during the daytime hours and 60 dBA during the nighttime hours. MECP guidelines recommend that the windows, walls and doors be designed so that the indoor sound levels comply with MECP noise criteria.

Floor plans and building elevations were not available at the time of this study. The required building components are selected based on the Acoustical Insulation Factor (AIF) value for road 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 (windows and walls) and the floor area of the adjacent room.

The minimum necessary specification for dwellings closest to Dixie Road are AIF-26 for living/dining/family rooms and AIF-29 for bedrooms, based on the possibility of sound entering the buildings through windows and walls.

Any well sealed thermopane unit having a Sound Transmission Class (STC) rating of 30, will provide sufficient noise insulation as long as the window to floor area ratio is less than 63% for living/dining and family rooms and 32% for bedrooms. If sliding patio doors are to be used in the dwellings, they must be included in the window area.

Any exterior wall construction meeting the OBC will be acceptable for the dwellings units adjacent to Dixie Road as long as the wall to floor area ratio is less than 160%. Any insulated metal exterior door meeting OBC requirements will be sufficient to provide noise insulation.

Additional Reviews

When detailed floor plans and building elevations are available for the lots directly adjacent to Dixie Road, an acoustical consultant should review the architectural drawings to refine the glazing constructions based on actual window to floor area ratios.

Remaining Lots

The remaining units within the development will have daytime and nighttime sound levels at the top storey façade that are less than 65 and 60 dBA respectively. For these units, 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.

5.4 Warning Clauses

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

Suggested wording for future dwellings with sound level excesses the MECP criteria is given below:

Type A:

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

Suggested wording for future dwellings 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 City's and the Ministry of the Environment, Conservation and Parks' noise criteria. The acoustical barrier as installed shall be maintained, repaired or replaced by the owner. Any

> maintenance, repair or replacement shall be with the same material, to the same standards and having the same colour and appearance of the original.

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

Type C:

> 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 sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.

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

Type D:

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

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

6 Summary and Recommendations

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

1. Acoustic barriers are required for dwellings with flanking exposure to Dixie Road. If grading is changed significantly, the acoustic barrier heights should be refined.

2. Central air conditioning is required for dwellings with direct exposure to Dixie Road. Forced air ventilation systems with ductwork sized for the future installation of central air conditioning system will be required for dwellings further from Dixie Road. The location, installation and sound ratings of the air conditioning devices should comply with NPC-300, as applicable.

3. Upgraded building and glazing constructions are required for dwellings with direct exposure to Dixie Road. When detailed floor plans and building elevations are available for the lots directly adjacent to Dixie Road, an acoustical consultant should review the architectural drawings to refine the glazing constructions based on actual window to floor area ratios. Building constructions meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for the indoor spaces for the remaining dwellings.

4. Noise warning clauses should be used to inform future residents of the traffic noise excesses.

The following table summarizes the noise control recommendations and noise warning clauses for the lots in the proposed subdivision. Please see Figure 3, for reference.

Table 5: Summary of Noise Control Requirements and Noise Warning Clauses

Lot	Acoustic Barrier	*Ventilation Requirements	Type of Warning Clause	Building Façade Constructions
1, 8, 9	✓	Central A/C	B, C	LRDR: AIF-26 BR: AIF-29
2, 3, 6, 7, 10, 11, 17, 18	--	Forced Air	A, D	OBC
Remaining Dwellings	--	--	--	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.

6.1 Implementation

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

1. A detailed noise study is required for the dwellings with direct exposure to Dixie Road detailed floor plans and building elevations are available to refine the acoustic barrier heights and the glazing constructions based on actual window to floor area ratios.

2. Prior to subdivision approval, the municipality requires a Professional Engineer qualified to provide acoustical engineering services in the Province of Ontario to review the grading plans of lots adjacent to Dixie Road to certify that the noise control barriers as approved have been incorporated.

3. Prior to an application for a building permit, the Municipality's Building Department or a Professional Engineer qualified to provide acoustical engineering services in Ontario shall review the unit plans (floor plans and building elevations) for future dwelling on the lots directly adjacent to Dixie Road to ensure that the windows and building constructions are adequately designed to ensure acceptable indoor noise levels.

4. Prior to assumption for this development, the Municipality's building inspector or a Professional Engineer qualified to provide acoustical engineering services in the Province of Ontario to shall certify that the noise control measures for the dwellings units have been properly installed and constructed.

