Thornton Tomasetti

Noise and Vibration Impact Study

121 Vansitmart Avenue Hamilton, Ontario

SW22183.00

Prepared For
Scott Beedie

Urban Solutions
3 Studebaker Place, Unit 1
Hamilton, ON L8L 0C8
Tel: 905.546.1087
sbeedie@urbansolutions.info

Prepared By
Robert Fuller, P.Eng.

Thornton Tomasetti
23-366 Revus Avenue
Mississauga, Ontario L5G 4S5
Tel: +1 647.769.7161
RFuller@ThorntonTomasetti.com
www.ThorntonTomasetti.com

Reviewed By
Michael Wesolowsky, Ph.D., P.Eng.
Principal

November 28, 2022

Table of Contents

List of Tables

List of Figures

1.0 Introduction

At the request of Urban Solutions (Client), Thornton Tomasetti (TT) presents this Noise Impact Study (NIS) regarding the planned Vansitmart Residential Development located at 121 Vansitmart Avenue, Hamilton, Ontario (the Project).

The purpose of this study is to assess the noise impact on the Project from surrounding noise sources and the noise impact of the Project on surrounding noise sensitive areas. This report is intended to support the Site Plan Approval (SPA) application for the Project as a detailed study.

Where applicable, this report will provide noise control recommendations to meet the requirements of the relevant Land Use Planning Authority (LUPA), and noise criteria developed by the Ontario Ministry of the Environment, Conservation and Parks (MECP).

Where predicted noise impacts are lower than applicable action thresholds identified, the project should be designed to meet the Ontario Building Code (OBC) as a minimum standard.

1.1 Previous Reports

TT has reviewed the following documents previously prepared by third parties in relation to the proposed development:

- *Environmental Noise And Vibration Impact Study "The Vansitmart Residential Development" Located at 121 Vansitmart Avenue Hamilton Ontario*, prepared by dBA Acoustical Consultants Inc., dated February 2021 (Previous NVIS)

- *Environmental Noise and Vibration Study Peer Review Proposed Residential Development 121 Vansitmart Avenue City of Hamilton*, prepared by Jade Acoustics Inc. Dated March 16, 2022 (Previous NVIS Peer Review)

The Previous NVIS was prepared for a similar proposed site layout, and described an assessment of rail noise, and measurements of vibration from rail traffic, as well as measurements of noise from activities in the rail yard. Key elements of the previous NVIS included:

- It was indicated that no outdoor living areas would be present in the development.
- The rail traffic noise assessment was based on train traffic data obtained in 2016.
- Rail traffic noise was predicted to be up to 67 dBA during the daytime and 52 dBA during the night at the most impacted façades.
- Building construction requirements were identified, including brick veneer equivalent construction on the façade closest to the rail lines, as well as a requirement for central air conditioning.
- Road noise was considered to be insignificant.
- Rail vibration measurements conducted in 2017 were described, and reported to have found a maximum RMS velocity of 0.16 mm/s, exceeding the recommended 0.14 mm/s criteria, therefore vibration mitigation measures were recommended for the foundation construction of impacted townhouses.

- Measured impulse noise levels from activity in the rail yard in 2017 were reported to have resulted in a predicted sound level of 68 dBAI at the most impacted façade of the proposed development, and impulsive noises were reported to occur only rarely (~1/hr).
- Steady noise from surrounding industry was considered to be insignificant.

The Previous NVIS Peer Review focused on the assessment of CN rail related noise, and identified the following key concerns, along with other less significant comments regarding the Previous NVIS report:

- The rail traffic data used was relatively old (2016), the peer reviewer recommended that data older than one year should not be used.
- The peer reviewer suggested that insufficient data had been collected to support the claim that impulses were consistently rare, and suggested that frequent impulses (>9/hr) could occur.
- The field measurements were relatively old (2017)
- The peer reviewer recommended that CN be contacted to inquire about current /planned operations in the rail yard.

2.0 Site and Surrounding Area

2.1 Project Location

The Project is located on the north side of Vansitmart Avenue, between Cope Street and Tragina Avenue North, approximately 400m west of Kenilworth Avenue North.

The Project is bordered on the north by CN rail tracks and a rail yard. The Project is bordered on the east, south, and west by residential land uses. The broader neighborhood includes mixed commercial and industrial uses to the north of the Project, and residential uses to the east, south and west of the Project.

The Project Site is currently occupied by Kemp Construction Ltd., a construction company which uses the property as an office space and equipment yard.

An illustration of the project location and surrounding area is provided in Figure 1.

2.2 Zoning & Official Plan

The Project site is zoned as RT-20 "Townhouse" under the City of Hamilton Zoning By-Law No. 6593, amended by By-Law No. 18-165, and is designated as "Neighborhoods" under the City of Hamilton's Urban Official Plan. Surrounding areas are zoned for residential (C) and industrial (M5, M6) uses.

A zoning map is presented in Figure 2.

2.3 Planned Development

The Project will consist of four new 3 storey back-to-back townhouse blocks, with a total of 40 units. The maximum height of the buildings will be 12.5m.

In this report, the townhouse blocks are referred to as Block 1 (northernmost) though to Block 4 (southernmost).

The proposed new site plan is provided in Figure 3.

2.4 Site Inspection

TT personnel attended the Project site on October 27, 2022 in order to inspect the acoustical environment in the area of the Project.

Transportation noise at the Project site was observed to be dominated by the adjacent CN Rail tracks. Transportation noise is discussed in Section 5.0 of this report.

Audible noise from rail yard activities and a steady noise source located to the north was observed at the Project site. It was unclear from the ground if the steady noise source was associated with the adjacent CN Rail yard, or the industrial facility located north of the rail yard. Stationary noise sources are discussed in Section 6.0 of this report.

2.4.1 Sound Level Measurements

TT contacted CN rail by email at proximity@cn.ca requesting any available information about current / future activities in the rail yard, as well as access and/or cooperation with the rail yard to perform field measurements of typical rail yard activities. Emails were sent to CN in relation to this inquiry on July 26, 2022, August 8, 2022, August 24, 2022, August 29, 2022 and October 14, 2022. No responsive answer was received, therefore TT proceeded with conducting noise measurements from the Project Site itself.

Measurements of the observed steady noise level were conducted at points coinciding with the planned north façade of townhouse Block 1. The steady sound level was found to be approximately 56 - 53 dBA on average at the planned north façade of townhouse Block 1 in readings conducted in the morning and afternoon respectively. The steady sound level was found to be approximately 50 – 52 dBA on average at the planned north façade of townhouse Block 2.

Measurements of the observed impulse noise level from activities in the train yard (coupling & taking out slack), with maximum coupling impulse sound levels recorded to be 68 – 72 dBAI. Additionally, one longer train departed the yard during the measurement period, resulting in a maximum recorded impulse sound level of 86 dBAI when the slack between each car was removed. All impulse measurements were taken at the approximate location of the north façade of townhouse Block 1.

Details of the measurement conditions, methodology, and results are included in Appendix D.

2.1 Topography

Based on the observed and/or reported conditions on and around the Project site, the local topography is expected to be approximately flat.

3.0 Ministry of the Environment Conservation and Parks

The MECP's *Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning* (NPC-300) provides province wide assessment standards and criteria for evaluating noise impacts from transportation sources such as roads, railways and aircraft, as well as stationary sources

such as mechanical equipment, and industrial facilities. In preparing this NIS report, TT has referred to *Part A Background and Part C Land Use Planning* of NPC-300.

This NIS report has been prepared to support land use planning decisions, and is not intended to support an application for an Environmental Compliance Approval (ECA) in accordance with *Part B Stationary Sources* of NPC-300, and Section 9 of the Environmental Protection Act.

4.0 Land Use Planning Authority

In addition to the MECP's standards and criteria, some LUPAs impose additional requirements on applications for development approval. The LUPAs for this Project are the City of Hamilton which generally defers to the MECP's guidelines as documented in NPC-300.

5.0 Transportation Noise Assessment

5.1 Critical Transportation Noise Receptors

NPC-300 defines a point of reception for the assessment of transportation noise sources as either the Plane of Window (POW) of a noise sensitive indoor space or an Outdoor Living Area (OLA) representing an area of a noise sensitive land use intended for quiet enjoyment of the outdoor environment.

The POW receptor(s) most likely to be affected by transportation noise are those representing the residential suites of the Project that have maximum exposure to the adjacent CN rail tracks. Specifically, POW receptors were assessed for the northwest and northeast corners of townhouse Block 1, and the northeast corner of townhouse Block 2, at the highest elevation with windows.

Based on provided site plans of the Project, TT understands that no outdoor amenity areas are planned for the development, therefore no OLA receptors have been considered.

The locations of the critical receptors for transportation noise are summarized in Table 1 and shown in Figure 4. POW elevations were taken to be the representative height for 3rd floor windows, as specified in NPC-300.

Table 1: Points of Reception – Transportation Noise

Receptor ID	Receptor Description	Receptor Location
POW1	Block 1, northwest corner	North façade, 7.5m above ground
POW2	Block 1, northeast corner	North façade, 7.5m above ground
POW3	Block 2, northeast corner	North façade, 7.5m above ground

5.2 Transportation Noise Sources

5.2.1 Road Noise Sources

The nearest roads to the Project site (Vansitmart Avenue, Cope Street, and Tragina Avenue North) have low levels of daily traffic, and the nearest significant streets (Barton Street East ~170m to the south, and Kenilworth Avenue North ~400m to the west) are shielded from the Project site by existing residential properties. Road traffic noise at the Project site is considered to be insignificant.

5.2.2 Rail Noise Sources

A railway operated by Canadian National Railway (CN) is located adjacent to the north of the Project, with the closest tracks approximately 50m from the nearest planned façade of the Project. Rail traffic data was obtained from CN pertaining to Mile 40.49 of the CN Grimsby Subdivision, in the vicinity of Kenilworth Avenue North, which is representative of the conditions impacting the Project.

This section of the Grimsby Subdivision is classified by CN as a Double Main Line. CN traffic on this rail line consists of freight, way freight, and passenger trains. According to the CN data, this track is considered to be continuously welded rail. There are three at-grade crossings in the area, but anti-whistling by-laws are in effect; therefore, train whistling is not expected outside of emergency situations. All trains are assumed to be diesel trains.

It is TT's understanding that these rail lines are also used infrequently by GO Transit for the Lakeshore West line, between the West Harbour GO Station and the St. Catherines GO Station. Current GO Transit traffic is low (~2 trips per day), but TT understands that Metrolinx's projections for future traffic include up to 93 trips per day along the lakeshore west line. The future projected data, as summarized in Table 2 is considered representative of the total rail traffic volume.

The 2022 CN train traffic volumes provided were projected to 2034 (10 years after the anticipated completion of the Project) using an annual growth rate of 2.5% for a 10-year period.

Table 2: Rail Traffic Data Summary

Parameter	CN Grimsby Subdivision			
Train Type	Freight	Way Freight	Passenger	GO Transit
Number of Trains Per Day (2022) Day (07:00 - 23:00) / Night (23:00 - 07:00)	4 / 0	0 / 2	2 / 0	88 / 5
Annual Growth Rate	2.5%	2.5%	2.5%	2.5%
Growth Period (years)	12	12	12	0
Locomotives Per Train	4	4	2	2
Cars Per Train	140	25	10	12
*Maximum Speed (mph) / (km/h)	30 / 50	30 / 50	30 / 50	30 / 48

*Note that the maximum speed of 30 mph reported by CN in 2022 is significantly lower than the maximum speed of 60-95 mph reported by CN in 2016, as described in the Previous NVIS report.

5.2.3 Aircraft Noise Sources

No airports located in the vicinity of the project have been identified.

5.3 Transportation Sound Level Limits

5.3.1 Indoor Living Areas

Impacts at POWs from rail traffic are assessed against a 16-hour daytime (07:00 – 23:00) and 8-hour nighttime (23:00 – 07:00) equivalent sound pressure level (L_{eq}) reported in dBA to determine the requirement for ventilation and warning clauses. The applicable POW sound level limits and the sliding

scale of required ventilation measures and warning clauses are listed in Table 3. Note that whistle noise is not included in the assessment of rail noise for this purpose.

Table 3: POW Sound Level Limit: Ventilation & Warning Clauses – Rail Traffic

Category	Daytime $L_{eq,16hr}$ (dBA)	Nighttime $L_{eq,8hr}$ (dBA)	Mitigation Measures	NPC-300 Warning Clause Required
POW Limit	55	50	None	None
POW Mitigation Threshold Living & Bedrooms	56 - 65	51 – 60	Include forced air heating and provision for central air conditioning	Type C
POW Mitigation Threshold Living & Bedrooms	>65	>60	Include central air conditioning	Type D

Impacts to indoor noise levels from rail traffic are assessed against a 16-hour daytime (07:00 – 23:00) and 8-hour nighttime (23:00 – 07:00) equivalent sound pressure level (L_{eq}) reported in dBA at representative POW receptors to determine the requirement for acoustically designed building components. The applicable indoor sound level limits and required noise reduction measures for rail noise at in the indoor environment are listed in Table 4. Note that whistle noise is included in the assessment of rail noise for this purpose.

Table 4: Indoor Sound Level Limit: Construction Requirements – Rail Traffic

Category	Daytime $L_{eq,16hr}$ (dBA)	Nighttime $L_{eq,8hr}$ (dBA)	Total $L_{eq,24hr}$ (dBA)	Mitigation Measures
Rail Sound Level Indoor Limit Living Rooms / Bedrooms	40 / 40	40 / 35	-	Not Applicable
Rail POW Sound Level Living & Bedrooms	>60	>55	-	Design building components to achieve indoor sound level limit
Rail POW Sound Level Bedrooms	-	-	>60	Minimum of brick veneer or masonry equivalent construction from foundation to rafters in 1st row of dwellings if within 100m of tracks

5.4 Transportation Sound Level Predictions

5.4.1 Rail Traffic

Calculations of rail traffic sound levels were performed using STAMSON 5.04, the software implementation of the MECP ORNAMENT model, which was developed and published by the MECP for transportation noise prediction. The calculated sound levels at the receptors are presented in Table 5.

Table 5: Calculated Sound Levels due to Rail Sources

POR ID	Predicted Transportation Sound Levels (dBA)	
	Daytime (07:00–23:00) $L_{eq,16hr}$	Nighttime (23:00–07:00) $L_{eq,8hr}$
POW01	65	61
POW02	65	60
POW03	58	52

The STAMSON calculation outputs for the traffic noise predictions are attached in Appendix C.

5.5 Transportation Noise Control Recommendations

Noise control recommendations for the identified critical receptors and the corresponding noise sensitive land uses that they represent in the proposed redevelopment are summarized in Table 6 and discussed in the subsequent sections.

Table 6: Transportation Noise Control Measures Summary

POR ID	Noise Barrier	Ventilation	Warning Clause	Building Components
POW1	N/A	Central AC	Type D	Designed to achieve indoor sound level criteria, use brick veneer or equivalent
POW2	N/A	Central AC	Type D	Designed to achieve indoor sound level criteria, use brick veneer or equivalent
POW3	N/A	Forced Air Heating Provision for Central AC	Type C	Meet OBC Requirements

5.5.1 Outdoor Living Areas – Barriers

Because no OLA receptors were identified, barrier mitigation of noise levels in outdoor living areas is not anticipated to be necessary.

The adjacent railway line is classified as a Double (Secondary) Main Line. In accordance with the *Guidelines for New Development in Proximity to Railway Operations Prepared for the Federation of Canadian Municipalities and the Railway Association of Canada (May 2013)*, it is generally recommended that a noise barrier be constructed in the railway right-of-way, parallel to the railway with returns at each end, and a minimum height of 4.5m above track level.

Based on the modelling results described in Section 5.4.1 of this report, the planned 2.5m crash berm is expected to be sufficient for protection of the POW receptors assessed. If permitted, an additional 2m fence could be constructed on top of the crash berm as an extra noise mitigation measure.

NPC-300 indicates that noise barriers, if constructed, should have a minimum surface density (face weight) of 20 kg/m^2. Barriers should be structurally sound, appropriately designed to withstand wind and snow load, and constructed without cracks or surface gaps. Any gaps under the barrier that are necessary for drainage purposes should be minimized and localized, so that the acoustical performance of the barrier is maintained. To improve the visual characteristics of the barrier, transparent elements and/or soil berms may be included, if they meet the above conditions.

5.5.2 Indoor Living Areas - Ventilation

Sensitive receptors along the north, east, and west façades of townhouse Block 1 of the Project are expected to face POW sound levels equal to or greater than 65 dBA during the 16-hour day (07:00 – 23:00) and/or equal to or greater than 60 dBA during the 8-hour night (23:00 – 07:00) due to rail noise (excluding whistle noise), therefore central air conditioning is the minimum requirement for these units.

Sensitive receptors along the other facades of the Project are expected to face POW sound levels between 55 and 65 dBA during the 16-hour day (07:00 – 23:00) and/or between 50 and 60 dBA during the 8-hour night (23:00 – 07:00) due to rail noise (excluding whistle noise), therefore forced air heating with provision for central air conditioning is the minimum requirement for these units.

TT understands that the Project plan includes forced air heating and central air conditioning for the entirety of the Project, therefore the above noted requirements are expected to be met.

5.5.3 Indoor Living Areas - Building Components

Sensitive receptors along the north façade of townhouse Block 1 of the Project are expected to face POW sound levels above 60 dBA over a full 24-hour day due to noise from rail traffic, and are located within 100m of a railway. Therefore, the exterior façade of these receptors is required to use, as a minimum, brick veneer or masonry equivalent construction from foundation to rafters.

Sensitive receptors along the north, east and west façade of townhouse Block 1 of the Project are expected to face POW sound levels above 60 dBA during the 16-hour day (07:00 – 23:00) and/or 55 dBA during the 8-hour night (23:00 – 07:00) due to rail noise, therefore building components on these façades must be designed to achieve the indoor sound level limit.

Sensitive receptors along the other façades of the Project are not expected to face POW sound levels above 60 dBA during the 16-hour day (07:00 – 23:00) and/or 55 dBA during the 8-hour night (23:00 – 07:00) due to rail noise, therefore building components on these façades need only be designed to meet the requirements of OBC.

Table 7 shows TT's estimation of the maximum exterior wall, fixed window, and operable window component areas as a percentage of the floor area of a typical room and the minimum recommended STC requirement of each component If a component with a higher STC rating than the noted requirement is used, then the maximum allowable area of that component may increase, and if a component occupies a smaller area the STC rating required may decrease.

Table 7: Building Envelope Requirements

Component	Maximum Component Area as Percentage of Floor Area	Equivalent STC
Sensitive Spaces Along the North Façade of Townhouse Block 1		
Solid Exterior	100%	40 (54*)
Fixed Glazing	50%	36
Operable Glazing	50%	36
Sensitive Spaces Along the East and West Façades of Townhouse Block 1		
Solid Exterior	100%	40
Fixed Glazing	50%	36
Operable Glazing	50%	36

*Brick veneer or masonry equivalent is expected to provide an STC rating of ~54.

Note that these building components are required only for exterior walls of sensitive spaces, such as bedrooms and living rooms. The remaining façades of the Project must meet minimum OBC requirements for the glazing and exterior wall constructions.

5.5.4 Example Constructions

Unless otherwise specified, all building components must meet the minimum STC requirements set out in OBC. Examples of building components that are expected to meet the identified STC requirements above are as follows. Example constructions described in *Building Research Note No. 148* (BRN-148) published by the National Research Council of Canada in 1980 are provided for reference only, and installed performance should be confirmed with material suppliers and/or as part of an architectural acoustics report.

Exterior wall

For exterior walls, the following construction(s) are recommended in order to meet the identified STC requirements:

- Northernmost Block, North façade, brick veneer or masonry equivalent (BRN-148: EW5 – STC 54):
  - 12.7mm gypsum board
  - vapour barrier
  - 38 x 89 mm studs
  - 50 mm (or thicker) mineral wool or glass fibre batts
  - Sheathing
  - 25 mm air space
  - 100 mm brick veneer
- Northernmost Block, East & West façades, solid exterior (BRN-148: EW1 – STC 38):
  - 12.7mm gypsum board
  - vapour barrier

- 38 x 89 mm studs
- 50 mm (or thicker) mineral wool or glass fibre batts
- Sheathing
- wood siding or metal siding and fibre backer board

Glazing

For operable windows, the following glazing constructions are recommended in order to meet the identified STC requirements:

- Northernmost Block, North, East, and West façades, operable window (STC 36): double glazed, laminated glass

For fixed windows, the following glazing constructions are recommended in order to meet the identified STC requirements:

- Northernmost Block, North, East, and West façades, inoperable window (STC 36): 3mm glass, 25mm airspace, 3mm glass

These provided glazing constructions are noted for reference only – STC of installed components should be verified with the window manufacturer. Window frames may create flanking paths for noise and could reduce the STC rating of windows compared to the rating of glazing alone; manufacturer specifications for window performance should be based on testing of window constructions that are similar or equivalent to the planned installation. Any window constructions with equivalent or greater STC values to the glazing recommendations above will be acceptable.

5.5.5 Warning Clauses

The **Type C** warning clause is required to be included in the development agreements for specific dwelling units if one or more representative POW receptors is predicted to be exposed to transportation sound pressure levels greater than 55 dBA and less than or equal to 65 dBA during the 16-hour day (07:00 – 23:00) or greater than 50 dBA and less than or equal to 60 dBA during the 8-hour night (23:00 – 07:00) (excluding train whistle noise), and the Project includes forced air heating with the provision for installation of central air conditioning in the future. The Type C warning clause is as follows:

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

The **Type D** warning clause is required to be included in the development agreements for specific dwelling units if one or more representative POW receptors is predicted to be exposed to transportation sound pressure levels greater than 65 dBA during the 16-hour day (07:00 – 23:00) or 60 dBA during the 8-hour night (23:00 – 07:00), and the Project includes central air conditioning. The Type D warning clause is as follows:

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

The **Type E** warning clause may be included in the development agreements for the Project if one or more unusual noise sources may have impacts on the Project, for informational purposes only. The Type E warning clause in no way reduces the obligation for a stationary noise source and/or Project to meet the sound level limits applicable to stationary noise sources impacting sensitive land uses. The Type E warning clause is as follows:

"Purchasers/tenants are advised that due to the proximity of the adjacent rail yard and tracks, noise from the rail yard and tracks may at times be audible."

6.0 Stationary Noise Assessment

6.1 Critical Stationary Noise Receptors

NPC-300 defines a point of reception for the assessment of stationary noise sources as any location on a noise sensitive land use where noise from a stationary source is received. This typically includes both points of reception on building façades, representing the plane-of-window of noise sensitive spaces (POR) and outdoor points of reception representing areas such as balconies, gardens, patios, and terraces (OPOR). These locations may be the same or different from the POW and OLA receptors identified as part of a transportation noise assessment.

6.1.1 Project Receptors

The project point of reception (PPOR) receptor(s) on the Project most likely to be affected by stationary noise sources are those representing the residential units that have maximum exposure to stationary noise sources associated with the surrounding properties in each direction.

TT understands that no outdoor amenity areas are planned, therefore no project outdoor points of reception (POPORs) will be present.

The locations of the critical receptors on the Project for stationary noise are summarized in Table 8 and shown in Figure 5. PPORs were assessed using representative receptors located at the most impacted points on the project façades.

