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# Noise Feasibility Study
# Proposed Mixed-Use/Residential Development
# Brant & Ghent
# Burlington, Ontario

Prepared for:

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October 5, 2022

HGC Project No: 02000534

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# 1 Introduction & Summary

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by Brant Street Venture Inc. to complete a Noise Feasibility Study for a proposed mixed-use/residential development, to be located at the northeast, northwest, and southeast corners of the intersection of Brant Street and Ghent Avenue, in Burlington, Ontario. This study is based on architectural drawings prepared by Graziana + Corazza Architects Inc. dated September 12, 2022.

The proposed development will include four mixed-use buildings between 8 to 25 storeys in height.

The noises source impacting the development were determined to be road traffic on Brant Street, Ghent Avenue and Fairview Street; and rail traffic on the Canadian National (CN) railway subdivisions to the north. Traffic volumes for the roadways and rail lines were obtained from the relevant authorities and adjusted as warranted to account for future potential growth. Road and rail traffic data were used to estimate future sound levels ($L_{EQ}$) at the location of the proposed building façades. The estimated sound levels were evaluated with respect to the guidelines of the Ministry of the Environment, Conservation and Parks (MECP) and CN.

The sound level predictions indicate that the future road traffic sound levels will exceed MECP guidelines at the buildings in the proposed development. Central air-conditioning is required for all buildings in the proposed development. Upgraded building and glazing constructions are required for the proposed buildings. Warning clauses are recommended to inform the residents of the building of the traffic noise impacts and the presence of nearby commercial/office/retail 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 elevations are available. 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.

# 2 Site Description

The subject property is located at the northwest, northeast, and southeast corner of the intersection of Brant Street and Ghent Avenue, in Burlington, Ontario. A key plan is attached as Figure 1, and the proposed site plan is attached as Figure 3. Surrounding uses are identified in Figure 2. Preliminary floor plans and building elevations are included in Appendix D.

According to the referenced architectural drawings, the subject properties are located on the northwest (Phase 1), northeast (Phase 2), and southeast (Phase 3) corners of the intersection of Brant Street and Ghent Avenue. The municipal addresses of each phase are provided below:

Phase 1: 774, 778, 782 Brant Street
Phase 2: 769, 779,783 Brant Street and 2023, 2027, 2031-2033 Ghent Avenue
Phase 3: 747, 761 Brant Street

The drawings indicate that Phase 1 of the development will consist of an 18-storey and 25-storey residential tower above a common 5-storey podium and four levels of underground parking. Phase 2 will consist of a 25-storey residential tower above a 7-storey podium and three levels of underground parking. Retail uses are proposed on the ground floor of the proposed buildings in Phase 1 and 2. Phase 3 will consist of an 8-storey residential building and two levels of underground parking.

A site visit was made by HGC Engineering personnel in August 2020, to make observations of the acoustical environment and to identify the significant noise sources in the vicinity.

The area is considered to be Class I (urban) in terms of its acoustical environment. The subject sites are currently occupied by a parking lot, residential buildings, and commercial buildings, all of which will be demolished to make way for the proposed development. The surrounding land includes retail, commercial and residential uses. Sounds were not audible at the time of the site visit. Road traffic Brant Street was confirmed to be the dominant source of noise in the area, with secondary contributions from road traffic on Ghent Avenue and Fairview Street, and rail traffic in the rail corridor to the north. There are no significant sources of stationary noise within 500 m of the subject site.

The subject site is located more than 75 m away from any sources of vibration such as rail lines, street cars and subways. Vibration measurements are therefore not required for the subject site.

# 3 Transportation Noise Assessment

## 3.1 Road and Rail Noise Criteria

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

**Table 1: Road and Rail Traffic Noise Criteria**

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

Daytime refers to the period between 07:00 and 23:00, while nighttime refers to the period between 23:00 and 07:00. Living areas include dining rooms, dens, studies, etc. Corridors and washrooms are not considered to be noise-sensitive areas.

The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace, a garden, or common areas associated with high-rise multi-unit buildings where passive outdoor recreation is expected to occur. Balconies and elevated terraces (e.g., rooftops) with a depth of less than 4 meters are not considered OLAs under MECP guidelines, and accordingly the noise criteria are not applicable there, unless they are the only OLA for the occupant.

The guidelines in the MECP publication allow the sound level in an OLA to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where 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 at the façade exceed 60 dBA or daytime sound levels at the façade exceed 65 dBA. Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at the façade are in the range of 51 to 60 dBA or when daytime sound levels at the façade are in the range of 56 to 65 dBA.

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

Railway guidelines recommend brick exterior walls from foundation to rafters as a minimum construction for any dwellings with a 24 hour $L_{EQ}$ that is greater than 60 dBA, and which are within 100 m of the right of way of the railway.

The railways also provide minimum requirements for safety as well as sound and vibration for proposed residential developments located adjacent to their rights-of-way. These refer to minimum required setbacks, berms, fencing and warning clauses. The reader is referred to a copy of CN requirements for a new development adjacent to a principal main rail line, which is located in Appendix A.

## 3.2 Traffic Noise Predictions

### 3.2.1 Road Traffic Data

Traffic data for Brant Street, Ghent Avenue, and Fairview Street were obtained from the City of Burlington Traffic Services and is included in Appendix B. Traffic volumes were conservatively assumed to grow at a typical rate of 2.5%/yr on all roadways, and average future daytime (07:00 to 23:00) and night-time (23:00 to 07:00) hourly volumes that will exist in 10 years (2032) were then calculated. The resulting future traffic volumes are listed in Table 2, in addition to calculated commercial vehicle (truck) percentages and the posted speed limit for each roadway. A 90%/10% day/night split was used for the three roadways.

**Table 2: Projected Road Traffic Data for 2032**

| Road Name | | Cars | Medium Trucks | Heavy Trucks | Total |
|---|---|---|---|---|---|
| **Brant Street** | Daytime | 22 690 | 738 | 1 181 | 24 609 |
| | Nighttime | 2 521 | 82 | 131 | 2 734 |
| | **Total** | **25 211** | **820** | **1 313** | **27 344** |
| **Ghent Avenue** | Daytime | 5 415 | 189 | 301 | 5 905 |
| | Nighttime | 602 | 21 | 33 | 656 |
| | **Total** | **6 016** | **210** | **335** | **6 561** |
| **Fairview Street** | Daytime | 53 378 | 1 244 | 1 923 | 56 544 |
| | Nighttime | 5 931 | 138 | 214 | 6 283 |
| | **Total** | **59 309** | **1 382** | **2 136** | **62 827** |

### 3.2.2 Rail Traffic Data

Rail traffic data was recently obtained from both GO Transit and CN representatives and is included in Appendix C. The data was projected to the year 2032 at an assumed growth of 2.5%/year, as required by MECP and CN guidelines. The rail volumes used in the analysis are summarized in Table 3.

**Table 3: Rail Traffic Data Projected to Year 2032**

| Type of Train | Number of Trains Day/ Night | Number of locomotives | Number of cars | Max Speed (KPH) |
|---|---|---|---|---|
| **CN – Oakville Subdivision** | | | | |
| **Way Freight** | 5 / 3 | 4 | 25 | 97 |
| **Passenger** | 17 / 0 | 2 | 10 | 129 |
| **GO** | 197 / 47 | 1 | 12 | 153 |
| **CN – Halton Subdivision** | | | | |
| **Freight** | 13 / 5 | 4 | 140 | 80 |
| **Way Freight** | 3 / 0 | 2 | 25 | 80 |

Note: All GO trains have been modeled as diesel trains as per recent direction from Metrolinx.

### 3.2.3 Prediction Results

To assess the levels of traffic noise that will impact the site, predictions were made using a numerical computer modelling package (*Cadna-A version 2022 MR1 (32 bit): build 189.5221)*. 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 sources were included in the model using line sources, calibrated to levels predicted in STAMSON 5.04, a computer algorithm developed by the MECP. The *Cadna-A* modelling as been qualified to be within 1 – 2 dBA of those predicted in STAMSON 5.04, a computer algorithm developed by the MECP. A sample output is included in Appendix E for the east façade of the podium of the proposed building in Phase 1 for confirmation purposes.

The model was used to predict traffic noise levels at each of the building façades. The maximum predicted sound levels at each of the building façades (for the extent of the total building height) calculated by Cadna-A are shown in Figures 4 and 5. A breakdown of the partial maximum sound level contributions from road and rail traffic noise sources at each façade are shown in Table 4 below.

**Table 4: Worst Case Predicted Road and Rail Traffic Sound Levels [dBA], Without Mitigation**

| Phase | Building | Location Description | Daytime (16hr avg) | | | Night (8hr avg) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Road Traffic | Rail Traffic | Total | Road Traffic | Rail Traffic | Total |
| Phase 1 | Podium | North Façade | 64 | 59 | 65 | 57 | 56 | 60 |
| | | East Façade | 68 | 56 | 68 | 61 | <50 | 62 |
| | | South Façade | 65 | <55 | 65 | 59 | 54 | 59 |
| | | West Façade | 58 | 57 | 60 | 51 | 56 | 56 |
| | Tower A | North Façade | 57 | 58 | 60 | 51 | 55 | 56 |
| | | East Façade | 60 | 55 | 61 | 53 | 52 | 55 |
| | | South Façade | 60 | <55 | 60 | 54 | <50 | 54 |
| | | West Façade | 57 | 56 | 59 | 50 | 53 | 54 |
| | Tower B | North Façade | 62 | 58 | 63 | 55 | 55 | 58 |
| | | East Façade | 65 | 55 | 65 | 58 | 53 | 59 |
| | | South Façade | 63 | <55 | 63 | 56 | <50 | 56 |
| | | West Façade | 56 | 56 | 59 | <50 | 54 | 54 |
| Phase 2 | Podium | North Façade | 64 | 58 | 65 | 57 | 56 | 60 |
| | | East Façade | 57 | <55 | 58 | 51 | 52 | 54 |
| | | South Façade | 65 | <55 | 65 | 58 | <50 | 58 |
| | | West Façade | 67 | 57 | 67 | 61 | 54 | 61 |
| | Tower | North Façade | 61 | 58 | 63 | 55 | 55 | 58 |
| | | East Façade | 55 | 55 | 58 | <50 | 52 | 53 |
| | | South Façade | 62 | <55 | 62 | 55 | <50 | 56 |
| | | West Façade | 65 | 56 | 65 | 58 | 53 | 59 |
| Phase 3 | Tower | North Façade | 64 | 53 | 65 | 58 | 51 | 58 |
| | | East Façade | 59 | <55 | 59 | 52 | <50 | 52 |
| | | South Façade | 63 | <55 | 63 | 56 | <50 | 56 |
| | | West Façade | 67 | 51 | 67 | 61 | 50 | 61 |

The preliminary plans indicate that there will be residential outdoor amenity spaces on the podiums of each building. Figure 3 shows the locations of the receivers used to predicted future noise levels in these areas. In accordance to NPC-300, the receptors for each elevated OLA listed below are located at the centre of the area. The results are summarized in Table 5.

**Table 5: Predicted Sound Levels in OLA's*, [dBA]**

| Receiver | Phase | Location | Daytime $L_{EQ}$ (16 hr) |
|---|---|---|---|
| R1 | 1 | 4/F | 59 |
| R2 | | 6/F | 58 |
| R3 | 2 | 4/F | 60 |
| R4 | | 8/F | 58 |
| R5 | 3 | 9/F | <55 |

Note:
* Assuming a standard 1.07 m high parapet or solid railing for elevated terraces, except as noted.

### 3.2.4 Recommendations

The predictions indicate that the future traffic sound levels are high enough at façades with exposure to the major roadways to warrant certain minimum noise control features. The following discussion outlines recommendations for barriers, ventilation requirements, and upgraded building façade constructions, to achieve the noise criteria stated in Table 1.

#### 3.2.4.1 Outdoor Living Areas

The predicted sound levels in the outdoor amenity areas on the podiums of the buildings will be between 55 dBA and 60 dBA, up to 5 dBA in excess of the MECP's limit of 55 dBA, assuming a standard minimum 1.07 m high solid parapet wall.

A barrier height table indicating the barrier heights needed to achieve 55 dBA in these areas are provided in Table 6.

**Table 6: Acoustic Barrier Heights Required to achieve various Sound Levels, [m]**

| Receiver | 55 dBA | 56 dBA | 57 dBA | 58 dBA | 59 dBA | 60 dBA |
|---|---|---|---|---|---|---|
| R1 | 2.2 | 1.7 | 1.4 | 1.3 | 1.07 | -- |
| R2 | 1.3 | 1.3 | 1.3 | 1.07 | -- | -- |
| R3 | 2.9 | 2.2 | 1.7 | 1.5 | 1.3 | 1.07 |
| R4 | 1.4 | 1.3 | -- | 1.07 | -- | -- |
| R5 | 1.07 | -- | -- | -- | -- | -- |

Consideration should be given in detailed design to integrate smaller structures or landscaping features to create quieter pockets or zones. Alternatively, these outdoor amenity areas could be reduced in size or relocated to an area that experiences greater shielding from the proposed or adjacent buildings.

The residential units may have balconies that are less than 4 metres in depth (which are exempt from the definition of OLA under MECP guidelines).

#### 3.2.4.2 Indoor Living Areas and Ventilation Requirements

**Central Air Conditioning**

Predicted sound levels at most of the façades of the proposed buildings exceed 65 dBA during the day and/or 60 dBA during the night. To address these excesses, the MECP guidelines recommend that these dwellings be equipped with central air conditioning systems, so that the windows can be closed. It is understood that central air conditioning will be provided for the proposed buildings in any case.

Window or through-the-wall air conditioning units are not recommended for any residential units because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall noise insulating properties of the envelope. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with the criteria of MECP publication NPC-300, as applicable.

#### 3.2.4.3 Building Façade Constructions

Given the projected future sound levels at the building facades, MECP guidelines recommend that the building envelope be designed so that indoor sound levels comply with the MECP noise criteria.

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

For the purposes of this preliminary analysis, typical window-to-floor area ratios were assumed to be 80% (assumed all fixed glass). Based upon these assumptions and the maximum predicted sound levels at the associated facades, the minimum sound transmission class (STC) ratings of fixed window glazing required to achieve the target indoor sound level criteria is STC-33. Note that these are minimums for the entire assembly (including mullions) and that test data should be provided to verify. If more glazing is incorporated, higher STC requirements may apply. Acoustical criteria for the building façades can be optimized as part of the detailed design of the building envelope, if required.

When detailed floor plans and 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 proposed buildings based on actual window to floor area ratios.

These calculations assume insignificant sound transmission through the walls in comparison with the windows. 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; to achieve this, exterior wall assemblies with a rating of at least 10 STC points above the surrounding window STC requirements are typically required, depending on the amount of wall area relative to window. In most cases, the wall sound insulation is much higher than this; sections of poured or pre-cast concrete will typically have a sound insulation rating of STC-55 or more, and can be

discounted. Insulated spandrel or metal panels backed by a drywall assembly generally have sound insulation ratings in the range of STC-45 to STC-60.

# 4 Stationary Noise Assessment

## 4.1 Criteria for Stationary Sources of Sound

Stationary sources of noise are defined as all sources that emit noise within a commercial or industrial facility boundary. The car servicing bays, rooftop mechanical equipment and at-grade exhaust vents associated with the existing commercial building and proposed buildings can be classified as stationary sources of sound.

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

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

The source sound levels for typical mechanical equipment obtained from past HGC Engineering project files were used as input to a predictive computer model (*Cadna-A version 2022 MR1 (32 bit): build 189.5221*), in order to estimate the sound levels at the neighbouring residential units and at the proposed building. Cadna/A is a computer implementation of ISO Standard 9613-2, *"Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation*", which takes into account attenuation due to distance (geometrical spreading), shielding by intervening structures and air attenuation.

## 4.2 Assessment of Proposed Stationary Noise Sources and their Impact on Adjacent Sensitive Receptors

At the time of this study, the design of the proposed building was in its initial stages, and the mechanical systems had not yet been developed. The City typically requires neoprene/rubber gaskets or alternative measures for any grates located on the driveways that are in a vehicle's path. A rubber roll-up door with rubber mounts at any points of support from the concrete structure should be considered to minimize the noise impact on adjacent sensitive receptors. An acoustical design review should be conducted at a later stage to determine the appropriate acoustical features to mitigate potential noise impacts on adjacent sensitive receptors.

Per the City of Burlington's comment, a preliminary noise impact assessment of the mechanical equipment associated with the proposed residential development at existing residences has been conducted based on information obtained from similar residential buildings. The potential sources of concern associated with this development are understood to be parking garage exhaust fans and cooling units located in the rooftop mechanical penthouse. Most of the mechanical units will likely be located inside the rooftop mechanical penthouse with an opening at the top for the cooling tower.

There are existing residences to the surrounding the site and representative residences are considered to be the sensitive receptors in this assessment (RS1 to RS6). RS1 and RS2 are multi-storey residential buildings, and RS3 to RS6 are two-storey residential buildings. Receptor locations are shown as green crosses on Figure 6.

An overall outdoor sound power level of 92 dBA was assumed for the rooftop mechanical penthouse of each residential tower (cooling tower opening). The HVAC equipment was assumed to operate at 100% capacity during daytime hours and 50% during night-time hours. The parking garage exhaust fans are likely to be low pressure fans which will be connected to a carbon monoxide system and as such, the exhaust fans will only operate on an as needed basis. An overall sound power level of 79 dBA at the at-grade parking garage exhaust grates were assumed. The parking garage exhaust fans are assumed to operate at 50% capacity conservatively during daytime and night-time hours. Proposed noise sources are also shown on Figure 6.

Calculations at the worst-case location at each receptor, which are the top-storeys of RS1 and RS2, and the 3rd floors of RS3 to RS6, indicate that the predicted sound levels from the proposed development using the assumptions stated above, can meet the applicable MECP sound level limits at residential receptors. The highest predicted daytime and night-time sound levels for each residential building are also shown on Figures 7 and 8.

The mechanical systems should be designed not to exceed the sound level assumptions mentioned above. A Professional Engineer qualified to perform acoustical engineering services should review the design of the mechanical building systems and the equipment selections when they have been determined, to ensure that the noise levels emitted by the development to the environment will meet the applicable MECP sound level limits.

## 4.3 Assessment of Existing Stationary Noise Sources and their Impact on the Proposed Building

There are car services bays at the auto repair shops to the north and rooftop mechanical equipment such as make-up air units and cooling towers at the existing residential buildings to the south and west of Phase 1 and to the north of Phase 2. Existing noise sources are shown as green crosses and lines in Figure 9.

An overall outdoor sound power level of 92 dBA and 84 dBA was assumed for the cooling tower openings and the rooftop make-up air units, respectively. The HVAC equipment was assumed to operate at 100% capacity during daytime hours and 50% during night-time hours. The car servicing bays were assumed to have a sound power level of 94 dBA as per measurements taken from similar past projects. The bays are assumed to be utilized for 20 minutes each.

Calculations conducted at the proposed buildings indicate a maximum sound level impact of 50 dBA during the day, and 43 dBA during the night. These predicted sound levels are less than the MECP minimum exclusionary limit of 50 dBA during the daytime hours and 45 dBA during the nighttime hours, based on a typical worst-case operating scenario.

It is concluded that the sounds from the existing rooftop mechanical equipment are anticipated to comply with the MECP guidelines and physical mitigation is not required.

## 4.4 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.

# 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/lots/blocks with anticipated traffic sound level excesses. Examples are provided below.

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

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

Type B:

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

Suggested wording for future dwellings with private balconies less than 4.0 m in depth is given below.

Type C:

> Purchasers/Tenants are advised that the private terraces of each unit are less than 4.0m in depth and are therefore not required to have noise mitigation measures as per the guidelines of Ministry of the Environment, Conservations and Parks. Sound levels due to road and rail traffic may interfere with some activities of the dwelling occupants use of their private terrace.

Suggested wording for informing future residents of the adjacent commercial and institutional facilities and that sound from these facilities may, at times, be audible.

Type D:

> Purchasers are advised that due to the proximity of the adjacent commercial and institutional facilities, noise from these facilities may at times be audible.

These sample clauses are provided only as examples, and can be modified by the owner's legal representative, in consultation with the City, in order to suit site-specific requirements.

# 6 Summary of Recommendations

The following list summarizes the recommendations made in this report:

1. Central air conditioning is required for all proposed buildings in the development.

2. Upgraded building and glazing constructions are required for the proposed buildings. Any exterior wall, and double-glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the

proposed buildings. When detailed floor plans and building elevations are available, a detailed study should be conducted to refine acoustic requirements.

3. Warning clauses should be included in the property and tenancy agreements and offers of purchase and sale to inform future residents of the traffic noise issues and the proximity to existing institutional and commercial uses.

4. Tarion Builder's 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.

## 6.1 Implementation

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

1) At the site plan stage, a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should review the architectural plans and building elevations to refine glazing requirement based on actual window to floor areas ratios.

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

# 7 CONCLUSION

The results of this study indicate that the proposed development is feasible on this site from a noise impact perspective, with the inclusion of appropriate acoustical features. Preliminary design recommendations are provided herein. A detailed noise study should be conducted at the site plan stage when additional details of building design/construction (detailed floor plans and elevations) are available to verify and/or refine the acoustic recommendations. 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.