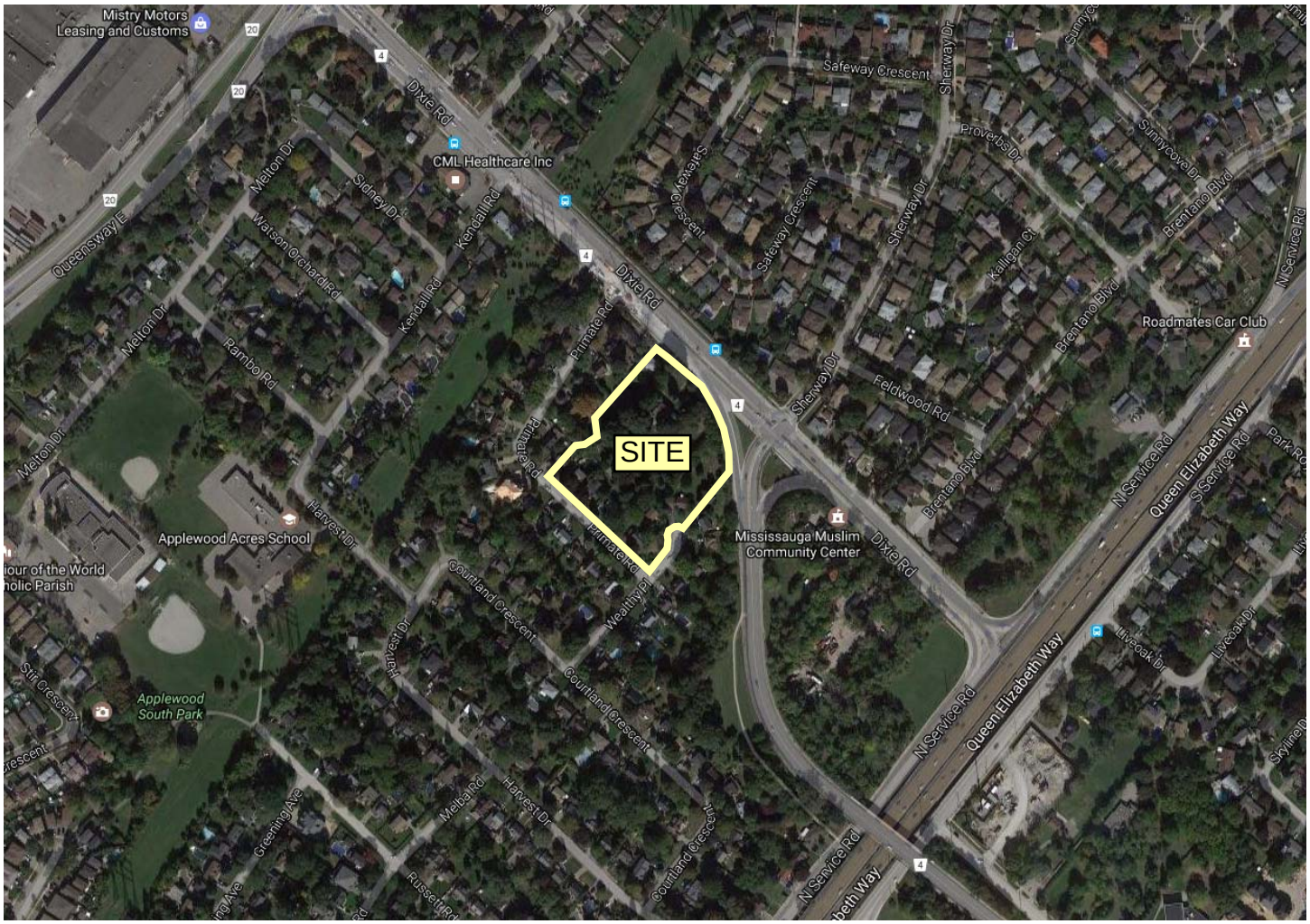

Figure 1 - Key Plan

KEY PLAN
NTS

SITE STATISTICS - FOR TOTAL SITE

GROSS SITE AREA	12659.20 m² / 3.128 Ac / 1.266 Ha
MTO(EXPROPRIATED LAND),	-1180.02m² / 0.292 Ac / 0.118 Ha
3m (REGION WIDENING)	- 374.05m² / 0.092 Ac / 0.037 Ha
16m EASEMENT	- 296.87m² / 0.073 Ac / 0.029 Ha
NET SITE AREA (Including common element condominium single lots 1-18 & freehold single lots 19-26)	10808.26 m² / 2.671 Ac / 1.081 Ha
TOTAL PROPOSED GFA (Including common element condominium single lots 1-18 & freehold single lots 19-26)	6396.38 m²
TOTAL DENSITY	26 UNITS/1.081 HA = 24.05 UPH 26 UNITS/2.671 AC = 9.734 UPA
FLOOR SPACE INDEX(FSI)	Gross floor area / Gross site area = 6396.38 / 10808.27 = 0.592

SITE STATISTICS - COMMON ELEMENT CONDOMINIUM (LOTS 1-18)

ZONING : R-XX	
NET SITE AREA (LOTS 1-18)	8523.96 m² / 2.106 Ac / 0.852 Ha
BUILDING COVERAGE (including Porch)	3377.26 m² 39.62%
LANDSCAPED OPEN SPACE	2104.26 m² 24.68%
ROADS, DRIVEWAYS, PARKING (including Sidewalks, D/W visitor parking)	3042.44 m² 35.70%

PARKING	REQUIRED	PROVIDED
REQUIRED PARKING @ 2 SPACES PER UNIT (18 LOTS)	36	
RESIDENT PARKING PROVIDED:		
1 PER LOT ON DRIVEWAY FOR LOTS 5-11,18		08
1 PER LOT IN ATTACHED GARAGE FOR LOTS 5-11,18		08
2 PER LOT ON DRIVEWAY FOR LOTS 1-4,12-17		20
2 PER LOT IN ATTACHED GARAGE FOR LOTS 1-4,12-17		20
VISITOR PARKING		
VISITOR PARKING REQUIRED 18 LOTS X 0.25/LOT	05	
VISITOR PARKING PROVIDED (INCLUDED 1 REQUIRED TYPE A ACCESSIBLE PARKING)		07
TOTAL	41	63