Table 8: Project Points of Reception – Stationary Noise

Receptor ID	Receptor Description	Receptor Location
PPOR1	Block 1, north façade	East side, 7.5m above ground
PPOR2	Block 1, north façade	West side, 7.5m above ground
PPOR3	Block 2, north façade	7.5m above ground
PPOR4	Block 3, north façade	7.5m above ground

6.2 Stationary Noise Sources

NPC-300 defines a stationary source of noise as one or more sources of sound that are normally operated within a given property. Stationary sources typically include mechanical equipment such as Heating, Ventilation and Air Conditioning (HVAC) equipment, standby power generators with routine testing, and heavy vehicle traffic (truck idling, driving, and loading).

Certain sources of noise, such as residential air conditioners, passenger automobile traffic in parking lots, or temporary noise such as that related to construction are not considered to be stationary sources in NPC-300 and are not assessed in this report. These sources are typically handled in a more qualitative fashion by applicable noise by-laws.

6.2.1 Project Sources

Due to the nature of the project (residential townhomes), no significant stationary noise sources are anticipated to be present.

6.2.2 Surrounding Sources

The area adjacent to the north of the Project Site includes a CN Rail yard serving the CN Metals Distribution Centre located at 419 Parkdale Avenue North, as well as the nearby industrial facilities. North of the rail yard is a large industrial facility operated by ArcelorMittal Dofasco Inc. located at 480 Kenilworth Avenue.

Based on publicly available information from the MECP's website Access Environment, the ArcelorMittal Dofasco Inc. facility is understood to have operated under a series of Certificates of Approval, the most recent of which is Number 5824-7U6RUX, dated July 26, 2009. As a condition of these certificates, the facility was required in meet applicable noise regulations at surrounding receptors, which would have included the residential properties adjacent to the east and west of the Project Site. TT has not reviewed the acoustical reports prepared in support of the industrial facility's approvals, however due to the proximity of existing sensitive receptors, it is assumed that the noise impacts from the industrial facility will also be compliant on the Project Site.

Based on observations made at the Project Site, TT has identified the following significant noise sources impacting the Project Site.

- Consistent steady noise was observed to be present throughout the duration of TT's field inspection;
- Shunting activities in the rail yard resulted in coupling related impulse noises; and,
- A train departing the rail yard resulted in a short duration noise as the slack was taken out of the train cars.

Although TT was unable to identify the source of the observed steady noise, it is assumed to be related to operations of the rail yard, due to the above noted compliance activities of the industrial facility.

Table 9 and Figure 5 provide a summary of the estimated surrounding stationary source data and assumed locations used for modelling.

Table 9: Surrounding Stationary Nose Sources

Source ID	Source Description	Source Sound Pressure		Source Sound Power	Source Type	Notes & Assumptions
		dBA/ dBAI	@ m*	dBA/ dBAI		
SNS-01	Measured Steady Noise	56	117	106	Steady	Measured @ N-01
INS-01	Measured Coupling Noise	72	65	116	Impulse	Measured @ N-01
INS-02	Measured Slack Taking Noise	86	53	128	Impulse	Measured @ N-01

*Distance to sources estimated based on field observations.

6.3 Project Area Classification

NPC-300 defines the applicable sound pressure level limit at a given receptor as the higher of a set exclusionary sound level limit based on the area classification of that receptor, or the actual background sound level at the location of the receptor, whichever is higher. In this report, the defined exclusionary limits were used for the purposes of assessing compliance.

The Project is currently located in a Class 1 area as defined in NPC-300, based on the surrounding area features and its distance from major roads. The Project site could potentially also meet the conditions to be considered a Class 4 area as defined in NPC-300.

6.3.1 Class 1 Area Exclusionary Sound Level Limits

NPC-300 defines a Class 1 area as having an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum" during both day and night.

Table 10 provides a summary of the applicable exclusionary sound level limits for steady noise sources impacting receptors in a Class 1 area. Steady stationary noise sources are assessed against a 1 hour equivalent sound pressure level (L_{eq}) expressed in A-weighted decibels (dBA). Routine testing of emergency equipment, if applicable, is assessed separately from other stationary noise sources, and is compared to sound level limits that are 5 dBA higher than would otherwise apply.

Table 10: Class 1 Exclusionary Sound Level Limits – Steady Noise

Time Period	Normal Operations Steady Noise ($L_{eq,1hr}$, dBA)		Emergency Equipment Testing Steady Noise ($L_{eq,1hr}$, dBA)	
	POR	OPOR	POR	OPOR
Daytime (07:00 – 19:00)	50	50	55	55
Evening (19:00 – 23:00)	50	50	55	55
Nighttime (23:00 – 07:00)	45	-	50	-

Table 11 provides a summary of the applicable exclusionary sound level limits for impulse noise sources impacting receptors in a Class 1 area, based on the number of impulses generated by stationary sources in a one-hour period. Impulse noise sources are assessed against a Logarithmic Mean Impulse Sound

Level, (L_{LM}) expressed in A-weighted impulsive decibels, dBAI. Impulse noise sources are assessed separately from steady noise sources.

Table 11: Class 1 Exclusionary Sound Level Limits – Impulsive Noise

Actual Number of Impulses in One Hour	Impulsive Sound Level Limits, Class 1 Area (L_{LM}, dBAI)	
	POR (L_{LM}, dBAI) Daytime (07:00 – 23:00) / Nighttime (23:00 – 07:00)	OPOR (L_{LM}, dBAI) Daytime (07:00 – 23:00) Only
9 or more	50 / 45	50
7 to 8	55 / 50	55
5 to 6	60 / 55	60
4	65 / 60	65
3	70 / 65	70
2	75 / 70	75
1	80 / 75	80

6.3.2 Class 4 Area Exclusionary Sound Level Limits

NPC-300 defines a Class 4 area as having an acoustical environment typical of Class 1 or Class 2, but which has not previously had noise sensitive land use(s), is intended for development with new noise sensitive land use(s) that are not yet built, is in proximity to existing, lawfully established stationary noise source(s), and has formal confirmation from the LUPA that a Class 4 designation is appropriate.

Table 12 provides a summary of the applicable exclusionary sound level limits for steady noise sources impacting receptors in a Class 4 area.

Table 12: Class 4 Exclusionary Sound Level Limits – Steady Noise

Time Period	Normal Operations Steady Noise ($L_{eq,1hr}$, dBA)		Emergency Equipment Testing Steady Noise ($L_{eq,1hr}$, dBA)	
	POR	OPOR	POR	OPOR
Daytime (07:00 – 19:00)	60	55	65	60
Evening (19:00 – 23:00)	60	55	65	60
Nighttime (23:00 – 07:00)	55	-	60	-

Table 13 provides a summary of the applicable exclusionary sound level limits for impulse noise sources impacting receptors in a Class 4 area, based on the number of impulses generated by stationary sources in a one-hour period.

Table 13: Class 4 Exclusionary Sound Level Limits – Impulsive Noise

Actual Number of Impulses in One Hour	Impulsive Sound Level Limits, Class 1 Area (L_{LM}, dBAI)	
	POR (L_{LM}, dBAI) Daytime (07:00 – 23:00) / Nighttime (23:00 – 07:00)	OPOR (L_{LM}, dBAI) Daytime (07:00 – 23:00) Only
9 or more	60 / 55	55
7 to 8	65 / 60	60
5 to 6	70 / 65	65
4	75 / 70	70
3	80 / 75	75
2	85 / 80	80
1	90 / 85	85

In addition to permitting higher plane-of-window sound levels, NPC-300 allows developments in Class 4 areas to benefit from certain receptor-based noise control measures which are not normally considered in Class 1, 2, or 3 areas. Examples of receptor-based noise control measures which are typically only considered in Class 4 areas include inoperable windows, enclosed noise buffers, and architectural noise control measures (enhanced windows, walls, roofs, etc.).

The **Type F** warning clause may be included in the development agreements for the Project if the Project is designated as a Class 4 area. The Type F warning clause is as follows:

"Purchasers/tenants are advised that sound levels due to the adjacent industry are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."

6.4 Stationary Sound Level Predictions

Sound levels at the PORs due to the nearby stationary sources were calculated using the software CadnaA in accordance with the methods described in ISO 9613-2. The CadnaA calculation outputs are presented in Appendix E.

Impulsive noises have a duration of less than one second, and are therefore unlikely to overlap. As such NPC-300 requires that these sources be assessed in isolation, rather than cumulatively with each other, or with other stationary noise sources. In the modelling conducted for this project, impacts from each individual impulsive noise source have been reported separately.

6.4.1 Stationary Noise Impacts on the Project

In modelling the impact of stationary noise sources to receptors located on the Project, TT has considered only the identified stationary sources associated with the surrounding area. The impact of stationary noise sources located on the project itself was not considered, as NPC-300 does not consider properties to be sensitive to their own noise sources: *"A land use that would normally be considered*

noise sensitive, such as a dwelling, but is located within the property boundaries of the stationary source is not considered a noise sensitive land use."

TT has evaluated the possible impact of every applicable impulsive noise source to receptors at the Project, of which the maximum possible impact is the relevant value for comparison to the applicable sound level limits. Table 14 provides a summary of the predicted impulse noise levels from each individual impulse source.

Table 14: Individual Impulse Noise Source Impacts to the Project

Source ID	PPOR1	PPOR2	PPOR3
	L_{LM}	L_{LM}	L_{LM}
INS-01	68.5	68.7	50.6
INS-02	78.7	79.6	61.2
Maximum	**79**	**80**	**61**

Table 15 provides a summary of the modelling results for stationary noise impacts to the Project, and Appendix E contains the full modelling output and illustrations.

Table 15: Predicted Stationary Noise Source Impacts to the Project

POR ID	Time Period	Steady Sound Level $L_{eq,1hr}$ (dBA)	Steady Sound Level Limit $L_{eq,1hr}$ (dBA) Class 1 / Class 4	Maximum Impulse Sound Level L_{LM} (dBAI)	Impulse Sound Level Limit* L_{LM} (dBAI) Class 1 / Class 4	Compliance
PPOR1	Daytime	53	50 / 60	79	50 / 60* 75 / 85**	Class 4**
	Evening	53	50 / 60	79	50 / 60* 75 / 85**	Class 4**
	Nighttime	53	45 / 55	79	45 / 55* 70 / 80**	Class 4**
PPOR2	Daytime	54	50 / 60	80	50 / 60* 75 / 85**	Class 4**
	Evening	54	50 / 60	80	50 / 60* 75 / 85**	Class 4**
	Nighttime	54	45 / 55	80	45 / 55* 70 / 80**	Class 4**
PPOR3	Daytime	36	50 / 60	71	50 / 60* 75 / 85**	Class 4**
	Evening	36	50 / 60	71	50 / 60* 75 / 85**	Class 4**
	Nighttime	36	45 / 55	71	45 / 55* 70 / 80**	Class 4**
PPOR4	Daytime	32	50 / 60	56	50 / 60* 75 / 85**	Class 4**
	Evening	32	50 / 60	56	50 / 60* 75 / 85**	Class 4**
	Nighttime	32	45 / 55	56	45 / 55* 70 / 80**	Class 4**

*Impulse Sound Level Limit for >9 Impulses / hour
**Impulse Sound Level Limit for 2 impulses / hour

Noise due to stationary noise sources is predicted to exceed an applicable Class 1 sound level limit at the north façade of the proposed townhouse Block 1 due to steady noise, and at all façades due to impulse noise if it is assumed that 9 or more impulses will occur per hour.

Noise due to stationary noise sources is predicted to meet the applicable Class 4 sound level limits at all façades, if it assumed that at most 2 of the loudest impulses (train slack taking during departure) will occur per hour.

6.5 Stationary Noise Mitigation Recommendations

Where possible, source mitigation and/or noise barriers are generally the preferred method for addressing stationary noise exceedances. In the case of this proposed development, the nature of the significant stationary noise sources (rail yard) makes source mitigation infeasible. The height of the proposed development (3 stories), combined with the magnitude of the potential noise exceedances, (particularly for impulse noises) makes the use of barriers alone infeasible.

NPC-300 does not generally accept receptor based on-building noise control measures in the context of noise source approvals under Part B of NPC-300 except in the case of receivers in Class 4 areas.

The rail yard is federally regulated, and not subject to Part B of NPC-300, and does not need to demonstrate compliance with applicable noise limits at neighboring properties. Despite the rail yard being federally regulated, NPC-300 still requires that it be assessed as a noise source in the context of development approvals for nearby properties, therefore a Class 4 designation for the project site is still recommended in order to most clearly comply with the recommendations of NPC-300.

Based on the characteristics of the proposed development (new sensitive receptors on a previously non-sensitive land use, located in proximity to existing legally established noise sources), a Class 4 designation would be appropriate for the project, conditional on approval by the LUPA.

6.5.1 Mitigation for Project Receptors

Once the project site has been designated a Class 4 area, NPC-300 will permit the benefits of receptor based on-building noise control measures to be accounted for in the assessment of stationary noise impacts.

Possible noise control measures for stationary noise at this project include:

- **Receptor Based Site Construction and Architectural Noise Control Measures**, such as implementation of central air conditioning in combination with acoustically enhanced windows and wall construction. This will allow windows to be installed as inoperable, and/or for operable windows to be kept closed by occupants. Windows should be selected to provide enhanced acoustical performance to meet recommended indoor sound level limits.

- **Receptor Based "On-Building" Noise Control Measures**, such as implementation of enclosed noise buffers. An enclosed noise buffer consists of an enclosed area outside the exterior façade of the proposed building, such as an enclosed balcony. The enclosed area needs to be fully sealed with a combination of parapet(s) and window(s), and to be of sufficient dimensions to shield exterior windows on sensitive façades.

Table C-9 of NPC-300 provides supplementary indoor noise limits for rail related noise, and identifies that indoor sound levels due to rail noise should be 40 dBA $L_{eq, 8hr}$. An indoor sound level of 40 dBA $L_{eq, 1hr}$ is targeted for steady stationary noise sources associated with the rail yard, and 40 dBAI for impulsive noise sources associated with the rail yard.

Note that the following comments regarding potential exterior façade construction are provided as examples only, and do not consider the relative size of windows vs. exterior wall areas, or the size of the receiving rooms. The examples provided may be used as a starting point for construction design, but performance and predicted indoor sound levels should be confirmed prior to construction. Acoustical performance of the actual design should be verified by manufacturers, and/or through a detailed review of actual construction plans under separate cover as part of an architectural review report.

Note that manufacturer's specifications for window performance should include the impact (if any) of the framing system, which may perform worse than the glazing itself.

Townhouse Block 1

The recommended brick veneer exterior wall construction (BRN-148: EW5) identified in Section 5.5.3 of this report for the north façade of townhouse Block 1 is expected to provide an OITC rating of approximately 44.

A double-glazed, acoustically insulating window (for example Viracon's assembly: *2-7/8" overall - 1/4" glass, .030" PVB, 1/4" glass, 2" airspace, 3/8" glass* can potentially provide an OITC value in excess of 40.

In order to conservatively mitigate potential stationary noise sources, the above noted constructions are recommended for the north, east, and west façades of townhouse Block 1. The south façade of townhouse Block 1 can be constructed using EW1 which is expected to provide an OITC rating of approximately 29, and OITC 30 windows.

For the north, east and west façades of townhouse Block 1, the limiting exterior noise level would be the impulsive noise at 80 dBAI, and the limiting building construction element would be the window assembly at an assumed OITC rating of approximately 40. As an approximation, the interior noise level can be estimated to be the exterior noise level reduced by the OITC rating of the exterior wall, or 40 dBAI.

A more detailed assessment of the expected performance of the actual façade assembly should be completed prior to construction in order to determine the composite OITC rating of the full assembly, and account for factors such as room size and interior sound absorption.

Townhouse Block 2

The recommended brick veneer exterior wall construction (BRN-148: EW5) identified in Section 5.5.3 of this report for the north façade of townhouse Block 1 is expected to provide an OITC rating of approximately 44.

A double-glazed window (for example Viracon's assembly: *1-1/4" overall - 3/8" glass, 1/2" airspace, 3/8" glass* can potentially provide an OITC value of approximately 32.

In order to conservatively mitigate potential stationary noise sources, the above noted constructions are recommended for the north, east, and west façades of townhouse Block 2. The south façade of townhouse Block 2 can be constructed using EW1 which is expected to provide an OITC rating of approximately 29, and OITC 25 windows.

For the north, east and west façades of townhouse Block 2, the limiting exterior noise level would be the impulsive noise at 71 dBAI, and the limiting building construction element would be the window assembly at an assumed OITC rating of approximately 32. As an approximation, the interior noise level can be estimated to be the exterior noise level reduced by the OITC rating of the exterior wall, or 39 dBAI.

A more detailed assessment of the expected performance of the actual façade assembly should be completed prior to construction in order to determine the composite OITC rating of the full assembly, and account for factors such as room size and interior sound absorption.

Other Townhouse Blocks

A standard exterior wall construction, approximately equivalent to BRN-148: EW1, is expected to provide an OITC rating of approximately 29.

Typical double glazed window assemblies generally provide an OITC rating of at least 25.

For these façades, the limiting exterior noise level would be the impulsive noise at 56 dBAI, and the limiting building construction element would be the window assembly at an assumed OITC rating of approximately 25. As an approximation, the interior noise level can be estimated to be the exterior noise level reduced by the OITC rating of the exterior wall, or <40 dBAI.

A more detailed assessment of the expected performance of the actual façade assembly should be completed prior to construction in order to determine the composite OITC rating of the full assembly, and account for factors such as room size and interior sound absorption.

Enclosed Noise Buffers

Alternatively to the above possible constructions, the use of an enclosed noise buffer providing a composite OITC of approximately 30 would be expected to reduce the maximum predicted impulse noise level at the northern façade of townhouse Block 1 to 50 dBAI, which would comply with the Class 1 exterior sound level limit, and permit the exterior façade to be constructed in accordance with the recommendations for mitigation of transportation noise identified in Section 5.5.3 of this report.

A summary of the recommended noise mitigation measures is illustrated in Figure 7.

7.0 Railway Vibration Assessment

7.1 Vibration Criteria

Currently, there are no guidelines for the impact of railway vibration in the land use approval process in Ontario. However, in May 2013, the Federation of Canadian Municipalities (FCM) and the Railway Association of Canada (RAC) issued "*Guidelines for New Development in Proximity to Railway Operations*" to address developments near railway operations. The FCM/RAC guidelines identify dwellings within 75 meters of railways alignments as susceptible to vibration impact and recommend an overall maximum vibration limit of 0.14 mm/sec root-mean-square (RMS) between 4 and 200 Hz.

The FCM/RAC guidelines further recommend that readings be collected from a minimum of five (5) train pass-by events covering the range of train types using the rail line.

7.2 Vibration Measurement Locations

Vibration measurements were conducted at two locations on the Project site, corresponding to the approximate location of the north façade of the northernmost townhouse block (closest to the railway), as well as the north façade of the next closest townhouse block.

Measurement locations are illustrated in Figure 6.

7.3 Vibration Measurement Equipment

Vibration measurements were conducted using two Brüel & KjærType 3680 Vibration Monitoring Terminals (VMT), using Brüel & Kjær Type 4450 analyzers and Type 8380 tri-axial geophones. The X direction was parallel to the tracks (East-West), the Y direction was perpendicular to the tracks (North-South), and the Z direction was vertical. Table 16 provides a summary of the equipment used.

Table 16: VMT Equipment Summary

Measurement Location ID	Measurement Location Description	Analyzer Model	Analyzer SN	Geophone Model	Geophone SN
V-01	North Façade, Townhouse Block 1 (~35m from Rail ROW)	4450	1000155	8380	182
V-02	North Façade, Townhouse Block 2 (~90m from Rail ROW)	4450	1000245	8380	408

7.4 Vibration Measurement Results

Vibrations from six (6) train pass-by events associated with the adjacent rail tracks and yard were recorded during TT's site inspection on October 27, 2022. The full results are provided in Appendix E and summarized in Table 17 along with field observations.

Table 17: VMT Results Summary

Pass-By Event	Train Operator	Train Type	Loc.	Cars	Direction	Speed	Time	Max RMS Velocity (mm/s)					
								V-01			V-02		
								X	Y	Z	X	Y	Z
PB-01	Amtrak	Passenger	1	5	Eastbound	Low	~09:20	0.02	0.03	0.01	-*	-*	-*
PB-02	CN	Freight	2	~100	Eastbound	Low	~10:10	0.03	0.03	0.02	0.01	0.01	0.01
PB-03	CN	Freight	1	~15	Westbound	Low	~11:07	0.02	0.03	0.01	0.01	0.01	0.00
PB-04	CN	Freight	1	~15	Eastbound	Low	~11:15	0.03	0.04	0.01	0.01	0.01	0.00
PB-05	CN	Freight	1	~20	Westbound	Low	~11:27	0.04	0.03	0.02	0.01	0.01	0.00
PB-06	CN	Freight	1	~10	Eastbound	Low	~11:34	0.03	0.03	0.01	0.01	0.01	0.00
FCM / RAC Guideline Recommended Limit								0.14	0.14	0.14	0.14	0.14	0.14

*Train pass-by occurred while VMT was being deployed.

7.5 Vibration Control Recommendations

Observed peak particle velocity in each axis was observed to be below the recommended limit of 0.14 mm/s during each train pass-by. Based on the results obtained, no specific vibration mitigation measures are expected to be required for the proposed development.

8.0 Concluding Comments

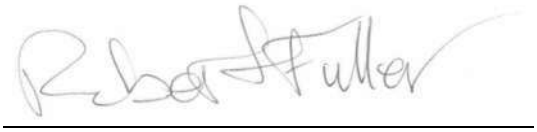
Noise impacts associated with the proposed development at 121 Vansitmart Avenue are expected to be able to meet all applicable MECP requirements with a Class 4 designation and the inclusion of noise control measures and warning clauses as summarized in Figure 7 and presented in Section 5.5 of this report for transportation noise sources and Section 6.5 of this report for stationary noise sources. The proposed development should therefore be approved.

As the design of the redevelopment proceeds, and mechanical equipment is selected, acoustical modelling of the impacts of this equipment should be confirmed in order to evaluate compliance with applicable MECP limits at surrounding sensitive receptors, and confirm that impacts to the Project itself will be acceptable.

Based on measurements conducted by TT, vibration mitigation measures are not expected to be necessary for the development.

Please do not hesitate to contact us if there are any questions.

Yours Truly,
Thornton Tomasetti



Robert Fuller, P.Eng.
Project Engineer

Reviewed by:
Michael Wesolowsky, Ph.D., P.Eng.
Principal

Disclaimer

Achieving the required noise control requirements relies on correct incorporation of noise control recommendations into Architectural and Mechanical drawings and specifications, as well as correct installation during construction. On Request, TT will conduct drawing reviews and onsite reviews of noise control measures and provide observations as appropriate; however, notwithstanding the foregoing, it is expressly understood and agreed that TT shall not have control or charge of, and shall not be responsible for the acts or omissions, including but not limited to means, methods, techniques, sequences and procedures, of the Design Professionals and/or Contractors performing design and/or construction on the Project. Accordingly, TT shall not be held responsible for the failure of any party to properly incorporate the noise control measures stated in this report.

