HGC ENGINEERING

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Noise Feasibility Study
Proposed Retirement Village
Delmanor West Oak
Oakville, Ontario

Prepared for:

Delmanor West Oak Inc.
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M3H 5S9

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1 Introduction and Summary

HGC Engineering was retained by Delmanor West Oak Inc. to conduct a Noise Feasibility Study for their proposed retirement village named Delmanor West Oak, to be located at 1280 Dundas Street West in the Town of Oakville, Ontario. The proposed development will consist of two 8-storey residential buildings atop a 3-storey podium and four blocks of senior friendly independent living units. The study is required by the municipality as part of the planning and approvals process.

The primary source of noise is road traffic on Dundas Street West. Ultimate annual average daily traffic data (AADT) was obtained from the Region of Halton. This data was used to predict future traffic sound levels at the locations of the proposed building façades and in the outdoor living areas. The predicted sound levels were compared to the guidelines of the Ministry of Environment, Conservation and Parks and the Region of Halton.

The results of this study indicate that with suitable noise control measures integrated into the design of the buildings, it is feasible to achieve the indoor MECP guideline sound levels from road traffic sources. The recommended noise control measures include appropriate wall and window glazing assemblies, and an alternative means of ventilation to open windows. Warning clauses will need to be included in the property, tenancy and rental agreements to warn occupants of potentially audible transportation noise levels and of the nearby commercial/institutional uses.

There is an existing cultural centre and chapel located to the southwest of the subject site. The potential noise impacts from the rooftop mechanical equipment associated with the existing commercial/institutional use has been evaluated. Detailed information regarding the type of rooftop units were not known for the existing building, but reasonable estimates of the size and tonnage have been used based on experience with similar projects. Manufacturer’s sound power data was used in the analysis to predict sound levels associated with the existing building.

A computer model of the area was created, using acoustic modelling software, in order to predict the sound levels from rooftop stationary noise sources at the closest façades of the proposed residential development. The results indicate that sound emissions are expected to meet the applicable noise guideline limits of the MECP at the proposed residential façades closest to the existing

commercial/institutional building. Physical mitigation will not be required at the existing commercial/institutional building.

2 Site Description and Noise Sources

Figure 1 is a key plan indicating the location of the subject site. The proposed development is located on the south side of Dundas Street, east of Proudfoot Trail, specifically at 1280 Dundas Street West, in Oakville, Ontario. Figure 2 includes the proposed site plan, prepared by Icke Brochu Architects Inc., dated August 24, 2020 ("Issued for Re-Zoning Application"). The sound level prediction locations are shown in Figure 2. The proposed development will consist of two 8-storey buildings and four blocks of 1.5 storey senior friendly independent living units for a total of 342 units. Drawings are included in Appendix A.

HGC Engineering personnel visited the site in July 2020 in order to investigate the acoustic and topographic environment of the site. The acoustical environment surrounding the site is urban in nature. There is an existing commercial/institutional building (St. Volodymyr Cultural Centre and All Saints of Ukraine Chapel) located southwest of the proposed development. Noise from the rooftop equipment associated with the existing use is of concern due to its close proximity to the proposed residences. The primary source of transportation noise is road traffic noise from Dundas Street West. Dundas Street West is a 6 lane roadway (3 lanes in each direction) in this area. There are no other stationary noise sources within 500 m of the area.

3 Sound Level Criteria

3.1 Traffic Noise

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

Table I: Road Traffic Noise Criteria

Space	Daytime $L_{EQ(16\ hour)}$ Road	Nighttime $L_{EQ(8\ hour)}$ Road
Outdoor Living Areas	55 dBA	--
Inside Living/Dining Rooms	45 dBA	45 dBA
Inside Bedrooms	45 dBA	40 dBA

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

The guidelines in the MECP publication allow the daytime sound levels 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.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom or living/dining room windows exceed 65 dBA. Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning by the occupant is required when nighttime sound levels at bedroom or living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom or living/dining room windows are in the range of 56 to 65 dBA.

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

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

4 Traffic Noise Assessment

4.1 Road Traffic Data

Traffic data for Dundas Street West was obtained from the Region of Halton in the form of Ultimate Average Annual Daily Traffic (AADT) and is provided in Appendix B. A commercial vehicle percentage of 1.2% heavy trucks and 1.3% medium trucks was applied on Dundas Street, as provided by Region of Halton personnel. A day/night split of 90/10% was used. A speed limit of 60 km/h posted near the subject site was used in the analysis for Dundas Street. Table II summarizes the traffic volume data used in this study.

Table II: Ultimate Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Dundas Street West *Ultimate*	Daytime	48 263	644	594	49 500
	Nighttime	5 363	72	66	5 500
	Total	**53 625**	**715**	**660**	**55 000**

4.2 Road Traffic Noise Predictions

To assess the levels of road traffic noise which will impact the study area in the future, sound level predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. This modelling software was used to predict the future road traffic sound levels (L_{EQ}) at the building facades. Sample STAMSON output is included in Appendix C.

Predictions of the traffic sound levels were made at the various building facades. Sound levels were predicted at the top stories of the proposed buildings to investigate ventilation and building façade construction requirements and in the outdoor amenity areas to investigate acoustic barrier requirements. Prediction locations are indicated in Figure 2. The results of these predictions are summarized in Table III. The distance setbacks of the buildings indicated on the site plan were used in the analysis.

Table III: Predicted Future Sound Levels, L_{EQ} [dBA], Without Mitigation

Prediction Location	Description	Daytime $L_{EQ(16)}$	Nighttime $L_{EQ(8)}$
[A]	West façade of Senior's Building	65	59
[B]	South façade of Senior's Building	62	56
[C]	East façade of Senior's Building	<55	<50
[D]	North façade of Senior's Building	62	56
[E]	Senior's Friendly Independent Living Units	65	59
[F]	Senior's Friendly Independent Living Units	57	50
[G]	Common Roof Terrace (4/F) +	<55	--
[H]	Common Roof Terrace (3/F) +	64	--
[I]	Common Roof Terrace (2/F) +	61	--
[J]	Common Outdoor Amenity Area	<55	--
[K]	Common Outdoor Amenity Area	<55	--

Note:
+ Assuming a 1.07 m high solid parapet wall.