LOT#	LOT AREA (m²)	BUILDING COVERAGE (m²)	GFA (m²) (Proposed) Maximum	FRONTAGE AT 7.5 (m)	BUILDING HEIGHT Maximum (m)
1	428.98	140.63	315.87	12.94	10.20
2	304.27	124.26	288.00	10.85	10.20
3	233.68	116.11	269.42	10.85	10.20
4	284.05	108.00	246.19	10.94	10.20
5	286.35	94.03	226.75	11.95	10.20
6	249.87	98.24	236.90	10.15	10.20
7	249.87	98.24	236.90	10.15	10.20
8	325.33	98.24	236.90	14.05	10.20
9	364.87	98.49	236.90	11.21	10.20
10	252.09	94.76	228.50	9.60	10.20
11	291.53	94.76	228.50	11.40	10.20
12	345.71	114.21	255.48	12.61	10.20
13	276.00	99.80	232.26	12.00	10.20
14	276.00	99.80	232.26	12.00	10.20
15	276.00	99.80	232.26	12.00	10.20
16	276.00	99.80	232.26	12.00	10.20
17	286.60	99.80	232.26	12.00	10.20
18	387.09	104.35	241.55	12.27	10.20

ROAD WIDTH	7.00 m
CL ROAD RADIUS	13 m
DENSITY	18 UNITS / 0.852 HA = 21.127 UpHA
TOTAL GFA (Maximum) :	4409.16 m²
FLOOR SPACE INDEX (FSI)	Gross floor area / Gross site area = 4409.16 / 8523.96 = 0.517

SITE STATISTICS - FREEHOLD LOTS FRONTING ON PRIMATE ROAD (LOTS 19-26)

ZONING : R-XX	
NET SITE AREA (LOTS 19-26)	2284.30 m² / 0.564 Ac / 0.228 Ha
BUILDING COVERAGE (Including Porch)	823.40 m² 36.05%
LANDSCAPED OPEN SPACE	1170.50 m² 51.24%
ROADS, DRIVEWAYS, PARKING (Including Sidewalks)	290.40 m² 12.71%

LOT #	LOT AREA (m²)	BUILDING COVERAGE (m²)	GFA (m²) (Proposed) Maximum	BUILDING HEIGHT Maximum (m)
19	314.32	101.12	232.26	10.20
20	276.00	99.80	232.26	10.20
21	276.00	99.80	232.26	10.20
22	276.00	99.80	232.26	10.20
23	276.00	99.80	232.26	10.20
24	276.00	99.80	232.26	10.20
25	276.00	99.80	232.26	10.20
26	313.98	123.48	278.71	10.20

LOT #	FRONTAGE AT 7.5 (m)	LANDSCAPE OPEN SPACE(m²)	FRONT LANDSCAPED AREA (m²)
19	15.85	176.90	40.82
20	12.00	139.90	23.92
21	12.00	139.90	23.92
22	12.00	139.90	23.92
23	12.00	139.90	23.92
24	12.00	139.90	23.92
25	12.00	139.90	23.92
26	13.00	154.22	26.84

DENSITY	8 UNITS / 0.228 HA = 35.09 UpHA
TOTAL GFA (Maximum) :	1904.53 m²
FLOOR SPACE INDEX (FSI)	Gross floor area / Gross site area = 1904.53 / 2284.30 = 0.834

NOTE:
The lot frontage, lot area, and lot coverage as currently shown are not certified.

The lot frontage, lot area calculations will be certified by an accredited Ontario Land Surveyor at the time of creating the parcels of land through the registration of a reference plan when the Condominium application is processed.

NOTE:
The building coverage, landscape open space & front landscaped area as currently shown are not certified.

The building coverage, landscape open space & front landscaped area are subject to change as per the actual grading & building footprint.

Date	Ref.	Description
09/13/2016	CZ	Added utility easement, Updated entrance & Stats
09/23/2016	CZ	Updated photo detail layout and site data
11/09/2016	SM	LANDSCAPE CO-ORDINATION
11/16/2017	SP	ADDED DWELLING UNIT DEPTH
11/21/2017	SM	SITE STATISTICS REVISED AS PER PLANNER
11/28/2017	SM	ENGINEERING DRAWING CO-ORDINATION
11/30/2017	SP	REVISED AS PER SURVEY
04/05/2017	SP	CHANGED C.A. RADIUS TO 12.0m
04/17/2017	SP	ADDED LOT AREA STATISTICS
05/29/2017	SP	PRELIMINARY SITE PLAN W/ MTO EXPROPRIATED LANDS
06/20/2017	SP	PRELIMINARY SITE PLAN

Revisions
Drawn: SP
Date: 04/25/17
Checked:
Approved:
Printed:
CAD File: 161353-SP11.DWG

The Architect has not been retained to carry out general review of the work and assumes no responsibility for the failure of the contractor or sub-contractors to carry out their work in accordance with the Contract Documents.

Single pages of documents are not to be read independently of all pages of the Contract Documents.

The contractor shall verify all dimensions on the Contract Documents. Any discrepancies prior to the commencement of the work.

Under no circumstances shall the Contractor or sub-contractors proceed in uncertainty.

Do not scale drawings.

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SP

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WEALTHY PLACE
PROPOSED COMMON ELEMENT CONDOMINIUM SINGLE-DETACHED DEVELOPMENT (LOTS 1-18)
& FREEHOLD SINGLE- DETACHED DEVELOPMENT (LOTS 19-26)
CITY OF MISSISSAUGA, ONTARIO

Sheet Title: SITE PLAN
Scales: 1:300
Sheet Number: 16-1353-SP1

Figure 2 - Proposed Site Plan Showing Prediction Locations

1. ALL SURFACE DRAINAGE WILL BE SELF CONTAINED, COLLECTED AND DISCHARGED AT A LOCATION TO BE APPROVED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT.