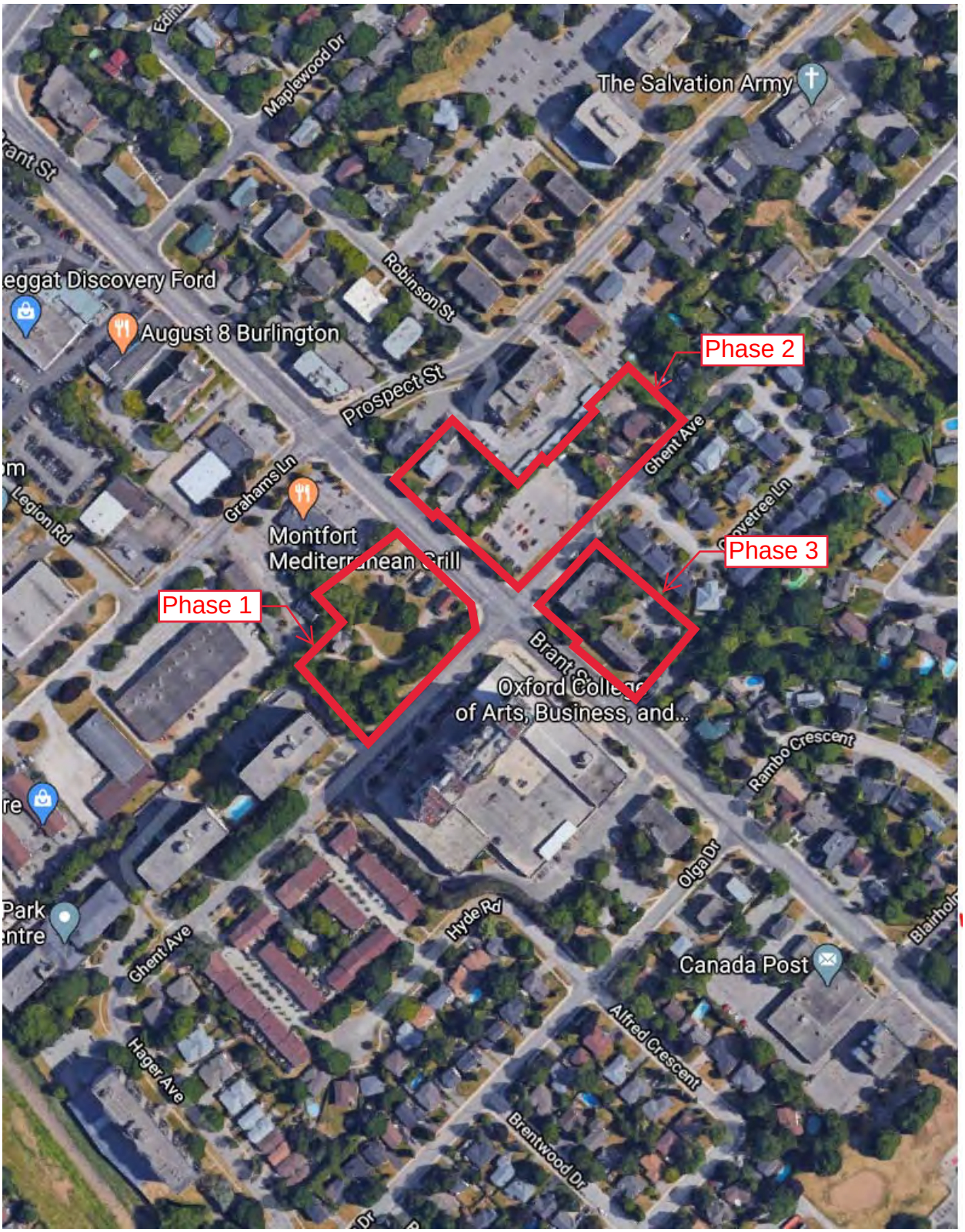



**Figure 1: Key Plan**

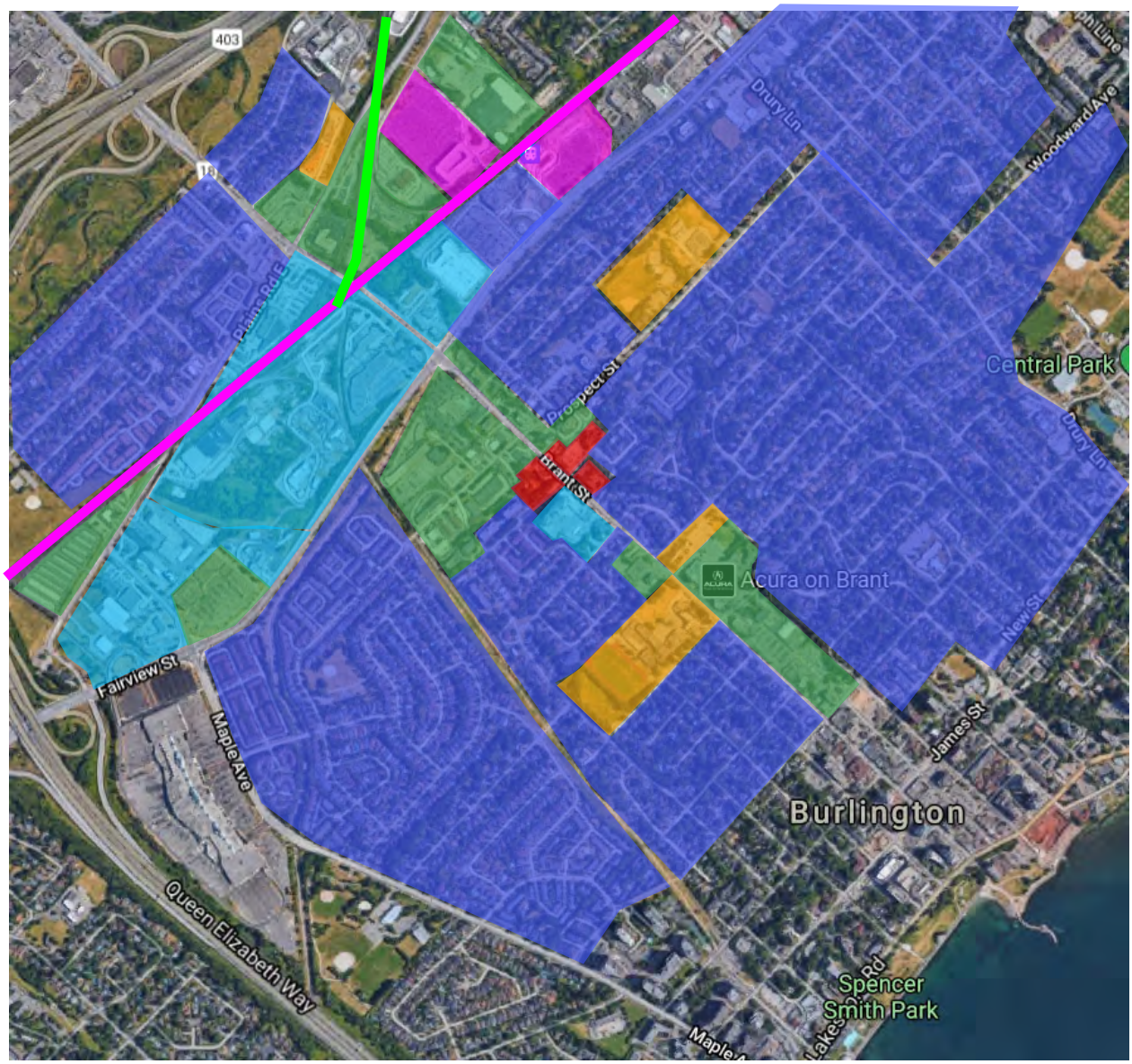
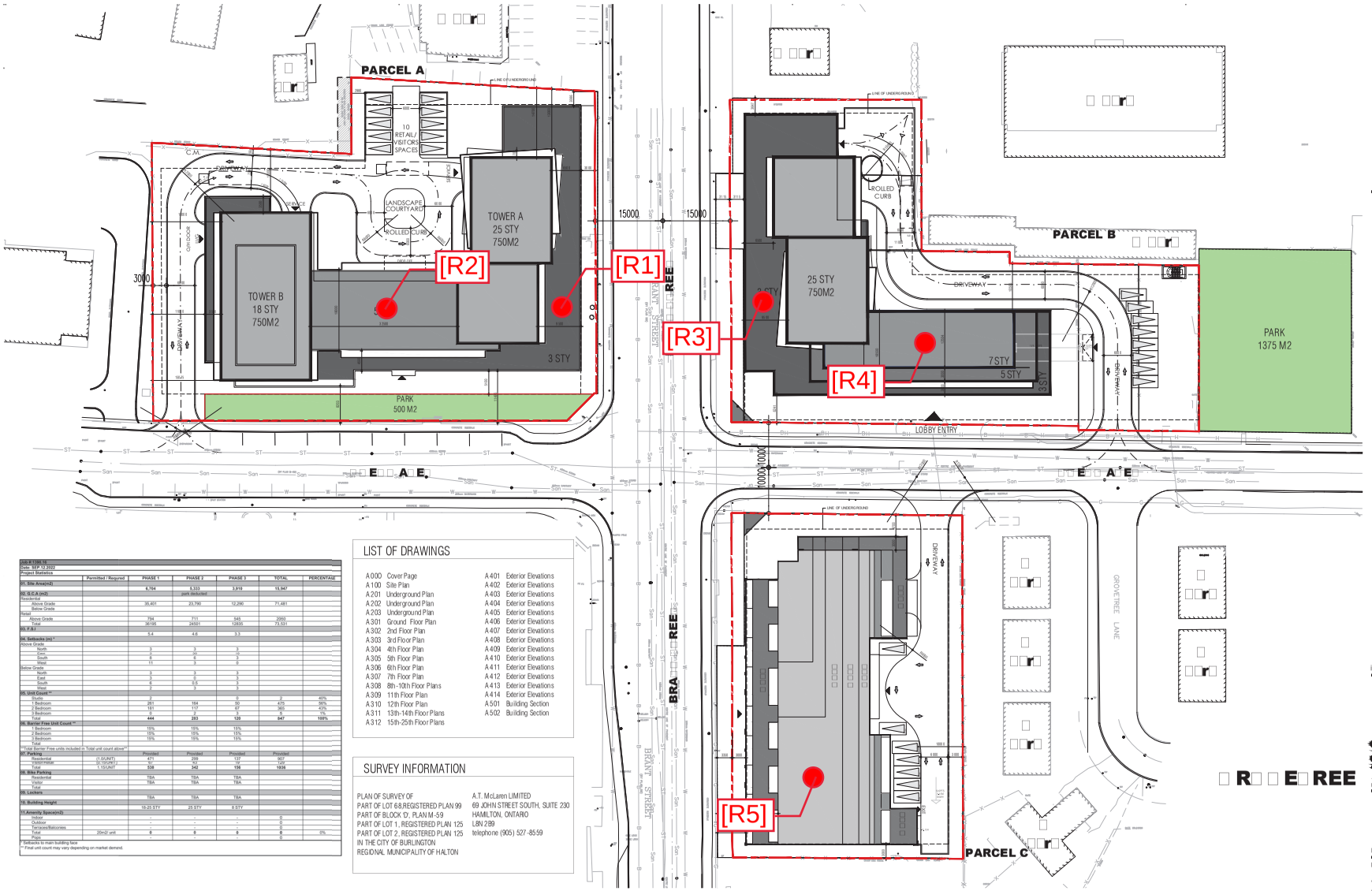



**Figure 2: Surrounding Uses**

LEGEND

- Subject Site
- Retail Uses
- Commercial/Industrial Uses
- Residential Uses
- Institutional Uses
- GO Station
- GO Rail Line
- CN Rail Line




| Job # 1398.16 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Date: SEP 12 2022 | | | | | | | |
| Project Statistics | | | | | | | |
| | Permitted / Required | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL | PERCENTAGE | |
| 01. Site Area(m2) | | 6,764 | 5,333 | 3,910 | 15,947 | | |
| 02. G.F.A (m2) | | | park deducted | | | | |
| Residential | | | | | | | |
| Above Grade | | 35,401 | 23,790 | 12,290 | 71,481 | | |
| Below Grade | | | | | | | |
| Retail | | | | | | | |
| Above Grade | | 794 | 711 | 545 | 2050 | | |
| Total | | 36195 | 24501 | 12835 | 73,531 | | |
| 03. F.S.I | | | | | | | |
| | | 5.4 | 4.6 | 3.3 | | | |
| 04. Setbacks (m) * | | | | | | | |
| Above Grade | | | | | | | |
| North | | 3 | 3 | 3 | | | |
| East | | 0 | 0 | 0 | | | |
| South | | 6 | 6 | 3 | | | |
| West | | 11 | 3 | 3 | | | |
| Below Grade | | | | | | | |
| North | | 3 | 3 | 3 | | | |
| East | | 3 | 0 | 3 | | | |
| South | | 6 | 0.5 | 3 | | | |
| West | | 2 | 3 | 3 | | | |
| 05. Unit Count ** | | | | | | | |
| Studio | | 2 | 0 | 0 | 2 | 40% | |
| 1 Bedroom | | 261 | 164 | 50 | 475 | 56% | |
| 2 Bedroom | | 181 | 117 | 87 | 365 | 43% | |
| 3 Bedroom | | 0 | 2 | 3 | 5 | 1% | |
| Total | | 444 | 283 | 120 | 847 | 100% | |
| 06. Barrier Free Unit Count ** | | | | | | | |
| 1 Bedroom | | 15% | 15% | 15% | | | |
| 2 Bedroom | | 15% | 15% | 15% | | | |
| 3 Bedroom | | 15% | 15% | 15% | | | |
| Total | | | | | | | |
| ** Total Barrier Free units included in Total unit count above** | | | | | | | |
| 07. Parking | | Provided | Provided | Provided | Provided | | |
| Residential | (1.0UNIT) | 471 | 299 | 137 | 907 | | |
| Visitor/Retail | (0.15UNIT) | 67 | 43 | 19 | 129 | | |
| Total | 1.15UNIT | 538 | 342 | 156 | 1036 | | |
| 08. Bike Parking | | | | | | | |
| Residential | | TBA | TBA | TBA | | | |
| Visitor | | TBA | TBA | TBA | | | |
| Total | | | | | | | |
| 09. Lockers | | | | | | | |
| | | TBA | TBA | TBA | | | |
| 10. Building Height | | | | | | | |
| | | 10-25 STY | 25 STY | 8 STY | | | |
| 11 Amenity Space(m2) | | | | | | | |
| Indoor | | - | - | - | 0 | | |
| Outdoor | | - | - | - | 0 | | |
| Terraces/Balconies | | - | - | - | 0 | | |
| Total | 20m2/ unit | 8 | 8 | 8 | 0 | 0% | |
| Pets | | - | - | - | 0 | | |

* Setbacks to main building face
** Final unit count may vary depending on market demand.

## LIST OF DRAWINGS

| | | | |
|---|---|---|---|
| A 000 | Cover Page | A 401 | Exterior Elevations |
| A 100 | Site Plan | A 402 | Exterior Elevations |
| A 201 | Underground Plan | A 403 | Exterior Elevations |
| A 202 | Underground Plan | A 404 | Exterior Elevations |
| A 203 | Underground Plan | A 405 | Exterior Elevations |
| A 301 | Ground Floor Plan | A 406 | Exterior Elevations |
| A 302 | 2nd Floor Plan | A 407 | Exterior Elevations |
| A 303 | 3rd Floor Plan | A 408 | Exterior Elevations |
| A 304 | 4th Floor Plan | A 409 | Exterior Elevations |
| A 305 | 5th Floor Plan | A 410 | Exterior Elevations |
| A 306 | 6th Floor Plan | A 411 | Exterior Elevations |
| A 307 | 7th Floor Plan | A 412 | Exterior Elevations |
| A 308 | 8th -10th Floor Plans | A 413 | Exterior Elevations |
| A 309 | 11th Floor Plan | A 414 | Exterior Elevations |
| A 310 | 12th Floor Plan | A 501 | Building Section |
| A 311 | 13th-14th Floor Plans | A 502 | Building Section |
| A 312 | 15th-25th Floor Plans | | |

## SURVEY INFORMATION

PLAN OF SURVEY OF
PART OF LOT 68,REGISTERED PLAN 99
PART OF BLOCK 'D', PLAN M-59
PART OF LOT 1, REGISTERED PLAN 125
PART OF LOT 2, REGISTERED PLAN 125
IN THE CITY OF BURLINGTON
REGIONAL MUNICIPALITY OF HALTON

A.T. McLaren LIMITED
69 JOHN STREET SOUTH, SUITE 230
HAMILTON, ONTARIO
L8N 2B9
telephone (905) 527 -8559

## GENERAL NOTES

1. For landscaping, refer to landscape drawings.
2. For proposed grading, refer to landscape drawings and approved grading plan.
3. All perimeter existing information indicated taken from survey.
4. All work to be done in conformance with the 2012 Ontario Building Code (O.B.C., as amended)
5. All driveway with access onto City owned roadway conform to City of Burlington standards.

## NOTES

1. Fire access route to existing buildings will be maintained during construction.
2. Accessibility for all pathway to Go Station, Wal-Mart during construction will be maintained.
3. The fire access route will be designed to support a load of not less than 11,363 kg per axle and have a change in gradient of not more than 1 in 12.5 over a minimum distance of 15m.
4. Fire Department access route will be constructed of hard surface material such as asphalt, concrete or lockstone.

## KEY PLAN



## VAN ACCESSIBLE SIGNAGE DETAIL




## GFA definition

The sum of the areas of each floor of a building, but shall include a basement or cellar when used for commercial purpose. Measurement shall be from the exterior face of outside walls, or from the centre line of partition and common walls. Gross Floor Area shall not include floor space devoted to:
-Vehicle Parking
-Storage
-Air Handling Equipment
-Enclosed mall and hallways, excluding kiosk, stairways
-Elevators and associated equipment
Washrooms
-Foyers, lobbies, but not waiting areas/rooms

This drawing, as an instrument of service is provided by and is the property of Graziani + Corazza Architects Inc. The contractor must verify and accept responsibility for all dimensions and conditions on site and must notify Graziani + Corazza Architects Inc. of any variations from the supplied information. Graziani + Corazza Architects Inc. is not responsible for the accuracy of survey, structural, mechanical, electrical, etc., engineering information shown on this drawing. Refer to the appropriate engineering drawings before proceeding with the work. Construction must conform to all applicable codes and requirement of the authorities having jurisdiction. Unless otherwise noted, no investigation has been undertaken or reported on by this office in regard to the environmental condition of this site.

This drawing is not to be scaled. All architectural symbols indicated on this drawing are graphic representations only.

Conditions for electronic information transfer

Electronic information is supplied to the other associated firms to assist them in the execution of their work/review. The recipient firms must determine the completeness/appropriateness/relevance of the information in respect to their particular responsibility.

Graziani + Corazza Architects Inc. shall not be responsible for:
1. Errors, omissions, incompleteness due to loss of information in whole or part when information is transferred.
2. Transmission of any virus or damage to the receiving electronic system when information is transferred.

issued for revisions

GRAZIANI + CORAZZA ARCHITECTS INC.
1320 Dorsten Drive, Suite 100 Mississauga Ontario L4W 1C3
Phone 905.795.2601 Fax 905.795.2644 www.gc-architects.com

Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington, Ontario

| | |
|---|---|
| Project Architect: | B. Grazioni |
| Assistant Designer: | R. Alami |
| Drawn By: | R. Alami |
| Checked By: | D. Biase |
| Plot Date: | Sep. 12, 2022 |
| Job # | 1398.16 |

