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Noise and Vibration Feasibility Study
Proposed Mixed Use Development,
Oval Court,
Burlington, Ontario

Prepared for:

Branthaven Development Corp.
720 Oval Court,
Burlington, on
L7L 6A9

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Table of Contents

1 Introduction and Summary 1
2 Site Description and Sources of Sound 2
2.1 Site Visit and Measurements 3
3 Criteria for Acceptable Sound Levels 4
3.1 Rail and Road Traffic Noise 4
3.2 Traffic Noise Assessment 5
3.2.1 Road Traffic Data 5
3.2.2 Rail Traffic Data 6
3.2.3 Road and Rail Traffic Noise Predictions 7
3.3 Traffic Noise Recommendations 10
3.3.1 Outdoor Living Areas and Sound Barriers 10
3.3.2 Indoor Living Areas and Ventilation Requirements 11
3.3.3 Building Facade Constructions 11
3.3.4 Assessment of Ground-borne Vibration from Rail Traffic 16
3.3.5 Warning Clauses 17
3.4 Impact of the Development on Itself 18
3.5 Impact of the Development on the Environment 18
4 Assessment of Existing Industrial (Stationary) Sources of Sound on the Proposed Mixed Use/Residential Buildings 20
4.1 MECP Guidelines for Land Use Compatibility and Distance Separation 20
4.2 Criteria for Acceptable Sound Levels 23
4.3 Description of the Nearby Facilities 27
5 Noise Assessment 29
5.1 Assumed Operating Scenarios 30
5.2 Results 31
5.3 Results with Alternative Assumptions 34
5.4 Discussion and Recommendations with Regard to the Industrial Facilities 35
6 Summary of Recommendations 36
7 Conclusions 37

Figure 1 – Key Plan
Figure 2 – Proposed Site Plan
Figure 3 – Aerial Photo Indicating Surrounding Land Uses
Figure 4 to 9 - Measured Velocity Level & Acceleration Spectrum from Pass-bys at 30 m from ROW
Figure 10 to 15 - Measured Velocity Level & Acceleration Spectrum from Pass-bys at 3 m from ROW
Figure 16 – Influence Areas According to MECP D6 guidelines
Figure 17 – Distance to Industries on Zoning Map
Figure 18 – Sketch Indicating Receptor Locations
Figure 19 – Minimum Daytime Hour Sound Levels, dBA
Figure 20 – Minimum Nighttime Hour Sound Levels, dBA
Figure 21 – Sound Levels Due to Steady Stationary Noise Sources, Daytime
Figure 22 – Sound Levels Due to Steady Stationary Noise Sources, Nighttime
Figure 23 – Sound Levels Due to Impulsive Stationary Noise Sources from the Logistics Facility
Figure 24 – Sound Levels Due to Impulsive Stationary Noise Sources from the Cold Storage Facility
Figure 25 – Sound Levels Due to Impulsive Stationary Noise Sources from Sofina Foods

Appendix A – Supporting Information
Appendix B – Traffic Information
Appendix C – Sample Stamson Output

1 Introduction and Summary

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by Branthaven Development Corp. to conduct a noise and vibration feasibility study for a proposed mixed-use development at Oval Court in Burlington, Ontario. The site is located south of the Queen Elizabeth Way (QEW), Metrolinx railway line, north of Fairview Street and on either side of Oval Court. A noise and vibration feasibility study is required by the municipality as part of the approvals process.

This report has been updated to include updated traffic data from Metrolinx and incorporates the designation of the subject lands as Class 4.

Road traffic volumes for Appleby Line, Harvester Road and Fairview Street were obtained from the City of Burlington. Road traffic volumes for the QEW were obtained from the Ministry of Transportation (MTO). Rail traffic data was obtained from Metrolinx personnel and Canadian National (CN) railway personnel. The data was used to predict future traffic sound levels at the locations of the proposed building facades. The predicted sound levels were compared to the guidelines of the Ministry of Environment, Conservation and Parks (MECP), Metrolinx and the City of Burlington.

Noise from transportation sources requires that appropriate sound insulation measures be considered for integration into the design of the buildings and building envelopes to maintain acceptable indoor sound levels. These requirements will be met through the use of appropriate wall and glazing assemblies, which will be implemented during the detailed building design process. Central air conditioning is required for all proposed mixed-use/residential buildings on the development site. Warning clauses are also required to inform the future occupants of the residential buildings of the traffic noise impacts and the presence of nearby commercial/office/retail/industrial facilities.

As this project is at an early stage of development, a review should be conducted to verify and/or refine the acoustic recommendations when more detailed floor plans and building elevations are available for individual buildings or on a phase by phase basis, as details become available or as part of individual site plan applications. In addition, an acoustical consultant should review the

mechanical drawings and details of demising constructions, when available, to help ensure that the noise impact of the development on the environment, and of the development on itself, are maintained within acceptable levels.

An analysis was also conducted to determine the potential impact of noise associated with the existing nearby industrial facilities (Cold Storage Facility, Sofina Foods, Load Bearing Logistics) on the proposed residences at the development site. The analysis is based on a review of the latest site plan, site visits, aerial photos and experience with similar past projects.

A computer model of the area was created, using acoustic modelling software, in order to predict the sound levels at the locations of the proposed development. Modelling was undertaken based on data from other similar facilities, from observations made during site visits and review of aerial photography, in conjunction with the screening procedures outlined in MECP publications, D-6 guidelines. Several commercial/industrial buildings to the northwest and west of the site were identified with respect to their potential noise impacts and have been included in this analysis.

The results indicate that the sound emissions from the activities associated with the Cold Storage facility, west of the northerly GO commuter parking lot, has the potential to exceed the background sound levels in the area during a worst-case operational scenario during the nighttime hours. The subject site has been designated as Class 4, which allows higher sound level limits in order to allow the existing industrial facilities to continue operating without affecting any relevant approval documents, such as Environmental Compliance Approval (ECA) documents with the MECP. Noise warning clauses are also recommended to be included in the property and tenancy agreements based on the Class 4 designations of the subject lands. A detailed noise study is also required for each building or phase, when detailed floor plans and building elevations are available to refine the acoustic recommendations.

2 Site Description and Sources of Sound

Figure 1 is a key plan of the area, showing the location of the proposed development. The entire site is located on either side of Oval Court, south of the Metrolinx railway corridor, north of Fairview Street, in Burlington, Ontario. Figure 2 is the preliminary site plan prepared by Core Architects Inc. dated February 2, 2023. Eight towers are proposed ranging in height from 11-storeys to 30-storeys. An

east/west connecting road (The Promenade) is proposed to the existing GO station to the west and Sherwood Park to the east. Appendix A provides a ground floor plan.

2.1 Site Visit and Measurements

Numerous site visits were made by HGC Engineering to identify the significant noise sources in the vicinity of development. The site is currently located in a Class I area dominated by road and rail traffic noise. Rail traffic on the Metrolinx railway corridor adjacent to the north of the subject site is the dominant source of transportation noise. Secondary sources of noise include road traffic on the QEW located to the further north, Appleby Line and Harvester Road. Fairview Street is a low volume roadway.

Since the residential portion of the site is located within 75 m from the railway right of way, ground-borne vibration measurements were completed for railway passbys at a 30 m setback and at the location of the proposed underground parking structure at approximately 10 m from the railway right of way. This is provided in Section 3.3.4.

The subject site is fairly flat and currently includes five large office and industrial buildings which will eventually be removed. Figure 3 indicates the surrounding land uses. There are existing 3-storey residences to the south of Fairview Street and one 6-storey apartment building. To the north and immediately west of the subject site are large GO commuter parking lots. To the further northwest includes a cold storage facility with truck loading bays at the south. To the further northwest is Sofina Foods. To the further west of the site and the GO parking lot is logistics facility. West of the site and the green space is an existing bus loop for the Appleby GO station.

A screening assessment was first conducted, in accordance with MECP guidelines D-6, to identify the facilities with potential noise impact on the development site. Several facilities surrounding the site were identified to have potential impacts, and these were modelled in further detail in Section 4.

3 Criteria for Acceptable Sound Levels

3.1 Rail and Road Traffic Noise

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

	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, 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 sound level in an Outdoor Living Area to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible.

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/living/dining room windows exceed 60 dBA or daytime sound levels outside bedroom/living/dining room windows exceed 65 dBA. Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at bedroom/living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom/living/dining room windows are in the range of 56 to 65 dBA. 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.

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

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

3.2 Traffic Noise Assessment

3.2.1 Road Traffic Data

Road traffic data for the QEW was obtained from the Ministry of Transportation (MTO) in the form of summer average daily traffic (SADT) at the Appleby Line exit for the year 2019, and is provided in Appendix B. The SADT was applied to QEW using a 2.5% growth rate to forecast to the year 2034 in conjunction with a day/night split of 67%/33%. Commercial vehicle percentages of 15% split into 5.8%/9.2% medium and heavy trucks were also provided by the MTO. A posted speed limit of 100 km/h was used. In this section of the highway there are more than 4 lanes. In the analysis, the roadway was split into two segments as per MECP guidelines.

Road traffic data for Appleby Line was obtained from the Region of Halton in the form of ultimate annual average daily traffic (AADT), and is provided in Appendix B. Commercial vehicle

percentages of 3.4% split into 1.0%/2.4% medium and heavy trucks was calculated from the data along with a day night split of 90%/10%. A posted speed limit of 60km/h was used.

Road traffic data for Harvester Road was obtained from the City of Burlington in the form of peak hour turning movement counts for the year 2019, and is provided in Appendix B. The peak data is typically 10% of the total AADT. The data was projected to the year 2034 using a 2.5% growth rate along with a day/night split of 90%/10%. Commercial vehicle percentages of 9.2% split into 3.5%/5.7% medium and heavy trucks was calculated from the data along with a day night split of 90%/10%. A posted speed limit of 60 km/h was used. Table II summarizes the traffic volume data used in this study.

Table II: Ultimate and Projected Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
QEW *(Projected to 2034)*	Daytime	177 580	12 118	19 220	208 918
	Nighttime	87 466	5 968	9 466	102 900
	Total	**265 046**	**18 086**	**28 686**	**311 818**
Appleby Line *(Ultimate)*	Daytime	39 123	405	972	40 500
	Nighttime	4 347	45	108	4 500
	Total	**43 470**	**450**	**1 080**	**45 000**
Harvester Road *(Projected to 2034)*	Daytime	21 517	829	1 351	23 697
	Nighttime	2 391	92	150	2 633
	Total	**23 908**	**921**	**1 501**	**26 330**

3.2.2 Rail Traffic Data

Rail traffic data for the CN Oakville Subdivision was obtained from CN railway and Metrolinx/GO Transit personnel and is attached in Appendix B. This line is used for way freight and passenger operations and is classified as a principal main line. The maximum permissible train speed for way freight trains in the area of the site is 97 kph (60 mph), 129 kph (80 mph) for passenger, and 153 kph (95 mph) for GO trains. In conformance with CN and GO Transit assessment requirements, the maximum speeds, maximum number of cars and locomotives per train were used in the traffic noise analysis to yield a worst-case estimate of train noise. The data was projected to the year 2034 using a

2.5% per year growth rate. Table III summarises the Metrolinx and CN rail traffic data used in the analysis.

Table III: Rail Traffic Data Projected to Year 2034

Type of Train	Number of Trains Day/ Night	Number of locomotives	Number of cars	Max Speed (KPH)
Way Freight	5.9 / 3.2	4	25	97
Passenger	19.8 / 0.0	2	10	129
GO	379.0 / 59.0	1	10	153

3.2.3 Road and Rail Traffic Noise Predictions

To assess the levels of traffic noise which will impact the site in the future, predictions were made using a numerical computer modelling package (Cadna-A version 2023 MR 2 build: 201.5366). The model is based on the 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.

The road and rail noise sources have been included in the model using line sources included in Cadna/A which have been calibrated using STAMSON 5,04. The rail traffic noise reference levels are based on the Federal Transit Authority (FTA) noise prediction manual (2018) which contains data on the modern vehicle and rolling stock noise emissions for the Tier 4 train engines (required upgrade). These rail source levels were modelled as line sources in *Cadna/A* for the rail corridors. Appendix C includes a sample calculation using Stamson for reference purposes.

Train whistle noise was not included in the predictions at the building facades since there are no at grade crossings in the vicinity of the site.

Predictions of overall sound levels from all rail and road sources were made at various representative façade locations throughout the site. The predicted maximum sound levels from road and rail traffic impacting the proposed residential development are summarized in Table IV.

Outdoor living areas are not currently identified on the site plan. Sound levels were also predicted along each façade during daytime and nighttime hours to investigate ventilation requirements. The building envelope setbacks indicated on the preliminary site plan were used in the analysis. The acoustic recommendations may be subject to modifications if the site orientation and/or the heights of the buildings are changed significantly. The values included in Table IV correspond to the worst case predicted sound level along each respective façade.

Table IV: Predicted Traffic Sound Levels [dBA], Without Mitigation

Building	Building	Location Description	Daytime at Façade $L_{EQ\text{-}16\ hr}$	Nighttime at Façade $L_{EQ\text{-}8\ hr}$
Building A	Podium 6-Storey	North Façade	63	60
		East Façade	60	58
		South Façade	<55	<50
		West Façade	65	60
	Tower 19-Storey	North Façade	64	60
		East Façade	62	59
		South Façade	<55	<50
		West Façade	63	58
Building B	Podium 6-Storey	North Façade	66	62
		East Façade	60	57
		South Façade	55	51
		West Façade	66	62
	Tower 19-Storey	North Façade	66	62
		East Façade	62	58
		South Façade	56	51
		West Façade	65	61
Building C	Podium 6-Storey	North Façade	71	67
		East Façade	62	58
		South Façade	61	56
		West Façade	69	64
	Tower 30-Storey	North Façade	70	66
		East Façade	67	63
		South Façade	58	54
		West Façade	68	63

Note: Daytime and nighttime sound levels include contributions from predominantly rail traffic and road traffic to a lesser extent.

Table IV: Predicted Traffic Sound Levels [dBA], Without Mitigation (continued)

Building	Building	Location Description	Daytime at Façade $L_{EQ-16\ hr}$	Nighttime at Façade $L_{EQ-8\ hr}$
Building D	Podium 6-Storey	North Façade	74	70
		East Façade	68	64
		South Façade	59	54
		West Façade	66	61
	Tower 30-Storey	North Façade	73	70
		East Façade	72	68
		South Façade	61	55
		West Façade	70	66
Building E/F	Podium E/F 6-Storey	North Façade	76	71
		East Façade	72	68
		South Façade	62	58
		West Façade	74	69
	Tower E 30-Storey	North Façade	75	71
		East Façade	73	68
		South Façade	63	58
		West Façade	71	66
	Building F 11-Storey	North Façade	69	65
		East Façade	68	64
		South Façade	59	54
		West Façade	66	62
Building G	Podium 6-Storey	North Façade	65	61
		East Façade	65	62
		South Façade	57	53
		West Façade	62	58
	Tower 19-Storey	North Façade	67	64
		East Façade	66	62
		South Façade	57	52
		West Façade	63	59

Note: Daytime and nighttime sound levels include contributions from predominantly rail traffic and road traffic to a lesser extent.

Table IV: Predicted Traffic Sound Levels [dBA], Without Mitigation (continued)

Building	Building	Location Description	Daytime at Façade $L_{EQ-16\ hr}$	Nighttime at Façade $L_{EQ-8\ hr}$
Building H	Podium 6-Storey	North Façade	65	62
		East Façade	65	62
		South Façade	55	51
		West Façade	57	54
	Tower 19-Storey	North Façade	64	60
		East Façade	63	59
		South Façade	55	50
		West Façade	61	57

Note: Daytime and nighttime sound levels include contributions from predominantly rail traffic and road traffic to a lesser extent.

3.3 Traffic Noise Recommendations

The sound level predictions indicate that traffic sound levels exceed MECP criteria during the daytime and nighttime at the facades with exposure to the railway. Road traffic contributes to a lesser extent. Recommendations are provided below.

3.3.1 Outdoor Living Areas and Sound Barriers

The proposed mixed-use/residential buildings may have balconies less than 4 metres in depth (which are exempt from the definition of OLA under MECP guidelines).

At this time, the drawings do not indicate the location of outdoor amenity spaces on or at the buildings, except a kids play area associated with Building H. If this area is at ground level, the predicted sound level will be 60 dBA and will need to be provided with noise mitigation in the form of acoustic barrier approximately 2 m high.

Any large outdoor amenity area associated with the residential buildings should be located on the shielded side of the buildings away from the railway and roadways (Appleby Line, and Harvester Road) to avoid the need for high noise barriers. During detailed design, a review of the proposed outdoor areas should be completed to assess the sound levels in potential outdoor areas and to review

the landscape drawings to determine if smaller pockets of spaces may be used for the quiet enjoyment, as necessary.

3.3.2 Indoor Living Areas and Ventilation Requirements

Central Air Conditioning

The predicted nighttime sound levels at most building facades closest to the railway and with exposure to the roadways exceed 60 dBA during the nighttime hours, and thus central air conditioning systems are required so that windows may remain closed. This is required for Buildings B – H and associated podiums. It is likely that all the residential buildings will be provided with air conditioning in any case.

Provision for the Future Installation of Air Conditioning

The predicted nighttime sound levels at the plane of the bedroom windows of Building A and podium will be between 51 and 60 dBA and between 56 and 65 dBA during the daytime. To address these excesses, the MECP guidelines recommend that these dwelling units be equipped with an alternative means of ventilation to open windows. Central air conditioning meets and exceeds this requirement. The guidelines also recommend warning clauses for the proposed building. Window or through-the-wall air conditioning units (similar to motel style) are not recommended for any residential units because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall noise insulating properties of the envelope. This can be achieved if the heating and cooling within each unit is housed in its 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, as applicable.

3.3.3 Building Facade Constructions

Future rail and road traffic sound levels at buildings with exposure to the railway and roadways will exceed 60 dBA at night and will exceed 65 dBA during the daytime hours. Accordingly, MECP guidelines recommend that the windows, walls and doors be designed so that the indoor sound levels comply with MECP noise criteria.

The building plans were not yet available for review by HGC Engineering at the time of this report, but 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 predicted future sound levels at the building facades, and the anticipated areas of the facade components (walls, windows and doors) relative to the floor area of the adjacent room.

a) Residential Buildings with direct exposure to the railway

Exterior Wall Construction

For the proposed residential portions of the buildings with direct exposure to the railway line (mainly the north façades), MECP and GO Transit guidelines require brick veneer or a masonry equivalent construction. Detailed elevation drawings are not yet available, but the exterior walls of the buildings may consist largely of metal or glass spandrel panels with some areas of precast concrete or masonry.

A typical brick veneer wall, with an insulated gypsum board partition on the inside, has an estimated sound transmission class (STC) rating of 54 or better. Exterior walls that are not glazed should have sufficient acoustical insulation value such that the noise transmitted through is negligible in comparison with the windows. For this assumption to be true, spandrel or metal panel sections must have an insulated drywall partition on separate framing behind, and be faced with one or more layers of drywall or alternative materials. Spandrel or metal panels with typical sound insulation rating of STC-50 or higher, backed by an independent insulated drywall assembly, should meet these requirements. An equivalent to brick veneer construction for high rise buildings in an urban environment is typically achieved by using two layers of 16 mm type X gypsum board on separate framing behind the spandrel panels, with batt insulation in the wall cavity. Further input regarding the design of the walls can be provided during design development if required.

Exterior Doors

There may be glazed sliding doors and some swing doors for entry onto the balconies from the suites in the residential buildings. The glazing areas on the exterior doors must 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.

Glazing Construction

For the purposes of this preliminary analysis, typical window-to-floor areas were assumed to be 50% for living/dining rooms (i.e. 40% fixed, 10% operable relative to floor area) and 40% for bedrooms (ie. 30% fixed, 10% operable relative to floor area). Based upon this assumption, the glazing for residential suites with direct exposure to the railway and roadways should achieve the sound transmission class ratings shown in Table V. The table indicates the worst cade window glazing requirements along each façade, including glass in fixed sections, doors, and operable windows for each representative building. In an urban area such as this, the minimum requirements for glazing is STC-33.

Table V: Minimum Glazing Requirements

Building	Façade	Glazing STC
Podium A	North façade	STC-33
	East façade	STC-33
	South façade	STC-33
	West façade	STC-33
Building A	North façade	STC-33
	East façade	STC-33
	South façade	STC-33
	West façade	STC-33
Podium B	North façade	STC-33
	East façade	STC-33
	South façade	STC-33
	West façade	STC-33
Building B	North façade	STC-33
	East façade	STC-33
	South façade	STC-33
	West façade	STC-33
Podium C	North façade	STC-37
	East façade	STC-33
	South façade	STC-33
	West façade	STC-35
Building C	North façade	STC-37
	East façade	STC-33
	South façade	STC-33
	West façade	STC-33

Note: Based on assumed typical window-to-floor areas, 50% for living/dining rooms (i.e. 40% fixed, 10% operable relative to floor area) and 40% for bedrooms (ie. 30% fixed, 10% operable relative to floor area). Assumed sound through wall areas are negligible when compared to sound through window glazing.

Table V: Minimum Glazing Requirements (continued)

Building	Façade	Glazing STC
Podium D	North façade	STC-40
	East façade	STC-34
	South façade	STC-33
	West façade	STC-33
Building D	North façade	STC-40
	East façade	STC-38
	South façade	STC-33
	West façade	STC-36
Podium E/F	North façade	STC-42
	East façade	STC-38
	South façade	STC-33
	West façade	STC-40
Building E	North façade	STC-41
	East façade	STC-39
	South façade	STC-33
	West façade	STC-36
Building F	North façade	STC-35
	East façade	STC-34
	South façade	STC-33
	West façade	STC-33
Podium G	North façade	STC-33
	East façade	STC-33
	South façade	STC-33
	West façade	STC-33
Building G	North façade	STC-34
	East façade	STC-33
	South façade	STC-33
	West façade	STC-33
Podium H	North façade	STC-33
	East façade	STC-33
	South façade	STC-33
	West façade	STC-33
Building H	North façade	STC-33
	East façade	STC-33
	South façade	STC-33
	West façade	STC-33

Note: Based on assumed typical window-to-floor areas, 50% for living/dining rooms (i.e. 40% fixed, 10% operable relative to floor area) and 40% for bedrooms (ie. 30% fixed, 10% operable relative to floor area). Assumed sound through wall areas are negligible when compared to sound through window glazing.

These results indicate that the glazing for windows in the buildings closest to and facing the railway must achieve higher sound transmission class (STC) ratings. Lower STC ratings may be achieved by using smaller window areas relative to the floor area especially in bedrooms. Façades with less exposure to the railway are less impacted, and accordingly lower STC values would be acceptable while still meeting the indoor targets. Acoustical criteria for different facades can be optimized as part of the detailed design of the building envelopes.

Note that acoustic performance varies with manufacturer's construction details, and these are only guidelines to provide some indication of the type of glazing likely to be required. Acoustical test data for the selected assemblies should be requested from the suppliers, to ensure that the stated acoustic performance will be achieved by their assemblies. Table VI provides some sample glazing configurations.

Table VI: Glazing Constructions Satisfying STC Requirements

STC Requirement	Glazing Configuration (STC)
28 – 29	Any double glazed unit
30 – 31	3(13)3
32 – 33	4(10)4
34	4(19)4
35 – 36	6(10)4, 5(16)4
37	6(13)4, 6(20)5
38	6(25)5, 6L(13)6
39	6L(13)6, 6(20)5
40	6L(24)6L, 7L(12)6
42	6(19)8L

Further Analysis

When detailed floor plans and building elevations are available for the proposed buildings, a detailed noise study should be performed to specify wall and window requirements with sufficient acoustical insulation for the dwelling units based on actual window to floor area ratios for each building or on a phase by phase basis.

3.3.4 Assessment of Ground-borne Vibration from Rail Traffic

Measurements were performed on the site at grade, at approximately 3 m (VM1) from the railway right-of-way and at 30 m (VM2) from the railway right-of-way. Figure 2 indicates the vibration measurement locations. Attended vibration measurements using Svantek 977 Sound Level Meter with a Wilcoxon Research type 793V velocity transducer on October 16, 2020. Vibration measurements were obtained for 9 GO Train pass-bys. The results of the measurements are presented in Table VII showing the maximum RMS vibration level measurements. Figures 4 – 15 show the pass-bys of five of the trains at 30 m from the right of way and at 3 m from the right of way at the location of the parking garage.

Table VII: Maximum RMS Vibration Velocity Measurements of Freight Train Pass-bys

Train Pass-by	Vibration Measurement	30 m from right of way (mm/s)	Criteria (mm/s)
1	VM1	0.07	0.14
	VM2	0.03	
2	VM1	0.03	0.14
	VM2	0.01	
3	VM1	0.02	0.14
	VM2	0.01	
4	VM1	0.02	0.14
	VM2	--	
5	VM1	0.02	0.14
	VM2	--	
6	VM1	0.02	0.14
	VM2	--	
7	VM1	0.04	0.14
	VM2	0.02	
8	VM1	0.03	0.14
	VM2	0.02	
9	VM1	0.02	0.14
	VM2	0.01	

The results indicate that vibration levels are below the CN/Metrolinx criteria of 0.14 mm/s and vibration mitigation measures are not required for this proposed development.

3.3.5 Warning Clauses

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

Type A:

> 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 and rail traffic may on occasion 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, Conservation and Parks.

Type B:

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

Type C:

> Purchasers are advised that due to the proximity of the nearby industrial/commercial/office facilities/GO station/GO bus loop, sound levels from the facilities may at times be audible.

CN requires a standard warning clause as this development is located near a principal mainline. The following sample clause is typical of those included in agreements of purchase and sale or lease on the Lands for all lots in the development.

Type E:

> Warning: Purchasers or tenants are to be advised that Canadian National Railway or its successors or assigns, have an operating right-of-way within 300 metres from the land subject hereof and there may be alterations to the right-of-way including the possibility that the Railway may expand its operations, which expansion may affect the living environment of the residents notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the subdivision and individual units, and that the Railway will not be responsible for complaints or claims arising from use of its facilities and/or operations.

GO Transit's standard warning clause for residential developments located within 300 m of a railway right-of-way (principal main line) is given below.

Type F:

> Warning: Metrolinx, and its assigns and successors in interest has or have a right-of-way within 300 metres from the subject land. There may be alterations to or expansions of the rail or other transit facilities on such right-of-way in the future including the possibility that Metrolinx or any railway entering into an agreement with Metrolinx to use the right-of-way or their assigns or successors as aforesaid may expand or alter their operations, which expansion or alternation may affect the environment of the occupants in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual lots, blocks or units.

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

3.4 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 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.

3.5 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 above the minimum exclusionary limits of 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.

At the time of this study, the design of the proposed mixed-use/residential buildings was in its initial stages, and the mechanical systems had not yet been developed. As a note, the City typical requires neoprene/rubber gaskets or alternative measures for any grates located on the driveways that are in a vehicle's path.