2. THE PORTIONS OF THE DRIVEWAY WITHIN THE MUNICIPAL BOULEVARD WILL BE PAVED BY THE APPLICANT.

3. ALL EXCESS EXCAVATED MATERIAL WILL BE REMOVED FROM THE SITE

4. THE EXISTING DRAINAGE PATTERN WILL BE MAINTAINED

A) PLANNING AND BUILDING DEPARTMENT

I) "I HEREBY CERTIFY THAT THIS DRAWING CONFORMS IN ALL RESPECTS TO THE SITE DEVELOPMENT PLANS AS APPROVED BY THE CITY OF MISSISSAUGA UNDER FILE NUMBER ______________

II) "THE CITY OF MISSISSAUGA REQUIRES THAT ALL WORKING DRAWINGS SUBMITTED TO THE BUILDING DIVISION AS PART OF AN APPLICATION FOR THE ISSUANCE OF A BUILDING PERMIT SHALL BE CERTIFIED BY THE ARCHITECT OF ENGINEER AS BEING IN CONFORMITY WITH THE SITE DEVELOPMENT PLAN AS APPROVED BY THE CITY OF MISSISSAUGA."

III) "GRADES WILL BE MET WITHIN A 33% MAXIMUM SLOPE AT THE PROPERTY LINES AND

IV) "THE STRUCTURAL DESIGN OF ANY RETAINING WALL OVER 0.60M IN HEIGHT OR ANY RETAINING WALL LOCATED ON A PROPERTY LINE IS TO BE SHOWN ON THE SITE GRADING PLAN FOR THIS PROJECT AND IS TO BE APPROVED BY THE CONSULTING ENGINEER FOR THE PROJECT."

CONSTRUCTION & RESTORATION WORKS FOR MUNICIPAL R.O.W.s. PRIMATE ROAD AND WEALTHY PLACE

1. PROPOSED STORM, SANITARY, AND WATER BUILDING CONNECTIONS WITHIN EXISTING MUNICIPAL R.O.W.s ARE TO BE BACKFILLED WITH UNSHRINKABLE FILL UP TO BASE OF EXISTING ROAD GRANULAR. EXISTING ROAD GRANULAR AND ASPHALT TO BE MATCHED WITH MINIMUM THICKNESSES IN ACCORDANCE WITH CITY STANDARD 2220.03.

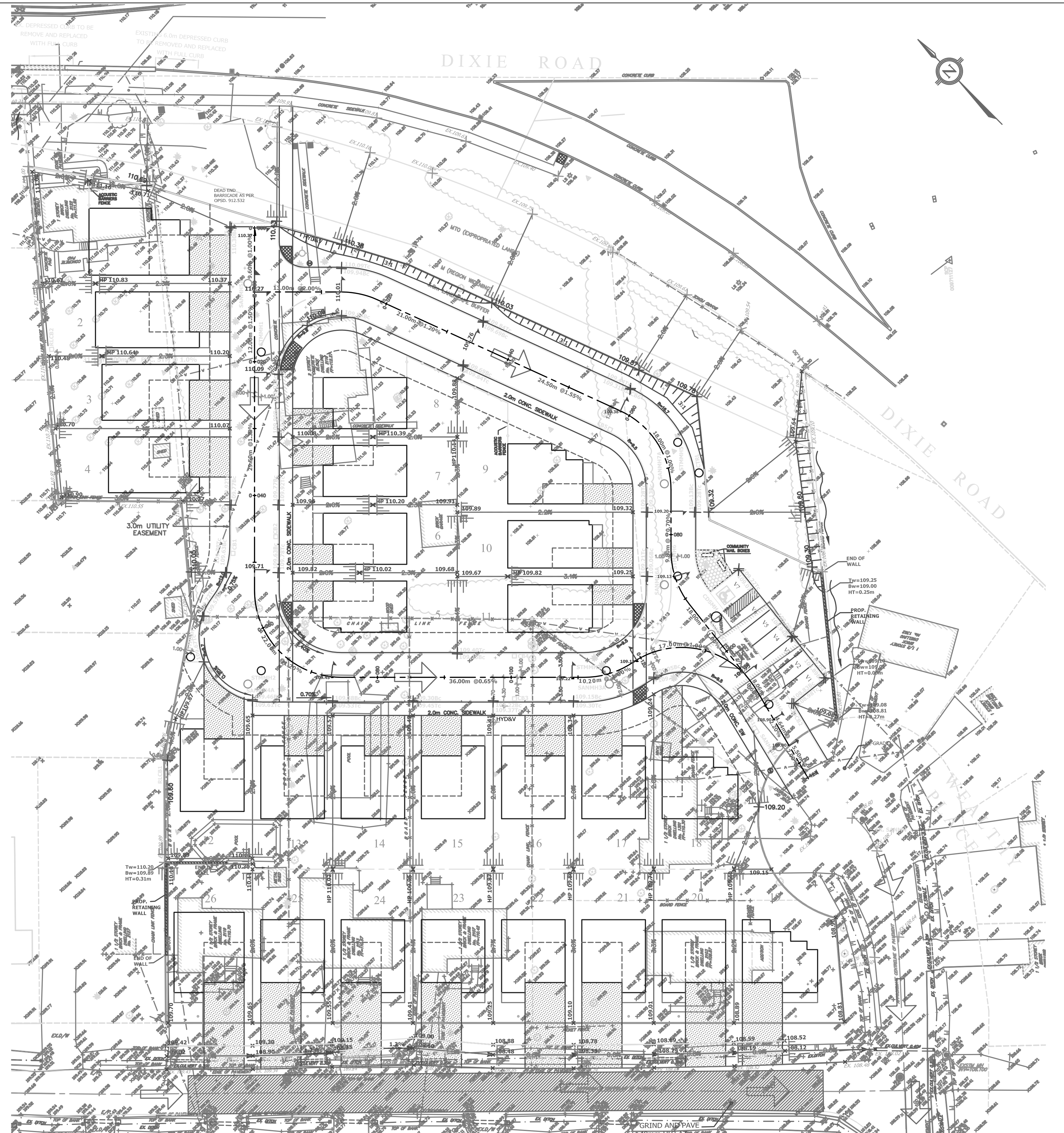
2. TRENCH CONSTRUCTION / RESTORATION SHALL BE IN ACCORDANCE WITH CITY STANDARDS 2220.03, 2220.031, AND 2220.032.