## SITE PLAN

1:400 A101

TITLEBLOCK SIZE: 610 x 900

Figure 3: Proposed Site Plan




**FIGURE 4a: Daytime Sound Level Predictions At Phase 1 From Transportation Noise Sources, dBA**



**FIGURE 4b: Daytime Sound Level Predictions At Phase 2 From Transportation Noise Sources, dBA**

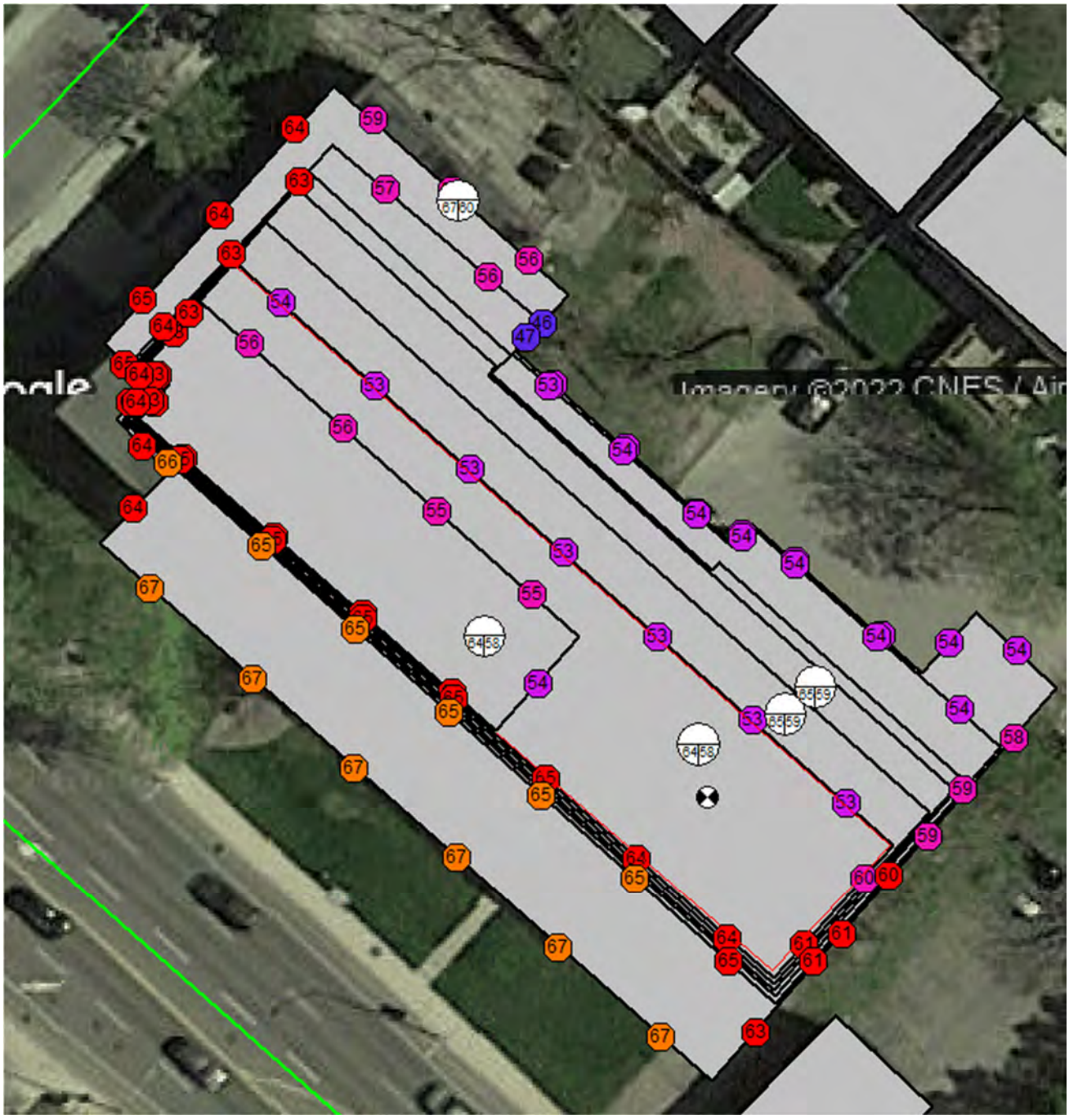



**FIGURE 4c: Daytime Sound Level Predictions At Phase 3 From Transportation Noise Sources, dBA**




**FIGURE 5a: Nighttime Sound Level Predictions At Phase 1 From Transportation Noise Sources, dBA**




**FIGURE 5b: Nighttime Sound Level Predictions At Phase 2 From Transportation Noise Sources, dBA**




**FIGURE 5c: Nighttime Sound Level Predictions At Phase 3 From Transportation Noise Sources, dBA**

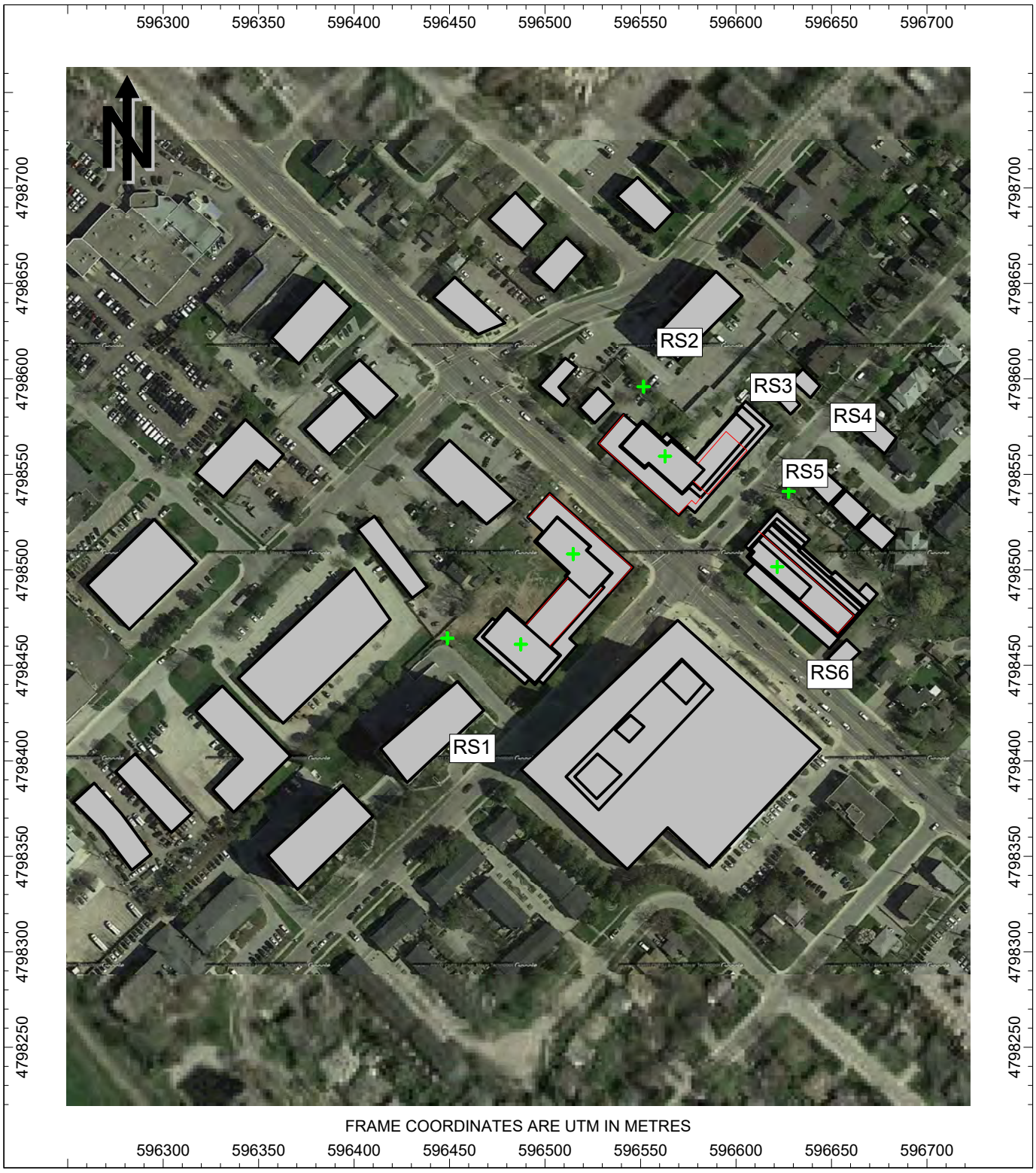



Figure 6: Proposed Noise Source Locations

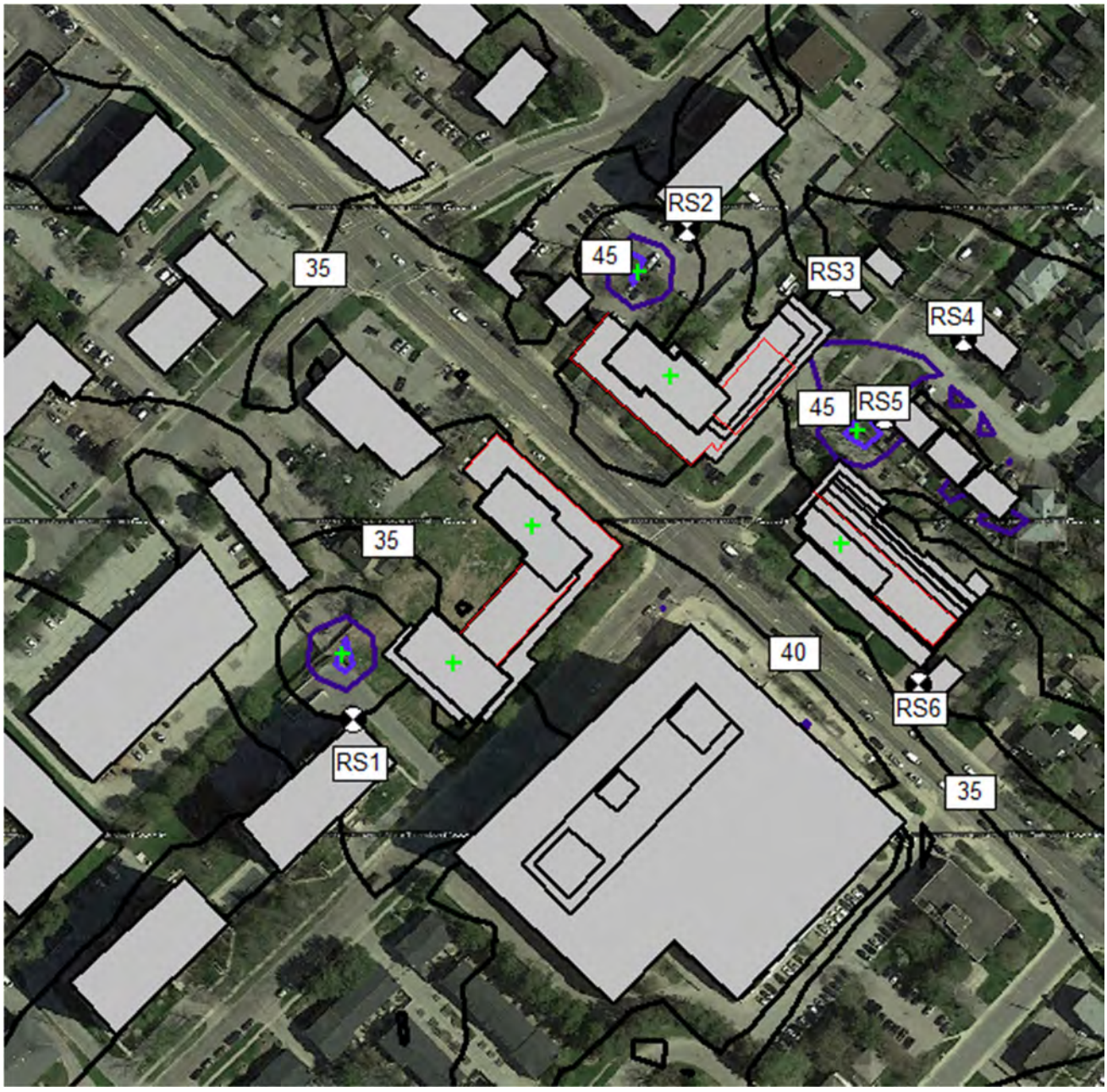



**Figure 7: Predicted Daytime Sound Levels from Proposed Stationary Noise Sources, dBA**

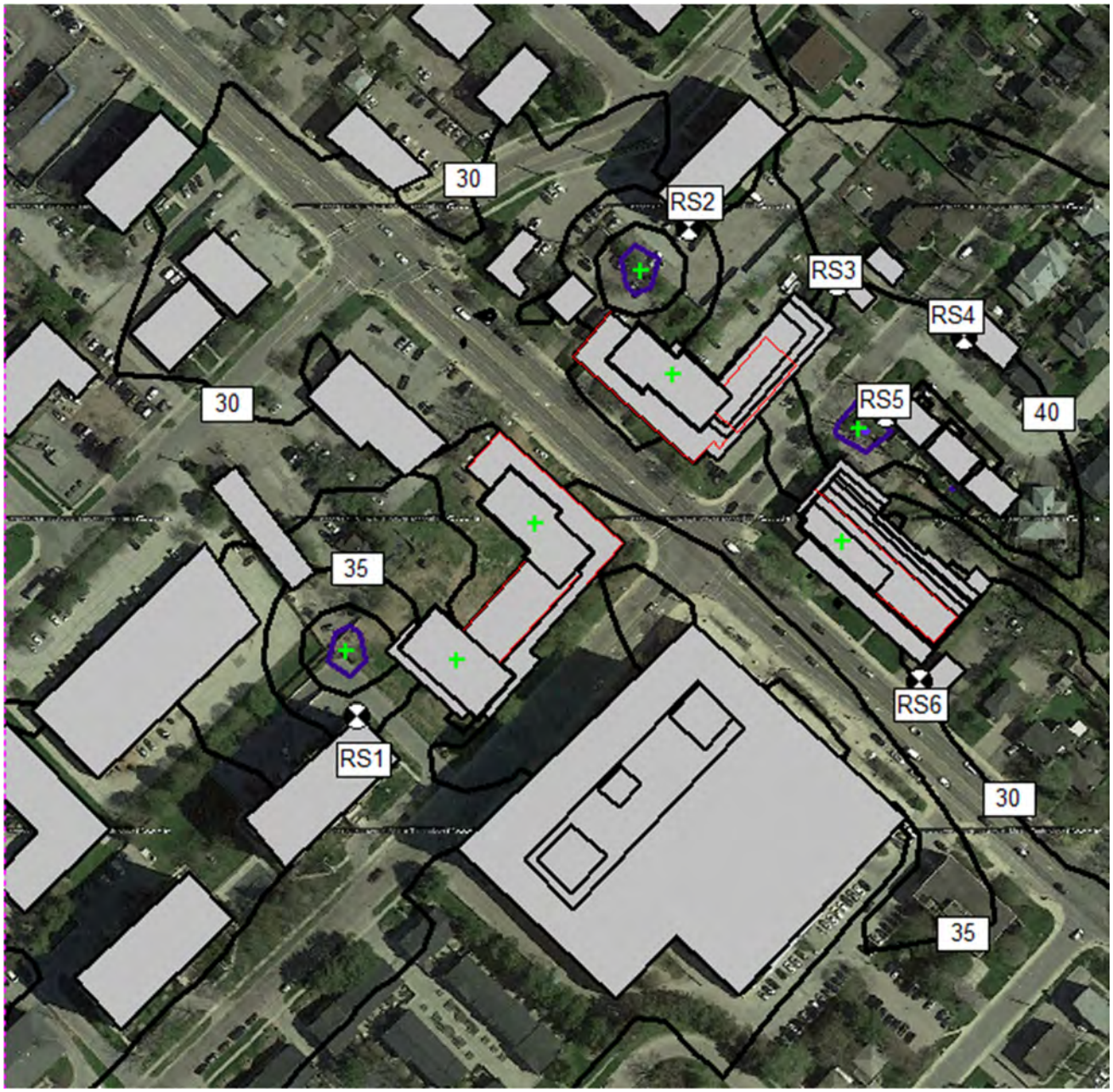



**Figure 8: Predicted Nighttime Sound Levels from Proposed Stationary Noise Sources, dBA**

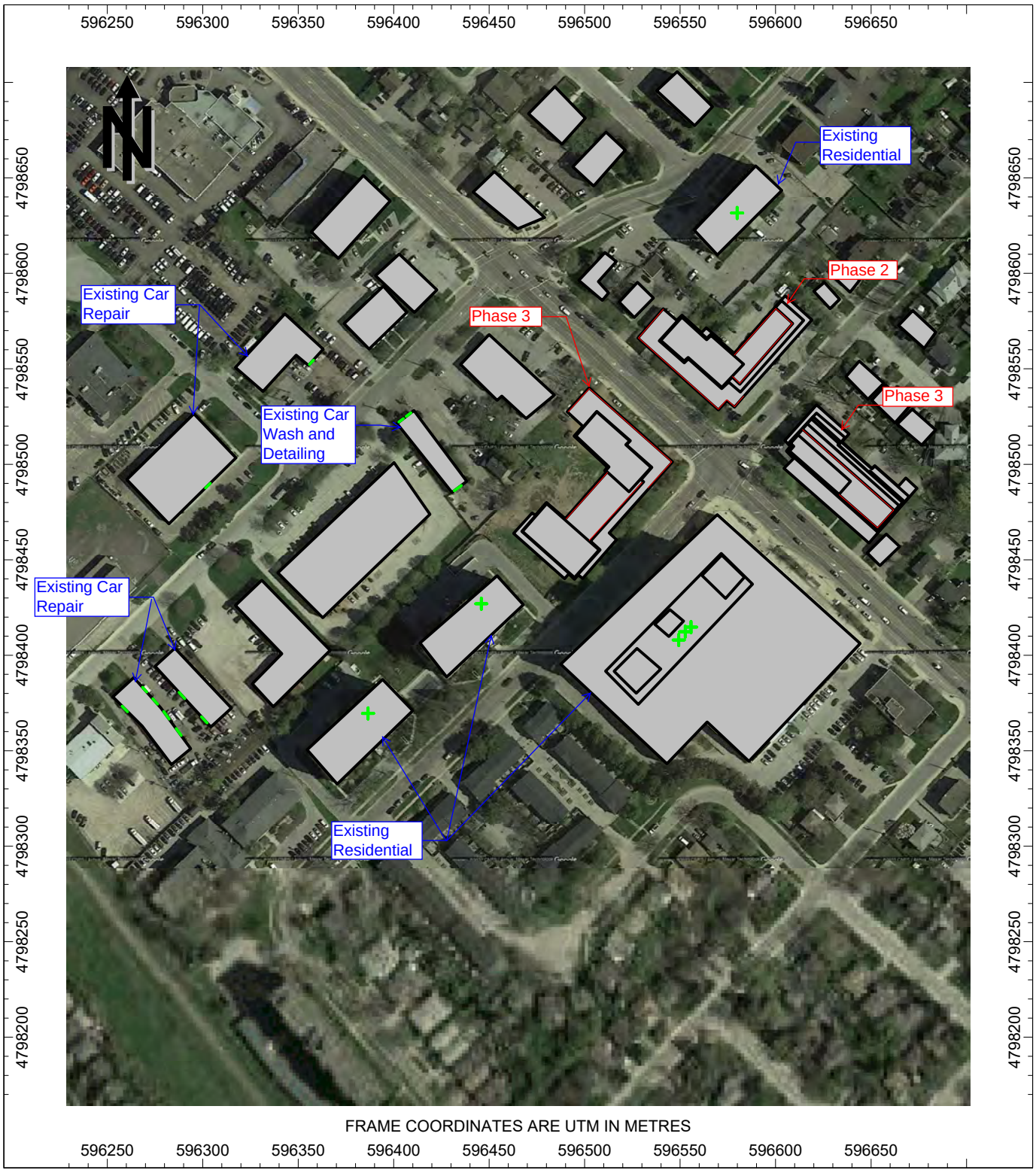



Figure 9: Existing Noise Source Locations

# APPENDIX A

# CN and Metrolinx Principle Mainline Requirements

Canadian National Railway Properties Inc.
Propriétés ferroviaires du Canadien National Inc.

277 Front Street West
Floor 8
Toronto, Ontario
M5V 2X7

Telephone: (416) 217-6961
Facsimile: (416) 217-6743

277, rue Front ouest
8e étage
Toronto (Ontario)
M5V 2X7

Téléphone: (416) 217-6961
Télécopieur: (416) 217-6743

# PRINCIPAL MAIN LINE REQUIREMENTS

**A.** Safety setback of dwellings from the railway rights-of-way to be a minimum of 30 metres in conjunction with a safety berm. The safety berm shall be adjoining and parallel to the railway rights-of-way with returns at the ends, 2.5 metres above grade at the property line, with side slopes not steeper than 2.5 to 1.

**B.** The Owner shall engage a consultant to undertake an analysis of noise. At a minimum, a noise attenuation barrier shall be adjoining and parallel to the railway rights-of-way, having returns at the ends, and a minimum total height of 5.5 metres above top-of-rail. Acoustic fence to be constructed without openings and of a durable material weighing not less than 20 kg. per square metre of surface area. Subject to the review of the noise report, the Railway may consider other measures recommended by an approved Noise Consultant.

**C.** Ground-borne vibration transmission to be evaluated in a report through site testing to determine if dwellings within 75 metres of the railway rights-of-way will be impacted by vibration conditions in excess of 0.14 mm/sec RMS between 4 Hz and 200 Hz. The monitoring system should be capable of measuring frequencies between 4 Hz and 200 Hz, ±3 dB with an RMS averaging time constant of 1 second. If in excess, isolation measures will be required to ensure living areas do not exceed 0.14 mm/sec RMS on and above the first floor of the dwelling.

**D.** The Owner shall install and maintain a chain link fence of minimum 1.83 metre height along the mutual property line.

**E.** The following clause should be inserted in all development agreements, offers to purchase, and agreements of Purchase and Sale or Lease of each dwelling unit within 300m of the railway right-of-way: "Warning: Canadian National Railway Company or its assigns or successors in interest has or have a rights-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the railway facilities on such rights-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CNR will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid rights-of-way."

**F.** Any proposed alterations to the existing drainage pattern affecting railway property must receive prior concurrence from the Railway and be substantiated by a drainage report to the satisfaction of the Railway.

**G.** The Owner shall through restrictive covenants to be registered on title and all agreements of purchase and sale or lease provide notice to the public that the safety berm, fencing and vibration isolation measures implemented are not to be tampered with or altered and further that the Owner shall have sole responsibility for and shall maintain these measures to the satisfaction of CN.

**H.** The Owner enter into an Agreement stipulating how CN's concerns will be resolved and will pay CN's reasonable costs in preparing and negotiating the agreement.

**I.** The Owner may be required to grant CN an environmental easement for operational noise and vibration emissions, registered against the subject property in favour of CN.



A wholly owned subsidiary of Canadian National Railway Company / Une filiale en propriété exclusive de la Compagnie des chemins de fer nationaux du Canada

# PRINCIPAL MAIN LINE REQUIREMENTS FOR NEW DEVELOPMENT

A. Safety setback of dwellings from the railway rights-of-way to be a minimum of 30 metres in conjunction with a safety berm. The safety berm shall be adjoining and parallel to the railway rights-of-way with returns at the ends, 2.5 metres above grade at the property line, with side slopes not steeper than 2.5 to 1.

B. Noise attenuation barrier shall be adjoining and parallel to the railway rights-of-way, having returns at the ends, and a minimum total height of 5.5 metres above top-of-rail. Acoustic fence to be constructed without openings and of a durable material weighing not less than 20 kg. per square metre of surface area. Subject to the review of the noise report, GO Transit may consider other measures recommended by an approved Noise Consultant.

C. Ground-borne vibration transmission to be evaluated in a report through site testing to determine if dwellings within 75 metres of the railway rights-of-way will be impacted by vibration conditions in excess of 0.14 mm/sec RMS between 4 Hz and 200 Hz. The monitoring system should be capable of measuring frequencies between 4 Hz and 200 Hz, $\pm$ 3 dB with an RMS averaging time constant of 1 second. If in excess, isolation measures will be required to ensure living areas do not exceed 0.14 mm/sec RMS on and above the first floor of the dwelling.

D. The Owner shall install and maintain a chain link fence of minimum 1.83 metre height along the mutual property line.

E. The following clause should be inserted in all development agreements, offers to purchase, and agreements of Purchase and Sale or Lease of each dwelling unit within 300m of the railway right-of-way.

> **Warning:** Metrolinx, carrying on business as GO Transit, and its assigns and successors in interest has or have a right-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future including the possibility that GO Transit or any railway entering into an agreement with GO Transit to use the right-of-way or their assigns or successors as aforesaid may expand their operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). Metrolinx will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way.

F. Any proposed alterations to the existing drainage pattern affecting the railway right-of-way must receive prior concurrence from GO Transit and be substantiated by a drainage report to the satisfaction of GO Transit.

G. The Owner shall through restrictive covenants to be registered on title and all agreements of purchase and sale or lease provide notice to the public that the safety berm, fencing and vibration isolation measures implemented are not to be tampered with or altered and further that the Owner shall have sole responsibility for and shall maintain these measures to the satisfaction of GO Transit.

H. The Owner enter into an Agreement stipulating how GO Transit's concerns will be resolved and will pay GO Transit's reasonable costs in preparing and negotiating the agreement.

I. The Owner may be required to grant GO Transit an environmental easement for operational emissions, registered on title against the subject property in favour of GO.

# APPENDIX B

# Road Traffic Data

| Highway | Location Description | Dist. (KM) | Year | Pattern Type | AADT | SADT | SAWDT | WADT | AR |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2014 | CR | 155,300 | 183,200 | 181,700 | 132,000 | N/A |
| | | | 2015 | CR | 158,300 | 186,800 | 185,200 | 134,600 | N/A |
| | | | 2016 | CR | 161,300 | 190,300 | 188,700 | 137,100 | N/A |
| QEW | FAIRVIEW ST IC-99 | 1.0 | 1988 | IC | 68,000 | 78,800 | 76,800 | 59,800 | 0.7 |
| | | | 1989 | IC | 76,600 | 88,000 | 86,500 | 68,100 | 0.8 |
| | | | 1990 | IC | 80,500 | 91,700 | 90,100 | 71,600 | 0.8 |
| | | | 1991 | IC | 82,900 | 93,600 | 91,900 | 73,700 | 1.1 |
| | | | 1992 | IC | 83,500 | 94,300 | 93,500 | 74,300 | 0.8 |
| | | | 1993 | IC | 84,100 | 93,300 | 92,500 | 76,500 | 0.6 |
| | | | 1994 | IC | 92,100 | 102,700 | 103,500 | 81,600 | 0.8 |
| | | | 1995 | IC | 95,900 | 106,900 | 108,400 | 85,000 | 0.3 |
| | | | 1996 | IC | 99,700 | 111,200 | 112,700 | 88,300 | 0.4 |
| | | | 1997 | IC | 103,600 | 115,500 | 117,100 | 91,200 | 0.4 |
| | | | 1998 | IC | 107,400 | 119,800 | 120,700 | 95,200 | 0.3 |
| | | | 1999 | IC | 111,300 | 124,100 | 125,100 | 98,600 | 0.6 |
| | | | 2000 | IC | 115,100 | 128,300 | 129,400 | 102,000 | 0.4 |
| | | | 2001 | IC | 118,900 | 133,200 | 133,200 | 104,600 | 0.3 |
| | | | 2002 | IC | 122,800 | 136,900 | 138,000 | 108,200 | 0.4 |
| | | | 2003 | IC | 126,600 | 140,500 | 141,800 | 111,400 | 0.3 |
| | | | 2004 | IC | 130,400 | 145,300 | 146,700 | 115,500 | 0.4 |
| | | | 2005 | IC | 134,300 | 149,300 | 150,800 | 118,400 | 0.5 |
| | | | 2006 | IC | 138,100 | 153,400 | 154,900 | 122,300 | 0.5 |
| | | | 2007 | IC | 141,900 | 157,600 | 162,500 | 125,400 | 0.4 |
| | | | 2008 | IC | 145,800 | 161,500 | 156,300 | 128,600 | 0.4 |
| | | | 2009 | IC | 149,600 | 165,800 | 167,300 | 132,600 | 0.4 |
| | | | 2010 | IC | 153,400 | 169,800 | 171,200 | 136,000 | 0.3 |
| | | | 2011 | IC | 157,300 | 173,000 | 179,300 | 141,500 | N/A |
| | | | 2012 | IC | 157,200 | 174,500 | 168,200 | 139,900 | N/A |
| | | | 2013 | IC | 153,000 | 169,800 | 168,300 | 136,200 | N/A |
| | | | 2014 | IC | 165,700 | 183,900 | 182,200 | 147,400 | N/A |
| | | | 2015 | IC | 169,300 | 187,900 | 186,200 | 150,700 | N/A |
| | | | 2016 | IC | 172,900 | 191,900 | 190,200 | 153,900 | N/A |
| QEW | HWY 403/407 IC-100 | 0.8 | 1988 | C | 90,800 | 100,800 | 100,800 | 81,700 | 1.1 |

## Yvonne Lo

**From:** Bee, Christopher (MTO) <Christopher.Bee@ontario.ca>
**Sent:** Wednesday, July 22, 2020 11:56 AM
**To:** Yvonne Lo
**Cc:** Bee, Christopher (MTO)
**Subject:** Fw: Bee, Christopher (MTO) shared "QEW at Fairview St(Plains Rd) (East Ramp)" with you.
**Attachments:** QEW at Fairview St(Plains Rd) (East Ramp).pdf; QEW at Fairview St(Plains Rd) (West Ramp).pdf

To Yvonne Lo:

The "% commercial" at QEW and Fairview was 25% for 2016, and several years before.
This includes small trucks, large trucks, cars with trailer, and specials, but NOT REGULAR CARS. There is no further breakdown.

This is a relatively large number, but does not imply the "% commercial" on the on-ramp is the same.

Christopher Bee
MTO CR Traffic Office
STIRCS

---

**From:** Bee, Christopher (MTO) <Christopher.Bee@ontario.ca>
**Sent:** Wednesday, July 22, 2020 11:50 AM
**To:** Banger, Kamal (MTO) <Kamal.Banger@ontario.ca>
**Cc:** Bee, Christopher (MTO) <Christopher.Bee@ontario.ca>
**Subject:** Fw: Bee, Christopher (MTO) shared "QEW at Fairview St(Plains Rd) (East Ramp)" with you.

Thanks Kamal.

Chris

---

**From:** Banger, Kamal (MTO) <Kamal.Banger@ontario.ca>
**Sent:** Wednesday, July 22, 2020 11:40 AM
**To:** Yvonne Lo <ylo@hgcengineering.com>
**Cc:** Bee, Christopher (MTO) <Christopher.Bee@ontario.ca>
**Subject:** RE: Bee, Christopher (MTO) shared "QEW at Fairview St(Plains Rd) (East Ramp)" with you.

Hi Yvonne,

Attached are the TMC data you requested.

Thanks,

Kamal

**From:** Yvonne Lo <ylo@hgcengineering.com>
**Sent:** July 22, 2020 8:13 AM
**To:** Bee, Christopher (MTO) <Christopher.Bee@ontario.ca>
**Cc:** Banger, Kamal (MTO) <Kamal.Banger@ontario.ca>; Bee, Christopher (MTO) <Christopher.Bee@ontario.ca>
**Subject:** RE: Bee, Christopher (MTO) shared "QEW at Fairview St(Plains Rd) (East Ramp)" with you.

**CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.**

Hi Christopher,

Thanks for coordination. I look forward to getting the volume data associated with the onramp. Can you please also provide "% commercial" on QEW in the vicinity of the on-ramp location?

Thank you!

Best,

**Yvonne Lo**, BASc, PEng
Project Consultant

**HGC Engineering** **NOISE | VIBRATION | ACOUSTICS**
**Howe Gastmeier Chapnik Limited**
2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7
**t:** 905.826.4044 **e:** ylo@hgcengineering.com
**Visit our website:** www.hgcengineering.com **Follow Us** – LinkedIn | Twitter | YouTube

**From:** Bee, Christopher (MTO) <Christopher.Bee@ontario.ca>
**Sent:** Tuesday, July 21, 2020 6:58 PM
**To:** Yvonne Lo <ylo@hgcengineering.com>
**Cc:** Banger, Kamal (MTO) <Kamal.Banger@ontario.ca>; Bee, Christopher (MTO) <Christopher.Bee@ontario.ca>
**Subject:** Fw: Bee, Christopher (MTO) shared "QEW at Fairview St(Plains Rd) (East Ramp)" with you.

To Yvonne Lo, HGC:

RE: % commercial + volume at on- ramp from Plains Road/Fairview to QEW

Sorry about the delay.

Re the above, unfortunately we do not have "% commercial" at the indicated on-ramp. But we have "% commercial" on QEW in the vicinity of the on-ramp location. I assume that is not what you want.

Re volume at the on-ramp, the latest we have is 2015. We do not have the on-ramp volumes, but we have the TMCs at both ramp terminals at QEW and Fairivew. From the TMCs, you can infer the on-ramp volume. The TMC data are on shared drive, and my computer cannot send the data to you. I have sent the data to Kamal Banger, who will forward both ramp terminal TMCs to you (please see email below).