The details of the exhaust fans and mechanical equipment will be reviewed at the SPA stage when the details are available. At this point, the site plan does not indicate any vents. It is likely that the majority of rooftop mechanical equipment will be housed in a mechanical penthouse on the roof of the proposed buildings. Any rooftop equipment not housed in the penthouse will be assessed and sufficiently shielded from neighbouring residences, as needed. It is noted that the residences (sensitive receptors) in the area are all 3-storeys in height. In HGC Engineering's experience, the roof edge and height of the proposed buildings (11-storeys and 30-storeys) will sufficiently shield any rooftop equipment that is not housed inside the penthouse. These will be verified at the detailed stage.

It is also HGC Engineering's experience with numerous developments, that typical HVAC equipment and parking garage exhaust fans can meet the applicable MECP noise criteria at neighbouring residential uses, either with low noise emission fans or relocation of the fans or through mitigation in the form of duct silencers or acoustic lining. Prior to building permit, an acoustical consultant should review the mechanical drawings and details of potential exhaust vents/fans, when available, to help ensure that the noise impact of the development on the environment, and of the development on itself, are maintained within acceptable levels. This is typically completed at the detailed noise study stage, at SPA.

4 Assessment of Existing Industrial (Stationary) Sources of Sound on the Proposed Mixed Use/Residential Buildings

Noise sources associated with industrial/commercial facilities are assessed separately from traffic sources under MECP Guidelines. These facilities are considered to be Stationary Sources of Sound and criteria for their assessment are contained in the following section.

HGC Engineering visited the subject site on a number of occasions to observe the operations of the facilities in the area and identify potentially significant sources of sound. From site observations, aerial photos and past experience with similar past projects, the noise sources identified to be potentially significant with respect to the subject site were determined. These sources include truck passbys and reefer units at the Cold Storage facility site to the northwest of the site, reefer truck movements at Sofina Foods and tractor trailer movements at the logistics facility to the further west at the northeast corner of Appleby Line and Fairview Street. Activities also include loading and unloading, and coupling/decoupling of trailers.

4.1 MECP Guidelines for Land Use Compatibility and Distance Separation

MECP Guidelines D-1, 'Land Use Compatibility' and D-6 'Compatibility Between Industrial Facilities and Sensitive Land Uses' were prepared to address the potential incompatibility of industrial land uses and noise sensitive land uses in relation to land use approvals under the Planning Act. They recommend that studies be conducted to investigate the feasibility of providing sufficient mitigation when noise sensitive land uses are proposed within the potential zone of influence of an existing industry/commercial facility. The mitigation can be provided at the source, or can be incorporated on the development lands where the industrial/commercial facility is operating in compliance with legislated Ministry requirements.

In planning a sensitive land use near an existing industrial/commercial area, guideline D-6 suggests certain potential zones of influence for the industry, depending on the characterization of that industry. Three classes of industry are defined, as follows:

Class I Industrial Facility

A place of business for a small scale, self-contained plant or building which produces/stores a product which is contained in a package and has a low probability of fugitive emissions. Outputs are infrequent, and could be point source or fugitive emissions for any of the following: noise, odour, dust and/or vibration. There are daytime operations only, with infrequent movement of products and/or heavy trucks and no outside storage.

Class II Industrial Facility

A place of business for medium scale processing and manufacturing with outdoor storage of wastes or materials (i.e. it has an open process) and/or there are periodic outputs of minor annoyance. There are occasional outputs of either point source or fugitive emissions for any of the following: noise, odour, dust and/or vibration, and low probability of fugitive emissions. Shift operations are permitted and there is frequent movement of products and/or heavy trucks during daytime hours.

Class III Industrial Facility

A place of business for large scale manufacturing or processing, characterized by: large physical size, outside storage of raw and finished products, large production volumes and continuous movement of products and employees during daily shift operation. It has frequent outputs of major annoyance and there is high probability of fugitive emissions.

For screening purposes, guideline D-6 outlines some potential influence areas for the different classes of industry, as follows. Outside these potential influence areas, it is unlikely that an industry which has been appropriately classified will have significant impact.

Class I – 70 metres
Class II – 300 metres
Class III – 1000 metres

Guideline D-6 acknowledges that the actual influence areas may be less, subject to site specific studies performed in accordance with guideline NPC-300, “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”. Notwithstanding the actual

influence area of an industry, in order to minimize the potential for future land use conflicts, the MECP recommends that certain minimum separation distances be respected, as follows:

Class I – 20 metres
Class II – 70 metres
Class III – 300 metres

The MECP recognizes that these minimum separation distances may not always be viable in certain cases, particularly in those cases of redevelopment, infilling and mixed-use areas, where the zoning or official plan has left no available land buffer. In those instances, the overall feasibility of the proposal is based on the anticipated adverse effects from the industrial/commercial use, including any mitigative measures that might be applied to address anticipated impacts.

The minimum separation distances would generally apply between the respective property lines of the industry and noise sensitive use. Portions of either lands can be considered as some or all the setback; if the specific use of that portion of the lands is controlled in a site specific zoning bylaw.

The noise sensitive portions of the subject lands are the facades of the residential buildings. Outdoor living space designated for passive recreation such as those associated with a dwelling unit is also considered to be noise sensitive. Commercial buildings, parking lots, playing fields etc. are generally not considered to be noise sensitive and can be considered to be part of the distance setback.

The guidelines do allow for reductions in the minimum setback distances, based on the results of supporting technical studies for infill developments or “Lands in Transition”. Detailed noise and possibly air emission studies would be required with regard to many of the nearby industries to justify such reductions.

Figure 3 identifies the commercial/industrial facilities surrounding the development site. Figure 16 identifies the areas in terms of D6 guidelines.

In the area, Sofina Foods and the cold storage facility generally exhibits characteristics of a Class II industry with the possible exception of the 24 hour operation and some release of fugitive emissions including odour and noise. There is no outdoor storage of materials except the parked trailers. Dominion Nickel Alloys is a Class III type industry and is located to the west of Appleby Line, approximately 800 m to the west of the subject site. Typically, the recommended minimum distance

setbacks apply between the property lines of the facilities, but exceptions can be made if portions of the residential or industrial/commercial lands are reserved for non-noise related uses, such as driveways or parking lots. In this case, there are appropriate distances between the subject site and the nearby facilities with the GO/Metrolinx parking lots acting as buffer areas. Figure 17 indicates the actual distance between the property lines and the distance between the usable areas and the subject site for reference.

4.2 Criteria for Acceptable Sound Levels

Under MECP guidelines, the acoustical environment in this area is classified as “urban” or “Class I”, as background sound levels are set by significant volumes of 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 facilities to the northwest and west 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. An industrial or 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, 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 and 2 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 (or rail 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 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.

The proposed mixed-use/residential buildings are located approximately 240 m to the southeast of the cold storage facility. The height of the mixed-use/residential buildings are 11-storeys to 30-storeys. Receptor locations (R1 to R5) are shown on Figure 18.

Hourly daytime traffic data was not available for the surrounding roadways (QEW, Appleby Line and Harvester Road). Using the current traffic volumes obtained from the City and MTO, the traffic data was applied to a generic 24 hour traffic pattern developed by the US Department of Transportation, Federal Highways Administration contained in the report titled “Summary of National and Regional Travel Trends 1970 – 1995” dated May 1996. The traffic volumes were then used to predict sound levels at the residential receptors during the day/nighttime hours to determine the minimum hour background sound levels at those locations due to the traffic on the public roadways.

The minimum hour traffic volumes used in the analysis are summarized in the following table.

Table VIII: Minimum Hourly Traffic Volumes on Surrounding Roadways

Roadway	Hourly Data		Heavy Vehicle %
	Day	Night	
QEW	2 789	643	9.2
Harvester Road	462	107	5.6
Appleby Line	833	193	2.4

The predicted quietest daytime hour and nighttime hour sound levels at the facades of the proposed residences, which will be exposed to the industries are found to be higher than the MECP exclusionary limits in the daytime hours for the majority of facades, especially those west facades of the proposed buildings on the west side of Oval Court. As such, the sound level limits as summarized in Table IX is therefore used in the following sections of this report as the applicable criteria for R1 to R5 and are provided graphically in Figures 19 and 20. Sound levels included in Table IX are the worst case along the respective building/façade.

As per MECP guidelines, *highly intrusive short duration noise caused by a source such as a train pass-by is normally excluded from the determination of the background sound level. However, under unique/special circumstances, train pass-by noise may be included in the determination of the background sound level in accordance with the following conditions and procedures:*

- the contribution of train pass-by sound levels to the background sound level only applies to noise sensitive land uses in Class 1, 2 and 4 areas (not in a Class 3 area);
- the noise sensitive land uses are located within 300 metres from the nearest track of railway lines carrying a minimum of 40 trains during daytime or 20 trains during nighttime;

While the railway line does include a minimum of 40 trains during the daytime and 20 trains during the nighttime, using the above method may add 1 dBA to the sound level limits in the table below.

Table IX: Applicable Sound Level Limits at Western Façades, L_{EQ} (dBA) for Class I Areas

Receptor	Building	West Façade	Sound Level Limits	
			Daytime & Evening (7:00 to 23:00)	Nighttime (23:00 to 7:00)
R1	D	Podium	50	45
		Tower	53	47
R2	C	Podium	55	48
		Tower	52	46
R3	B	Podium	54	46
		Tower	52	45
R4	A	Podium	50	45
		Tower	50	45
R5	G	Podium	51	45
		Tower	50	45

Note: If the area is designated as Class 4, higher criteria applies: OLA 55 dBA (07:00 – 23:00), 60 dBA from 07:00 – 23:00 and 55 dBA from 23:00 – 07:00.

Compliance with MECP criteria generally results in acceptable levels of sound at residential receptors although there may be residual audibility during periods of low background sound.

Stationary Sources (Impulsive Sound)

Under guideline NPC-300, the exclusion limits for impulsive sounds differ depending on how frequently the impulses occur, as summarized in the following table:

Table X – Exclusion Limits, Impulsive Sound, L_{LM} [dBAI]

Number of Impulses per Hour	Daytime/Evening (7:00 – 23:00)	Nighttime (23:00 – 7:00)
9 or more	50	45
7 to 8	55	50
5 to 6	60	55
4	65	60
3	70	65
2	75	70
1	80	75

The sound level limit for frequent impulse sounds is characterized by the average impulse sound level (L_{LM}). This average impulse sound level is then evaluated against the acceptability criteria as

described above. Note that each impulsive noise source is assessed independently (i.e. impacts from independent sources are not added together).

Compliance with MECP criteria generally results in acceptable levels of sound at residential receptors although there may be residual audibility during periods of low background sound.

4.3 Description of the Nearby Facilities

For each facility within the potential radius of influence of the subject site, preliminary noise modelling was conducted. The modelling was based on a review of aerial photography and site visit observations, and associated source sound emission levels were based on measurements conducted by HGC Engineering for similar past projects.

Cold Storage Facility at 5100 Harvester Road

This facility is located northwest of the site and west of an existing GO parking lot. The facility is classified as a Class II industry in this study and is less than 300 m from the edge of the subject site. Thus, under D-6 guidelines, the development falls within the potential zone of influence of the facility. This facility operates seven days a week, 24 hours a day. The loading and trailer parking area is located on the south side of the building. Tractor trailers with reefer units enter the site from Harvester Road, move towards the south and exit via the same driveway at Harvester Road. There are trailers parked along the southerly property line. There are 12 loading bays facing south associated with the cold storage facility. There are no rooftop units except one outdoor cooling unit at the east on a lower roof, visible from the east GO parking lot. Site observations were used to model the site. Since this is a warehousing facility, it is likely that there is no Environmental Compliance Approval (ECA) with the MECP in place.

Sofina Foods (Fearman's Pork) at 821 Appleby Line

Sofina Foods/Fearman's Pork is a large slaughterhouse and meat processing facility and is located to the northwest of the subject lands at approximately 316 m. This facility is classified as Class II in the study, and is slightly more than 300 m from away from the site. It is a 24 hour operation and shows many of the characteristics of a Class II (Medium) industrial use. It also shows some characteristics of a Class III use due to its shiftwork and fugitive emissions (both odour and noise). There are a row

of trailers with refrigeration units lined up at the loading bay doors facing south at the southwest corner of the facility. There is also extensive rooftop equipment, much of which is related to refrigeration and plant ventilation located on the roof. An assessment of the rooftop equipment has not been completed.

No odours were noted during the site visit, but the Municipality may at some point require an assessment of potential odours since it is a Slaughterhouse facility.

A recent ECA for the Sofina Foods facility was not found. A previous ECA when the facility was operated/owned by Maple Leaf foods was found in HGC Engineering files and is included in Appendix A. There are existing residences (3-storey and 6-storey) to the south of Fairview Street at approximately 379 m from this facility.

A further review should be completed at the detailed noise study stage or through phasing of the proposed development. A detailed noise study, with the cooperation of Fearman's Pork, would be required to investigate their operations. The municipality may wish to request this cooperation to assist in the land use compatibility issues. An industry of this size and scale could actively oppose residential development to protect their future business interests.

Logistics facility (York Warehouse) at 747 Appleby Line

This facility is classified as Class II in the study, and is 311 m from away from the site. Thus, under D-6 guidelines, the development is near the potential zone of influence of this facility. This facility was assumed to operate 24 hours a day and has 12 loading bays facing east. The trailers do not include reefer units.

Bristol Powder and Shotblast

A review of the business website indicates comprehensive metal coating, powder coating and metal treatment services to industries of all types. There are six loading bays facing south. Further assessment of this industry should be conducted during the detailed noise study for the subject lands.

GO/Metrolinx Parking Lots

The parking lots are located on the south and north of the GO station. These areas are used to park commuter vehicles and are not required to be assessed as per MECP guidelines.

Appleby Bus Station/Loop

The Appleby GO Station is located directly to the west of the site, immediately west of the green space. The site is separated from the GO bus lop by more than 30 m. During our site visit conducted in November 2020, it was noted that noise from bus traffic at this location was occasionally audible, and has therefore been included in the model of the site. Bus traffic from the GO Station was also obtained from the GO Transit website, and was included in the acoustic model. A total of 40 buses in the day and 40 buses at night. Average daytime and night-time volumes were estimated to be 5 buses per hour.

GO Station

When trains were operated in reverse and when the train is about to leave the station, a warning bell is operated. Communications with GO transit staff indicate that these bells are safety devices used for warning purposes only, and are thus exempt from noise assessment under MECP guidelines. Other occasional noises emitted from this station (such as occasional announcements over the outdoor PA system) are not anticipated to be an issue.

5 Noise Assessment

Predictive noise modelling was used to assess the potential sound impact of trucking activities, passbys and idling of engines and reefers, loading and unloading, at the closest residential receptors. The noise prediction model was based on sound emission levels for assumed operational profiles (during the daytime and nighttime), 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.

Sound emission data for typical rooftop equipment obtained from HGC Engineering project files were used in the analysis. In accordance with establishing the predictable worst-case conditions, any

rooftop HVAC equipment was assumed to operate at 100% capacity during daytime hours, and 50% during nighttime hours.

The sound levels were used as input to a predictive computer model. The software used for this purpose (*Cadna-A 2023 MR 2 build: 201.5366*) is a computer implementation of ISO Standard 9613-2.2 "Acoustics - Attenuation of Sound During Propagation Outdoors." The ISO method accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as barriers.

The assumed sound power levels are listed in the table below.

Table XI - Sound Power Level Specifications for Equipment [dB re 10-12 W]

Item	Octave Band Centre Frequency [Hz]							
	63	125	250	500	1k	2k	4k	8K
Truck Passby, tractor trailer	101	100	94	96	97	95	91	86
Idling Truck Engine	96	91	88	88	91	90	81	70
Reefer unit, tractor trailer	112	105	96	95	93	91	85	77
Loading/unloading of trailer	74	76	88	100	106	101	94	87

5.1 Assumed Operating Scenarios

The analysis considers the following sound sources and operating assumptions for a predictable worst-case-hour based on site observations, aerial imagery around the site, and typical operating scenarios for similar facilities. Daytime-hour refers to a busy daytime hour between 7 am and 11 pm. Nighttime-hour refers to a busy nighttime hour between 11 pm and 7 am.

Cold Storage Facility

- 1 rooftop unit at east side
- 15 truck movements in a busy daytime hour, 15 truck movements in a busy nighttime hour
- 15 idling reefer units on trucks
- Loading/unloading at the south during the daytime and nighttime hours

Sofina Foods

- Numerous rooftop units (not assessed)
- 15 daytime-hour truck movements, 15 nighttime-hour truck movements

- 15 idling reefer units on trucks
- Loading/unloading at the south during the daytime and nighttime hours

Load Bearing Logistics

- 10 daytime-hour truck movements, 5 nighttime-hour truck movements
- 2 idling trucks, no reefers
- Loading/unloading at the east, during daytime hours only

Impulsive noises are assessed separately from the non-impulsive sound sources. Two types of impulsive sounds are expected to be emitted from the facilities: loading/unloading of trailers by forklifts and coupling/uncoupling of trucks to/from trailers. The multiple impulsive noises are combined to obtain a logarithmic mean impulse sound level (L_{LM}) of 108 dBAI. This was calculated based on measurements conducted by HGC Engineering for similar past projects. Impulsive sounds were modeled as an area source, distributing the assumed source sound power levels throughout the loading area of the site. The impulsive sounds were assumed to be emitted during all daytime, evening and nighttime periods.

The operating profiles outlined above were assumed in determining the one-hour equivalent sound level, L_{EQ}, for a predictable worst-case daytime and nighttime hour at the facades of the proposed mixed-use development.

The calculations consider the acoustical effects of distance and shielding by the buildings. The unmitigated sound levels due to the rooftop mechanical equipment at the closest neighbouring residences are summarized in the following table.

5.2 Results

Steady Sound Levels

The calculations consider the acoustical effects of distance and shielding by the buildings. The predicted sound levels due to the trucking activities (arriving, idling of engines, running of reefer units and departing and buses at the GO station) and mechanical equipment at the closest residences (R1 to R5) during a worst-case busiest hour operating scenario along the western façade (most exposed façade), are summarized in the following table and shown on Figure 21 and 22. Sound levels included in Table XII include the worst case along the respective building/façade.:

Table XII: Predicted Steady Sound Levels (L_{EQ-1HR}) at Residential Receptors during a Worst-case Operating Scenario hour

Receptor	Building	Western Façade	Criteria Day / Night (dBA)	Predicted	
				Daytime & Evening (7:00 to 23:00)	Nighttime (23:00 to 7:00)
R1	D	Podium	50/45	52	52
		Tower	53/47	51	51
R2	C	Podium	55/48	54	54
		Tower	52/46	53	52
R3	B	Podium	54/46	52	52
		Tower	52/45	51	51
R4	A	Podium	50/45	51	51
		Tower	50/45	49	49
R5	G	Podium	51/45	44	44
		Tower	50/45	47	47

Note: If the area is designated as Class 4, higher criteria applies: OLA 55 dBA (07:00 – 23:00), 60 dBA from 07:00 – 23:00 and 55 dBA from 23:00 – 07:00.

The results of this analysis indicate that the predicted steady sound levels due to truck passbys, idling truck engines, and operation of reefers and operation of the buses at the GO bus loop may be in excess of the background sound level criteria during the nighttime hours by up to 7 dBA considering a worst-case operation scenario. Sound levels are due to the activity at the bus loop which is the closest noise source.

Impulse Sound Levels

Impulsive noises are assessed separately from the steady sound sources. This was calculated based on measurements conducted by HGC Engineering for similar past projects. Sound levels included in tables include the worst case along the respective building/façade.:

Table XIII: Predicted Impulsive Sound Levels (L_{EQ-1HR}) at Residential Receptors during a Worst-case Operating Scenario hour due to Logistics Facility to the West

Receptor	Building	West Façade	Criteria Day / Night (dBAI)	Predicted (dBAI)	
				Daytime & Evening (7:00 to 23:00)	Nighttime (23:00 to 7:00)
R1	D	Podium	50/45	48	44
		Tower	53/47	45	42
R2	C	Podium	55/48	49	45
		Tower	52/46	47	43
R3	B	Podium	54/46	48	45
		Tower	52/45	47	43
R4	A	Podium	50/45	48	44
		Tower	50/45	46	42
R5	G	Podium	51/45	46	41
		Tower	50/45	44	40

Note: If the area is designated as Class 4, higher criteria applies: OLA 55 dBA (07:00 – 23:00), 60 dBA from 07:00 – 23:00 and 55 dBA from 23:00 – 07:00.

The results of this analysis indicate that the predicted impulsive sound levels due to the Logistic Facility to the west are within the background sound levels. Figure 23 provides the sound levels.

Table XIV: Predicted Impulsive Sound Levels (L_{EQ-1HR}) at Residential Receptors during a Worst-case Operating Scenario hour due to Cold Storage to the Northwest

Receptor	Building	West Façade	Criteria Day / Night (dBAI)	Predicted (dBAI)	
				Daytime & Evening (7:00 to 23:00)	Nighttime (23:00 to 7:00)
R1	D	Podium	50/45	49	49
		Tower	53/47	47	47
R2	C	Podium	55/48	50	50
		Tower	52/46	48	48
R3	B	Podium	54/46	48	48
		Tower	52/45	47	47
R4	A	Podium	50/45	47	47
		Tower	50/45	45	45
R5	G	Podium	51/45	47	47
		Tower	50/45	45	45

Note: If the area is designated as Class 4, higher criteria applies: OLA 55 dBA (07:00 – 23:00), 60 dBA from 07:00 – 23:00 and 55 dBA from 23:00 – 07:00.

The results of this analysis indicate that the predicted impulsive sound levels due to the cold storage facility has the potential to be above the background sound level criteria at the west facades of Building A and B by up to 4 dBA during the nighttime hours, as shown in Figure 24.

Table XV: Predicted Impulsive Sound Levels (L_{EQ-1HR}) at Residential Receptors during a Worst-case Operating Scenario hour due to Sofina Foods to the Northwest

Receptor	Building	West Façade	Criteria Day / Night (dBAI)	Predicted (dBAI)	
				Daytime & Evening (7:00 to 23:00)	Nighttime (23:00 to 7:00)
R1	D	Podium	50/45	44	44
		Tower	53/47	42	42
R2	C	Podium	55/48	45	45
		Tower	52/46	43	43
R3	B	Podium	54/46	44	44
		Tower	52/45	42	42
R4	A	Podium	50/45	43	43
		Tower	50/45	41	41
R5	G	Podium	51/45	41	41
		Tower	50/45	<40	<40

Note: If the area is designated as Class 4, higher criteria applies: OLA 55 dBA (07:00 – 23:00), 60 dBA from 07:00 – 23:00 and 55 dBA from 23:00 – 07:00.

The results of this analysis indicate that the predicted impulsive sound levels due to Sofina Foods are expected to be below the background sound level criteria at the westerly of the residential buildings. The sound levels are less than the MECP criteria during the daytime hours and at the remaining receptors as shown in Figure 25.

5.3 Results with Alternative Assumptions

If some or all of the surrounding facilities have higher operational levels during the nighttime than assumed above, greater impacts may be possible. To assess this, sensitivity analysis was conducted based on doubling the assumed nighttime hour truck movements and assuming that rooftop units operate at full capacity for 60 minutes per hour in the middle of the night (ie. Twice as long as the typical nighttime operation assumption above).

Under these alternative assumptions, some moderate impacts of up to 4 dBA are expected in localized areas of the development.

Impacts of this magnitude could potentially be addressed through modifications to the site plan and/or building plans. Confirmation of specific operating parameters for the surrounding industries will require direct discussions with the representatives of those facilities, which is expected to be required in any case before detailed design can commence.

5.4 Discussion and Recommendations with Regard to the Industrial Facilities

A Class 4 designation for the proposed site has been granted as per the Ontario Land Tribunal Case No. OLT-22-003893 decision. A Class 4 area is defined in NPC-300 as:

- is 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.

This designation provides relaxed (higher) daytime and nighttime sound level limits (60 dBA during the day and 55 dBA during the night) from that otherwise permitted in an urban area, for both indoor and outdoor areas. 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 use. Class 4 Areas require formal recognition of the classification by the land use planning authority.

With a Class 4 designation, the following mitigation is required:

1) The building is required to include air conditioning, which is already required for traffic noise for all of the buildings with the exception of Building A.

2) An additional clause is required to be included in the property and tenancy agreements and offers of purchase and sale for all dwelling units with a Class 4 designation:

   Type G:

   "Purchasers/tenants are advised that sound levels due to the adjacent industry are required 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. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."

3) Additionally, upgraded building and glazing constructions are recommended for all dwellings with a Class 4 designation as recommended in Table V.

With the above mitigation measures in place and a Class 4 designation, the predicted sound levels due to the surrounding stationary noise sources under a worst-case operational scenario will meet the Class 4 criteria.

6 Summary of Recommendations

The following recommendations are provided in regard to noise mitigation.

Transportation Noise

1. Central air conditioning is required for the majority of buildings and will likely be included in any case.

2. Upgraded building constructions are required for the majority of facades of the proposed buildings as indicated in Section 3.3.3. When detailed floor plans and building elevations are available for each building, an acoustical consultant should revise the glazing constructions based on actual window to floor area ratios.

3. Warning clauses should be included in the property and tenancy agreements and offers of purchase and sale to inform the future owners/residents of the presence of the railway, roadways and the nearby industrial/commercial operations as indicated in Section 3.3.5.

4. When detailed drawings are available and Phasing information is available, at SPA or as a condition, a detailed noise study should be conducted.

5. Tarion's Builder Bulletin (B19R) requires that the internal design of condominium projects integrates suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the buildings on its residents. If B19R certification is needed, an acoustical

consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself are maintained within acceptable levels. Outdoor sound emissions should also be checked to ensure compliance with the City's by-law.

Stationary Noise

6. A Class 4 designation has been granted for the site. Noise from surrounding stationary noise sources are expected to be below the applicable Class 4 sound level limits. Upgraded glazing is required as included in Table V.

7. When detailed floor plans and building elevations are available for the residential buildings, an acoustic consultant shall verify the incorporation of the required mitigation measures for stationary noise at the north, east and south to Class 4 limits.

8. To address the potential for audible sound from the nearby light industrial/office facilities, railway yard, and nuisance sources, specific noise warning clauses are required as indicated throughout the noise report.

7 Conclusions

Based on the assessment presented herein, the conceptual development proposal is feasible from a noise impact perspective. Transportation noise can be mitigated by standard building envelope assemblies. Preliminary noise modelling of the nearby industries indicates results to be within criteria at the majority of residential facades, with the exception of the westerly facades of the podium and tower of the proposed buildings closest to the bus loop and warehousing facilities during facilities nighttime hours. No specific mitigation is required to meet Class 4 sound level limits as granted by the land use planning authority. Detailed noise studies are recommended for each building and each phase as the development proposal proceeds.

Limitations

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Any conclusions and/or recommendations herein reflect the judgment of HGC Engineering based on information available at the time of preparation, and were developed in good faith on information provided by others, as noted in the report, which has been assumed to be factual and accurate. Changed conditions or information occurring or becoming known after the date of this report could affect the results and conclusions presented.

