

Noise Feasibility Study

Proposed Mixed-Use/Residential Development Bisgould Lands Woolwich, Ontario

May 20, 2026
HGC Project #: 02600011



Prepared for:

Thomasfield Homes Limited
295 Southgate Drive
Guelph, Ontario
N1G 3M5

Version Control
Proposed Mixed-Use/Residential Development, Bisgould Lands, Woolwich, Ontario

Ver.	Date	Version Description	Prepared By
1.0	May 20, 2026	Noise Feasibility Study for planning and approvals process.	E. Jaklic / V. Garcia

Prepared by:



Elise Jaklic, BEng

Reviewed by:



Victor Garcia, PEng



Howe Gastmeier Chapnik Limited

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1 INTRODUCTION AND SUMMARY

HGC Noise Vibration Acoustics was retained by Thomasfield Homes Limited to conduct a noise feasibility study for a proposed mixed-use/residential development located east of Greenhouse Road and South of Victoria Street North, in Woolwich, Ontario. The development will consist of low-density residential dwellings, stacked/back-to-back townhouses blocks, mixed-use blocks, a park, a stormwater management pond, and associated at-grade roadways. The study is required by the Municipality as part of the planning and approvals process.

The primary source of noise is road traffic on Victoria Street North and Greenhouse Road. Rail traffic from the Guelph Subdivision Metrolinx railway line to the south is a secondary noise source. Relevant traffic data was obtained from the Ministry of Transportation Ontario (MTO), Metrolinx, and HGC project files. The data was used to predict future traffic sound levels at the proposed building façades and outdoor living areas. The predicted sound levels were compared to the guidelines of the Ministry of the Environment, Conservation and Parks (MECP), and the railway.

The sound level predictions indicate that with suitable noise control measures integrated into the design of the residential buildings, it is feasible to achieve the MECP guideline sound levels for transportation noise. Central air conditioning is required for the mixed-use buildings adjacent to Victoria Street North. The provision for the installation of central air conditioning at the occupants discretion is required for the stacked/back-to-back townhouse blocks with exposure to Victoria Street North, and Greenhouse Road, along with the southernmost dwellings with exposure to the railway. Upgraded window glazing is required for the northern, eastern, and western façades of the mixed-use buildings adjacent to Victoria Street North. Warning clauses are also recommended to inform future owners and tenants of the traffic noise impacts.

A computer model of the area was created to predict the sound levels at the façades of the proposed development due to off-site stationary noise sources



from existing commercial/agricultural facilities around the site area. The results indicate that the sound emissions of the nearby steady noise sources exceed the applicable MECP guideline sound level limits. Mitigation could be provided in the form of acoustic barriers and/or designing townhouse blocks and low-density dwellings such that window into sensitive spaces are not provided along façades with exposure to the stationary noise sources. Alternatively, a Class 4 designation could be requested for the development from the municipality if the mitigation measures required to achieve Class 1 criteria are deemed onerous. With a Class 4 designation the following is required: upgraded building and glazing constructions, air conditioning, acoustic barriers, and a Class 4 specific warning clause.

Noise warning clauses are required to inform future occupants of the sound level excesses, and the proximity to agricultural/commercial uses, and the designation of Class 4, if granted by the municipality.

As the Site Plan application progresses, a review should be conducted to verify and/or refine the acoustic recommendations as the floor plans and elevations are refined and finalized.

2 SITE DESCRIPTION AND NOISE SOURCES

Figure 1 is a key plan indicating the location of the proposed site [1]. The site is located east of Greenhouse Road and south of Victoria Street North in the Township of Woolwich, Ontario. Figure 2 shows the concept plan prepared by GSP Group, dated December 19, 2023, also showing prediction locations. The proposed development will consist of low-density residential dwellings, thirteen blocks of stacked/back-to-back townhouses, four blocks of 4-storey mixed-use buildings, a park, stormwater management pond, and associated at-grade roadways and parking spaces.

HGC personnel visited the site in February 2026, to make observations of the acoustical environment. During the site visit, it was noted that the primary source of noise impacting the site was road traffic on Victoria Street North and

Greenhouse Road. The Guelph Subdivision rail line, located approximately 400 m to the south, is a secondary source of noise. The site is currently vacant. Areas around the site are mostly flat. To the north are agricultural lands. There are existing detached and townhouse dwellings to the west of the site. To the east of the site is a cemetery and agricultural lands. To the northwest of the site is Belgian Nursery, located approximately 30 m away from the closest proposed façade. Located to the southwest of the site are Grobe Nursery & Garden Centre and the National Engineered Fasteners Inc. facility, situated approximately 8 m and 230 m, respectively, from the nearest proposed residential dwelling. A preliminary stationary noise assessment has been conducted in Section 4.0. Figure 3 is an aerial photo showing the surrounding land uses.

3 TRAFFIC NOISE ASSESSMENT

3.1 Traffic Noise Criteria

Guidelines for acceptable levels of road and rail traffic noise impacting residential developments are given in the MECP publication NPC-300, "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning" [2], 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]. The Federation of Canadian Municipalities (FCM) and Railway Associated of Canada (RAC) "Guidelines for New Development in Proximity to Railway Operations", dated May 2013 (RAC/FCM guidelines were also reviewed dated November 2006).

Table 1: MECP Traffic Noise Criteria

Space	Daytime L_{EQ} (16 hour) Road / Rail	Nighttime L_{EQ} (8 hour) Road / Rail
Outdoor Living Areas	55 dBA	--
Inside Living/Dining Rooms	45 dBA / 40 dBA	45 dBA / 40 dBA
Inside Bedrooms	45 dBA / 40 dBA	40 dBA / 35 dBA

Daytime refers to the period between 07:00 and 23:00, while 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, backyard or terrace or other areas where passive recreation is expected to occur. Balconies and terraces that are less than 4 m in depth are not considered to be outdoor living areas under MECP guidelines, and accordingly the noise criteria are not applicable there. Large private terraces require consideration only if they are the only OLA for the occupant in general. Common outdoor amenity terraces associated with apartment buildings are the only OLA that require consideration.

The guidelines in the MECP publication allow the daytime sound levels in an OLA to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where the 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 practical.

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

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom or living/dining room windows exceed 65 dBA. If the sound level in the plane of a bedroom or living/dining room window is greater than 55 dBA and less than or equal to 65 dBA, the dwelling should be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion.

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



due to road traffic noise; greater than 55 dBA during the nighttime or greater than 60 dBA during the daytime hours due to rail traffic noise.

3.2 Traffic Noise Assessment

3.2.1 Road Traffic Data

Traffic data for Victoria Street North was obtained from the MTO in the form of summer average daily traffic (SADT) for the year 2021, and is provided in Appendix A. The data was projected to the year 2036 using a 2.5%/year growth rate. A posted speed limit of 80 km/h along with a day/night traffic volume split of 90/10 was used in the analysis. A commercial vehicle percentage of 6.0, split into 3.0% medium trucks and 3.0% heavy trucks, calculated from the obtained data, was applied for the roadway.

Traffic projections to the year 2034 for Greenhouse Road was obtained from a traffic study prepared by Paradigm Transportation Solutions Limited, and is provided in Appendix A. The data was further projected to 2036 using a 2.5%/year growth rate. A posted speed limit of 50 km/h along with a day/night split of 90/10 was used for the analysis. A commercial vehicle percentage of 2.0% split into 0.8% medium trucks and 1.2% heavy trucks was applied for the roadway.

Table 2 summarizes the traffic volume data used in this study.

Table 2: Projected Road Traffic Data to 2036

Roadway	AADT	Day / Night Split [%]	Trucks Percentage [%]		Speed Limit [km/h]
			Medium	Heavy	
Victoria Street North	36 063	90 / 10	3.0	3.0	80
Greenhouse Road	7 846	90 / 10	0.8	1.2	50

3.2.2 Rail Traffic Data

Rail traffic data for typical operations of the Guelph Subdivision was obtained from CN and Metrolinx personnel and is included in Appendix B. The Guelph

Subdivision is used for freight and passenger operations. The railway is a principal mainline and is a continuously welded line. The maximum train speed of 89 kph (55 mph) for freight and 113 kph (70 mph) was used in the analysis. In conformance with Metrolinx assessment requirements, these maximum speeds, number of cars and maximum locomotives per train were used in the traffic noise analysis to yield a worst-case estimate of train noise. The CN data was projected to the year 2036 using a 2.5% per year growth rate. The Metrolinx data has been forecasted by Metrolinx and is shown in Table 3.

Table 3: Projected Rail Traffic Data to 2036

Type of Train	Number of Trains Day/Night	Number of Locomotives	Number of Cars	Speed Limit [km/h]
GO <i>Forecasted</i>	56.0 / 12.0	1	8	113
GO <i>Forecasted</i>	8.0 / 0.0	2	8	113
CN Freight	0.0 / 3.0	4	140	89
CN Passenger	9.2 / 0.0	2	10	113

3.2.3 Traffic Noise Predictions

To assess the levels of road and rail 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. Sample STAMSON output is included in Appendix C. Reflective surfaces were used in the analysis for dwellings adjacent to roadways.

Predictions of the traffic sound levels were made at various dwelling façades of the proposed development. The results of these predictions are summarized in Table 3. The acoustic requirements may be subject to modifications if the site plan is changed significantly.

Sound levels were predicted at the plane of the top storey windows during daytime and nighttime hours to investigate ventilation requirements and during the daytime in the OLAs. Building setbacks indicated in the concept plans for

the mixed-use block and stacked townhouse blocks have been used in the analysis. Distance setbacks of 6 m rear yard, 2 m front yard and a 0.5 m side yard were assumed for the low density residential dwellings in the analysis.

The results of these predictions are summarized in Table 4.

Table 4: Future Traffic Sound Levels, [dBA], Without Mitigation

Prediction Location	Description	Daytime in OLA L _{EQ} (16 hour)	Daytime at Façade L _{EQ} (16 hour)	Nighttime at Façade L _{EQ} (8 hour)
		Road/Rail/Total	Road/Rail/Total	Road/Rail/Total
[A]	Mixed-Use building, north façade adjacent to Victoria St N	-- / -- / --	74 / <55 / 74	67 / <50 / 67
[B]	Mixed-Use building, west façade with exposure to Victoria St N	-- / -- / --	69 / <55 / 69	63 / <50 / 63
[C]	Stacked Townhouse block with exposure to Victoria St N	60 / <55 / 60	59 / <55 / 59	53 / <50 / 53
[D]	Stacked townhouse block, east façade with exposure to Victoria St N	59 / <55 / 59	58 / <55 / 58	52 / <50 / 52
[E]	Proposed low density dwellings with exposure to Victoria St N	55 / <55 / 55	55 / <55 / 55	<50 / <50 / <50
[F]	West façade of townhouse block adjacent to Greenhouse Road	57 / <55 / 57	61 / <55 / 61	54 / <50 / 54
[G]	Northwest façade of townhouse block adjacent to Greenhouse Road with exposure to Victoria St N	55 / <55 / 55	<55 / <55 / <55	<50 / <50 / <50
[H]	Southernmost dwellings with exposure to the railway line	<55 / <55 / <55	<55 / 55 / 55	<50 / 53 / 53
[I]	Second row of southernmost dwellings with some exposure to the railway line	<55 / <55 / <55	<55 / <55 / <55	<50 / 50 / 50

3.3 Traffic Noise Discussion and Recommendations

The sound level predictions indicate that the future traffic sound levels will exceed MECP guidelines at the proposed development. The following discussion outlines the recommendations for acoustic barrier requirements, ventilation requirements, upgraded building façade construction, and warning clauses to achieve the noise criteria stated in Table 1.

3.3.1 Building Façade Constructions

The predicted sound levels at the façades of the future mixed-use buildings adjacent to Victoria Road North will exceed 65 dBA during daytime and 60 dBA during nighttime. MECP guidelines stipulate that in such cases, building components including windows, walls, and doors be designed so that the indoor sound levels comply with the noise criteria in Table 1.

Preliminary calculations have been performed to determine the building envelope constructions likely to be required to maintain indoor sound levels within MECP guidelines. The calculation methods were developed by the National Research Council (NRC). They are based on the maximum predicted future sound levels at the building façades, and the anticipated areas of the façade components (walls, doors and windows) relative to the floor area of the adjacent room.

Exterior Wall Construction

In this analysis, for the midrise building it has been assumed that sound transmitted through elements other than the glazing elements is negligible in comparison. Thus, the exterior walls should have sufficient acoustical insulation value such that the noise transmitted through the walls is negligible in comparison with the windows. Further input regarding the design of the exterior walls can be provided during design development, if required.

Exterior Doors

There may be glazed exterior doors (sliding or swing) for entry onto the balconies from living/dining rooms and some bedrooms. The glazing areas of the doors should be counted as part of the total window glazing area. All exterior doors should include good weather seals to reduce air infiltration to the minimum achievable levels.

Acoustical Requirements for Glazing

The required building components are selected based on the AIF value for road traffic. A summary of the STC requirements is given in Table 5 for the building façades, based on the possibility of sound entering the building through walls, windows and doors for all of the dwellings.

Detailed floor plans and building elevations were not available for review at the time of this report. A window to floor ratio of 50% (30% fixed, 20% operable) for living/dining and bedrooms were assumed to determine preliminary window STC ratings required to mitigate road traffic noise levels.

Table 5: Preliminary Minimum STC Requirements

Prediction Location	Description	STC Glazing Requirements*
[A]	North façade of mixed-use buildings facing Victoria Street North	STC-36
[B]	Western and eastern façades of mixed-use buildings with exposure to Victoria Street North	STC-31
	Remaining façades/dwellings	OBC

Notes:

OBC – Ontario Building Code

* Sound entering through windows only since transmission through exterior wall is considered negligible compared to sounds transmitted through glazing elements.

Note that acoustic performance varies with manufacture's construction details, and these are only guidelines to provide some indication of the type of glazing likely to be required; the STC requirements in Table 5 are provided as a guideline based on the preliminary drawings. Acoustical test data for the selected assemblies should be requested from the supplier, to ensure that the stated acoustic performance levels will be achieved by their assemblies.

Further Analysis

When detailed floor plans and building elevations are available for the dwelling units along Victoria Street North, window glazing construction should be refined based on actual window to floor area ratios.

3.3.2 Indoor Living Areas

Central Air Conditioning

The predicted future sound levels outside the façades of the mixed-use buildings (prediction locations [A] and [B]) will be greater than 65 dBA during the daytime and 60 dBA during the nighttime. To address these excesses, the MECP guidelines recommend that these buildings be equipped with central air conditioning systems, so that the windows can be closed.

Provision for Adding Central Air Conditioning

The predicted sound levels at the façades of the stacked/back-to-back townhouse blocks with exposure to Victoria Street North and/or Greenhouse Road (prediction locations [C], [D], and [F]), and exposure to the Guelph Subdivision railway line (prediction location [H]), will be between 56 and 65 dBA during the daytime hours and/or between 51 and 60 dBA during the nighttime. To address this excess, the MECP guidelines recommend that these dwellings be equipped with the provision for the future installation of air conditioning at the occupant's discretion.