Appendix A: Figures

Google Maps 121 Vansitmart Ave

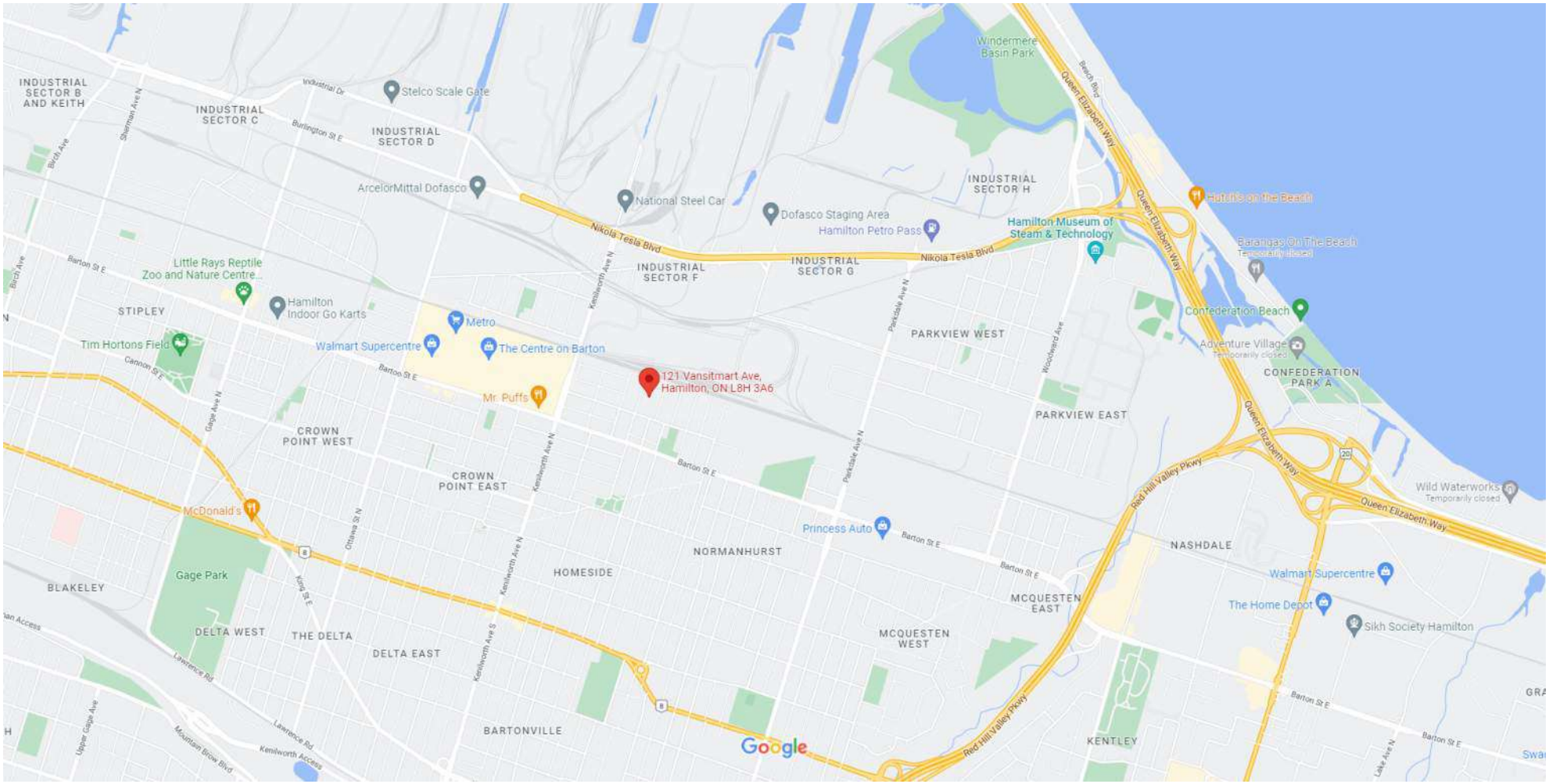
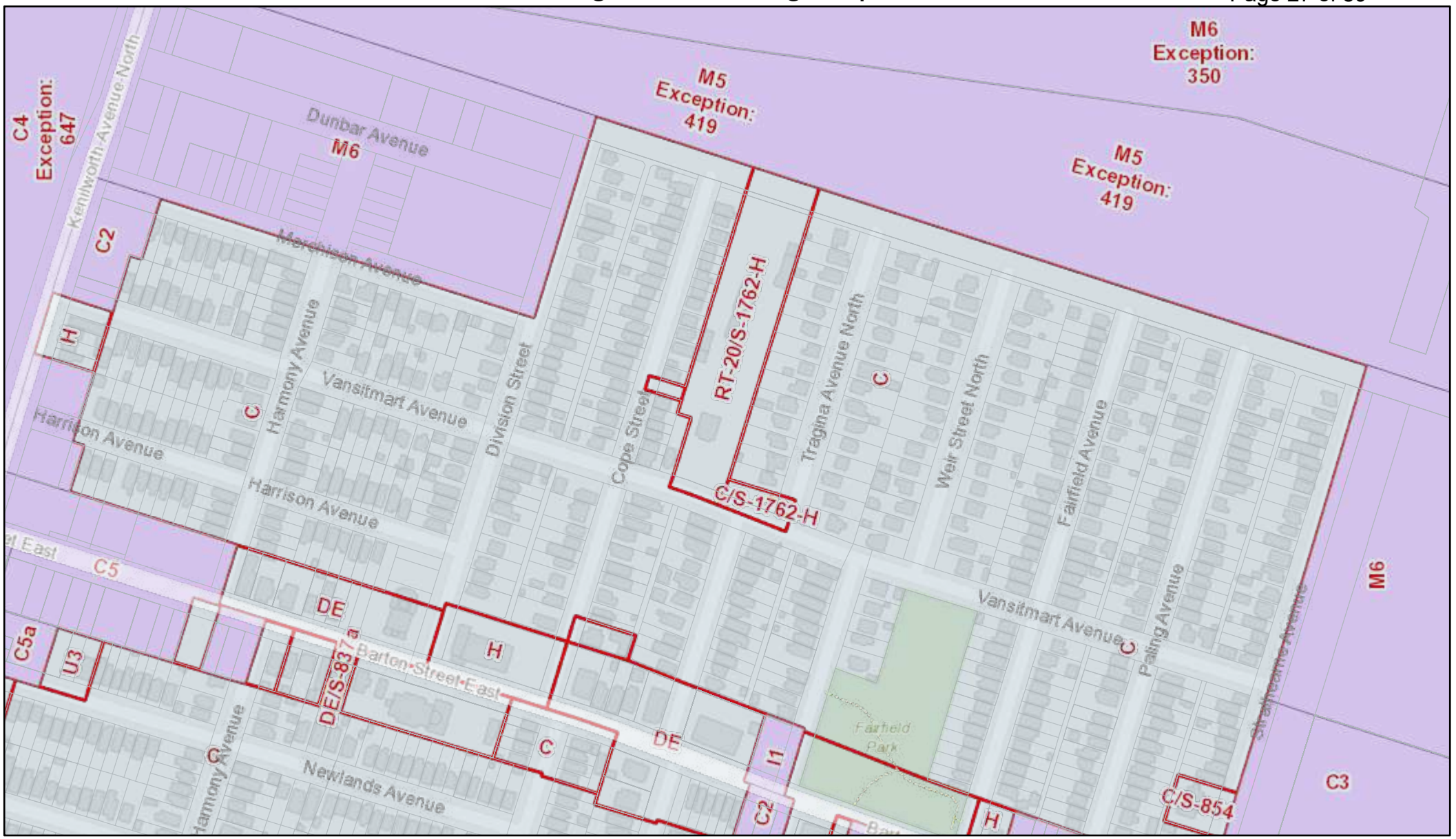


Figure 2: Zoning Map



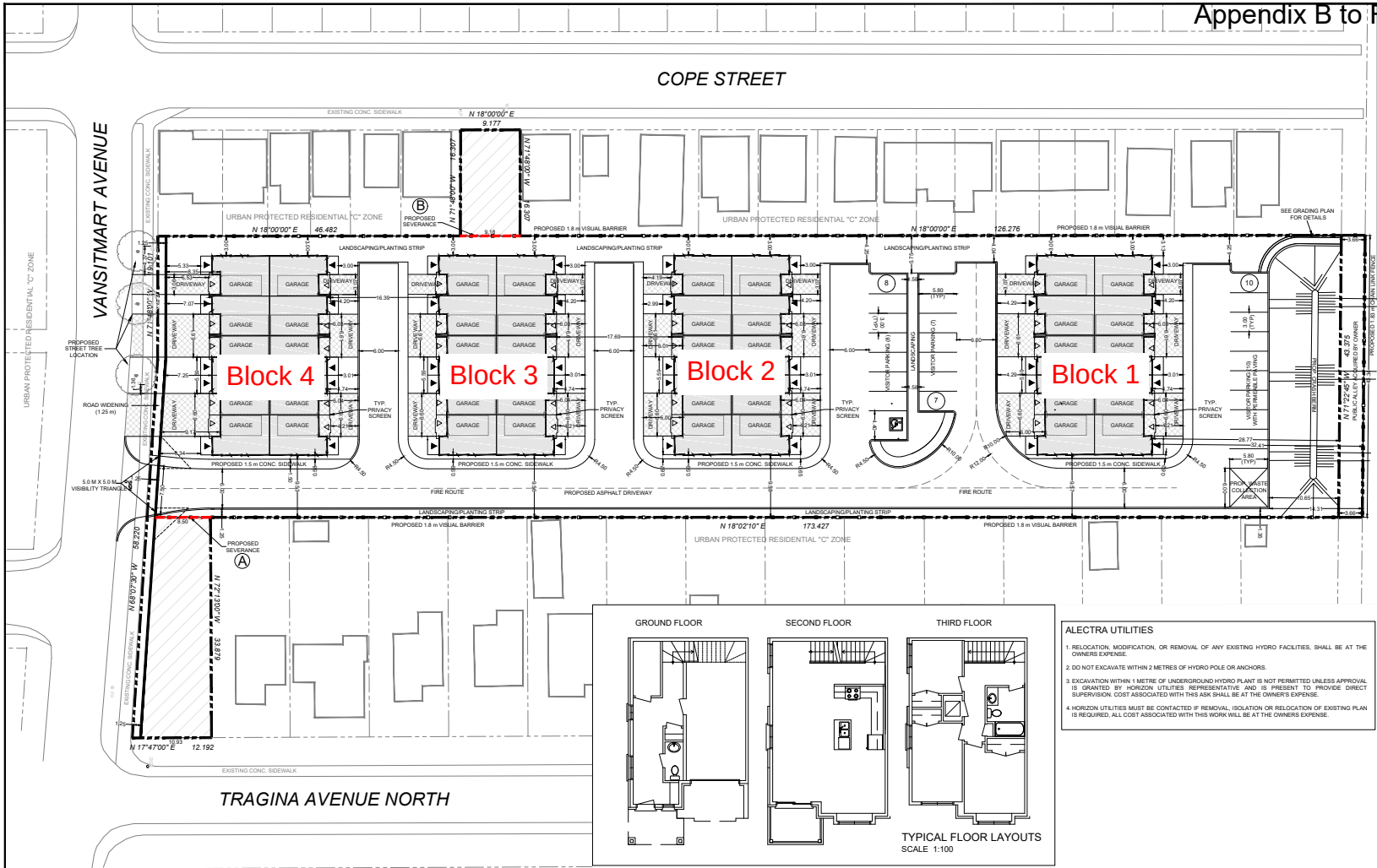
10/11/2022, 9:21:19 AM

Ward Boundary
Community Boundary
City Boundary
Urban Boundary
Property Parcels
Zoning Boundaries
Temporary Use Zone
Interim Control Bylaw Zone

1:4,514

0 0.03 0.06 0.11 mi
0 0.04 0.09 0.17 km

City of Hamilton, City of Hamilton - Web GIS Framework



DEVELOPMENT STATISTICS

Proposed Back to Back Townhouse Block

Item	Required	Proposed
Lot Area	N/A	8,051.46 m²
Min.. Front Yard	5.5 m (1st storey) 4.3 m (2nd & 3rd storey) 6.0 m (garage)	7.07 m (1st storey) 6.53 m (2nd & 3rd storey) 8.35 m (garage)
Min. Side Yard (West)	3.0 m	3.00 m
Min. Side Yard (East)	3.0 m	9.53 m
Min. Rear Yard	3.0 m	32.41 m
Max. Building Height	12.6 m	12.50 m
No. of Units	N/A	40 units
Density	N/A	50 UPH
Min. Building Separation	15.0 m	16.39 m
Min. Landscaped Area	23%	1,989.22 m² (25%)
Parking		
No. of Spaces per Unit	1.0 per unit =40 spaces	1.0 per unit = 40 spaces
No. of Visitor Spaces	0.3 per unit =12 spaces	26 spaces
Parking Stall Size	5.8 m X 3.0 m	5.8 m x 3.0 m
No. of Barrier Free Spaces	N/A	1 space

UNDERTAKING

RE: DA-19-015

I, (WE) _____, THE OWNER(S) OF THE LAND, HEREBY UNDERTAKE AND AGREE WITHOUT RESERVATION:

(a) TO COMPLY WITH ALL THE CONTENT OF THIS PLAN AND DRAWING AND NOT TO VARY THEREFROM;

(b) TO PERFORM THE FACILITIES, WORKS OR MATTERS MENTIONED IN SECTION 41(7)(A) OF THE PLANNING ACT SHOWN ON THIS PLAN AND DRAWING(S) IN ACCORDANCE WITH THE CONDITIONS OF APPROVAL AS SET OUT IN THE LETTER OF APPROVAL DATED _____;

(c) TO MAINTAIN TO THE SATISFACTION OF THE CITY AND AT MY (OUR) SOLE RISK AND EXPENSE, ALL OF THE FACILITIES, WORKS OR MATTERS MENTIONED IN SECTION 41(7)(B) OF THE SAID ACT, SHOWN IN THIS PLAN AND DRAWING, INCLUDING REMOVAL OF SNOW FROM ACCESS RAMPS AND DRIVEWAYS, PARKING AND LOADING AREAS AND WALKWAYS; AND,

(d) IN THE EVENT THAT THE OWNER DOES NOT COMPLY WITH THE PLAN DATED _____, THE OWNER AGREES THAT THE CITY MAY ENTER THE LAND AND DO THE REQUIRED WORKS, AND FURTHER THE OWNER AUTHORIZES THE CITY TO USE THE SECURITY FILED AS TO OBTAIN COMPLIANCE WITH THIS PLAN.

(e) CAUTION: NOTWITHSTANDING CURRENT SURFACE CONDITIONS, THE PROPERTY HAS BEEN DETERMINED TO BE OF AN AREA OF ARCHAEOLOGICAL POTENTIAL. ALTHOUGH AN ARCHAEOLOGICAL ASSESSMENT IS NOT REQUIRED BY THE CITY OF HAMILTON, THE PROPONENT IS CAUTIONED THAT DURING DEVELOPMENT ACTIVITIES, SHOULD DEEPLY BURIED ARCHAEOLOGICAL MATERIALS BE FOUND ON THE PROPERTY THE ONTARIO MINISTRY OF TOURISM, CULTURE AND SPORT (MTCS) SHOULD BE NOTIFIED IMMEDIATELY (416-314-7143). IN THE EVENT THAT HUMAN REMAINS ARE ENCOUNTERED DURING CONSTRUCTION, THE PROPONENT SHOULD IMMEDIATELY CONTACT BOTH MTCS AND THE REGISTRAR OR DEPUTY REGISTRAR OF THE CEMETERIES REGULATION UNIT OF THE MINISTRY OF SMALL BUSINESS AND CONSUMER SERVICES (416-326-8392).

(f) THAT THE OWNER HALL INCLUDE THE FOLLOWING WARNING CLAUSE IN ALL OFFERS OF PURCHASE AND SALE:
(i) THAT THE HOME/ BUSINESS MAIL DELIVERY WILL BE FROM A DESIGNATED CENTRALIZED MAIL BOX.
(ii) THAT THE DEVELOPER/OWNER BE RESPONSIBLE FOR OFFICIALLY NOTIFYING THE PURCHASERS OF THE EXACT CENTRALIZED MAIL BOX LOCATIONS PRIOR TO THE CLOSING OF AN HOME SALES.
(iii) PURCHASERS/TENANTS ARE ADVISED THAT DESPITE THE INCLUSION OF NOISE CONTROL FEATURES IN THE DEVELOPMENT AND WITHIN THE BUILDINGS UNITS, SOUND LEVELS DUE TO INCREASING RAIL TRAFFIC BE ON OCCASION INTERFERE WITH SOME ACTIVITIES OF THE DWELLING OCCUPANTS AS THE SOUND LEVELS EXCEED THE MUNICIPALITY'S AND THE MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARK'S NOISE CRITERIA.
(iv) THIS DWELLING UNIT HAS BEEN SUPPLIED WITH CENTRAL AIR CONDITIONING SYSTEM WHICH WILL ALLOW WINDOWS AND EXTERIOR DOORS TO REMAIN CLOSED, THEREBY ENSURING THAT INDOOR SOUND LEVELS ARE WITHIN THE MUNICIPALITY'S AND THE MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS NOISE CRITERIA.
(v) "WARNING: THE CANADIAN NATIONAL RAILWAY COMPANY OR ITS ASSIGNS OR SUCCESSORS IN INTEREST HAVE A RIGHTS-OF-WAY WITHIN 300 METRES FROM THE LAND THE SUBJECT HEREOF. THERE MAY BE ALTERATIONS TO, OR EXPANSIONS OF, HE 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 EXPANSIONS MAY AFFECT THE LIVING ENVIRONMENT OF PRESIDENTS IN THE VICINITY, NOTWITHSTANDING THE INCLUSION OF ANY NOISE AND VIBRATION ATTENUATING MEASURES IT IS 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 RIGHT OF WAY."

(g) THAT THE OWNER AGREE TO INCLUDE THE FOLLOWING NOISE MITIGATION MEASURES FOR THE PROPOSED DEVELOPMENT:
(i) THAT THE NORTHERLY MOST BUILDING UTILIZE BRICK VENEER OR ACOUSTICALLY TESTED MASONRY EQUIVALENT WILL BE IMPLEMENTED;
(ii) THAT THE REQUIRED STC RATING FOR DOORS AND WINDOWS IDENTIFIED ON TABLE 7 OF THE ENVIRONMENTAL NOISE AND VIBRATION IMPACT STUDY PREPARED BY DBA ACOUSTICAL CONSULTANTS INC. DATED JUNE 2017 WILL BE IMPLEMENTED.
(iii) TO ESTABLISH A SAFETY BERM AND ACOUSTICAL FENCE.
(iv) ESTABLISH ISOLATION PADS, VIBRATION ABSORPTIVE MATERIAL, OR VIBRATION DAMPENING MATERIAL TO BE APPLIED TO THE NORTH, EAST AND WEST SIDE OF THE NORTHERLY MOST BUILDING.
(v) ANY AND ALL MITIGATION MEASURES AND OTHER REQUIREMENTS AS STIPULATED BY CN RAIL.

(h) THAT THE OWNER AGREES TO DISPLAY THE MUNICIPAL NUMBER (121) OR FULL ADDRESS (121 VANSITMART AVENUE) NEAR THE ENTRANCEWAY IN A MANNER THAT IS VISIBLE FROM THE STREET.
(i) THE OWNER SHALL THROUGH RESTRICTIVE COVENANT 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.

DATED THIS _____ DAY OF _____, 20____

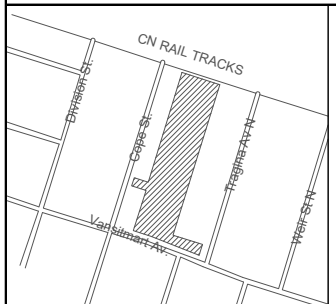
_____ (SEAL)
WITNESS (SIGNATURE) OWNER(S) (SIGNATURE)

_____
WITNESS (PRINT) OWNER (PRINT)

_____
ADDRESS OF WITNESS

ALECTRA UTILITIES

1. RELOCATION, MODIFICATION, OR REMOVAL OF ANY EXISTING HYDRO FACILITIES, SHALL BE AT THE OWNERS EXPENSE.
2. DO NOT EXCAVATE WITHIN 2 METRES OF HYDRO POLE OR ANCHORS.
3. EXCAVATION WITHIN 1 METRE OF UNDERGROUND HYDRO PLANT IS NOT PERMITTED UNLESS APPROVAL IS GRANTED BY HORIZON UTILITIES REPRESENTATIVE AND IS PRESENT TO PROVIDE DIRECT SUPERVISION. COST ASSOCIATED WITH THIS ASK SHALL BE AT THE OWNER'S EXPENSE.
4. HORIZON UTILITIES MUST BE CONTACTED IF REMOVAL, ISOLATION OR RELOCATION OF EXISTING PLAN IS REQUIRED, ALL COST ASSOCIATED WITH THIS WORK WILL BE AT THE OWNERS EXPENSE.



KEYMAP - N.T.S.

GENERAL NOTES

1. ALL WORK INVOLVED IN THE CONSTRUCTION, RELOCATION, REPAIR OF MUNICIPAL SERVICES FOR THE PROJECT SHALL BE TO THE SATISFACTION OF THE DIRECTOR AND CHIEF PLANNER OF THE PLANNING DIVISION, PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT;
2. FIRE ROUTE SIGNS AND 3-WAY FIRE HYDRANTS SHALL BE ESTABLISHED TO THE SATISFACTION OF THE CITY FIRE DEPARTMENT AND AT THE EXPENSE OF THE OWNER.
3. MAIN DRIVEWAY DIMENSIONS AT THE PROPERTY LINE BOUNDARIES ARE 7.5 M UNLESS OTHERWISE STATED.
4. ALL DRIVEWAYS FROM PROPERTY LINES FOR THE FIRST 7.5 M SHALL BE WITHIN 5% MAXIMUM GRADE, THEREAFTER, ALL DRIVEWAYS SHALL BE WITHIN 10% MAXIMUM GRADES.
5. THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE OWNER'S BONDED CONTRACTOR FROM THE REQUIREMENTS TO OBTAIN THE VARIOUS PERMITS/APPROVALS NORMALLY REQUIRED TO COMPLETE A CONSTRUCTION PROJECT, SUCH AS, BUT NOT LIMITED TO THE FOLLOWING:
   - BUILDING PERMIT
   - ROAD CUT PERMITS
   - APPROACH APPROVAL PERMITS
   - ENCROACHMENT AGREEMENTS (IF REQUIRED)
   - SEWER AND WATER PERMITS
   - RELOCATION OF SERVICES
   - COMMITTEE OF ADJUSTMENT
6. ABANDONED ACCESSES MUST BE REMOVED AND THE CURB AND BOULEVARD RESTORED WITH SOD AT THE OWNER'S EXPENSE TO THE SATISFACTION OF THE TRAFFIC ENGINEERING SECTION, PUBLIC WORKS DEPARTMENT.
7. FOR VISIBILITY TRIANGLES AT THE VEHICULAR ACCESS POINTS, THE FOLLOWING NOTE TO BE PROVIDED:
   "_ METRE BY _ METRE VISIBILITY TRIANGLES IN WHICH THE MAXIMUM HEIGHT OF ANY OBJECTS OR MATURE VEGETATION IS NOT TO EXCEED A HEIGHT OF 0.70 METRES ABOVE THE CORRESPONDING PERPENDICULAR CENTRELINE ELEVATION OF THE ADJACENT STREET."
8. ALL SIGNS MUST COMPLY WITH HAMILTON SIGN BY-LAW NO. 10-197.
9. ALL FENCES MUST COMPLY WITH HAMILTON FENCE BY-LAW NO. 10-142.
10. THIS PROPERTY IS ELIGIBLE FOR WEEKLY COLLECTION OF GARBAGE, RECYCLING, ORGANICS, AND LEAF AND YARD WASTE THROUGH THE CITY OF HAMILTON SUBJECT TO COMPLIANCE WITH SPECIFICATIONS INDICATED BY THE PUBLIC WORKS DEPARTMENT AND SUBJECT TO COMPLIANCE WITH THE CITY'S SOLID WASTE MANAGEMENT BY-LAW 09-067, AS AMENDED
11. LIGHTING MUST BE DIRECTED ON-SITE AND MUST NOT SPILL OVER TO ADJACENT PROPERTIES OR STREETS. MUST PROVIDED HOUSE SHIELDS WHERE NEEDED, TO COMPLETELY ELIMINATE GLARE TO ADJACENT PROPERTIES.
12. UNION GAS HAS SERVICE LINES RUNNING WITHIN THE AREA WHICH MAY OR MAY NOT BE AFFECTED BY THE DEVELOPMENT. SHOULD THE SITE PLAN IMPACT THE SERVICES IT MAY BE NECESSARY TO RELOCATE THE LINES, ANY SERVICE RELOCATION WOULD BE AT THE COST OF THE PROPERTY OWNER.