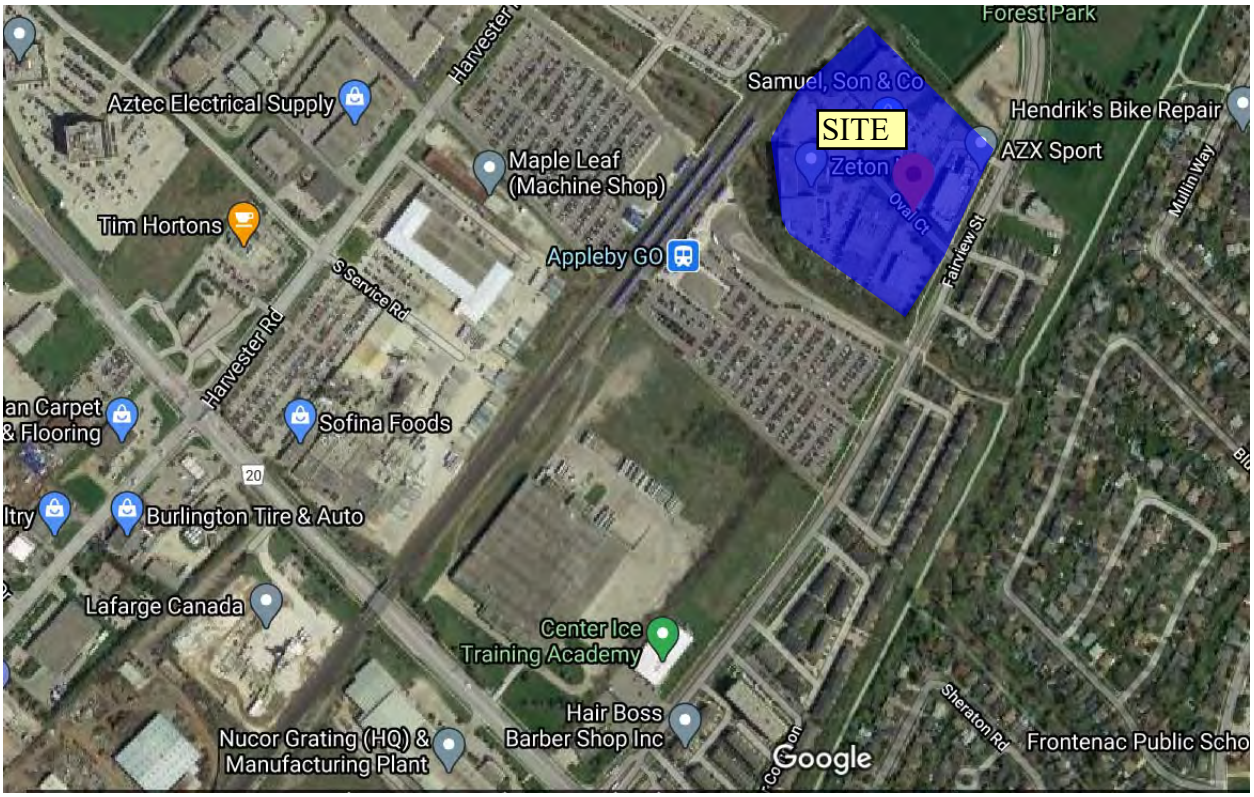


Figure 1 - Key Plan

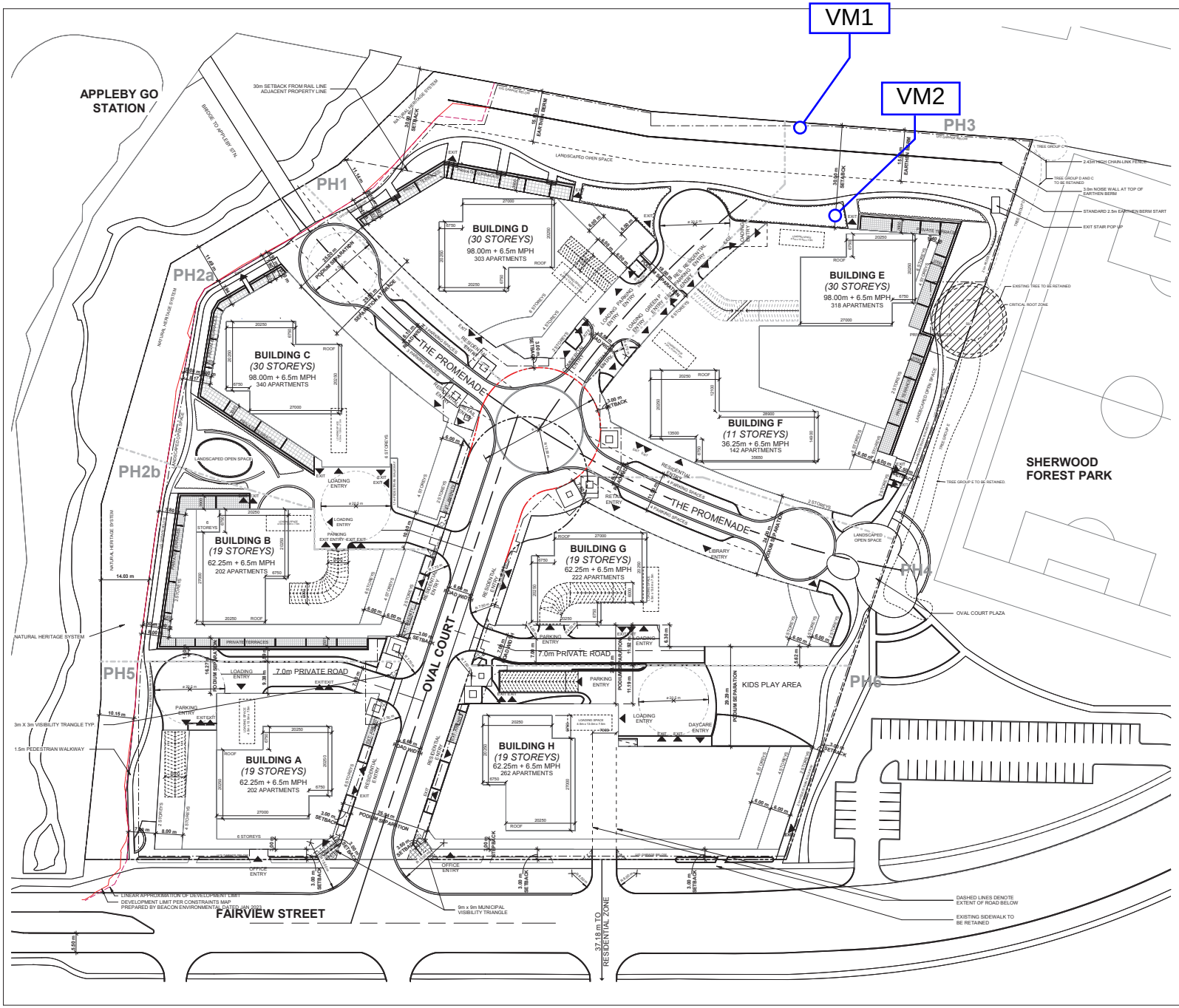


Figure 2 - Proposed Site Plan

NO.	REVISIONS	DATE
0	ISSUED FOR ZBA/OPA	21 OCT, 2022
1	ISSUED FOR INFORMATION	27 JAN, 2022
2	ISSUED FOR ZBA/OPA	14 MAY, 2021

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DRAWN	KP
SCALE	1 : 500
CHECKED	CW
DATE	FEBRUARY 02, 2023
TITLE	SITE PLAN
PROJECT NO.	20-145
DRAWING NO.	A-101

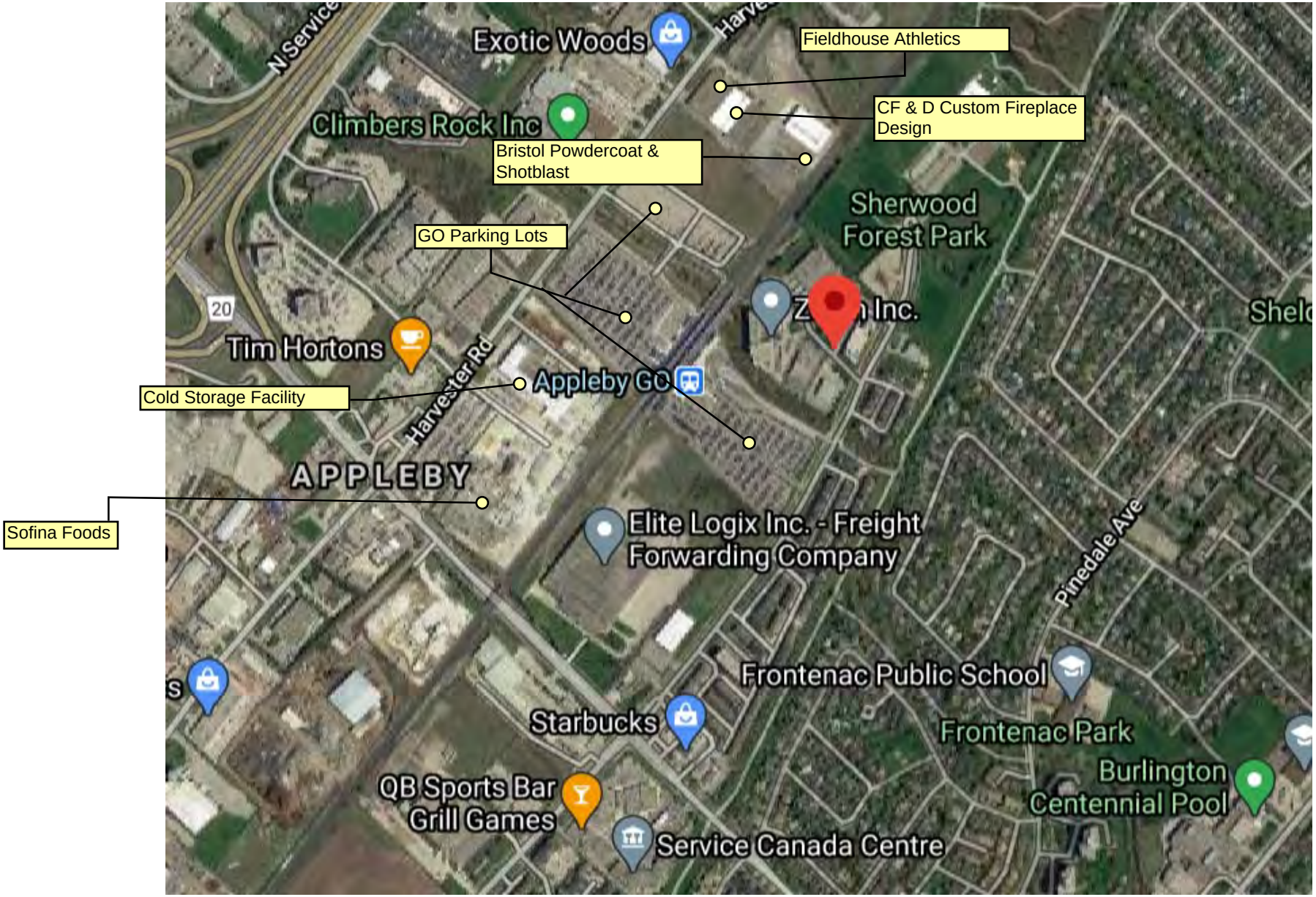


Figure 3 - Aerial Photo Indicating Surrounding Land Uses

Figure 4a: Pass-by 1 at 30 m from ROW
Measured Vibratory Velocity Level

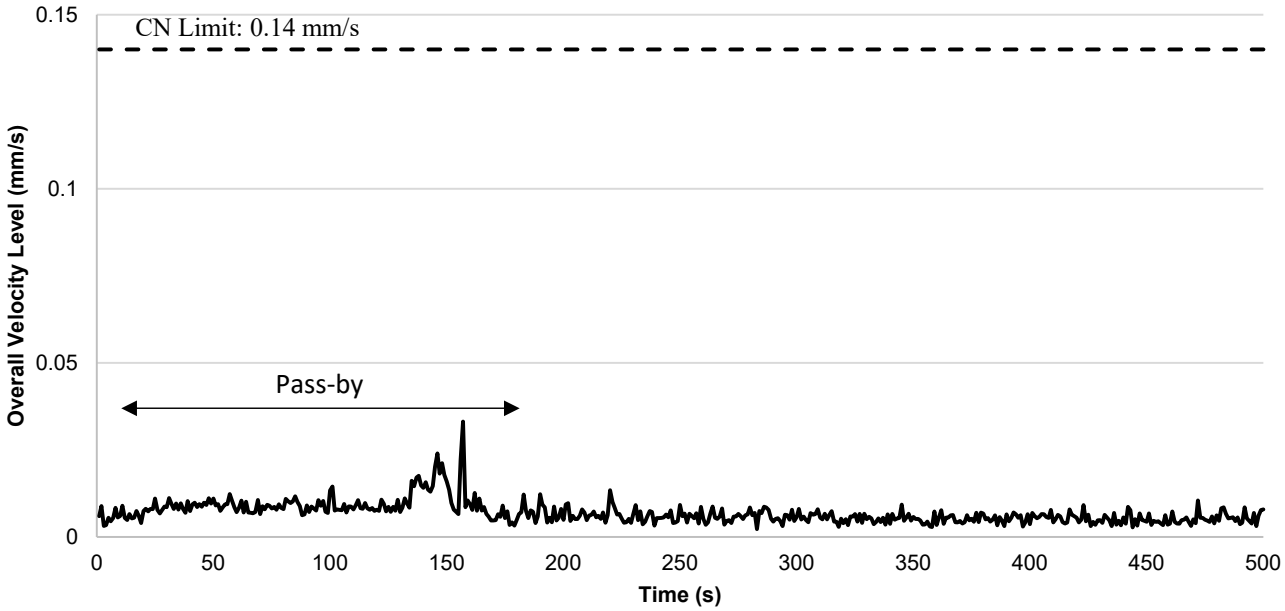


Figure 4b: Pass-by 1
Acceleration Spectrum @ Peak Level (1 sec. Duration)

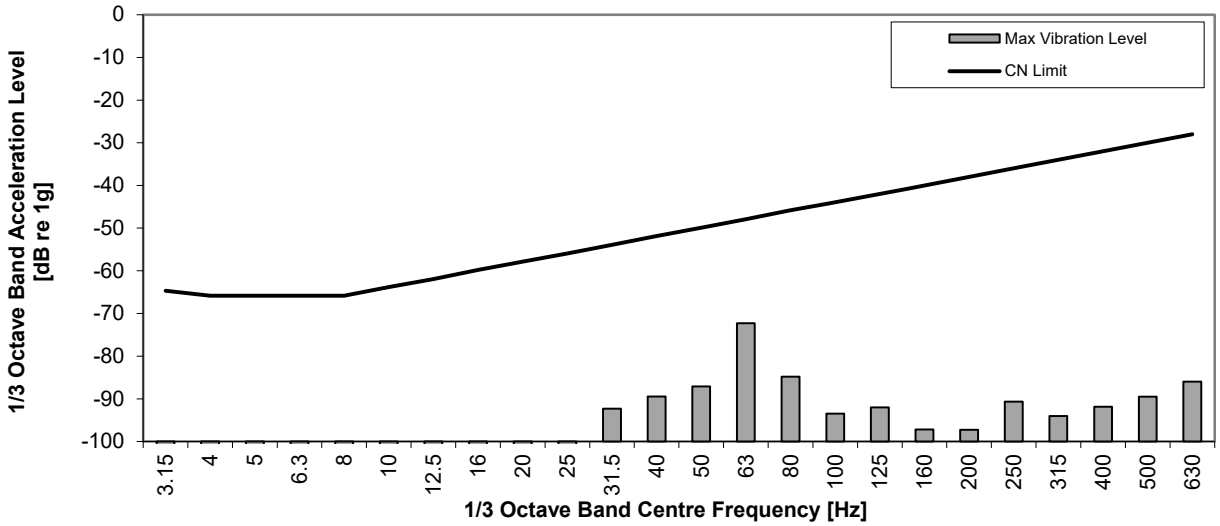


Figure 5a: Pass-by 2 at 30 m from ROW
Measured Vibratory Velocity Level

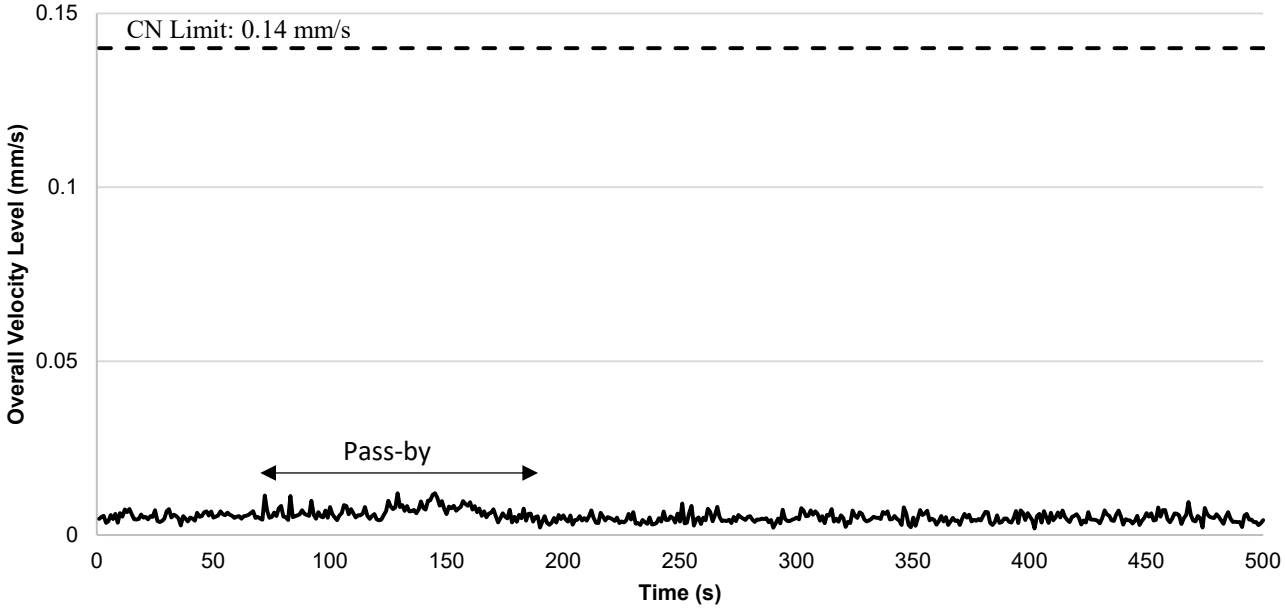


Figure 5b: Pass-by 2
Acceleration Spectrum @ Peak Level (1 sec. Duration)

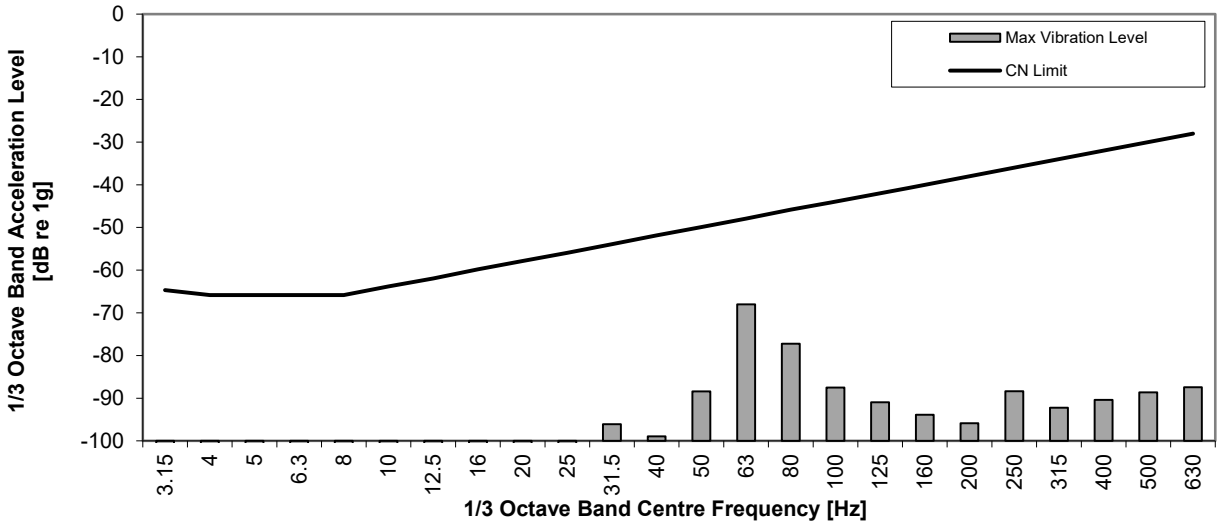


Figure 6a: Pass-by 7 at 30 m from ROW
Measured Vibratory Velocity Level

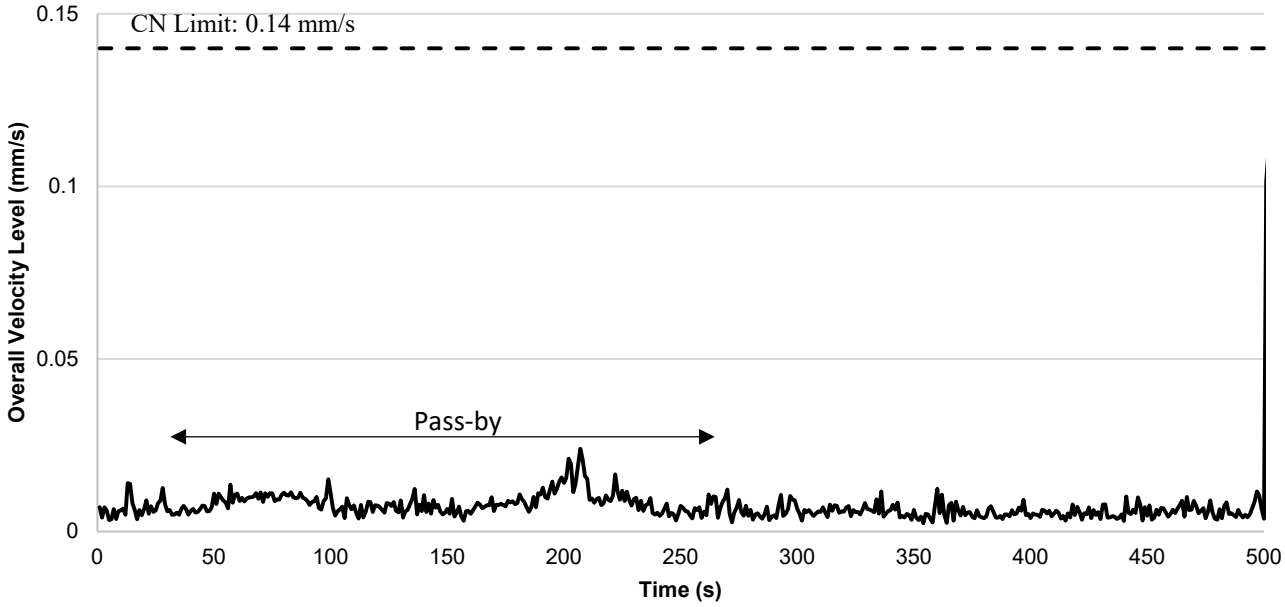


Figure 6b: Pass-by 7
Acceleration Spectrum @ Peak Level (1 sec. Duration)

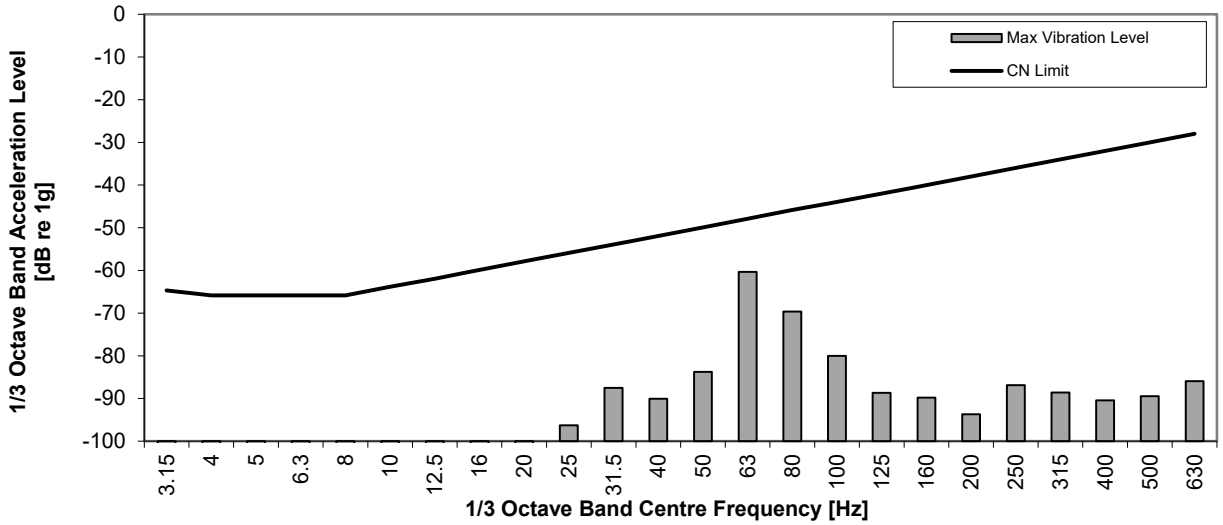


Figure 7a: Pass-by 8 at 3 m from ROW
Measured Vibratory Velocity Level

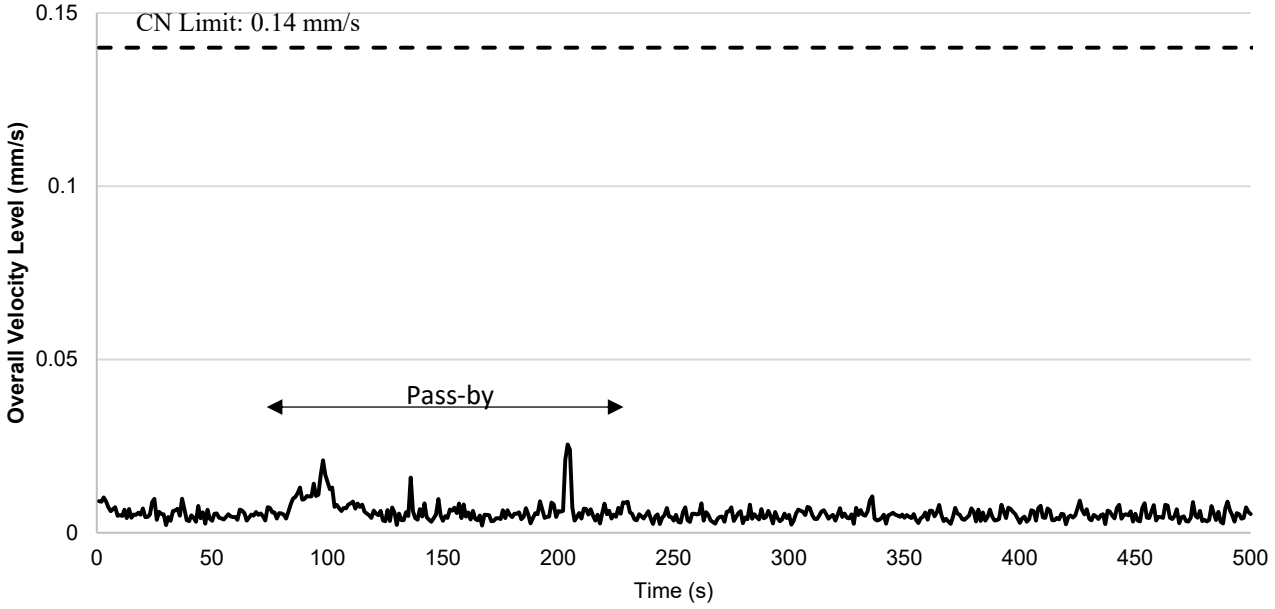


Figure 7b: Pass-by 8
Acceleration Spectrum @ Peak Level (1 sec. Duration)