Remaining Dwellings

The predicted future sound levels at the façades of the remaining proposed residential dwellings (prediction locations [E], [G], and [I]) will be less than or equal to 55 dBA during the day less than or equal to 50 dBA during the night. There are no specific ventilation requirements for these dwellings.

Ventilation requirements for the proposed development are shown in Figure 4.

As a general note, window or through-the-wall air conditioning units are not recommended because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall sound insulating properties of the envelope. Acceptable 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.

3.3.3 Outdoor Living Areas

The predicted sound level in the rear yards of the low-density dwelling units with exposure to Victoria Street North (prediction location [E]) and/or exposure to the railway (prediction location [H], [I]) will be 55 dBA or less. No further mitigation is required.

There may be rooftop terraces located on the stacked/back-to-back townhouses. The predicted sound levels on these rooftop terraces with exposure to Victoria Street North and/or Greenhouse Road will be up to 60 dBA (prediction locations [C], [D], [F] and [G]), 5 dBA in excess of the MECP limit of 55 dBA. The predicted sound level is within the allowable 5 dBA discretionary range of the MECP's limit of 55 dBA, provided that a warning clause be included in the property and tenancy agreements.

The conceptual plans do not show private balconies or terraces that are more than 4 m in depth. Balconies and elevated terraces less than 4 m in depth are not considered to be outdoor living areas under the MECP guidelines and are except from traffic noise assessment. Further analysis may be required if balconies or elevated terraces with depths greater than 4 m are present.

4 STATIONARY NOISE ASSESSMENT

Noise sources associated with industrial, commercial/retail, and institutional facilities are considered to be Stationary Sources of Sound and criteria for their assessment are contained in the following section.

HGC personnel made a site visit in February 2026 to identify the noise sources to be potentially significant with respect to the subject site. From site observations, along with aerial imagery and past experience with similar projects, the noise sources expected to be potentially significant with respect to the site were determined. These sources included mechanical equipment on the roof and façades of the neighbouring commercial/agricultural facilities, trucking movements, idling truck engines and forklift activity.

There are four proposed mixed-use buildings proposed for the north side of the development, facing Victoria Street North. The primary sources of sound associated with these buildings include the rooftop mechanical equipment. The rooftop mechanical equipment units have not been selected for the proposed mixed-use buildings. Typical sound levels and tonnages of the rooftop equipment were obtained from HGC project files and originally from the manufacturer.

4.1 Criteria for Acceptable Sound Levels

4.1.1 Stationary Noise Criteria

Under MECP guidelines, the acoustical environment in this area is classified as “urban” or “Class 1,” as background sound levels are set by road traffic on surrounding roadways during daytime and nighttime hours.

Stationary sources of sound are collectively defined as all sources that emit sound within a commercial or industrial facility boundary. The proposed commercial facilities are therefore classified as a stationary source of sound. The following MECP guidelines and criteria apply in this case.

MECP Guideline NPC-300 is the applicable guideline for use in investigating Land Use Compatibility issues with regard to noise. A commercial facility is classified in the MECP Guideline NPC-300 as a stationary source of sound (as compared to sources such as traffic or construction, for example) for noise assessment purposes. A stationary noise source encompasses the noise from all the activities and equipment within the property boundary of a facility including regular on-site truck traffic for deliveries, material handling and mechanical equipment. In terms of background sound, the development is located in an urban acoustical environment which is characterized by an acoustical environment dominated by road traffic and human activity.

Stationary Source (Steady Sound)

NPC-300 is intended for use in the planning of both residential and commercial/industrial land uses and provides the acceptability limits for sound

due to commercial operations in that regard. The facade of a residence (i.e., in the plane of a window) or any associated usable outdoor area is considered a sensitive point of reception (within 30 m of a dwelling façade). NPC-300 stipulates that the exclusionary sound level limit for a stationary noise source in urban Class 1 areas are taken to be 50 dBA during daytime and evening hours (07:00 to 19:00 and 19:00 to 23:00), and 45 dBA during nighttime hours (23:00 to 07:00) at the plane of the windows of noise sensitive spaces. If the background sound levels due to road traffic exceed the exclusionary limits, then that background sound level becomes the criterion. The background sound level is defined as the sound level that occurs when the source under consideration is not operating and may include traffic noise and natural sounds.

Commercial activities such as the occasional movement of customer/employee vehicles, deliveries to convenience 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.

4.1.2 Sound Level Criteria at the Sensitive Receptors

Typical ambient sound levels can be determined through prediction of road traffic volumes in areas where traffic sound is dominant. Where it can be demonstrated that the hourly ambient sound levels are greater than the exclusionary minimum limits listed above, the criterion becomes the lowest predicted one-hour LEQ sound level during each respective period. At locations where the ambient sound levels are low, the exclusionary minimum criteria of 50/45 apply.

4.2 Stationary Noise Assessment

Predictive noise modelling was used to assess the potential sound impact of the nearby land uses at the closest sensitive receptors. The noise prediction model was based on the sound emission levels from the nearby noise sources, proposed noise sources, assumed operational profiles (during the day and

night), and established engineering methods for the prediction of outdoor sound propagation. These methods include the effects of distance, air absorption, and acoustical screening by barrier obstacles.

The potentially significant noise sources associated with the nearby commercial/agricultural uses are rooftop equipment, trucking movements, idling truck engines, greenhouse exhaust fans, and forklift activities. Measurements were obtained on site for the exhaust fans at the Belgian and Grobe Nurseries. The remaining sound levels were obtained from HGC project files and was used in the analysis based on a site visit and a review of aerial photography. Discussions with Belgian Nursery and Grobe Nursery personnel indicated their operating hours for the greenhouse and nurseries are anticipated to extend into the nighttime hours, as seasonal factors impact their schedules. Discussions from Grobe Nursery occurred during a site visit conducted for the Hopewell Crossing Subdivision. Correspondence with Belgian Nursery personnel from our February 2025 site visit are included in Appendix E. The source levels associated with the equipment and activities are listed in Table 7 below, in terms of sound power level.

Table 7: Source Sound Power Levels [dB re 10-12 w]

Source	Octave Band Centre Frequency [Hz]									Overall [dBA]
	32	63	125	250	500	1k	2k	4k	8k	
Carrier 10-ton HVAC Unit	--	89	85	82	81	82	76	74	67	85
Belgian Nursery Exhaust Fan	70	72	83	85	81	77	71	67	63	87
Grobe Nursery Exhaust Fan	60	62	73	75	71	67	61	57	53	77
Forklift	97	106	97	89	88	87	83	80	74	92
Delivery Van Movements	--	91	86	91	78	76	75	71	61	85
Trucking Movements	--	101	100	94	96	97	95	91	86	101
Idling Truck Engine	--	96	91	88	88	91	90	81	70	95

The above outlined sound levels and site features were used as input to a predictive computer model. The software used for this purpose (Cadna-A Version 2025 build: 209.5501) is a computer implementation of ISO Standard

9613-2.2 “Acoustics – Attenuation of Sound During Propagation Outdoors” [3]. The ISO method accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustic shielding by intervening structures such as barriers.

The following information and assumptions were used in the analysis.

- The proposed stacked townhouse blocks were assumed to be 3-storey with heights of 9.0 m above grade. The proposed low density dwellings were assumed to be 2-storey single detached dwellings with heights of 6.0 m above grade.
- The existing rooftop mechanical equipment was assumed to be Carrier 10-Ton units (ARZ012) at a height of 1.5 m above the roof.
- The forklift and van activities are assumed to be 1.0 m in height, above grade.
- The trucking activities are assumed to be 2.0 m in height, above grade.
- Sound data for the exhaust fans for the Belgian Nursery were measured on site. The sound data for the Grobe Nursery greenhouse exhaust fans were obtained from past HGC project files, which were originally measured on site.
- The greenhouse exhaust fans have a height of 2.0 m above grade at the Belgian Nursery, and 3.0 m above grade at the Grobe Nursery.
- Location of the noise sources are shown in Figure 5a and 5b. Rooftop mechanical equipment, idling truck engines, greenhouse exhaust fans and are shown as green crosses. Truck and van movements are shown as green lines. Forklift activities are shown as green hatched areas.

In this impact assessment, we have considered typical worst-case (busiest hour) scenario for each time period to be as follows:

Assumed daytime/evening worst-case scenario:

- All exhaust fans operate continuously for 60 minutes in an hour.

- All rooftop HVAC equipment operate continuously for 60 minutes in an hour.
- The forklifts may at the Grobe and Belgian nurseries may operate for up to 10 minutes in an hour.
- Up to six delivery vans can on site in an hour at the Grobe and Belgian nurseries.
- One truck may be on site at the Grobe Nursery and three trucks on site at the National Engineered Fasteners Inc. facility in any given hour.

Assumed night-time worst-case scenario:

- Greenhouse exhaust fans operate for 45 minutes in an hour.
- All rooftop HVAC equipment operate for 30 minutes in an hour.
- Vehicle operations (trucks, forklifts, delivery vans) do not occur during the nighttime.

4.3 Results

The unmitigated sound levels due to stationary noise sources at the proposed development are summarized in Table 8 and presented graphically in Figures 6a through 6d. A sample Cadna/A output table is included in Appendix D for a location on the west façade of the townhouse block with exposure to the Belgian Nursery exhaust fans. Building evaluations were used to determine the sound level along each façade and in the rear yards. The worst-case sound level along each façade is presented in the table below.

Table 8: Predicted Sound Levels from the Existing Stationary Noise Sources on the Proposed Residential Development [dBA]

Receptor	Façade	Criteria (Daytime/Night)	OLA Day/Eve (07:00 to 23:00)	Façade Day/Eve (07:00 to 23:00)	Façade Nighttime (23:00 to 07:00)	Meets Criteria
R1	North	50 / 45	--	37	35	Y
	East	50 / 45	--	36	35	Y
	South	50 / 45	--	56	55	N
	West	50 / 45	--	56	55	N
R2	North	50 / 45	--	57	56	N
	East	50 / 45	--	38	36	Y
	South	50 / 45	--	54	52	N
	West	50 / 45	--	60	59	N
R3	North	50 / 45	--	52	50	N
	East	50 / 45	--	<35	31	Y
	South	50 / 45	--	48	46	N
	West	50 / 45	--	42	40	Y
R4	North	50 / 45	60	58	57	N
	East	50 / 45	--	43	42	Y
	South	50 / 45	--	41	39	Y
	West	50 / 45	--	58	57	N
R5	North	50 / 45	--	35	32	Y
	East	50 / 45	--	54	51	N
	South	50 / 45	60	58	55	N
	West	50 / 45	--	52	49	N
Remaining Dwellings		50 / 45	--	50	45	Y

The result of the analysis indicates that the predicted steady sound levels due to the operation of nearby stationary sources of noise, may exceed the applicable sound criteria at receptors by up to 10 dBA during the day, 14 dBA during the nighttime at the façades of the dwellings, and 10 dBA in the rear yard of the low density dwelling nearest to the Belgian Nursery, and year yard of the townhouse block nearest to the Grobe Nursery. These excesses are primarily attributed to the greenhouse exhaust fans for both Belgian Nursery and Grobe Nursery. Recommendations are discussed in the following section.

4.4 Discussion and Recommendations with Regard to Stationary Sources

4.4.1 Mitigation Option 1a

In order to meet the applicable Class 1 criteria at the proposed residential development, mitigation is required. Excesses at the façades of the proposed buildings are primarily due to the greenhouse exhaust fans associated with Belgian Nursery and Grobe Nursery. Acoustic barriers, with heights ranging from 6.0 m to 9.0 m would be required along the property lines closest to Belgian Nursery and Grobe Nursery, to shield the subject site from the stationary Sources. The heights and extent of the recommended barriers to achieve Class 1 criteria is shown in Figures 7a and 7b.

4.4.2 Mitigation Option 1b

Alternatively, mitigation to achieve the applicable Class 1 criteria at the proposed residential development could include designing the dwellings such that there are no windows to noise sensitive spaces on façades with exposure to the nurseries. This would be required for:

- The west façade of R2;
- The 3rd and 4th storeys of the west façade, and western portion of the southern façade, of R1;
- Any storey above the ground floor for R4;
- Rear façade for R5.

Acoustic barrier with heights ranging from 3.8 m to 6.5 m are also required along the property lines along the Belgian Nursery and Grobe Nursery facilities. Figures 8a and 8b show the barrier height, length and façade requirements.

4.4.3 Mitigation Option 2

Since the required mitigation measures to achieve Class 1 limits are onerous, given the design restrictions and significant height of barriers required, a



Class 4 designation for the abovementioned dwellings could be requested from the municipality. The designation provides relaxed (higher) daytime and nighttime sound level limits from those otherwise permitted for both indoor and outdoor areas. The steady stationary sound level limits for a Class 4 area are 60 dBA during the daytime and 55 dBA during the nighttime at the façade, and 55 dBA in an OLA during the day.

A Class 4 area permits receptor-based noise control measures (noise walls, specific construction techniques and materials, etc.) to be used within a proposed new sensitive land use within the vicinity of an industrial/ commercial use. Class 4 areas require formal recognition by the land use planning authority.

A Class 4 area is defined in NPC-300 as:

- In an area intended for development with new noise sensitive land use(s) that are not yet built.
- Is in proximity to existing, lawfully established stationary source(s); and
- Has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process,

For buildings with a Class 4 designation, the following mitigation is required:

- 1) The townhouse blocks, mixed-use blocks, and low-density dwellings designated as Class 4 are required to include air conditioning.
- 2) An additional warning clause is required to be included in the property and tenancy agreements and offers of purchase and sale for all dwelling units with Class 4 designation.
- 3) Additionally upgraded building and glazing constructions are recommended for all dwellings with a Class 4 designation, subject to a minimum STC-35



rating for all windows into sensitive spaces to further protect the interior spaces of the dwellings with a Class 4 designation.

- 4) An acoustic barrier of 3.8 m in height is required along the property line adjacent to the Belgian Nursery.
- 5) An acoustic barrier of 3.0 in height is required along the property line adjacent to the Grobe Nursery greenhouse.
- 6) No windows into noise sensitive spaces for R5.

With the above mitigation measures in place, and a Class 4 designation for the R1, R2, R3 and the neighbouring dwelling to R3, predicted sound levels due to the surrounding stationary noise sources under a worst-case operational scenario will meet Class 4 criteria. Figures 9a and 9b show the Class 4 mitigation requirements.

As a general note, the wall component of the barrier should be of a solid construction with a surface density of no less than 20 kg/m². The walls may be constructed from a variety of materials such as wood, brick, pre-cast concrete or other concrete/wood composite systems or transparent materials provided that it is free of gaps or cracks within or below its extent.

5 IMPACT OF THE DEVELOPMENT ON ITSELF

Section 5.8.1.1 of the Ontario Building Code (OBC), released on January 1, 2020, specifies the minimum required sound insulation characteristics for demising partitions, in terms of Sound Transmission Class (STC) or Apparent Sound Transmission Class (ASTC) values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls must meet or exceed STC-50 or ASTC-47. Suite separation from a refuse chute or elevator shaft must 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 buildings on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself is maintained within acceptable levels.