5 Discussion and Recommendations

The predictions indicate that the traffic sound levels will exceed the outdoor MECP guidelines listed in Table I at the façades of the proposed buildings. Recommendations to meet the indoor MECP guidelines are discussed below.

5.1 Outdoor Living Areas

The predicted future sound levels in the rooftop terraces on the 2nd and 3rd floors of the Senior's Building (Prediction Location [H] and [I]) will be up to 64 dBA, 9 dBA in excess of the MECP's limit of 55 dBA, assuming a standard 1.07 m high solid parapet. An acoustic barrier 1.7 m in height will reduce sound levels to less than 60 dBA in these areas, which is within the discretionary range acceptable to the MECP and the Region with the use of a noise warning clause. The acoustic barrier may be comprised of a solid parapet with solid glass on top. The surface density of the acoustic barrier is required to achieve 20 kg/m^2 and should be free of gaps below or between.

The predicted future sound levels in the common roof terrace on the 4th floor of the Senior's Building (Prediction Location [G]) and in the common outdoor amenity areas in the interior of the

development (Prediction Location [J] and [K]) will be less than 55 dBA. Physical mitigation will not be required.

Small patios are proposed for the senior friendly independent living units which are less than 4 m in depth. These areas due to their size are not considered to be outdoor living areas and a noise assessment is not required. The residents also have access to three nearby common outdoor amenity areas.

5.2 Indoor Living Areas

Provision for the Future Installation of Air Conditioning

The predicted sound levels at the façades of the proposed Senior's Building and Senior's Friendly Assisted Living Buildings (Prediction Locations [A] to [F]) will be between 56 and 65 dBA during the daytime hours and between 51 and 60 dBA during the nighttime hours. These dwelling units require the provision for the future installation of central air conditioning systems or an alternative means of ventilation to open windows. This requirement is typically satisfied through the installation of forced air ventilation systems with ductwork sized for the future installation of central air conditioning by the occupant. The inclusion of central air conditioning will exceed this requirement.

Window or through-the-wall air conditioning units are not recommended for any residential unit because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall noise insulating properties of the envelope. For the Senior's Building, suitable units are those housed in their own closet with an access door for maintenance. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300.

5.3 Building Façade Constructions

The proposed buildings will have daytime and nighttime sound levels at the top storey façade that are 65 dBA or less and 60 dBA or less respectively. Any exterior wall and double glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the dwelling units. Any insulated metal exterior door meeting OBC requirements will be sufficient to provide noise insulation.

5.4 Warning Clauses

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

Suggested wording for ground floor units, as required by the Region of Halton.

Type A:

> Purchasers shall be advised that ground floor units with balconies with direct unobstructed access to the Regional road system and/or the Active Transportation Network will not be eligible the retrofit provisions of the Region's Noise Attenuation technical Policy in the future.

Suggested wording for buildings with sound level excesses the MECP criteria 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 may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the noise criteria of the Municipality and the Ministry of the Environment, Conservation and Parks.

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

Type C:

> This dwelling unit has been fitted with a forced air heating system and the ducting etc., was sized to accommodate central air conditioning. Installation of central air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-300.)

The sample clauses are provided by the MECP as an example and can be modified by the Municipality as required.

6 Impact of the Development on Itself

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

Tarion's Builder Bulletin B19R requires the internal design of condominium projects to integrate suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the building on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself is maintained within acceptable levels.

7 Impact of the Development on the Environment

Sound levels from noise sources such as rooftop air-conditioners, cooling towers, exhaust fans, etc. should not exceed the minimum one-hour L_{EQ} ambient (background) sound level from road traffic, at any potentially impacted residential point of reception. Based on the levels observed during our site visit, the typical minimum ambient sound levels in the area are expected to be 50 dBA or more during the day and 45 dBA or more at night. Thus, any electro-mechanical equipment associated with this development (e.g. emergency generator testing, fresh-air handling equipment, etc.) should be designed such that they do not result in noise impact beyond these ranges.

8 Stationary Noise Assessment

8.1 Criteria Governing Stationary (Industrial) Noise Sources

An industrial or commercial facility is classified in MECP guidelines as a stationary source of sound (as compared to sources such as traffic or construction, for example) for noise assessment purposes. The rooftop mechanical equipment located on the roof of the existing commercial/institutional building (S St. Volodymyr Cultural Centre and All Saints of Ukraine Chapel) to the southwest of the subject site can be classified as stationary sources of sound. The stationary noise source locations and receptor locations (R1 to R5) are shown in Figure 3.

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

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

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

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

Sources sound levels for typical rooftop mechanical units and assumed operational information (outlined below) were used as input to a predictive computer (*Cadna/A version 2020 (32 bit) build: 177.5010*), in order to estimate the sound levels from the existing commercial buildings at the proposed. The computer model is based on the methods from ISO Standard 9613-2.2, "Acoustic – Attenuation of Sound During Propagation Outdoors", which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures.

Sound power levels from the existing rooftop mechanical equipment at the commercial/institutional building to the southwest of the subject site were estimated based on an aerial photo and manufacturer's data for similar mechanical equipment used in similar past projects. Rooftop units on the existing commercial buildings with sound power ratings of 81 to 88 dBA were assumed in the analysis.

Assumptions regarding the operating duty cycles of the equipment (100% during the daytime and 50% during the night-time) were included.

The unmitigated sound levels due to the rooftop mechanical equipment at the closest neighbouring residences are summarized in the following table. Sound level contours are shown in Figures 4 and 5. The resultant sound levels due to the rooftop mechanical equipment at the closest neighbouring residences (R1 to R5) are summarized in the following table.

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

Receptor	Criteria Day/ Night	Predicted Daytime – at Façade	Predicted Night-time – at Façade
R1 (Proposed Senior's Independent Living Units)	50 / 45	46	43
R2 (Proposed Senior's Independent Living Units)	50 / 45	45	42
R3 (Proposed Senior's Independent Living Units)	50 / 45	41	38
R4 (Proposed Senior's Independent Living Units)	50 / 45	27	24
R5 (Proposed Senior's Building)	50 / 45	39	36

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

An additional warning clause should be included in the offers of purchase and sale and tenancy agreements to inform the future residents of the proposed residential buildings of the presence of the nearby commercial/institutional uses.