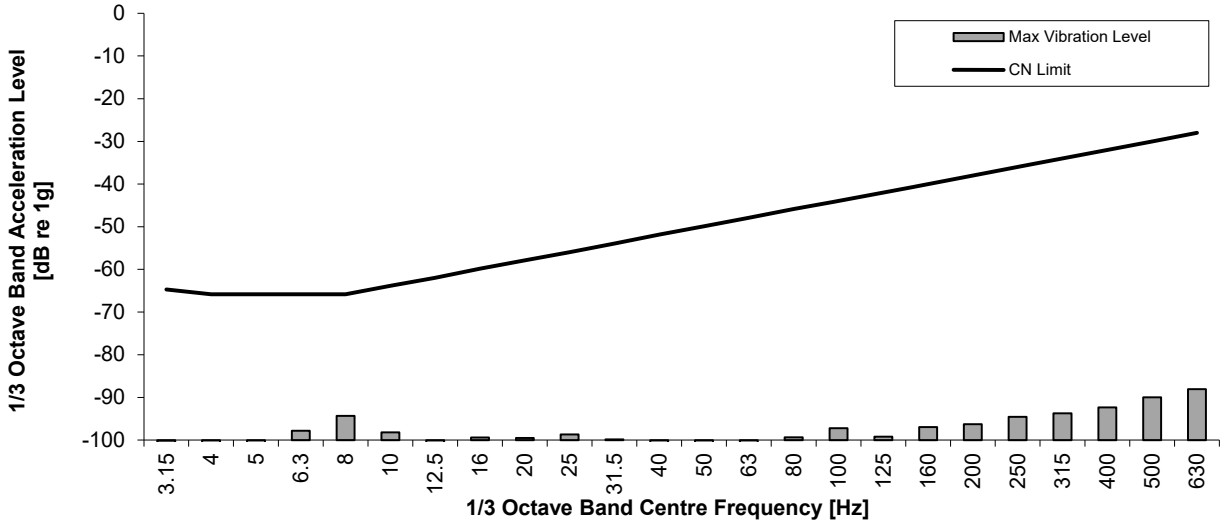


Figure 8a: Pass-by 9 at 3 m from ROW
Measured Vibratory Velocity Level

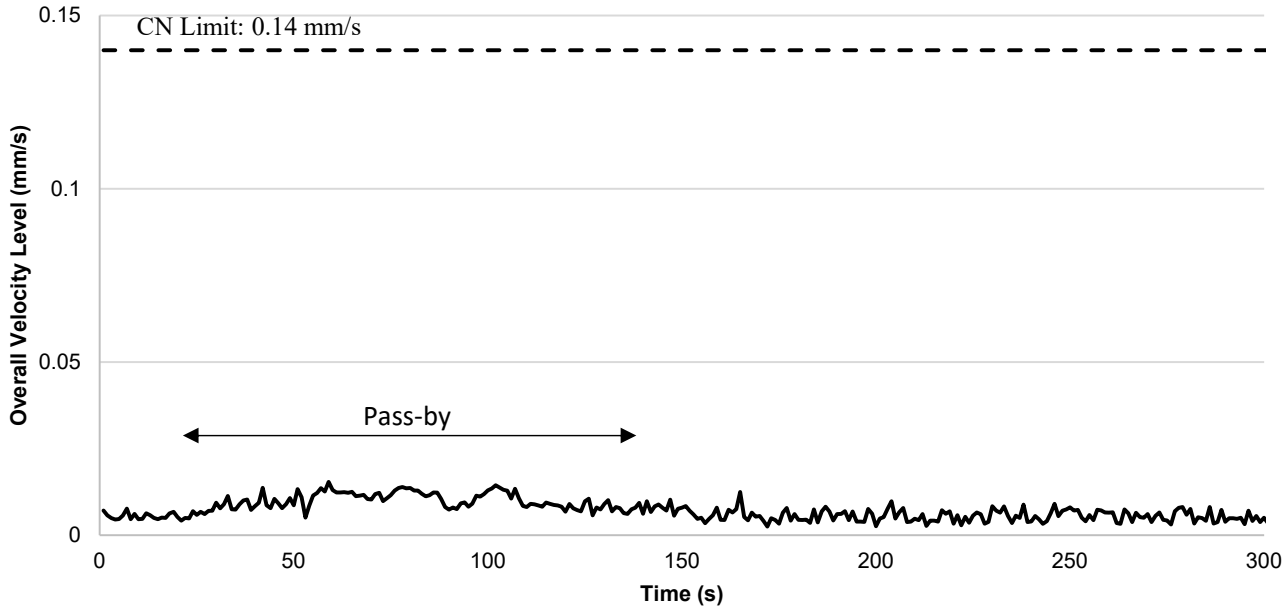


Figure 8b: Pass-by 9
Acceleration Spectrum @ Peak Level (1 sec. Duration)

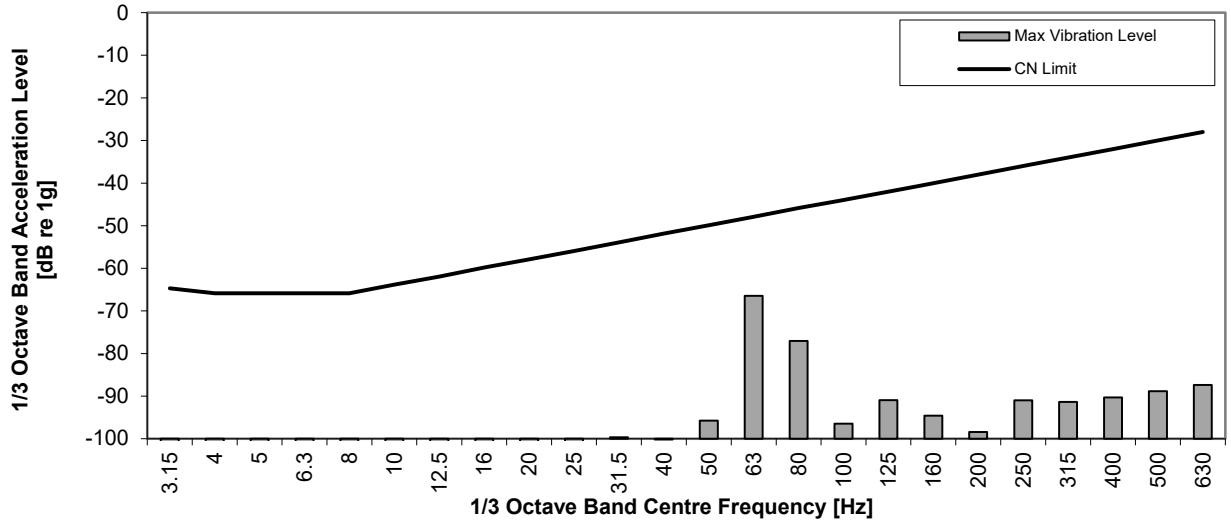


Figure 10a: Pass-by 1 at 3 m from ROW
Measured Vibratory Velocity Level

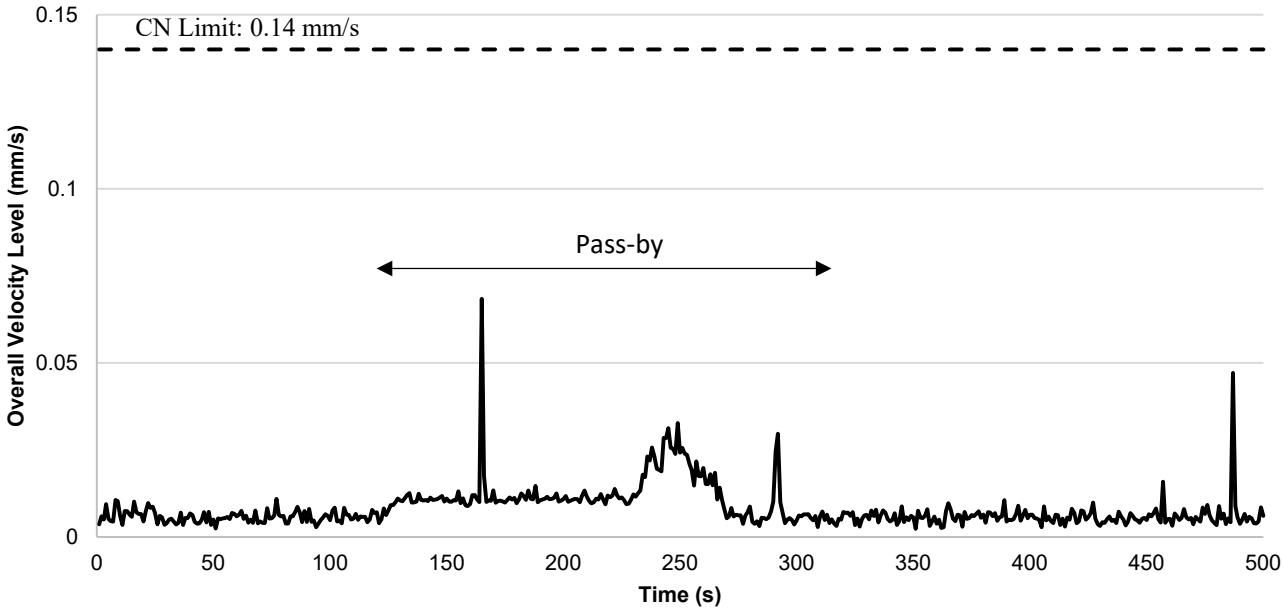


Figure 10b: Pass-by 1
Acceleration Spectrum @ Peak Level (1 sec. Duration)

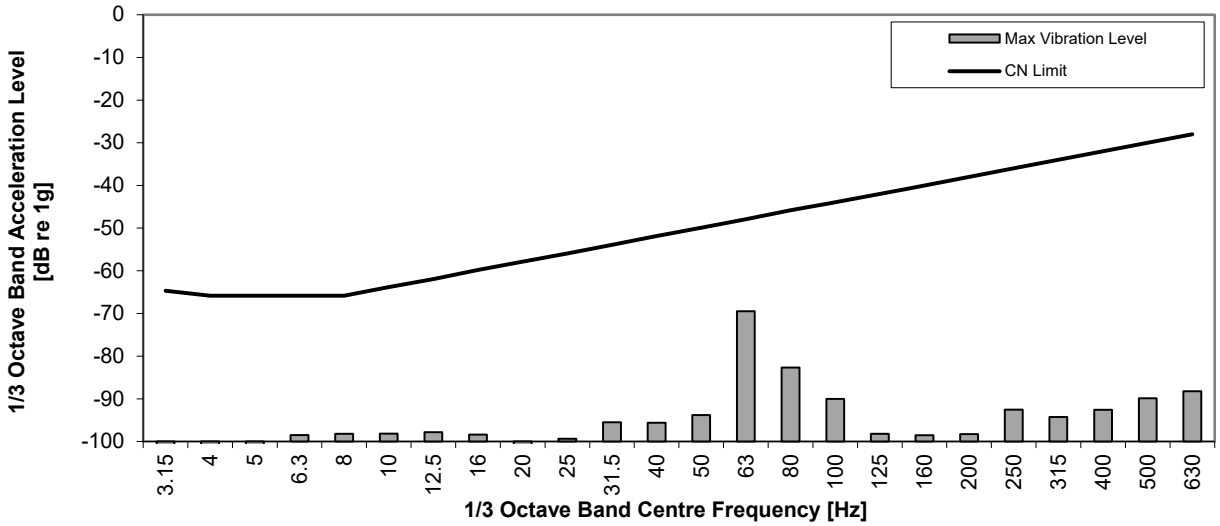


Figure 11a: Pass-by 2 at 3 m from ROW
Measured Vibratory Velocity Level

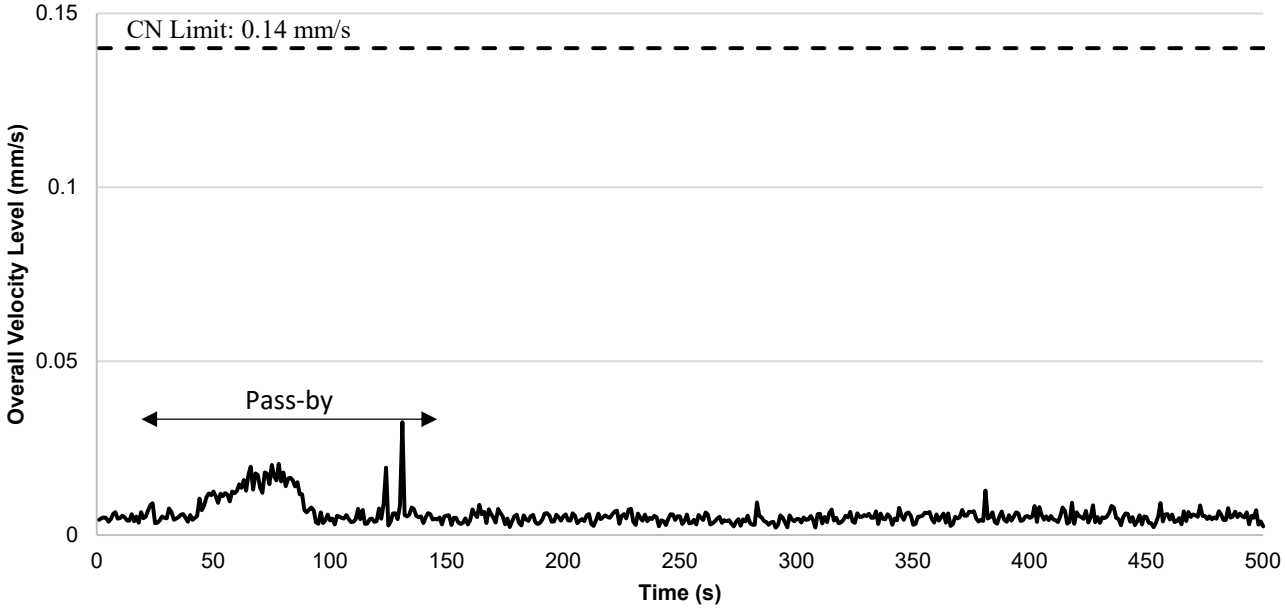


Figure 11b: Pass-by 2
Acceleration Spectrum @ Peak Level (1 sec. Duration)

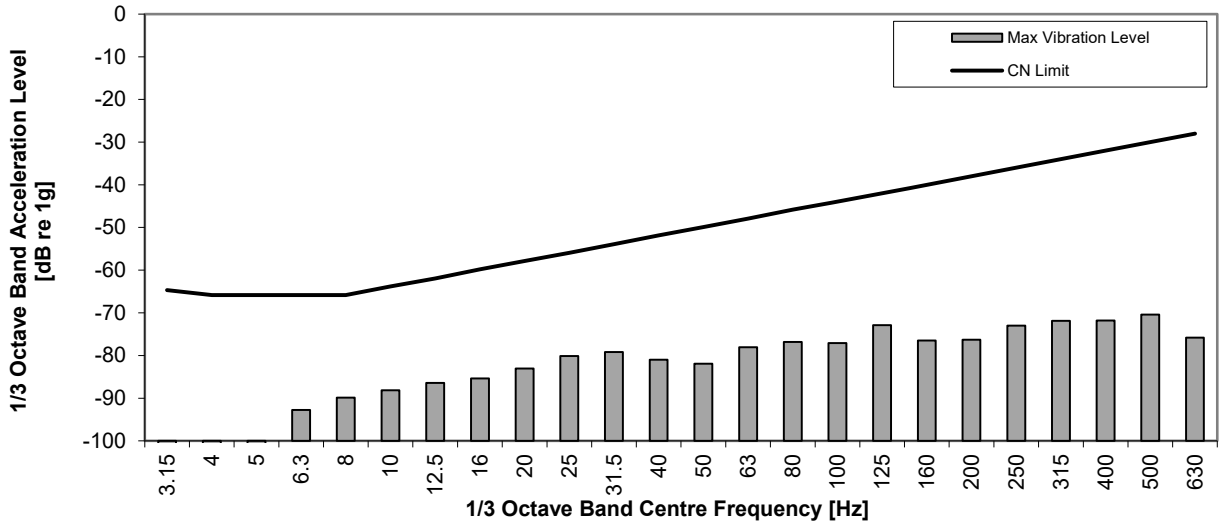


Figure 12a: Pass-by 7 at 3 m from ROW
Measured Vibratory Velocity Level

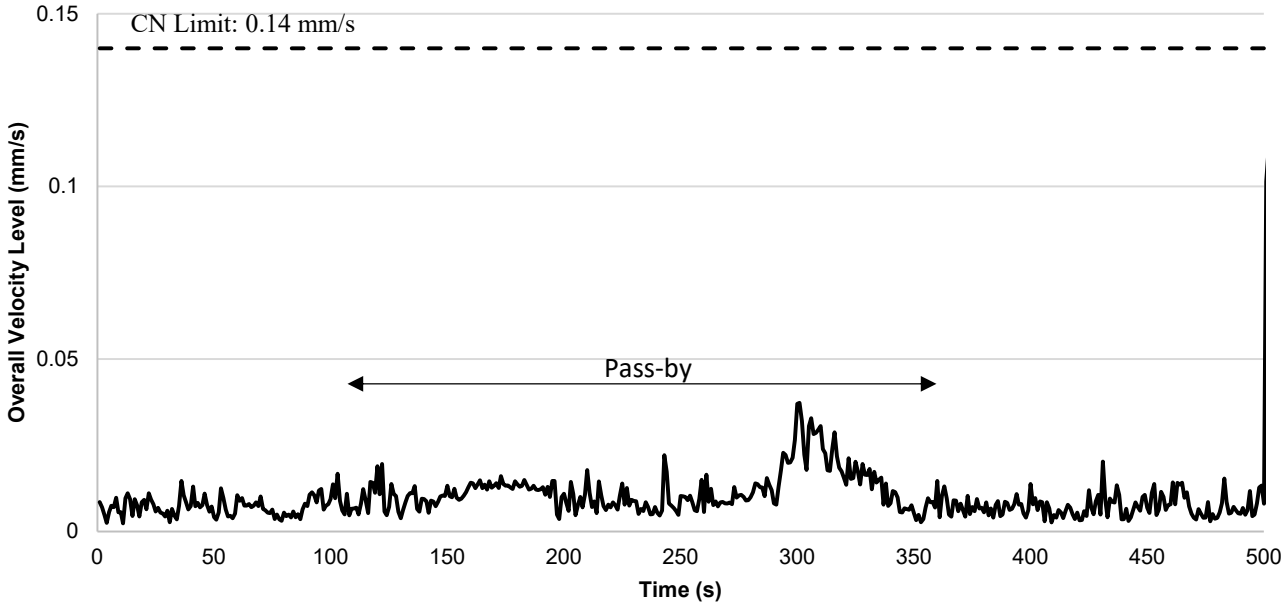


Figure 12b: Pass-by 7
Acceleration Spectrum @ Peak Level (1 sec. Duration)

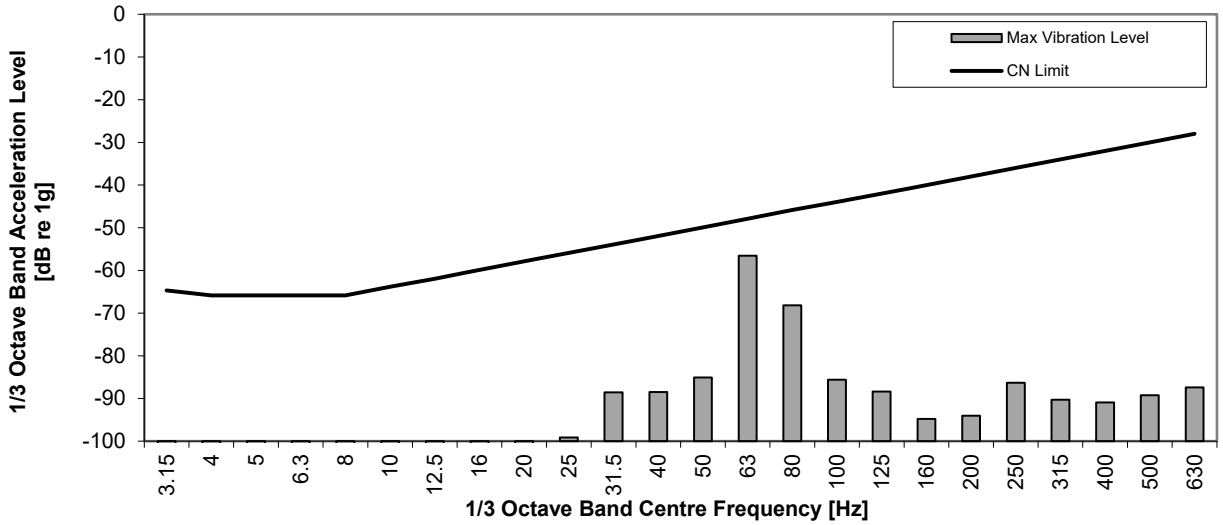


Figure 13a: Pass-by 8 at 3 m from ROW
Measured Vibratory Velocity Level

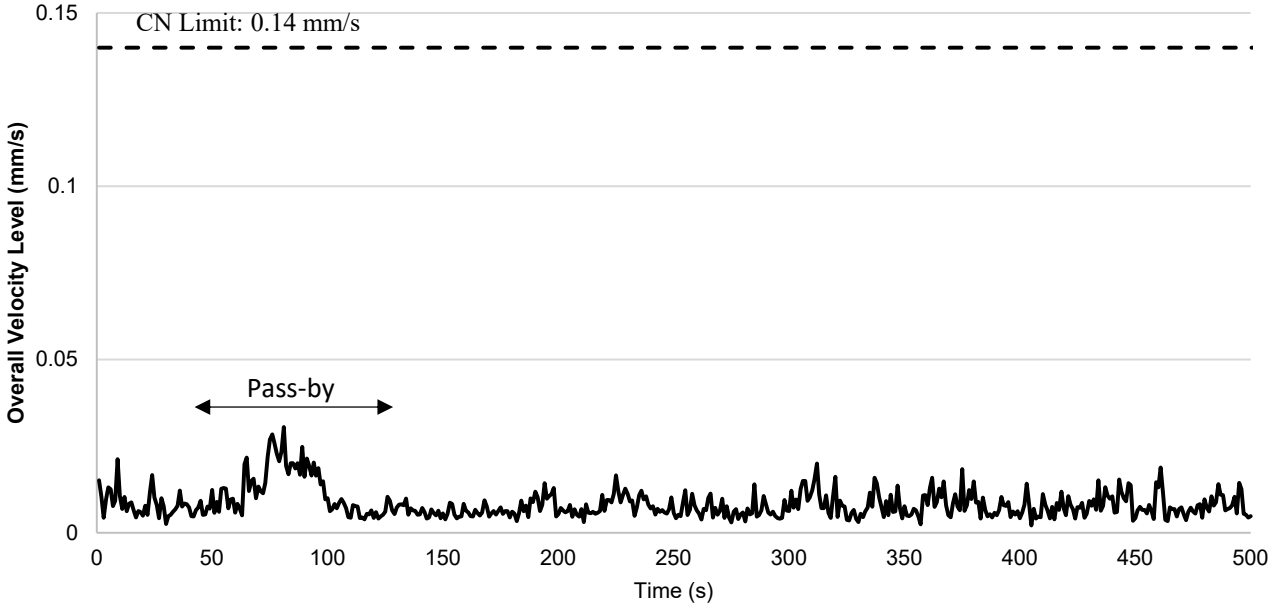


Figure 13b: Pass-by 8
Acceleration Spectrum @ Peak Level (1 sec. Duration)

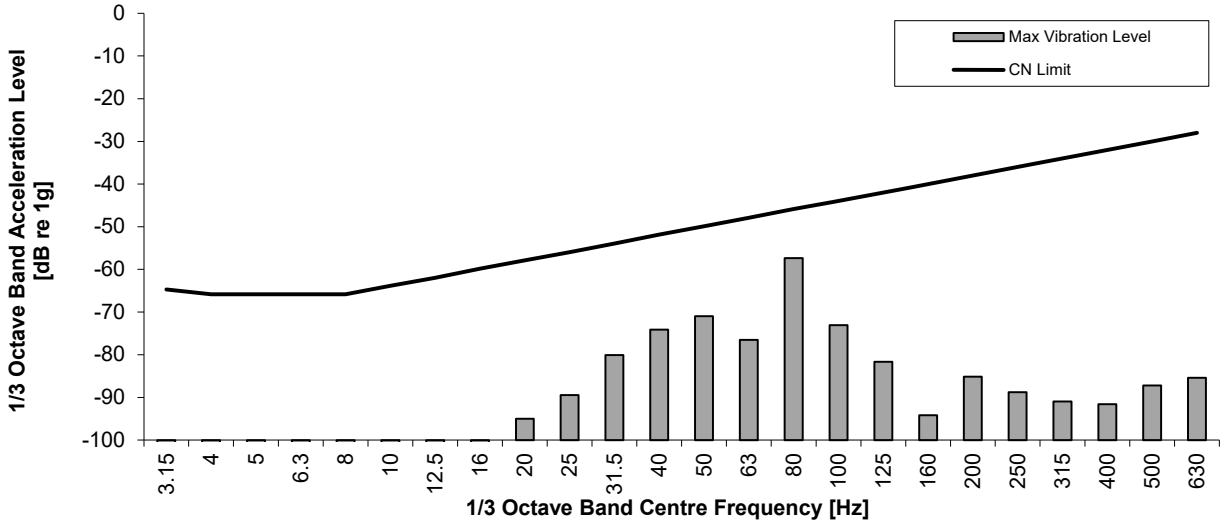


Figure 14a: Pass-by 9 at 3 m from ROW
Measured Vibratory Velocity Level

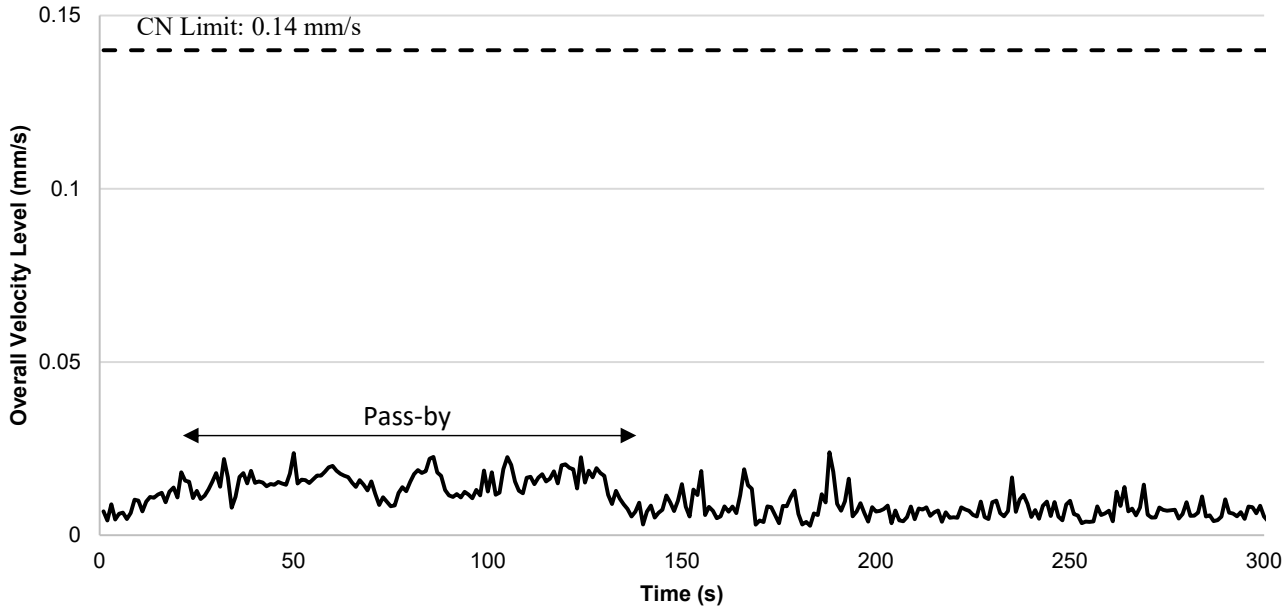


Figure 14b: Pass-by 9
Acceleration Spectrum @ Peak Level (1 sec. Duration)