6 IMPACT OF THE DEVELOPMENT ON THE ENVIRONMENT

Sound levels from stationary (non-traffic) sources of noise such as rooftop air-conditioners, 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 the 4-storey mixed-use buildings of the development (e.g. emergency generator testing, fresh-air handling equipment, etc.) should be designed with these targets in mind such that they do not result in noise impact beyond these ranges.

7 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. The following noise warning clauses are required for specific dwellings as indicated in Table 9.



A suggested wording for future dwellings with sound level excesses of the MECP criteria for which physical mitigation has not been provided is given below.

Type A:

Purchasers/tenants are advised that sound levels due to increasing road and/or rail traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment.

Suitable wording for future dwellings requiring the provision for the future installation of air conditioning at the occupant's discretion is given below.

Type C:

This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning 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.

Suitable wording for future dwelling units requiring the inclusion of central air conditioning systems is given below.

Type D:

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

Suggested wording for future dwelling units in proximity to agricultural/commercial facilities is given below.

Type E:

Purchasers are advised that due to the proximity of the existing agricultural and commercial facilities, sound levels from the facilities may be at times be audible.

If a Class 4 designation is granted by the municipality, the following warning clause is required:

Type F:

Purchasers/tenants are advised that the residential area has been designated Class 4 as defined by the Ministry of the Environment, Conservation and Parks guidelines as the sound levels at the proposed development exceed the Class 1 sound level limits. The developer/builder is required to provide mitigation measures to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. The Class 4 designation permits this dwelling unit to be supplied with a central air conditioning system which will allow windows and exterior doors to remain closed.

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

8 SUMMARY OF RECOMMENDATIONS

The following list and Table 9 summarize the recommendations made in this report. The reader is referred to previous sections where these recommendations are applied and discussed in more detail.

For Transportation Noise

1. Upgraded glazing constructions are recommended for the proposed mixed-use buildings as outlined in Section 3.3.1. When detailed floor plans and building elevations are available, a detailed review should be conducted to determine the required glazing and building façade constructions based on the actual window-to-floor area ratios.
2. Central air conditioning will be required for all residential units in the mixed-use buildings. The provision for the installation of air conditioning at the occupant's discretion is required for the dwellings with exposure to Victoria Street North, Greenhouse Road, and/or the railway. The remaining dwelling units have no specific ventilation requirements. The location, installation, and sound ratings of the air conditioning devices should comply with NPC-300, as applicable.



3. The use of warning clauses in the property and tenancy agreements is recommended to inform future residents of traffic noise issues and proximity to the railway.

For Stationary Noise

1. Mitigation Option 1a (Class 1)

- a. An Acoustic barrier, with segment heights ranging from 6.0 m to 9.0 m, is required along the western property line shielding façades from the Belgian Nursery greenhouse, as indicated in Figure 7a.
- b. An acoustic barrier of 7.5 m height, is required along the southern property line shielding façades from Grobe Nursery, as indicated in Figure 7b.

2. Mitigation Option 1b (Class 1)

- a. An acoustic barrier, with segment heights ranging from 3.8 m to 6.5 m, is required along the western property line shielding facades from Belgian nursery, as indicated in Figure 8a.
- b. An acoustic barrier of 4.0 m height is required along the southern property line shielding façades from Grobe Nursery, as indicated in Figure 8b.
- c. No windows into noise sensitive spaces on the west façade of R2.
- d. No windows into noise sensitive spaces on the 3rd and 4th Storeys of West façade and western portion of southern façade of R1.
- e. No windows into noise sensitive spaces along the ground floor for R4.
- f. No windows into noise sensitive spaces on the rear façade for R5.

3. Mitigation Option 2 (Class 4)

- a. If the requirements to achieve Class 1 criteria are deemed onerous, a Class 4 designation should be requested from the municipality for the dwellings



as indicated in Figures 9a and 9b. Under a Class 4 designation, the residential dwellings will require air conditioning, upgraded building constructions, and an additional warning clause indicating Class 4 designation.

- b. An acoustic barrier, of 3.8 m in height, is also required along the property line adjacent to the Belgian Nursery greenhouse.
- c. An acoustic barrier of 3.0 m in height is required along the property line adjacent to the Grobe Nursery greenhouse.
- d. No windows into noise sensitive spaces for the rear façade of R5.

Table 9: Summary of Noise Control Requirements and Noise Warning Clauses

Prediction Location	Description	Acoustic Barrier	*Ventilation Requirements	Type of Warning Clause	Required Minimum STC for Glazing	Stationary Noise
[A], [B]	Mixed-Use Buildings	--	Central A/C	A, D, E, #F	North Façade: STC-35	See Section 4.4
					East Façade: STC-30 (#STC-35)	
					West Façade: STC-30 (#STC-35)	
[C], [D]	Townhouse blocks with exposure to Victoria St N					
[F]	Townhouse block adjacent to Greenhouse Road	--	Provision for A/C	A, C, E	OBC	See Section 4.4
[H]	Southernmost dwellings with exposure to the railway line					
[E], [G], [I]	Remaining Dwellings	--	--	A, E	OBC	See Section 4.4
Dwellings recommended to be Class 4		--	#Central A/C	#F	#STC-35	See Section 4.4

Notes: * The location, installation and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-300, as applicable.
-- No specific requirement.
If Class 4 designation is granted.

8.1 Implementation

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

1. Prior to the issuance of building permits for this development, a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should review the detailed architectural plans and building elevations to refine glazing requirements based on actual window to floor areas ratios.
2. Prior to the issuance of occupancy permits for this development, the Municipality's building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures have been properly installed and constructed.

9 CONCLUSIONS

The results of this study indicate that the proposed residential development located east of Greenhouse Road and South of Victoria Street North, in Woolwich, Ontario, is feasible from a noise perspective, with the inclusion of upgraded acoustical design mitigation features for portions of the site.

Mitigation options to achieve the applicable Class 1 criteria for stationary noise are presented above. If mitigation requirements to achieve the Class 1 criteria are deemed onerous, a Class 4 designation could be considered. Preliminary design recommendations are provided herein and can be developed in greater detail as the design proceeds through tender and construction.



10 REFERENCES

- [1] Google Maps and Aerial Imagery, Internet application: *maps.google.com*
- [2] Ontario Ministry of the Environment, Conservation and Parks Publication NPC-300, *Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning*, October, 2013.
- [3] International Organization for Standardization, *Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation*, ISO-9613-2, Switzerland, 1996.