Thanks

Christopher Bee
MTO CR Traffic Office
STIRCS

# *Fairview St & QEW E Ramp*

## Morning Peak Diagram

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

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

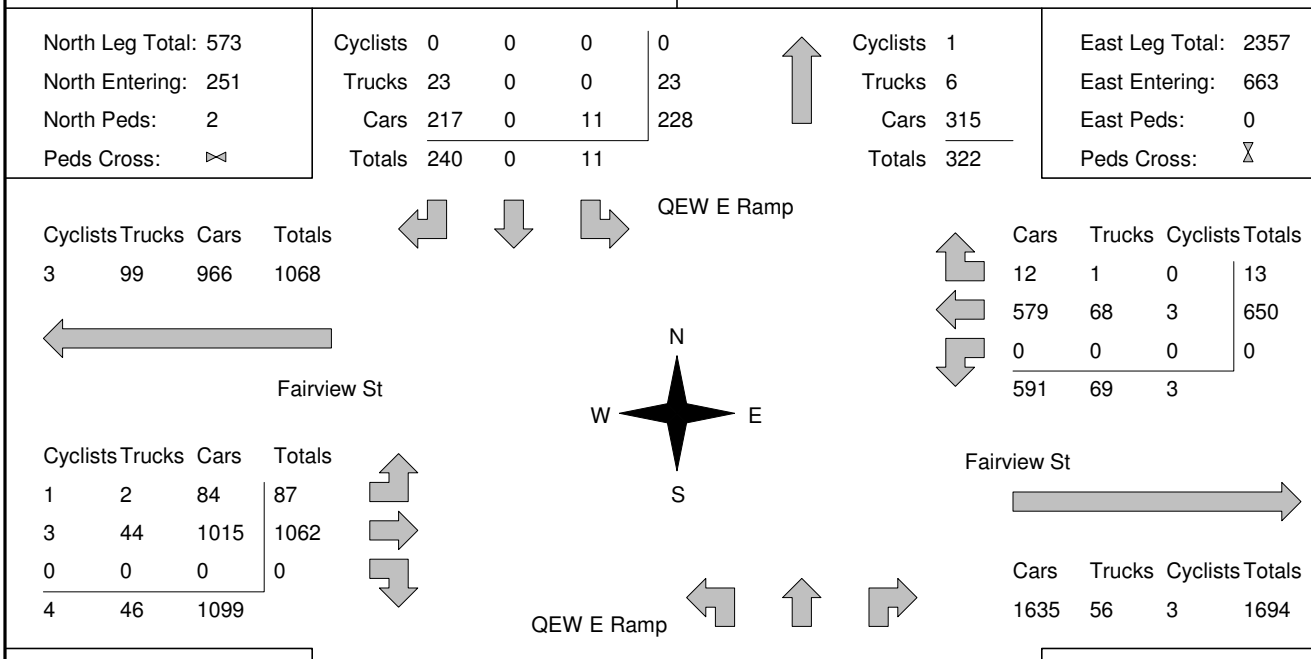
**Municipality:** Burlington
**Site #:** 0000201936
**Intersection:** Fairview St & QEW E Ramp
**TFR File #:** 1
**Count date:** 15-Nov-2017

**Weather conditions:**
Cloudy

**Person(s) who counted:**
Nikola
Mike

**** Signalized Intersection ****

**Major Road:** Fairview St runs W/E




### Comments

# *Fairview St & QEW E Ramp*

## Mid-day Peak Diagram

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

**One Hour Peak**
**From:** 12:30:00
**To:** 13:30:00

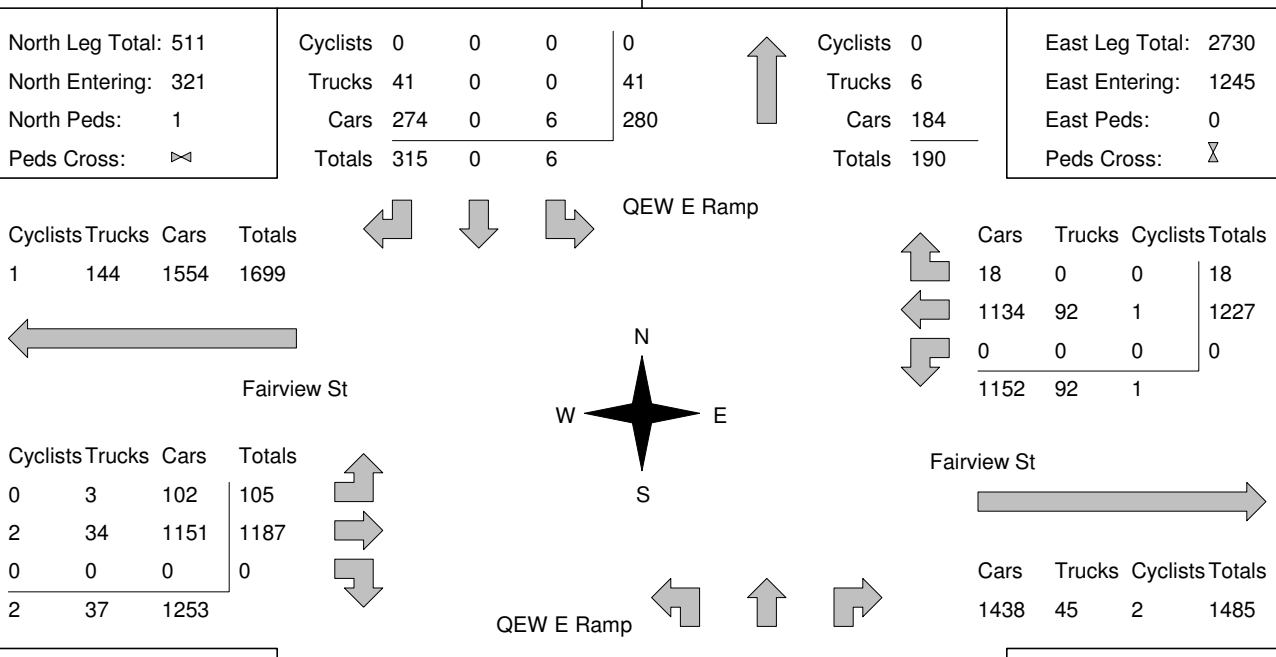
**Municipality:** Burlington
**Site #:** 0000201936
**Intersection:** Fairview St & QEW E Ramp
**TFR File #:** 1
**Count date:** 15-Nov-2017

**Weather conditions:**
Cloudy

**Person(s) who counted:**
Nikola
Mike

**** Signalized Intersection ****

**Major Road:** Fairview St runs W/E




### Comments

# *Fairview St & QEW E Ramp*

## Afternoon Peak Diagram

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

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

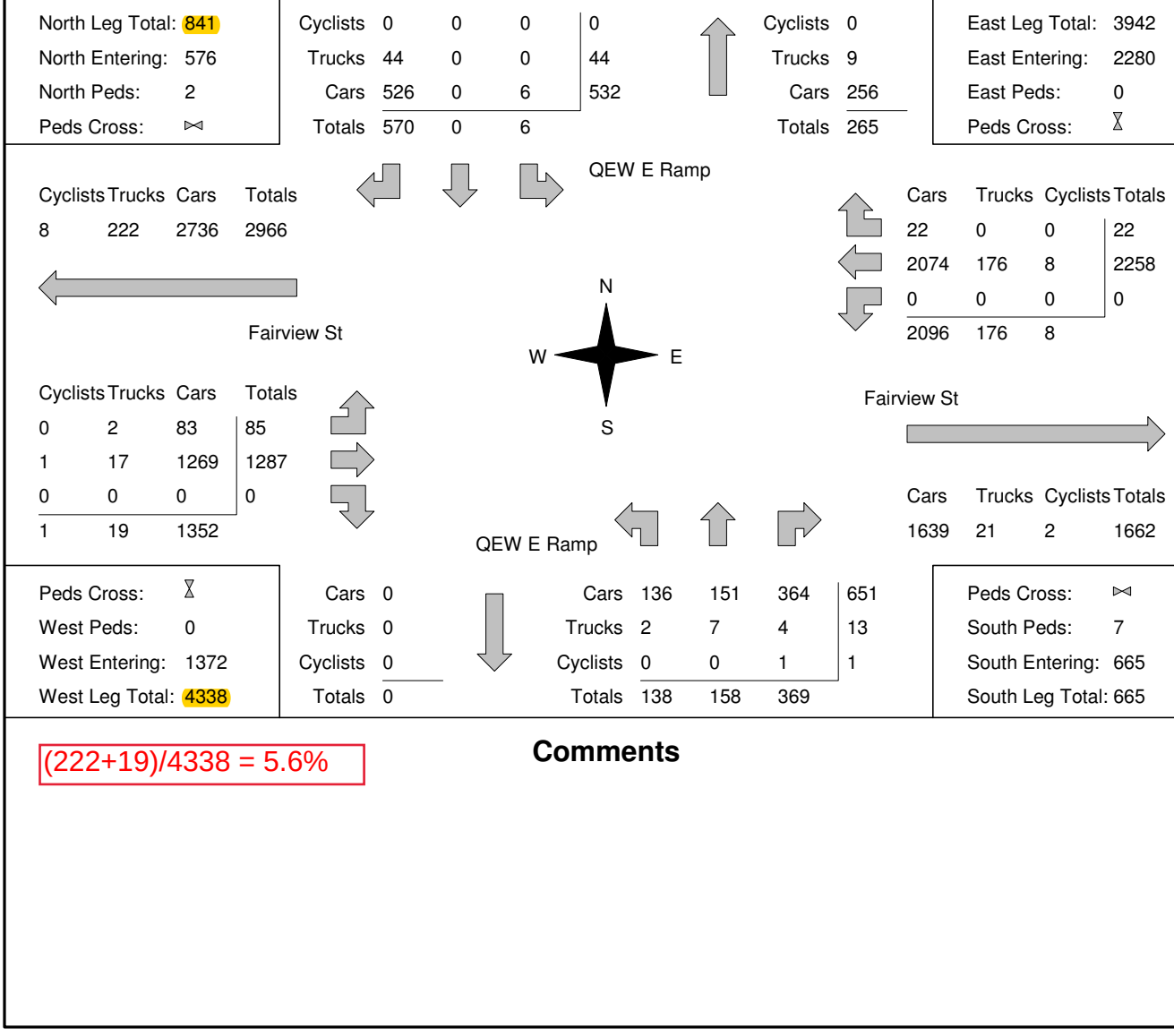
**Municipality:** Burlington
**Site #:** 0000201936
**Intersection:** Fairview St & QEW E Ramp
**TFR File #:** 1
**Count date:** 15-Nov-2017

**Weather conditions:**
Cloudy

**Person(s) who counted:**
Nikola
Mike

**** Signalized Intersection **** (44+9)/841 = 6.3%

**Major Road:** Fairview St runs W/E




(222+19)/4338 = 5.6%

**Comments**

# *Fairview St & QEW E Ramp*

## Total Count Diagram

**Municipality:** Burlington
**Site #:** 0000201936
**Intersection:** Fairview St & QEW E Ramp
**TFR File #:** 1
**Count date:** 15-Nov-2017

**Weather conditions:**
Cloudy

**Person(s) who counted:**
Nikola
Mike

**** Signalized Intersection ****

**Major Road:** Fairview St runs W/E

| | | | | |
|---|---|---|---|---|
| North Leg Total: | 4957 | | | |
| North Entering: | 2978 | | | |
| North Peds: | 28 | | | |
| Peds Cross: | ⋈ | | | |
| Cyclists | 0 | 0 | 0 | 0 |
| Trucks | 268 | 0 | 3 | 271 |
| Cars | 2648 | 0 | 59 | 2707 |
| Totals | 2916 | 0 | 62 | |
| Cyclists | 1 | | | |
| Trucks | 74 | | | |
| Cars | 1904 | | | |
| Totals | 1979 | | | |
| East Leg Total: | 23269 | | | |
| East Entering: | 11059 | | | |
| East Peds: | 8 | | | |
| Peds Cross: | ⧖ | | | |

QEW E Ramp

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 22 | 1218 | 13844 | 15084 |

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 116 | 4 | 0 | 120 |
| 10036 | 881 | 22 | 10939 |
| 0 | 0 | 0 | 0 |
| 10152 | 885 | 22 | |

Fairview St

N
W E
S

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 1 | 30 | 766 | 797 |
| 31 | 234 | 8868 | 9133 |
| 0 | 0 | 0 | 0 |
| 32 | 264 | 9634 | |

Fairview St

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 11870 | 308 | 32 | 12210 |

QEW E Ramp

| | | | | |
|---|---|---|---|---|
| Peds Cross: | ⧖ | | | |
| West Peds: | 0 | | | |
| West Entering: | 9930 | | | |
| West Leg Total: | 25014 | | | |
| Cars | 0 | | | |
| Trucks | 0 | | | |
| Cyclists | 0 | | | |
| Totals | 0 | | | |
| Cars | 1160 | 1022 | 2943 | 5125 |
| Trucks | 69 | 40 | 71 | 180 |
| Cyclists | 0 | 0 | 1 | 1 |
| Totals | 1229 | 1062 | 3015 | |
| Peds Cross: | ⋈ | | | |
| South Peds: | 61 | | | |
| South Entering: | 5306 | | | |
| South Leg Total: | 5306 | | | |

### Comments

# *Fairview St & QEW E Ramp*
# Traffic Count Summary

**Intersection:** Fairview St & QEW E Ramp | **Count Date:** 15-Nov-2017 | **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 | 10 | 0 | 187 | 197 | 0 | 1298 |
| 9:00:00 | 9 | 0 | 257 | 266 | 4 | 1088 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 4 | 0 | 284 | 288 | 9 | 824 |
| 13:00:00 | 12 | 0 | 311 | 323 | 1 | 890 |
| 14:00:00 | 7 | 0 | 318 | 325 | 3 | 841 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 6 | 0 | 440 | 446 | 5 | 929 |
| 17:00:00 | 9 | 0 | 562 | 571 | 5 | 1218 |
| 18:00:00 | 5 | 0 | 557 | 562 | 1 | 1196 |
| Totals: | 62 | 0 | 2916 | 2978 | 28 | 8284 |

## 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 | 155 | 276 | 670 | 1101 | 2 |
| 9:00:00 | 176 | 177 | 469 | 822 | 2 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 138 | 68 | 330 | 536 | 5 |
| 13:00:00 | 178 | 65 | 324 | 567 | 13 |
| 14:00:00 | 151 | 75 | 290 | 516 | 12 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 138 | 101 | 244 | 483 | 10 |
| 17:00:00 | 149 | 151 | 347 | 647 | 7 |
| 18:00:00 | 144 | 149 | 341 | 634 | 10 |
| Totals: | 1229 | 1062 | 3015 | 5306 | 61 |

## 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 | 0 | 558 | 6 | 564 | 0 | 1520 |
| 9:00:00 | 0 | 678 | 11 | 689 | 0 | 1921 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 0 | 1082 | 8 | 1090 | 2 | 2285 |
| 13:00:00 | 0 | 1181 | 18 | 1199 | 0 | 2470 |
| 14:00:00 | 0 | 1244 | 18 | 1262 | 1 | 2530 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 0 | 1847 | 20 | 1867 | 5 | 3173 |
| 17:00:00 | 0 | 2138 | 18 | 2156 | 0 | 3488 |
| 18:00:00 | 0 | 2211 | 21 | 2232 | 0 | 3602 |
| Totals: | 0 | 10939 | 120 | 11059 | 8 | 20989 |

## 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 | 73 | 883 | 0 | 956 | 0 |
| 9:00:00 | 112 | 1120 | 0 | 1232 | 0 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 98 | 1097 | 0 | 1195 | 0 |
| 13:00:00 | 113 | 1158 | 0 | 1271 | 0 |
| 14:00:00 | 116 | 1152 | 0 | 1268 | 0 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 100 | 1206 | 0 | 1306 | 0 |
| 17:00:00 | 99 | 1233 | 0 | 1332 | 0 |
| 18:00:00 | 86 | 1284 | 0 | 1370 | 0 |
| Totals: | 797 | 9133 | 0 | 9930 | 0 |

## 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: | 441 | 362 | 212 | 255 | 234 | 250 | 309 | 298 |

# *Brant St @ Fairview St*

## Morning Peak Diagram

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

**One Hour Peak**
**From:** 8:00:00
**To:** 9:00:00

**Municipality:** Halton Region
**Site #:** 1020550100
**Intersection:** Fairview St & Brant St
**TFR File #:** 4
**Count date:** 2-May-2018

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Signalized Intersection ****

**Major Road:** Fairview St runs W/E

| | | | | |
|---|---|---|---|---|
| North Leg Total: | 1965 | | | |
| North Entering: | 975 | | | |
| North Peds: | 6 | | | |
| Peds Cross: | ⋈ | | | |
| Heavys | 20 | 11 | 3 | 34 |
| Trucks | 7 | 9 | 0 | 16 |
| Cars | 110 | 610 | 205 | 925 |
| Totals | 137 | 630 | 208 | |
| Heavys | 39 | | | |
| Trucks | 11 | | | |
| Cars | 940 | | | |
| Totals | 990 | | | |
| East Leg Total: | 1954 | | | |
| East Entering: | 551 | | | |
| East Peds: | 21 | | | |
| Peds Cross: | ⧖ | | | |

Brant St

| Heavys | Trucks | Cars | Totals |
|---|---|---|---|
| 32 | 12 | 558 | 602 |

| | Cars | Trucks | Heavys | Totals |
|---|---|---|---|---|
| | 129 | 4 | 5 | 138 |
| | 290 | 4 | 11 | 305 |
| | 103 | 4 | 1 | 108 |
| | 522 | 12 | 17 | |

Fairview St

N
W E
S

| Heavys | Trucks | Cars | Totals |
|---|---|---|---|
| 17 | 5 | 284 | 306 |
| 6 | 15 | 941 | 962 |
| 3 | 4 | 216 | 223 |
| 26 | 24 | 1441 | |

Fairview St

| Cars | Trucks | Heavys | Totals |
|---|---|---|---|
| 1376 | 18 | 9 | 1403 |

Brant St

| | | | | |
|---|---|---|---|---|
| Peds Cross: | ⧖ | | | |
| West Peds: | 22 | | | |
| West Entering: | 1491 | | | |
| West Leg Total: | 2093 | | | |
| Cars | 929 | | | |
| Trucks | 17 | | | |
| Heavys | 15 | | | |
| Totals | 961 | | | |
| Cars | 158 | 527 | 230 | 915 |
| Trucks | 1 | 2 | 3 | 6 |
| Heavys | 1 | 17 | 0 | 18 |
| Totals | 160 | 546 | 233 | |
| Peds Cross: | ⋈ | | | |
| South Peds: | 1 | | | |
| South Entering: | 939 | | | |
| South Leg Total: | 1900 | | | |

**Comments**

# *Brant St @ Fairview St*

## Mid-day Peak Diagram

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

**One Hour Peak**
**From:** 12:15:00
**To:** 13:15:00

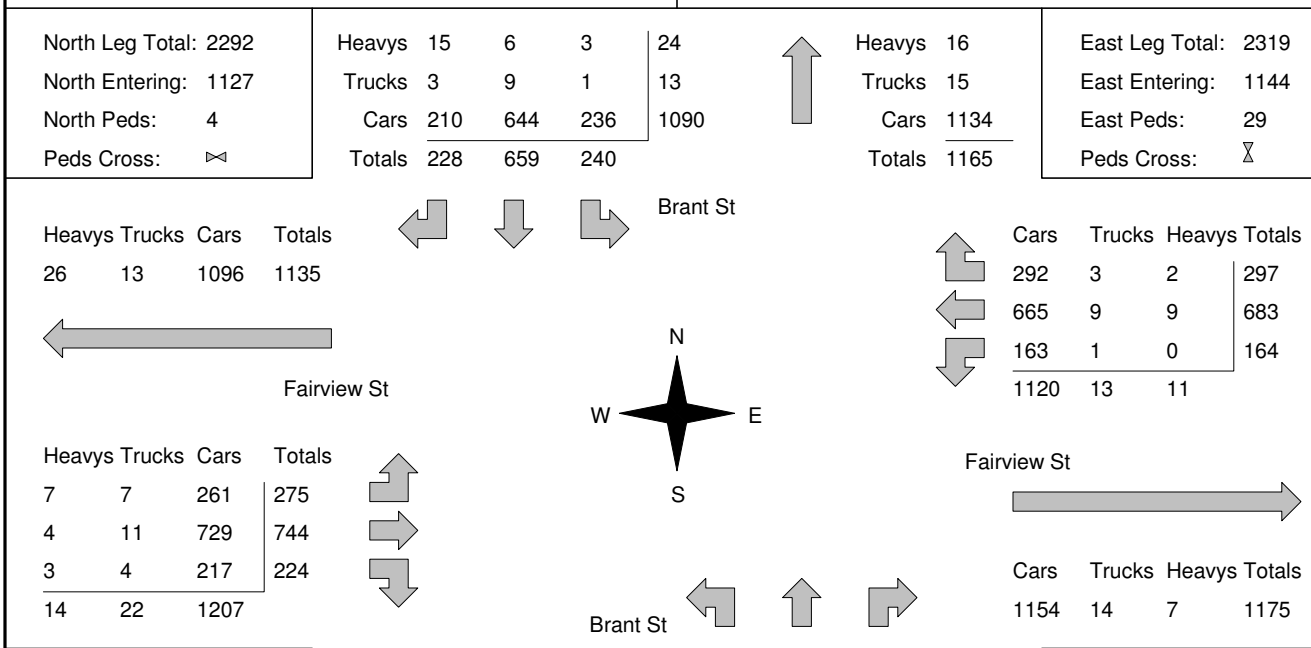
**Municipality:** Halton Region
**Site #:** 1020550100
**Intersection:** Fairview St & Brant St
**TFR File #:** 4
**Count date:** 2-May-2018

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Signalized Intersection ****

**Major Road:** Fairview St runs W/E




**Comments**

# *Brant St @ Fairview St*

## Afternoon Peak Diagram

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

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

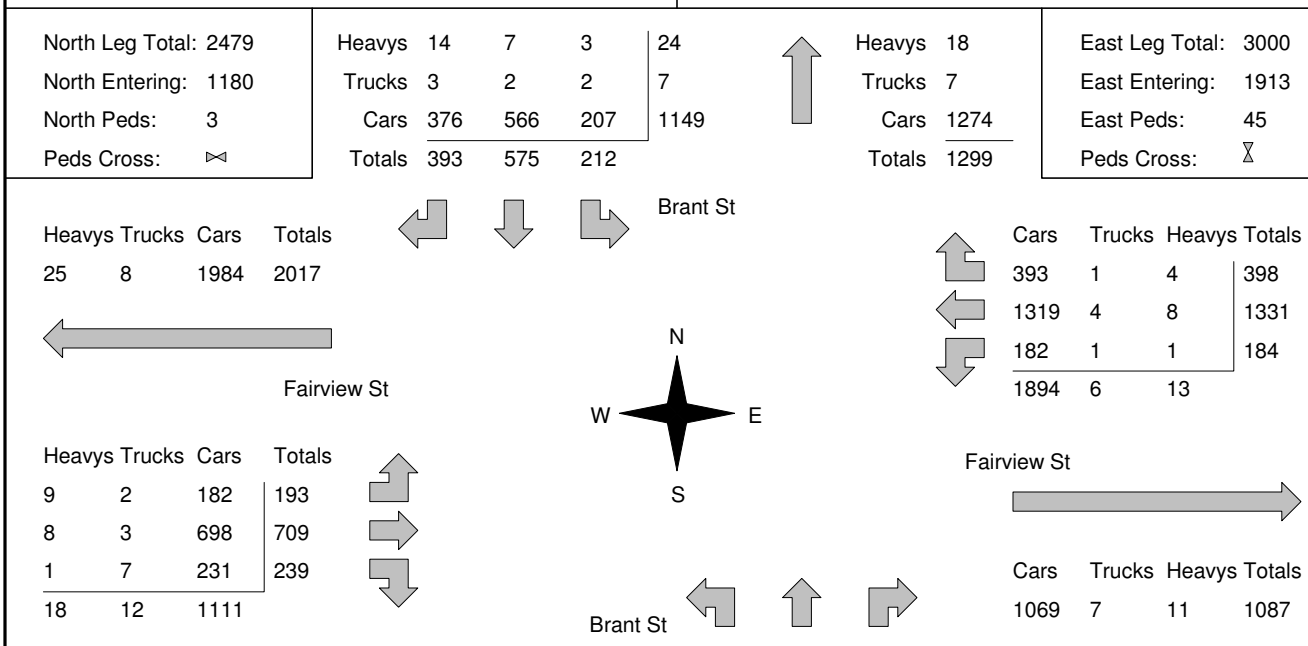
**Municipality:** Halton Region
**Site #:** 1020550100
**Intersection:** Fairview St & Brant St
**TFR File #:** 4
**Count date:** 2-May-2018

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Signalized Intersection ****

**Major Road:** Fairview St runs W/E




## Comments

# *Brant St @ Fairview St*

## Total Count Diagram

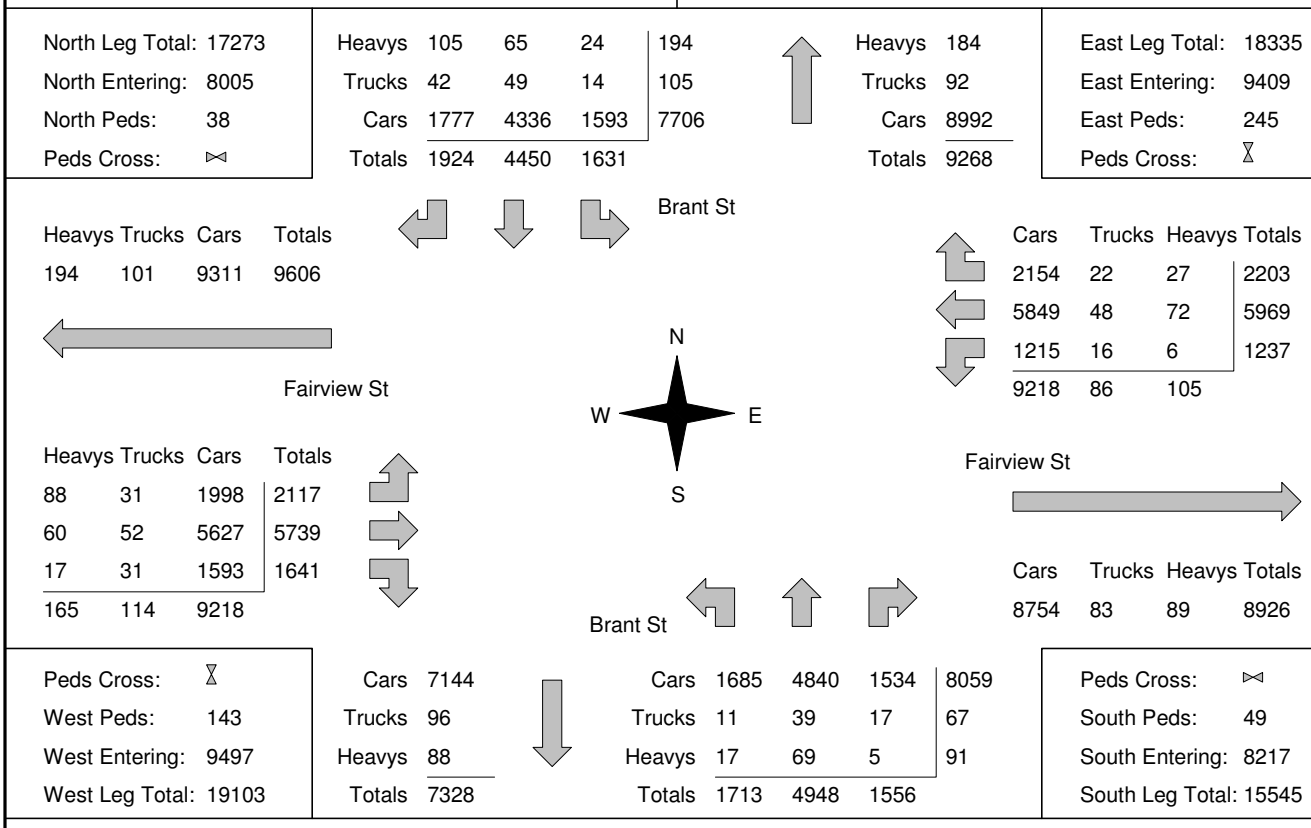
**Municipality:** Halton Region
**Site #:** 1020550100
**Intersection:** Fairview St & Brant St
**TFR File #:** 4
**Count date:** 2-May-2018