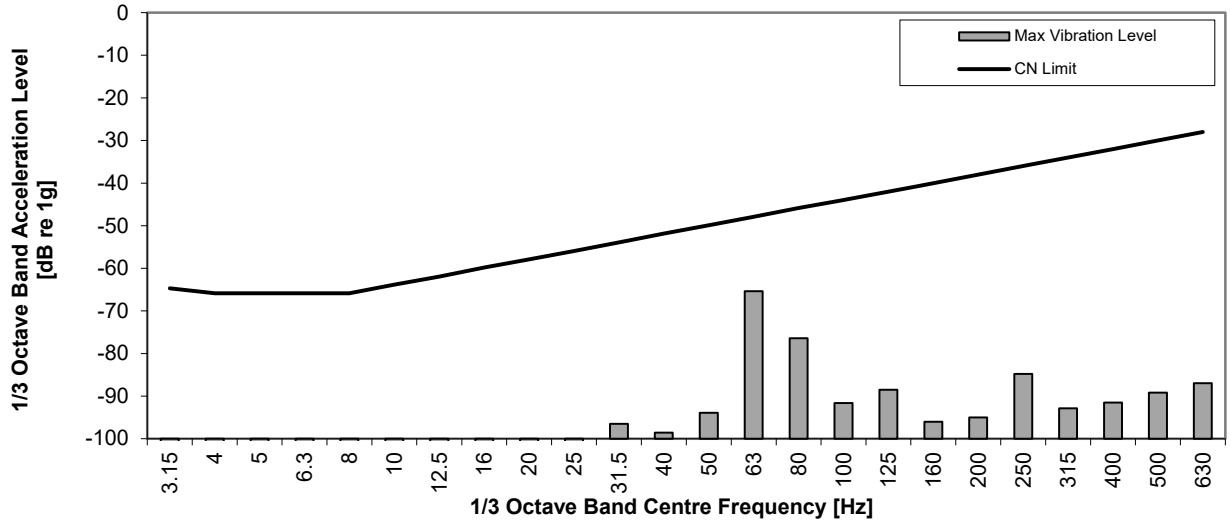




Figure 16 - Influence Areas According to MECP D6 Guidelines



Figure 17 - Distance to Industries on Zoning Map



Figure 18: Aerial Photo Showing Receptor Locations

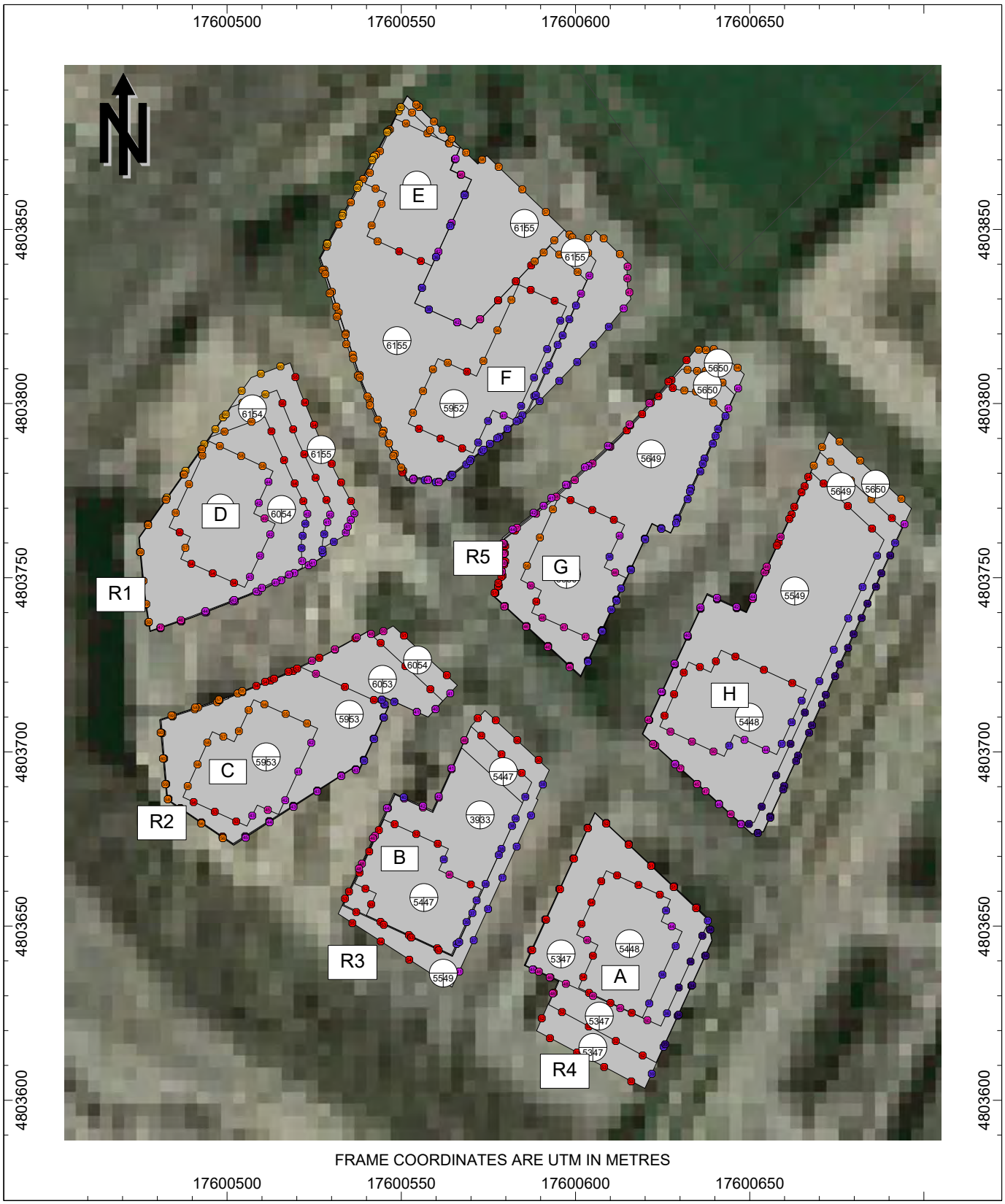


Figure 19: Minimum Daytime Hour Sound Levels, dBA

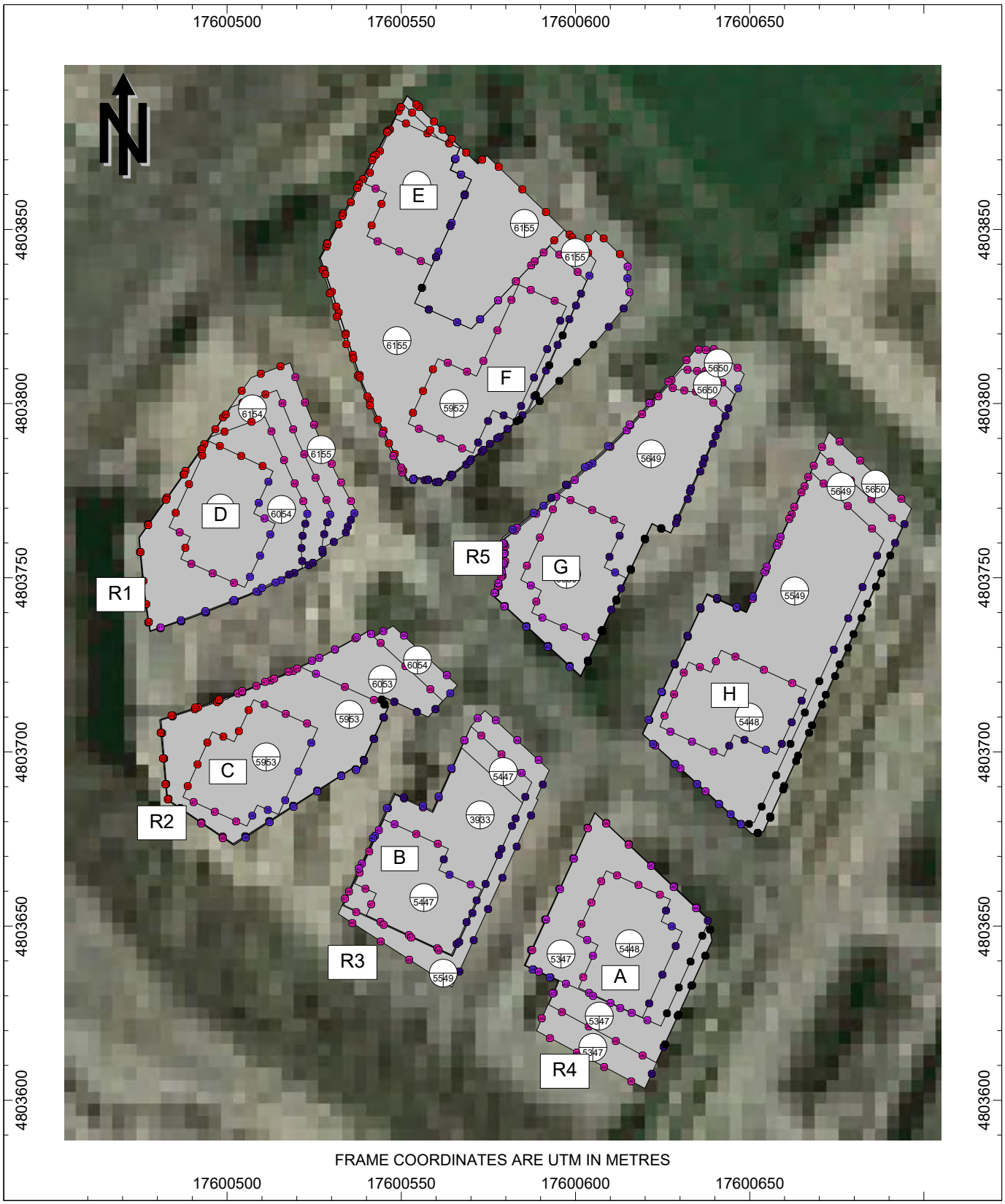


Figure 20: Minimum Nighttime Hour Sound Levels, dBA

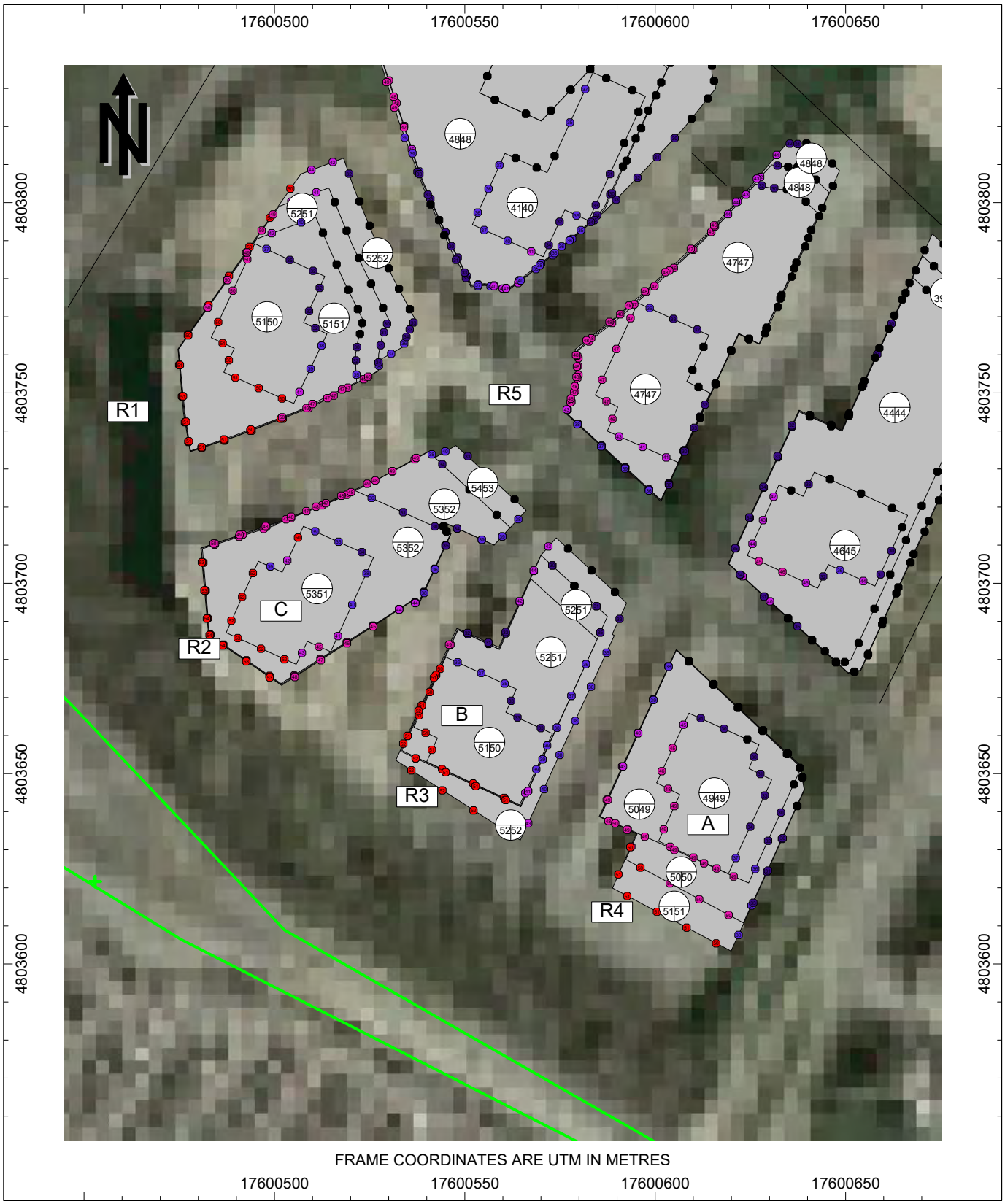


Figure 21: Sound Levels Due to Steady Stationary Noise Sources, Daytime

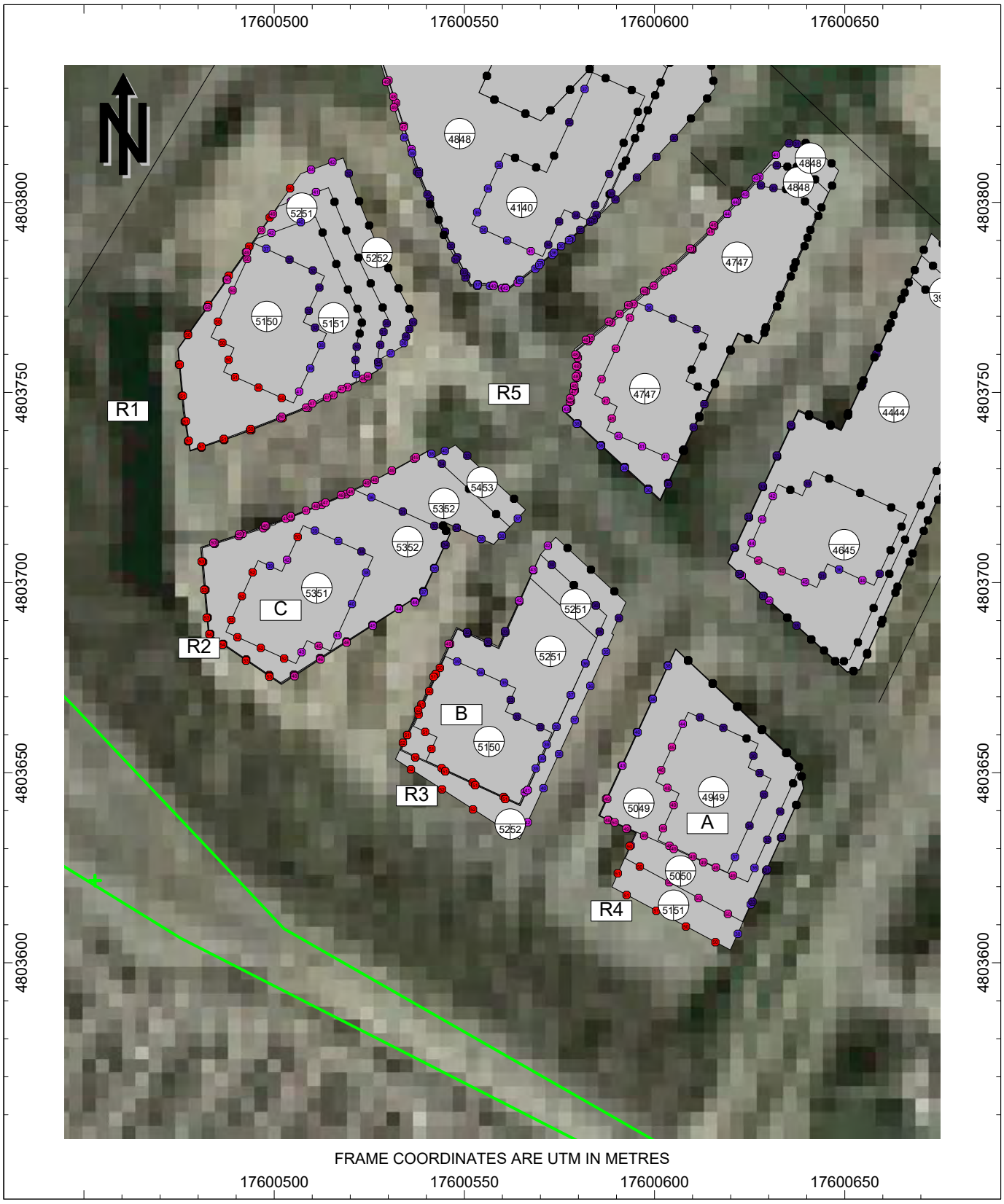


Figure 22: Sound Levels Due to Steady Stationary Noise Sources, Nighttime

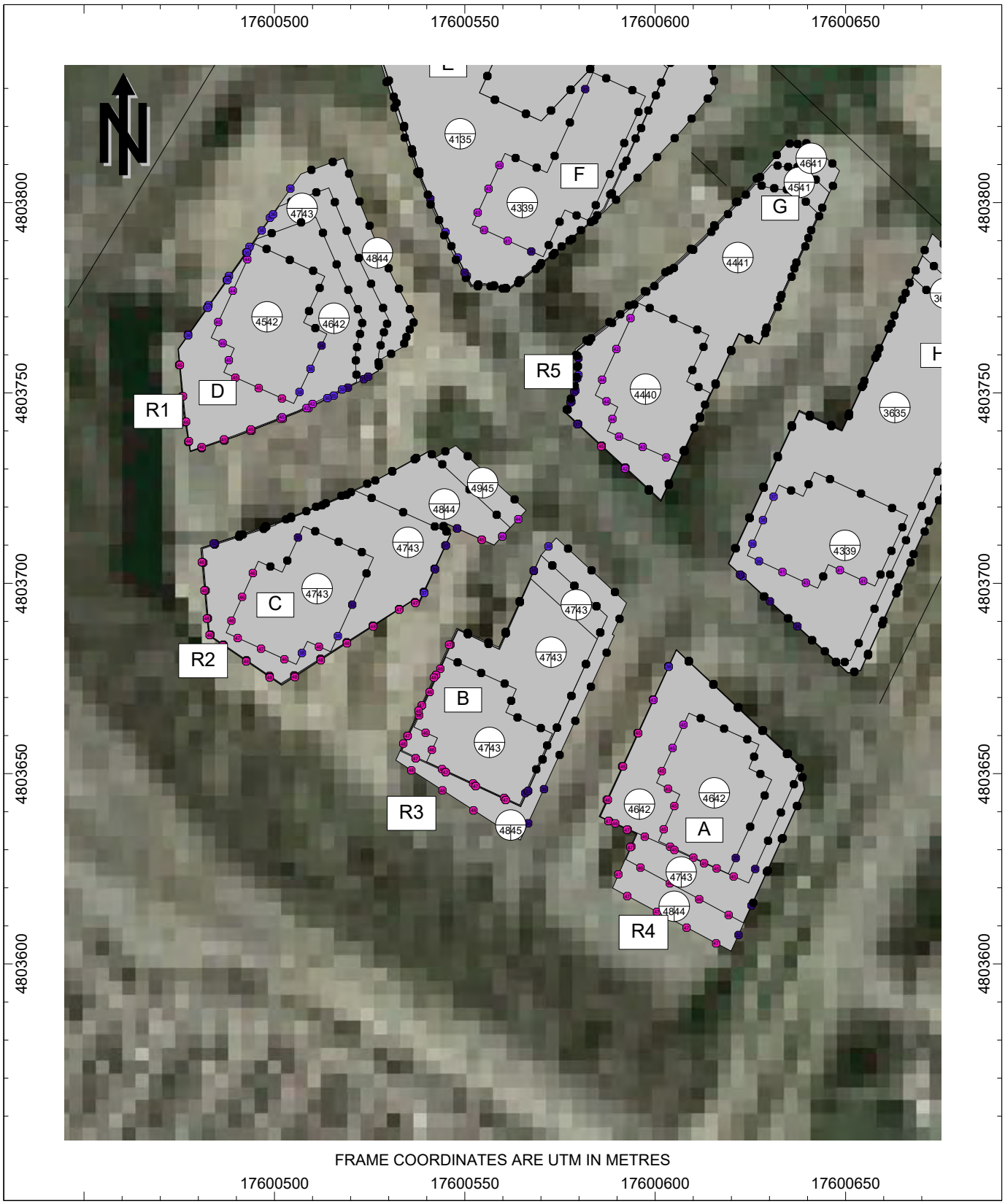


Figure 23: Sound Levels Due to Impulsive Stationary Noise Sources from the Logistics Facility

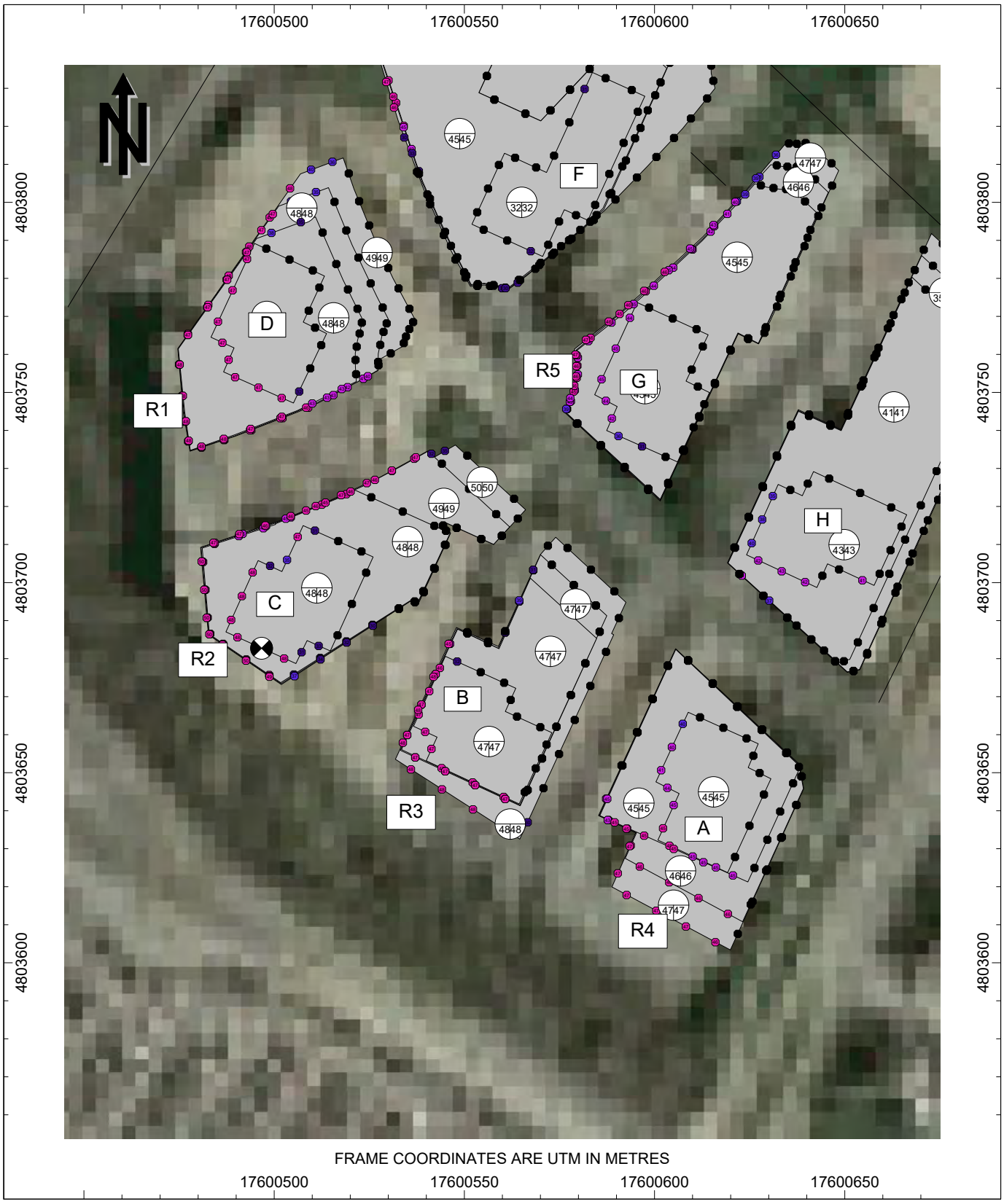


Figure 24: Sound Levels Due to Impulsive Stationary Noise Sources from the Cold Storage Facility