Figure 1: Key Plan

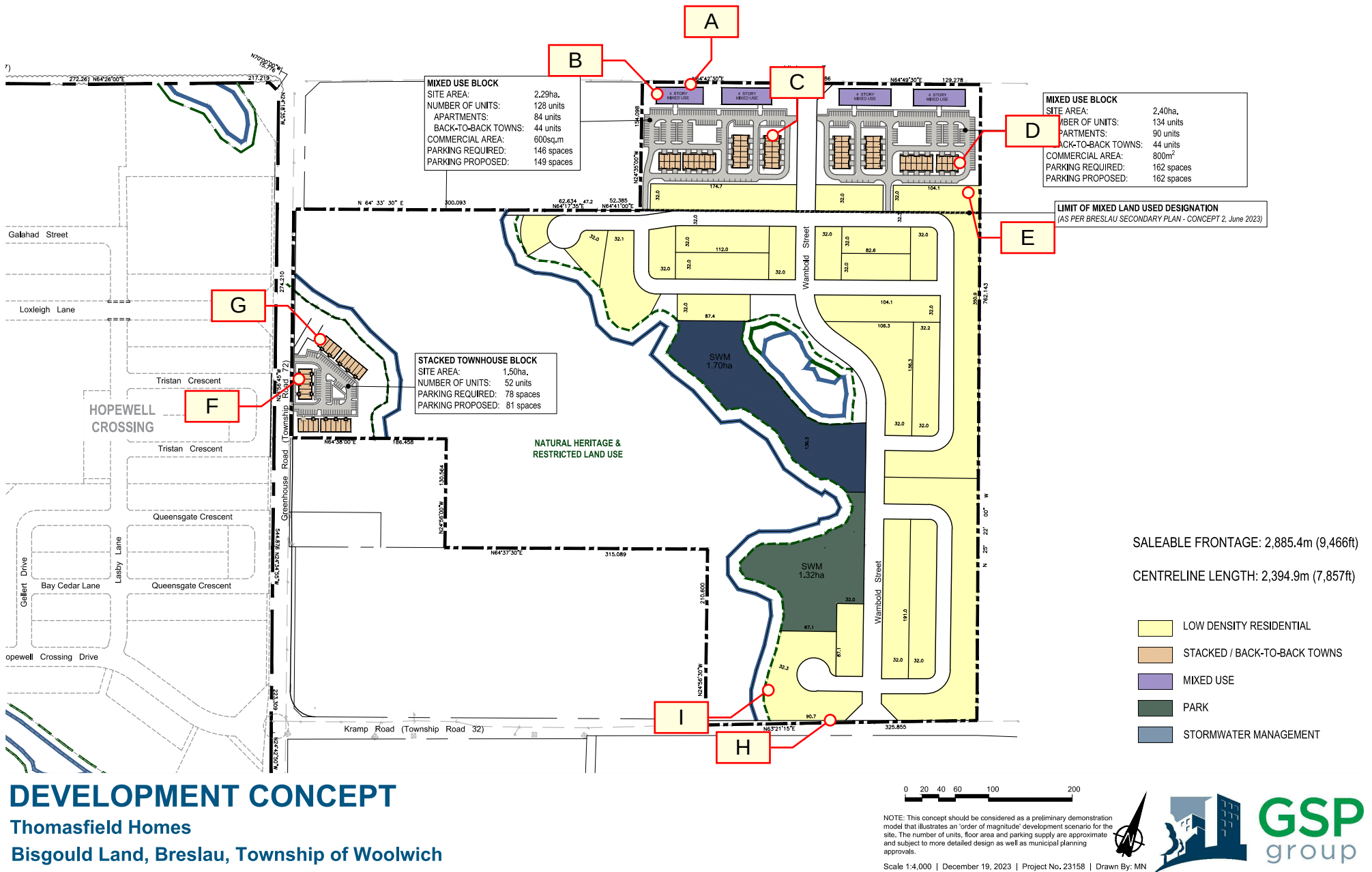


Figure 2: Proposed Concept Plan Showing Prediction Locations

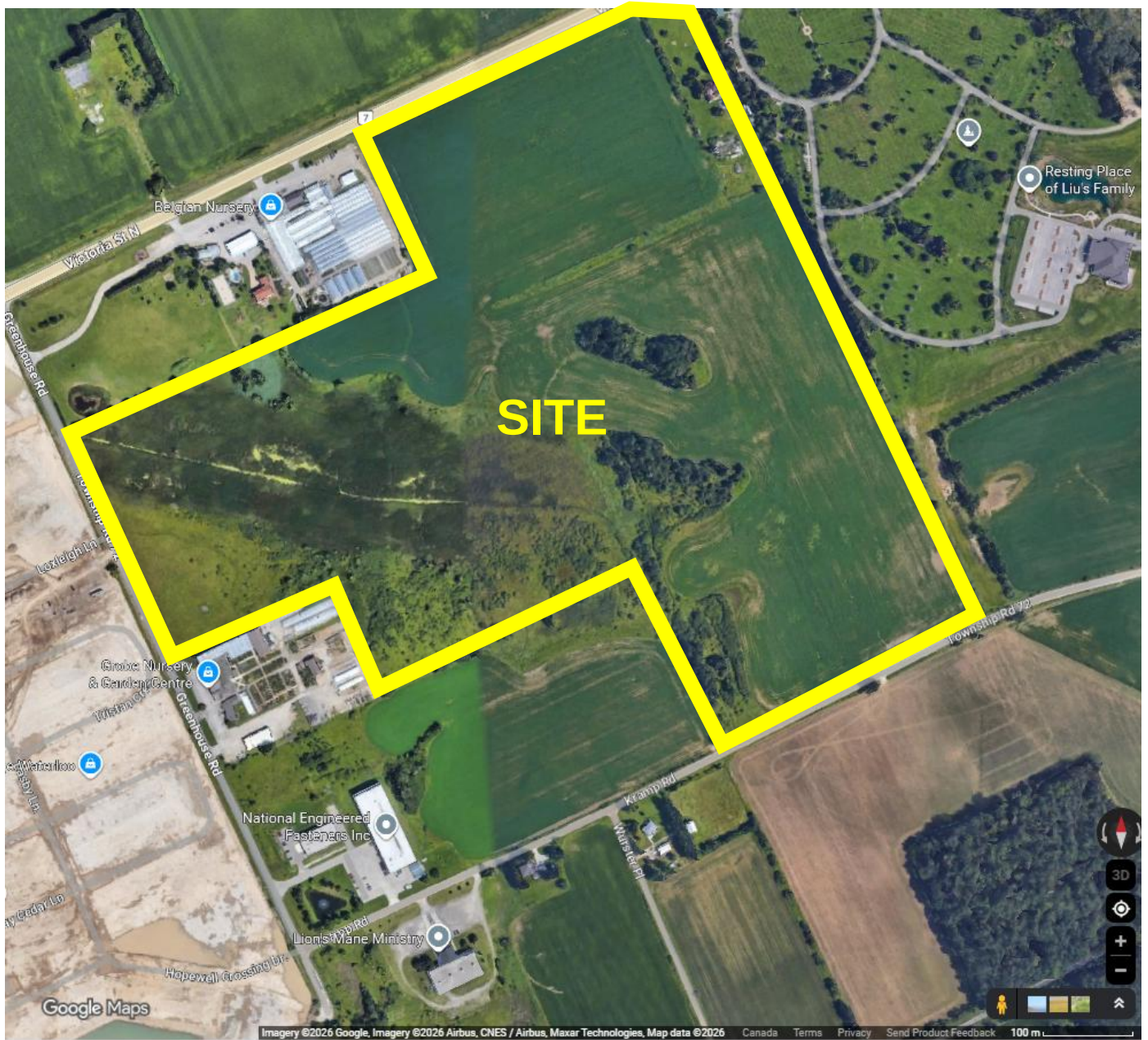


Figure 3: Aerial Photo Showing Surrounding Land Uses

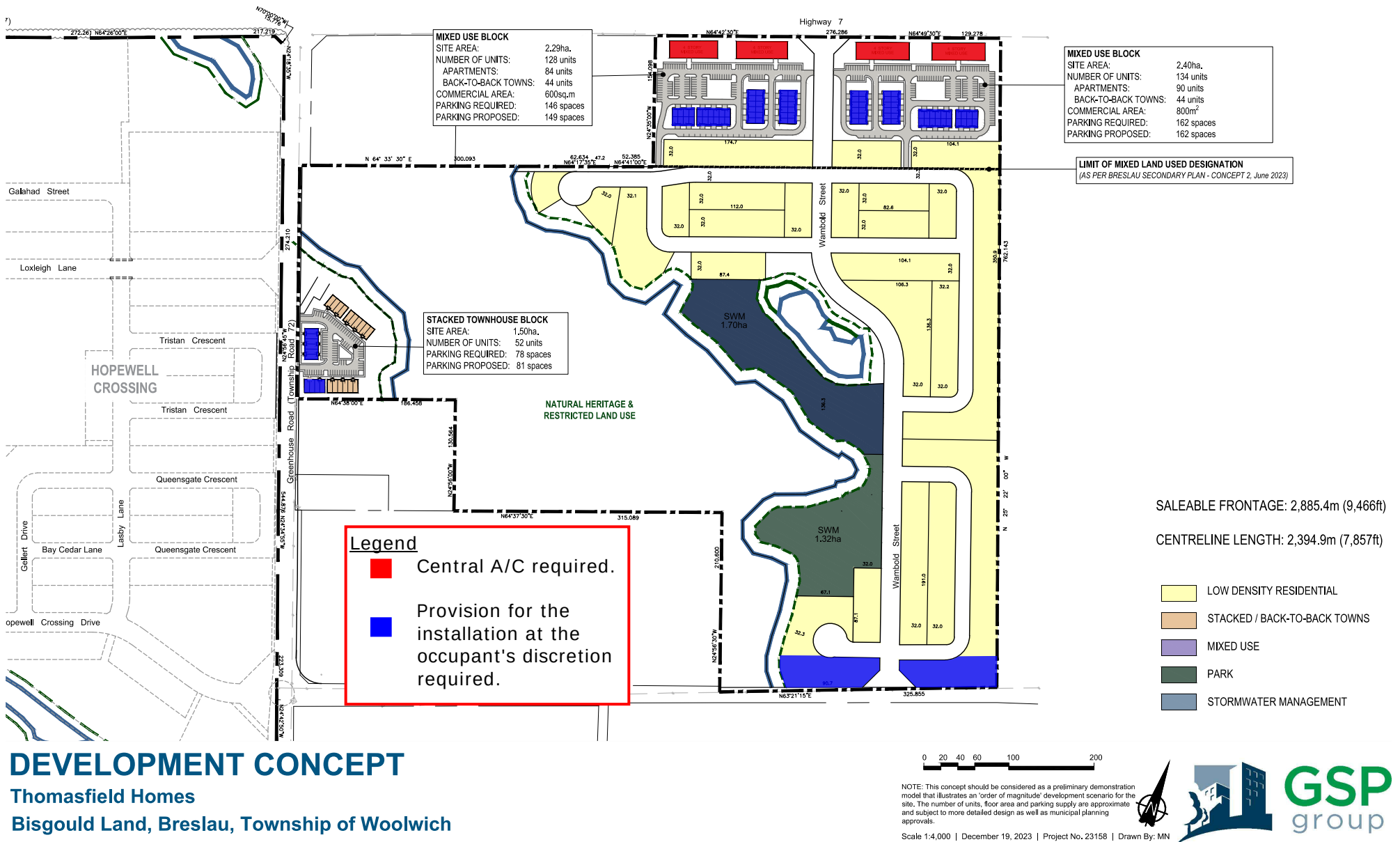


Figure 4: Proposed Concept Plan Showing Ventilation Requirements

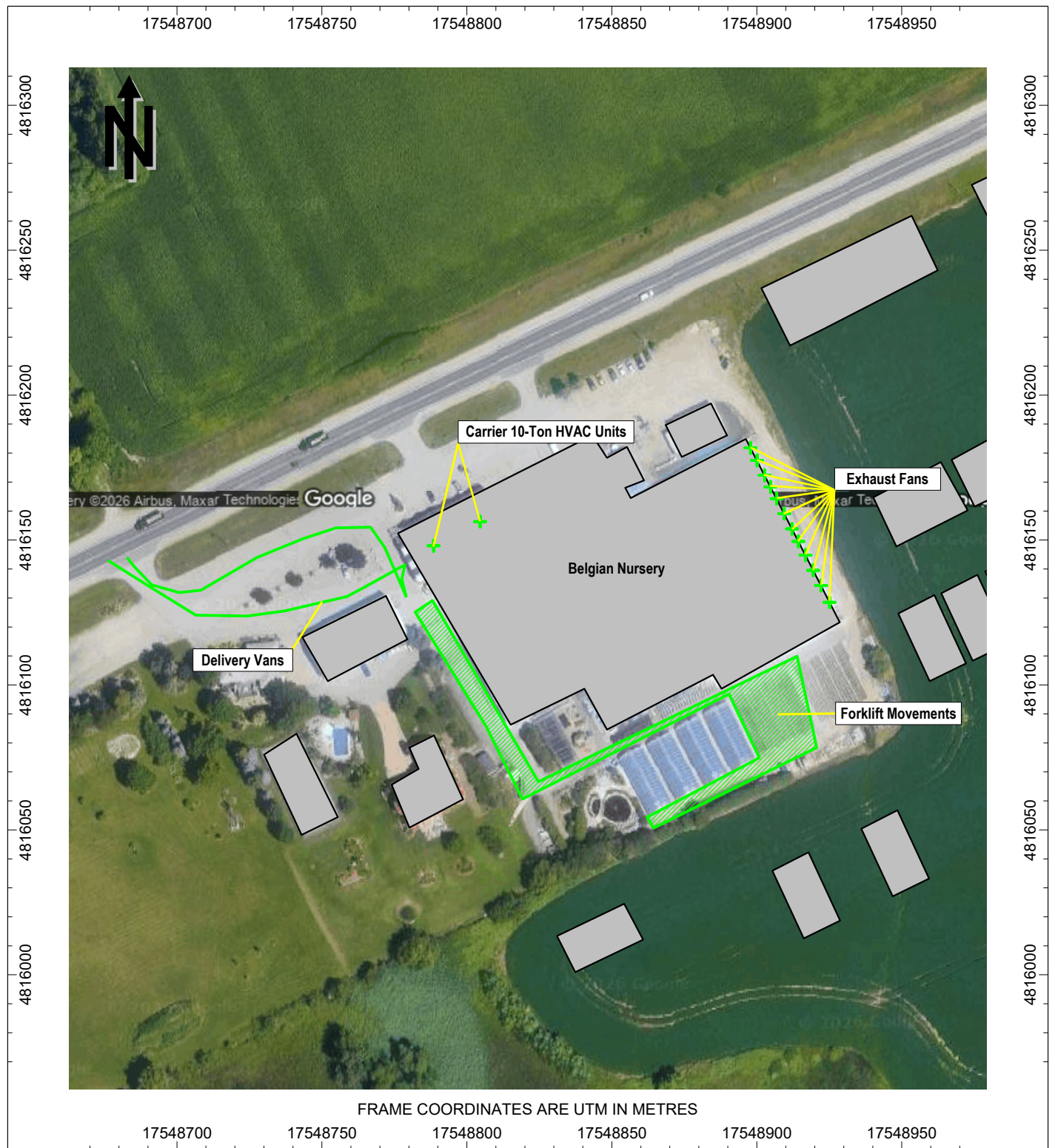


Figure 5a: Aerial Photo Showing Stationary Sources of Noise

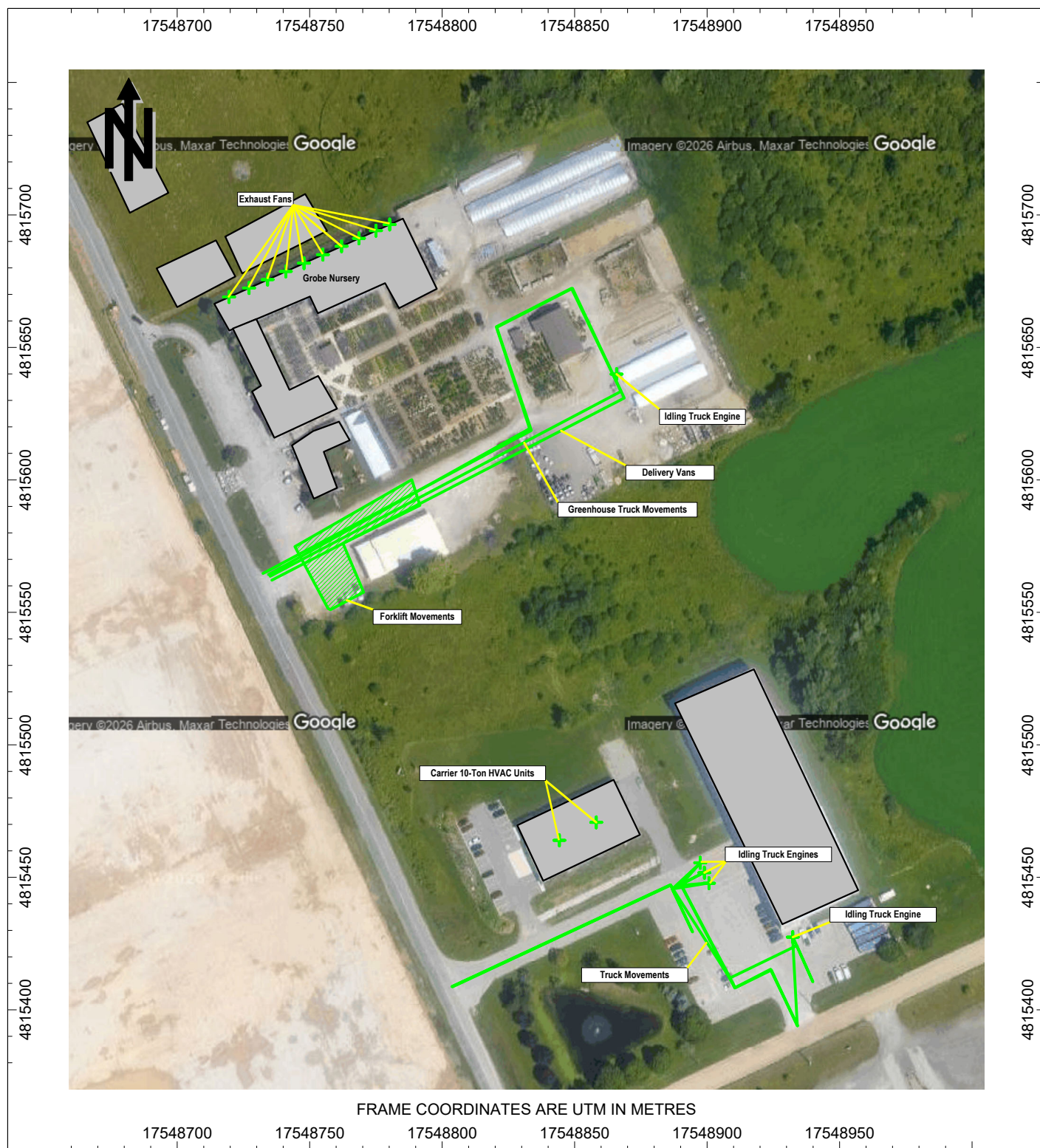


Figure 5b: Aerial Photo Showing Stationary Sources of Noise