**Weather conditions:**
Clear/Dry

**Person(s) who counted:**
Cam

**** Signalized Intersection ****

**Major Road:** Fairview St runs W/E




### Comments

# *Brant St & Ghent Ave*

## Morning Peak Diagram

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

**One Hour Peak**
**From:** 8:00:00
**To:** 9:00:00

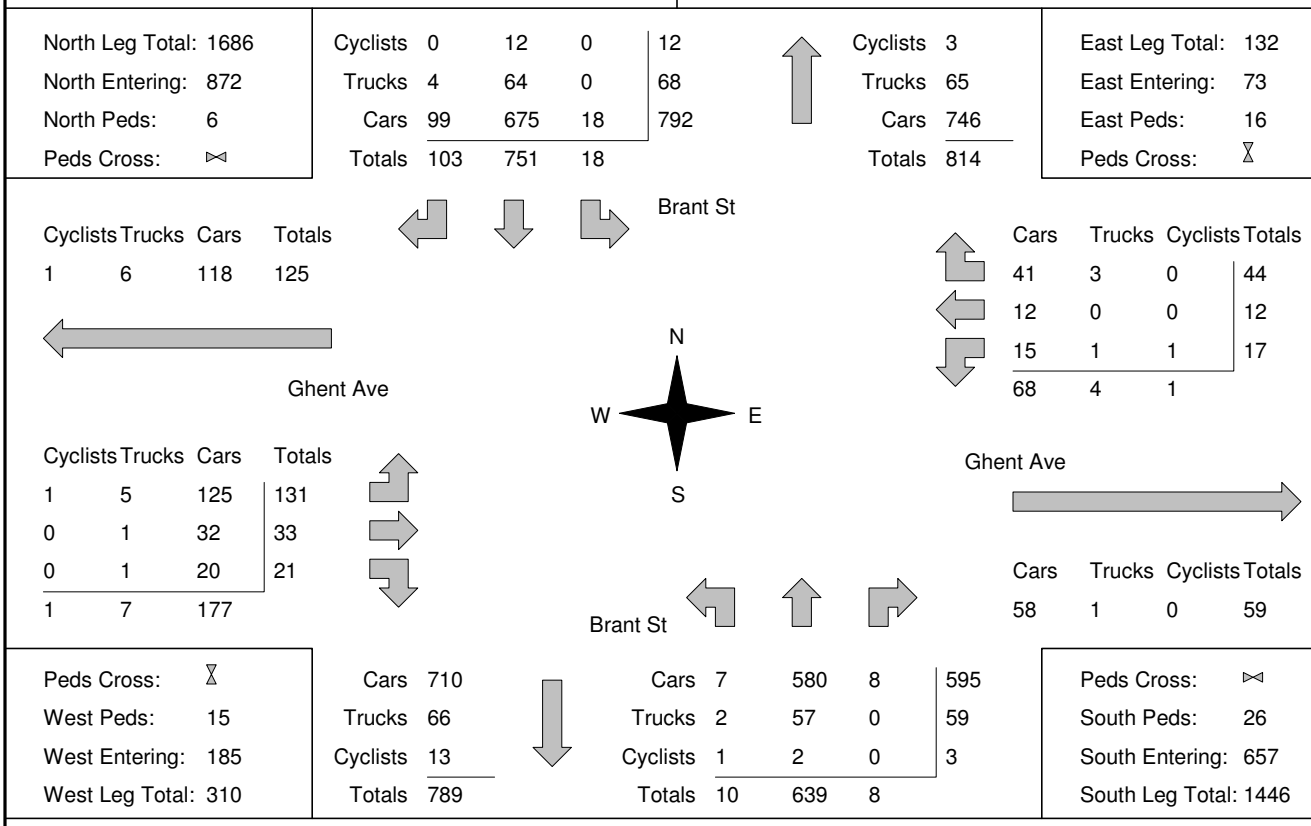
**Municipality:** Burlington
**Site #:** 0000200274
**Intersection:** Brant St & Ghent Ave
**TFR File #:** 1
**Count date:** 4-Oct-2017

**Weather conditions:**
Sunny

**Person(s) who counted:**
Mira

**** Signalized Intersection ****

**Major Road:** Brant St runs N/S




### Comments

# *Brant St & Ghent Ave*

## Mid-day Peak Diagram

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

**One Hour Peak**
**From:** 11:45:00
**To:** 12:45:00

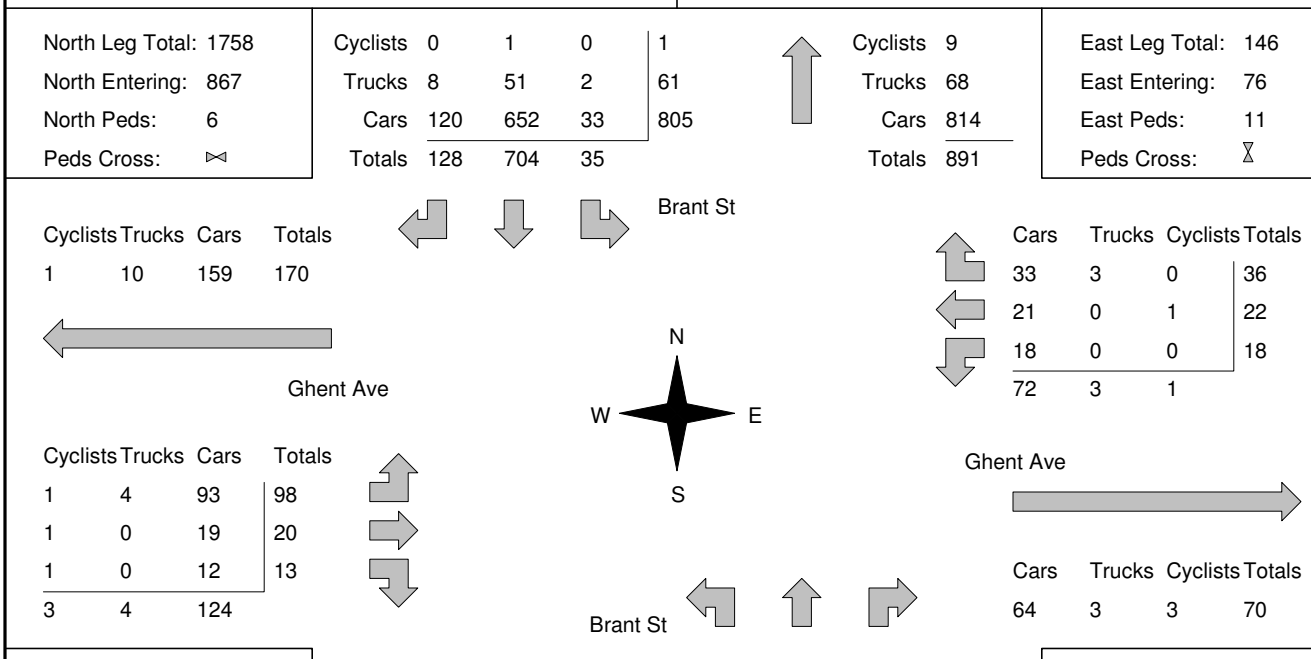
**Municipality:** Burlington
**Site #:** 0000200274
**Intersection:** Brant St & Ghent Ave
**TFR File #:** 1
**Count date:** 4-Oct-2017

**Weather conditions:**
Sunny

**Person(s) who counted:**
Mira

**** Signalized Intersection ****

**Major Road:** Brant St runs N/S




### Comments

# *Brant St & Ghent Ave*

## Afternoon Peak Diagram

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

**One Hour Peak**
**From:** 16:15:00
**To:** 17:15:00

**Municipality:** Burlington
**Site #:** 0000200274
**Intersection:** Brant St & Ghent Ave
**TFR File #:** 1
**Count date:** 4-Oct-2017

**Weather conditions:**
Sunny

**Person(s) who counted:**
Mira

(67+81)/1888=7.8%

**** Signalized Intersection ****

**Major Road:** Brant St runs N/S

North Leg Total: 1888
North Entering: 952
North Peds: 7
Peds Cross: ⋈

| | | | | |
|---|---|---|---|---|
| Cyclists | 2 | 8 | 0 | 10 |
| Trucks | 17 | 48 | 2 | 67 |
| Cars | 190 | 652 | 33 | 875 |
| Totals | 209 | 708 | 35 | |

| | |
|---|---|
| Cyclists | 6 |
| Trucks | 81 |
| Cars | 849 |
| Totals | 936 |

East Leg Total: 164
East Entering: 90
East Peds: 16
Peds Cross: ⧖

Brant St

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 4 | 19 | 246 | 269 |

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 21 | 1 | 0 | 22 |
| 42 | 2 | 1 | 45 |
| 22 | 1 | 0 | 23 |
| 85 | 4 | 1 | |

Ghent Ave

N
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S

| Cyclists | Trucks | Cars | Totals |
|---|---|---|---|
| 0 | 17 | 123 | 140 |
| 0 | 0 | 25 | 25 |
| 0 | 2 | 17 | 19 |
| 0 | 19 | 165 | |

Ghent Ave

| Cars | Trucks | Cyclists | Totals |
|---|---|---|---|
| 70 | 2 | 2 | 74 |

Brant St

Peds Cross: ⧖
West Peds: 23
West Entering: 184
West Leg Total: 453

| | | | | |
|---|---|---|---|---|
| Cars | 691 | | | |
| Trucks | 51 | | | |
| Cyclists | 8 | | | |
| Totals | 750 | | | |

| | | | | |
|---|---|---|---|---|
| Cars | 14 | 705 | 12 | 731 |
| Trucks | 0 | 63 | 0 | 63 |
| Cyclists | 1 | 6 | 2 | 9 |
| Totals | 15 | 774 | 14 | |

Peds Cross: ⋈
South Peds: 12
South Entering: 803
South Leg Total: 1553

(19+19)/453=8.3%

**Comments**

# *Brant St & Ghent Ave*

## Total Count Diagram

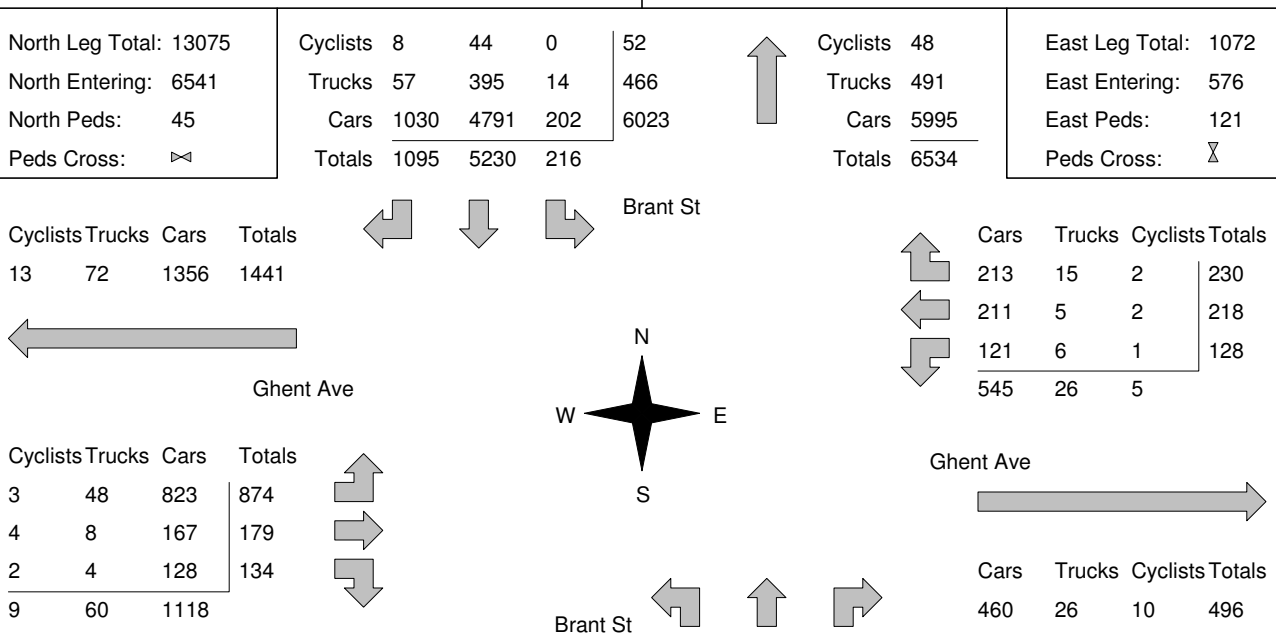
**Municipality:** Burlington
**Site #:** 0000200274
**Intersection:** Brant St & Ghent Ave
**TFR File #:** 1
**Count date:** 4-Oct-2017

**Weather conditions:**
Sunny

**Person(s) who counted:**
Mira

**** Signalized Intersection ****

**Major Road:** Brant St runs N/S




### Comments

# *Brant St & Ghent Ave*
# Traffic Count Summary

**Intersection:** Brant St & Ghent Ave | **Count Date:** 4-Oct-2017 | **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 | 12 | 405 | 61 | 478 | 7 | 939 |
| 9:00:00 | 18 | 751 | 103 | 872 | 6 | 1529 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 36 | 688 | 101 | 825 | 10 | 1550 |
| 13:00:00 | 33 | 668 | 133 | 834 | 6 | 1609 |
| 14:00:00 | 21 | 649 | 143 | 813 | 1 | 1544 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 30 | 622 | 154 | 806 | 5 | 1643 |
| 17:00:00 | 34 | 690 | 197 | 921 | 7 | 1733 |
| 18:00:00 | 32 | 757 | 203 | 992 | 3 | 1653 |
| Totals: | 216 | 5230 | 1095 | 6541 | 45 | 12200 |

## 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 | 7 | 451 | 3 | 461 | 23 |
| 9:00:00 | 10 | 639 | 8 | 657 | 26 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 12 | 702 | 11 | 725 | 11 |
| 13:00:00 | 19 | 740 | 16 | 775 | 18 |
| 14:00:00 | 15 | 700 | 16 | 731 | 8 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 35 | 784 | 18 | 837 | 13 |
| 17:00:00 | 16 | 782 | 14 | 812 | 13 |
| 18:00:00 | 14 | 632 | 15 | 661 | 15 |
| Totals: | 128 | 5430 | 101 | 5659 | 127 |

## 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 | 6 | 6 | 30 | 42 | 18 | 191 |
| 9:00:00 | 17 | 12 | 44 | 73 | 16 | 258 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 14 | 20 | 41 | 75 | 13 | 209 |
| 13:00:00 | 18 | 22 | 36 | 76 | 9 | 198 |
| 14:00:00 | 17 | 27 | 24 | 68 | 14 | 197 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 16 | 29 | 16 | 61 | 16 | 206 |
| 17:00:00 | 22 | 43 | 24 | 89 | 19 | 262 |
| 18:00:00 | 18 | 59 | 15 | 92 | 16 | 242 |
| Totals: | 128 | 218 | 230 | 576 | 121 | 1763 |

## 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 | 113 | 27 | 9 | 149 | 31 |
| 9:00:00 | 131 | 33 | 21 | 185 | 15 |
| 11:00:00 | 0 | 0 | 0 | 0 | 0 |
| 12:00:00 | 92 | 23 | 19 | 134 | 24 |
| 13:00:00 | 96 | 13 | 13 | 122 | 11 |
| 14:00:00 | 92 | 21 | 16 | 129 | 11 |
| 15:00:00 | 0 | 0 | 0 | 0 | 0 |
| 16:00:00 | 104 | 21 | 20 | 145 | 18 |
| 17:00:00 | 129 | 25 | 19 | 173 | 20 |
| 18:00:00 | 117 | 16 | 17 | 150 | 11 |
| Totals: | 874 | 179 | 134 | 1187 | 141 |

## 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: | 176 | 213 | 150 | 160 | 145 | 167 | 214 | 212 |

# APPENDIX C

# Rail Traffic Data

## Victor Garcia

**From:** Rail Data Requests <RailDataRequests@metrolinx.com>
**Sent:** March 15, 2019 10:32 AM
**To:** Victor Garcia
**Cc:** Brandon Gaffoor
**Subject:** RE: Rail Traffic Data Verification

Good Morning Victor,

I apologize for the delay in our response.

Further to your request dated December 19, 2018 (attached below), the subject site (1335 Plains Road East, Burlington) is located within 300 metres of CNR's Halton Subdivision which carries Lakeshore West GO Train service.

It's anticipated that GO service on this line will be comprised of a mix of both diesel and electric trains within (at least) a 10-year time horizon. The combined preliminary midterm weekday train volume forecast at this location, including both revenue and equipment trips is in the order of 238 trains (54 diesel: 45 day, 9 night; 184 electric: 147 day, 37 night). Trains will be comprised of a single locomotive and up to 12 passenger cars.

The current maximum design speed on this corridor is 95 mph (153 km/h).

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. Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. We can, however, provide the following interim information which may be helpful;

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

2. Along with electrification, Metrolinx will intensify service levels along all of its corridors to deliver the promised GO Expansion service. Everything else being equal, this will likely result in an overall increase in train noise emissions.

Given the above considerations, it would be prudent, for the purposes of acoustical analyses, 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.

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 CNR and VIA operate trains in this area and it would be prudent to contact them directly for rail traffic information.

I trust this information is useful. Should you have any questions, please feel free to contact me.

Best Regards,

**IVAN CHEUNG, M.Sc, B.URPl**
Intern | Third Party Projects Review
Pre-Construction Services | Capital Projects Group
Metrolinx
20 Bay Street, Suite 600 | Toronto | Ontario | M5J 2W3
T: 416-202-5920

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<br>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<br>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

System Engineering
Engineering Services

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

# Train Count Data

## TRANSMITTAL

| | | | |
|---|---|---|---|
| *To:*<br>*Destinataire :* | HGC Engineering<br>2000 Argentia Rd, Plaza One, Suite 203, Mississauga, ON L5N 1P7 | *Project :* | HAL-45.17- Upper Middle Rd, Burlington, ON |
| *Att'n:* | Victor Garcia | *Routing:* | vgarcia@hgcengineering.com |
| *From:*<br>*Expéditeur :* | Michael Vallins | *Date:* | 02/05/2019 |
| *Cc:* | Adjacent Development<br>CN via e-mail | | |

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

**Re: Train Traffic Data – CN Halton Subdivision near Upper Middle 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:** 2019/02/05 Project Number: HAL-45.17- Upper Middle Rd, Burlington, ON

Dear Victor:

**Re: Train Traffic Data – CN Halton Subdivision near Upper Middle Road in Burlington, ON**

The following is provided in response to Victor's 2018/12/18 request for information regarding rail traffic in the vicinity of Plains Road in Burlington, ON at approximately Mile 32.23 on CN's Halton 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 | 10 | 140 | 50 | 4 |
| Way Freight | 2 | 25 | 50 | 4 |
| Passenger | 0 | 10 | 50 | 2 |

| | 2300-0700 | | | |
|---|---|---|---|---|
| Type of Train | Volumes | Max.Consist | Max. Speed | Max. Power |
| Freight | 4 | 140 | 50 | 4 |
| Way Freight | 0 | 25 | 50 | 4 |
| Passenger | 0 | 10 | 50 | 2 |

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

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There is one (1) at-grade crossing in the immediate vicinity of the study area at Mile 46.16 (Mainway Drive). Anti-whistling bylaws are not in effect at this crossing. 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 double mainline track is considered to be continuously welded rail throughout the study area.

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

# APPENDIX D

# Supporting Drawings

PLAN OF SURVEY
OF PART OF
LOT 68
REGISTRAR'S COMPILED PLAN 99
IN THE
CITY OF BURLINGTON
REGIONAL MUNICIPALITY OF HALTON

SCALE 1:200 METRIC

4 2 0 4 8 12 metres

S.D. McLAREN, O.L.S. – 2022

| SCHEDULE | | | |
|---|---|---|---|
| PART | LOT | PLAN | P.I.N. |
| 1 | PART OF LOT 68 | REGISTRAR'S COMPILED PLAN 99 | ALL OF PIN 07090–0670 (LT) |
| 2 | | | PART OF PIN 07090–0431 (LT) |
| 3 | PART OF BLOCK 'D' | PLAN M–59 | ALL OF PIN 07074–0428(LT) |

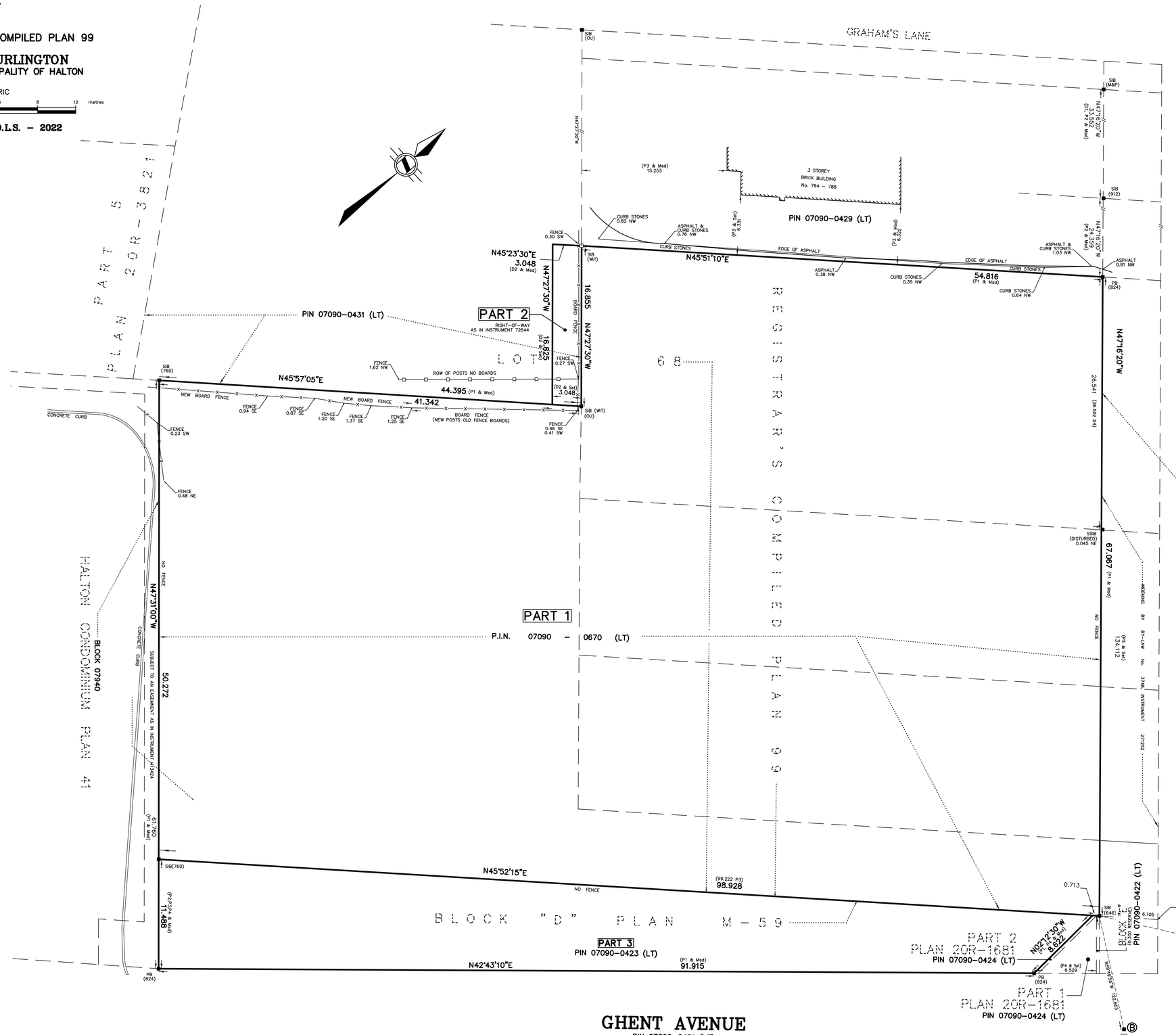
PART 2 IS SUBJECT TO AN EASEMENT AS IN INSTRUMENT 72644