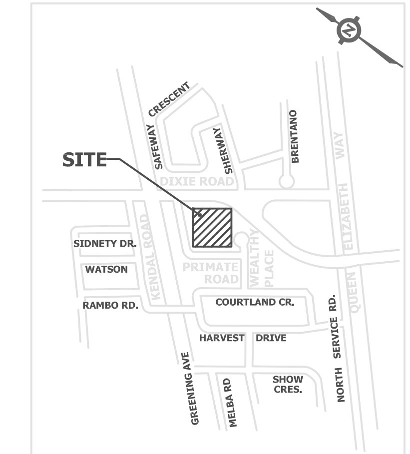
3. BOULEVARD AREAS SHALL BE RESTORED TO EXISTING CONDITIONS OR BETTER.

PROPOSED CULVERT TABLE

LOT No	SIZE	LENGTH	W INV	E INV
LOT 26	300mm∅	6.6m	108.97	108.90
LOT 25	300mm∅	6.6m	108.89	108.81
LOT 24	300mm∅	6.6m	108.73	108.66
LOT 23	300mm∅	6.6m	108.59	108.52
LOT 22	300mm∅	6.6m	108.44	108.39
LOT 21	300mm∅	6.6m	108.37	108.32
LOT 20	300mm∅	6.6m	108.25	108.20
LOT 19	300mm∅	6.6m	108.18	108.12

NOTE:
EXISTING CULVERTS TO BE REMOVED





KEY PLAN
N.T.S.

PLAN OF SURVEY SHOWING TOPOGRAPHY OF LOTS 26, 27, 28, 29, 30 AND 31 AND PART OF LOT 18
REGISTERED PLAN 473 AND PART OF LOT 6, CONCESSION 1 SOUTH OF DUNDAS STREET
(GEOGRAPHIC TOWNSHIP OF TORONTO)
CITY OF MISSISSAUGA REGIONAL MUNICIPALITY OF PEEL

LEGEND

EXISTING MANHOLE	180.00 PROPOSED ELEVATION
PROPOSED STM MANHOLE	215.93 EXISTING ELEVATION
PROPOSED SAN MANHOLE	EXISTING LIGHT STANDARD
PROPOSED CATCHBASIN	EXISTING HYDRO POLE
PROPOSED FIRE HYDRANT	STANDARD IRON BAR
SUMP PUMP (DETAIL REFER TO DWG 15-048-09)	EXISTING WATER METER LOCATION
LIMIT OF BOUNDARY	PROPOSED DRAINAGE ARROW
PROPOSED CHAIN LINK FENCE	EXISTING DRAINAGE PATTERN
PROPOSED WOOD ACOUSTIC FENCE	EMERGENCY OVER LAND FLOW ROUTE
PROPOSED TRANSFORMER	RETAINING WALL
PROPOSED LIGHT STANDARD	3:1 SLOPE
	SWALE

BENCHMARK NOTE

ELEVATIONS SHOWN HEREON ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK No. 351 HAVING AN ELEVATION OF 108.675 METRES LOCATED ON THE EAST FACE AT THE MAIN ENTRANCE OF APPLEWOOD PUBLIC SCHOOL ON THE WEST SIDE OF HARVEST DRIVE, 30.5 METRES SOUTH OF KENDALL ROAD.

	REVISION BLOCK	DATE	APPR. BY
2.	CITY COMMENTS FROM AUGUST 8, 2018	SEPT.24/2018	S.Ng.
1.	FIRST SUBMISSION	JAN.09.18	S.Ng.

CITY PARK (DIXIE) INC.

2103-2119 PRIMATE ROAD, 1351 & 1357 WEALTHY PLACE, 2116& 2112 DIXIE ROAD

SEP.29/18

APPROVED AS TO FORM IN RELIANCE UPON THE PROFESSIONAL SKILL AND ABILITY OF CONDELAND ENGINEERING LIMITED AS TO DESIGN AND SPECIFICATION

DIRECTOR OF DEVELOPMENT/ TRANSPORTATION ENGINEERING
DATE: ______________

CONDELAND
CONSULTING ENGINEERS & PROJECT MANAGERS
350 Creditstone Road, Unit 200
Concord, Ontario L4K 3Z2
P: (905) 695-2096
F: (905) 695-2099

GRADING PLAN

DESIGNED BY:	S.NG.	DATE:	SEPTEMBER 2018	CHECKED BY:	M.E.H.
DRAWN BY:	G.M.	DRAWING NO.	17-017-03		
SCALES	HOR 1:300			CITY FILE	DARC 17-192