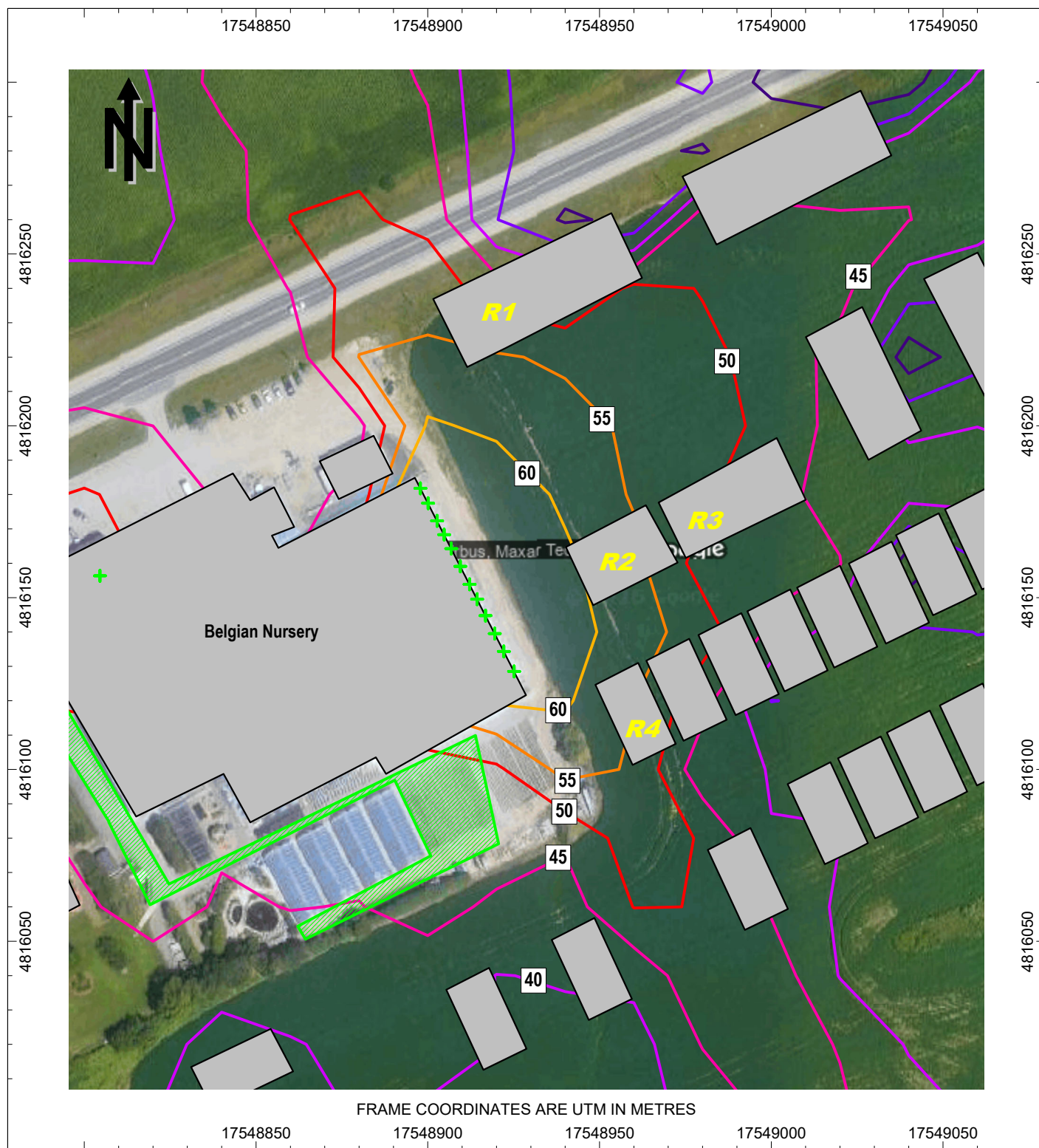


Figure 6a: Daytime Sound Levels from Stationary Noise Sources

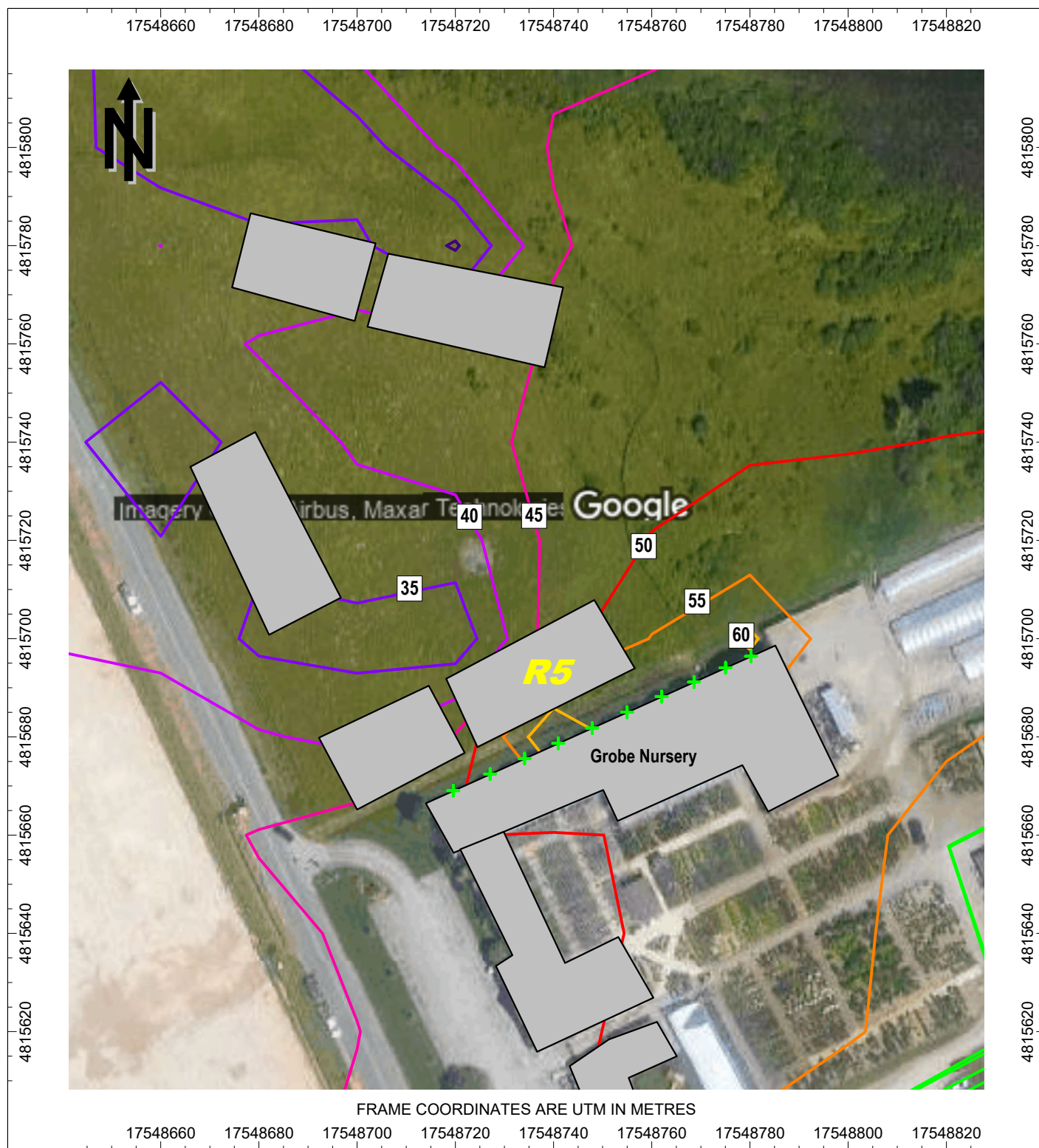


Figure 6b: Daytime Sound Levels from Stationary Noise Sources

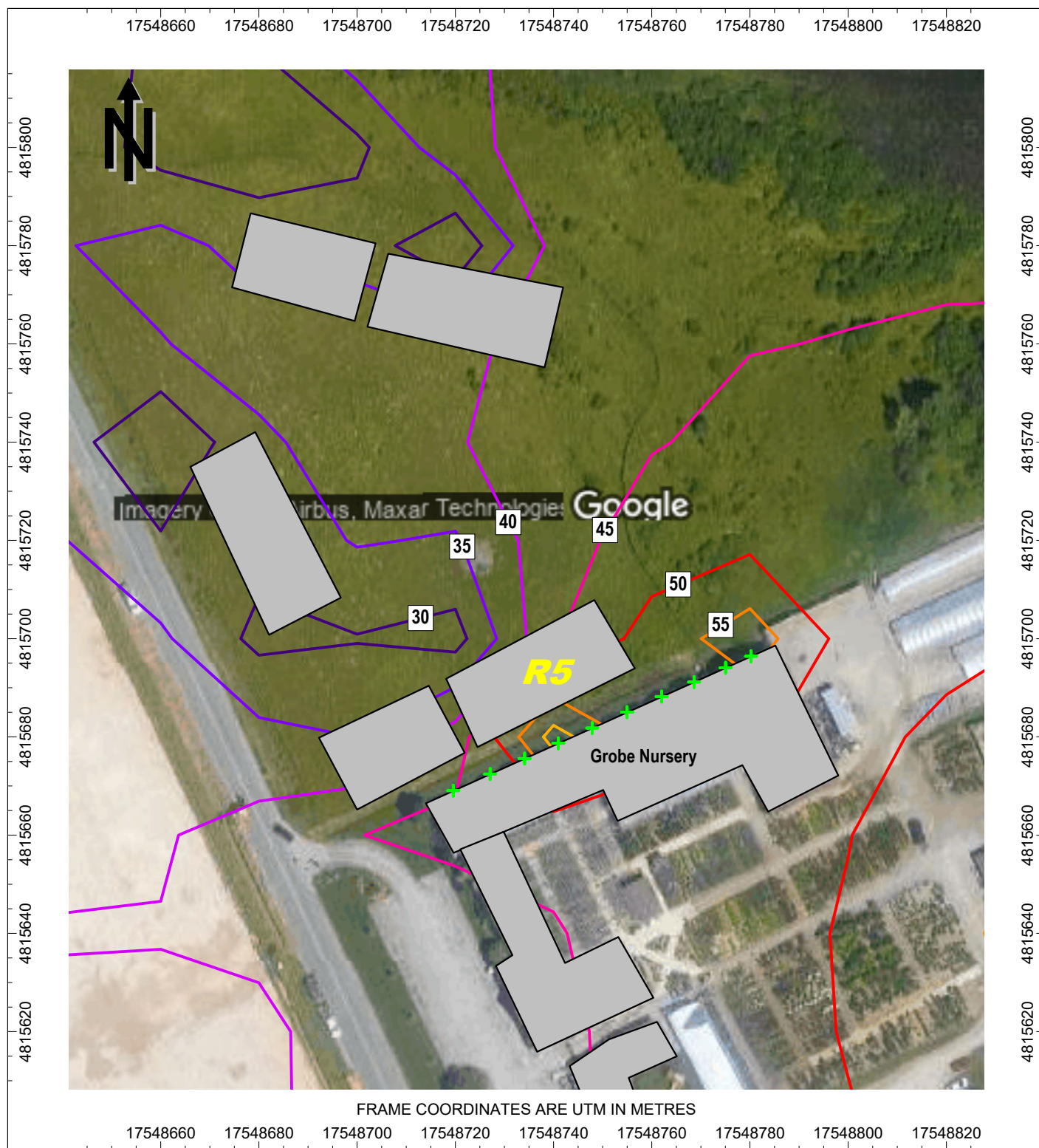


Figure 6d: Nighttime Sound Levels from Stationary Noise Sources

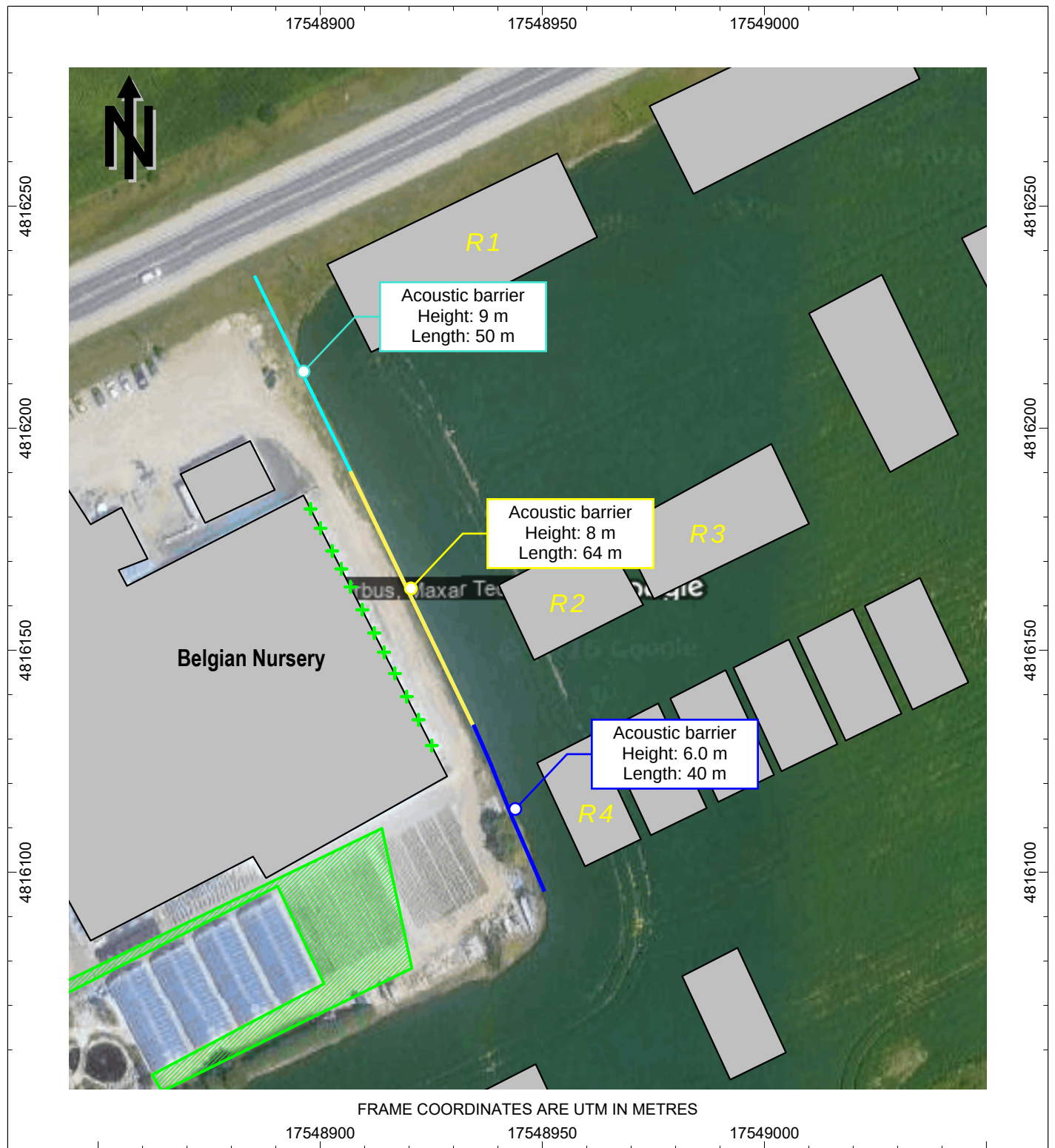


Figure 7a: Mitigation to Achieve Class 1 - Adjacent to Belgian Nursery (Option 1a)

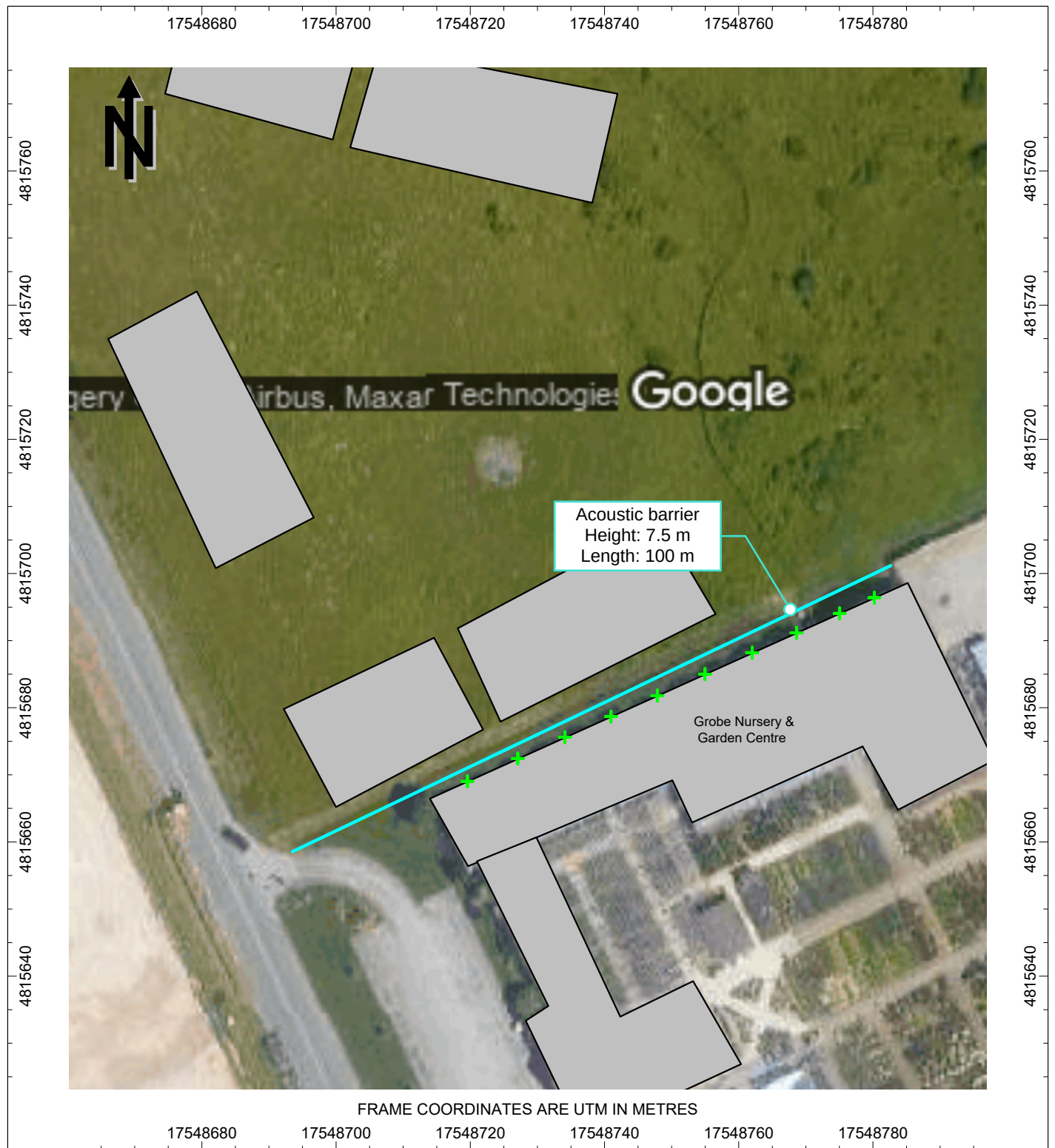


Figure 7b: Mitigation to Achieve Class 1 - Adjacent to Grobe Nursery (Option 1a)