**PLAN 20 R–** _____
RECEIVED AND DEPOSITED
Date _____

REPRESENTATIVE FOR LAND REGISTRAR FOR THE LAND TITLES DIVISION OF HALTON (No. 20)

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.
Date FEBRUARY 22, 2021

S. DAN McLAREN, O.L.S.




## LEGEND:

| | | |
|---|---|---|
| □ | DENOTES | MONUMENT SET |
| ■ | " | MONUMENT FOUND |
| IB | " | IRON BAR |
| IB# | " | ROUND IRON BAR |
| PB | " | PLASTIC BAR |
| SIB | " | STANDARD IRON BAR |
| SSIB | " | SHORT STANDARD IRON BAR |
| 824 | " | A.T. McLAREN, O.L.S. |
| M&P | " | MACKAY MACKAY & PETERS |
| OU | " | ORIGIN UNKNOWN |
| MSD | " | MEASURED |
| P1 | " | PLAN BY A.T. McLAREN, O.L.S., DATED JULY 22, 2016, FILE 34855–1 |
| P2 | " | PLAN BY TOWN OF BURLINGTON ATTACHED TO INSTRUMENT 445732 |
| P3 | " | PLAN BY MARSHALL, MACKLIN & MONAGHAN DATED MAY 29,1984 (FILE L–2595 |
| P4 | " | PLAN 20R–1681 |
| P5 | " | REGISTERED PLAN 99 |
| CLF | " | CHAIN LINK FENCE |
| BF | " | BOARD FENCE |
| D1 | " | INSTRUMENT 798893 |
| D2 | " | INSTRUMENT 445732 |

**BEARING NOTE:**
BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0)

**NOTE:**
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999705843

## INTEGRATION DATA

OBSERVED REFERENCE POINTS (ORP's): UTM ZONE 17, NAD83 (CSRS) (2010.0). COORDINATES TO URBAN ACCURACY PER SEC. 14(2) OF O.REG. 216/10

| POINT ID | NORTHING | EASTING |
|---|---|---|
| ORP Ⓐ | 4798514.824 | 596573.029 |
| ORP Ⓑ | 4798439.041 | 596658.639 |

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

## SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 7TH DAY OF JANUARY, 2021

SEPTEMBER 30, 2022
DATE

S. DAN McLAREN, O.L.S.

A.T. McLaren Limited
LEGAL AND ENGINEERING SURVEYS
69 JOHN STREET SOUTH, SUITE 230
HAMILTON, ONTARIO, L8N 2B9
PHONE (905) 527–8559 FAX (905) 527–0032

| Drawn LC | Checked DG | Scale 1:200 | Dwg.No.34885–R2 |
|---|---|---|---|

# PLAN OF SURVEY
OF PART OF
## LOT 2
## REGISTERED PLAN 125
IN THE
## CITY OF BURLINGTON
**REGIONAL MUNICIPALITY OF HALTON**

SCALE 1:200 METRIC

4 2 0 4 8 12 metres

**S.D. McLAREN, O.L.S. – 2022**

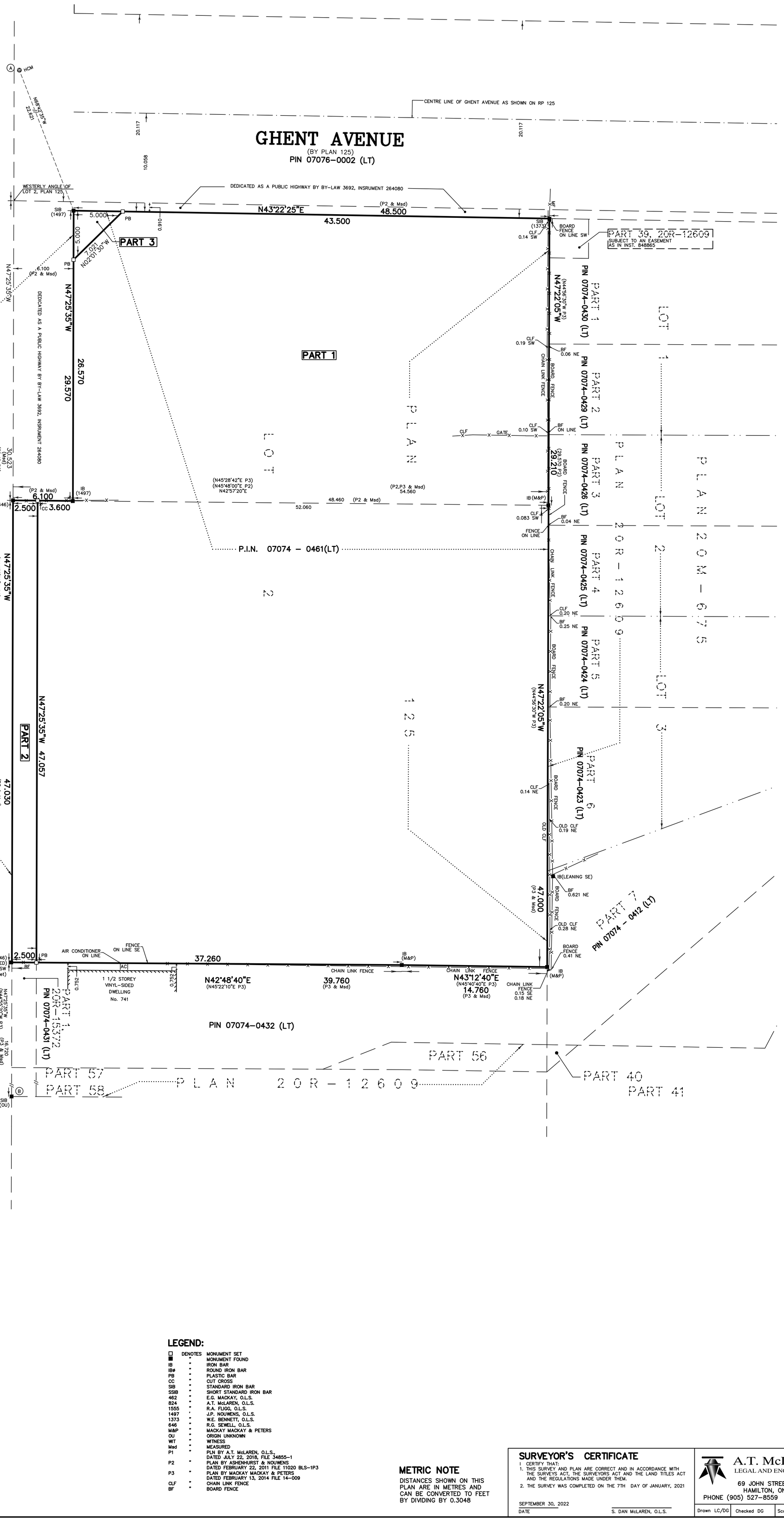
| SCHEDULE | | | |
|---|---|---|---|
| PART | LOT | PLAN | P.I.N. |
| 1 | PART OF LOT 2 | PLAN 125 | ALL OF PIN 07074–0461(LT) |
| 2 | | | |
| 3 | | | |

**PLAN 20 R–** _____
RECEIVED AND DEPOSITED
Date _____

_____
REPRESENTATIVE FOR
LAND REGISTRAR FOR THE LAND
TITLES DIVISION OF HALTON (No. 20)

I REQUIRE THIS PLAN TO BE
DEPOSITED UNDER THE LAND
TITLES ACT.
Date _____

_____
S. DAN McLAREN, O.L.S.




## BEARING NOTE:
BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0)

## NOTE:
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999705844

## INTEGRATION DATA

OBSERVED REFERENCE POINTS (ORP's): UTM ZONE 17, NAD83 (CSRS) (2010.0).
COORDINATES TO URBAN ACCURACY PER SEC. 14(2) OF O.REG. 216/10

| POINT ID | NORTHING | EASTING |
|---|---|---|
| ORP A | 4789518.862 | 592009.672 |
| ORP B | 4798514.824 | 596573.029 |

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

## LEGEND:

| | | |
|---|---|---|
| □ | DENOTES | MONUMENT SET |
| ■ | " | MONUMENT FOUND |
| IB | " | IRON BAR |
| IBø | " | ROUND IRON BAR |
| PB | " | PLASTIC BAR |
| CC | " | CUT CROSS |
| SIB | " | STANDARD IRON BAR |
| SSIB | " | SHORT STANDARD IRON BAR |
| 462 | " | E.G. MACKAY, O.L.S. |
| 824 | " | A.T. McLAREN, O.L.S. |
| 1555 | " | R.A. FLIGG, O.L.S. |
| 1497 | " | J.P. NOUWENS, O.L.S. |
| 1373 | " | W.E. BENNETT, O.L.S. |
| 646 | " | R.G. SEWELL, O.L.S. |
| M&P | " | MACKAY MACKAY & PETERS |
| OU | " | ORIGIN UNKNOWN |
| WIT | " | WITNESS |
| Msd | " | MEASURED |
| P1 | " | PLN BY A.T. McLAREN, O.L.S., DATED JULY 22, 2018, FILE 34855–1 |
| P2 | " | PLAN BY ASHENHURST & NOUWENS DATED FEBRUARY 22, 2011 FILE 11020 BLS–1P3 |
| P3 | " | PLAN BY MACKAY MACKAY & PETERS DATED FEBRUARY 13, 2014 FILE 14–009 |
| CLF | " | CHAIN LINK FENCE |
| BF | " | BOARD FENCE |

## METRIC NOTE
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

## SURVEYOR'S CERTIFICATE
I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 7TH DAY OF JANUARY, 2021

SEPTEMBER 30, 2022
DATE

S. DAN McLAREN, O.L.S.

A.T. McLaren Limited
LEGAL AND ENGINEERING SURVEYS
69 JOHN STREET SOUTH, SUITE 230
HAMILTON, ONTARIO, L8N 2B9
PHONE (905) 527–8559 FAX (905) 527–0032

| Drawn LC/DG | Checked DG | Scale 1:200 | Dwg.No. 34458–LT |
|---|---|---|---|

# PLAN OF SURVEY
OF PART OF
## LOT 1
## REGISTERED PLAN 125
IN THE
## CITY OF BURLINGTON
## REGIONAL MUNICIPALITY OF HALTON

SCALE 1:200 METRIC

4 2 0 4 8 12 metres

**S.D. McLAREN, O.L.S. – 2022**

| SCHEDULE | | | |
|---|---|---|---|
| PART | LOT | PLAN | PIN |
| 1 | PART OF LOT 1 | PLAN 125 | ALL OF PIN 07076–0382 (LT) |
| 2 | | | |
| 3 | | | |
| 4 | | | |

**PLAN 20 R–** _____
RECEIVED AND DEPOSITED
Date _____

_____
REPRESENTATIVE FOR
LAND REGISTRAR FOR THE LAND
TITLES DIVISION OF HALTON (No. 20)

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.
Date FEBRUARY 3, 2021

_____
S. DAN McLAREN, O.L.S.

### BEARING NOTE:
BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0)

### NOTE:
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999705843

### INTEGRATION DATA

OBSERVED REFERENCE POINTS (ORP's): UTM ZONE 17, NAD83 (CSRS) (2010.0). COORDINATES TO URBAN ACCURACY PER SEC. 14(2) OF O.REG. 216/10

| POINT ID | NORTHING | EASTING |
|---|---|---|
| ORP Ⓐ | 4798514.824 | 596573.029 |
| ORP Ⓑ | 4798574.207 | 596630.404 |

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

### LEGEND:

| | | |
|---|---|---|
| □ | DENOTES | MONUMENT SET |
| ■ | " | MONUMENT FOUND |
| IB | " | IRON BAR |
| IB⌀ | " | ROUND IRON BAR |
| PB | " | PLASTIC BAR |
| SIB | " | STANDARD IRON BAR |
| SSIB | " | SHORT STANDARD IRON BAR |
| 462 | " | E.G. MACKAY, O.L.S. |
| 824 | " | A.T. McLAREN, O.L.S. |
| 1555 | " | R.A. FLUGG, O.L.S. |
| 1497 | " | J.P. NOUWENS, O.L.S. |
| 1373 | " | W.E. BENNETT, O.L.S. |
| 646 | " | R.G. SEWELL, O.L.S. |
| M&P | " | MACKAY MACKAY & PETERS |
| MMM | " | MARSHAL MACKLIN & MONAUGHAN |
| Y | " | YATES AND YATES LIMITED |
| OU | " | ORIGIN UNKNOWN |
| WIT | " | WITNESS |
| Msd | " | MEASURED |
| P1 | " | REGISTERED PLAN 125 |
| P2 | " | PLAN BY MACKAY MACKAY & PETERS, O.L.S., DATED NOVEMBER 24, 2010, FILE 10–214 |
| P3 | " | PLAN 20R–10228 |
| P4 | " | PLAN BY A.T. McLAREN, O.L.S., DATED FEBRUARY 12, 2016, FILE 34885–2 |
| P5 | " | PLAN BY ASHENHURST & NOUWENS, O.L.S., DATED FEBRUARY 22, 2011, FILE 11020–BLS–1 |
| P6 | " | PLAN BY SEWELL & SEWELL O.L.S., DATED FEBRUARY 1972, FILE 72–50 |
| D1 | " | DEED AS IN INSTRUMENT 627931 |
| D2 | " | DEED AS IN INSTRUMENT 702639 |
| D3 | " | DEED AS IN INSTRUMENT 781476 |
| D4 | " | DEED AS IN INSTRUMENT 815801 |
| D5 | " | DEED AS IN INSTRUMENT 468091 DATED FEBRUARY 13, 2014 FILE 14–009 |
| CLF | " | CHAIN LINK FENCE |
| BF | " | BOARD FENCE |

PROSPECT STREET

PART 1, 20R–9044

PART 1, PLAN 20R–10228

PIN 07076–0272 (LT)

BRICK DWELLING No. 789

1 STOREY BRICK DWELLING No. 783

1 STOREY BRICK DWELLING No. 779

P.I.N. 07076 – 0382 (LT)

PIN 07076–0285 (LT)

PIN 07076–0286 (LT)

PART 2

PART 3

PART 4

BRANT STREET
(BY PLAN 99)
PIN 07076–0001 (LT)

GHENT AVENUE
(BY PLAN 125)
PIN 07076–0002 (LT)

CENTRE LINE OF GHENT AVENUE AS SHOWN ON RP 125

PIN 07076–0279 (LT)

### METRIC NOTE
DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

### SURVEYOR'S CERTIFICATE
I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 7th DAY OF JANUARY, 2021

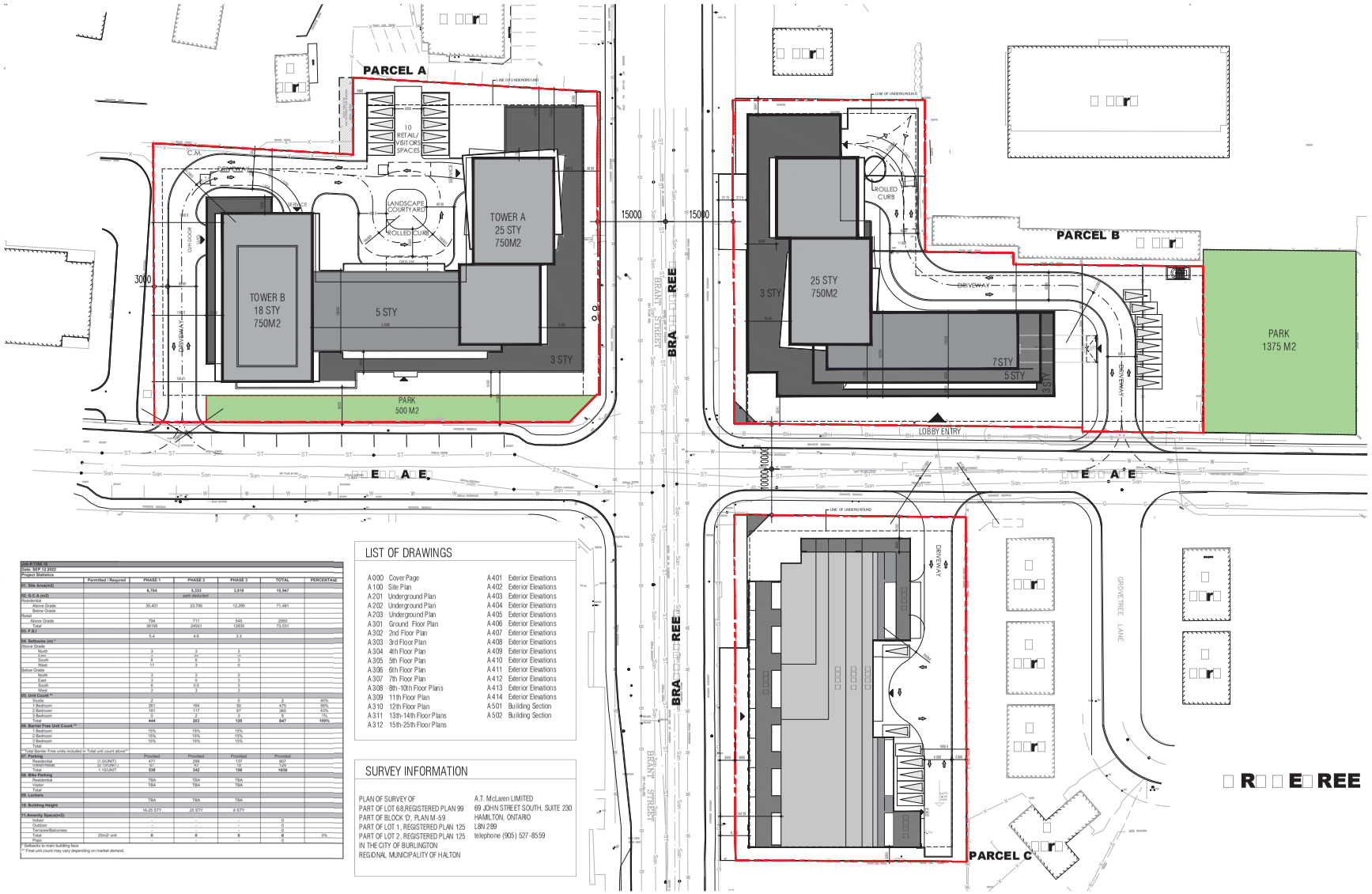
SEPTEMBER 30, 2022
DATE

_____
S. DAN McLAREN, O.L.S.

A.T. McLaren Limited
LEGAL AND ENGINEERING SURVEYS
69 JOHN STREET SOUTH, SUITE 230
HAMILTON, ONTARIO, L8N 2B9
PHONE (905) 527–8559 FAX (905) 527–0032

| Drawn | Checked | Crew Chief | Scale | Dwg.No. |
|---|---|---|---|---|
| LC | DG | SM | 1:200 | 34885–R1 |

FILE NAME: 34885–LT1 769–779 Brant 2023–2033 Ghent Avenue.dwg
LAYOUT: R1
LAST SAVED BY: David DATE: September 30, 2022




| Job # 1398.16 | | | | | | |
|---|---|---|---|---|---|---|
| Date: SEP 12 2022 | | | | | | |
| **Project Statistics** | | | | | | |
| | Permitted / Required | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL | PERCENTAGE |
| **01. Site Area(m2)** | | 6,764 | 5,333 | 3,910 | 15,947 | |
| | | | park deducted | | | |
| **02. G.F.A (m2)** | | | | | | |
| Residential | | | | | | |
| Above Grade | | 35,401 | 23,790 | 12,290 | 71,481 | |
| Below Grade | | | | | | |
| Retail | | | | | | |
| Above Grade | | 794 | 711 | 545 | 2050 | |
| Total | | 36195 | 24501 | 12835 | 73,531 | |
| **03. F.S.I** | | | | | | |
| | | 5.4 | 4.6 | 3.3 | | |
| **04. Setbacks (m) *** | | | | | | |
| Above Grade | | | | | | |
| North | | 3 | 3 | 3 | | |
| East | | 3 | 3 | 3 | | |
| South | | 6 | 6 | 3 | | |
| West | | 11 | 3 | 3 | | |
| Below Grade | | | | | | |
| North | | 3 | 3 | 3 | | |
| East | | 3 | 3 | 3 | | |
| South | | 6 | 3.5 | 3 | | |
| West | | 2 | 3 | 3 | | |
| **05. Unit Count **** | | | | | | |
| Studio | | 2 | 0 | 0 | 2 | 40% |
| 1 Bedroom | | 261 | 164 | 50 | 475 | 56% |
| 2 Bedroom | | 181 | 117 | 67 | 365 | 43% |
| 3 Bedroom | | 0 | 0 | 8 | 8 | 1% |
| Total | | 444 | 283 | 125 | 847 | 100% |
| **06. Barrier Free Unit Count **** | | | | | | |
| 1 Bedroom | | 15% | 15% | 15% | | |
| 2 Bedroom | | 15% | 15% | 15% | | |
| 3 Bedroom | | 15% | 15% | 15% | | |
| Total | | | | | | |
| **Total Barrier Free units included in Total unit count above** | | | | | | |
| **07. Parking** | | Provided | Provided | Provided | Provided | |
| Residential | (1.0/UNIT) | 471 | 299 | 137 | 907 | |
| Visitor/Retail | (0.15/UNIT) | 68 | 43 | 19 | 129 | |
| Total | 1.15/UNIT | 539 | 342 | 156 | 1036 | |
| **08. Bike Parking** | | | | | | |
| Residential | | TBA | TBA | TBA | | |
| Visitor | | TBA | TBA | TBA | | |
| Total | | | | | | |
| **09. Lockers** | | | | | | |
| | | TBA | TBA | TBA | | |
| **10. Building Height** | | | | | | |
| | | 10-25 STY | 25 STY | 8 STY | | |
| **11 Amenity Space(m2)** | | | | | | |
| Indoor | | - | - | - | 0 | |
| Outdoor | | - | - | - | 0 | |
| Terraces/Balconies | | - | - | - | 0 | |
| Total | 20m2/ unit | 8 | 8 | 8 | 0 | 0% |
| Pools | | - | - | - | 0 | |

* Setbacks to main building face
** Final unit count may vary depending on market demand.

## LIST OF DRAWINGS


| | | | |
|---|---|---|---|
| A 000 | Cover Page | A 401 | Exterior Elevations |
| A 100 | Site Plan | A 402 | Exterior Elevations |
| A 201 | Underground Plan | A 403 | Exterior Elevations |
| A 202 | Underground Plan | A 404 | Exterior Elevations |
| A 203 | Underground Plan | A 405 | Exterior Elevations |
| A 301 | Ground Floor Plan | A 406 | Exterior Elevations |
| A 302 | 2nd Floor Plan | A 407 | Exterior Elevations |
| A 303 | 3rd Floor Plan | A 408 | Exterior Elevations |
| A 304 | 4th Floor Plan | A 409 | Exterior Elevations |
| A 305 | 5th Floor Plan | A 410 | Exterior Elevations |
| A 306 | 6th Floor Plan | A 411 | Exterior Elevations |
| A 307 | 7th Floor Plan | A 412 | Exterior Elevations |
| A 308 | 8th -10th Floor Plans | A 413 | Exterior Elevations |
| A 309 | 11th Floor Plan | A 414 | Exterior Elevations |
| A 310 | 12th Floor Plan | A 501 | Building Section |
| A 311 | 13th-14th Floor Plans | A 502 | Building Section |
| A 312 | 15th-25th Floor Plans | | |


## SURVEY INFORMATION

PLAN OF SURVEY OF
PART OF LOT 68,REGISTERED PLAN 99
PART OF BLOCK 'D', PLAN M-59
PART OF LOT 1, REGISTERED PLAN 125
PART OF LOT 2, REGISTERED PLAN 125
IN THE CITY OF BURLINGTON
REGIONAL MUNICIPALITY OF HALTON

A.T. McLaren LIMITED
69 JOHN STREET SOUTH, SUITE 230
HAMILTON, ONTARIO
L8N 2B9
telephone (905) 527 -8559

## GENERAL NOTES

1. For landscaping, refer to landscape drawings.
2. For proposed grading, refer to landscape drawings and approved grading plan.
3. All perimeter existing information indicated taken from survey.
4. All work to be done in conformance with the 2012 Ontario Building Code (O.B.C., as amended)
5. All driveway with access onto City owned roadway conform to City of Burlington standards.

## NOTES

1. Fire access route to existing buildings will be maintained during construction.
2. Accessibility for all pathway to Go Station, Wal-Mart during construction will be maintained.
3. The fire access route will be designed to support a load of not less than 11,363 kg per axle and have a change in gradient of not more than 1 in 12.5 over a minimum distance of 15m.
4. Fire Department access route will be constructed of hard surface material such as asphalt, concrete or lockstone.