Figure 3 - Proposed Grading Plan

Figure 4 - Proposed Site Plan Showing Barrier and Ventilation Requirements

APPENDIX A

Road Traffic Data

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			1994	C	137,700	146,000	154,200	126,700	0.8
			1995	C	139,600	148,000	155,000	128,400	1.1
			1996	C	141,500	150,600	165,600	134,400	0.9
			1997	C	143,400	150,600	167,800	134,800	0.7
			1998	C	152,100	161,800	178,000	144,500	0.7
			1999	C	152,600	162,400	178,500	145,000	0.8
			2000	C	155,900	165,900	183,700	146,500	0.7
			2001	C	159,200	170,300	187,900	149,600	0.8
			2002	C	162,500	173,100	191,200	152,100	0.7
			2003	C	165,700	175,600	195,500	155,800	0.6
			2004	C	166,000	175,400	194,500	156,800	0.8
			2005	C	163,300	172,800	191,000	153,200	0.7
			2006	C	165,000	174,500	192,800	155,300	0.8
			2007	C	167,000	177,100	193,300	156,700	0.9
			2008	C	168,900	178,400	167,500	158,000	0.6
			2009	C	163,400	172,500	190,400	153,700	0.5
			2010	C	167,800	184,900	186,600	151,100	0.5
			2011	C	170,000	187,000	188,700	153,000	N/A
			2012	C	175,700	193,300	189,800	158,100	N/A
			2013	C	177,600	195,300	193,600	159,800	N/A
			2014	C	179,500	197,400	192,000	161,500	N/A
			2015	C	181,300	199,400	194,000	163,200	N/A
			2016	C	183,200	201,500	196,000	164,900	N/A
QEW	DIXIE RD(WBL)IC-136	1.8	1988	UC	155,000	162,700	175,100	145,600	0.8
			1989	UC	160,300	168,200	181,000	152,200	0.7
			1990	UC	165,100	176,600	191,400	156,700	0.7
			1991	UC	162,200	171,900	186,500	157,300	0.6
			1992	UC	163,200	172,900	184,400	150,100	0.7
			1993	UC	163,800	173,600	188,300	157,200	0.9
			1994	UC	164,500	174,400	184,200	151,300	0.6
			1995	UC	165,000	174,900	183,200	151,800	0.6
			1996	UC	165,500	176,100	193,600	157,200	0.6
			1997	UC	166,100	174,400	194,300	156,100	0.6

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			1998	UC	166,600	177,300	194,900	158,300	0.4
			1999	UC	170,000	209,100	185,300	148,600	0.7
			2000	UC	174,200	185,300	205,200	163,700	0.3
			2001	UC	168,500	180,300	198,800	158,400	0.5
			2002	UC	168,900	180,000	198,700	158,100	0.6
			2003	UC	169,300	179,500	199,800	159,100	0.6
			2004	UC	165,800	175,200	194,200	156,600	0.6
			2005	UC	170,200	180,100	199,100	159,600	0.4
			2006	UC	168,100	177,800	196,400	158,200	0.5
			2007	UC	168,200	178,400	194,700	157,800	0.5
			2008	UC	168,300	177,800	166,900	157,500	0.7
			2009	UC	163,600	172,700	190,600	153,900	0.7
			2010	UC	168,500	178,100	196,100	158,400	0.4
			2011	UC	168,600	168,600	173,700	160,200	N/A
			2012	UC	168,700	168,700	180,500	160,300	N/A
			2013	UC	168,800	168,800	170,500	160,400	N/A
			2014	UC	168,900	168,900	162,100	160,500	N/A
			2015	UC	169,000	169,000	162,200	160,600	N/A
			2016	UC	169,100	169,100	162,300	160,600	N/A
QEW	EVANS AV IC-138	0.6	1988	UC	140,000	146,900	158,100	131,500	0.8
			1989	UC	144,800	151,900	163,500	137,500	0.8
			1990	UC	149,500	159,900	173,400	142,000	0.7
			1991	UC	146,500	155,200	168,400	142,100	0.4
			1992	UC	147,500	156,300	166,600	135,700	0.9
			1993	UC	148,100	156,900	170,300	142,100	1.2
			1994	UC	148,400	157,300	166,200	136,500	0.7
			1995	UC	148,700	157,600	165,100	136,800	0.4
			1996	UC	151,000	160,700	176,700	143,500	0.4
			1997	UC	154,200	161,900	180,400	144,900	0.5
			1998	UC	159,100	169,300	186,100	151,100	0.3
			1999	UC	160,400	170,700	187,700	152,400	0.3
			2000	UC	163,000	173,400	192,000	153,200	0.9
			2001	UC	165,700	177,300	195,500	155,800	1.2

June 6, 2017

Victor Garcia, P.Eng
Project Engineer
HGC Engineering
Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203, Mississauga, ON, L5N 1P7
Re: Road Traffic Data Request – Dixie Rd

Victor:

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

Dixie Rd 0.1km North of Primate Rd

	Existing	Planned
24 Hour Traffic Volume	14,087	48,100
# of Lanes	4	6
Day/Night Split	78/22	78/22
Day Trucks (% of Total Volume)	1.4% Medium 1.6% Heavy	1.4% Medium 1.6% Heavy
Night Trucks (% of Total Volume)	2.5% Medium 1.7% Heavy	2.5% Medium 1.7% Heavy
Right-of-Way Width	45 metres	
Posted Speed Limit	60 km/h	

If you require further assistance, please contact me at (905) 791-7800 ext. 4549.