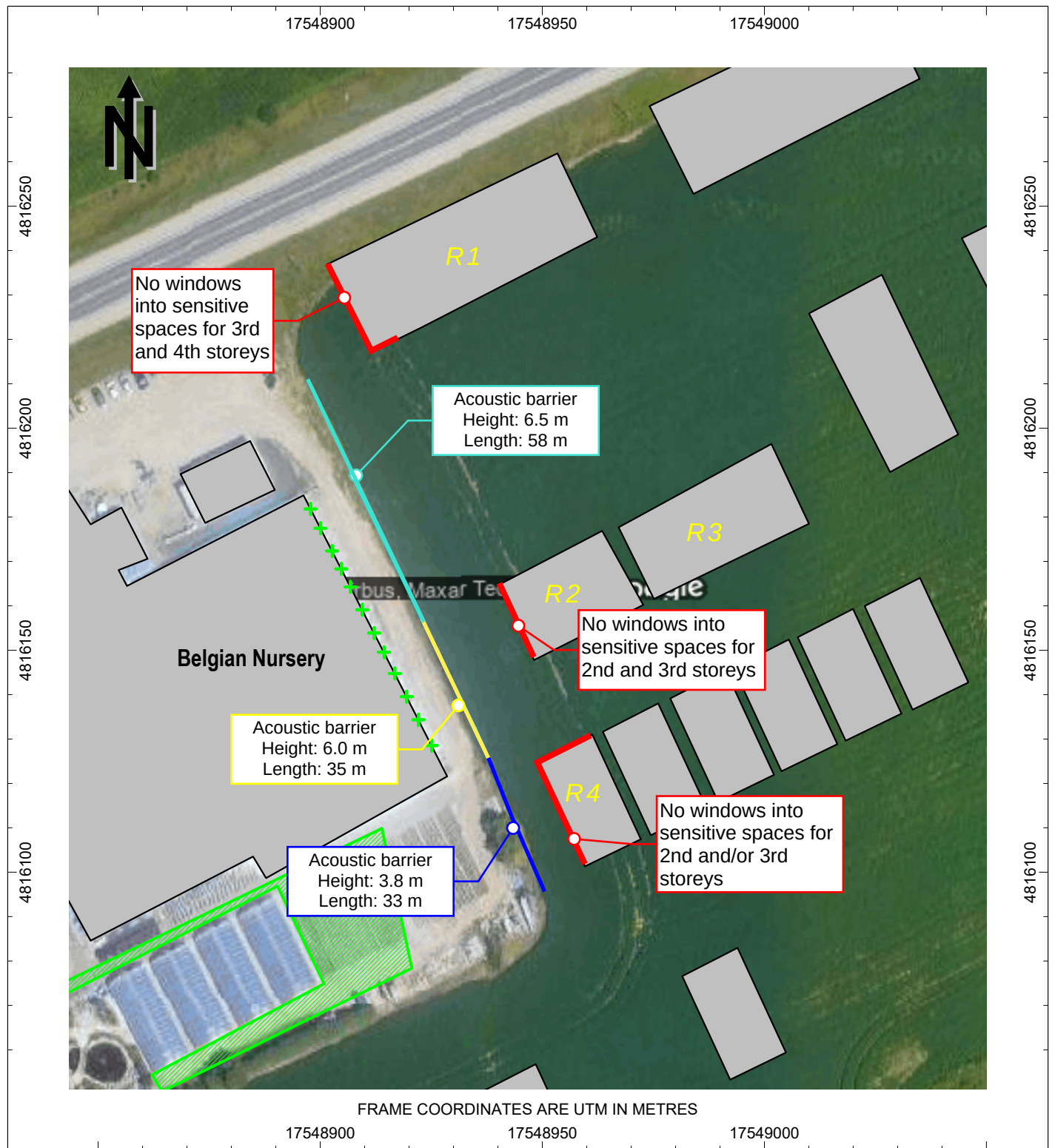


Figure 8a: Mitigation to Achieve Class 1 - Adjacent to Belgian Nursery (Option 1b)

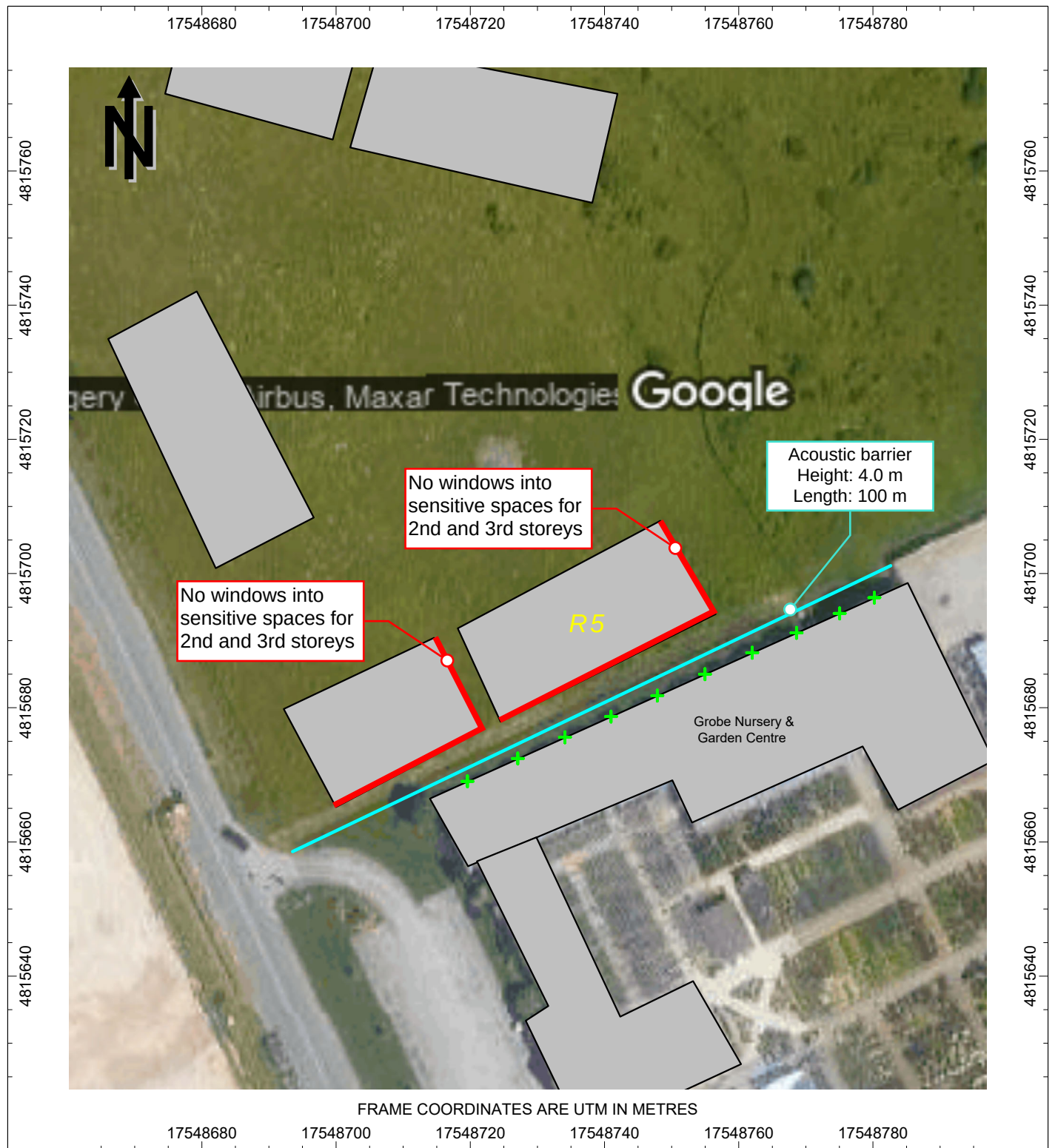


Figure 8b: Mitigation to Achieve Class 1 - Adjacent to Grobe Nursery (Option 1b)

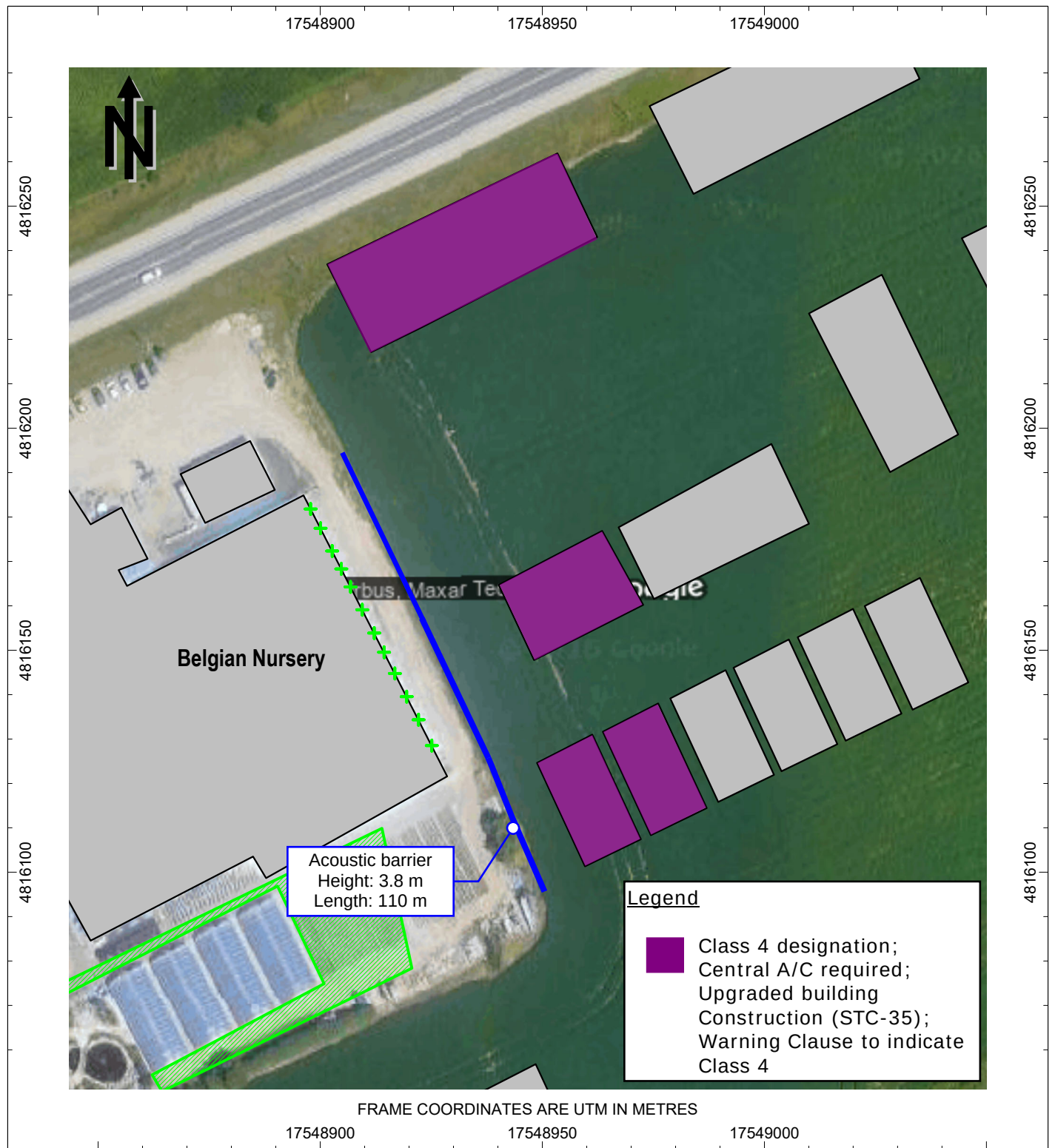


Figure 9a: Mitigation to Achieve Class 4 - Adjacent to Belgian Nursery (Option 2)

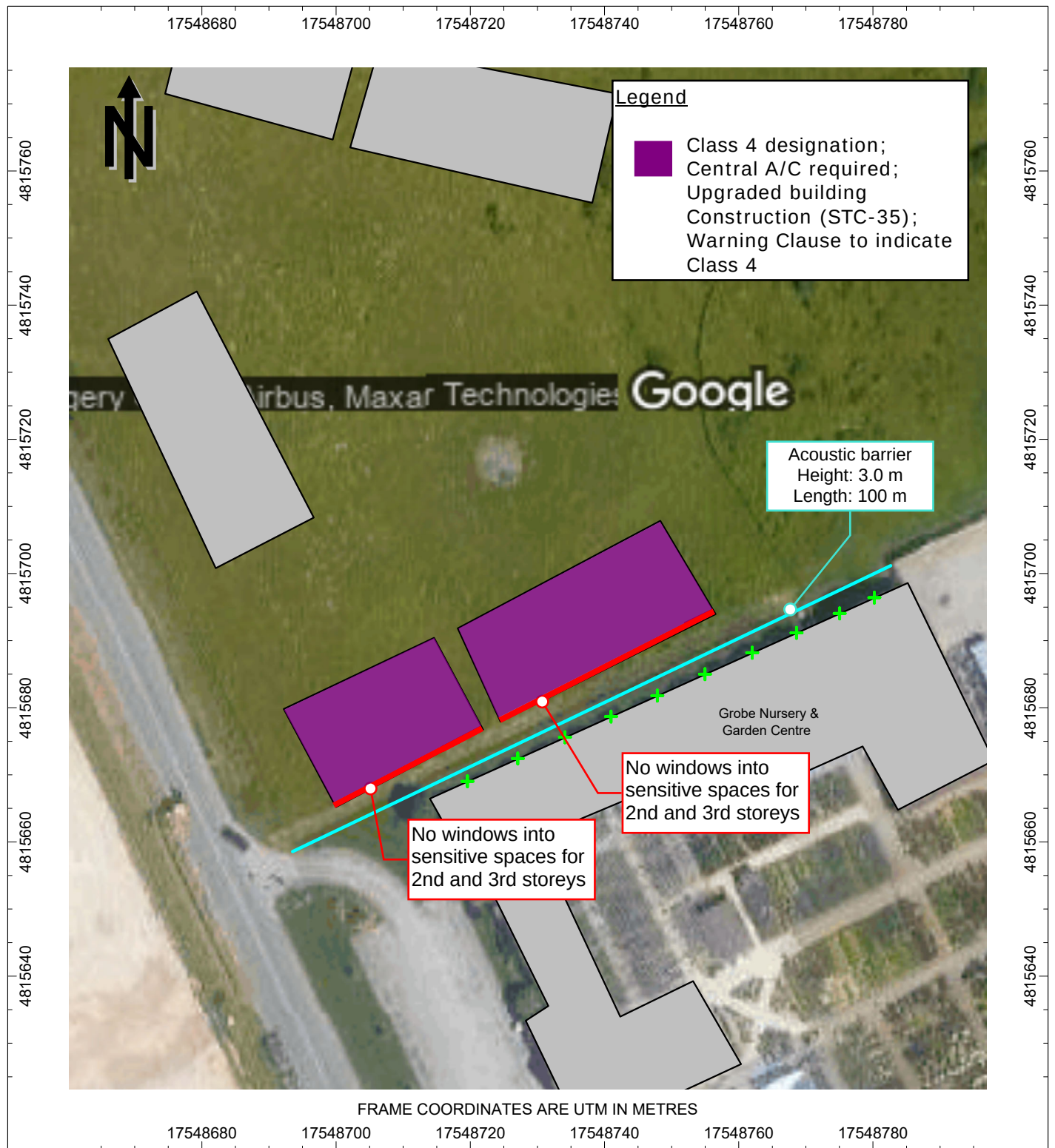


Figure 9b: Mitigation to Achieve Class 4 - Adjacent to Grobe Nursery (Option 2)

APPENDIX A

Road Traffic Data



NOISE



VIBRATION



ACOUSTICS

www.hgcacoustics.com

Yvonne Lo

From: Matt Brouwer <mbrouwer@ptsl.com>
Sent: February 10, 2021 8:26 AM
To: Yvonne Lo
Cc: Maddison Murch
Subject: RE: FW: Hopewell Crossing - Phase 2

Hi Yvonne,

The forecasts were for the 2034 horizon.