LEGEND:

- SUBJECT LANDS
- SURROUNDING PROPERTY LINE
- PROPOSED BUILDING
- EXISTING BUILDING
- PROPOSED ROAD WIDENING
- PROPOSED VISUAL BARRIER
- PROPOSED SEVERANCE
- PROPOSED DRIVEWAY
- (5) PROPOSED NO. OF PARKING SPACES
- PROPOSED GARAGE DOOR
- PROPOSED MAN DOOR

SCALE 1:300

0 5 10 15 25 35 METRES

NOTES:
- ALL DIMENSIONS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

SITE PLAN

LEGAL DESCRIPTION:

PARTS OF LOTS 1 AND 2, CONCESSION 1, GEOGRAPHIC TOWNSHIP OF BARTON, AND ALL OF LOT 15, REGISTERED PLAN 737 AND ALL OF LOT 162, REGISTERED PLAN 500 IN THE CITY OF HAMILTON.

URBAN SOLUTIONS
PLANNING & LAND DEVELOPMENT
3 Studebaker Place Hamilton, ON L8L 0C8
905-546-1087 - UrbanSolutions.info

PROJECT:
THE VANSITMART
115 & 121 VANSITMART AVENUE
DA-19-015
CITY OF HAMILTON

CLIENT:
1349010 ONTARIO INC.

U/S FILE NUMBER:	SHEET NUMBER:
167-16	1

NOT FOR CONSTRUCTION

DESIGN BY: S. McKAY	CHECKED BY: S. MANCHIA
DRAWN BY: M.GOWANS	DATE: MARCH 21, 2019

NO.	DATE	BY	DESCRIPTION
4	01/04/22	S.E	AS PER CITY COMMENTS
3	10/22/21	L.D	AS PER CITY COMMENTS
2	10/19/20	L.D	AS PER REVISED SITE PLAN
1	03/21/19	M.G	AS PER CITY COMMENTS

DRAWING ISSUE RECORD

Thornton Tomasetti
366 Revus Avenue, Unit 23
Mississauga, ON Canada L5G 4S5
Tel: 905.271.7888 Fax: 905.271.1846
www.thorntontomasetti.com

True North

TT PROJECT CODE
SW22183

DRAWN BY: RF

REVIEWED BY:

REVISION

#	DATE	DESCRIPTION
0	2022/11/04	FOR INFORMATION ONLY, NOT FOR CONSTRUCTION
1	202Y/MM/DD	FOR INFORMATION ONLY, NOT FOR CONSTRUCTION

PROJECT NAME
121 VANSITMART AVENUE
HAMILTON

DRAWING NAME
FIGURE 4:
TRANSPORTATION NOISE
PORS & SOURCES

SCALE	DATE
ON DRAWING	2022/11/04
Project SK. No	SHEET 1 OF 1

Thornton Tomasetti
366 Revus Avenue, Unit 23
Mississauga, ON Canada L5G 4S5
Tel: 905.271.7888 Fax: 905.271.1846
www.thorntontomasetti.com

True North

TT PROJECT CODE
SW22183

DRAWN BY: RF

REVIEWED BY:

REVISION

#	DATE	DESCRIPTION
0	2022/11/04	FOR INFORMATION ONLY, NOT FOR CONSTRUCTION
1	202Y/MM/DD	FOR INFORMATION ONLY, NOT FOR CONSTRUCTION

PROJECT NAME
121 VANSITMART AVENUE HAMILTON

DRAWING NAME
FIGURE 5: STATIONARY NOISE PORS & SOURCES

SCALE	DATE
ON DRAWING	2022/11/04
Project SK. No	SHEET 1 OF 1

Thornton Tomasetti
366 Revus Avenue, Unit 23
Mississauga, ON Canada L5G 4S5
Tel: 905.271.7888 Fax: 905.271.1846
www.thorntontomasetti.com

True North

TT PROJECT CODE
SW22183

DRAWN BY: RF

REVIEWED BY:

REVISION

#	DATE	DESCRIPTION
0	2022/11/04	FOR INFORMATION ONLY, NOT FOR CONSTRUCTION
1	202Y/MM/DD	FOR INFORMATION ONLY, NOT FOR CONSTRUCTION

PROJECT NAME
121 VANSITMART AVENUE
HAMILTON

DRAWING NAME
FIGURE 6:
FIELD MEASUREMENT LOCATIONS

SCALE	DATE
ON DRAWING	2022/11/04
Project SK. No	SHEET 1 OF 1

Thornton Tomasetti
366 Revus Avenue, Unit 23
Mississauga, ON Canada L5G 4S5
Tel: 905.271.7888 Fax: 905.271.1846
www.thorntontomasetti.com

True North

TT PROJECT CODE
SW22183

DRAWN BY: RF

REVIEWED BY:

REVISION

#	DATE	DESCRIPTION
0	2022/11/04	FOR INFORMATION ONLY, NOT FOR CONSTRUCTION
1	202Y/MM/DD	FOR INFORMATION ONLY, NOT FOR CONSTRUCTION

PROJECT NAME
121 VANSITMART AVENUE
HAMILTON

DRAWING NAME
FIGURE 7:
RECOMMENDED MITIGATION MEASURES

SCALE ON DRAWING
DATE 2022/11/04
Project SK. No
SHEET 1 OF 1

Appendix B: Traffic Data

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 :*	Thorton Tomasetti 23-366 Revus Avenue, Mississauga, ON L5G 4S5	*Project :*	GRM- 40.49 Kenilworth Avenue N Hamilton ON
Att'n:	Robert Fuller	*Routing:*	RFuller@ThorntonTomasetti.com
From: *Expéditeur :*	Umair Naveed	*Date:*	09/27/2022
Cc:	Adjacent Development CN via e-mail		

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

Re: Train Traffic Data – CN Grimsby Subdivision near Kenilworth Avenue N in Hamilton, 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 permits.gld@cn.ca.

Sincerely,

Umair Naveed

Umair Naveed
Officer Public Works – Eastern Canada
Permits.gld@cn.ca

Date: 2022/09/27 Project Number: GRM –40.49- Kenilworth Avenue N , Hamilton, ON

Dear Robert:

Re: Train Traffic Data – CN Grimsby Subdivision near Kenilworth Avenue N in Hamilton, ON

The following is provided in response to Robert's 2022/06/20 request for information regarding rail traffic in the vicinity of grade separation at Kenilworth Avenue N in Hamilton, ON at approximately Mile 40.49 on CN's Grimsby 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	4	140	30	4
Way Freight	0	25	30	4
Passenger	2	10	30	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	140	30	4
Way Freight	2	25	30	4
Passenger	0	10	30	2

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

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are 3(Three) at-grade crossing in the immediate vicinity of the study area at Mile 39.50 Parkdale Avenue, Mile 41.02 Ottawa Street and Mile 41.54 Gage Avenue. Anti-whistling bylaws are in effect at these crossings. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

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

The double mainline track is considered continuously welded rail throughout the study area. This location is near CN's Hamilton yard. Be advised, that any development within 1000m of a yard should take extra measures to understand and assess noise impacts and the creation of noise due to CN operations within the yard as this is not reflected in the data provided.

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,

Umair Naveed
Officer Public Works – Eastern Canada
Permits.gld@cn.ca

Fuller, Robert

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: Monday, November 28, 2022 10:25 AM
To: Fuller, Robert
Subject: RE: Train Volume Data Request - Kenilworth Avenue North & Vansitmart Avenue

[External Sender]

Good morning,
Further to your request dated November 23, 2022, the subject lands (121 Vansitmart Avenue, Hamilton) are located within 300 metres of the CN Grimsby Subdivision (which carries Lakeshore West GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of diesel trains. The GO rail fleet combination on this Subdivision will consist of up to 2 locomotives and 12 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 93 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive	2 Diesel Locomotives		1 Diesel Locomotive	2 Diesel Locomotives
Day (0700-2300)	81	7	Night (2300-0700)	3	2

The current track design speed near the subject lands is 30 mph (48 km/h).

There are *anti-whistling by-laws* in affect near the subject lands at Wellington St, and Victoria Ave.
Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability and passenger demand.

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

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

Tara Kamal Ahmadi
Junior Analyst
Third Party Projects Review, Capital Projects Group
Metrolinx | 20 Bay Street | Suite 600 | Toronto | Ontario | M5J 2W3

METROLINX

From: Fuller, Robert <RFuller@ThorntonTomasetti.com>
Sent: November 22, 2022 1:56 PM
To: Rail Data Requests <RailDataRequests@metrolinx.com>
Subject: Train Volume Data Request - Kenilworth Avenue North & Vansitmart Avenue

Good afternoon,

I'm writing to request train volume data in relation to a noise study for a proposed residential development in the vicinity of the Lakeshore West GO Train line (121 Vansitmart Avenue, Hamilton, in the vicinity of the intersection of Kenilworth Avenue North & Vansitmart Avenue).

The following train data is requested for the Metrolinx train volumes on this rail line:

Requested Train Data:
· Number of trains per day during daytime (07:00-23:00)
· Number of trains per day during night-time (23:00-07:00)
· Types of trains
· Annual growth rate for train volume
· Number of train cars
· Number of locomotives
· Speed of trains
· Any whistle signals in the area

Please let us know if there is any fee required to obtain the train volume data and the payment method.

Sincerely,

Robert Fuller, P.Eng. | Project Engineer
Thornton Tomasetti | 23-366 Revus Avenue, Mississauga, ON L5G 4S5, Canada
Direct +1.905.629.3583 | **Main** +1.905.271.7888 | **Cell** +1.647.769.7161
RFuller@ThorntonTomasetti.com | www.ThorntonTomasetti.com

Appendix C: Transportation Noise Predictions

STAMSONO 5.0 NORMAL REPORT Date: 28-11-2022 10:41:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: pow1.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/0.0	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	88.0/5.0	48.0	2.0	12.0	Diesel	Yes

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

Train type: No Name	Unadj. Trains	Annual % Increase	Years of Growth
1. CNFreight	4.0/0.0	2.50	12.00
2. CNWFreight	0.0/2.0	2.50	12.00
3. CNPass	2.0/0.0	2.50	12.00

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

Angle1 Angle2	: -90.00 deg	-24.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 50.00 / 50.00	m
Receiver height	: 7.50 / 7.50	m
Topography	: 2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	: -90.00 deg	Angle2 : -24.00 deg
Barrier height	: 5.00	m
Barrier receiver distance	: 20.00 / 20.00	m
Source elevation	: 0.00	m
Receiver elevation	: 0.00	m
Barrier elevation	: 0.00	m
Reference angle	: 0.00	

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/5.4	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	21.0/3.0	105.0	2.0	12.0	Diesel	Yes

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

Train type: No	Name	Unadj. Trains	Annual % Increase	Years of Growth
1.	CNFreight	4.0/4.0	2.50	12.00
2.	CNWFreight	0.0/2.0	2.50	12.00
3.	CNPass	2.0/0.0	2.50	12.00

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

Angle1 Angle2	-24.00 deg	8.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	50.00 / 50.00	m
Receiver height	7.50 / 7.50	m
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Rail data, segment # 3: Berm (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/0.0	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	21.0/3.0	105.0	2.0	12.0	Diesel	Yes

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

Train type: No	Name	Unadj. Trains	Annual % Increase	Years of Growth
1.	CNFreight	4.0/0.0	2.50	12.00
2.	CNWFreight	0.0/2.0	2.50	12.00
3.	CNPass	2.0/0.0	2.50	12.00

Data for Segment # 3: Berm (day/night)

Angle1 Angle2	8.00 deg	53.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	50.00 / 50.00	m
Receiver height	7.50 / 7.50	m
Topography	2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	8.00 deg	Angle2 : 53.00 deg
Barrier height	2.50 m	
Barrier receiver distance	25.00 / 25.00	m
Source elevation	0.00 m	
Receiver elevation	0.00 m	
Barrier elevation	0.00 m	
Reference angle	0.00	

Rail data, segment # 4: EGap (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/0.0	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	21.0/3.0	105.0	2.0	12.0	Diesel	Yes

* 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.	CNFreight	4.0/0.0	2.50	12.00
2.	CNWFreight	0.0/2.0	2.50	12.00
3.	CNPass	2.0/0.0	2.50	12.00

Data for Segment # 4: EGap (day/night)

Angle1 Angle2	53.00 deg	64.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	50.00 / 50.00	m
Receiver height	7.50 / 7.50	m
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Rail data, segment # 5: EHouse (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/0.0	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	21.0/3.0	105.0	2.0	12.0	Diesel	Yes

* 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.	CNFreight	4.0/0.0	2.50	12.00
2.	CNWFreight	0.0/2.0	2.50	12.00
3.	CNPass	2.0/0.0	2.50	12.00

Data for Segment # 5: EHouse (day/night)

Angle1 Angle2	64.00 deg	90.00 deg
Wood depth	0	(No woods.)

```
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  50.00 / 50.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  64.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.80 m
Barrier receiver distance :  25.00 / 25.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        6.10 !         6.10
       0.50 !        7.50 !        4.70 !         4.70

LOCOMOTIVE (0.00 + 60.33 + 0.00) = 60.33 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -24   0.10  73.43  -5.78  -4.76   0.00   0.00  -3.30  59.58*
   -90    -24   0.41  73.43  -7.35  -5.75   0.00   0.00   0.00  60.33
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 47.91 + 0.00) = 47.91 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -24   0.21  64.47  -6.33  -5.13   0.00   0.00  -5.10  47.91
-------------------------------------------------------------------------

Segment Leq : 60.57 dBA

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

LOCOMOTIVE (0.00 + 57.42 + 0.00) = 57.42 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -24      8   0.41  72.31  -7.35  -7.54   0.00   0.00   0.00  57.42
-------------------------------------------------------------------------

WHEEL (0.00 + 48.52 + 0.00) = 48.52 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -24      8   0.51  63.97  -7.90  -7.55   0.00   0.00   0.00  48.52
-------------------------------------------------------------------------
```

```
Segment Leq : 57.95 dBA

Results segment # 3: Berm (day)
-------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.75 !         5.75
       0.50 !        7.50 !        4.00 !         4.00

LOCOMOTIVE (0.00 + 58.63 + 0.00) = 58.63 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
     8     53   0.25  72.31  -6.56  -6.22   0.00   0.00   0.00  59.53*
     8     53   0.41  72.31  -7.35  -6.34   0.00   0.00   0.00  58.63
-------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 49.66 + 0.00) = 49.66 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
     8     53   0.36  63.97  -7.11  -6.30   0.00   0.00  -0.16  50.39*
     8     53   0.51  63.97  -7.90  -6.42   0.00   0.00   0.00  49.66
-------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 59.15 dBA

Results segment # 4: EGap (day)
-------------------------------

LOCOMOTIVE (0.00 + 51.68 + 0.00) = 51.68 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    53     64   0.41  72.31  -7.35 -13.29   0.00   0.00   0.00  51.68
-------------------------------------------------------------------

WHEEL (0.00 + 42.49 + 0.00) = 42.49 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    53     64   0.51  63.97  -7.90 -13.58   0.00   0.00   0.00  42.49
-------------------------------------------------------------------

Segment Leq : 52.17 dBA

Results segment # 5: EHouse (day)
---------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
```

```
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.75 !         5.75
       0.50 !        7.50 !        4.00 !         4.00

LOCOMOTIVE (0.00 + 53.67 + 0.00) = 53.67 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    64     90   0.12  72.31  -5.84  -9.29   0.00   0.00  -4.55  52.63*
    64     90   0.41  72.31  -7.35 -11.29   0.00   0.00   0.00  53.67
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 42.25 + 0.00) = 42.25 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    64     90   0.22  63.97  -6.39 -10.05   0.00   0.00  -5.28  42.25
-------------------------------------------------------------------------

Segment Leq : 53.97 dBA

Total Leq All Segments: 64.77 dBA

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

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        6.10 !         6.10
       0.50 !        7.50 !        4.70 !         4.70

LOCOMOTIVE (0.00 + 52.80 + 0.00) = 52.80 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -24   0.10  65.89  -5.78  -4.76   0.00   0.00  -3.30  52.05*
   -90    -24   0.41  65.89  -7.35  -5.75   0.00   0.00   0.00  52.80
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 39.57 + 0.00) = 39.57 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -24   0.21  56.13  -6.33  -5.13   0.00   0.00  -5.10  39.57
-------------------------------------------------------------------------

Segment Leq : 53.00 dBA

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

LOCOMOTIVE (0.00 + 57.27 + 0.00) = 57.27 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
```

```
   -24      8   0.41  72.15  -7.35  -7.54   0.00   0.00   0.00  57.27
-------------------------------------------------------------------------

WHEEL (0.00 + 49.06 + 0.00) = 49.06 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -24      8   0.51  64.50  -7.90  -7.55   0.00   0.00   0.00  49.06
-------------------------------------------------------------------------

Segment Leq : 57.88 dBA

Results segment # 3: Berm (night)
---------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.75 !         5.75
       0.50 !        7.50 !        4.00 !         4.00

LOCOMOTIVE (0.00 + 53.47 + 0.00) = 53.47 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     8     53   0.25  67.16  -6.56  -6.22   0.00   0.00   0.00  54.37*
     8     53   0.41  67.16  -7.35  -6.34   0.00   0.00   0.00  53.47
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 43.51 + 0.00) = 43.51 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
     8     53   0.36  57.83  -7.11  -6.30   0.00   0.00  -0.16  44.25*
     8     53   0.51  57.83  -7.90  -6.42   0.00   0.00   0.00  43.51
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 53.89 dBA

Results segment # 4: EGap (night)
---------------------------------

LOCOMOTIVE (0.00 + 46.52 + 0.00) = 46.52 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    53     64   0.41  67.16  -7.35 -13.29   0.00   0.00   0.00  46.52
-------------------------------------------------------------------------

WHEEL (0.00 + 36.35 + 0.00) = 36.35 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    53     64   0.51  57.83  -7.90 -13.58   0.00   0.00   0.00  36.35
-------------------------------------------------------------------------
```

```
Segment Leq : 46.92 dBA

Results segment # 5: EHouse (night)
-----------------------------------

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.75 !         5.75
       0.50 !        7.50 !        4.00 !         4.00

LOCOMOTIVE (0.00 + 48.52 + 0.00) = 48.52 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    64     90   0.12  67.16  -5.84  -9.29   0.00   0.00  -4.55  47.48*
    64     90   0.41  67.16  -7.35 -11.29   0.00   0.00   0.00  48.52
-------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 36.11 + 0.00) = 36.11 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    64     90   0.22  57.83  -6.39 -10.05   0.00   0.00  -5.28  36.11
-------------------------------------------------------------------

Segment Leq : 48.76 dBA

Total Leq All Segments: 60.73 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.77
                           (NIGHT): 60.73
```

STAMSONO 5.0 NORMAL REPORT Date: 28-11-2022 10:42:01
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: pow2.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/0.0	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	88.0/5.0	48.0	2.0	12.0	Diesel	Yes

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

Train type: No Name	Unadj. Trains	Annual % Increase	Years of Growth
1. CNFreight	4.0/0.0	2.50	12.00
2. CNWFreight	0.0/2.0	2.50	12.00
3. CNPass	2.0/0.0	2.50	12.00

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

Angle1 Angle2	: -90.00 deg	-62.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 49.00 / 49.00	m
Receiver height	: 7.50 / 7.50	m
Topography	: 2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	: -90.00 deg	Angle2 : -62.00 deg
Barrier height	: 5.00	m
Barrier receiver distance	: 20.00 / 20.00	m
Source elevation	: 0.00	m
Receiver elevation	: 0.00	m
Barrier elevation	: 0.00	m
Reference angle	: 0.00	

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/5.4	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	21.0/3.0	105.0	2.0	12.0	Diesel	Yes

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

Train type: No Name	Unadj. Trains	Annual % Increase	Years of Growth
1. CNFreight	4.0/4.0	2.50	12.00
2. CNWFreight	0.0/2.0	2.50	12.00
3. CNPass	2.0/0.0	2.50	12.00

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

Angle1 Angle2	: -62.00 deg	-44.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 49.00 / 49.00	m
Receiver height	: 7.50 / 7.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	: 0.00	

Rail data, segment # 3: Berm (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/0.0	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	21.0/3.0	105.0	2.0	12.0	Diesel	Yes

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

Train type: No Name	Unadj. Trains	Annual % Increase	Years of Growth
1. CNFreight	4.0/0.0	2.50	12.00
2. CNWFreight	0.0/2.0	2.50	12.00
3. CNPass	2.0/0.0	2.50	12.00

Data for Segment # 3: Berm (day/night)

Angle1 Angle2	: -44.00 deg	11.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 0 / 0	
Surface	: 1	(Absorptive ground surface)
Receiver source distance	: 49.00 / 49.00	m
Receiver height	: 7.50 / 7.50	m
Topography	: 2	(Flat/gentle slope; with barrier)
No Whistle		
Barrier angle1	: -44.00 deg	Angle2 : 11.00 deg
Barrier height	: 2.50 m	
Barrier receiver distance	: 25.00 / 25.00	m
Source elevation	: 0.00 m	
Receiver elevation	: 0.00 m	
Barrier elevation	: 0.00 m	
Reference angle	: 0.00	

Rail data, segment # 4: EGap (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/0.0	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	21.0/3.0	105.0	2.0	12.0	Diesel	Yes

* 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.	CNFreight	4.0/0.0	2.50	12.00
2.	CNWFreight	0.0/2.0	2.50	12.00
3.	CNPass	2.0/0.0	2.50	12.00

Data for Segment # 4: EGap (day/night)

Angle1 Angle2	11.00 deg	48.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	49.00 / 49.00	m
Receiver height	7.50 / 7.50	m
Topography	1	(Flat/gentle slope; no barrier)
No Whistle		
Reference angle	0.00	

Rail data, segment # 5: EHouse (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/0.0	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	21.0/3.0	105.0	2.0	12.0	Diesel	Yes

* 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.	CNFreight	4.0/0.0	2.50	12.00
2.	CNWFreight	0.0/2.0	2.50	12.00
3.	CNPass	2.0/0.0	2.50	12.00

Data for Segment # 5: EHouse (day/night)