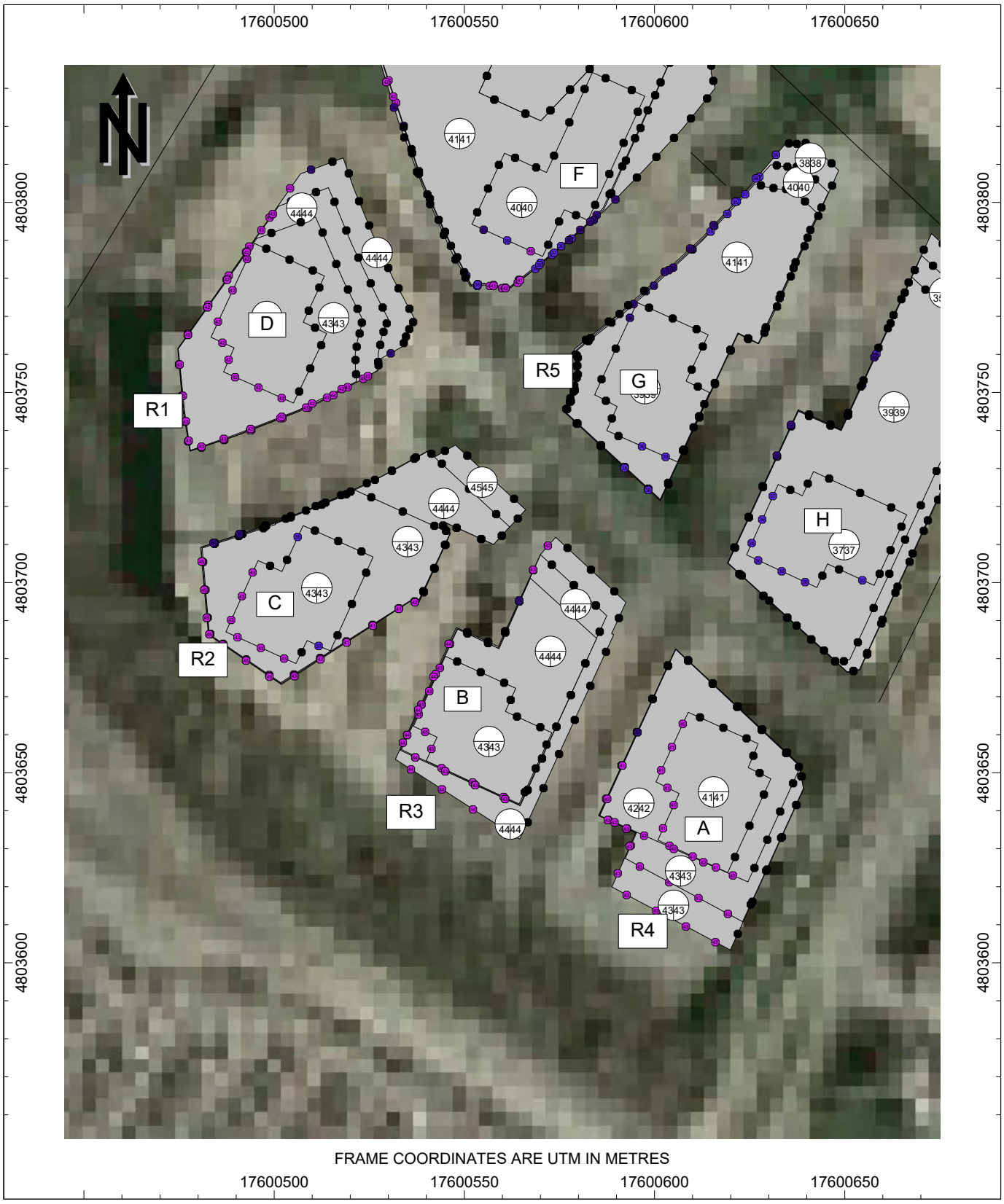
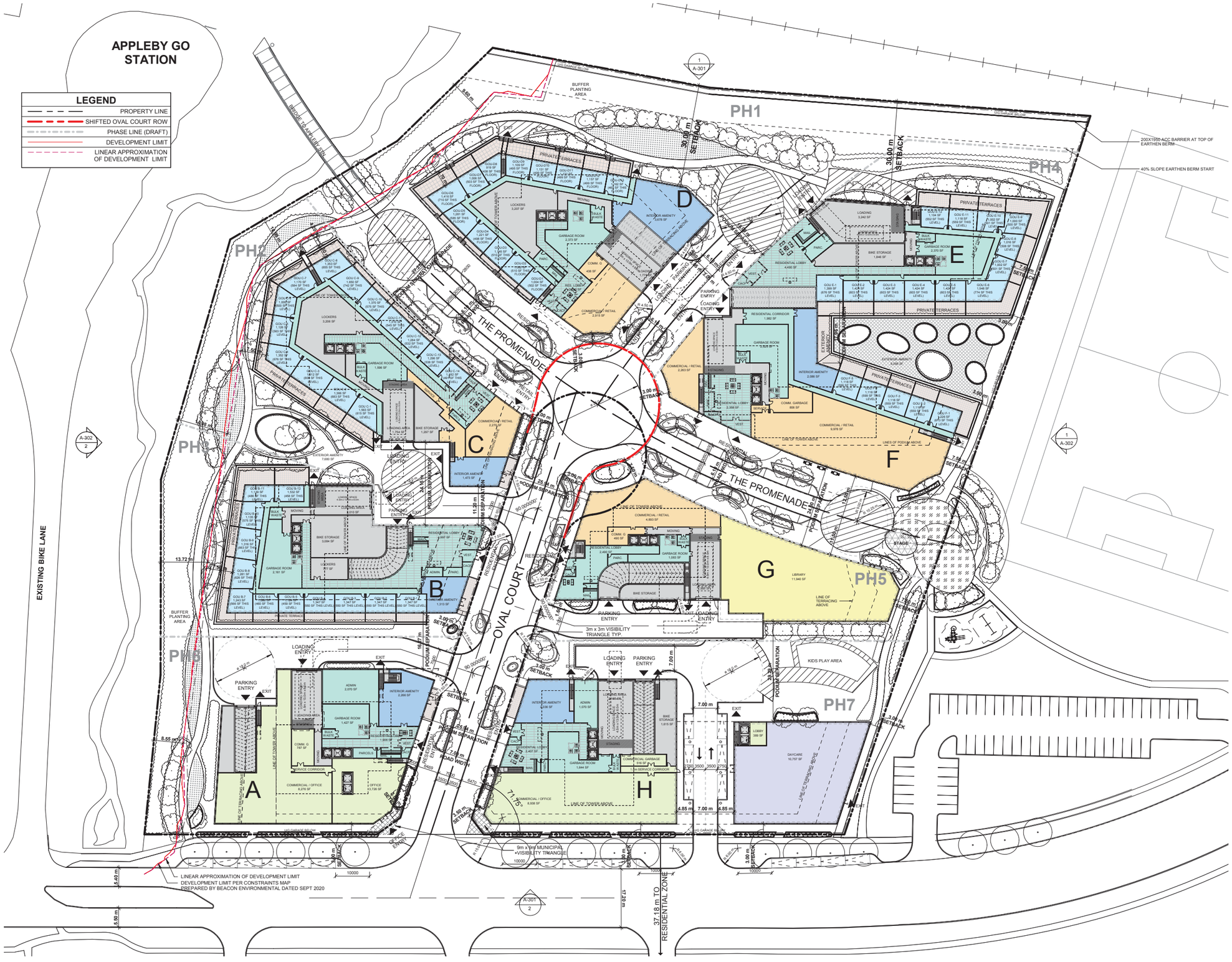


Figure 25: Sound Levels Due to Impulsive Stationary Noise Sources from Sofina Foods

APPENDIX A

Supporting Information



OVAL COURT

720, 735, 740 OVAL CT.
& 5135, 5155 FAIRVIEW ST.

BURLINGTON ON L7L 6A9

NO.	REVISIONS	DATE
1	ISSUED FOR ZBA/OPA	APRIL ??, 2021

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CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS ON THE JOB.

ISSUED FOR COORDINATION

GROUND LEVEL PLAN

MARCH 22, 2021

SCALE 1 : 500

A-201

CORE

CORE ARCHITECTS INC
130 Queens Quay East Suite 700
Toronto ON Canada M5A 0P6

Tel 416 343 0400
Fax 416 343 0401
info@corearchitects.com
COREARCHITECTS.COM

CONTENT COPY OF ORIGINAL

Ontario

Ministry of the Environment **Ministère de l'Environnement**

AMENDED CERTIFICATE OF APPROVAL
AIR
NUMBER 4494-685MWW

Maple Leaf Foods Inc.
PO Box 5091 Station LCD 1
Burlington, Ontario
L7R 4R3

Site Location: 821 Appleby Line
Burlington City, Regional Municipality of Halton, Ontario

You have applied in accordance with Section 9 of the Environmental Protection Act for approval of:

a pork processing facility comprising the live animals holding area, stunning and slaughtering area, dehairing/singeing area, evisceration area, dressing/facing area, cooling/storage area, cutting area and packaging shipping area and including the following equipment venting to the atmosphere:

- one (1) general exhaust system, No. Ex.133, collecting exhausts from existing exhaust systems Nos. Ex.1 to Ex.8 and Ex.127 to Ex.129, to vent emissions from the hog holding area (the "barn"). The system includes a fan and a stack, as outlined in Schedule "A", part of this Certificate;

- one (1) general exhaust system, No. Ex.134, collecting exhausts from existing exhaust systems Nos. Ex.14 to Ex.16, to vent emissions from the front kill/scalding/dehairing area. The system includes a fan and a stack, as outlined in Schedule "A";

- one (1) general exhaust system, No. Ex.135, collecting exhausts from existing exhaust systems Nos. Ex.130 and Ex.131, to vent emissions from the waste water treatment area. The system includes a fan and a stack, as outlined in Schedule "A";

- one (1) general exhaust system, No. Ex.136, collecting exhausts from existing exhaust systems Nos. Ex.95 to Ex.98, to vent emissions from the edible by-product process and area. The system includes a fan and a stack, as outlined in Schedule "A";

- one (1) general exhaust system, No. Ex.137, collecting exhausts from existing exhaust systems Nos. Ex.99A and Ex.106, to vent emissions from the head boning area. The system includes a fan and a stack, as outlined in Schedule "A";

- one (1) stunning tunnel, venting to the atmosphere through an exhaust system, No. Ex.9, including a fan and a stack, as outlined in Schedule "A";

- two (2) general exhaust systems, Nos. Ex.10 and Ex.11, to vent emissions from the singe room. Each system includes a fan and a stack, as outlined in Schedule "A";

- two (2) exhaust systems, Nos. Ex.12 and Ex.13, to vent emissions from the singeing process. Each system includes a fan and a stack, as outlined in Schedule "A";

- four (4) natural gas fired boilers, each having a maximum heat input of 10,600,000 kilojoules per hour, each venting the flue gases to the atmosphere through a stack, Nos. Ex.17 to Ex.20, as outlined in Schedule "A";

- two (2) exhaust systems, Nos. Ex.84 and Ex.117, to vent emissions from the knife sharpening area. Each system includes a fan and a stack, or wall mounted vent, as outlined in Schedule "A";

- two (2) laboratory fume hoods, used for various quality control tests on meat products, Nos. Ex.113 and Ex.114. Each fume hood vents to the atmosphere through a fan and a stack, as outlined in Schedule "A";

- thirty (30) natural gas fired make-up air units, chillers and water heaters, Nos. MAU2 to MAU29 and WH30 and WH31,

located throughout the building and having a total maximum heat input of 55,159,00 kilojoules per hour;

- one (1) general exhaust system, No. Ex.31, to vent emissions from the dressing floor/hog kill area, including a fan and a stack, as outlined in Schedule "A";

- one (1) general exhaust system, No. Ex.32, to vent emissions from the casing room, including a fan and stack, as outlined in Schedule "A";

- four (4) general exhaust systems, Nos. Ex.43 to Ex.47, to vent emissions from the blood room area. Each system includes a fan and a stack, as outlined in Schedule "A";

- two (2) general exhaust systems, Nos. Ex.51 and Ex.52, to vent emissions from the dressing floor area. Each system includes a fan and a stack, as outlined in Schedule "A";

- three (3) exhaust systems, Nos. Ex.59, Ex.60 and Ex.119, to vent emissions from the steam shrink wraping process. Each system includes a fan and a stack, as outlined in Schedule "A";

- two (2) general exhaust systems, Nos. Ex.87 and Ex.88, to vent emissions from the shrink tunnel and packaging area. Each system includes a fan and a stack, as outlined in Schedule "A";

- one (1) general exhaust system, No. Ex.120, to vent emissions from the ham boning area, including a fan and a stack, as outlined in Schedule "A";

- one (1) exhaust system, No. Ex.102, to vent metal fumes from a welding operation for maintenance purposes, using food grade stainless steel welding rods at a maximum rate of 177 grams per hour. The exhaust system includes a fan and a stack, as outlined in Schedule "A";

- one (1) natural ventilation source, No. Ex.132, to vent emissions from the waste water treatment sludge tank;

- one (1) lot of equipment used to provide comfort heating and ventilation to the newly constructed employee facility, which includes change room areas and a cafeteria, as follows:

- five (5) natural gas-fired heating, ventilation and air-condition (HVAC) units, having a total thermal input of 881,000 kilojoules per hour,

- three (3) energy recovery ventilators, as described in Schedule "B",

- four (4) general exhaust systems, as described in Schedule "B"; and

- one (1) lot of equipment and exhaust to serve the chilled meat transfer and holding areas, as described in Schedule "C", as follows:

- four (4) natural gas-fired dehumidification units, designated as EX-N1, EX-N2, EX-N3 and EX-N4, used to reactivate the desiccant wheel with heat,

- one (1) natural gas indirectly fired air make up unit, designated as EX-N5, used to replace exhausted air inside the hog transfer tunnel;

all in accordance with the Applications for Certificate of Approval (Air), one dated May 28, 2004 and signed by Anthony Keough, Maple Leaf Foods Inc. and another dated October 8, 2004 and signed by Dave Reid, P.Eng., Maple Leaf Foods Inc., and all information associated with the applications, including additional information (a CD-ROM with electronic AERMOD-Prime model input and output files) provided by Pinchin Environmental Ltd. on behalf of Maple Leaf Foods Inc. on January 4, 2005, and the additional information contained in facsimiles sent by Paul Geisberger, P.Eng., Pinchin Environmental Ltd. on behalf of Maple Leaf Foods Inc., to Rudolf Wan, P.Eng., Ontario Ministry of the Environment, on January 4, 2005, February 2, 2005, and the facsimiles sent by Nicholas Sylvestre-Williams, Pinchin Environmental Ltd. on behalf of Maple Leaf Foods Inc. to Rudolf Wan, P.Eng., Ontario Ministry of the Environment on February 1, 2005.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions

apply:

1. "Act" means the *Environmental Protection Act*;

2. "AERMOD" means the dispersion model developed by the American Meteorological Society/U.S. Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC) including the PRIME (Plume Rise Model Enhancement) algorithm, used to calculate one-hour average concentrations of a contaminant at the Point of Impingement;

3. "Certificate" means this Certificate of Approval, including Schedule "A", "B", "C" and "D" issued in accordance with the Act;

4. "Company" means Maple Leaf Foods Inc.;

5. "Director" means any Ministry employee appointed by the Minister pursuant to Section 5 of the Act;

6. "District Manager" means the District Manager, Halton-Peel District Office, Central Region of the Ministry;

7. "Equipment" means the two (2) laboratory fume hoods and the maintenance welding exhaust system, described in the Company's application, this Certificate and in the supporting documentation referred to herein, to the extent approved by this Certificate;

8. "Facility" means the entire operation located on the property where the Equipment is located;

9. "Manager" means the Manager, Technical Services Section, Standard Development Branch, or any other person who represents and carries out the duties of the Manager, Technical Services Section, Standards Development Branch, as those duties relate to the conditions of this Certificate;

10. "Ministry" means the Ontario Ministry of the Environment;

11. "Point of Impingement" means any point in the natural environment. The point of impingement for the purposes of verifying compliance with the Act shall be chosen as the point located outside the Company's property boundaries at which the highest concentration is expected to occur, when that concentration is calculated in accordance with the Appendix to Regulation 346 written under the Act, or any other method accepted by the Director;

12. "Pre-test Information" means the information outlined in Section 1 of the Source Testing Code;

13. "Sensitive Receptor" means any location where routine or normal activities occurring at reasonably expected times would experience adverse effect(s) from odour discharges from the Facility, including one or a combination of:

(a) private residences or public facilities where people sleep (eg: single and multi-unit dwellings, nursing homes, hospitals, trailer parks, camping grounds, etc.),
(b) institutional facilities (eg: schools, churches, community centres, day care centres, recreational centres, etc.), and
(c) outdoor public recreational areas (eg: trailer parks, play grounds, picnic areas, etc.),

or any other receptors that may be identified by the District Manager to be a sensitive receptor;

14. "Source Testing" means sampling and testing to measure odour emissions from the exhaust systems No. Ex.133, Ex.134, Ex.135, Ex.136 and Ex.137 stacks, identified in this Certificate and when the Facility is operating at a maximum production level; and

15. "Source Testing Code" means the Source Testing Code, Version 2, Report No. ARB-66-80, dated November 1980, prepared by the Ministry, as amended.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

OPERATION AND MAINTENANCE

1. The Company shall ensure that the Equipment is properly operated and maintained at all times. The Company shall:

(1) prepare, not later than three (3) months after the date of this Certificate, and update, as necessary, a Manual outlining the operating procedures and a maintenance program for the Equipment, including:

(a) routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the Equipment suppliers;

(b) emergency procedures;

(c) the procedures for recording and responding to complaints and record keeping activities relating to operation and maintenance of the Equipment;

(d) all appropriate measures to minimize emissions from all potential sources, including fume hood spill clean-up procedures; and

(2) implement the recommendations of the operating and maintenance Manual.

SOURCE TESTING

2. The Company shall monitor the emissions from the operation of the Facility as follows:

(1) The Company shall perform Source Testing to determine the odour emission rates from the exhaust systems Nos. Ex. 133, Ex. 134, Ex. 135, Ex. 136 and Ex. 137 stacks.

(2) The Company shall submit, not later than three (3) months after the date of this Certificate, or as directed by the District Manager, to the Manager a test protocol, including the Pre-Test Information for the Source Testing required by the Source Testing Code.

(3) The Company shall finalize the test protocol in consultation with the Manager.

(4) The Company shall not commence the Source Testing until the Manager has accepted the test protocol.

(5) The Company shall complete the Source Testing not later than three (3) months after the Manager has accepted the test protocol or as directed by the District Manager.

Notification of Upcoming Source Testing

3. The Company shall notify the District Manager and the Manager, in writing, of the location, date and time of any impending Source Testing required by this Certificate, at least ten (10) business days prior to the Source Testing.

Report on Source Testing

4. The Company shall submit a report on the Source Testing to the District Manager and the Manager not later than two (2) months after completing the Source Testing. The report shall be in the format described in the Source Testing Code, and shall also include:

(1) an executive summary including the results from the Source Testing of the five (5) exhaust systems, together with results from previous sampling programs for the rest of the other odour sources, resulting in maximum emission rate for odour for the entire Facility in odour units per second,

(2) records of all operating conditions of the Facility and weather conditions during the Source Testing, and

(3) the results of dispersion calculations in accordance with AERMOD model, using the above noted maximum emission rate for odour for the entire Facility, indicating the maximum concentration of the odour, 10 minute-average, calculated in accordance with the procedures outlined in Schedule "D", at the Point of Impingement and at the nearby Sensitive

Receptors and the yearly frequency of exceedance of 1 odour unit at the Sensitive Receptors.

Refusal of Source Testing

5. The Director may not accept the results of the Source Testing if:

(1) the Source Testing Code or the requirements of the Manager were not followed, or

(2) the Company did not notify the District Manager and the Manager of the Source Testing, or

(3) the Company failed to provide a complete report on the Source Testing.

6. If the Director does not accept the results of the Source Testing, the Director may require re-testing.

ENVIRONMENTAL RESPONSE PROCEDURES MANUAL

7. The Company shall maintain, and update as necessary, and implement its Environmental Response Procedures Manual. The Manual shall contain, as a minimum, procedures such as:

(1) regular cleaning of the "barn" areas;

(2) yard maintenance; and

(3) spill and complaint response protocol.

RECORD RETENTION

8. The Company shall retain, for a minimum of two (2) years from the date of their creation, all records on the maintenance and repair of the Equipment, as well as information related to or resulting from the monitoring and recording activities required by this Certificate, and make these records available for review by staff of the Ministry upon request. The Company shall retain:

(1) all records on the maintenance, repair and inspection of the Equipment,

(2) records of any spill in the two (2) fume hoods, complete with the date, name and amount of substance spilled and action taken to clean-up the spill,

(3) records of the odour source testing,

(4) all measures taken to minimize odour emissions from all potential sources, and

(5) all records of the environmental complaints; including:

(a) a description, time and date of the incident causing the complaint,
(b) wind direction and wind speed at the time of the incident, and
(c) a description of the measures taken to address the cause of incident to which the complaint relates and to prevent a similar occurrence in the future.

NOTIFICATION OF COMPLAINTS

9. The Company shall notify the District Manager, in writing, of each complaint and the measures taken to address the cause of the complaint within two (2) business days of the complaint.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition No. 1 is included to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the Act, the regulations and this Certificate.

2. Condition Nos. 2 to 6, inclusive, are included to require the Company to gather accurate information so that compliance

CONTENT COPY OF ORIGINAL

with the Act, the regulations and this Certificate can be verified.

3. Condition No. 7 is included to require the Company to take all reasonable care to reduce odour emissions and to prevent an adverse effect resulting from the operation of the Facility.

4. Condition No. 8 is included to require the Company to keep records and provide information to staff of the Ministry so that compliance with the Act, the regulations and this Certificate can be verified.

5. Condition No. 9 is included to require the Company to notify staff of the Ministry so as to assist the Ministry with the review of the site's compliance.

SCHEDULE "A"
STACK DATA

Stack No.	Venting from	Volumetric Flow Rate (m3/s)	Temperature (degrees Celsius)	Stack Diameter (metres)	Stack Height Above Roof (metres)	Stack Height Above Grade (metres)
Ex.133	Barn - General	89.0	20	1.83	-	25
Ex.134	Front Kill/Scald/Dehairing - General	33.1	35	1.22	10.7	20
Ex.135	Waste Water Treat - General	2.60	20	0.41	4.3	12
Ex.136	Rendering	7.23	37	0.71	5.0	15
Ex.137	Head Boning	4.25	28	0.56	6.6	13
Ex.9	Stunning Tunnel	3.4	29	1.17 x 0.56	0.56	6.9
Ex.10	Singe Room - General	2.3	54	0.71	0.61	7.4
Ex.11	Singe Room - General	2.5	60	0.71	0.76	9.2
Ex.12	Singe (south)	2.7	44	0.4 x 0.4	0.84	10.1
Ex.13	Singe (north)	2.9	49	0.4 x 0.4	0.86	10.4
Ex.17	Boiler	-	-	0.76	6.09	12.7
Ex.18	Boiler	-	-	0.76	6.40	14.2
Ex.19	Boiler	-	-	0.76	6.40	14.2
Ex.20	Boiler	-	-	0.76	6.40	14.2
Ex.84	Knife Sharpening-Hood	0.114	30	0.20 x 0.25	2.00	8.90
Ex.117	Knife Sharpening Area	2.36	20	0.50 x 0.80	1.02	10.9
Ex.113	Laboratory Fume Hood	0.85	20	0.25 x 0.38	0.79	10.7
Ex.114	Laboratory Fume Hood	0.85	20	0.25 x 0.38	0.71	10.6
Ex.31	Dressing Floor-Hog Kill - General	1.65	31	0.50 x 0.60	0.91	11.0
Ex.32	Casing Room - General	5.51	29	0.76	0.89	10.8
Ex.43	Blood Room - General	1.21	28	0.50 x 0.45	0.53	6.60
Ex.44	Blood Room - General	1.32	30	0.30 x 0.40	0.61	7.30
Ex.46	Blood Room - General	2.56	24	1.02	0.51	6.20
Ex.47	Blood Room - General	1.47	26	1.02	0.51	6.20
Ex.49	Dressing Floor/Pan Wash - General	-	-	0.61	0.61	7.20
Ex.51	Dressing Floor - General	0.98	30	0.76	0.89	10.7
Ex.52	Dressing Floor - General	3.49	30	1.22	0.86	10.4
Ex.53	Dressing Floor - General	-	-	0.40 x 0.50	0.89	10.8
Ex.55	Dressing Floor - General	-	-	0.76 x 0.76	1.68	11.6
Ex.56	Dressing Floor - General	-	-	1.52 x 0.76	1.42	11.3
Ex.108	Dressing Floor - General	-	-	1.09 x 1.09	0.76	10.7
Ex.110	Dressing Floor - General	7.11	27	0.76	0.91	13.2
Ex.111	Dressing Floor - General	-	-	0.53 x 0.71	1.42	13.7
Ex.112	Dressing Floor - General	-	-	0.61	0.66	13.0
Ex.59	Steam Shrink Wrap	0.61	63	0.20 x 0.30	0.86	10.5
Ex.60	Steam Shrink Wrap	0.35	54	0.76	0.84	10.2
Ex.87	Shrink Tunnel and Packaging	0.45	64	0.30 x 0.20	1.04	12.5
Ex.88	Shrink Tunnel and Packaging	0.21	56	0.30 x 0.20	1.04	12.5
Ex.119	Steam Shrink Wrap	0.31	17	0.40 x 0.30	0.89	10.6
Ex.99B	Head Boning Area Pump Room	2.07	28	0.66 x 0.70	0.71	8.70
Ex.101	Head Boning/Sausage - General	-	-	0.50 x 0.66	0.69	8.20
Ex.103	Ham Boning-Clean-up	-	-	0.20	0.64	7.50
Ex.120	Ham Boning-Belt Wash - General	0.22	24	0.56	0.86	10.3
Ex.121	Chilled Pork Clean-up Area	-	-	0.84	0.91	10.8
Ex.122	Chilled Pork Clean-up Area	-	-	0.84	0.91	10.8
Ex.132	Waste Water Treat - Sludge Tank	0.01	20	0.40 x 0.40	-	2.00

Ex.58	Mechanical Room/Compressor	-	-	0.90 x 0.60	0.91	10.8
Ex.83	Maintenance	-	-	0.45 x 0.45	2.00	8.90
Ex.85	Vacuum Pump Exchange	-	-	0.22	2.03	7.50
Ex.102	Maintenance Shop Welding	0.74	29	0.40 x 0.36	0.46	7.00
Ex.107	Maintenance Shop - General	-	-	0.15	0.28	6.80

Note: m3/s - means actual cubic metres per second

SCHEDULE "B" - Employee Facility Ventilation Systems

Source ID	Description	Volumetric Flow Rate (cubic metre per second)	Stack Parameters		
			Exit Diameter (metre)	Height Above Roof (metre)	Height Above Grade (metre)
ERV-1	Energy Recovery Ventilator - Employee Facility	2.12	0.4 x 0.35	0.58	7.78
ERV-2	Energy Recovery Ventilator - Employee Facility	1.1	0.33 x 0.3	0.53	7.73
ERV-3	Energy Recovery Ventilator - Employee Facility	1.1	0.33 x 0.3	0.53	7.73
EF-1	General Exhaust Employee Facility	0.42	0.3 x 0.3	0.6	7.8
EF-2	General Exhaust Employee Facility	1.42	0.34 x 0.23	0.66	7.56
EF-3	General Exhaust Employee Facility	0.33	0.29 x 0.21	0.67	7.57
SEF	General Exhaust Employee Facility	0.11	0.83 x 0.83	0.53	7.73

SCHEDULE "C" - Chilled Meat Transfer and Holding Areas

Source ID	Description	Maximum Heat Input Capacity (kJ/hr)	Maximum Volumetric Flow Rate (m3/s)	Diameter of Stack (m)	Stack Height Above Roof (m)	Stack Height Above Grade (m)
EX-N1	Desiccant dehumidification unit	907,300	1.4	0.3	3.6	13.5
EX-N2	Desiccant dehumidification unit	907,300	1.4	0.3	3.6	13.5
EX-N3	Desiccant dehumidification unit	907,300	1.4	0.3	3.6	13.5
EX-N4	Desiccant dehumidification unit	569,700	0.53	0.33	3.3	13.2
EX-N5	Hog transfer tunnel air make up unit	822,900	-	-	1.0	10.9

kJ/hr - kilojoules per hour;
m3/s - cubic metres per second;
m - metres.