Type D:

> Purchasers are advised of the proximity of surrounding commercial/institutional facilities, the sound from which may at times be audible.

9 Summary of Recommendations

In summary, HGC Engineering has reviewed the site plan and performed calculations to determine the potential road traffic noise impact on the proposed residential development with respect to MECP guidelines. The sound level predictions indicate that feasible means exist to reduce sound levels to ensure MECP guidelines are satisfied inside the proposed residential buildings. The following are the recommendations.

For transportation noise sources

1. An alternative means of ventilation to open windows should be implemented with a warning clause for all proposed buildings. The use of central air conditioning will exceed this requirement.

2. Acoustic barriers with an increased height of 1.7 m will be required in the 2nd and 3rd floor rooftop amenity areas of the Senior's Building.

3. Any building construction meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for the indoor spaces.

4. Warning clauses should be used to inform future owners of the road traffic noise issues and the presence of nearby commercial/institutional facilities.

5. Tarion Builders Bulletin B19R requires that the internal design of condominium projects integrates suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the building on its residents. If B19R certification is to be sought, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself are maintained within acceptable levels.

For stationary noise sources

6. The predicted sound levels from existing rooftop mechanical equipment at St. Volodymyr will be below the MECP minimum exclusionary limit at the proposed residential buildings. Physical mitigation will not be required for the existing rooftop mechanical equipment.

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

Prediction Location	Description	Acoustic Barrier	Ventilation Requirements *	Warning Clause	Upgraded Building Constructions Required
[A]	West façade of Senior's Building	--	Provision for Central A/C	A, B, C, D	OBC
[B]	South façade of Senior's Building	--			
[C]	East façade of Senior's Building	--			
[D]	North façade of Senior's Building	--			
[E]	Senior's Friendly Independent Living Units	--			
[F]	Senior's Friendly Independent Living Units	--			
[G]	Common Roof Terrace (4/F)	+	--	--	--
[H]	Common Roof Terrace (3/F)	✓	--	--	--
[I]	Common Roof Terrace (2/F)	✓	--	--	--
[J]	Common Outdoor Amenity Area	--	--	--	--
[K]	Common Outdoor Amenity Area	--	--	--	--

Notes:
-- no specific requirement
OBC – meeting the minimum requirements of the Ontario Building Code
LRDR – Living Room/Dining Room
BR – Bedroom
+ Assuming a standard 1.07 m high solid parapet
✓ Acoustic barrier required, as indicated in Section 5.1

9.1 Implementation

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

1. Prior to the issuance of occupancy permits for this development, the City's building inspector or a Professional Engineer qualified to perform acoustical engineer services in the province of Ontario should certify that the noise control measures have been properly incorporated, installed and constructed.

Figure 1: Key Plan

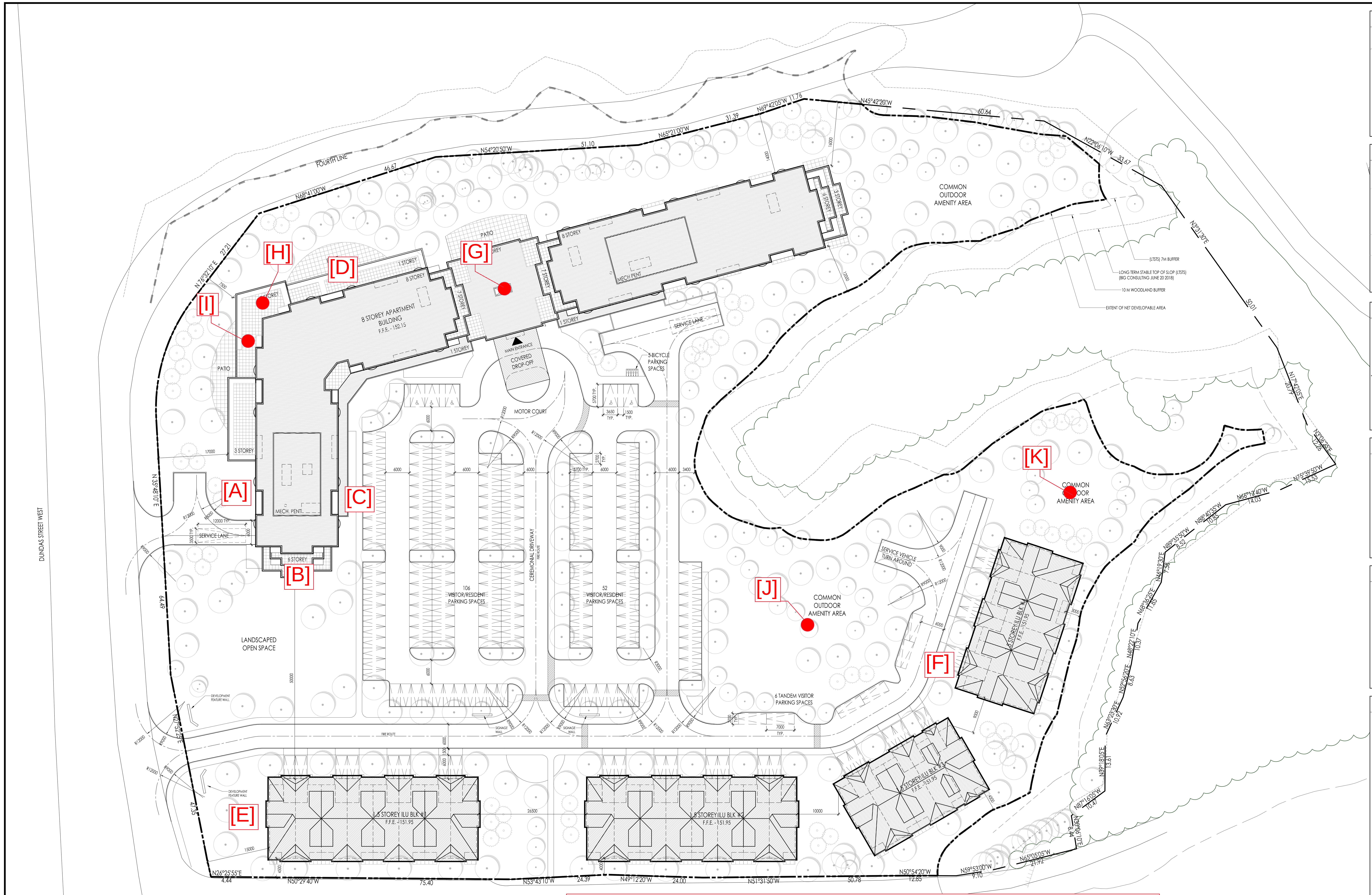
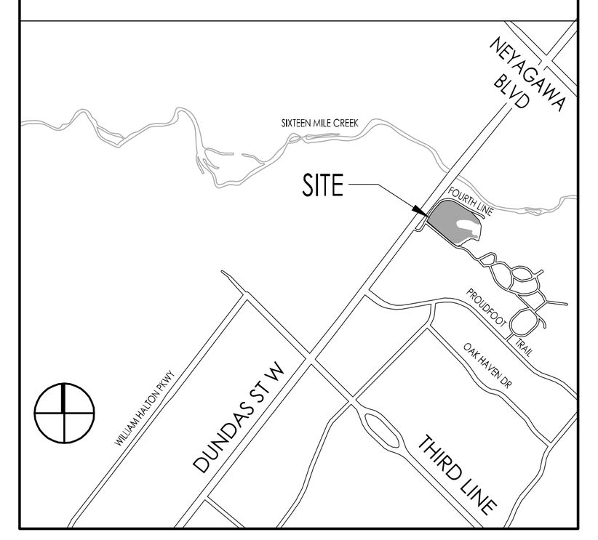