Regards,

Gordon Hui, EIT
Planner, Transportation Planning Engineering
Transportation Division, Public Works, Region of Peel

10 Peel Centre Drive, Suite B, 4th Floor, Brampton, ON, L6T 4B9
E: Gordon.hui@peelregion.ca • W: 905-791-7800 x4549 • C: 416-845-5172

Date:	01-Jun-17

NOISE REPORT FOR PROPOSED DEVELOPMENT

REQUESTED BY:	
Name:	Victor Garcia
Company	HGC Engineering

PREPARED BY:	
Name:	Jacqueline Hunter
Tel#:	(905) 615-3200

Location:	North Service Road, west of Dixie Road
Look Up ID#:	373

ON SITE TRAFFIC DATA

Specific	***Street Names***				
	North Service Road				
AADT:	14,933				
# of Lanes:	2 lanes				
% Trucks:	3%				
Medium/Heavy Trucks Ratio:	55/45				
Day/Night Traffic Split:	90/10				
Posted Speed Limit:	60 km/h				
Gradient of Road:	<2%				
Ultimate R O W:	20m				

Comments:

APPENDIX B

Sample STAMSON 5.04 Output

STAMSON 5.0 NORMAL REPORT Date: 10-10-2018 10:51:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Description: Lot 1, proposed 2.5 storey dwelling

Road data, segment # 1: Dixie E (day/night)

Car traffic volume : 17971/5069 veh/TimePeriod *
Medium truck volume : 469/132 veh/TimePeriod *
Heavy truck volume : 319/90 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): 24050
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 2.50
Heavy Truck % of Total Volume : 1.70
Day (16 hrs) % of Total Volume : 78.00

Data for Segment # 1: Dixie E (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 : 25.00 / 25.00 m
Receiver height : 6.00 / 6.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 17971/5069 veh/TimePeriod *
Medium truck volume : 469/132 veh/TimePeriod *
Heavy truck volume : 319/90 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:

```
                                        A
    24 hr Traffic Volume (AADT or SADT):  24050
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.50
    Heavy Truck  % of Total Volume     :   1.70
    Day (16 hrs) % of Total Volume     :  78.00

Data for Segment # 2: Dixie E (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  :  35.00 / 35.00  m
Receiver height           :   6.00 / 6.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 3: N Service Rd (day/night)
------------------------------------------------
Car traffic volume  : 17105/1901  veh/TimePeriod  *
Medium truck volume :   291/32    veh/TimePeriod  *
Heavy truck volume  :   238/26    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):  14933
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  11.00
    Medium Truck % of Total Volume     :   1.65
    Heavy Truck  % of Total Volume     :   1.35
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: N Service Rd (day/night)
------------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      5 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 322.00 / 322.00 m
Receiver height           :   6.00 / 6.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 4: QEW (day/night)
```

```
--------------------------------------
Car traffic volume  : 87057/11871 veh/TimePeriod  *
Medium truck volume :  5003/682   veh/TimePeriod  *
Heavy truck volume  :  8005/1092  veh/TimePeriod  *
Posted speed limit  :   100 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):  84550
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  12.00
    Medium Truck % of Total Volume     :   5.00
    Heavy Truck  % of Total Volume     :   8.00
    Day (16 hrs) % of Total Volume     :  88.00

Data for Segment # 4: QEW (day/night)
-------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      5 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 336.60 / 336.60 m
Receiver height           :   6.00 / 6.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 5: QEW (day/night)
---------------------------------------
Car traffic volume  : 87057/11871 veh/TimePeriod  *
Medium truck volume :  5003/682   veh/TimePeriod  *
Heavy truck volume  :  8005/1092  veh/TimePeriod  *
Posted speed limit  :   100 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):  84550
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  12.00
    Medium Truck % of Total Volume     :   5.00
    Heavy Truck  % of Total Volume     :   8.00
    Day (16 hrs) % of Total Volume     :  88.00

Data for Segment # 5: QEW (day/night)
-------------------------------------
```

```
                                        A
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      5 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 351.00 / 351.00 m
Receiver height           :   6.00 / 6.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Dixie E (day)

Source height = 1.14 m

ROAD (0.00 + 63.65 + 0.00) = 63.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.54	68.30	0.00	-3.41	-1.24	0.00	0.00	0.00	63.65

Segment Leq : 63.65 dBA

Results segment # 2: Dixie E (day)

Source height = 1.14 m

ROAD (0.00 + 61.41 + 0.00) = 61.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.54	68.30	0.00	-5.65	-1.24	0.00	0.00	0.00	61.41

Segment Leq : 61.41 dBA

Results segment # 3: N Service Rd (day)

Source height = 1.08 m

ROAD (0.00 + 31.57 + 0.00) = 31.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.54	67.43	0.00	-20.48	-4.26	0.00	-11.13	0.00	31.57

Segment Leq : 31.57 dBA

Results segment # 4: QEW (day)

Source height = 1.68 m

ROAD (0.00 + 47.96 + 0.00) = 47.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.52	83.81	0.00	-20.53	-4.22	0.00	-11.10	0.00	47.96

Segment Leq : 47.96 dBA

Results segment # 5: QEW (day)

Source height = 1.68 m

ROAD (0.00 + 47.72 + 0.00) = 47.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.52	83.81	0.00	-20.81	-4.22	0.00	-11.07	0.00	47.72

Segment Leq : 47.72 dBA

Total Leq All Segments: 65.83 dBA

Results segment # 1: Dixie E (night)

Source height = 1.14 m

ROAD (0.00 + 61.17 + 0.00) = 61.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.54	65.81	0.00	-3.41	-1.24	0.00	0.00	0.00	61.17

Segment Leq : 61.17 dBA

Results segment # 2: Dixie E (night)

Source height = 1.14 m

ROAD (0.00 + 58.92 + 0.00) = 58.92 dBA

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

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.54	65.81	0.00	-5.65	-1.24	0.00	0.00	0.00	58.92

Segment Leq : 58.92 dBA

Results segment # 3: N Service Rd (night)

Source height = 1.07 m

ROAD (0.00 + 36.13 + 0.00) = 36.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.54	60.87	0.00	-20.48	-4.26	0.00	0.00	0.00	36.13

Segment Leq : 36.13 dBA

Results segment # 4: QEW (night)

Source height = 1.68 m

ROAD (0.00 + 53.42 + 0.00) = 53.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.52	78.17	0.00	-20.53	-4.22	0.00	0.00	0.00	53.42

Segment Leq : 53.42 dBA

Results segment # 5: QEW (night)

Source height = 1.68 m

ROAD (0.00 + 53.14 + 0.00) = 53.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.52	78.17	0.00	-20.81	-4.22	0.00	0.00	0.00	53.14

Segment Leq : 53.14 dBA

Total Leq All Segments: 64.01 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.83 dBA

A
(NIGHT): 64.01 dBA

STAMSON 5.0 NORMAL REPORT Date: 16-10-2018 10:31:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: aola.te Time Period: 16 hours

Description: OLA of Lot 1, proposed 2.5 storey dwelling

Road data, segment # 1: Dixie E

Car traffic volume : 17971 veh/TimePeriod *
Medium truck volume : 469 veh/TimePeriod *
Heavy truck volume : 319 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Dixie E

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 28.29 m
Receiver height : 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 45.00 deg
Barrier height : 2.00 m
Barrier receiver distance : 8.00 m
Source elevation : 110.17 m
Receiver elevation : 111.05 m
Barrier elevation : 110.96 m
Reference angle : 0.00

Road data, segment # 2: Dixie E

Car traffic volume : 17971 veh/TimePeriod *
Medium truck volume : 469 veh/TimePeriod *
Heavy truck volume : 319 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Dixie E

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0