## KEY PLAN



## VAN ACCESSIBLE SIGNAGE DETAIL




## GFA definition

The sum of the areas of each floor of a building, but shall include a basement or cellar when used for commercial purpose. Measurement shall be from the exterior face of outside walls, or from the centre line of partition and common walls. Gross Floor Area shall not include floor space devoted to:
-Vehicle Parking
-Storage
-Air Handling Equipment
-Enclosed mall and hallways, excluding kiosk, stairways
-Elevators and associated equipment
Washrooms
-Foyers, lobbies, but not waiting areas/rooms


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Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington, Ontario

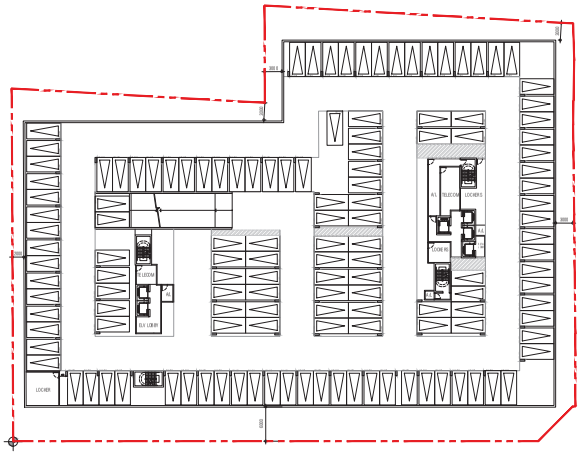
| | |
|---|---|
| Project Architect: | B. Graziani |
| Assistant Designer: | R. Alami |
| Drawn By: | R. Alami |
| Checked By: | D. Biase |
| Plot Date: | Sep. 12, 2022 |
| Job # | 1398.16 |

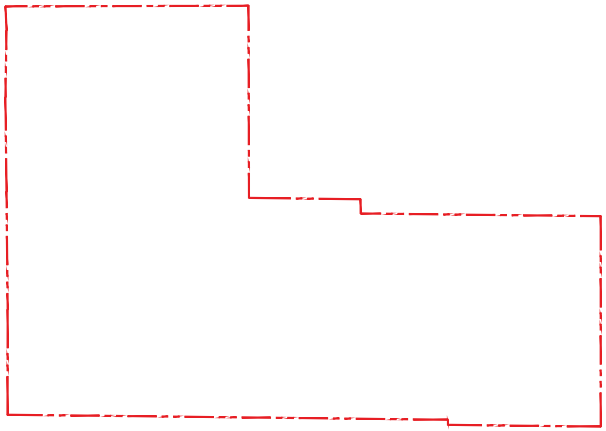
## SITE PLAN

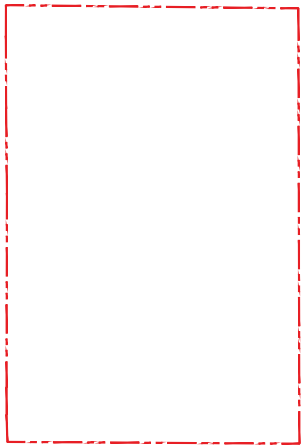
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A101

TITLEBLOCK SIZE: 610 x 900







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PARKING LEGEND

residential parking space
minimum width = 2.75 m
minimum area = 16.50 m2

residential parking space (barrier free)
size as per (a)
+ 2.00 m delineated accessible parking walkway

visitor/office/retail parking space
size as per (a)

visitor/office/retail parking space
size as per (a)
+ 2.00 m delineated accessible parking walkway

car share parking space
size as per (a)

** designated parking spaces on plans to be provided for low emitting and fuel efficient vehicles

issued for revisions

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Residential Development

# BRANT+GHENT
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Burlington, Ontario

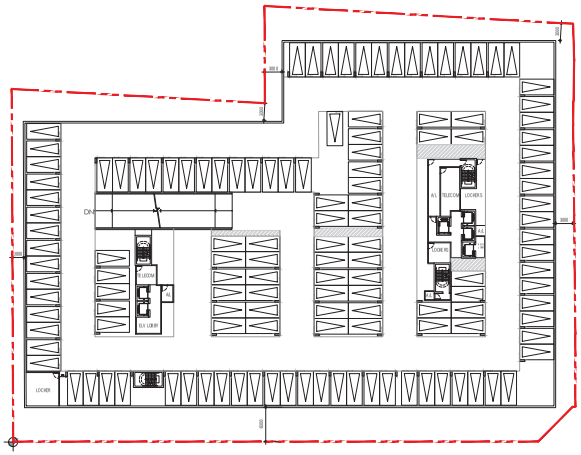
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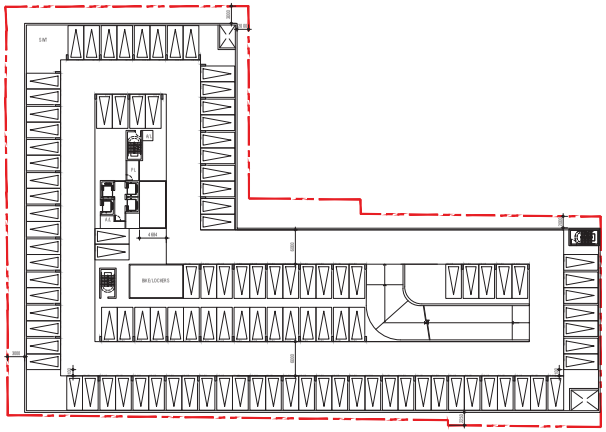
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A203

TITLEBLOCK SIZE: 610 x 900





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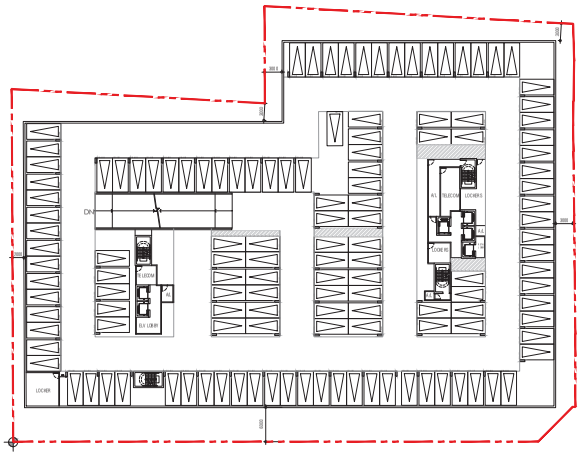
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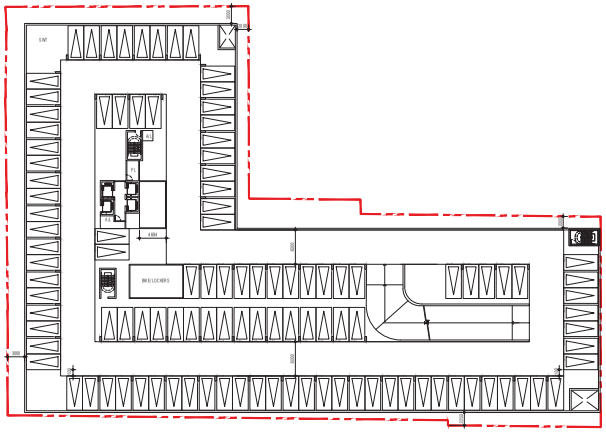
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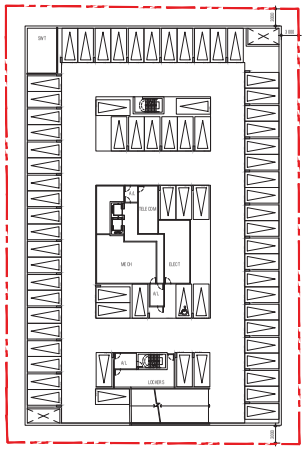
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A203

TITLEBLOCK SIZE: 610 x 900







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size as per (a)

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Residential Development

# BRANT+GHENT
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Burlington, Ontario

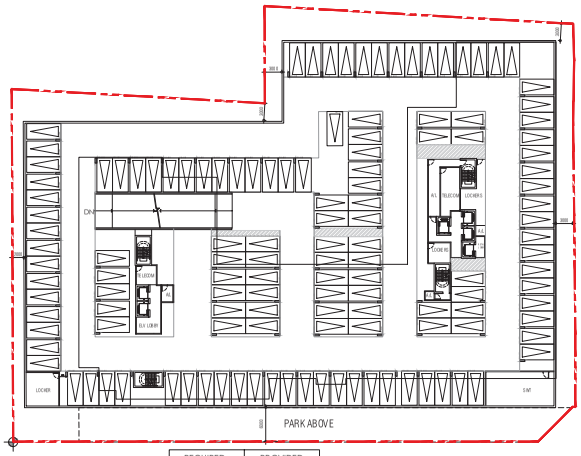
| | |
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## P2 LEVEL

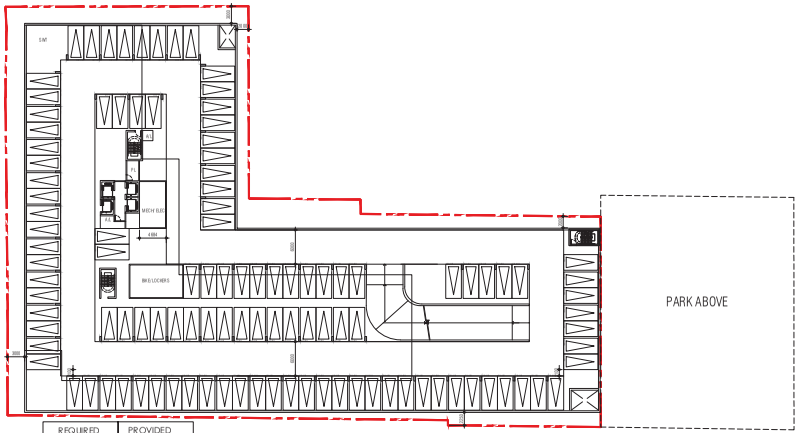
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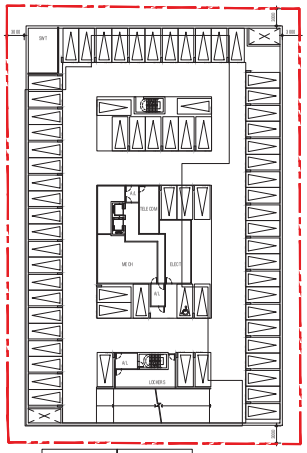
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|---|---|
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| 511 | 538 |




| REQUIRED | PROVIDED |
|---|---|
| 1.15 PER UNIT<br>284 X 1.15<br><br>284 RES.<br>43 VIS | SURFACE 8<br>P1 111<br>P2 111<br>P3 112 |
| 327 | 342 |



| REQUIRED | PROVIDED |
|---|---|
| 1.15 PER UNIT<br>124 X 1.15<br><br>124 RES.<br>19 VIS | SURFACE 7<br>P1 71<br>P2 78 |

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Residential Development

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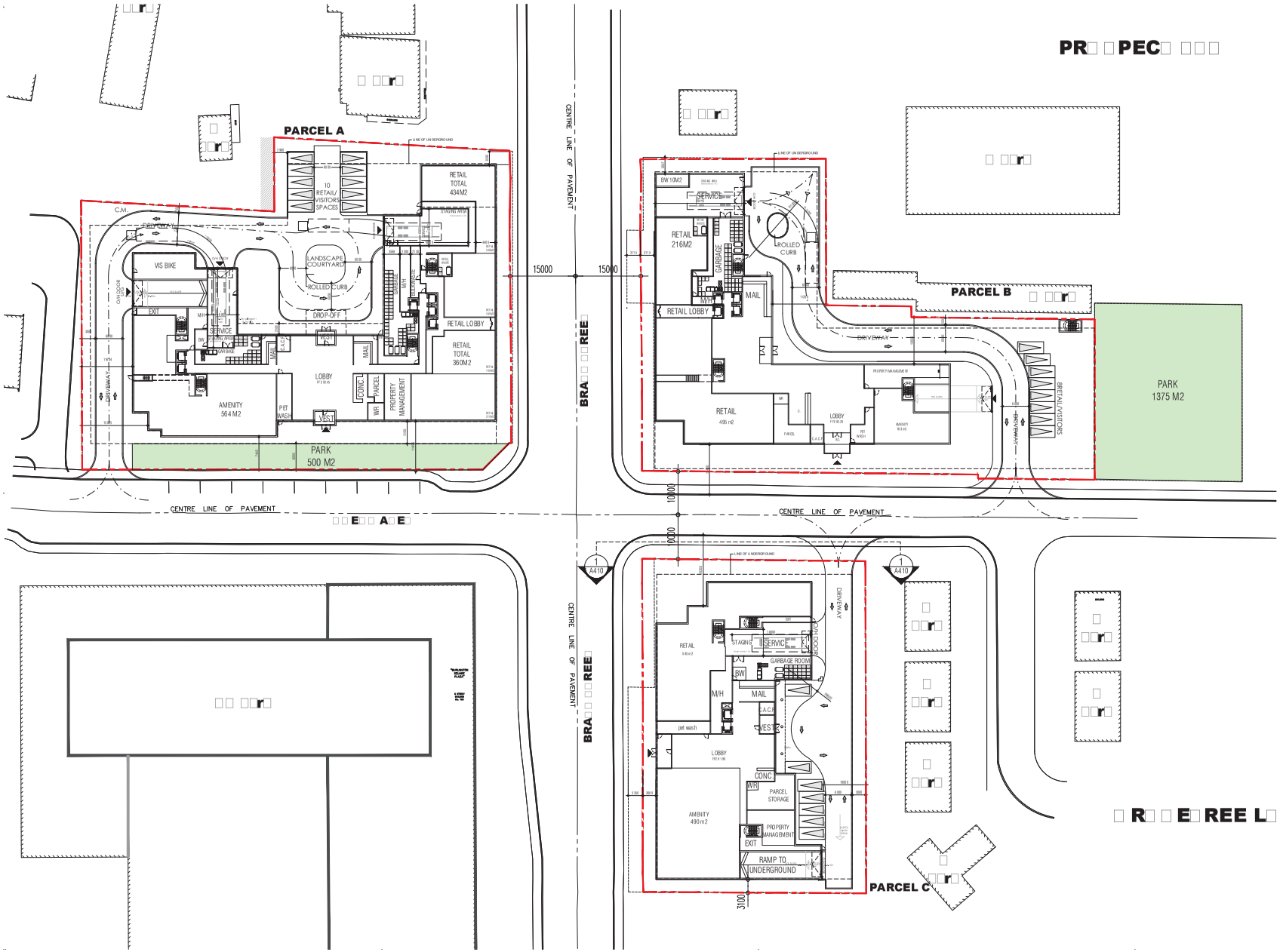
| | |
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| Drawn By: | R. Alami |
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## P1 LEVEL

1:400

A201

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Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington, Ontario

| | |
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GROUND LEVEL

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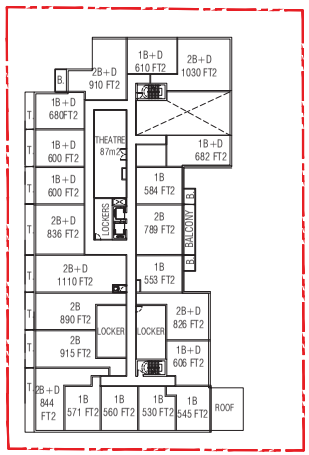
A301

TITLEBLOCK SIZE: 610 x 900










**PARCEL C**

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Residential Development

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Burlington, Ontario

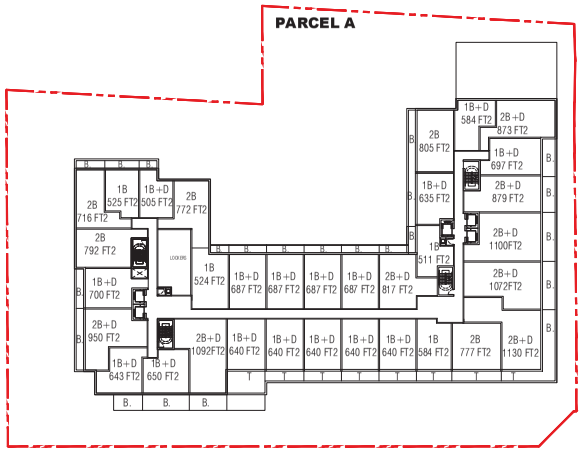
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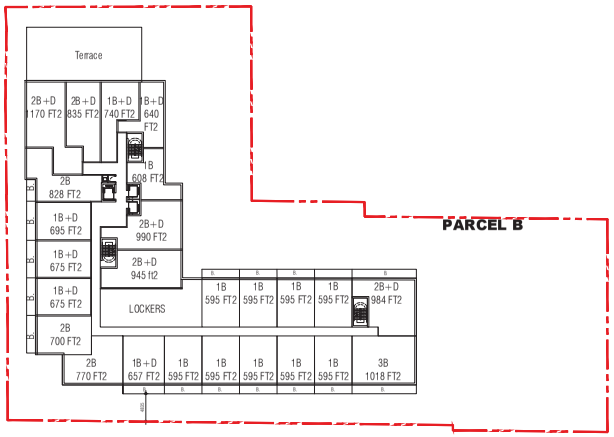
## 2ND FLOOR

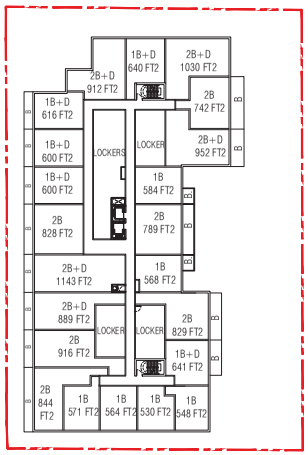
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A302

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## 3RD FLOOR

1:400

A303

TITLEBLOCK SIZE: 610 x 900

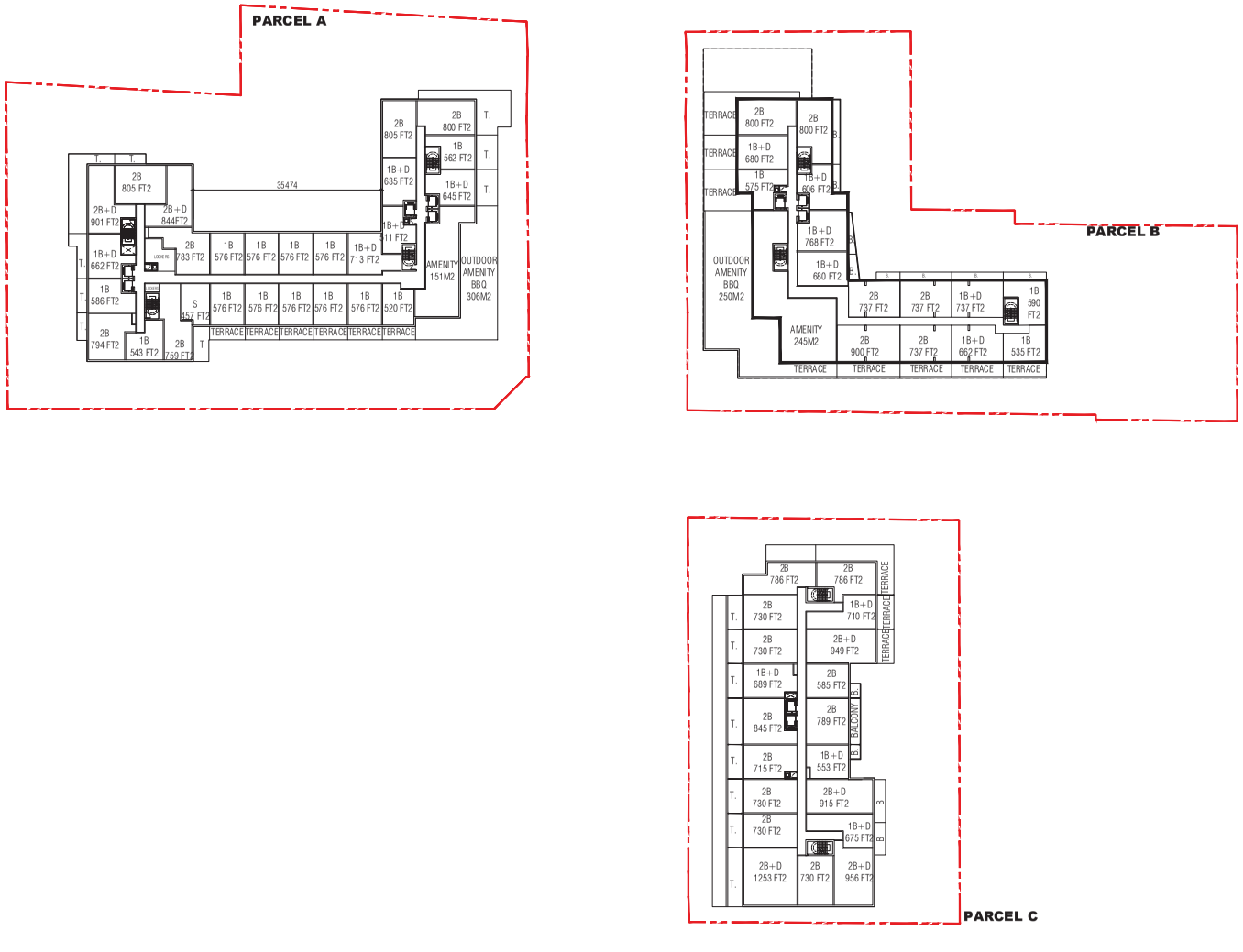
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Phone: 905.795.2601 Fax 905.795.2644 www.gc-architects.com

Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington, Ontario

| | |
|---|---|
| Project Architect: | B. Grazioni |
| Assistant Designer: | R. Alomi |
| Drawn By: | R. Alomi |
| Checked By: | D. Biase |
| Plot Date: | Sep. 12, 2022 |
| Job # | 1398.16 |

## 4TH FLOOR

1:400

A304

TITLEBLOCK SIZE: 610 x 900

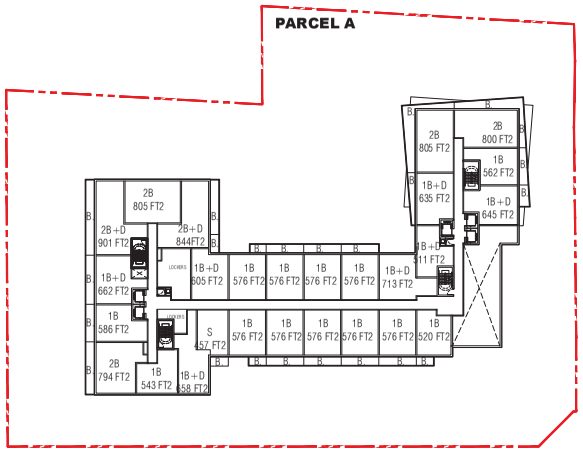
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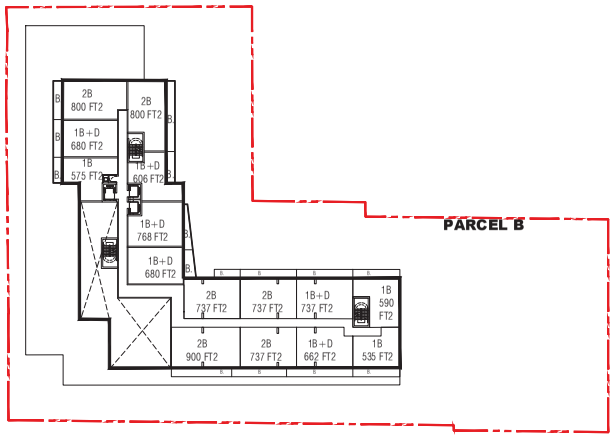
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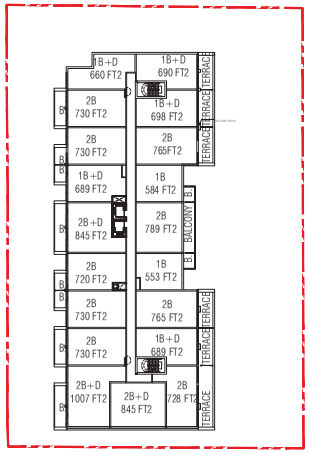
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Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington, Ontario

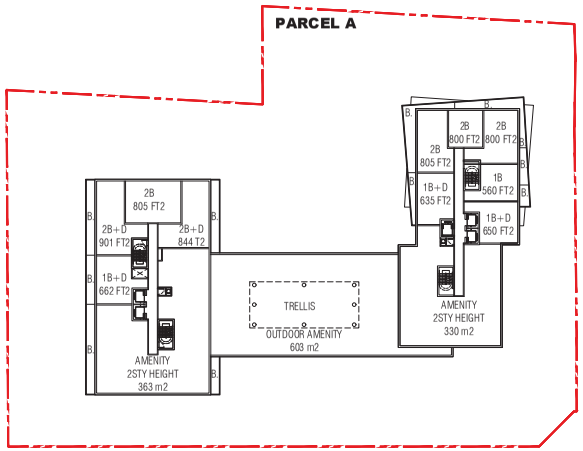
| | |
|---|---|
| Project Architect: | B. Grazioni |
| Assistant Designer: | R. Alomi |
| Drawn By: | R. Alomi |
| Checked By: | D. Biase |
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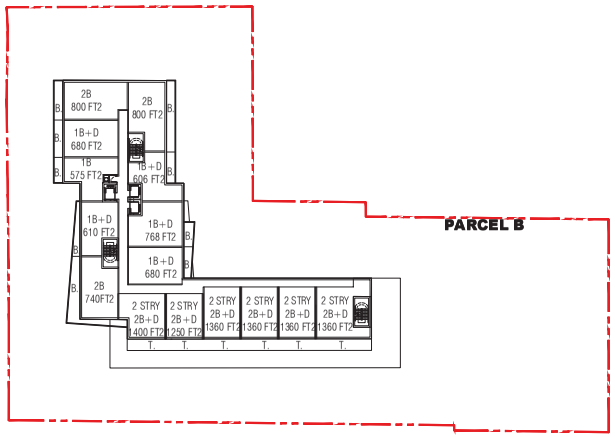
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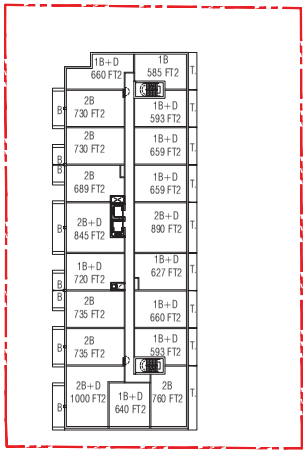
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TITLEBLOCK SIZE: 610 x 900