Figure 2: Proposed Concept Plan Showing Prediction Locations

KEY PLAN



SURVEY INFORMATION

PLAN OF SURVEY	PART OF LOT 23 CONCESSION 1 SOUTH OF DUNDAS STREET (GEOGRAPHIC TOWNSHIP OF TRAFALGAR) TOWN OF OAKVILLE REGIONAL MUNICIPALITY OF HALTON
NOTES	BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD 83 (CSRS) (2010.0). DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999708.
ADDITIONAL NOTES	DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048
SURVEYOR CONTACT INFORMATION	J.D. BARNES LIMITED 401 WHEELABRATOR WAY, SUITE A MILTON, ON, L9T 3C1 TEL: (905) 875-9955 FAX: (905) 875-9956 www.jdbarnes.com

SITE PLAN LEGEND NTS

- MAIN ENTRANCE
- SECONDARY ENTRANCE
- EXISTING GRADE DATUM
- FINISH FLOOR ELEVATION
- ESTABLISHED GRADE
- PROPOSED GRADE DATUM
- AIR CONDITIONING UNIT (REFER TO MECH DWGS)
- GAS METER (REFER TO MECH DWGS)
- HYDRO METER (REFER TO ELEC DWGS)
- RECEPTACLE (REFER TO ELEC DWGS)
- MAILBOXES

PARKING/BICYCLE LEGEND NTS

- BICYCLE PARKING SPACE 600W x 1800L (mm)
- PROPOSED VISITOR/RESIDENT PARKING SPACE 2700W x 5700L (mm) SURFACE PARKING
- PROPOSED BARRIER-FREE PARKING SPACE TYPE 'A' 3650W x 5700L (mm) SURFACE PARKING + 1500mm AISLE
- PROPOSED BARRIER-FREE PARKING SPACE TYPE 'B' 2700W x 5700L (mm) SURFACE PARKING +1500mm AISLE
- PROPOSED PARALLEL VISITOR PARKING SPACE 2700W x 7000L (mm) SURFACE PARKING
- PROPOSED LOADING SPACE 3500W x 12000L x 4200H (mm)

CONSULTANT SYMBOLS NTS

- EXISTING HYDRANT (REFER TO SURVEY)
- PROPOSED HYDRANT (REFER TO CIVIL DWGS)
- SIAMESE CONNECTION (REFER TO MECH/CIVIL DWGS)
- SANITARY MANHOLE (REFER TO CIVIL DWGS)
- STORM SEWER MANHOLE (REFER TO CIVIL DWGS)
- CATCHBASIN MANHOLE (REFER TO CIVIL DWGS)
- CATCHBASIN (REFER TO CIVIL DWGS)
- EXISTING STREET LIGHT (REFER TO SURVEY/ELEC)
- PROPOSED STREET LIGHT (REFER TO ELEC DWGS)
- TRANSFORMER (REFER TO ELEC DWGS)

GENERAL NOTES

1. ALL GROUND LEVEL VENTILATION GRATES WILL HAVE A POROSITY OF LESS THAN 2 cm x 2 cm.

2. FOR GRADING AND SITE SERVICING INFORMATION, REFER TO DRAWINGS PREPARED BY ;
R. V. ANDERSON ASSOCIATES LIMITED - 2001 SHEPPARD AVENUE EAST, SUITE 300, TORONTO, ON, M2J 4Z8 (416) 497-8600

3. FOR LANDSCAPE INFORMATION, REFER TO DRAWINGS PREPARED BY ;
COSBURN NAUBORIS LTD. - 20 CROWN STEEL DR, SUITE 2, MARKHAM, ON, L3R 9X9 (905) 940 4443

4. FOR TRASPORTATION STUDY INFORMATION, REFER TO DRAWINGS PREPARED BY;
LEA CONSULTING LTD. - 625 COCHRANE DRIVE, 8TH FLOOR, MARKHAM ON, L3R 9R9 (905) 470-0015

5. FOR ECOLOGICAL INFORMATION, REFER TO DRAWINGS PREPARED BY;
SLR CONSULTING LTD. - 55 UNIVERSITY AVE., #501, TORONTO, ON, M5J 2H7 (905) 415-7248

6. A TRAINED ON-SITE STAFF MEMBER WILL BE AVAILABLE TO MANOEUVRE BINS FOR THE COLLECTION DRIVER AND ACT AS A FLAGMAN WHEN THE TRUCK IS REVERSING.

7. THE SITE CONTRACTOR IS TO PROVIDE A RISK MANAGEMENT PLAN TO ADDRESS PROTOCOL IN THE EVENT OF AN OIL OR GAS SPILL DURING CONSTRUCTION. THE RISK MANAGEMENT PLAN IS TO BE DISCUSSED WITH ALL PARTIES AT THE PRE-CONSTRUCTION MEETING.