Matt Brouwer, P.Eng.
Senior Project Manager



Paradigm Transportation Solutions Limited

p: 519.896.3163 x201
m: 519.498.2663

From: Yvonne Lo <ylo@hgcengineering.com>
Sent: February 9, 2021 10:03 PM
To: Matt Brouwer <mbrouwer@ptsl.com>
Cc: Maddison Murch <mmurch@ptsl.com>
Subject: RE: FW: Hopewell Crossing - Phase 2

Hi Matt,

Final question for you: what is the forecast horizon for the data your provided?

Thank you!

Best,

Yvonne Lo, MEng, 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 ext.232 e: ylo@hgcengineering.com
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From: Matt Brouwer <mbrouwer@ptsl.com>
Sent: January 29, 2021 8:35 AM
To: Yvonne Lo <ylo@hgcengineering.com>

Cc: Maddison Murch <mmurch@ptsl.com>; mgereghty@gspgroup.ca

Subject: RE: FW: Hopewell Crossing - Phase 2

Also, if it is needed, trucks will be about 2% on Greenhouse Road. Trucks will be negligible on Ironhorse Street or throughout the neighbourhood.

Matt Brouwer, P.Eng.

Senior Project Manager



Paradigm Transportation Solutions Limited

p: 519.896.3163 x201

m: 519.498.2663

From: Matt Brouwer

Sent: January 28, 2021 7:00 PM

To: Yvonne Lo <ylo@hgcengineering.com>

Cc: Maddison Murch <mmurch@ptsl.com>; mgereghty@gspgroup.ca

Subject: RE: FW: Hopewell Crossing - Phase 2

Hi Yvonne, sorry for the delay in getting back to you. We had to recalculate after the Region got back to us regarding the Breslau East Connector and the assumptions for the GO Station. Here are our forecasts for daily (AADT) volumes:

On Greenhouse Road, south of Victoria Street, the AADT is forecast to be 7,468 (2,248 is assumed to be from the GO Station).

On Ironhorse Street, south of Hopewell Crossing Drive, the AADT is forecast to be 5,974 (1,124 is assumed to be from the GO Station). This volume will increase gradually through the development until Greenhouse Road is reached.

Please let me know if you have any questions,

Matt Brouwer, P.Eng.

Senior Project Manager



Paradigm Transportation Solutions Limited

p: 519.896.3163 x201

m: 519.498.2663

From: Yvonne Lo <ylo@hgcengineering.com>

Sent: January 25, 2021 4:14 PM

To: Matt Brouwer <mbrouwer@ptsl.com>

Cc: Maddison Murch <mmurch@ptsl.com>; mgereghty@gspgroup.ca

Subject: RE: FW: Hopewell Crossing - Phase 2

Hi Matt,

Year	Highway	Location Description	Dist (KM)	Pattern Type	AADT	SADT	SWADT	WADT	Truck AADT	Total Collisions	Total CR	Trucks Collisions	Truck CR
2010	7			SC	19,300	20,400	22,600	17,000	1,350	10	0.4	0	0.0
2011	7			SC	19,300	24,700	22,600	15,400	1,150	31	1.4	2	0.1
2012	7			UC	17,500	17,600	18,700	16,600	1,150	18	0.9	1	0.0
2013	7			UC	17,700	17,800	17,800	16,800	1,150	26	1.3	2	0.1
2014	7			UC	18,600	18,700	17,900	17,700	1,200	24	1.1	0	0.0
2015	7			UC	18,600	18,700	17,900	17,700	1,200	27	1.2	1	0.0
2016	7			UC	18,500	18,600	17,800	17,600	1,200	25	1.2	0	0.0
2017	7			UC	18,500	18,400	18,600	17,700	1,200	26	1.2	1	0.0
2018	7			UC	18,400	18,300	18,500	17,700	1,200	45	2.1	2	0.1
2019	7			UC	18,400	18,100	18,400	17,700	1,200	26	1.2	3	0.1
2021	7			UC	18,300	18,300	18,600	17,600	1,300	24	1.1	5	0.2
1988	7	71 WOOLWICH GUELPH TOWNLINE	6.0	SC	15,300	16,500	18,100	13,800	1,050	34	1.0	2	0.1
1989	7			C	15,700	17,400	17,600	14,100	1,100	30	0.9	1	0.0
1990	7			C	16,400	18,200	18,200	14,800	1,150	38	1.1	1	0.0
1991	7			C	17,100	18,800	19,000	15,600	1,200	28	0.7	2	0.1
1992	7			SC	15,700	16,500	18,400	14,400	1,100	28	0.8	3	0.1
1993	7			SC	15,900	17,600	19,400	14,200	950	34	1.0	1	0.0
1994	7			SC	17,000	17,700	19,600	15,600	1,000	31	0.8	0	0.0
1995	7			UC	17,900	18,900	20,500	16,700	1,050	32	0.8	1	0.0
1996	7			UC	18,900	20,000	22,100	18,000	1,300	35	0.8	4	0.1
1997	7			SC	19,800	21,000	23,200	17,600	1,400	37	0.9	3	0.1
1998	7			SC	20,900	22,200	24,500	18,600	1,450	30	0.7	0	0.0
1999	7			SC	22,000	23,300	25,700	19,600	1,300	47	1.0	2	0.0
2000	7			SC	21,800	23,100	25,500	19,200	1,300	52	1.1	3	0.1
2001	7			SC	21,900	23,400	25,600	19,300	1,300	51	1.1	4	0.1
2002	7			SC	21,900	23,200	25,600	19,300	1,300	35	0.7	3	0.1
2003	7			SC	21,500	22,700	25,100	19,000	1,300	58	1.2	2	0.0
2004	7			SC	21,300	22,700	24,900	18,800	1,300	31	0.7	2	0.0
2005	7			SC	21,600	22,900	25,200	19,000	1,300	42	0.9	2	0.0
2006	7			SC	21,900	23,200	25,600	19,300	1,550	41	0.9	1	0.0
2007	7			SC	22,200	23,500	25,700	19,500	1,550	49	1.0	5	0.1
2008	7			SC	22,500	23,600	22,300	19,800	1,350	36	0.7	2	0.0
2009	7			SC	22,500	23,800	26,300	19,800	1,350	32	0.6	2	0.0
2010	7			SC	23,300	24,600	27,300	20,500	1,150	34	0.7	2	0.0
2011	7			SC	23,300	29,800	27,200	18,500	930	38	0.7	1	0.0
2012	7			UC	21,800	21,900	23,300	20,700	1,150	36	0.8	1	0.0
2013	7			UC	21,800	21,900	21,900	20,700	1,150	32	0.7	0	0.0
2014	7			C	19,900	21,900	21,300	17,900	780	33	0.8	0	0.0
2015	7			C	20,100	22,100	21,500	18,100	780	43	1.0	2	0.0
2016	7			C	20,300	22,300	21,700	18,300	790	46	1.0	3	0.1
2017	7			C	22,500	24,600	24,600	20,400	880	44	0.9	0	0.0

Year	Highway	Location Description	Dist (KM)	Pattern Type	AADT	SADT	SWADT	WADT	Truck AADT	Total Collisions	Total CR	Trucks Collisions	Truck CR
2018	7			C	22,600	24,800	24,600	20,400	880	41	0.8	1	0.0
2019	7			C	22,700	24,800	24,700	20,500	890	50	1.0	2	0.0
2021	7			C	22,900	24,900	24,800	20,800	920	34	0.7	2	0.0
2021	7	WOOLWICH ST E JCT START OF NA	5.5										
1994	7	HWY 85 CONESTOGA PKWY OP IC KITCHENER	1.5	SC	73,700	76,600	84,800	67,800	6,650	35	0.9	2	0.0
1995	7			SC	76,300	79,800	88,600	69,400	6,850	44	1.1	4	0.1
1996	7			SC	78,800	83,800	92,200	70,600	7,100	32	0.7	5	0.1
1997	7			SC	81,300	86,200	95,100	72,400	7,300	40	0.9	7	0.2
1998	7			SC	83,800	88,800	98,000	74,600	7,550	20	0.4	2	0.0
1999	7			SC	86,300	91,500	101,000	76,800	7,750	24	0.5	2	0.0
2000	7			SC	88,800	94,100	103,900	78,100	8,000	20	0.4	5	0.1
2001	7			SC	91,300	97,400	106,900	80,500	8,200	26	0.5	4	0.1
2002	7			SC	93,800	99,500	109,800	82,700	8,450	39	0.8	6	0.1
2003	7			SC	95,800	101,200	111,800	84,800	8,600	34	0.6	1	0.0
2004	7			SC	97,400	103,900	114,000	85,800	8,750	30	0.6	3	0.1
2005	7			SC	99,000	104,800	115,600	87,100	8,900	16	0.3	1	0.0
2006	7			SC	100,600	106,400	117,600	88,700	9,050	29	0.5	4	0.1
2007	7			SC	102,200	108,000	118,200	89,900	9,200	25	0.4	1	0.0
2008	7			SC	103,800	108,900	102,700	91,300	9,350	21	0.4	0	0.0
2009	7			SC	107,600	114,100	125,900	94,700	9,700	22	0.4	3	0.1
2010	7			SC	109,800	116,100	128,500	96,800	9,900	24	0.4	1	0.0
2011	7			SC	109,800	140,500	128,300	87,400	9,900	44	0.7	6	0.1
2012	7			SC	109,800	116,300	109,400	96,900	9,900	38	0.6	4	0.1
2013	7			SC	110,900	117,300	106,900	97,800	10,000	35	0.6	4	0.1
2014	7			SC	111,000	117,400	114,600	97,900	10,000	44	0.7	3	0.0
2015	7			SC	111,100	117,500	114,700	98,000	10,000	50	0.8	2	0.0
2016	7			SC	111,200	117,600	114,800	98,100	10,000	51	0.8	4	0.1
2017	7			SC	118,800	126,300	126,400	105,400	10,700	57	0.9	10	0.2
2018	7			SC	120,600	128,800	128,100	106,100	10,900	69	1.0	11	0.2
2019	7			SC	122,400	129,900	129,200	108,200	11,000	63	0.9	6	0.1
2021	7			SC	126,000	133,300	132,800	112,100	11,300	28	0.4	4	0.1
1988	7	OTTAWA ST UP IC	1.3	UC	56,500	59,300	63,800	53,100	3,950	36	1.3	3	0.1
1989	7			UC	60,600	63,600	68,500	57,600	4,250	50	1.7	5	0.2
1990	7			UC	61,000	65,300	70,800	58,000	4,250	42	1.5	5	0.2
1991	7			UC	62,800	66,600	72,200	60,900	4,400	54	1.8	3	0.1
1992	7			SC	62,800	65,900	73,500	57,800	4,400	47	1.6	3	0.1
1993	7			SC	63,400	70,400	77,300	56,400	4,450	60	2.0	3	0.1
1994	7			SC	67,500	70,200	77,600	62,100	4,700	60	1.9	6	0.2
1995	7			UC	65,900	69,500	75,300	61,500	4,600	54	1.7	4	0.1
1996	7			UC	67,900	71,900	79,400	64,600	4,750	63	2.0	2	0.1
1997	7			UC	69,900	73,400	81,800	65,700	4,900	68	2.1	3	0.1

APPENDIX B

Rail Traffic Data



NOISE



VIBRATION



ACOUSTICS

www.hgcacoustics.com



Train Count Data

TRANSMITTAL

To: HGC Engineering
Destinataire : 2000 Argentia Road, Plaza
One, Suite 203, Mississauga,
Ontario, L5N 1P7

Project : GPH-58.04-Fountain St, Breslav ON

Att'n: Victor Garcia
From: Michael Vallins
Expéditeur :

Routing: vgarcia@hgcengineering.com
Date: 2019/10/23

Cc: Adjacent Development
CN via e-mail

☐ Urgent ☐ For Your Use ☐ For Review ☐ For Your Information ☐ Confidential

**Re: Train Traffic Data – CN Guelph Subdivision near Fountain St in
Breslav, ON**

Please find attached the requested Train Traffic Data; this data does not reflect GO Metrolinx Traffic. The application fee in the amount of **\$500.00 +HST** will be invoiced.

Should you have any questions, please do not hesitate to contact the undersigned at 905-669-3264.

Sincerely,
CN Design & Construction

Michael Vallins P.Eng
Manager of Public Works
permits.gld@cn.ca

Date: 2019/10/23

Project Number: GPH-58.04-Fountain St, Breslav ON

Dear Victor:

Re: Train Traffic Data – CN Guelph Subdivision near Fountain St in Breslav, ON

The following is provided in response to Victor's 2019/09/20 request for information regarding rail traffic in the vicinity of Fountain St in Breslav, ON at approximately Mile 58.04 on CN's Guelph Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	140	55	4
Way Freight	0	25	55	4
Passenger	6	10	70	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	2	140	55	4
Way Freight	0	25	55	4
Passenger	0	10	70	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Guelph Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are five (5) at-grade crossings in the immediate vicinity of the study area at Mile 57.00 Wurster Road, Mile 57.19 Private Rd, Mile 58.39 Woolwich St, Mile 59.67 Farm Xing, and Mile 59.80 Lackner Blvd. Anti-whistling bylaws are not in effect at these crossings. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs.