```
Surface                    :      1       (Absorptive ground surface)
Receiver source distance   :  42.20 m
Receiver height            :   1.50 m
Topography                 :      2       (Flat/gentle slope; with barrier)
Barrier angle1             : -90.00 deg   Angle2 : 45.00 deg
Barrier height             :   2.00 m
Barrier receiver distance  :   8.00 m
Source elevation           : 110.17 m
Receiver elevation         : 111.05 m
Barrier elevation          : 110.96 m
Reference angle            :   0.00

Road data, segment # 3: Dixie E
------------------------------
Car traffic volume  : 17971 veh/TimePeriod  *
Medium truck volume :   469 veh/TimePeriod  *
Heavy truck volume  :   319 veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: Dixie E
------------------------------
Angle1   Angle2            :  45.00 deg   90.00 deg
Wood depth                 :      0       (No woods.)
No of house rows           :      0
Surface                    :      1       (Absorptive ground surface)
Receiver source distance   :  28.29 m
Receiver height            :   1.50 m
Topography                 :      2       (Flat/gentle slope; with barrier)
Barrier angle1             :  45.00 deg   Angle2 : 90.00 deg
Barrier height             :   7.00 m
Barrier receiver distance  :   3.00 m
Source elevation           : 110.17 m
Receiver elevation         : 111.05 m
Barrier elevation          : 110.96 m
Reference angle            :   0.00

Road data, segment # 4: Dixie E
------------------------------
Car traffic volume  : 17971 veh/TimePeriod  *
Medium truck volume :   469 veh/TimePeriod  *
Heavy truck volume  :   319 veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 4: Dixie E
```

```
----------------------------
Angle1   Angle2           :  45.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  42.20 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            :  45.00 deg   Angle2 : 90.00 deg
Barrier height            :   7.00 m
Barrier receiver distance :   3.00 m
Source elevation          : 110.17 m
Receiver elevation        : 111.05 m
Barrier elevation         : 110.96 m
Reference angle           :   0.00

Results segment # 1: Dixie E
----------------------------

Source height = 1.14 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.14 !        1.50 !        1.24 !       112.20

ROAD (0.00 + 55.27 + 0.00) = 55.27 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     45   0.55  68.30   0.00  -4.27  -2.15   0.00   0.00  -6.60  55.27
-------------------------------------------------------------------------------

Segment Leq : 55.27 dBA

Results segment # 2: Dixie E
----------------------------

Source height = 1.14 m

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.14 !        1.50 !        1.36 !       112.32
```

ROAD (0.00 + 53.09 + 0.00) = 53.09 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.55	68.30	0.00	-6.97	-2.15	0.00	0.00	-6.09	53.09

Segment Leq : 53.09 dBA

Results segment # 3: Dixie E

Source height = 1.14 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.14	1.50	1.46	112.42

ROAD (0.00 + 41.67 + 0.00) = 41.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
45	90	0.25	68.30	0.00	-3.45	-7.30	0.00	0.00	-15.89	41.67

Segment Leq : 41.67 dBA

Results segment # 4: Dixie E

Source height = 1.14 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.14	1.50	1.50	112.46

ROAD (0.00 + 39.70 + 0.00) = 39.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
45	90	0.25	68.30	0.00	-5.62	-7.30	0.00	0.00	-15.68	39.70

Segment Leq : 39.70 dBA

Total Leq All Segments: 57.51 dBA

TOTAL Leq FROM ALL SOURCES: 57.51 dBA