1. ZONING ZONING BY-LAW 2014-014

EXISTING ZONING: OPEN SPACE ZONE " O2 "

2. SITE AREA

	SQ. FEET (FT²)	SQ. METER (M²)	ACRES (AC)	HECTARES (HA)
OVERALL SITE AREA	497,685 FT²	46,233 M²	11.42 AC	4.62 HA
NET DEVELOPABLE SITE AREA	391,774 FT²	36,397 M²	8.99 AC	3.63 HA
NATURAL HERITAGE LAND AREA	105,911 FT²	9,836 M²	2.43 AC	0.99 HA

3. FLOOR AREA (FA)

"MEANS THE AGGREGATE AREA OF A BUILDING WITHIN THE EXTERIOR AREA OF A BUILDING CONTAINED WITHIN THE EXTERIOR WALLS , BUT DOES NOT INCLUDE ATTIC OR BASEMENT SPACE UNLESS OTHERWISE SPECIFIED ".

SENIORS RESIDENCE	NO. FLS x SQ METER (M²)	SQ METER (M²)	SQ FEET (FT²)
GROUND FLOOR		4,870 M²	52,420 FT²
2ND FLOOR		4,290 M²	46,178 FT²
3RD FLOOR		4,210 M²	45,316 FT²
4TH FLOOR		3,370 M²	36,274 FT²
5TH & 6TH FLOOR	2 FLOORS x 3,370 M²	6,740 M²	72,548 FT²
7TH FLOOR		3,290 M²	35,414 FT²
8TH FLOOR		3,160 M²	34,014 FT²
SUB TOTAL		29,930 M²	322,164 FT²
INDEPENDENT LIVING UNITS (ILU)		SQ METER (M²)	SQ FEET (FT²)
GROUND FLOOR/ LOFT		4,445 M²	47,846 FT²
TOTAL		34,375 M²	370,010 FT²

4. NET FLOOR AREA (NFA)

"MEANS THE TOTAL AREA OF ALL FLOORS OF A BUILDING MEASURED FROM THE INTERIOR FACES OF THE EXTERIOR WALLS OR DEMISING WALLS, BUT DOES NOT INCLUDE THE AREA OF STAIR WELLS, ELEVATORS, ESCALATORS, VENTILATING SHAFTS, ATTICS, CONCOURSES, WASHROOMS, ATTACHED ENCLOSED AND COVERED LOADING DOCKS AND RELATED ENCLOSED CORRIDORS USED FOR LOADING PURPOSES, ABOVE AND BELOW GRADE PARKING STRUCTURES, STORAGE ROOMS, ROOMS FOR GARBAGE CONTAINMENT, AND MECHANICAL ROOMS."

SENIORS RESIDENCE	NO. FLS x SQ METER (M²)	SQ METER (M²)	SQ FEET (FT²)
GROUND FLOOR		4,450 M²	47,900 FT²
2ND FLOOR		4,030 M²	43,379 FT²
3RD FLOOR		3,950 M²	42,517 FT²
4TH FLOOR		3,120 M²	33,583 FT²
5TH & 6TH FLOOR	2 FLOORS x 3,120 M²	6,240 M²	67,166 FT²
7TH FLOOR		3,030 M²	32,615 FT²
8TH FLOOR		2,910 M²	31,323 FT²
SUB TOTAL		27,730 M²	298,483 FT²
INDEPENDENT LIVING UNITS (ILU)		SQ METER (M²)	SQ FEET (FT²)
GROUND FLOOR/ LOFT		3,520 M²	37,889 FT²
TOTAL		31,250 M²	336,372 FT²

5. UNITS

SENIORS RESIDENCE	ASSISTED LIVING (AL)	MEMORY CARE (MC)	INDEPENDENT SUPPORTIVE LIV. (ISL)	INDEPENDENT LIVING SUITES (IL)	TOTAL
GROUND	-	-	-	13	13
2ND FLOOR	34	-	-	16	50
3RD FLOOR	-	34	-	16	50
4TH FLOOR	-	-	24	18	42
5TH FLOOR	-	-	24	18	42
6TH FLOOR	-	-	24	18	42
7TH FLOOR	-	-	23	16	39
8TH FLOOR	-	-	21	16	37
SUBTOTAL	34	34	116	131	315 UNITS
INDEPENDENT LIVING UNITS (ILU)					
GROUND FLOOR/LOFT	27				27 UNITS
TOTAL					342 UNITS

6. DENSITY UNITS PER HECTARE/ACRE

TOTAL UNITS / DEVELOPABLE SITE AREA (AC)	342 UNITS / 8.99 AC	38 UAC
TOTAL UNITS / DEVELOPABLE SITE AREA (HA)	342 UNITS / 3.63 HA	94 UHA

7. FLOOR SPACE INDEX (FSI)

"MEANS THE NET FLOOR AREA OF ALL BUILDINGS ON A LOT DIVIDED BY THE LOT AREA"

NET FLOOR AREA/DEVELOPABLE SITE AREA	31,250 / 36,397 M²	0.86 FSI

8. BUILDING HEIGHT

"MEANS THE VERTICAL DISTANCE BETWEEN ESTABLISHED GRADE TO THE HIGHEST POINT OF A STRUCTURE, UNLESS OTHERWISE SPECIFIED BY THIS BY-LAW"

ZONING BY-LAW 2014-014: PART 12.3	SENIORS RESIDENCE	SENIORS FRIENDLY IND. LIVING UNITS (SFIL)
MAX PERMITTED	14M	14M
PROPOSED	30.5M (8 STOREY)	6M (1.5 STOREY)

9. COVERAGE

	SQ. METER (M²)	SQ. FEET (FT²)	%
BUILDING	8,140 M²	87,618 FT²	22% (25% MAX PERMITTED)
PAVED AREAS (DRIVE AISLES & PARKING AREAS)	8,630 M²	92,892 FT²	24%
LANDSCAPED AREAS (HARD/SOFT)	19,627 M²	211,264 FT²	54%
TOTAL	36,397 M²	391,774 FT²	100%