The single mainline track is considered to be continuously welded rail throughout the study area. The presence of two (2) switches located at Mile 56.12, and Mile 60.30 may exacerbate the noise and vibration caused by train movements.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Michael Vallins', with a long horizontal flourish extending to the right.

Michael Vallins P.Eng
Manager of Public Works

Victor Garcia

From: Umair Naveed <Umair.Naveed@cn.ca> on behalf of GLD-Permits <permits.gld@cn.ca>
Sent: June 17, 2022 3:09 PM
To: Victor Garcia
Cc: Sheeba Paul; Matthew Warzecha
Subject: RE: Rail Traffic Data Verification - Breslau, Ontario

Yes it's a principal mainline.

Thanks,

Team GLD

From: Victor Garcia <vgarcia@hgcengineering.com>
Sent: Friday, June 17, 2022 12:35 PM
To: GLD-Permits <permits.gld@cn.ca>
Cc: Sheeba Paul <spaul@hgcengineering.com>; Matthew Warzecha <matthew@polocorpinc.com>
Subject: RE: Rail Traffic Data Verification - Breslau, Ontario

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Hi Umair,

So just to clarify, this would be classified as a principal mainline?

Thanks,

Victor Garcia, P.Eng
HGC Engineering NOISE | VIBRATION | ACOUSTICS
Howe Gastmeier Chapnik Limited
t: 905.826.4044

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From: Umair Naveed <Umair.Naveed@cn.ca> **On Behalf Of** GLD-Permits
Sent: June 17, 2022 12:34 PM
To: Victor Garcia <vgarcia@hgcengineering.com>
Subject: RE: Rail Traffic Data Verification - Breslau, Ontario

The data is still valid. This a mainline where Freight and passenger train operate.

Thanks,

Team GLD

From: Victor Garcia <vgarcia@hgcengineering.com>
Sent: Thursday, June 16, 2022 4:26 PM
To: GLD-Permits <permits.gld@cn.ca>
Subject: Re: Rail Traffic Data Verification - Breslau, Ontario

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Good afternoon,

Are we able to get an update on the status of this request as well as confirmation of the classification of the line?

Thanks,

Victor Garcia, P.Eng
HGC Engineering NOISE | VIBRATION | ACOUSTICS
Howe Gastmeier Chapnik Limited
t: 905.826.4044

From: Victor Garcia <vgarcia@hgcengineering.com>
Sent: Wednesday, May 18, 2022 10:36 AM
To: GLD-Permits <permits.gld@cn.ca>
Subject: Rail Traffic Data Verification - Breslau, Ontario

Good morning,

HGC Engineering is preparing an update to a study for a site located along Fountain Street North in Breslau, Ontario. A google link is included for your reference:

https://secure-web.cisco.com/1dHQGmWd6rd0CALmju6FLEPu3KO8tCFKY1a5GzOAYYgtyrNA8APteRNP_GmKh15ylqG16zjkekJYaNYwhX_YbZewPFwaZenKuu7K37ZqRakuuZ8GIQ1AkEzAoxpBOEmsrPtIYj_JewEFkpuiETUt5yYIVd8SXejmQWqEEBgzeRj84r_DxXD4r_PTSurfY5AyjDnS9DpeBPwxlvlr0evOIDJsZCz53OWCjt3Vq_O5lxvsLBv3yQnfXwr4hqQw_tKAmuevj3ECgR4brAI7Q1_QDCfLP3_mldB7vNxx1YyzXN31wnGDOrlSoWoTBinRQjsNlr/https%3A%2F%2Fgoo.gl%2Fmaps%2FKxVumSCmT9kB3uoR6

We currently have the attached data for the proposed site, is it still valid. Additionally, are you able to confirm what the classification of this track is?

Thanks,

Victor Garcia, P.Eng
Associate

HGC Engineering NOISE | VIBRATION | ACOUSTICS
Howe Gastmeier Chapnik Limited

2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044 e: vgarcia@hgcengineering.com

Visit our website – http://secure-web.cisco.com/1w7dvxKnNt8OMbj9ZPURhNo315CkMJCiZr5ykRnPjocoLSi9afoXuglWbULOWGgWPq7TrtuXO7hY5ODaZbQiYmCvgP1A5rKq8iTeJaMrg9ebP2cXmbRCBDXbXx1NbpU9oS-rmV31zTaMugKL2D8NLyNYS5QUETcxVmbY3yxEM8UkmsjLceEw6mTbuflm2Dp9YNRMVCibO1_MgFrD0jibSgPS0n5N_4g65ljBhML

RE: Request for Rail Data Verification - Woolwich, ON

From Rail Data Requests <RailDataRequests@metrolinx.com>

Date Fri 2026-03-06 1:39 PM

To Elise Jaklic <ejaklic@hgcacoustics.com>

Good afternoon,

Further to your request dated February 25, 2026, the subject lands (Greenhouse Road + Victoria Street N, Woolwich) are located within 300 metres of the Metrolinx Guelph Subdivision (which carries Kitchener GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel trains only. The GO rail fleet combination on this Subdivision will consist of up to 2 locomotives and 8 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 76 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive	2 Diesel Locomotives		1 Diesel Locomotive	2 Diesel Locomotives
Day (0700-2300)	56	8	Night (2300-0700)	12	0

The current track design speed near the subject lands is 70 mph (113 km/h).

There are no *anti-whistling by-laws* in affect near the subject lands.

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

It should be noted that this information only pertains to Metrolinx rail service. It would be prudent to contact other rail operators in the area directly for rail traffic information pertaining to non-Metrolinx rail service.

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

Best Regards,

Jenna Auger (She/Her)

Project Analyst, Adjacent Construction Review (ACR)

Integrated Delivery Division

T: (416)-881-0579

20 Bay Street | Toronto | Ontario | M5J 2W3

From: Elise Jaklic <ejaklic@hgcacoustics.com>
Sent: February 25, 2026 4:23 PM
To: Rail Data Requests <RailDataRequests@metrolinx.com>
Subject: Request for Rail Data Verification - Woolwich, ON

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Good afternoon,

We are preparing a noise feasibility study for a development located near the intersection of Greenhouse Road and Victoria Street North in Woolwich, Ontario. A google link is included below for your reference:

[Google Maps](#)

We currently having the attached data. Can you please confirm if the data is still valid at this location?

Thank you!

Best,
Elise

Elise Jaklic, BEng
Project Consultant

HGC NOISE VIBRATION ACOUSTICS

2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7

t: 905-826-4044 x271 e: ejaklic@hgcacoustics.com

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APPENDIX C

Sample STAMSON 5.04 Output



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Filename: b.te Time Period: Day/Night 16/8 hours
Description: Prediction Location B_West Facade Mixed Use

Road data, segment # 1: victoria1 (day/night)

Car traffic volume : 15254/1695 veh/TimePeriod *
Medium truck volume : 487/54 veh/TimePeriod *
Heavy truck volume : 487/54 veh/TimePeriod *
Posted speed limit : 80 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): 12450
Percentage of Annual Growth : 2.50
Number of Years of Growth : 15.00
Medium Truck % of Total Volume : 3.00
Heavy Truck % of Total Volume : 3.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: victoria1 (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 22.00 / 22.00 m
Receiver height : 10.50 / 10.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: victoria2 (day/night)

Car traffic volume : 15254/1695 veh/TimePeriod *
Medium truck volume : 487/54 veh/TimePeriod *
Heavy truck volume : 487/54 veh/TimePeriod *
Posted speed limit : 80 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): 12450
Percentage of Annual Growth : 2.50
Number of Years of Growth : 15.00



Medium Truck % of Total Volume : 3.00
 Heavy Truck % of Total Volume : 3.00
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: victoria2 (day/night)

 Angle1 Angle2 : 0.00 deg 90.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 2 (Reflective ground surface)
 Receiver source distance : 28.00 / 28.00 m
 Receiver height : 10.50 / 10.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: victoria1 (day)

 Source height = 1.32 m

ROAD (0.00 + 66.84 + 0.00) = 66.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	71.51	0.00	-1.66	-3.01	0.00	0.00	0.00	66.84

Segment Leq : 66.84 dBA

Results segment # 2: victoria2 (day)

 Source height = 1.32 m

ROAD (0.00 + 65.79 + 0.00) = 65.79 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	71.51	0.00	-2.71	-3.01	0.00	0.00	0.00	65.79

Segment Leq : 65.79 dBA

Total Leq All Segments: 69.36 dBA

Results segment # 1: victoria1 (night)

 Source height = 1.32 m

ROAD (0.00 + 60.30 + 0.00) = 60.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	71.51	0.00	-2.71	-3.01	0.00	0.00	0.00	60.30



0	90	0.00	64.97	0.00	-1.66	-3.01	0.00	0.00	0.00	60.30
---	----	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 60.30 dBA

Results segment # 2: victoria2 (night)

Source height = 1.32 m

ROAD (0.00 + 59.25 + 0.00) = 59.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	64.97	0.00	-2.71	-3.01	0.00	0.00	0.00	59.25

Segment Leq : 59.25 dBA

Total Leq All Segments: 62.82 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 69.36
(NIGHT): 62.82



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APPENDIX D

Cadna/A Model Parameters and Output Tables



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The predictive model used for this Assessment (Cadna-A version 2025 MR2, Build 209.5501) is based on methods from ISO Standard 9613-2.2 "Acoustics - 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 such as buildings. This modelling technique is acceptable to the MECP.

The subject site and surrounding area were modelled based on observations during the site visit. Foliage was not included in the modelling. Ground attenuation was assumed to be spectral for all sources, with a ground factor (G) of 0.25 in paved areas and 0.8 for soft-ground areas. The temperature and relative humidity were assumed to be 15° C and 70%, respectively. The reference times were Daytime and Evening 07:00 to 23:00 and Nighttime 23:00 to 07:00. All buildings in the model had an absorption coefficient alpha of 0.2.

The predictive modelling considered one order of reflection, the sufficiency of which was verified through an iterative convergence analysis, using successively increasing orders of reflection.

The HVAC equipment, greenhouse exhaust fans, and idling truck engines were modelled as point sources of sound, shown as crosses in Figures 5a and 5b. Truck and delivery van movements were modelled as line sources of sound, shown as green lines in Figures 5a and 5b. Forklift activities were modelled as area sources, shown as green hatched areas in Figures 5a and 5b.



Where: $I_r = I_x - A_{div} + K_0 + D_c - A_{gnd} - A_{har} - A_{atm} - A_{fol} - A_{hous} + C_{met} + Refl$

APPENDIX E

Supporting Information



NOISE



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www.hgcacoustics.com

RE: Belgian Nursery Noise Information Inquiry

From Julie Clancy <julie@belgian-nursery.com>

Date Tue 2026-02-24 12:02 PM

To Elise Jaklic <ejaklic@hgcacoustics.com>

Hello,

I just let a message for you. Please call me to schedule a time.
Trevor will be able to assist you on-site with all the noise we make!

Regards,

Julie Clancy

519-654-0539 cell

Belgian Nursery

www.belgian-nursery.com

2615 Victoria St. N. Breslau ON N0B 1M0

519-648-2608



From: Belgian Nursery <info@belgian-nursery.com>

Sent: 24-Feb-26 10:37 AM

To: rosemary <rosemary@belgian-nursery.com>; Julie Clancy <julie@belgian-nursery.com>

Subject: Fwd: Belgian Nursery Noise Information Inquiry

Subject: Belgian Nursery Noise Information Inquiry

From: Elise Jaklic <ejaklic@hgcacoustics.com>

Date: Mon, 2026-02-23 11.21 AM

To: "<info@belgian-nursery.com>" <info@belgian-nursery.com>

Good morning,

We are conducting a noise study for a proposed development near your nursery in Woolwich, Ontario, and would like to coordinate a time to visit your site to measure the greenhouse fan exhausts. We also have a few questions regarding any outdoor machinery or material-handling equipment that may be used on the property (e.g., forklifts, loaders, truck deliveries).

If possible, please let me know a suitable time this week for a site visit. You can email me or give me a call at 647-554-0664. Thank you!

Kind regards,
Elise

Elise Jaklic, BEng

Project Consultant

HGC NOISE VIBRATION ACOUSTICS

2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7

t: 905-826-4044 x271 e: ejaklic@hgcacoustics.com

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Calculation Record

Client	Project Name	Project #	Page ①
Subject Belgian Nursery		By	Date Feb, 25

Run when hot outside, rarely at night, only warmer months

File 1 74.2 Leg 2m high ↑
measured 3.5m away from fan ↔

File 2 72. Leg between fans

(69 per fan)

They can all run at the same time in warmer months
(fans)

lawn mower (other side)

fork lift

deliveries → in the front

Mostly inside noises

APPENDIX F

Consultant's Statutory Declaration



NOISE



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CONSULTANT STATUTORY DECLARATION

CANADA	)	In the Matter of the
	)	Environmental Protection
PROVINCE OF ONTARIO	)	Act and the Planning Act
	)	
	)	And in the Matter of an
	)	Application for a
	)	Noise Feasibility Study, Proposed
	)	Mixed-Use/Residential Development,
	)	Bisgould Lands, Woolwich,
	)	Ontario

I, Victor Garcia, of the City of Burlington, in the Region of Halton, SOLEMNLY
DECLARE THAT:

1. I am a Professional Engineer employed by HGC Noise Vibration Acoustics which holds a Certificate of Authorization and have personal knowledge of the matters set out below.
2. I was retained or employed as the principal consultant to undertake the assessment of noise impacts and recommendation of noise mitigation measures for the property described as the proposed Bisgould Lands mixed-use/residential development located east of Greenhouse Road and south of Victoria Street North, in Woolwich, Ontario.
3. I had the expertise required to perform these services. Any assessment activities or recommendations requiring the application of engineering principles have been undertaken or supervised by an engineer qualified to perform such services.
4. The information used in the study entitled Noise Feasibility Study, Proposed Mixed-Use/Residential Development, Bisgould Lands, Woolwich, Ontario, is the best available information as of the date of the study.
5. The sound level calculations, the interpretation of noise attenuation requirements, and the recommended measures are in accordance with Ministry of Environment, Conservation and Parks Guidelines, Region of Waterloo policies, any applicable policy of guidclines or the Arca Municipality, and any other applicable policy or guideline.
6. The physical noise attenuation measures proposed in this study are feasible to implement and will provide the level of attenuation indicated in the study.

7. I acknowledge that this study may be subject to a peer review conducted at my cost.
8. I acknowledge that public authorities and future owners, occupants and others may rely on this statement.

AND I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath.

Sworn/Affirmed by video
conference remotely at the City of
Burlington, Ontario, before me,
Kazuki Takahashi, at the City of
Markham, Ontario, on May 20, 2026,
in accordance with O. Reg 431/20:
Administering Oath or Declaration
Remotely.

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Victor Garcia




KAZUKI TAKAHASHI (LSO: P08880)
Notary Public, Paralegal, RCIC
53 Norn Crescent, Markham
Ontario L3S 2A9 Canada
T: 1647-699-3111, 519-312-7777
Email: expert@laws.services
canadianlegalcounsel@gmail.com
www.Laws.Services