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Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington, Ontario

| | |
|---|---|
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| Assistant Designer: | R. Alomi |
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| Checked By: | D. Biase |
| Plot Date: | Sep. 12, 2022 |
| Job # | 1398.16 |

## 6TH FLOOR

1:400

A306

TITLEBLOCK SIZE: 610 x 900

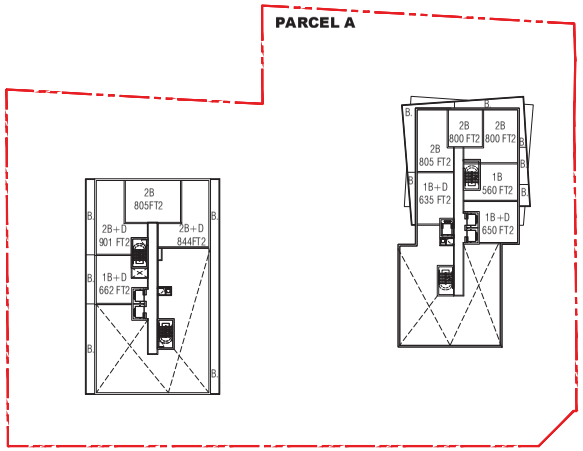
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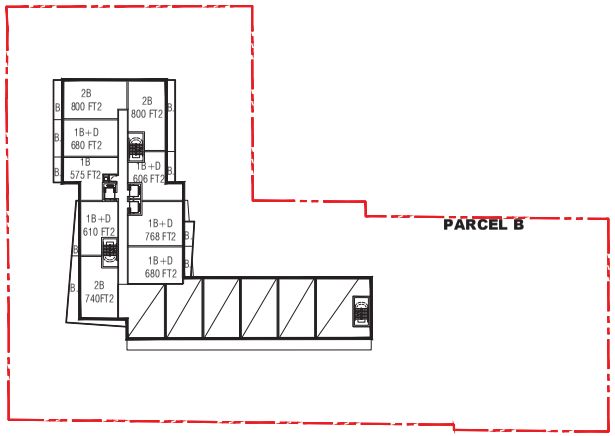
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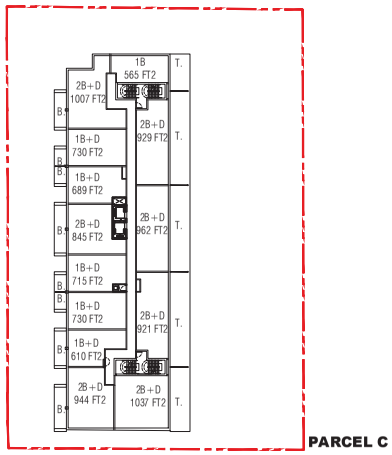
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Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

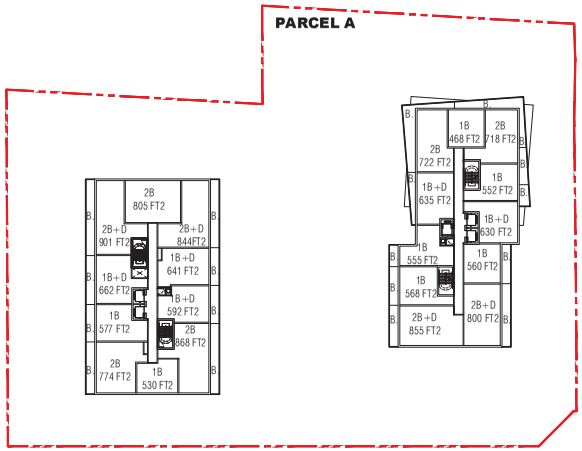
| | |
|---|---|
| Burlington | Ontario |
| Project Architect: | B. Grazioni |
| Assistant Designer: | R. Alomi |
| Drawn By: | R. Alomi |
| Checked By: | D. Biase |
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| Job # | 1398.16 |

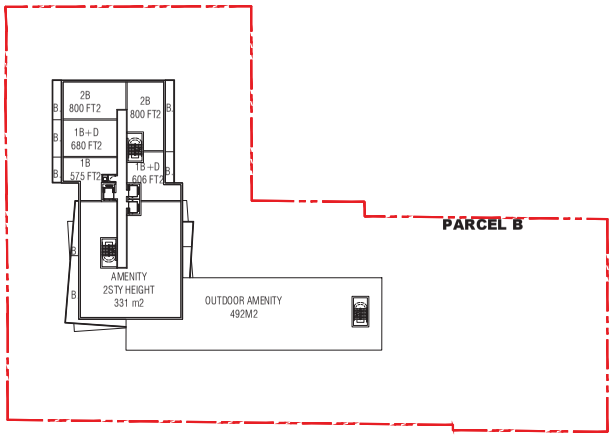
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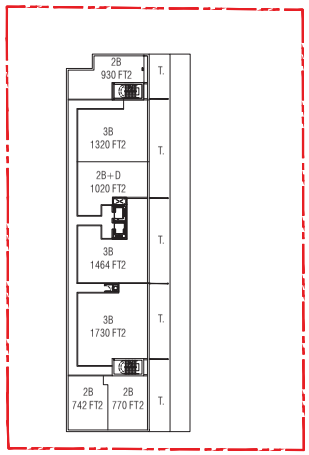
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A307

TITLEBLOCK SIZE: 610 x 900




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Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington, Ontario

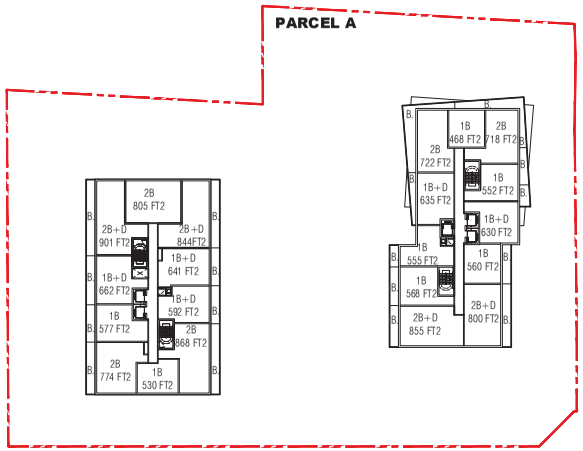
| | |
|---|---|
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| Assistant Designer: | R. Alomi |
| Drawn By: | R. Alomi |
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| Job # | 1398.16 |

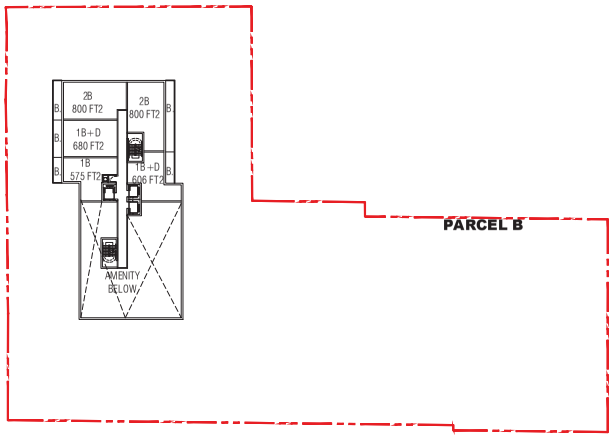
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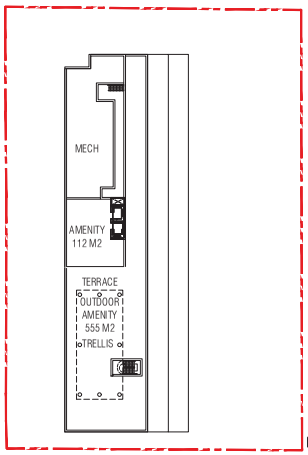
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A308

TITLEBLOCK SIZE: 610 x 900




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Phone 905.795.2601 Fax 905.795.2644 www.gc-architects.com

Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington, Ontario

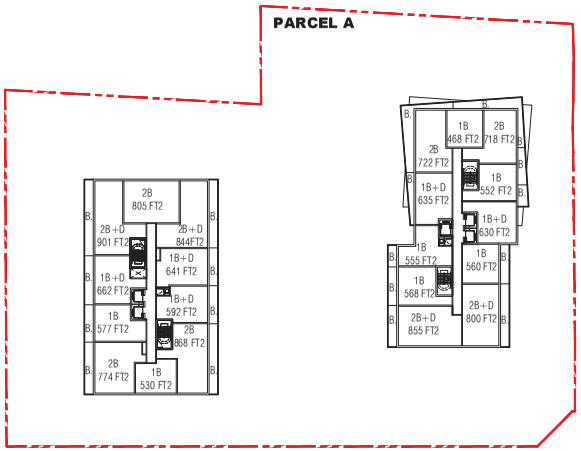
| | |
|---|---|
| Project Architect: | B. Grazioni |
| Assistant Designer: | R. Alomi |
| Drawn By: | R. Alomi |
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| Job # | 1398.16 |

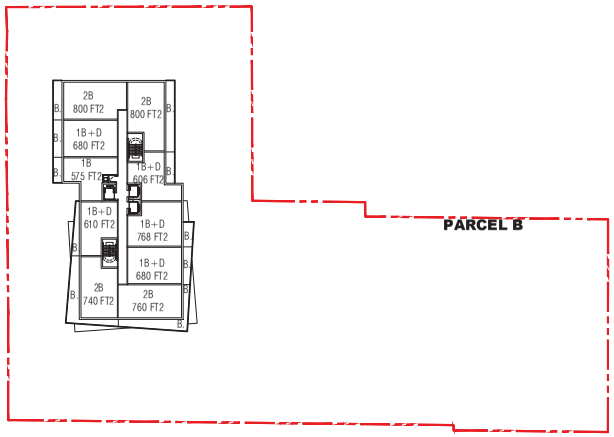
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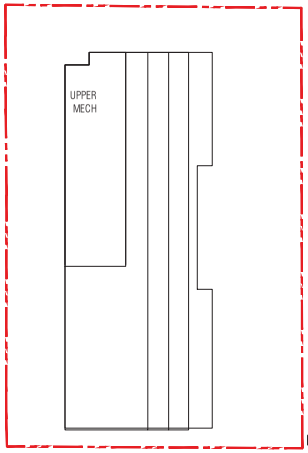
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A309

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Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington Ontario

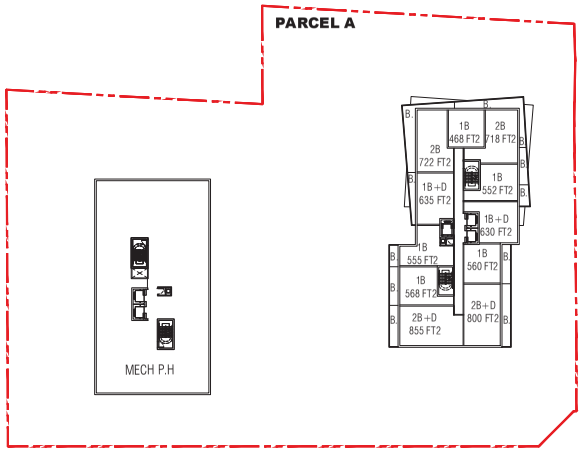
| | |
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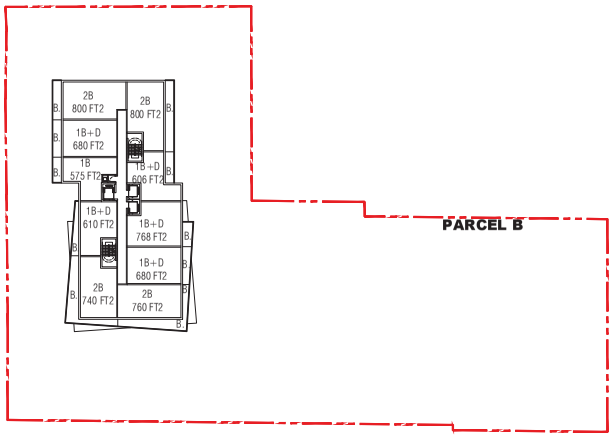
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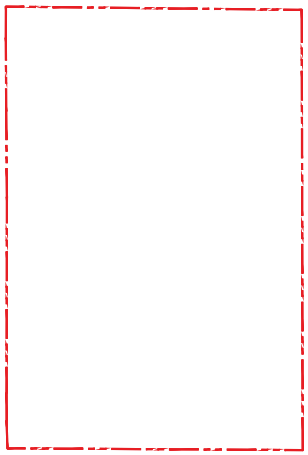
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A310

TITLEBLOCK SIZE: 610 x 900



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Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington, Ontario

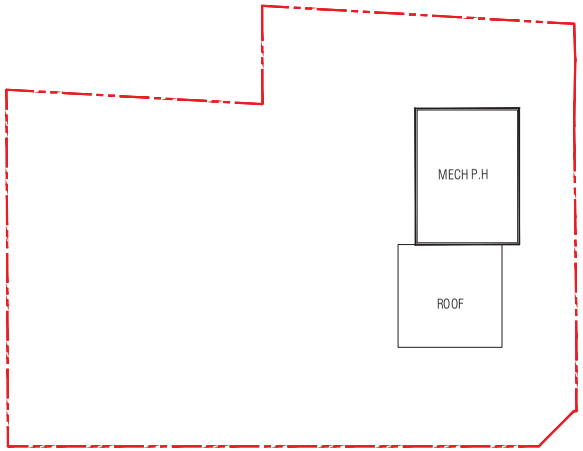
| | |
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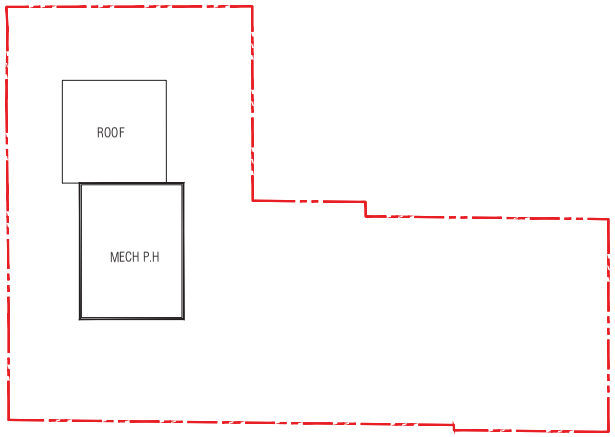
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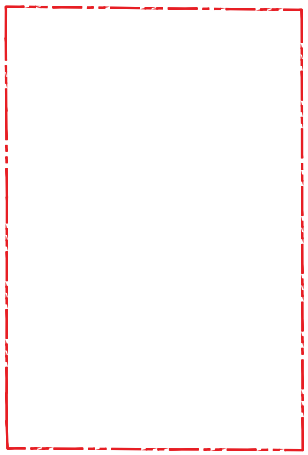
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A311

TITLEBLOCK SIZE: 610 x900



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Residential Development

# BRANT+GHENT
## PHASE 1,2 AND 3

Burlington, Ontario

| | |
|---|---|
| Project Architect: | B. Graziani |
| Assistant Designer: | R. Alami |
| Drawn By: | R. Alami |
| Checked By: | D. Biase |
| Plot Date: | Sep. 12, 2022 |
| Job # | 1398.16 |

## MECH FLOOR

1:400

A312

TITLEBLOCK SIZE: 610 x 900

# APPENDIX E

Sample Calculation

STAMSON 5.0 NORMAL REPORT Date: 05-10-2022 09:23:55
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: sample.te Time Period: Day/Night 16/8 hours
Description: **Future daytime and nighttime sound levels at the east façade of the podium of the proposed building in Phase 1**

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

| Train Type | Trains | Speed (km/h) | # loc /Train | # Cars /Train | Eng type | Cont weld |
|---|---|---|---|---|---|---|
| * 1. Way | 5.4/2.7 | 97.0 | 4.0 | 25.0 | Diesel | No |
| * 2. Passenger | 17.5/0.0 | 129.0 | 2.0 | 10.0 | Diesel | No |
| * 3. GO | 196.8/47.2 | 150.0 | 1.0 | 12.0 | Diesel | No |

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

| No | Train type: Name | Unadj. Trains | Annual % Increase | Years of Growth |
|---|---|---|---|---|
| 1. | Way | 4.0/2.0 | 2.50 | 12.00 |
| 2. | Passenger | 13.0/0.0 | 2.50 | 12.00 |
| 3. | GO | 192.0/46.0 | 2.50 | 1.00 |

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

| | | |
|---|---|---|
| Angle1 Angle2 | -90.00 deg | 0.00 deg |
| Wood depth | 0 | (No woods.) |
| No of house rows | 3 / 3 | |
| House density | 50 % | |
| Surface | 1 | (Absorptive ground surface) |
| Receiver source distance | 500.00 / 500.00 m | |
| Receiver height | 12.00 / 12.00 m | |
| Topography | 1 | (Flat/gentle slope; no barrier) |
| No Whistle | | |
| Reference angle | 0.00 | |

Rail data, segment # 2: Halton (day/night)

| Train Type | Trains | Speed (km/h) | # loc /Train | # Cars /Train | Eng type | Cont weld |
|---|---|---|---|---|---|---|
| * 1. Freight | 13.4/5.4 | 80.0 | 4.0 | 140.0 | Diesel | No |
| * 2. Way | 2.7/0.0 | 80.0 | 4.0 | 25.0 | Diesel | No |

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

| No | Train type: Name | Unadj. Trains | Annual % Increase | Years of Growth |
|---|---|---|---|---|
| 1. | Freight | 10.0/4.0 | 2.50 | 12.00 |
| 2. | Way | 2.0/0.0 | 2.50 | 12.00 |

Data for Segment # 2: Halton (day/night)
---
Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 3 / 3
House density : 50 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 500.00 / 500.00 m
Receiver height : 12.00 / 12.00 m
Topography : 1 (Flat/gentle slope; no barrier)
No Whistle
Reference angle : 0.00

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

LOCOMOTIVE (0.00 + 52.28 + 0.00) = 52.28 dBA

| Angle1 | Angle2 | Alpha | RefLeq | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|---|---|---|---|---|---|---|---|---|---|
| -90 | 0 | 0.27 | 80.74 | -19.34 | -3.71 | 0.00 | -5.40 | 0.00 | 52.28 |

WHEEL (0.00 + 46.22 + 0.00) = 46.22 dBA

| Angle1 | Angle2 | Alpha | RefLeq | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|---|---|---|---|---|---|---|---|---|---|
| -90 | 0 | 0.38 | 76.50 | -20.94 | -3.94 | 0.00 | -5.40 | 0.00 | 46.22 |

Segment Leq : 53.24 dBA

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

LOCOMOTIVE (0.00 + 46.05 + 0.00) = 46.05 dBA

| Angle1 | Angle2 | Alpha | RefLeq | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|---|---|---|---|---|---|---|---|---|---|
| -90 | 0 | 0.27 | 74.51 | -19.34 | -3.71 | 0.00 | -5.40 | 0.00 | 46.05 |

WHEEL (0.00 + 40.49 + 0.00) = 40.49 dBA

| Angle1 | Angle2 | Alpha | RefLeq | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|---|---|---|---|---|---|---|---|---|---|
| -90 | 0 | 0.38 | 70.77 | -20.94 | -3.94 | 0.00 | -5.40 | 0.00 | 40.49 |

Segment Leq : 47.12 dBA

Total Leq All Segments: 54.19 dBA

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

LOCOMOTIVE (0.00 + 48.86 + 0.00) = 48.86 dBA

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

```
-------------------------------------------------------------------------
   -90      0   0.27  77.32 -19.34  -3.71   0.00  -5.40   0.00  48.86
-------------------------------------------------------------------------

WHEEL (0.00 + 42.91 + 0.00) = 42.91 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.38  73.19 -20.94  -3.94   0.00  -5.40   0.00  42.91
-------------------------------------------------------------------------

Segment Leq : 49.84 dBA

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

LOCOMOTIVE (0.00 + 44.80 + 0.00) = 44.80 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.27  73.26 -19.34  -3.71   0.00  -5.40   0.00  44.80
-------------------------------------------------------------------------

WHEEL (0.00 + 39.38 + 0.00) = 39.38 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.38  69.66 -20.94  -3.94   0.00  -5.40   0.00  39.38
-------------------------------------------------------------------------

Segment Leq : 45.90 dBA

Total Leq All Segments: 51.31 dBA

Road data, segment # 1: Brant (day/night)
-----------------------------------------
Car traffic volume  : 22700/2522  veh/TimePeriod  *
Medium truck volume :   739/82    veh/TimePeriod  *
Heavy truck volume  :  1182/131   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  18888
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  15.00
    Medium Truck % of Total Volume     :   3.00
    Heavy Truck  % of Total Volume     :   4.80
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Brant (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  :  17.00 / 17.00  m
Receiver height           :  12.00 / 12.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Fairview (day/night)
-------------------------------------------
Car traffic volume  : 53378/5931  veh/TimePeriod  *
Medium truck volume :  1244/138   veh/TimePeriod  *
Heavy truck volume  :  1923/214   veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  43380
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  15.00
    Medium Truck % of Total Volume     :   2.20
    Heavy Truck  % of Total Volume     :   3.40
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: Fairview (day/night)
------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 400.00 / 400.00 m
Receiver height           :  12.00 / 12.00  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 3: Ghent (day/night)
-----------------------------------------
Car traffic volume  :  5415/602   veh/TimePeriod  *
Medium truck volume :   189/21    veh/TimePeriod  *
Heavy truck volume  :   301/33    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):   4530
    Percentage of Annual Growth        :   2.50
    Number of Years of Growth          :  15.00
    Medium Truck % of Total Volume     :   3.20
    Heavy Truck  % of Total Volume     :   5.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 3: Ghent (day/night)
---------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
```

```
Wood depth                 :      0       (No woods.)
No of house rows           :      0 / 0
Surface                    :      1       (Absorptive ground surface)
Receiver source distance   :  20.00 / 20.00  m
Receiver height            :  12.00 / 12.00  m
Topography                 :      1       (Flat/gentle slope; no barrier)
Reference angle            :   0.00
```

Results segment # 1: Brant (day)

Source height = 1.48 m

ROAD (0.00 + 68.78 + 0.00) = 68.78 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|---|---|---|---|---|---|---|---|---|---|---|
| -90 | 90 | 0.35 | 70.37 | 0.00 | -0.73 | -0.87 | 0.00 | 0.00 | 0.00 | 68.78 |

Segment Leq : 68.78 dBA

Results segment # 2: Fairview (day)

Source height = 1.36 m

ROAD (0.00 + 49.77 + 0.00) = 49.77 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|---|---|---|---|---|---|---|---|---|---|---|
| -90 | 0 | 0.35 | 72.89 | 0.00 | -19.24 | -3.89 | 0.00 | 0.00 | 0.00 | 49.77 |

Segment Leq : 49.77 dBA

Results segment # 3: Ghent (day)

Source height = 1.50 m

ROAD (0.00 + 58.82 + 0.00) = 58.82 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 90 | 0.34 | 64.38 | 0.00 | -1.68 | -3.88 | 0.00 | 0.00 | 0.00 | 58.82 |

Segment Leq : 58.82 dBA

Total Leq All Segments: 69.25 dBA

Results segment # 1: Brant (night)

Source height = 1.48 m

ROAD (0.00 + 62.24 + 0.00) = 62.24 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|---|---|---|---|---|---|---|---|---|---|---|
| -90 | 90 | 0.35 | 63.83 | 0.00 | -0.73 | -0.87 | 0.00 | 0.00 | 0.00 | 62.24 |

Segment Leq : 62.24 dBA

Results segment # 2: Fairview (night)

Source height = 1.36 m

ROAD (0.00 + 43.24 + 0.00) = 43.24 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|---|---|---|---|---|---|---|---|---|---|---|
| -90 | 0 | 0.35 | 66.36 | 0.00 | -19.24 | -3.89 | 0.00 | 0.00 | 0.00 | 43.24 |

Segment Leq : 43.24 dBA

Results segment # 3: Ghent (night)

Source height = 1.50 m

ROAD (0.00 + 52.25 + 0.00) = 52.25 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 90 | 0.35 | 57.81 | 0.00 | -1.68 | -3.88 | 0.00 | 0.00 | 0.00 | 52.25 |

Segment Leq : 52.25 dBA

Total Leq All Segments: 62.70 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.38
(NIGHT): 63.01

**Cadna Input Data**

Ground Absorption: 0.25

Max. Order of Reflection: 1

Temperature: 10°C

Relative Humidity: 70%