SCHEDULE "D"

Procedure for the calculation of 10-minute average concentration of odour

CALCULATE ONE-HOUR AVERAGE CONCENTRATION

1. The one-hour average concentration of odour at the Point of Impingement and at the Sensitive Receptors can be calculated using the Procedure described as follows:

(a) Calculate one-hour average concentration of odour at the Point of Impingement and at the Sensitive Receptors, employing the AERMOD atmospheric dispersion model or with another atmospheric dispersion model acceptable to the Director that employs at least five (5) years of hourly local meteorological data and that can provide results reported as individual one-hour odour concentrations;

(b) Convert each of the one-hour average concentrations predicted over the five (5) years of hourly local meteorological data to a 10-minute average concentration using the One-hour Average to 10-Minute Average Conversion described below; and

(c) Present the 10-Minute Average concentrations predicted to occur over a five (5) year period at the Point of Impingement and at the Sensitive Receptors in a histogram. The maximum 10-minute average concentration of odour at the Sensitive Receptors will be considered to be the maximum odour concentration at the most impacted Sensitive Receptor that occurs and is represented in the histogram, disregarding outlying data points on the histogram as agreed to by the Director.

ONE-HOUR AVERAGE TO 10-MINUTE AVERAGE CONVERSION

2. Use the following formula to convert one-hour average concentration predicted by the AERMOD atmospheric dispersion model to a 10-minute average concentration:

$$\mathbf{X_{10min} = X_{60min} * 1.65}$$

where X_{10min} = 10-minute average concentration
X_{60min} = one-hour average concentration

This Certificate of Approval revokes and replaces Certificate(s) of Approval No. 6749-5ACJKW issued on June 25, 2002.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written Notice served upon me, the Environmental Review Tribunal and in accordance with Section 47 of the Environmental Bill of Rights, S.O. 1993, Chapter 28, the Environmental Commissioner, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

CONTENT COPY OF ORIGINAL

The Secretary*	AND	The Environmental Commissioner	AND	The Director
Environmental Review Tribunal		1075 Bay Street, 6th Floor		Section 9, *Environmental Protection Act*
2300 Yonge St., 12th Floor		Suite 605		Ministry of Environment and Energy
P.O. Box 2382		Toronto, Ontario		2 St. Clair Avenue West, Floor 12A
Toronto, Ontario		M5S 2B1		Toronto, Ontario
M4P 1E4				M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

This instrument is subject to Section 38 of the Environmental Bill of Rights, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at www.ene.gov.on.ca, you can determine when the leave to appeal period ends.

The above noted works are approved under Section 9 of the Environmental Protection Act.

DATED AT TORONTO this 1st day of April, 2005

Neil Parrish, P.Eng.
Director
Section 9, *Environmental Protection Act*

RW/
c: District Manager, MOE Halton-Peel District Office
Paul Geisberger, P.Eng., Pinchin Environmental Ltd.
Nicholas Sylvestre-Williams, Pinchin Environmental Ltd.

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Ontario

Ministry of the Environment **Ministère de l'Environnement**

AMENDMENT TO CERTIFICATE OF APPROVAL
AIR
NUMBER 4494-685MWW
Notice No. 1
Issue Date: October 19, 2007

Maple Leaf Foods Inc.
PO Box 5091 Stn LCD 1
Burlington, Ontario
L7R 4R3

Site Location: 821 Appleby Line
Burlington City, Regional Municipality of Halton
Ontario L7L 4W9

You are hereby notified that I have amended Certificate of Approval No. 4494-685MWW issued on April 1, 2005 for various equipment to serve a pork processing facility comprising the live animals holding area, stunning and slaughtering area, dehairing/singeing area, evisceration area, dressing/facing area, cooling/storage area, cutting area and packaging shipping area, as follows:

add four (4) air make-up units, having a combined maximum thermal input of 13,420,312 kJ/hr.

Other Terms and Conditions remain the same.

all in accordance with the Application for Approval (Air & Noise) dated November 14, 2006 and signed by Dave Reid, P. Eng., (Environmental, Health, and Safety Manager), Maple Leaf Foods Inc., and all supporting information associated with the application provided by Paul Geisberger, P. Eng., Pinchin Environmental.

This Notice shall constitute part of the approval issued under Certificate of Approval No. 4494-685MWW dated April 1, 2005

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

CONTENT COPY OF ORIGINAL

The Secretary*
Environmental Review Tribunal
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 9, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted works are approved under Section 9 of the Environmental Protection Act.

DATED AT TORONTO this 19th day of October, 2007

Mansoor Mahmood, P.Eng.
Director
Section 9, *Environmental Protection Act*

GB/
c: District Manager, MOE Halton-Peel District Office
Paul Geisberger, P. Eng., Pinchin Environmental

APPENDIX B

Traffic Information

Victor Garcia

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: June 25, 2024 11:36 AM
To: Victor Garcia
Subject: RE: Rail Traffic Data Request - Oval Court, Burlington, Ontario

Hi Victor,

Further to your request dated June 21, 2024, the subject lands (Oval Court, Burlington) are located within 300 metres of the Metrolinx Oakville Subdivision (which carries Lakeshore West GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel and electric trains. The GO rail fleet combination on this Subdivision will consist of up to 1 locomotive and 10 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 438 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive	1 Electric Locomotive		1 Diesel Locomotive	1 Electric Locomotive
Day (0700-2300)	132	247	Night (2300-0700)	20	39

The current track design speed near the subject lands is 95 mph (153 km/h).

There are *anti-whistling by-laws* in affect near the subject lands Burloak Drive & McPherson Rd.

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network and we are currently working towards the next phase.

Options have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program, currently in the Development Phase. ONxpress will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion. Construction to support GO Expansion is currently underway.

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

Given the above considerations, it would be prudent at this time, for the purposes of acoustical analyses for development in proximity to Metrolinx corridors, to assume that the acoustical characteristics of electrified and diesel trains are equivalent. In light of the aforementioned information, acoustical models should employ diesel train parameters as the basis for analyses. We anticipate that additional information regarding specific operational parameters for electrified trains will become available in the future once the proponent team is selected.

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,

Jenna Auger (She/Her)
Third Party Projects Review (TPPR)

Victor Garcia

From: Umair Naveed <Umair.Naveed@cn.ca> on behalf of GLD-Permits <permits.gld@cn.ca>
Sent: July 15, 2020 10:30 AM
To: Victor Garcia
Subject: RE: Rail traffic data request

Good Morning Victor,

The train count data is still valid. On the Oakville sub the mileage and the crossings in vicinity would be the same but for Halton the mileage would be 49.21 with no at grade crossings in the vicinity.

Thanks,

Umair Naveed
Project Officer- Public Works | Eastern Canada Division of Engineering
T: **905-669-3184** C: **416-436-7930**

Celebrating 100 years | Célébrons nos 100 ans

From: Victor Garcia <vgarcia@hgcengineering.com>
Sent: Monday, July 13, 2020 5:44 PM
To: GLD-Permits <permits.gld@cn.ca>
Subject: Rail traffic data request

Good evening,

HGC Engineering is conducting a noise impact study at a site located at 2089-2095 Fairview Street in Burlington, Ontario. A google link is included for your reference:

https://goo.gl/maps/qjgRPEHCn3cX3PYa9

We currently have the data attached for the two CN lines in the area, is this data still valid?

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 – www.hgcengineering.com **Follow Us** – LinkedIn | Twitter | YouTube

This e-mail and any attachments may contain confidential and privileged information. If you are not the intended recipient, please notify the sender immediately by return e-mail, delete this e-mail and destroy any copies. Any

System Engineering
Engineering Services

1 Administration Road
Concord, ON, L4K 1B9
T: 905.669.3264
F: 905.760.3406

Train Count Data

TRANSMITTAL

To: *Destinataire :*	HGC Engineering 2000 Argentia Rd, Plaza One, Suite 203, Mississauga, ON L5N 1P7	*Project :*	OAK-32.23 - Plains Rd, Burlington, ON
Att'n:	Victor Garcia	*Routing:*	vgarcia@hgcengineering.com
From: *Expéditeur :*	Michael Vallins	*Date:*	02/05/2019
Cc:	Adjacent Development CN via e-mail		

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

Re: Train Traffic Data – CN Oakville Subdivision near Plains Road in Burlington, 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
public_works_gld@cn.ca

Date: 2019/01/16 Project Number: OAK-32.23 - Plains Rd, Burlington, ON

Dear Victor:

Re: Train Traffic Data – CN Oakville Subdivision near Plains Road in Burlington, ON

The following is provided in response to Victor's 2018/12/19 request for information regarding rail traffic in the vicinity of Plains Road in Burlington, ON at approximately Mile 32.23 on CN's Oakville 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	60	4
Way Freight	4	25	60	4
Passenger	13	10	80	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	140	60	4
Way Freight	2	25	60	4
Passenger	0	10	80	2

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

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are no at-grade crossing in the immediate vicinity of the study area at Mile 32.23 (Plains Road). 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 triple mainline track is considered to be continuously welded rail throughout the study area. The presence of eleven (11) switches located at Mile 32.08, 32.15, 32.17,

32.18, 32.25, 32.33, 32.40, 32.48, 33.18, 33.23 and 33.31 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,

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

Appleby Line @ Harvester Rd

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

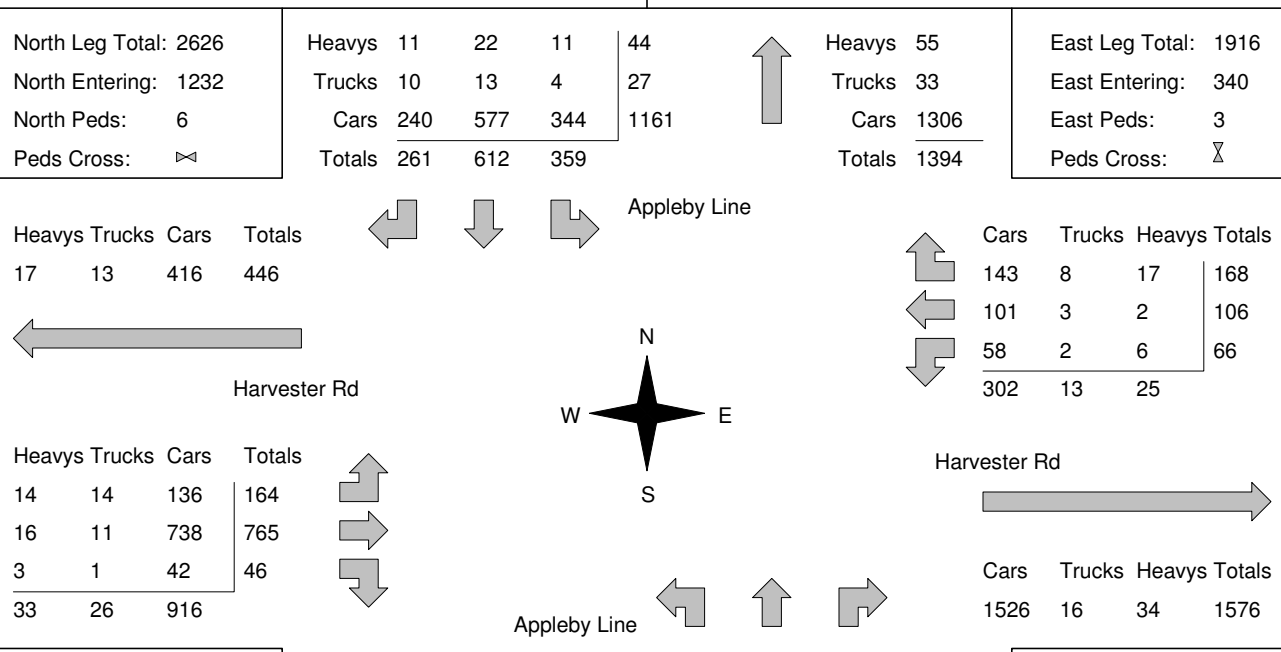
Municipality: Halton Region
Site #: 1024560100
Intersection: Appleby Line & Harvester Rd
TFR File #: 22
Count date: 10-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S



Comments

Appleby Line @ Harvester Rd

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:00:00
To: 13:00:00

Municipality: Halton Region
Site #: 1024560100
Intersection: Appleby Line & Harvester Rd
TFR File #: 22
Count date: 10-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S

North Leg Total:	2403			
North Entering:	1184			
North Peds:	4			
Peds Cross:	⋈			
Heavys	16	20	21	57
Trucks	10	12	7	29
Cars	188	803	107	1098
Totals	214	835	135	
Heavys	63			
Trucks	29			
Cars	1127			
Totals	1219			
East Leg Total:	1137			
East Entering:	623			
East Peds:	5			
Peds Cross:	⧖			

Appleby Line

Heavys	Trucks	Cars	Totals
26	13	478	517

Cars	Trucks	Heavys	Totals
164	9	21	194
176	3	6	185
237	2	5	244
577	14	32	

Harvester Rd

N
W E
S

Heavys	Trucks	Cars	Totals
17	11	217	245
2	5	162	169
5	2	160	167
24	18	539	

Harvester Rd

Cars	Trucks	Heavys	Totals
471	13	30	514

Appleby Line

Peds Cross:	⧖			
West Peds:	1			
West Entering:	581			
West Leg Total:	1098			
Cars	1200			
Trucks	16			
Heavys	30			
Totals	1246			
Cars	114	746	202	1062
Trucks	0	9	1	10
Heavys	4	25	7	36
Totals	118	780	210	
Peds Cross:	⋈			
South Peds:	1			
South Entering:	1108			
South Leg Total:	2354			

Comments

Appleby Line @ Harvester Rd

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Halton Region
Site #: 1024560100
Intersection: Appleby Line & Harvester Rd
TFR File #: 22
Count date: 10-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S

North Leg Total:	3509			
North Entering:	1933			
North Peds:	3			
Peds Cross:	⋈			
Heavys	35	7	16	58
Trucks	4	4	4	12
Cars	245	1482	136	1863
Totals	284	1493	156	
Heavys	16			
Trucks	16			
Cars	1544			
Totals	1576			
East Leg Total:	1881			
East Entering:	1322			
East Peds:	5			
Peds Cross:	⧖			

Appleby Line

Heavys	Trucks	Cars	Totals
54	5	772	831

Cars	Trucks	Heavys	Totals
415	5	2	422
449	1	11	461
430	3	6	439
1294	9	19	

Harvester Rd

N
W E
S

Heavys	Trucks	Cars	Totals
4	3	317	324
4	2	248	254
5	1	171	177
13	6	736	

Harvester Rd

Cars	Trucks	Heavys	Totals
526	8	25	559

Appleby Line

Peds Cross:	⧖			
West Peds:	3			
West Entering:	755			
West Leg Total:	1586			
Cars	2083			
Trucks	8			
Heavys	18			
Totals	2109			
Cars	78	812	142	1032
Trucks	0	8	2	10
Heavys	8	10	5	23
Totals	86	830	149	
Peds Cross:	⋈			
South Peds:	5			
South Entering:	1065			
South Leg Total:	3174			

Comments

Appleby Line @ Harvester Rd

Total Count Diagram

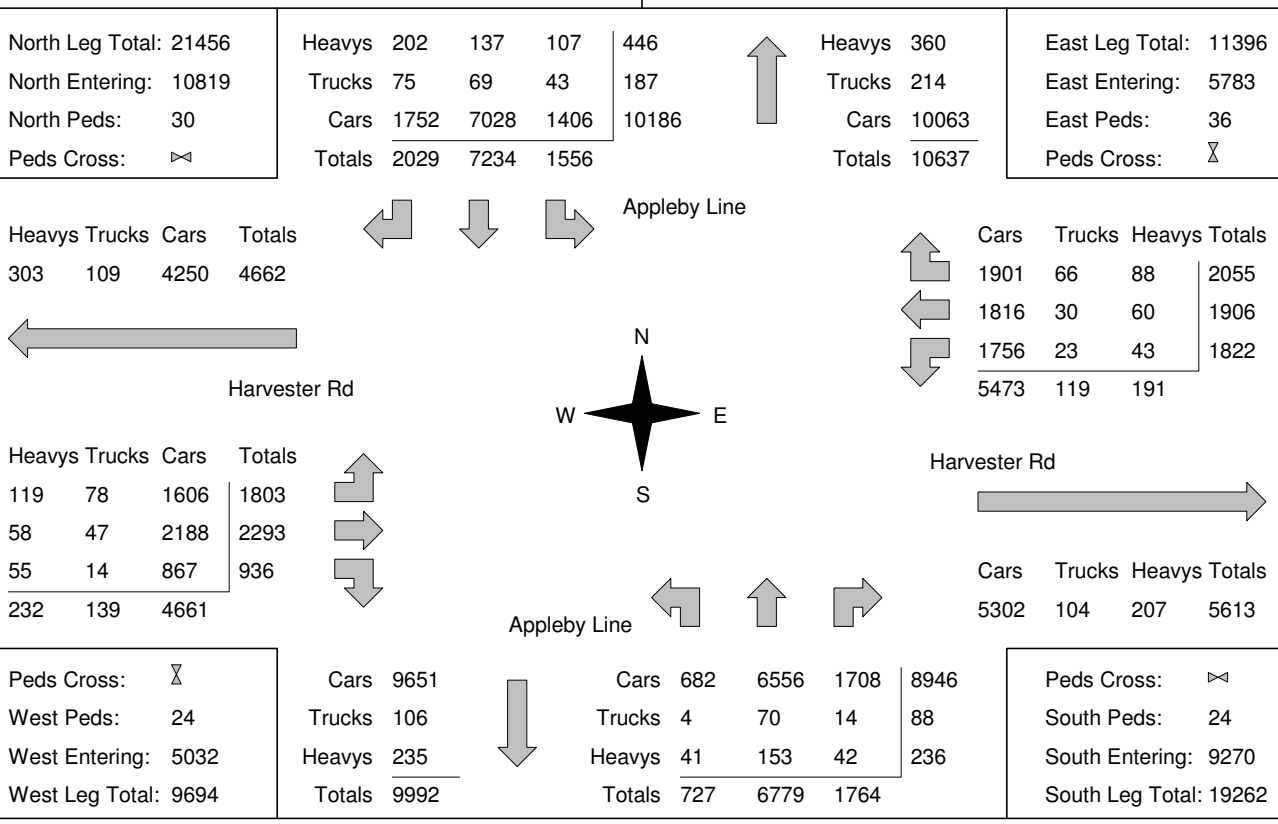
Municipality: Halton Region
Site #: 1024560100
Intersection: Appleby Line & Harvester Rd
TFR File #: 22
Count date: 10-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S



Comments

Appleby Line @ Fairview St

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

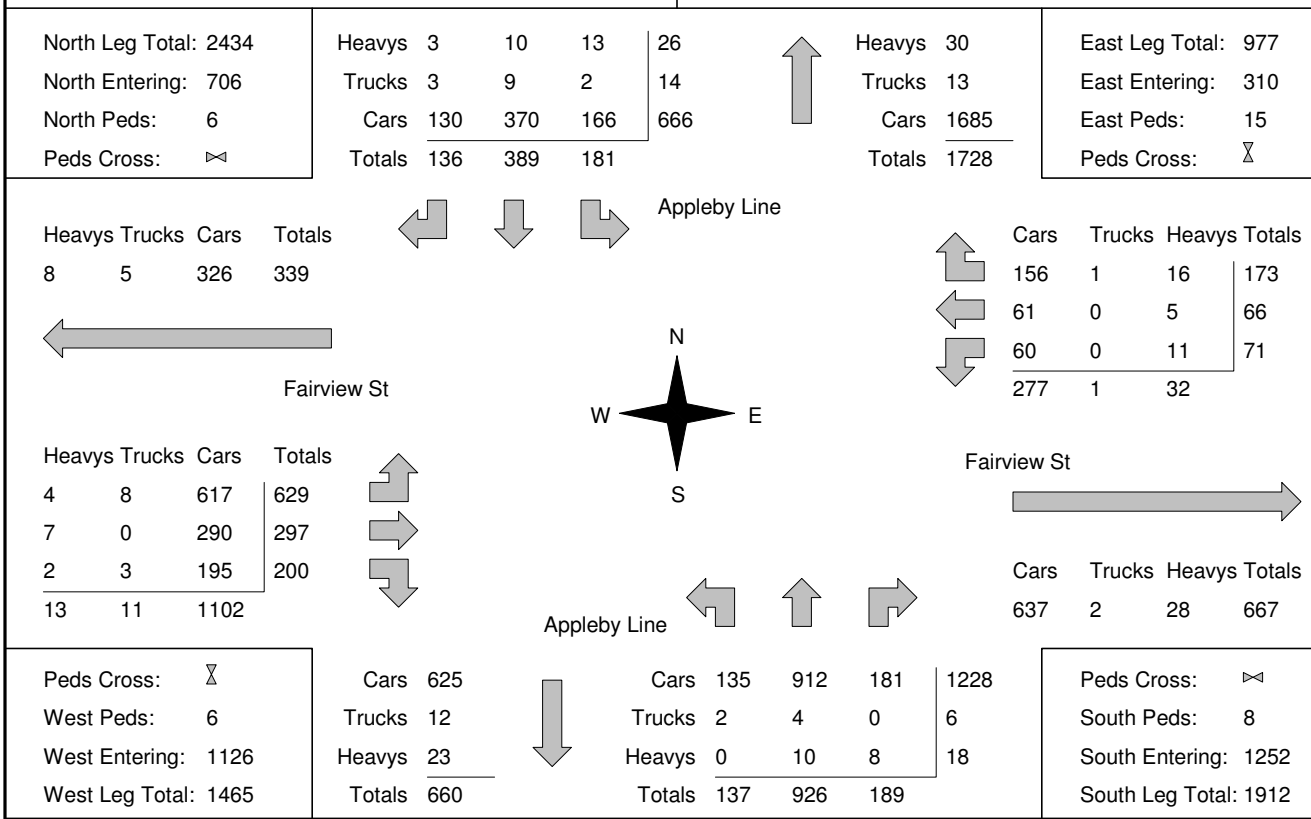
Municipality: Halton Region
Site #: 1024510100
Intersection: Appleby Line & Fairview St
TFR File #: 21
Count date: 10-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S



Comments

Appleby Line @ Fairview St

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:00:00
To: 13:00:00

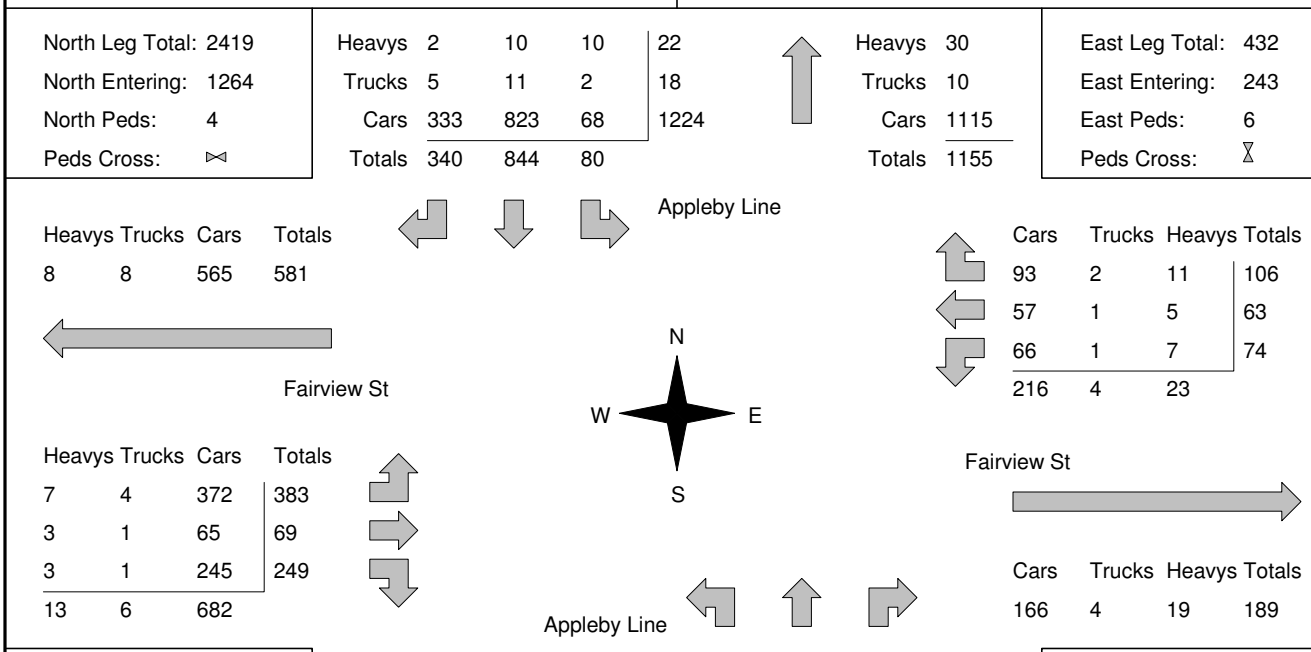
Municipality: Halton Region
Site #: 1024510100
Intersection: Appleby Line & Fairview St
TFR File #: 21
Count date: 10-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S