Angle1 Angle2	48.00 deg	90.00 deg
Wood depth	0	(No woods.)

```
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  49.00 / 49.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  48.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.80 m
Barrier receiver distance :  25.00 / 25.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        6.07 !         6.07
       0.50 !        7.50 !        4.64 !         4.64

LOCOMOTIVE (0.00 + 55.36 + 0.00) = 55.36 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90    -62   0.10  73.43  -5.68  -8.85   0.00   0.00  -4.33  54.57*
   -90    -62   0.41  73.43  -7.22 -10.85   0.00   0.00   0.00  55.36
-------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 43.61 + 0.00) = 43.61 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90    -62   0.21  64.47  -6.22  -9.57   0.00   0.00  -5.07  43.61
-------------------------------------------------------------------

Segment Leq : 55.64 dBA

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

LOCOMOTIVE (0.00 + 54.18 + 0.00) = 54.18 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -62    -44   0.41  72.31  -7.22 -10.91   0.00   0.00   0.00  54.18
-------------------------------------------------------------------

WHEEL (0.00 + 45.07 + 0.00) = 45.07 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -62    -44   0.51  63.97  -7.76 -11.14   0.00   0.00   0.00  45.07
-------------------------------------------------------------------
```

```
Segment Leq : 54.68 dBA

Results segment # 3: Berm (day)
-------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.71 !         5.71
       0.50 !        7.50 !        3.93 !         3.93

LOCOMOTIVE (0.00 + 59.79 + 0.00) = 59.79 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -44     11   0.25  72.31  -6.45  -5.24   0.00   0.00   0.00  60.62*
   -44     11   0.41  72.31  -7.22  -5.30   0.00   0.00   0.00  59.79
-------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 50.88 + 0.00) = 50.88 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -44     11   0.36  63.97  -6.99  -5.28   0.00   0.00  -0.06  51.64*
   -44     11   0.51  63.97  -7.76  -5.33   0.00   0.00   0.00  50.88
-------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 60.32 dBA

Results segment # 4: EGap (day)
-------------------------------

LOCOMOTIVE (0.00 + 57.94 + 0.00) = 57.94 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    11     48   0.41  72.31  -7.22  -7.15   0.00   0.00   0.00  57.94
-------------------------------------------------------------------

WHEEL (0.00 + 48.98 + 0.00) = 48.98 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    11     48   0.51  63.97  -7.76  -7.22   0.00   0.00   0.00  48.98
-------------------------------------------------------------------

Segment Leq : 58.46 dBA

Results segment # 5: EHouse (day)
---------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
```

```
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.71 !         5.71
       0.50 !        7.50 !        3.93 !         3.93

LOCOMOTIVE (0.00 + 56.68 + 0.00) = 56.68 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    48     90   0.12  72.31  -5.74  -6.97   0.00   0.00  -4.31  55.29*
    48     90   0.41  72.31  -7.22  -8.41   0.00   0.00   0.00  56.68
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 44.65 + 0.00) = 44.65 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    48     90   0.22  63.97  -6.28  -7.52   0.00   0.00  -5.52  44.65
-------------------------------------------------------------------------

Segment Leq : 56.94 dBA

Total Leq All Segments: 64.67 dBA

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

Barrier height for grazing incidence
-----------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        6.07 !         6.07
       0.50 !        7.50 !        4.64 !         4.64

LOCOMOTIVE (0.00 + 47.83 + 0.00) = 47.83 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -62   0.10  65.89  -5.68  -8.85   0.00   0.00  -4.33  47.04*
   -90    -62   0.41  65.89  -7.22 -10.85   0.00   0.00   0.00  47.83
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 35.27 + 0.00) = 35.27 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90    -62   0.21  56.13  -6.22  -9.57   0.00   0.00  -5.07  35.27
-------------------------------------------------------------------------

Segment Leq : 48.06 dBA

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

LOCOMOTIVE (0.00 + 54.02 + 0.00) = 54.02 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
```

```
   -62    -44   0.41  72.15  -7.22 -10.91   0.00   0.00   0.00  54.02
-------------------------------------------------------------------------

WHEEL (0.00 + 45.60 + 0.00) = 45.60 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -62    -44   0.51  64.50  -7.76 -11.14   0.00   0.00   0.00  45.60
-------------------------------------------------------------------------

Segment Leq : 54.60 dBA

Results segment # 3: Berm (night)
---------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.71 !         5.71
       0.50 !        7.50 !        3.93 !         3.93

LOCOMOTIVE (0.00 + 54.64 + 0.00) = 54.64 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -44     11   0.25  67.16  -6.45  -5.24   0.00   0.00   0.00  55.46*
   -44     11   0.41  67.16  -7.22  -5.30   0.00   0.00   0.00  54.64
-------------------------------------------------------------------------

 * Bright Zone !

WHEEL (0.00 + 44.73 + 0.00) = 44.73 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -44     11   0.36  57.83  -6.99  -5.28   0.00   0.00  -0.06  45.50*
   -44     11   0.51  57.83  -7.76  -5.33   0.00   0.00   0.00  44.73
-------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 55.06 dBA

Results segment # 4: EGap (night)
---------------------------------

LOCOMOTIVE (0.00 + 52.78 + 0.00) = 52.78 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    11     48   0.41  67.16  -7.22  -7.15   0.00   0.00   0.00  52.78
-------------------------------------------------------------------------

WHEEL (0.00 + 42.84 + 0.00) = 42.84 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
    11     48   0.51  57.83  -7.76  -7.22   0.00   0.00   0.00  42.84
-------------------------------------------------------------------------
```

Segment Leq : 53.20 dBA

Results segment # 5: EHouse (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.50	5.71	5.71
0.50	7.50	3.93	3.93

LOCOMOTIVE (0.00 + 51.53 + 0.00) = 51.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.12	67.16	-5.74	-6.97	0.00	0.00	-4.31	50.13*
48	90	0.41	67.16	-7.22	-8.41	0.00	0.00	0.00	51.53

* Bright Zone !

WHEEL (0.00 + 38.50 + 0.00) = 38.50 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.22	57.83	-6.28	-7.52	0.00	0.00	-5.52	38.50

Segment Leq : 51.74 dBA

Total Leq All Segments: 60.13 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.67
(NIGHT): 60.13

STAMSONO 5.0 NORMAL REPORT Date: 28-11-2022 10:42:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: pow3.te Time Period: Day/Night 16/8 hours
Description:

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/0.0	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	88.0/5.0	48.0	2.0	12.0	Diesel	Yes

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

Train type: No Name	Unadj. Trains	Annual % Increase	Years of Growth
1. CNFreight	4.0/0.0	2.50	12.00
2. CNWFreight	0.0/2.0	2.50	12.00
3. CNPass	2.0/0.0	2.50	12.00

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

Angle1 Angle2	: -90.00 deg -38.00 deg
Wood depth	: 0 (No woods.)
No of house rows	: 0 / 0
Surface	: 1 (Absorptive ground surface)
Receiver source distance	: 105.00 / 105.00 m
Receiver height	: 7.50 / 7.50 m
Topography	: 2 (Flat/gentle slope; with barrier)
No Whistle	
Barrier angle1	: -90.00 deg Angle2 : -38.00 deg
Barrier height	: 5.00 m
Barrier receiver distance	: 75.00 / 75.00 m
Source elevation	: 0.00 m
Receiver elevation	: 0.00 m
Barrier elevation	: 0.00 m
Reference angle	: 0.00

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
* 1. CNFreight	5.4/5.4	50.0	4.0	140.0	Diesel	Yes
* 2. CNWFreight	0.0/2.7	50.0	4.0	25.0	Diesel	Yes
* 3. CNPass	2.7/0.0	50.0	2.0	10.0	Diesel	Yes
4. GOTransit	21.0/3.0	105.0	2.0	12.0	Diesel	Yes

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

```
Train type:          ! Unadj. ! Annual % ! Years of !
 No  Name            ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. CNFreight       !   4.0/4.0   !    2.50  !   12.00  !
  2. CNWFreight      !   0.0/2.0   !    2.50  !   12.00  !
  3. CNPass          !   2.0/0.0   !    2.50  !   12.00  !

Data for Segment # 2: TownHouse (day/night)
-------------------------------------------
Angle1   Angle2           : -38.00 deg   2.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 105.00 / 105.00 m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            : -38.00 deg   Angle2 : 2.00 deg
Barrier height            :  12.50 m
Barrier receiver distance :  56.00 / 56.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Rail data, segment # 3: EGap (day/night)
----------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. CNFreight   !   5.4/0.0   !  50.0 !  4.0 !140.0 !Diesel! Yes
* 2. CNWFreight  !   0.0/2.7   !  50.0 !  4.0 ! 25.0 !Diesel! Yes
* 3. CNPass      !   2.7/0.0   !  50.0 !  2.0 ! 10.0 !Diesel! Yes
  4. GOTransit   !  21.0/3.0   ! 105.0 !  2.0 ! 12.0 !Diesel! Yes

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

Train type:          ! Unadj. ! Annual % ! Years of !
 No  Name            ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. CNFreight       !   4.0/0.0   !    2.50  !   12.00  !
  2. CNWFreight      !   0.0/2.0   !    2.50  !   12.00  !
  3. CNPass          !   2.0/0.0   !    2.50  !   12.00  !

Data for Segment # 3: EGap (day/night)
--------------------------------------
Angle1   Angle2           :   2.00 deg   19.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 105.00 / 105.00 m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00
```

```
Rail data, segment # 4: EHouse (day/night)
------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. CNFreight   !   5.4/0.0   !  50.0 !  4.0 !140.0 !Diesel! Yes
* 2. CNWFreight  !   0.0/2.7   !  50.0 !  4.0 ! 25.0 !Diesel! Yes
* 3. CNPass      !   2.7/0.0   !  50.0 !  2.0 ! 10.0 !Diesel! Yes
  4. GOTransit   !  21.0/3.0   ! 105.0 !  2.0 ! 12.0 !Diesel! Yes

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

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. CNFreight      !   4.0/0.0   !    2.50  !   12.00  !
  2. CNWFreight     !   0.0/2.0   !    2.50  !   12.00  !
  3. CNPass         !   2.0/0.0   !    2.50  !   12.00  !

Data for Segment # 4: EHouse (day/night)
----------------------------------------
Angle1   Angle2           :  19.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 105.00 / 105.00 m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1            :  19.00 deg   Angle2 : 90.00 deg
Barrier height            :   4.80 m
Barrier receiver distance :  82.00 / 82.00  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.00 !         5.00
       0.50 !        7.50 !        2.50 !         2.50

LOCOMOTIVE (0.00 + 53.19 + 0.00) = 53.19 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90    -38   0.10  73.43  -9.34  -5.89   0.00   0.00  -5.00  53.19
-------------------------------------------------------------------
```

```
WHEEL (0.00 + 40.58 + 0.00) = 40.58 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90    -38   0.21  64.47 -10.23  -6.36   0.00   0.00  -7.30  40.58
-------------------------------------------------------------------

Segment Leq : 53.42 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.63 !         5.63
       0.50 !        7.50 !        3.77 !         3.77

LOCOMOTIVE (0.00 + 40.50 + 0.00) = 40.50 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -38      2   0.00  72.31  -8.45  -6.53   0.00   0.00 -16.83  40.50
-------------------------------------------------------------------

WHEEL (0.00 + 30.11 + 0.00) = 30.11 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -38      2   0.00  63.97  -8.45  -6.53   0.00   0.00 -18.88  30.11
-------------------------------------------------------------------

Segment Leq : 40.88 dBA

Results segment # 3: EGap (day)
-------------------------------

LOCOMOTIVE (0.00 + 50.15 + 0.00) = 50.15 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
     2     19   0.41  72.31 -11.87 -10.28   0.00   0.00   0.00  50.15
-------------------------------------------------------------------

WHEEL (0.00 + 40.92 + 0.00) = 40.92 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
     2     19   0.51  63.97 -12.76 -10.29   0.00   0.00   0.00  40.92
-------------------------------------------------------------------

Segment Leq : 50.64 dBA

Results segment # 4: EHouse (day)
---------------------------------

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
```

```
------------+-------------+-------------+--------------
       4.00 !        7.50 !        4.77 !         4.77
       0.50 !        7.50 !        2.03 !         2.03

LOCOMOTIVE (0.00 + 53.41 + 0.00) = 53.41 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    19     90   0.12  72.31  -9.44  -4.46   0.00   0.00  -5.00  53.41
-------------------------------------------------------------------

WHEEL (0.00 + 40.27 + 0.00) = 40.27 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
    19     90   0.22  63.97 -10.33  -4.80   0.00   0.00  -8.57  40.27
-------------------------------------------------------------------

Segment Leq : 53.62 dBA

Total Leq All Segments: 57.62 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.00 !         5.00
       0.50 !        7.50 !        2.50 !         2.50

LOCOMOTIVE (0.00 + 45.66 + 0.00) = 45.66 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90    -38   0.10  65.89  -9.34  -5.89   0.00   0.00  -5.00  45.66
-------------------------------------------------------------------

WHEEL (0.00 + 32.24 + 0.00) = 32.24 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------
   -90    -38   0.21  56.13 -10.23  -6.36   0.00   0.00  -7.30  32.24
-------------------------------------------------------------------

Segment Leq : 45.85 dBA

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

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       4.00 !        7.50 !        5.63 !         5.63
       0.50 !        7.50 !        3.77 !         3.77

LOCOMOTIVE (0.00 + 40.34 + 0.00) = 40.34 dBA
```

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	2	0.00	72.15	-8.45	-6.53	0.00	0.00	-16.83	40.34

WHEEL (0.00 + 30.64 + 0.00) = 30.64 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	2	0.00	64.50	-8.45	-6.53	0.00	0.00	-18.88	30.64

Segment Leq : 40.78 dBA

Results segment # 3: EGap (night)

LOCOMOTIVE (0.00 + 45.00 + 0.00) = 45.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
2	19	0.41	67.16	-11.87	-10.28	0.00	0.00	0.00	45.00

WHEEL (0.00 + 34.77 + 0.00) = 34.77 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
2	19	0.51	57.83	-12.76	-10.29	0.00	0.00	0.00	34.77

Segment Leq : 45.39 dBA

Results segment # 4: EHouse (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	7.50	4.77	4.77
0.50	7.50	2.03	2.03

LOCOMOTIVE (0.00 + 48.26 + 0.00) = 48.26 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
19	90	0.12	67.16	-9.44	-4.46	0.00	0.00	-5.00	48.26

WHEEL (0.00 + 34.13 + 0.00) = 34.13 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
19	90	0.22	57.83	-10.33	-4.80	0.00	0.00	-8.57	34.13

Segment Leq : 48.42 dBA

Total Leq All Segments: 51.89 dBA

```
TOTAL Leq FROM ALL SOURCES (DAY): 57.62
                           (NIGHT): 51.89
```

Appendix D: Measured Sound Levels

Weather Conditions

Prevailing weather conditions at the time of sound level measurements were as follows, based on information recorded at the Hamilton Airport weather station operated by NAVCAN, obtained by TT from Environment and Climate Change Canada's *Historical Data* portal.

Parameter	Conditions (October 27, 2022)
Wind Direction	North
Wind Speed	11 km/h
Relative Humidity	67%
Pressure	99.91 kPa
Temperature	6 ºC
Cloud Cover	Cloudy
Precipitation	None

Instrumentation

Measurements were conducted using a Brüel & Kjær model 2250 Sound Level Meter / Analyzer, serial number 3007997 fitted with a Brüel & Kjær model 4189 free-field microphone transducer, serial number 2983426.

A wind screen was used for all outdoor measurements. All equipment was within its laboratory calibration window, and was field calibrated before and after measurements using a Bruel & Kjaer Type 4231 calibrator, serial number 2623794.

Measurement Methodology

Measurement methodology was based on the procedures identified in NPC-103 and NPC-300, specifically:

Steady Noise Sources:

NPC-103 defines a steady noise as having a maximum difference of 6 dB between the lowest and highest observed sound levels.

NPC-103 requires that measurements of steady noise to be conducted using slow response, and A-weighting, with a minimum of six (6) 15 second observations of the minimum, average, and maximum sound level. The one-hour equivalent sound level (Leq) to be reported is the arithmetic average of the observed average sound pressure level readings.

TT's sound level meter was configured to log 15 second readings for a period of 2 minutes (8 readings). The logged data included slow response maximum and minimum values in 1/3 octave bands and dBA broadband, as well as Leq values in 1/3 octave bands and dBA broadband. The values used for the purposes of modelling noise impacts were the arithmetic average of Leq results from each reading, in each 1/3 octave band.

Impulse Noise Sources:

NPC-103 requires that measurements of impulse noise be conducted using impulse response, and A-weighting. If at least one impulse occurs in every 5-minute period over the course of 20 minutes, then a

minimum of twenty (20) impulse events should be recorded, and the logarithmic mean impulse sound level (LLM) to be reported is the combined log average of the impulse peaks recorded. Otherwise, individual impulse event peaks should be measured and reported separately.

Due to the infrequent nature of the rail yard activities, individual impulse events were recorded separately.

Measurement Results

The following table provides a summary of the reported results from each sound level measurement.

Reading ID	Start Time	Description	Octave Band (Hz)	Sound Pressure Level (dB)
SNS-01	2022/09/21 14:52	Steady noise observed from the Project site.	31.5	62.9
			63	63.6
			125	59.1
			250	56.8
			500	49.7
			1000	48.5
			2000	51.4
			4000	45.4
			8000	29.5
			Total (L_{eq}, dBA)	56.3
INS-01	2022/09/21 14:52	Train coupling noise.	31.5	85.7
			63	83.8
			125	80.9
			250	69.4
			500	64.4
			1000	65.9
			2000	65.1
			4000	56.4
			8000	39.8
			Total (dBAI)	71.8
INS-02	2022/09/21 14:52	Train departure (slack-taking) noise.	31.5	94.0
			63	93.7
			125	91.7
			250	84.6
			500	76.1
			1000	78.1
			2000	78.9
			4000	73.3
			8000	64.4
			Total (dBAI)	85.8

Appendix E: Measured Vibration Levels

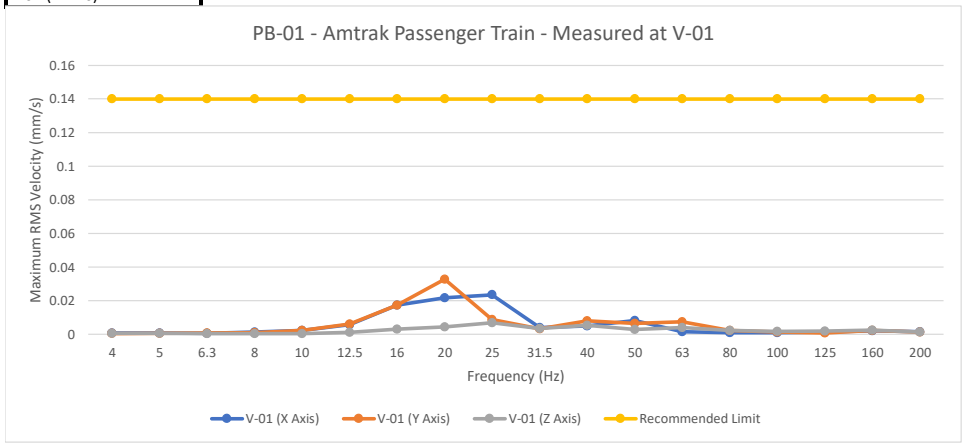
Train Pass-By: PB-01

	Maximum Velocity (mm/s) per Frequency																	
FCM / RAC Guideline	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200
Recommended Limit	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (X Axis)	0.0007	0.0008	0.0006	0.0012	0.0023	0.0056	0.0173	0.0216	0.0235	0.0039	0.0049	0.0081	0.0014	0.0009	0.0009	0.0012	0.002	0.0015	0.0235
V-02 (X Axis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Y Axis)	0.0005	0.0006	0.0007	0.0009	0.0023	0.006	0.0172	0.0327	0.0087	0.0032	0.008	0.0065	0.0074	0.0023	0.0013	0.0008	0.0022	0.0013	0.0327
V-02 (Y Axis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Z Axis)	0.0005	0.0006	0.0004	0.0004	0.0004	0.0011	0.003	0.0044	0.0068	0.0033	0.0052	0.0029	0.004	0.0022	0.0016	0.0019	0.0024	0.0012	0.0068
V-02 (Z Axis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



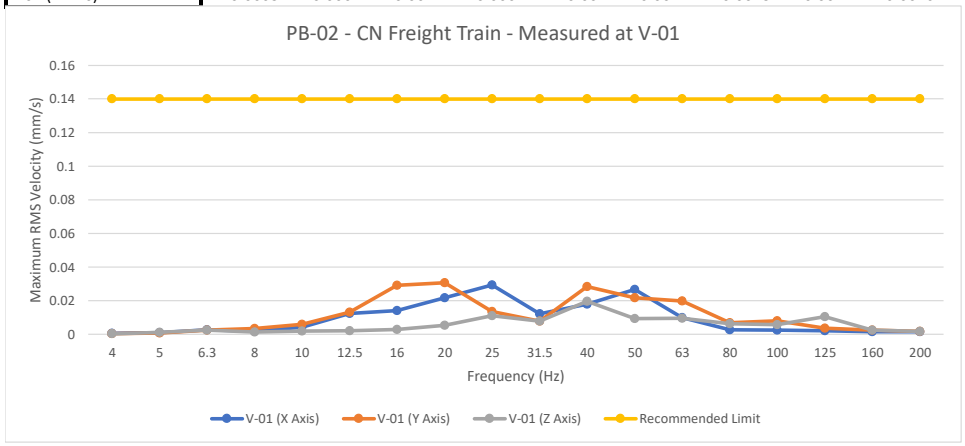
Train Pass-By: PB-02

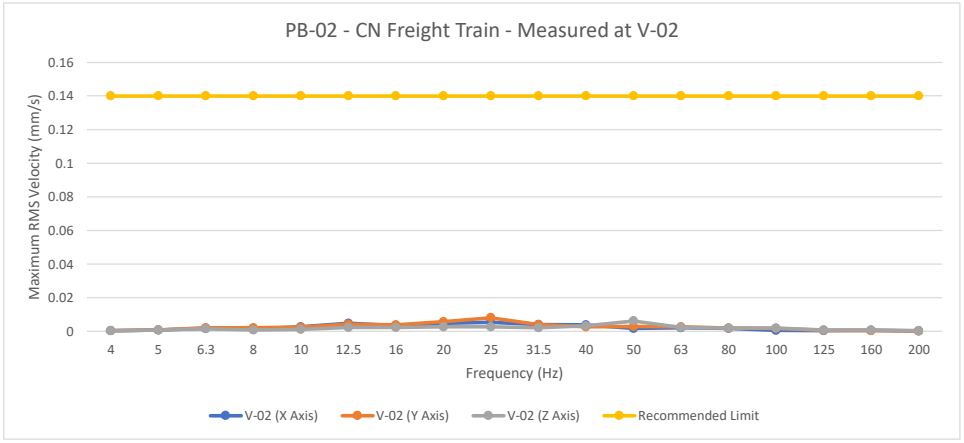
	Maximum Velocity (mm/s) per Frequency																	
FCM / RAC Guideline	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200
Recommended Limit	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (X Axis)	0.0006	0.0009	0.0026	0.0019	0.0041	0.0124	0.0141	0.0217	0.0293	0.0122	0.0179	0.0267	0.0098	0.0026	0.0025	0.0021	0.0014	0.0015	0.0293
V-02 (X Axis)	0.0003	0.0007	0.0017	0.0012	0.0027	0.0047	0.0033	0.0048	0.0054	0.004	0.0037	0.0017	0.0021	0.0017	0.0005	0.0003	0.0006	0.0002	0.0054

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Y Axis)	0.0004	0.0008	0.0025	0.0033	0.0058	0.0131	0.0291	0.0307	0.0135	0.0078	0.0284	0.0216	0.0197	0.0068	0.008	0.0035	0.0024	0.0017	0.0307
V-02 (Y Axis)	0.0003	0.0007	0.002	0.0021	0.0025	0.0041	0.0037	0.0056	0.0081	0.004	0.0027	0.0028	0.0027	0.0018	0.0016	0.0006	0.0003	0.0002	0.0081