10. SETBACKS ZONING BY-LAW 2014-014: PART 12.3

	FRONT YARD (FOURTH LINE)	FLANKAGE YARD	INTERIOR SIDE YARD	REAR YARD
REQUIRED	12M	12M	12M	12M
PROPOSED	7.5M	14M	4M	3M

11. LOADING AREA

	SENIORS RESIDENCE	INDEPENDENT LIVING UNITS (ILU)
LOADING AREAS	2	N/A

12. PARKING

	MINIMUM REQUIRED	PROVIDED
RETIREMENT HOME SUITES (0.33 PER ASST/D LIVING UNIT & DWELLING UNIT (DU))	104 RESIDENT/VISITOR SPACES	152 RESIDENT/VISITOR SPACES
IL UNITS (2/ DU + .25 OF DU FOR VISITORS)	54 RESIDENT & 7 VISITOR SPACES	61 RESIDENT VISITOR /SPACES
*ACCESSIBLE PARKING SPACES	5	5
TOTAL PROVIDED	170	218

* (2 PLUS 2% OF THE TOTAL NUMBER OF PARKING SPACES IN THE PARKING AREA)

13. BICYCLE SPACES

MIN. BICYCLES REQUIRED	"LESSER OF 5 OR 0.25 PER ASSISTED LIVING UNIT OR DWELLING UNIT"
TOTAL PROVIDED	5

PAUL ICKE
B. TECH., MARCH OAA MRAIC DATE

NO.	DATE	ISSUE	BY
1.	AUG. 24, 2020	ISSUED FOR RE-ZONING APPLICATION	PI

Issued

ICKE | BROCHU ARCHITECTS INC
517 Wellington St W., Suite 201, Toronto, Ontario, M5V 1G1
T 647 288 1800 ibarchitects.net

ONTARIO ASSOCIATION OF ARCHITECTS PAUL ANDREW ICKE LICENCE 5395

APPLICANT NAME :DELMANOR WEST OAK INC.

DELMANOR West Oak
Inspired Retirement Living™

1280 DUNDAS STREET W. OAKVILLE, ONTARIO

Drawing title
SITE PLAN & STATISTICS

Date	AUG 5, 2020	Drawn By	AA
Scale	1:400	Reviewed By	PI
Project No.	17.23	Drawing No.	A101
Plot Date	August 24, 2020		