Comments

Appleby Line @ Fairview St

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

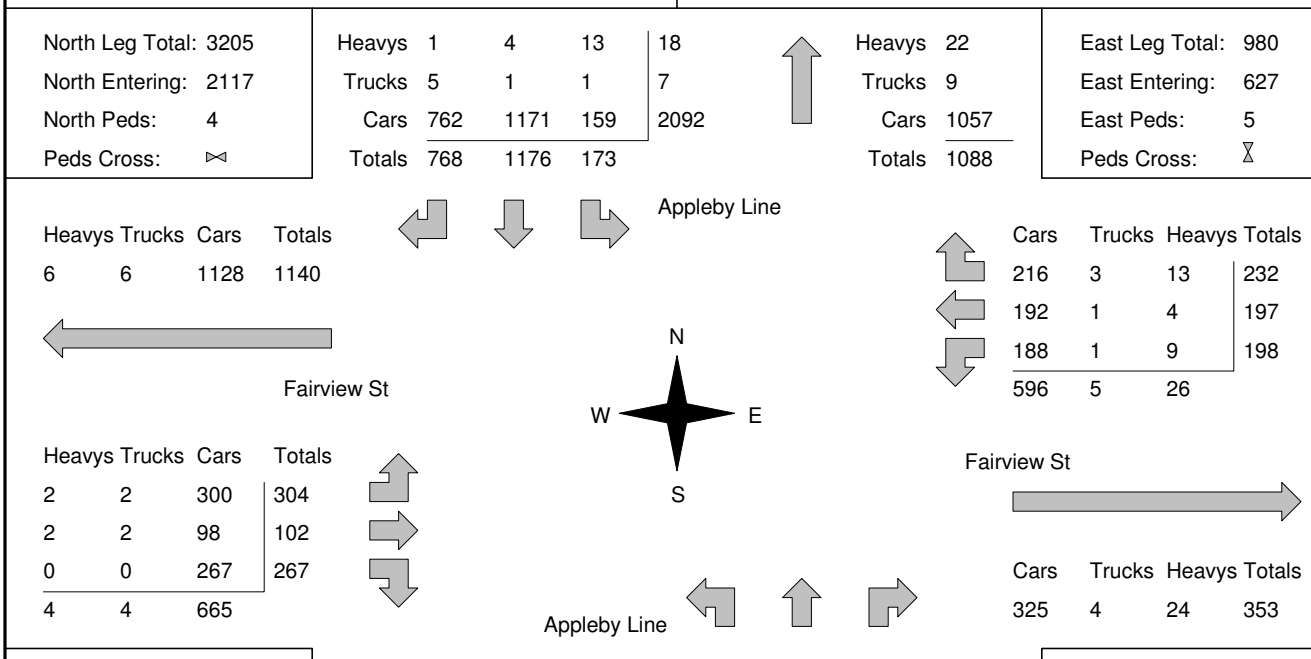
Municipality: Halton Region
Site #: 1024510100
Intersection: Appleby Line & Fairview St
TFR File #: 21
Count date: 10-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S



Comments

Appleby Line @ Fairview St

Total Count Diagram

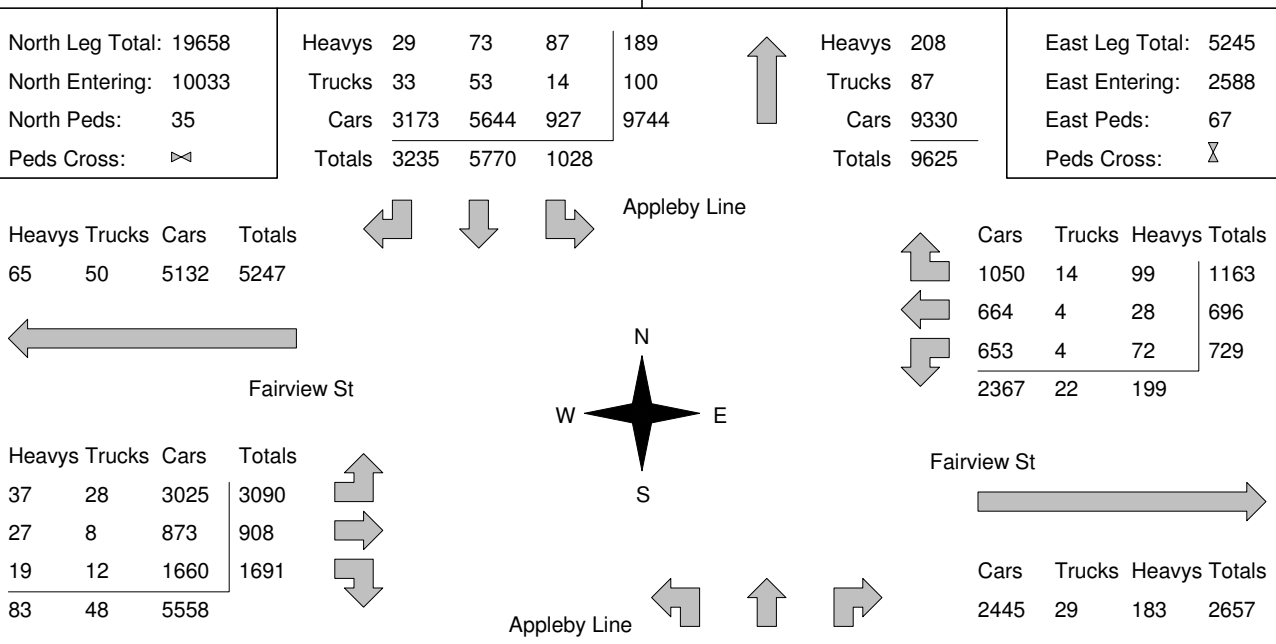
Municipality: Halton Region
Site #: 1024510100
Intersection: Appleby Line & Fairview St
TFR File #: 21
Count date: 10-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Appleby Line runs N/S



Comments

202701-Harvester Rd & S.S. Rd

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

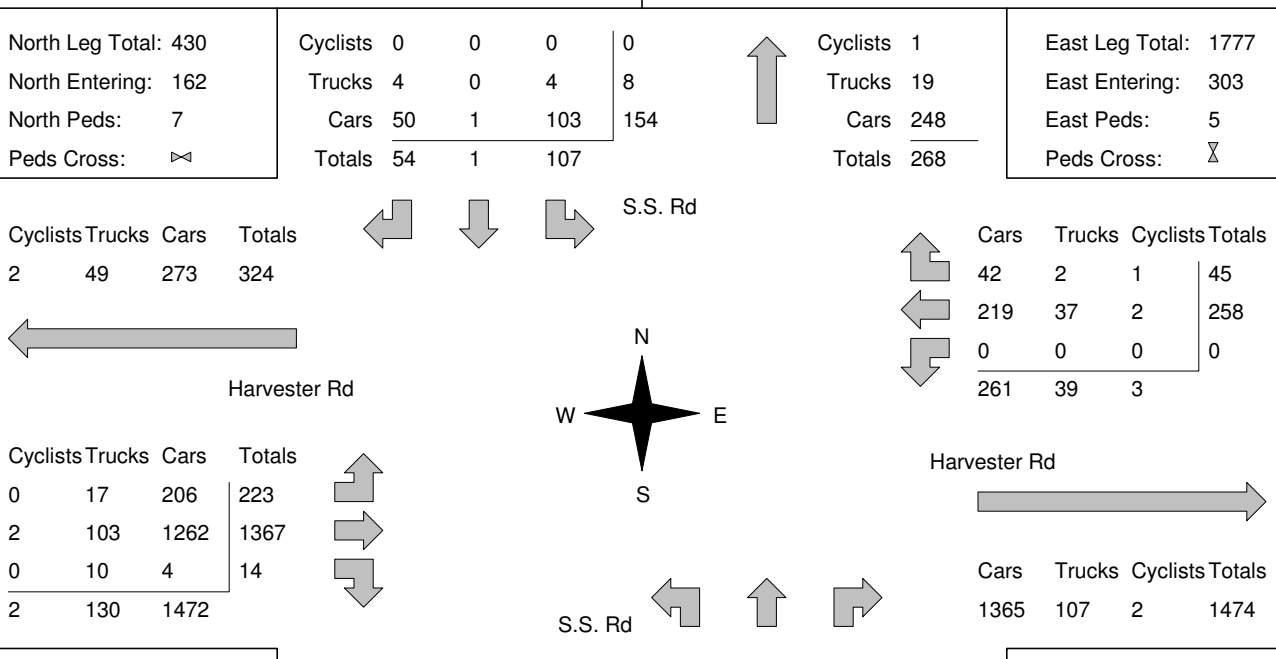
Municipality: Burlington
Site #: 0000202701
Intersection: Harvester Rd & S.S. Rd
TFR File #: 1
Count date: 8-May-2019

Weather conditions:
Cloudy

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Harvester Rd runs W/E



Comments

202701-Harvester Rd & S.S. Rd

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:00:00
To: 13:00:00

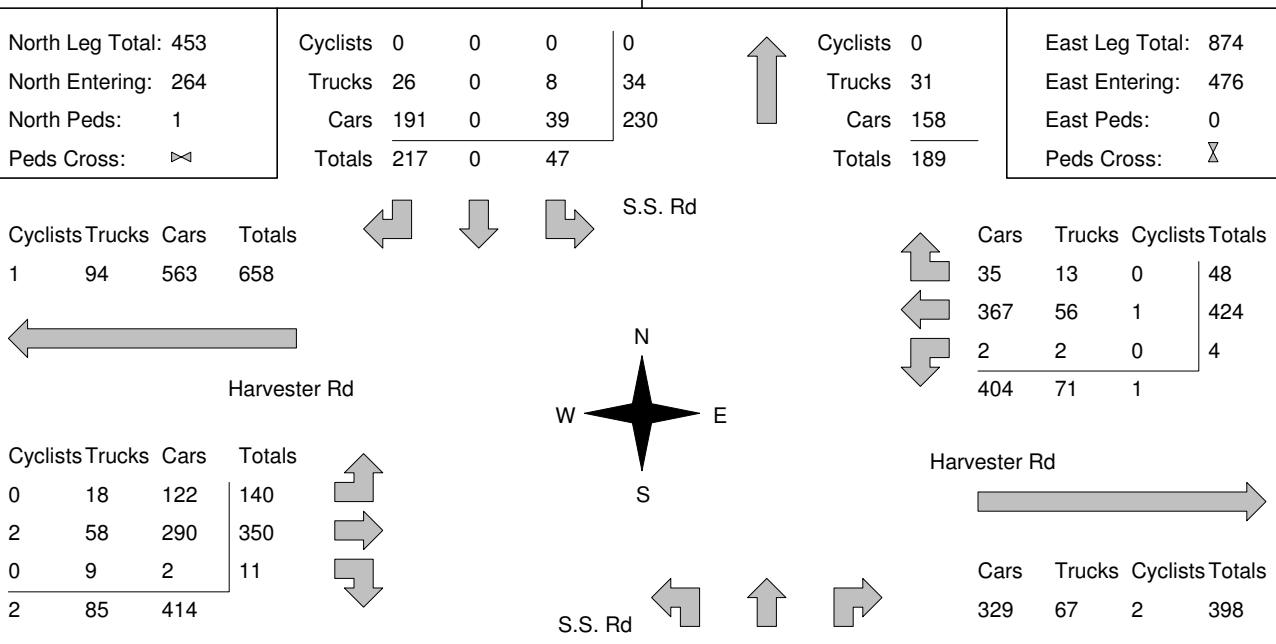
Municipality: Burlington
Site #: 0000202701
Intersection: Harvester Rd & S.S. Rd
TFR File #: 1
Count date: 8-May-2019

Weather conditions:
Cloudy

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Harvester Rd runs W/E



Comments

202701-Harvester Rd & S.S. Rd

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

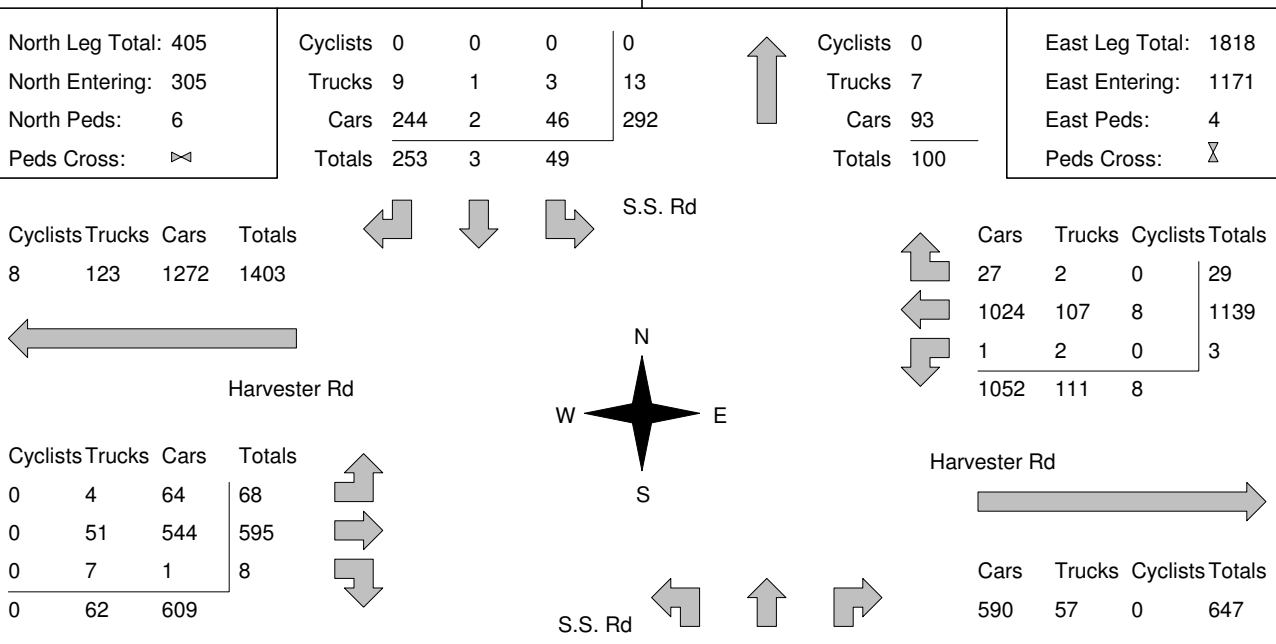
Municipality: Burlington
Site #: 0000202701
Intersection: Harvester Rd & S.S. Rd
TFR File #: 1
Count date: 8-May-2019

Weather conditions:
Cloudy

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Harvester Rd runs W/E



Comments

202701-Harvester Rd & S.S. Rd

Total Count Diagram

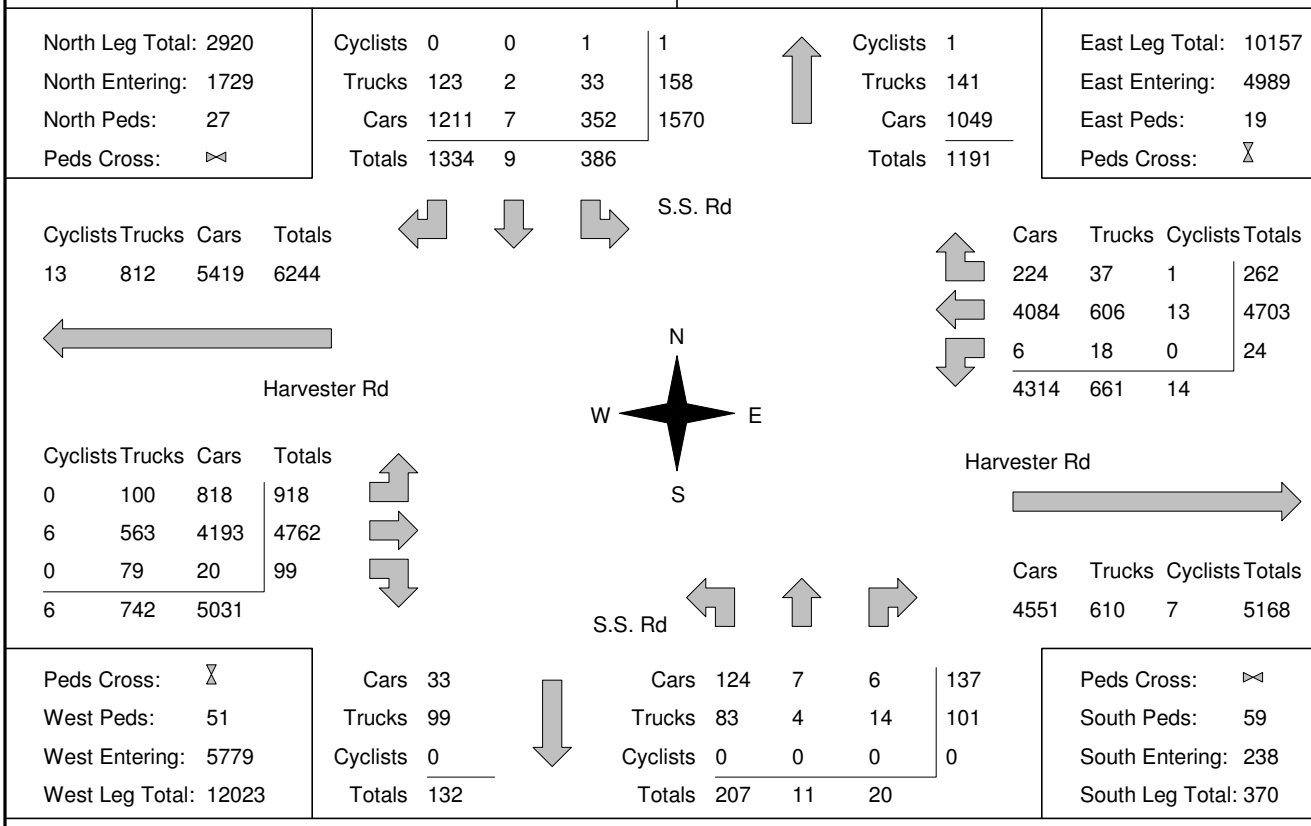
Municipality: Burlington
Site #: 0000202701
Intersection: Harvester Rd & S.S. Rd
TFR File #: 1
Count date: 8-May-2019

Weather conditions:
Cloudy

Person(s) who counted:
Tanya

**** Signalized Intersection ****

Major Road: Harvester Rd runs W/E



Comments

202701-Harvester Rd & S.S. Rd
Traffic Count Summary

Intersection: Harvester Rd & S.S. Rd | **Count Date:** 8-May-2019 | **Municipality:** Burlington

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	67	0	61	128	5	142
9:00:00	94	1	81	176	7	190
11:00:00	0	0	0	0	0	0
12:00:00	23	1	126	150	1	167
13:00:00	47	0	217	264	1	283
14:00:00	46	4	147	197	0	220
15:00:00	0	0	0	0	0	0
16:00:00	22	0	188	210	3	318
17:00:00	43	1	272	316	4	349
18:00:00	44	2	242	288	6	298
Totals:	386	9	1334	1729	27	1967

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	13	0	1	14	11
9:00:00	12	0	2	14	13
11:00:00	0	0	0	0	0
12:00:00	15	1	1	17	2
13:00:00	17	1	1	19	2
14:00:00	17	2	4	23	1
15:00:00	0	0	0	0	0
16:00:00	100	3	5	108	5
17:00:00	25	3	5	33	14
18:00:00	8	1	1	10	11
Totals:	207	11	20	238	59

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	1	231	28	260	4	1615
9:00:00	2	284	51	337	5	1774
11:00:00	0	0	0	0	0	0
12:00:00	6	369	25	400	1	804
13:00:00	4	424	48	476	0	977
14:00:00	3	439	42	484	0	975
15:00:00	0	0	0	0	0	0
16:00:00	4	758	22	784	1	1197
17:00:00	1	1116	14	1131	5	1642
18:00:00	3	1082	32	1117	3	1784
Totals:	24	4703	262	4989	19	10768

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	167	1173	15	1355	7
9:00:00	265	1157	15	1437	14
11:00:00	0	0	0	0	0
12:00:00	60	329	15	404	3
13:00:00	140	350	11	501	5
14:00:00	109	372	10	491	4
15:00:00	0	0	0	0	0
16:00:00	62	337	14	413	9
17:00:00	51	451	9	511	2
18:00:00	64	593	10	667	7
Totals:	918	4762	99	5779	51

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	91	126	43	70	71	135	78	64

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			2002	LT	155,700	174,400	175,700	140,100	0.4
			2003	LT	157,900	176,800	178,400	142,100	0.7
			2004	LT	160,000	178,700	179,900	144,400	0.5
			2005	LT	165,000	183,700	185,200	148,200	0.7
			2006	LT	166,500	185,000	186,500	149,800	0.6
			2007	LT	168,000	186,700	189,300	150,900	0.8
			2008	LT	187,100	283,300	278,500	118,500	0.7
			2009	LT	156,800	205,400	208,300	118,300	1.0
			2010	LT	184,800	241,300	244,400	139,500	0.8
			2011	LT	189,500	253,900	252,000	149,700	N/A
			2012	LT	185,000	247,900	236,800	136,900	N/A
			2013	LT	172,000	230,500	235,600	127,300	N/A
			2014	LT	185,000	247,900	251,600	136,900	N/A
			2015	LT	188,000	251,900	255,700	139,100	N/A
			2016	LT	190,000	254,600	258,400	140,600	N/A
QEW	APPLEBY LINE IC-107	1.9	1988	C	93,100	103,300	103,300	83,800	0.6
			1989	C	96,600	107,100	108,100	86,800	0.9
			1990	C	99,900	110,900	110,900	89,900	0.7
			1991	C	103,000	113,300	114,300	93,700	0.6
			1992	C	105,500	113,900	117,100	97,100	0.7
			1993	C	109,000	117,700	121,000	101,400	0.7
			1994	C	111,400	121,400	124,800	100,300	0.9
			1995	C	114,300	123,400	128,000	105,200	0.5
			1996	C	117,200	131,900	133,600	105,600	0.5
			1997	C	120,100	135,100	136,900	108,200	0.7
			1998	C	123,000	138,400	138,900	110,800	0.5
			1999	C	140,100	158,300	158,200	126,200	0.7
			2000	C	143,300	161,200	161,800	129,100	0.9
			2001	C	136,500	154,200	154,200	122,900	0.7
			2002	C	140,300	157,100	158,300	126,300	0.6
			2003	C	152,900	171,200	172,800	137,600	0.8
			2004	C	145,400	162,400	163,500	131,200	0.7
			2005	C	145,500	162,000	163,300	130,700	0.6

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			2006	C	147,000	163,300	164,600	132,300	0.6
			2007	C	149,500	166,100	168,400	134,300	0.7
			2008	C	151,900	167,600	165,300	136,300	0.8
			2009	C	146,100	161,200	162,800	131,500	0.8
			2010	C	147,900	163,000	164,500	133,100	0.9
			2011	C	185,000	203,500	205,400	166,500	N/A
			2012	C	184,000	202,400	198,700	165,600	N/A
			2013	C	173,900	191,300	189,500	156,500	N/A
			2014	C	177,000	194,700	189,400	159,300	N/A
			2015	C	190,000	209,000	203,300	171,000	N/A
			2016	C	195,000	214,500	208,700	175,500	N/A
QEW	BURLOAK DR IC-109	1.5	1988	C	96,200	106,700	106,700	86,500	0.6
			1989	C	99,600	110,600	111,600	89,600	0.8
			1990	C	102,000	113,200	113,200	91,800	1.0
			1991	C	105,100	115,600	116,700	95,600	0.9
			1992	C	108,000	116,600	119,900	99,400	0.8
			1993	C	110,900	119,800	123,100	103,100	0.8
			1994	C	113,800	124,000	127,500	102,400	0.7
			1995	C	116,700	126,000	130,700	107,400	0.7
			1996	C	119,600	134,600	136,300	107,800	0.5
			1997	C	122,500	137,800	139,700	110,400	0.8
			1998	C	125,400	141,100	141,600	113,000	0.8
			1999	C	132,500	149,700	149,600	119,400	0.7
			2000	C	136,700	153,800	154,300	123,200	1.0
			2001	C	140,800	159,100	159,100	126,700	0.8
			2002	C	147,100	164,700	166,000	132,400	0.8
			2003	C	149,200	167,100	168,600	134,300	0.9
			2004	C	151,300	171,200	172,400	138,400	1.0
			2005	C	148,900	175,400	176,800	141,500	0.8
			2006	C	151,500	168,300	169,700	136,300	0.8
			2007	C	150,700	161,600	163,800	130,600	1.2
			2008	C	150,000	153,900	151,700	125,100	1.3
			2009	C	150,000	147,100	148,500	120,000	1.8

APPENDIX C

Sample Stamson Output

STAMSON 5.0 NORMAL REPORT Date: 25-07-2024 12:31:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Description: North facade of Podium E/F

Rail data, segment # 1: CN (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. Way Freight	5.9/3.2	96.0	3.1	25.0	Diesel	No
2. Passenger	19.8/0.0	129.0	2.0	10.0	Diesel	No
3. GO1	379.0/59.0	150.0	1.0	12.0	Diesel	No

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

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00
```

Results segment # 1: CN (day)

LOCOMOTIVE (0.00 + 75.60 + 0.00) = 75.60 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.41	83.30	-6.70	-0.99	0.00	0.00	0.00	75.60

WHEEL (0.00 + 70.78 + 0.00) = 70.78 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.51	79.18	-7.20	-1.19	0.00	0.00	0.00	70.78

Segment Leq : 76.84 dBA

Total Leq All Segments: 76.84 dBA

Results segment # 1: CN (night)

LOCOMOTIVE (0.00 + 70.50 + 0.00) = 70.50 dBA

```
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90     90   0.41  78.19  -6.70  -0.99   0.00   0.00   0.00  70.50
-------------------------------------------------------------------

WHEEL (0.00 + 65.73 + 0.00) = 65.73 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90     90   0.51  74.13  -7.20  -1.19   0.00   0.00   0.00  65.73
-------------------------------------------------------------------

Segment Leq : 71.75 dBA

Total Leq All Segments: 71.75 dBA

Road data, segment # 1: Harvester (day/night)
-----------------------------------------
Car traffic volume  : 20991/2332  veh/TimePeriod  *
Medium truck volume :   809/90    veh/TimePeriod  *
Heavy truck volume  :  1318/146   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):  25687
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   3.50
    Heavy Truck  % of Total Volume     :   5.70
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Harvester (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 319.80 / 319.80 m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

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

Source height = 1.55 m

ROAD (0.00 + 51.35 + 0.00) = 51.35 dBA
```

```
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.48  72.13   0.00 -19.65  -1.13   0.00   0.00   0.00  51.35
-------------------------------------------------------------------------------

Segment Leq : 51.35 dBA

Total Leq All Segments: 51.35 dBA

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

Source height = 1.54 m

ROAD (0.00 + 44.81 + 0.00) = 44.81 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.48  65.59   0.00 -19.65  -1.13   0.00   0.00   0.00  44.81
-------------------------------------------------------------------------------

Segment Leq : 44.81 dBA

Total Leq All Segments: 44.81 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 76.85 dBA
                           (NIGHT): 71.76 dBA
```