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Z Axis)	0.0003	0.0011	0.0025	0.0013	0.0018	0.0021	0.0029	0.0052	0.011	0.0078	0.0196	0.0092	0.0094	0.0062	0.0056	0.0104	0.0024	0.0017	0.0196
V-02 (Z Axis)	0.0003	0.0007	0.0014	0.0007	0.001	0.0022	0.0023	0.0027	0.0026	0.002	0.0032	0.0062	0.0022	0.0018	0.0019	0.0008	0.0007	0.0004	0.0062





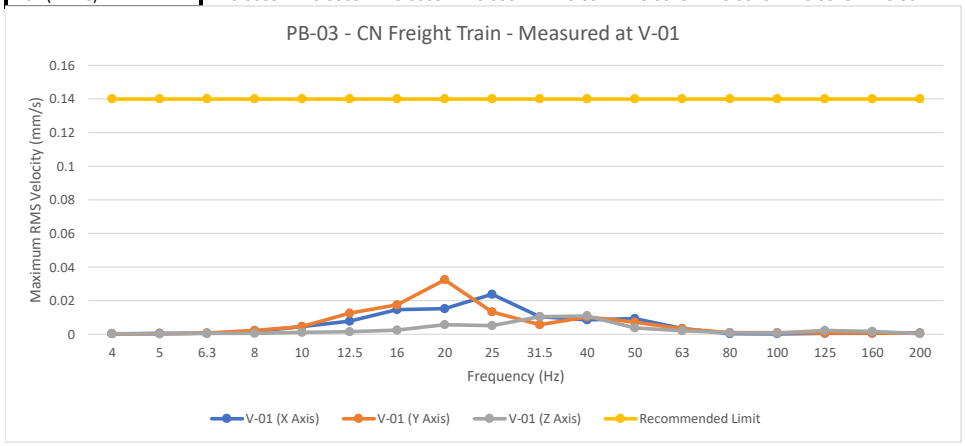
Train Pass-By: PB-03

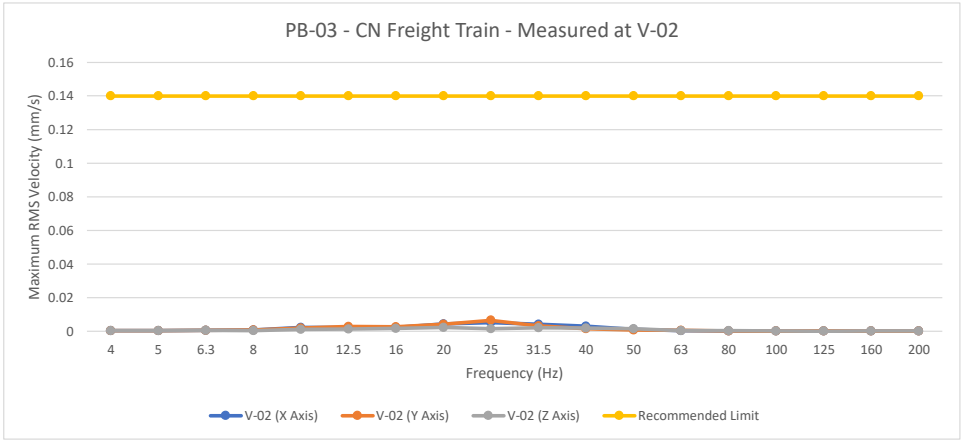
	Maximum Velocity (mm/s) per Frequency																	
FCM / RAC Guideline	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200
Recommended Limit	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (X Axis)	0.0003	0.0005	0.0006	0.0016	0.0046	0.0077	0.0146	0.0152	0.0238	0.0104	0.0085	0.0093	0.0034	0.0004	0.0003	0.0005	0.0006	0.0007	0.0238
V-02 (X Axis)	0.0003	0.0004	0.0005	0.0007	0.0022	0.0023	0.0023	0.0043	0.0052	0.0042	0.003	0.001	0.0004	0.0002	0.0001	0.0001	0.0001	0.0001	0.0052

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Y Axis)	0.0003	0.0003	0.0007	0.0023	0.0046	0.0126	0.0175	0.0325	0.0132	0.0056	0.0102	0.0071	0.0031	0.0009	0.0009	0.0007	0.0007	0.0006	0.0325
V-02 (Y Axis)	0.0003	0.0003	0.0005	0.0008	0.0018	0.0029	0.0027	0.0042	0.0066	0.0031	0.0015	0.0008	0.0005	0.0002	0.0001	0.0002	0.0001	0.0001	0.0066

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Z Axis)	0.0003	0.0002	0.0006	0.0005	0.0011	0.0015	0.0025	0.0057	0.005	0.0104	0.0109	0.0037	0.002	0.0009	0.0008	0.0023	0.0016	0.0004	0.0109
V-02 (Z Axis)	0.0003	0.0003	0.0005	0.0004	0.001	0.0013	0.0016	0.0023	0.0014	0.002	0.0018	0.0014	0.0004	0.0003	0.0002	0.0001	0.0002	0.0002	0.0023





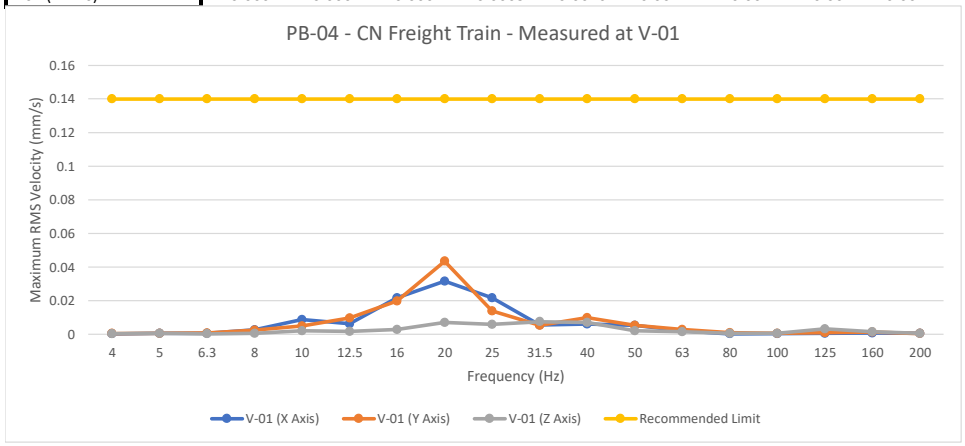
Train Pass-By: PB-04

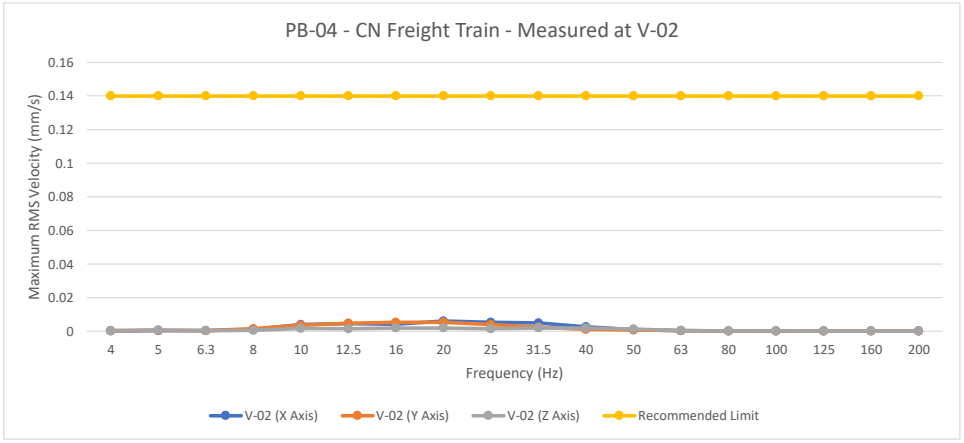
	Maximum Velocity (mm/s) per Frequency																	
FCM / RAC Guideline	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200
Recommended Limit	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (X Axis)	0.0003	0.0005	0.0006	0.0026	0.0087	0.0063	0.0216	0.0316	0.0216	0.0055	0.006	0.0052	0.002	0.0003	0.0004	0.0005	0.0007	0.0005	0.0316
V-02 (X Axis)	0.0002	0.0004	0.0004	0.0011	0.0039	0.0045	0.0042	0.0061	0.0052	0.0049	0.0026	0.0009	0.0004	0.0002	0.0001	0.0001	0.0001	0.0001	0.0061

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Y Axis)	0.0005	0.0006	0.0007	0.0024	0.0049	0.0096	0.0197	0.0435	0.0138	0.0053	0.0098	0.0052	0.0028	0.0009	0.0006	0.0009	0.0013	0.0005	0.0435
V-02 (Y Axis)	0.0003	0.0005	0.0003	0.0015	0.0035	0.0048	0.0052	0.0053	0.0039	0.0024	0.0011	0.0007	0.0004	0.0002	0.0001	0.0001	0.0001	0.0001	0.0053

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Z Axis)	0.0004	0.0006	0.0003	0.0005	0.0021	0.0016	0.0029	0.0069	0.0058	0.0075	0.007	0.0021	0.0014	0.0006	0.0006	0.0031	0.0015	0.0005	0.0075
V-02 (Z Axis)	0.0004	0.0007	0.0004	0.0005	0.0016	0.0014	0.002	0.002	0.0014	0.002	0.0019	0.0013	0.0004	0.0002	0.0002	0.0001	0.0001	0.0001	0.002





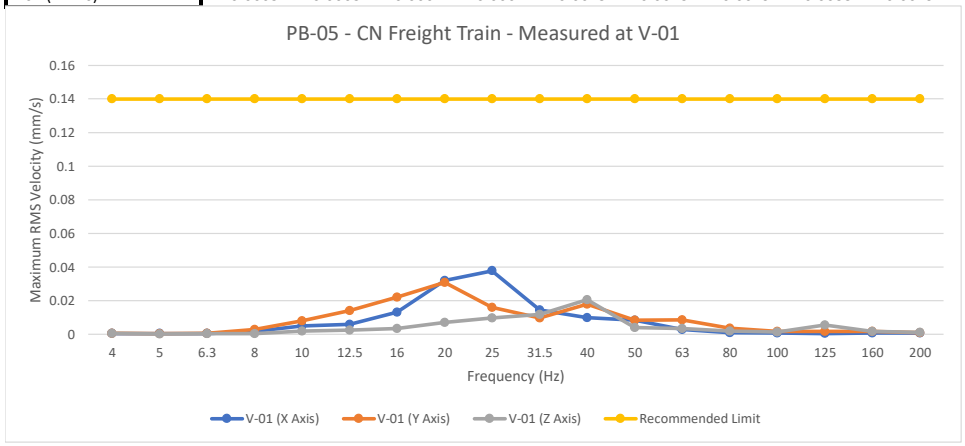
Train Pass-By: PB-05

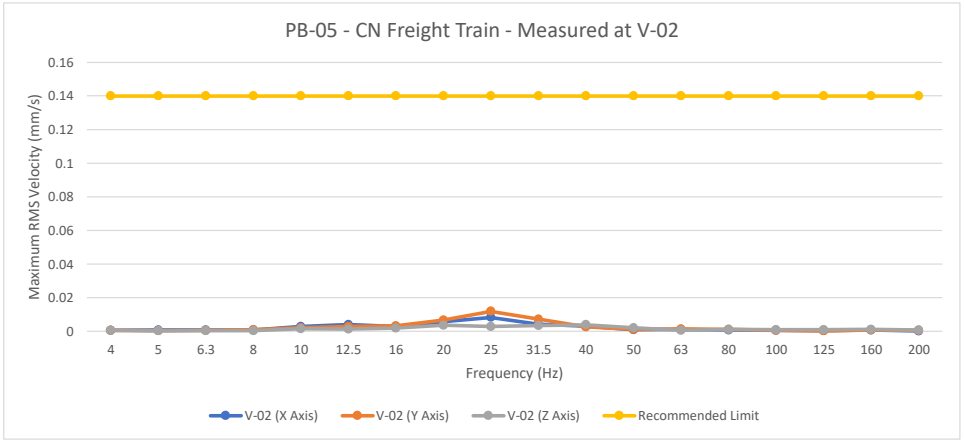
	Maximum Velocity (mm/s) per Frequency																	
FCM / RAC Guideline	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200
Recommended Limit	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (X Axis)	0.0005	0.0005	0.0005	0.0016	0.0049	0.0059	0.013	0.0319	0.0378	0.0145	0.0098	0.0084	0.0029	0.0009	0.0007	0.0005	0.0007	0.0007	0.0378
V-02 (X Axis)	0.0006	0.0007	0.0007	0.0008	0.0029	0.004	0.0029	0.0057	0.0083	0.0041	0.003	0.0009	0.0011	0.0008	0.0005	0.0004	0.0008	0.0002	0.0083

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Y Axis)	0.0005	0.0004	0.0006	0.0028	0.0079	0.014	0.022	0.0308	0.0159	0.0096	0.0179	0.0084	0.0086	0.0035	0.0017	0.0016	0.0017	0.0009	0.0308
V-02 (Y Axis)	0.0005	0.0004	0.0005	0.0009	0.0021	0.0028	0.0032	0.0066	0.0119	0.0071	0.0026	0.0011	0.0012	0.001	0.0005	0.0003	0.0007	0.0005	0.0119

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Z Axis)	0.0005	0.0002	0.0004	0.0004	0.0018	0.0024	0.0034	0.0069	0.0097	0.0118	0.0206	0.004	0.0033	0.0019	0.0013	0.0054	0.0016	0.001	0.0206
V-02 (Z Axis)	0.0005	0.0003	0.0004	0.0004	0.0015	0.0013	0.0019	0.0035	0.0029	0.0033	0.0039	0.002	0.0005	0.001	0.0009	0.0009	0.001	0.0007	0.0039





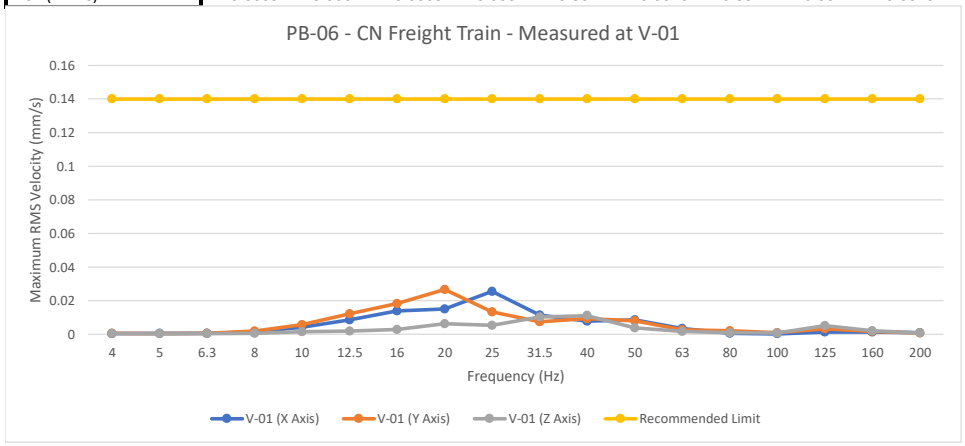
Train Pass-By: PB-06

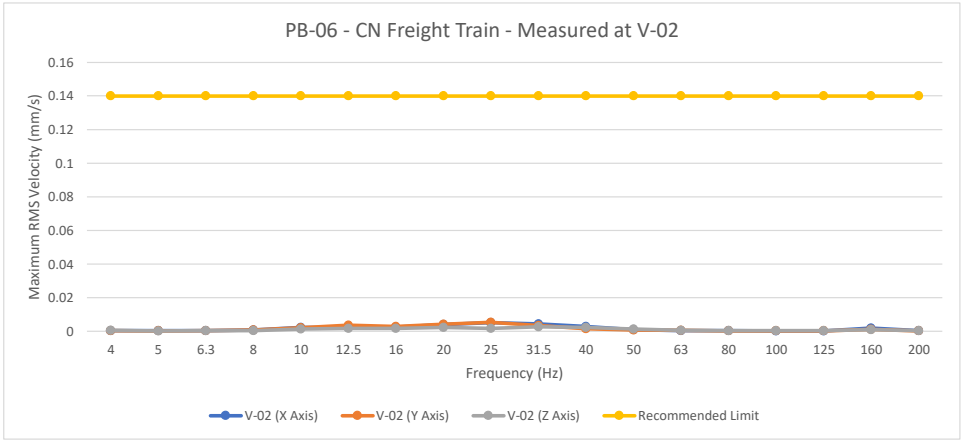
	Maximum Velocity (mm/s) per Frequency																	
FCM / RAC Guideline	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200
Recommended Limit	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14

	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (X Axis)	0.0004	0.0005	0.0005	0.0012	0.0042	0.0086	0.0138	0.015	0.0255	0.0113	0.0077	0.0086	0.0034	0.0005	0.0003	0.0013	0.0012	0.0009	0.0255
V-02 (X Axis)	0.0003	0.0004	0.0004	0.0007	0.0022	0.0022	0.0024	0.0039	0.0051	0.0044	0.0028	0.0009	0.0004	0.0004	0.0002	0.0002	0.0019	0.0004	0.0051

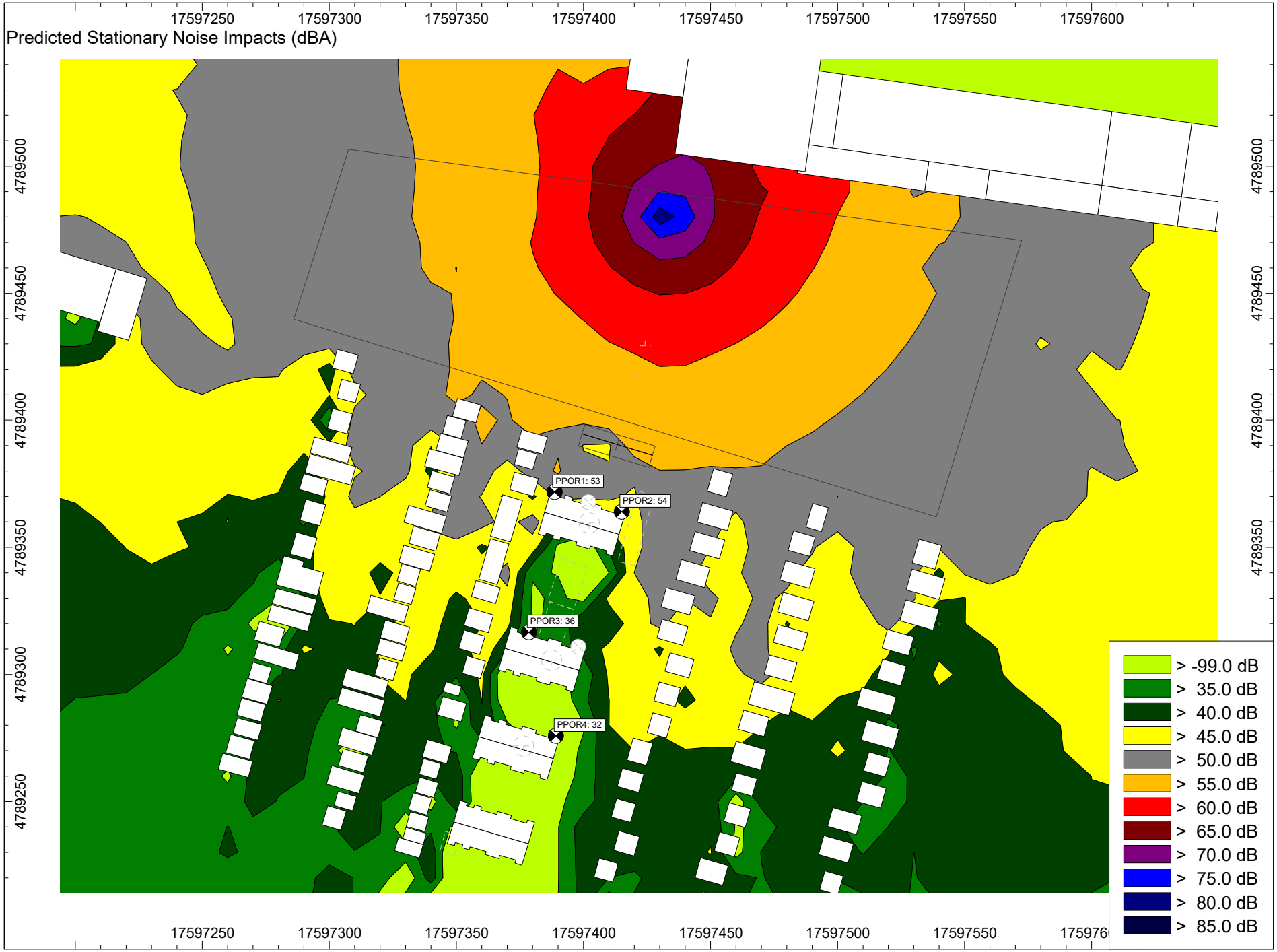
	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Y Axis)	0.0005	0.0004	0.0006	0.0019	0.0057	0.0122	0.0182	0.0267	0.0132	0.0074	0.0093	0.0079	0.0027	0.002	0.0009	0.0032	0.0017	0.0008	0.0267
V-02 (Y Axis)	0.0004	0.0003	0.0004	0.0008	0.002	0.0035	0.0028	0.0041	0.0053	0.0033	0.0015	0.0008	0.0005	0.0003	0.0003	0.0003	0.0011	0.0003	0.0053

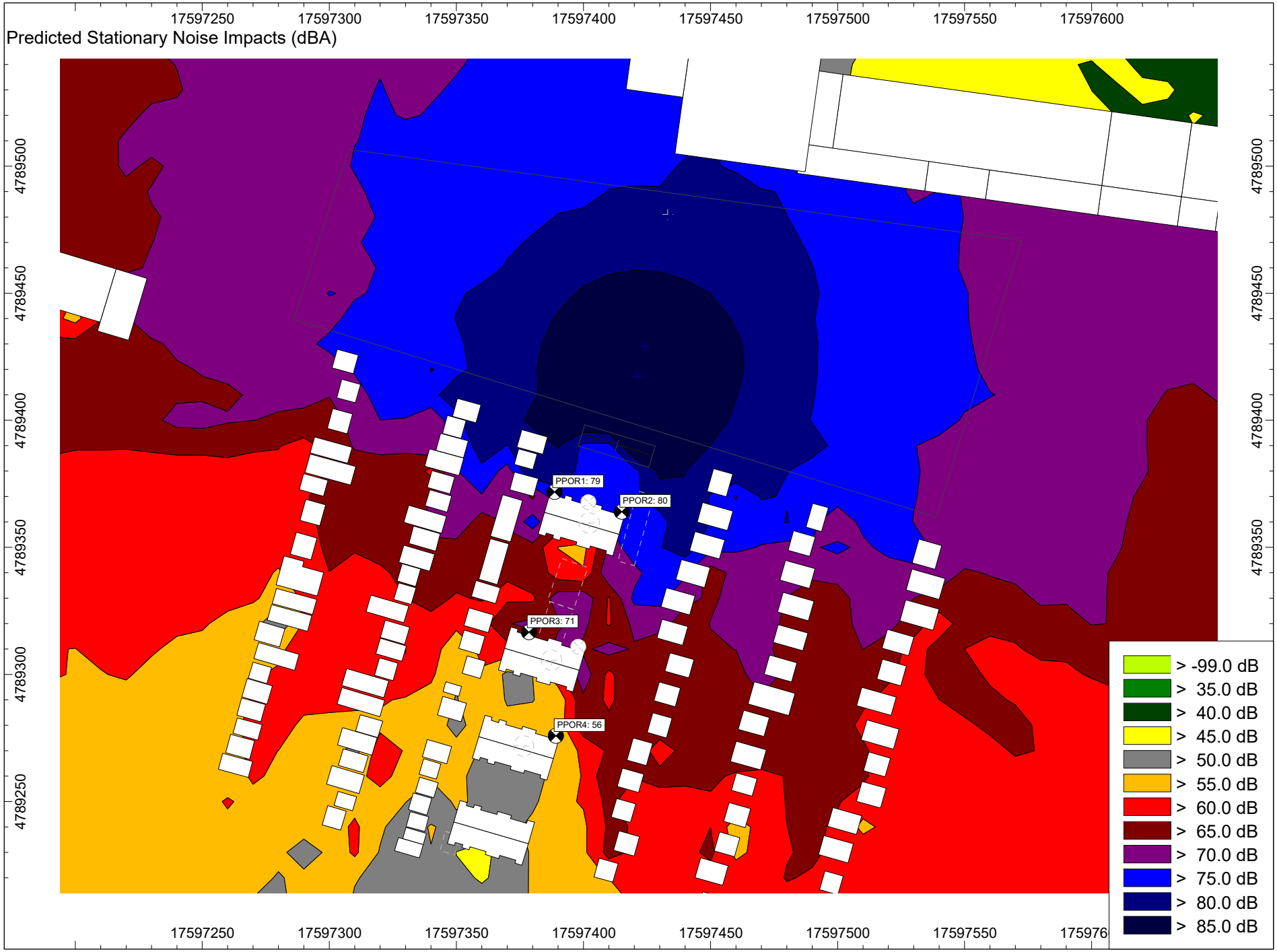
	Maximum Velocity (mm/s) per Frequency																		
Measurement Location	4	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160	200	Max
V-01 (Z Axis)	0.0005	0.0003	0.0004	0.0005	0.0014	0.0018	0.0029	0.0063	0.0053	0.0103	0.0111	0.0037	0.0016	0.0009	0.0007	0.0051	0.002	0.0008	0.0111
V-02 (Z Axis)	0.0005	0.0002	0.0003	0.0004	0.0012	0.0016	0.0017	0.0022	0.0016	0.0027	0.0023	0.0012	0.0005	0.0004	0.0004	0.0003	0.0009	0.0003	0.0027