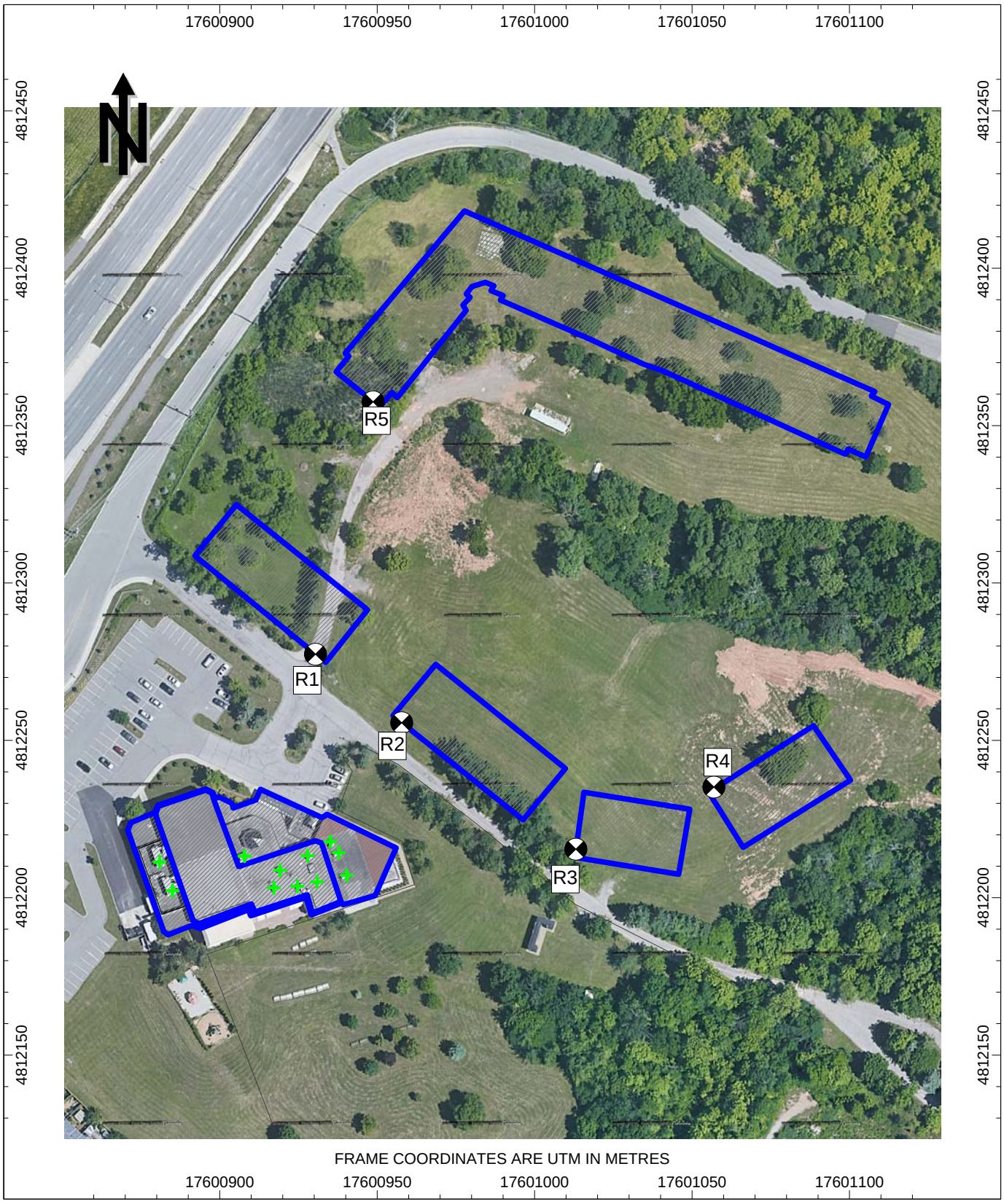


Figure 3: Existing Noise Source Locations

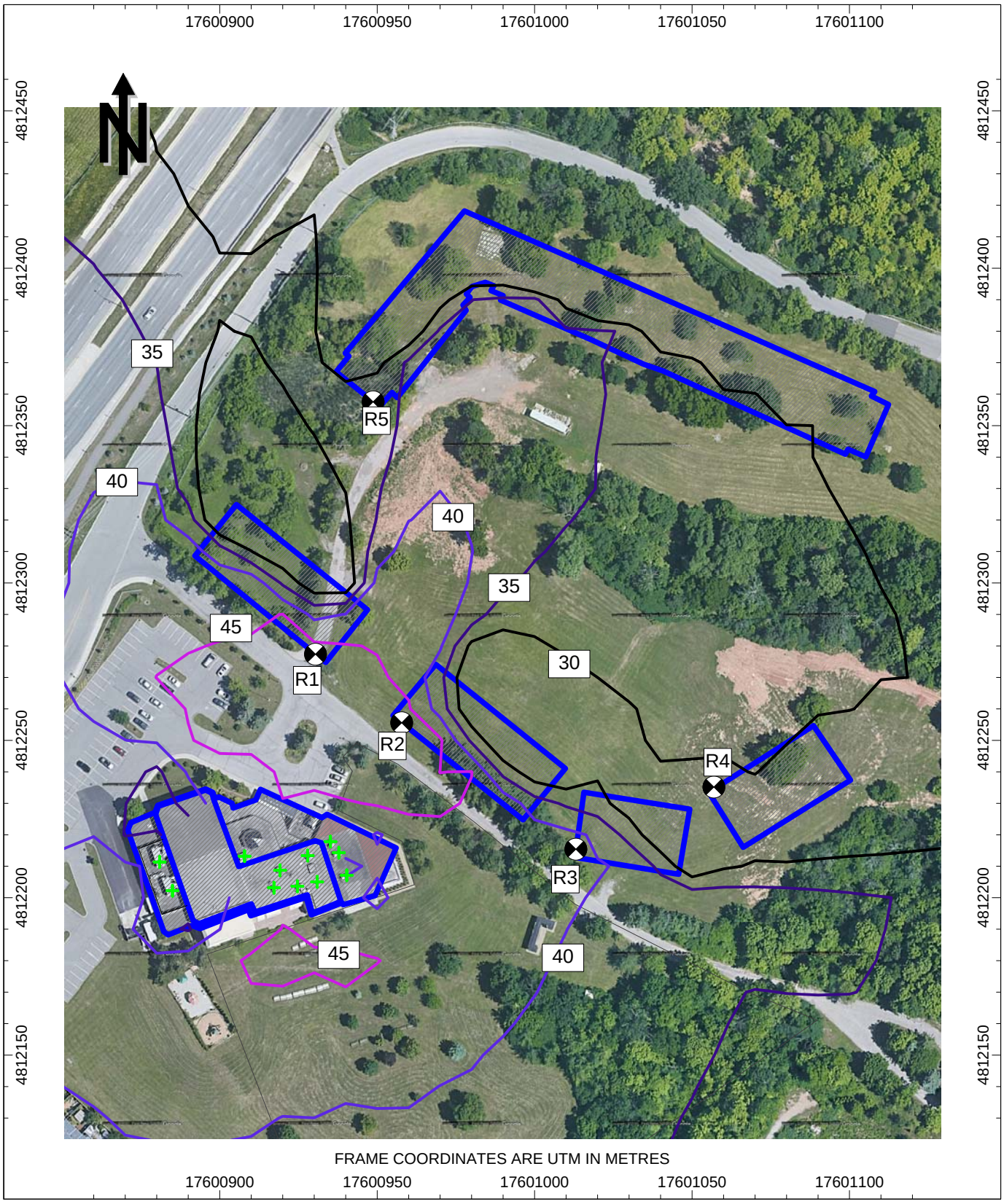


Figure 4 – Predicted Daytime Sound Level Contours from Stationary Noise Sources, dBA