Appendix F: CadnaA Calculation Output


Predicted Stationary Noise Impacts (dBA)
17597250
17597300
17597350
17597400
17597450
17597500
17597550
17597600
4789500
4789450
4789400
4789350
4789300
4789250
PPOR1: 53
PPOR2: 54
PPOR3: 36
PPOR4: 32
> -99.0 dB
> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB


Predicted Stationary Noise Impacts (dBA)
17597250
17597300
17597350
17597400
17597450
17597500
17597550
17597600
4789500
4789450
4789400
4789350
4789300
4789250
PPOR1: 79
PPOR2: 80
PPOR3: 71
PPOR4: 56
> -99.0 dB
> 35.0 dB
> 40.0 dB
> 45.0 dB
> 50.0 dB
> 55.0 dB
> 60.0 dB
> 65.0 dB
> 70.0 dB
> 75.0 dB
> 80.0 dB
> 85.0 dB

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	1000.00
Min. Length of Section (#(Unit,LEN))	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	0.00
Night-time Penalty (dB)	0.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.20
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Result Table

Receiver		Land Use	Limiting Value		rel. Axis			Lr w/o Noise Control		dL req.		Lr w/ Noise Control		Exceeding		passive NC
Name	ID		Day	Night	Station	Distance	Height	Day	Night	Day	Night	Day	Night	Day	Night	
			dB(A)	dB(A)	m	m	m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
PPOR1	!0001!PPOR1		0	0				-88.0	-88.0	-	-	53.3	53.3	53.3	53.3	53.3
PPOR2	!0001!PPOR2		0	0				-88.0	-88.0	-	-	53.8	53.8	53.8	53.8	53.8
PPOR3	!0001!PPOR3		0	0				-88.0	-88.0	-	-	35.9	35.9	35.9	35.9	35.9
PPOR4	!0001!PPOR4		0	0				-88.0	-88.0	-	-	31.5	31.5	31.5	31.5	31.5

Group Day and Night

Name	Expression	Partial Sum Level Proposed_Impulse											
		PPOR1			PPOR2			PPOR3			PPOR4		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Root	!*	79.1	79.1	79.1	79.9	79.9	79.9	71.3	71.3	71.3	56.3	56.3	56.3
Receivers	!00*												
Measurement Points	!0000*												
Project Receivers	!0001*												
Surrounding Receivers	!0002*												
Buildings	!01*												
Old Buildings	!0100*												

Name	Expression	Partial Sum Level Proposed_Impulse											
		PPOR1			PPOR2			PPOR3			PPOR4		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Project Buildings	!0101*												
Surrounding Buildings	!0102*												
Sources	!02*	79.1	79.1	79.1	79.9	79.9	79.9	71.3	71.3	71.3	56.3	56.3	56.3
Project Sources	!0200*												
Surrounding Sources	!0201*	79.1	79.1	79.1	79.9	79.9	79.9	71.3	71.3	71.3	56.3	56.3	56.3
Surrounding Steady	!020100*												
Surrounding Impulse	!020101*	79.1	79.1	79.1	79.9	79.9	79.9	71.3	71.3	71.3	56.3	56.3	56.3

Partial Day/Night

Source			Partial Level Proposed_Impulse										
Name	M.	ID	PPOR1			PPOR2			PPOR3			PPOR4	
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
SNS01_Measured_Steady_Source	~	!020100!SNS01_Measured_Steady_Source												
INS01_Measured_Train_Coupling		!020101!INS01_Measured_Train_Coupling	68.5	68.5	68.5	68.7	68.7	68.7	60.3	60.3	60.3	46.7	46.7	46.7
INS02_Measured_Train_Slack		!020101!INS02_Measured_Train_Slack	78.7	78.7	78.7	79.6	79.6	79.6	70.9	70.9	70.9	55.8	55.8	55.8

Sound Sources

Point Sources

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
SNS01_Measured_Steady_Source	~	!020100!SNS01_Measured_Steady_Source	105.7	105.7	105.7	Lw	Measured_Steady_Noise		0.0	0.0	0.0							0.0		(none)	1.50	r	17597433.15	4789480.99	1.50
INS01_Measured_Train_Coupling		!020101!INS01_Measured_Train_Coupling	116.2	116.2	116.2	Lw	Measured_Train_Coupling		0.0	0.0	0.0							0.0		(none)	1.00	r	17597424.23	4789429.24	1.00
INS02_Measured_Train_Slack		!020101!INS02_Measured_Train_Slack	128.3	128.3	128.3	Lw	Measured_Train_Slack		0.0	0.0	0.0							0.0		(none)	1.00	r	17597421.20	4789417.30	1.00

Line Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		Speed
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(km/h)

Geometry Line Sources

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)

Area Sources

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night

Geometry Area Sources

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)

Vertical Area Sources

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night			
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)	

Geometry Vertical Area Sources

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(m)	(m)	(m)	(m)	(m)	(m)

Road

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)

Geometry Road

Name	Height		Coordinates				Dist	LSlope
	Begin	End	x	y	z	Ground	(m)	(%)
	(m)	(m)	(m)	(m)	(m)	(m)		

Receptors

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Evening	Night	Day	Evening	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
N-01	~	!0000!N-01	-88.0	-88.0	-88.0	0.0	0.0	0.0		x	Total	1.50	r	17597402.00	4789367.82	1.50
N-02	~	!0000!N-02	-88.0	-88.0	-88.0	0.0	0.0	0.0		x	Total	1.50	r	17597398.01	4789310.89	1.50
PPOR1		!0001!PPOR1	79.1	79.1	79.1	0.0	0.0	0.0		x	Total	7.50	r	17597388.61	4789371.77	7.50
PPOR2		!0001!PPOR2	79.9	79.9	79.9	0.0	0.0	0.0		x	Total	7.50	r	17597415.07	4789363.99	7.50
PPOR3		!0001!PPOR3	71.3	71.3	71.3	0.0	0.0	0.0		x	Total	7.50	r	17597378.60	4789316.60	7.50
PPOR4		!0001!PPOR4	56.3	56.3	56.3	0.0	0.0	0.0		x	Total	7.50	r	17597389.20	4789275.81	7.50

Obstacles

Barriers

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			
			left	right		horz.	vert.	Begin		End	
					(m)	(m)	(m)	(m)		(m)	
Barrier_Wall		!0101!Barrier_Wall	0.21	0.21				4.50	r		

Geometry Barriers

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
			left	right		horz.	vert.	Begin		End	x	y	z	Ground
					(m)	(m)	(m)	(m)		(m)	(m)	(m)	(m)	(m)
Barrier_Wall		!0101!Barrier_Wall	0.21	0.21				4.50	r		17597399.41	4789394.68	4.50	0.00
											17597427.15	4789386.24	4.50	0.00

Building

Name	M.	ID	RB	Residents	Absorption	Height	
						Begin	
						(m)	
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	9.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	8.75	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.10	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.20	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.10	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.20	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.60	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.20	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.20	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.20	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.30	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a

Name	M.	ID	RB	Residents	Absorption	Height Begin (m)	
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	2.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.00	a
	~	!0100!Notes_Old_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	18.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	35.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	21.00	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	67.50	a

Name	M.	ID	RB	Residents	Absorption	Height	
						Begin	
						(m)	
		!0102!Notes_Surrounding_Buildings	x	0	0.21	38.20	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	18.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	31.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	13.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	8.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	20.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	8.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	8.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	14.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	20.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	8.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	22.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	17.80	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	19.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	24.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	19.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	13.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	20.30	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	10.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	15.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	32.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	27.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	12.50	a
		!0102!Notes_Surrounding_Buildings	x	0	0.21	16.00	a
	~	!0100!Notes_Old_Buildings	x	0	0.21	5.00	a
	~	!0100!Notes_Old_Buildings	x	0	0.21	4.00	a
	~	!0100!Notes_Old_Buildings	x	0	0.21	4.00	a
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a