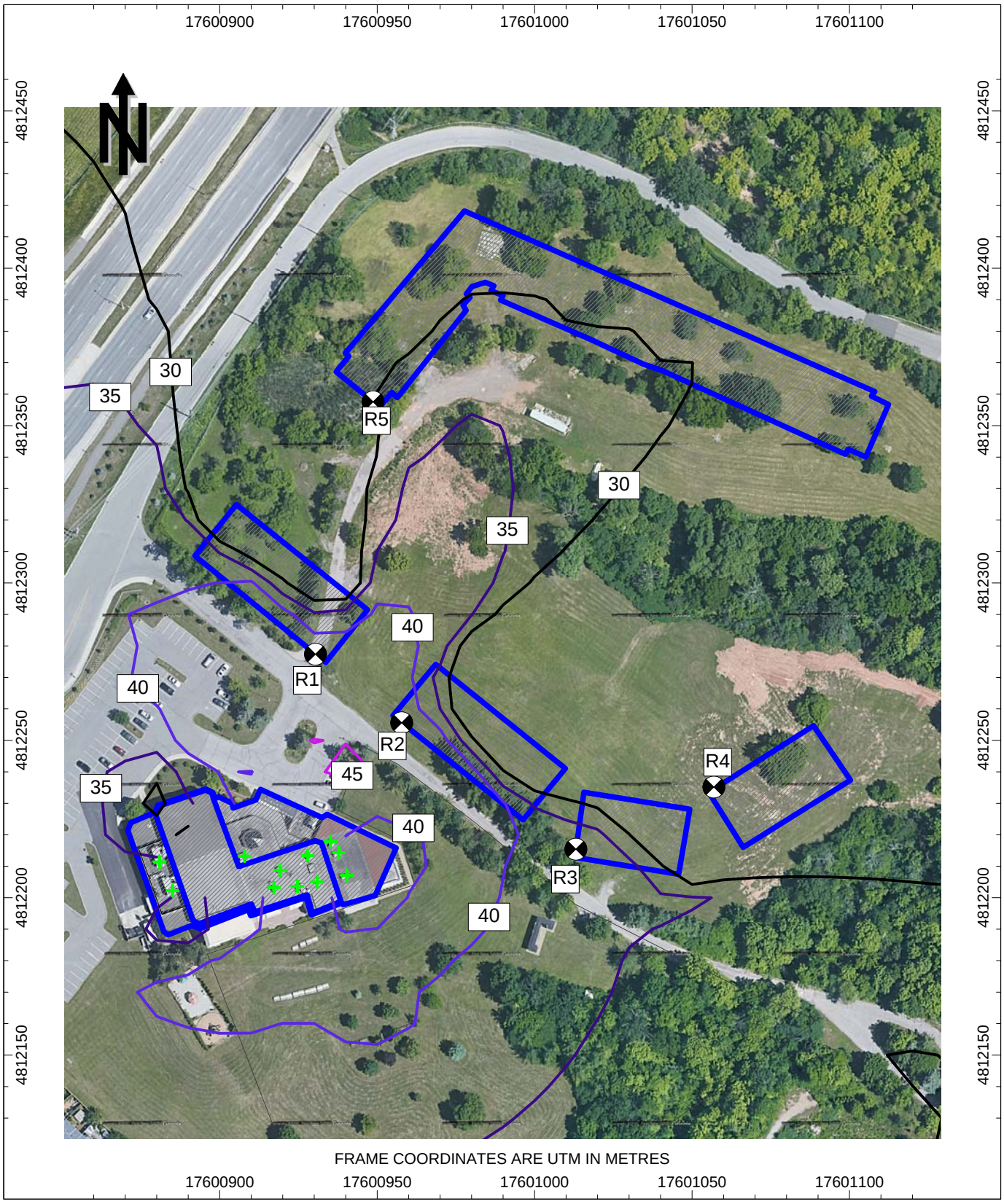


Figure 5 – Predicted Nighttime Sound Level Contours from Stationary Noise Sources, dBA

APPENDIX A

Supporting Drawings

NORTH ELEVATION

SOUTH ELEVATION

CKE | BROCHU ARCHITECTS INC.

DELMANOR- OAKVILLE

1280 DUNDAS STREET W
OAKVILLE, ONTARIO

BUILDING ELEVATIONS

PROJECT NO. 17.23
DATE: JULY 28, 2020 SCALE: 1:500

WEST ELEVATION

EAST ELEVATION

CKE | BROCHU ARCHITECTS INC.

DELMANOR- OAKVILLE

1280 DUNDAS STREET W
OAKVILLE, ONTARIO

BUILDING ELEVATIONS

PROJECT NO. 17.23
DATE: JULY 28, 2020 SCALE: 1:500

APPENDIX B

Road Traffic Data

Yvonne Lo

From: Krusto, Matt <Matt.Krusto@halton.ca>
Sent: June 23, 2020 4:02 PM
To: Yvonne Lo
Subject: RE: Road Traffic Data Request - 1280 Dundas Street West

Follow Up Flag: Follow up
Flag Status: Flagged

HI Yvonne,

I hope all is well with you and your family through all this.

For Noise Studies along/near Dundas Street please use the following for Dundas Street assumptions:

-Future ultimate volumes and lane assumptions for Dundas Street must be 55,000 AADT and 6 lanes.

For the truck percentages, we now use the existing percentages. These would have to be obtained from existing traffic counts. That request can be made to our Road Operations group at trafficdatarequests@halton.ca

I hope this helps.

Matt

Matt Krusto
Transportation Planning Coordinator
Infrastructure Planning & Policy
Public Works
Halton Region
905-825-6000, ext. 7225 | 1-866-442-5866

From: Yvonne Lo <ylo@hgcengineering.com>
Sent: Tuesday, June 23, 2020 3:39 PM
To: Krusto, Matt <Matt.Krusto@halton.ca>
Subject: Road Traffic Data Request - 1280 Dundas Street West

Hi Matt,

HGC Engineering is currently conducting a noise feasibility study for a proposed development located at 1280 Dundas Street West in Oakville, Ontario, as shown below:

https://goo.gl/maps/JKBxvvWm9uGYBYr1A

We are requesting ultimate road traffic for Dundas Street West in the vicinity of the subject site.

Thank you.

Best,

Yvonne Lo, BASc, PEng
Project Consultant

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**: ylo@hgcengineering.com
Visit our website: www.hgcengineering.com **Follow Us** – LinkedIn | Twitter | YouTube

APPENDIX C

Sample STAMSON 5.04 Output

STAMSON 5.0 NORMAL REPORT Date: 28-08-2020 16:30:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: a.te Time Period: Day/Night 16/8 hours
Description: ***Predicted daytime and nighttime sound levels at the west façade of the proposed Senior's Building, prediction location [A].***

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

Car traffic volume : 24131/2681 veh/TimePeriod *
Medium truck volume : 322/36 veh/TimePeriod *
Heavy truck volume : 297/33 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): 27500
Percentage of Annual Growth : 2.50
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.30
Heavy Truck % of Total Volume : 1.20
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Dundas (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 55.00 / 55.00 m
Receiver height : 23.50 / 23.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 24131/2681 veh/TimePeriod *
Medium truck volume : 322/36 veh/TimePeriod *
Heavy truck volume : 297/33 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): 27500
Percentage of Annual Growth : 2.50
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 1.30
Heavy Truck % of Total Volume : 1.20
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                   :      2       (Reflective ground surface)
Receiver source distance  :  75.00 / 75.00  m
Receiver height           :  23.50 / 23.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.05 m

ROAD (0.00 + 62.98 + 0.00) = 62.98 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  68.62   0.00  -5.64   0.00   0.00   0.00   0.00
62.98
-------------------------------------------------------------------------
---

Segment Leq : 62.98 dBA

Results segment # 2: Dundas (day)
---------------------------------

Source height = 1.05 m

ROAD (0.00 + 61.63 + 0.00) = 61.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  68.62   0.00  -6.99   0.00   0.00   0.00   0.00
61.63
-------------------------------------------------------------------------
---

Segment Leq : 61.63 dBA

Total Leq All Segments: 65.37 dBA

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

Source height = 1.05 m

ROAD (0.00 + 56.45 + 0.00) = 56.45 dBA
```

```
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  62.09   0.00  -5.64   0.00   0.00   0.00   0.00
56.45
-------------------------------------------------------------------------
---

Segment Leq : 56.45 dBA

Results segment # 2: Dundas (night)
-----------------------------------

Source height = 1.05 m

ROAD (0.00 + 55.10 + 0.00) = 55.10 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj
SubLeq
-------------------------------------------------------------------------
---
   -90     90   0.00  62.09   0.00  -6.99   0.00   0.00   0.00   0.00
55.10
-------------------------------------------------------------------------
---

Segment Leq : 55.10 dBA

Total Leq All Segments: 58.84 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.37
                           (NIGHT): 58.84
```