Geometry Building

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a	17597024.84	4789487.17	6.50	0.00
								17597032.96	4789513.93	6.50	0.00
								17597023.51	4789516.80	6.50	0.00
								17597015.39	4789490.03	6.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	9.00	a	17597879.04	4789042.46	9.00	0.00
								17597896.81	4789103.12	9.00	0.00
								17597966.58	4789082.67	9.00	0.00
								17597948.81	4789022.01	9.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	8.75	a	17597217.10	4789106.53	8.75	0.00
								17597245.82	4789097.97	8.75	0.00
								17597250.71	4789114.39	8.75	0.00
								17597221.99	4789122.94	8.75	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.00	a	17597043.29	4789511.38	6.00	0.00
								17597035.30	4789484.99	6.00	0.00
								17597053.70	4789479.42	6.00	0.00
								17597061.69	4789505.80	6.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.10	a	17597129.24	4789477.27	6.10	0.00
								17597125.06	4789463.45	6.10	0.00
								17597134.84	4789460.50	6.10	0.00
								17597136.22	4789465.06	6.10	0.00
								17597135.74	4789465.21	6.10	0.00
								17597138.54	4789474.47	6.10	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.20	a	17597125.06	4789463.45	4.20	0.00
								17597129.24	4789477.27	4.20	0.00
								17597111.62	4789482.60	4.20	0.00
								17597109.12	4789474.35	4.20	0.00
								17597100.13	4789477.06	4.20	0.00
								17597098.44	4789471.49	4.20	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.10	a	17597134.84	4789460.50	6.10	0.00
								17597101.02	4789470.72	6.10	0.00
								17597098.86	4789463.58	6.10	0.00
								17597132.69	4789453.37	6.10	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.20	a	17597138.54	4789474.47	5.20	0.00
								17597140.88	4789482.24	5.20	0.00
								17597113.96	4789490.37	5.20	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
								17597111.62	4789482.60	5.20	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.70	a	17597140.88	4789482.24	7.70	0.00
								17597169.69	4789473.54	7.70	0.00
								17597164.54	4789456.51	7.70	0.00
								17597135.74	4789465.21	7.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.60	a	17597136.22	4789465.06	7.60	0.00
								17597132.69	4789453.37	7.60	0.00
								17597149.34	4789448.34	7.60	0.00
								17597152.88	4789460.03	7.60	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.50	a	17597169.69	4789473.54	5.50	0.00
								17597216.12	4789459.51	5.50	0.00
								17597209.81	4789438.63	5.50	0.00
								17597163.38	4789452.66	5.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a	17597216.12	4789459.51	6.50	0.00
								17597228.29	4789455.83	6.50	0.00
								17597220.94	4789431.48	6.50	0.00
								17597208.76	4789435.16	6.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597303.11	4789427.91	4.70	0.00
								17597311.41	4789425.63	4.70	0.00
								17597309.40	4789418.35	4.70	0.00
								17597301.11	4789420.62	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597304.92	4789416.15	4.70	0.00
								17597312.26	4789414.14	4.70	0.00
								17597310.26	4789406.85	4.70	0.00
								17597302.92	4789408.87	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597301.31	4789404.61	5.00	0.00
								17597309.12	4789402.46	5.00	0.00
								17597306.99	4789394.69	5.00	0.00
								17597299.17	4789396.84	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a	17597294.20	4789393.43	4.80	0.00
								17597308.95	4789389.38	4.80	0.00
								17597307.22	4789383.06	4.80	0.00
								17597292.46	4789387.11	4.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597292.41	4789386.73	4.50	0.00
								17597310.37	4789381.80	4.50	0.00
								17597308.37	4789374.51	4.50	0.00
								17597290.41	4789379.44	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597289.88	4789379.03	5.00	0.00
								17597299.45	4789376.40	5.00	0.00
								17597297.73	4789370.14	5.00	0.00
								17597288.16	4789372.77	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597290.72	4789368.90	4.70	0.00
								17597298.54	4789366.75	4.70	0.00
								17597296.27	4789358.50	4.70	0.00
								17597288.46	4789360.65	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597287.00	4789355.94	4.70	0.00
								17597295.17	4789353.69	4.70	0.00
								17597292.81	4789345.10	4.70	0.00
								17597284.64	4789347.34	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597282.16	4789346.65	4.50	0.00
								17597290.01	4789344.50	4.50	0.00
								17597289.42	4789342.37	4.50	0.00
								17597297.75	4789340.08	4.50	0.00
								17597295.23	4789330.85	4.50	0.00
								17597279.06	4789335.30	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a	17597279.19	4789333.85	6.50	0.00
								17597295.03	4789329.50	6.50	0.00
								17597293.39	4789323.52	6.50	0.00
								17597277.55	4789327.87	6.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a	17597277.26	4789327.48	6.50	0.00
								17597293.11	4789323.12	6.50	0.00
								17597291.42	4789316.97	6.50	0.00
								17597275.57	4789321.32	6.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a	17597272.51	4789320.93	4.80	0.00
								17597282.50	4789318.00	4.80	0.00
								17597280.37	4789310.75	4.80	0.00
								17597270.39	4789313.68	4.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.20	a	17597272.15	4789312.56	4.20	0.00
								17597288.15	4789307.87	4.20	0.00
								17597286.30	4789301.59	4.20	0.00
								17597270.30	4789306.28	4.20	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.20	a	17597269.94	4789304.81	5.20	0.00
								17597277.24	4789302.67	5.20	0.00
								17597275.39	4789296.38	5.20	0.00
								17597268.10	4789298.52	5.20	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597267.68	4789298.42	5.00	0.00
								17597277.63	4789295.52	5.00	0.00
								17597275.51	4789288.27	5.00	0.00
								17597265.55	4789291.17	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597265.46	4789290.72	5.00	0.00
								17597274.89	4789288.13	5.00	0.00
								17597273.03	4789281.35	5.00	0.00
								17597263.60	4789283.94	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597263.79	4789282.90	5.00	0.00
								17597273.54	4789280.23	5.00	0.00
								17597271.87	4789274.15	5.00	0.00
								17597262.12	4789276.83	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597261.18	4789276.47	4.70	0.00
								17597270.58	4789273.89	4.70	0.00
								17597268.58	4789266.60	4.70	0.00
								17597259.18	4789269.18	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597258.05	4789268.93	4.70	0.00
								17597269.77	4789265.71	4.70	0.00
								17597268.06	4789259.46	4.70	0.00
								17597256.33	4789262.68	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597350.40	4789408.59	5.00	0.00
								17597359.67	4789406.04	5.00	0.00
								17597357.74	4789399.02	5.00	0.00
								17597348.47	4789401.56	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.50	a	17597346.46	4789401.87	5.50	0.00
								17597353.79	4789399.86	5.50	0.00
								17597351.87	4789392.86	5.50	0.00
								17597344.54	4789394.88	5.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597343.81	4789394.89	5.00	0.00
								17597354.64	4789391.92	5.00	0.00
								17597352.80	4789385.22	5.00	0.00
								17597341.97	4789388.20	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597339.43	4789388.77	4.50	0.00
								17597352.89	4789385.08	4.50	0.00
								17597351.01	4789378.22	4.50	0.00
								17597337.55	4789381.92	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597340.41	4789380.23	5.00	0.00
								17597349.35	4789377.69	5.00	0.00
								17597347.47	4789371.05	5.00	0.00
								17597338.52	4789373.59	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597339.53	4789372.69	5.00	0.00
								17597348.15	4789370.16	5.00	0.00
								17597346.31	4789363.87	5.00	0.00
								17597337.68	4789366.40	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597331.30	4789366.53	4.70	0.00
								17597346.07	4789362.20	4.70	0.00
								17597344.10	4789355.50	4.70	0.00
								17597329.33	4789359.83	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597333.13	4789358.43	5.00	0.00
								17597343.63	4789355.35	5.00	0.00
								17597341.81	4789348.50	5.00	0.00
								17597331.31	4789351.58	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a	17597329.33	4789350.86	4.80	0.00
								17597341.41	4789347.31	4.80	0.00
								17597339.44	4789340.61	4.80	0.00
								17597327.36	4789344.15	4.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.20	a	17597328.65	4789343.58	5.20	0.00
								17597335.94	4789341.44	5.20	0.00
								17597333.94	4789334.61	5.20	0.00
								17597326.64	4789336.75	5.20	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597327.23	4789336.06	4.70	0.00
								17597334.11	4789334.04	4.70	0.00
								17597332.19	4789327.51	4.70	0.00
								17597325.32	4789329.53	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.30	a	17597316.38	4789331.20	4.30	0.00
								17597331.22	4789326.84	4.30	0.00
								17597329.32	4789320.35	4.30	0.00
								17597314.47	4789324.71	4.30	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597322.03	4789321.37	5.00	0.00
								17597331.63	4789318.55	5.00	0.00
								17597329.63	4789311.76	5.00	0.00
								17597320.04	4789314.58	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597320.10	4789314.20	5.00	0.00
								17597330.28	4789311.21	5.00	0.00
								17597328.51	4789305.16	5.00	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
								17597318.32	4789308.15	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597319.75	4789306.52	5.00	0.00
								17597327.05	4789304.38	5.00	0.00
								17597325.03	4789297.52	5.00	0.00
								17597317.74	4789299.66	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597306.84	4789302.26	5.00	0.00
								17597323.36	4789297.42	5.00	0.00
								17597321.44	4789290.86	5.00	0.00
								17597304.92	4789295.71	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597304.95	4789294.79	5.00	0.00
								17597321.78	4789289.85	5.00	0.00
								17597319.88	4789283.40	5.00	0.00
								17597303.05	4789288.34	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597312.20	4789284.15	5.00	0.00
								17597320.96	4789281.58	5.00	0.00
								17597319.07	4789275.15	5.00	0.00
								17597310.31	4789277.72	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597305.19	4789279.04	5.00	0.00
								17597318.77	4789275.05	5.00	0.00
								17597316.78	4789268.25	5.00	0.00
								17597303.19	4789272.24	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597305.49	4789270.73	5.00	0.00
								17597315.29	4789267.85	5.00	0.00
								17597313.38	4789261.34	5.00	0.00
								17597303.58	4789264.22	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597300.96	4789264.11	5.00	0.00
								17597313.79	4789260.34	5.00	0.00
								17597311.67	4789253.09	5.00	0.00
								17597298.83	4789256.86	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597303.42	4789253.96	5.00	0.00
								17597310.71	4789251.82	5.00	0.00
								17597309.10	4789246.30	5.00	0.00
								17597301.80	4789248.45	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597299.39	4789248.34	5.00	0.00
								17597306.68	4789246.20	5.00	0.00
								17597304.47	4789238.66	5.00	0.00
								17597297.17	4789240.81	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597375.76	4789396.26	5.00	0.00
								17597385.89	4789393.38	5.00	0.00
								17597383.96	4789386.60	5.00	0.00
								17597373.83	4789389.47	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a	17597374.45	4789388.73	4.80	0.00
								17597381.78	4789386.72	4.80	0.00
								17597380.12	4789380.65	4.80	0.00
								17597372.78	4789382.67	4.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597372.91	4789379.63	4.50	0.00
								17597382.25	4789377.07	4.50	0.00
								17597380.33	4789370.07	4.50	0.00
								17597370.99	4789372.63	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a	17597368.18	4789370.69	6.50	0.00
								17597376.04	4789368.38	6.50	0.00
								17597371.27	4789352.11	6.50	0.00
								17597363.41	4789354.42	6.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.50	a	17597363.36	4789353.44	6.50	0.00
								17597370.67	4789351.36	6.50	0.00
								17597366.14	4789335.39	6.50	0.00
								17597358.82	4789337.46	6.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597357.72	4789336.92	5.00	0.00
								17597367.28	4789334.12	5.00	0.00
								17597365.45	4789327.88	5.00	0.00
								17597355.89	4789330.69	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597355.01	4789326.22	5.00	0.00
								17597364.56	4789323.42	5.00	0.00
								17597362.52	4789316.45	5.00	0.00
								17597352.96	4789319.26	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597353.08	4789317.45	5.00	0.00
								17597361.29	4789315.04	5.00	0.00
								17597359.17	4789307.82	5.00	0.00
								17597350.96	4789310.23	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.00	a	17597354.24	4789307.25	7.00	0.00
								17597361.43	4789305.14	7.00	0.00
								17597359.44	4789298.37	7.00	0.00
								17597352.25	4789300.48	7.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	2.50	a	17597345.87	4789297.11	2.50	0.00
								17597352.05	4789295.29	2.50	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
								17597350.91	4789291.38	2.50	0.00
								17597344.72	4789293.20	2.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597344.62	4789291.35	5.00	0.00
								17597353.98	4789288.60	5.00	0.00
								17597351.85	4789281.35	5.00	0.00
								17597342.49	4789284.10	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597338.56	4789274.41	5.00	0.00
								17597348.13	4789271.60	5.00	0.00
								17597346.15	4789264.83	5.00	0.00
								17597336.57	4789267.64	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.00	a	17597337.10	4789266.82	6.00	0.00
								17597343.92	4789264.82	6.00	0.00
								17597342.14	4789258.77	6.00	0.00
								17597335.32	4789260.77	6.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.00	a	17597335.56	4789259.54	7.00	0.00
								17597342.86	4789257.40	7.00	0.00
								17597341.12	4789251.48	7.00	0.00
								17597333.82	4789253.62	7.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.00	a	17597333.04	4789253.41	4.00	0.00
								17597340.33	4789251.27	4.00	0.00
								17597338.40	4789244.67	4.00	0.00
								17597331.10	4789246.81	4.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597331.85	4789246.02	5.00	0.00
								17597339.18	4789244.00	5.00	0.00
								17597337.58	4789238.17	5.00	0.00
								17597330.24	4789240.19	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.00	a	17597330.19	4789239.77	6.00	0.00
								17597338.24	4789237.40	6.00	0.00
								17597336.96	4789233.05	6.00	0.00
								17597328.91	4789235.42	6.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.00	a	17597327.15	4789235.85	6.00	0.00
								17597336.96	4789233.01	6.00	0.00
								17597335.43	4789227.80	6.00	0.00
								17597325.63	4789230.64	6.00	0.00
	~	!0100!Notes_Old_Buildings	x	0	0.21	5.00	a	17597345.64	4789238.24	5.00	0.00
								17597351.45	4789236.64	5.00	0.00
								17597349.37	4789229.07	5.00	0.00
								17597343.56	4789230.66	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a	17597451.18	4789380.95	4.80	0.00
								17597458.72	4789378.81	4.80	0.00
								17597456.19	4789369.91	4.80	0.00
								17597448.65	4789372.05	4.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597446.93	4789367.64	4.50	0.00
								17597458.82	4789364.26	4.50	0.00
								17597456.65	4789356.59	4.50	0.00
								17597444.75	4789359.97	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597443.94	4789356.21	4.50	0.00
								17597455.62	4789352.89	4.50	0.00
								17597453.50	4789345.43	4.50	0.00
								17597441.82	4789348.75	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597438.56	4789345.21	5.00	0.00
								17597449.84	4789342.01	5.00	0.00
								17597447.61	4789334.17	5.00	0.00
								17597436.33	4789337.37	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597432.67	4789334.11	5.00	0.00
								17597443.95	4789330.91	5.00	0.00
								17597441.82	4789323.41	5.00	0.00
								17597430.54	4789326.62	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597430.99	4789321.73	4.50	0.00
								17597441.12	4789318.85	4.50	0.00
								17597439.00	4789311.41	4.50	0.00
								17597428.87	4789314.29	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597434.07	4789308.50	5.00	0.00
								17597443.51	4789305.81	5.00	0.00
								17597441.46	4789298.61	5.00	0.00
								17597432.02	4789301.29	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597429.80	4789297.00	5.00	0.00
								17597438.17	4789294.62	5.00	0.00
								17597436.09	4789287.31	5.00	0.00
								17597427.73	4789289.69	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597427.28	4789284.91	4.50	0.00
								17597434.88	4789282.75	4.50	0.00
								17597432.68	4789275.02	4.50	0.00
								17597425.08	4789277.18	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597419.62	4789274.99	4.50	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
								17597427.24	4789272.83	4.50	0.00
								17597424.76	4789264.11	4.50	0.00
								17597417.14	4789266.27	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597415.36	4789263.11	5.00	0.00
								17597423.73	4789260.73	5.00	0.00
								17597421.70	4789253.58	5.00	0.00
								17597413.33	4789255.96	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597413.02	4789251.19	5.00	0.00
								17597420.58	4789249.04	5.00	0.00
								17597418.50	4789241.73	5.00	0.00
								17597410.94	4789243.88	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597414.02	4789238.42	5.00	0.00
								17597422.09	4789236.13	5.00	0.00
								17597419.93	4789228.54	5.00	0.00
								17597411.86	4789230.84	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.00	a	17597406.21	4789227.70	7.00	0.00
								17597413.61	4789225.60	7.00	0.00
								17597411.52	4789218.24	7.00	0.00
								17597404.12	4789220.35	7.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	6.00	a	17597490.20	4789367.33	6.00	0.00
								17597496.37	4789365.58	6.00	0.00
								17597493.71	4789356.22	6.00	0.00
								17597487.55	4789357.98	6.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597482.70	4789356.53	4.70	0.00
								17597491.21	4789354.11	4.70	0.00
								17597489.03	4789346.42	4.70	0.00
								17597480.52	4789348.84	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597479.49	4789344.88	4.70	0.00
								17597491.11	4789341.58	4.70	0.00
								17597488.91	4789333.86	4.70	0.00
								17597477.30	4789337.15	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597478.57	4789332.27	5.00	0.00
								17597490.70	4789328.82	5.00	0.00
								17597488.51	4789321.12	5.00	0.00
								17597476.38	4789324.56	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597476.65	4789319.58	5.00	0.00
								17597488.30	4789316.27	5.00	0.00
								17597486.32	4789309.30	5.00	0.00
								17597474.67	4789312.61	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597473.23	4789307.60	5.00	0.00
								17597484.00	4789304.55	5.00	0.00
								17597481.86	4789296.99	5.00	0.00
								17597471.09	4789300.05	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597467.23	4789297.08	4.70	0.00
								17597483.27	4789292.52	4.70	0.00
								17597480.79	4789283.80	4.70	0.00
								17597464.75	4789288.35	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597463.04	4789285.92	5.00	0.00
								17597473.16	4789283.05	5.00	0.00
								17597471.03	4789275.54	5.00	0.00
								17597460.90	4789278.42	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597460.09	4789273.70	4.70	0.00
								17597471.94	4789270.33	4.70	0.00
								17597469.70	4789262.42	4.70	0.00
								17597457.85	4789265.78	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	7.00	a	17597460.22	4789261.29	7.00	0.00
								17597468.36	4789258.98	7.00	0.00
								17597466.41	4789252.09	7.00	0.00
								17597458.26	4789254.40	7.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.50	a	17597457.31	4789249.56	5.50	0.00
								17597465.76	4789247.16	5.50	0.00
								17597463.65	4789239.74	5.50	0.00
								17597455.21	4789242.14	5.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597453.60	4789238.00	4.50	0.00
								17597461.57	4789235.74	4.50	0.00
								17597459.46	4789228.30	4.50	0.00
								17597451.48	4789230.56	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a	17597446.10	4789227.85	4.80	0.00
								17597457.01	4789224.75	4.80	0.00
								17597454.81	4789216.99	4.80	0.00
								17597443.89	4789220.09	4.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597447.00	4789214.46	4.70	0.00
								17597459.31	4789210.97	4.70	0.00
								17597457.19	4789203.53	4.70	0.00
								17597444.89	4789207.02	4.70	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597449.37	4789200.63	4.70	0.00
								17597458.47	4789198.04	4.70	0.00
								17597455.89	4789188.94	4.70	0.00
								17597446.78	4789191.52	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.70	a	17597532.02	4789353.24	4.70	0.00
								17597540.99	4789350.69	4.70	0.00
								17597538.34	4789341.34	4.70	0.00
								17597529.37	4789343.89	4.70	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597529.32	4789341.46	4.50	0.00
								17597542.34	4789337.76	4.50	0.00
								17597540.00	4789329.53	4.50	0.00
								17597526.98	4789333.23	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a	17597526.86	4789329.37	4.80	0.00
								17597539.92	4789325.66	4.80	0.00
								17597537.57	4789317.38	4.80	0.00
								17597524.51	4789321.09	4.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.80	a	17597519.61	4789317.74	4.80	0.00
								17597530.04	4789314.77	4.80	0.00
								17597527.93	4789307.36	4.80	0.00
								17597517.50	4789310.32	4.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597517.64	4789305.98	5.00	0.00
								17597527.10	4789303.30	5.00	0.00
								17597524.89	4789295.51	5.00	0.00
								17597515.43	4789298.20	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597509.55	4789294.93	5.00	0.00
								17597523.11	4789291.08	5.00	0.00
								17597521.06	4789283.87	5.00	0.00
								17597507.51	4789287.72	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597511.54	4789282.08	5.00	0.00
								17597524.22	4789278.48	5.00	0.00
								17597521.98	4789270.62	5.00	0.00
								17597509.31	4789274.22	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597512.30	4789269.47	5.00	0.00
								17597520.79	4789267.06	5.00	0.00
								17597518.71	4789259.73	5.00	0.00
								17597510.22	4789262.14	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597509.64	4789257.90	5.00	0.00
								17597519.09	4789255.22	5.00	0.00
								17597516.87	4789247.40	5.00	0.00
								17597507.42	4789250.08	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597498.14	4789247.62	5.00	0.00
								17597509.53	4789244.39	5.00	0.00
								17597507.43	4789237.00	5.00	0.00
								17597496.04	4789240.24	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597494.61	4789236.62	5.00	0.00
								17597506.24	4789233.32	5.00	0.00
								17597504.11	4789225.84	5.00	0.00
								17597492.49	4789229.14	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597495.02	4789222.72	5.00	0.00
								17597502.26	4789220.66	5.00	0.00
								17597500.16	4789213.26	5.00	0.00
								17597492.92	4789215.31	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597495.98	4789210.79	5.00	0.00
								17597504.04	4789208.50	5.00	0.00
								17597501.71	4789200.30	5.00	0.00
								17597493.65	4789202.59	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	5.00	a	17597484.57	4789200.61	5.00	0.00
								17597495.98	4789197.37	5.00	0.00
								17597493.88	4789189.99	5.00	0.00
								17597482.47	4789193.23	5.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	4.50	a	17597475.10	4789190.26	4.50	0.00
								17597486.42	4789187.04	4.50	0.00
								17597483.75	4789177.64	4.50	0.00
								17597472.43	4789180.86	4.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	18.50	a	17597703.23	4789478.52	18.50	0.00
								17597824.24	4789461.69	18.50	0.00
								17597828.28	4789490.74	18.50	0.00
								17597707.28	4789507.58	18.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	35.50	a	17597703.23	4789478.52	35.50	0.00
								17597707.28	4789507.58	35.50	0.00
								17597676.01	4789511.93	35.50	0.00
								17597671.96	4789482.87	35.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	21.00	a	17597671.96	4789482.87	21.00	0.00
								17597676.01	4789511.93	21.00	0.00
								17597639.37	4789517.02	21.00	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
								17597635.32	4789487.97	21.00	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	67.50	a	17597635.32	4789487.97	67.50	0.00
								17597639.37	4789517.02	67.50	0.00
								17597607.98	4789521.39	67.50	0.00
								17597603.94	4789492.33	67.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	38.20	a	17597603.94	4789492.33	38.20	0.00
								17597607.98	4789521.39	38.20	0.00
								17597502.17	4789536.11	38.20	0.00
								17597498.13	4789507.05	38.20	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	18.50	a	17597498.13	4789507.05	18.50	0.00
								17597502.17	4789536.11	18.50	0.00
								17597489.79	4789537.83	18.50	0.00
								17597485.75	4789508.77	18.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	31.80	a	17597603.94	4789492.33	31.80	0.00
								17597635.32	4789487.97	31.80	0.00
								17597633.72	4789476.41	31.80	0.00
								17597602.34	4789480.77	31.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	13.80	a	17597633.72	4789476.41	13.80	0.00
								17597635.32	4789487.97	13.80	0.00
								17597650.23	4789485.89	13.80	0.00
								17597648.62	4789474.33	13.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	8.80	a	17597648.62	4789474.33	8.80	0.00
								17597650.23	4789485.89	8.80	0.00
								17597679.15	4789481.87	8.80	0.00
								17597677.54	4789470.31	8.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	20.80	a	17597677.54	4789470.31	20.80	0.00
								17597679.15	4789481.87	20.80	0.00
								17597703.23	4789478.52	20.80	0.00
								17597701.63	4789466.96	20.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	8.80	a	17597701.63	4789466.96	8.80	0.00
								17597703.23	4789478.52	8.80	0.00
								17597740.54	4789473.33	8.80	0.00
								17597738.93	4789461.77	8.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	8.80	a	17597745.65	4789460.84	8.80	0.00
								17597747.26	4789472.40	8.80	0.00
								17597778.48	4789468.05	8.80	0.00
								17597776.88	4789456.49	8.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	14.80	a	17597602.34	4789480.77	14.80	0.00
								17597603.94	4789492.33	14.80	0.00
								17597559.77	4789498.48	14.80	0.00
								17597558.16	4789486.92	14.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	20.80	a	17597558.16	4789486.92	20.80	0.00
								17597559.77	4789498.48	20.80	0.00
								17597535.86	4789501.80	20.80	0.00
								17597534.25	4789490.24	20.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	8.80	a	17597534.25	4789490.24	8.80	0.00
								17597535.86	4789501.80	8.80	0.00
								17597485.75	4789508.77	8.80	0.00
								17597484.14	4789497.21	8.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	22.80	a	17597487.25	4789497.79	22.80	0.00
								17597510.34	4789663.80	22.80	0.00
								17597460.86	4789670.68	22.80	0.00
								17597462.82	4789684.79	22.80	0.00
								17597431.06	4789689.20	22.80	0.00
								17597412.18	4789553.47	22.80	0.00
								17597442.20	4789549.30	22.80	0.00
								17597436.02	4789504.92	22.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	17.80	a	17597439.11	4789527.11	17.80	0.00
								17597442.20	4789549.30	17.80	0.00
								17597419.84	4789552.41	17.80	0.00
								17597416.75	4789530.22	17.80	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	19.50	a	17597415.07	4789574.20	19.50	0.00
								17597425.03	4789645.80	19.50	0.00
								17597372.24	4789653.14	19.50	0.00
								17597367.57	4789619.51	19.50	0.00
								17597094.72	4789657.46	19.50	0.00
								17597091.91	4789637.30	19.50	0.00
								17597116.84	4789633.83	19.50	0.00
								17597114.36	4789616.03	19.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	24.50	a	17597412.25	4789553.97	24.50	0.00
								17597344.63	4789563.37	24.50	0.00
								17597347.44	4789583.61	24.50	0.00
								17597415.07	4789574.20	24.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	19.50	a	17597344.63	4789563.37	19.50	0.00
								17597347.44	4789583.61	19.50	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
								17597317.64	4789587.75	19.50	0.00
								17597314.83	4789567.52	19.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	13.50	a	17597307.99	4789563.10	13.50	0.00
								17597293.85	4789565.07	13.50	0.00
								17597296.04	4789580.80	13.50	0.00
								17597310.17	4789578.83	13.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	20.30	a	17597316.03	4789626.68	20.30	0.00
								17597279.93	4789631.70	20.30	0.00
								17597282.64	4789651.15	20.30	0.00
								17597318.74	4789646.13	20.30	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	10.50	a	17597265.41	4789595.02	10.50	0.00
								17597257.36	4789596.14	10.50	0.00
								17597256.72	4789591.53	10.50	0.00
								17597264.77	4789590.41	10.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	15.50	a	17597256.72	4789591.53	15.50	0.00
								17597257.36	4789596.14	15.50	0.00
								17597211.91	4789602.46	15.50	0.00
								17597210.28	4789590.71	15.50	0.00
								17597258.56	4789583.99	15.50	0.00
								17597259.55	4789591.14	15.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	32.50	a	17597216.94	4789640.46	32.50	0.00
								17597220.94	4789669.26	32.50	0.00
								17597194.46	4789672.94	32.50	0.00
								17597190.45	4789644.14	32.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	27.50	a	17597193.20	4789663.87	27.50	0.00
								17597190.45	4789644.14	27.50	0.00
								17597172.82	4789646.60	27.50	0.00
								17597175.57	4789666.32	27.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	12.50	a	17597204.31	4789590.02	12.50	0.00
								17597201.98	4789573.31	12.50	0.00
								17597177.45	4789576.72	12.50	0.00
								17597179.77	4789593.44	12.50	0.00
		!0102!Notes_Surrounding_Buildings	x	0	0.21	16.00	a	17597120.96	4789615.11	16.00	0.00
								17597175.22	4789607.56	16.00	0.00
								17597172.01	4789584.50	16.00	0.00
								17597117.75	4789592.05	16.00	0.00
	~	!0100!Notes_Old_Buildings	x	0	0.21	5.00	a	17597420.01	4789342.83	5.00	0.00
								17597427.70	4789370.40	5.00	0.00
								17597421.25	4789372.19	5.00	0.00
								17597413.57	4789344.63	5.00	0.00
	~	!0100!Notes_Old_Buildings	x	0	0.21	4.00	a	17597381.38	4789312.48	4.00	0.00
								17597386.89	4789328.62	4.00	0.00
								17597396.07	4789325.49	4.00	0.00
								17597390.55	4789309.35	4.00	0.00
	~	!0100!Notes_Old_Buildings	x	0	0.21	4.00	a	17597396.07	4789325.49	4.00	0.00
								17597385.83	4789328.98	4.00	0.00
								17597391.50	4789345.58	4.00	0.00
								17597401.74	4789342.08	4.00	0.00
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a	17597348.94	4789241.95	12.50	0.00
								17597351.42	4789250.41	12.50	0.00
								17597354.21	4789249.59	12.50	0.00
								17597353.85	4789248.39	12.50	0.00
								17597356.80	4789247.53	12.50	0.00
								17597357.15	4789248.73	12.50	0.00
								17597359.93	4789247.91	12.50	0.00
								17597359.58	4789246.71	12.50	0.00
								17597365.92	4789244.85	12.50	0.00
								17597366.28	4789246.05	12.50	0.00
								17597371.65	4789244.48	12.50	0.00
								17597371.30	4789243.28	12.50	0.00
								17597377.63	4789241.42	12.50	0.00
								17597377.98	4789242.62	12.50	0.00
								17597380.77	4789241.80	12.50	0.00
								17597378.28	4789233.34	12.50	0.00
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a	17597348.94	4789241.95	12.50	0.00
								17597346.46	4789233.49	12.50	0.00
								17597349.24	4789232.67	12.50	0.00
								17597349.59	4789233.87	12.50	0.00
								17597352.54	4789233.01	12.50	0.00
								17597352.19	4789231.81	12.50	0.00
								17597354.97	4789230.99	12.50	0.00
								17597355.32	4789232.19	12.50	0.00
								17597361.66	4789230.33	12.50	0.00
								17597361.31	4789229.13	12.50	0.00
								17597366.69	4789227.55	12.50	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
								17597367.04	4789228.75	12.50	0.00
								17597373.37	4789226.89	12.50	0.00
								17597373.02	4789225.69	12.50	0.00
								17597375.80	4789224.88	12.50	0.00
								17597378.28	4789233.34	12.50	0.00
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a	17597358.77	4789275.46	12.50	0.00
								17597361.25	4789283.92	12.50	0.00
								17597364.04	4789283.11	12.50	0.00
								17597363.69	4789281.91	12.50	0.00
								17597366.63	4789281.04	12.50	0.00
								17597366.98	4789282.24	12.50	0.00
								17597369.77	4789281.43	12.50	0.00
								17597369.41	4789280.23	12.50	0.00
								17597375.76	4789278.37	12.50	0.00
								17597376.11	4789279.57	12.50	0.00
								17597381.48	4789277.99	12.50	0.00
								17597381.13	4789276.79	12.50	0.00
								17597387.46	4789274.93	12.50	0.00
								17597387.82	4789276.13	12.50	0.00
								17597390.60	4789275.32	12.50	0.00
								17597388.12	4789266.85	12.50	0.00
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a	17597358.77	4789275.46	12.50	0.00
								17597356.29	4789267.00	12.50	0.00
								17597359.07	4789266.18	12.50	0.00
								17597359.42	4789267.38	12.50	0.00
								17597362.37	4789266.52	12.50	0.00
								17597362.02	4789265.32	12.50	0.00
								17597364.80	4789264.50	12.50	0.00
								17597365.15	4789265.70	12.50	0.00
								17597371.50	4789263.84	12.50	0.00
								17597371.14	4789262.64	12.50	0.00
								17597376.52	4789261.07	12.50	0.00
								17597376.87	4789262.27	12.50	0.00
								17597383.20	4789260.41	12.50	0.00
								17597382.85	4789259.21	12.50	0.00
								17597385.63	4789258.39	12.50	0.00
								17597388.12	4789266.85	12.50	0.00
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a	17597368.97	4789310.22	12.50	0.00
								17597371.45	4789318.69	12.50	0.00
								17597374.23	4789317.87	12.50	0.00
								17597373.88	4789316.67	12.50	0.00
								17597376.83	4789315.81	12.50	0.00
								17597377.18	4789317.01	12.50	0.00
								17597379.96	4789316.19	12.50	0.00
								17597379.61	4789314.99	12.50	0.00
								17597385.95	4789313.13	12.50	0.00
								17597386.31	4789314.33	12.50	0.00
								17597391.68	4789312.75	12.50	0.00
								17597391.33	4789311.55	12.50	0.00
								17597397.66	4789309.69	12.50	0.00
								17597398.01	4789310.89	12.50	0.00
								17597400.80	4789310.08	12.50	0.00
								17597398.31	4789301.62	12.50	0.00
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a	17597368.97	4789310.22	12.50	0.00
								17597366.49	4789301.76	12.50	0.00
								17597369.27	4789300.95	12.50	0.00
								17597369.62	4789302.15	12.50	0.00
								17597372.57	4789301.28	12.50	0.00
								17597372.22	4789300.08	12.50	0.00
								17597375.00	4789299.27	12.50	0.00
								17597375.35	4789300.46	12.50	0.00
								17597381.69	4789298.60	12.50	0.00
								17597381.34	4789297.40	12.50	0.00
								17597386.72	4789295.83	12.50	0.00
								17597387.07	4789297.03	12.50	0.00
								17597393.40	4789295.17	12.50	0.00
								17597393.05	4789293.97	12.50	0.00
								17597395.83	4789293.15	12.50	0.00
								17597398.31	4789301.62	12.50	0.00
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a	17597384.66	4789363.71	12.50	0.00
								17597387.14	4789372.18	12.50	0.00
								17597389.93	4789371.36	12.50	0.00
								17597389.57	4789370.16	12.50	0.00
								17597392.52	4789369.30	12.50	0.00
								17597392.87	4789370.50	12.50	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
								17597395.66	4789369.68	12.50	0.00
								17597395.30	4789368.48	12.50	0.00
								17597401.65	4789366.62	12.50	0.00
								17597402.00	4789367.82	12.50	0.00
								17597407.37	4789366.24	12.50	0.00
								17597407.02	4789365.04	12.50	0.00
								17597413.35	4789363.18	12.50	0.00
								17597413.70	4789364.38	12.50	0.00
								17597416.49	4789363.57	12.50	0.00
								17597414.01	4789355.11	12.50	0.00
		!0101!Notes_Project_Buildings	x	0	0.21	12.50	a	17597384.66	4789363.71	12.50	0.00
								17597382.18	4789355.25	12.50	0.00
								17597384.96	4789354.44	12.50	0.00
								17597385.31	4789355.64	12.50	0.00
								17597388.26	4789354.77	12.50	0.00
								17597387.91	4789353.57	12.50	0.00
								17597390.69	4789352.76	12.50	0.00
								17597391.04	4789353.96	12.50	0.00
								17597397.39	4789352.09	12.50	0.00
								17597397.03	4789350.90	12.50	0.00
								17597402.41	4789349.32	12.50	0.00
								17597402.76	4789350.52	12.50	0.00
								17597409.09	4789348.66	12.50	0.00
								17597408.74	4789347.46	12.50	0.00
								17597411.52	4789346.64	12.50	0.00
								17597414.01	4789355.11	12.50	0.00

3D Reflector

Name	M.	ID	Type	Attenuation	B	m	Height
				dB/100m	%	1/m	(m)

Geometry Absorption

Name	M.	ID	Type	Attenuation	B	m	Height	Coordinates			
				dB/100m	%	1/m	(m)	x	y	z	Ground
								(m)	(m)	(m)	(m)

Ground Absorption

Name	M.	ID	G
Rail_Yard		Rail_Yard	0.8

Geometry Absorption

Name	M.	ID	G	Coordinates	
				x	y
				(m)	(m)
Rail_Yard		Rail_Yard	0.8	17597307.64	4789506.57
				17597572.45	4789470.74
				17597538.86	4789361.99
				17597286.00	4789439.76

Contour Lines

Geometry Contour Line

Name	M.	ID	OnlyPts	Height		Coordinates		
				Begin	End	x	y	z
				(m)	(m)	(m)	(m)	(m)