

Environmental Noise Control Study Proposed Multi-Storey Mixed-Use Building

294-300 Tremblay Road
Ottawa, Ontario

Prepared for TC United Development Corporation
c/o ZW Project Management

Report PG5406-1 Revision 1 dated September 29, 2023

Table of Contents

	PAGE
1.0 Introduction.....	1
2.0 Proposed Development	1
3.0 Methodology and Noise Assessment Criteria.....	2
4.0 Methodology and Vibration Assessment Criteria	6
5.0 Analysis.....	9
6.0 Results.....	14
7.0 Discussion and Recommendations	16
7.1 Outdoor Living Areas.....	16
8.0 Summary of Findings	19
9.0 Statement of Limitations	21

Appendices

- Appendix 1** Table 12 - Summary of Reception Points and Geometry
Drawing PG5406-1 - Site Plan
Drawing PG5406-2 - Receptor Location Plan
Drawing PG5406-3 - Site Geometry
Drawing PG5406-3A - Site Geometry (REC 1-1 and REC 1-6)
Drawing PG5406-3B - Site Geometry (REC 2-1 and REC 2-6)
Drawing PG5406-3C - Site Geometry (REC 3-1 and REC 3-6)
Drawing PG5406-3D - Site Geometry (REC 4-1 and REC 4-6)
Drawing PG5406-3E - Site Geometry (REC 5)
Drawing PG5406-3F - Site Geometry (REC 5) - Enlarged
- Appendix 2** STAMSON Results
- Appendix 3** VIA Rail Train Count
VIA Rail Correspondence
O-Train Rail Train Count
OLRT Schedule 15-2 Design and Construction Requirements –
Part 2 Guideway
- Appendix 4** Roof Plan
Elevation Plans
Exterior Wall and Typical Wall Construction Details

1.0 Introduction

Paterson Group (Paterson) was commissioned by ZW Project Management on behalf of TC United Development to conduct an environmental noise control study for the proposed multi-storey mixed-use apartment building to be located at 294 to 300 Tremblay Road, in the City of Ottawa.

The objectives of the current study are to:

- Determine the primary noise sources impacting the site and compare the projected sound levels to guidelines set out by the Ministry of Environment and Climate Change (MOECC) and the City of Ottawa.
- Review the projected noise levels and offer recommendations regarding warning classes, construction materials or alternative sound barriers.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes acoustical recommendations pertaining to the design and construction of the subject development as they are understood at the time of writing this report.

This study has been conducted according to City of Ottawa document – Engineering Noise Control Guidelines (ENCG), dated January 2016, and the Ontario Ministry of the Environment Guideline NPC-300.

2.0 Proposed Development

It is understood that the proposed development will consist of a six (6) storey mixed-use apartment building with one (1) basement level. The building will consist of 1 commercial unit and 100 residential units. The building will rise 20m above grade. Associated at-grade walkways, access lanes, and landscaped areas are further anticipated. Outdoor living area – rooftop amenity area is identified on the proposed site plan.

3.0 Methodology and Noise Assessment Criteria

The City of Ottawa outlines three (3) sources of environmental noise that must be analyzed separately:

- Surface Transportation Noise
- Stationary Noise
 - new noise-sensitive development applications (noise receptors) in proximity to existing or approved stationary sources of noise, and
 - new stationary sources of noise (noise generating) in proximity to existing or approved noise-sensitive developments
- Aircraft Noise

Surface Transportation Noise

Surface roadway traffic noise, equivalent to sound level energy L_{eq} , provides a measure of the time varying noise level over a period of time. For roadways, the L_{eq} is commonly calculated on the basis of 16-hour (L_{eq16}) daytime (07:00-23:00) and 8-hour (L_{eq8}) nighttime (23:00-7:00) split to assess its impact on residential, commercial and institutional buildings.

The City of Ottawa's Official Plan dictates that the influence area must contain any of following conditions to classify as a surface transportation noise source for a subject site:

- Within 100 m of the right-of-way of an existing or proposed arterial, collector or major collector road; a light rail transit corridor; bus rapid transit, or transit priority corridor
- Within 250 m of the right-of-way for an existing or proposed highway or secondary rail line
- Within 300 m from the right of way of a proposed or existing rail corridor or a secondary main railway line
- Within 500 m of an existing 400 series provincial highway, freeway or principle main railway line.

The Environmental Noise Guidelines for Stationary and Transportation Sources – NPC-300 outlines the limitations of noise levels in relation to the location of the receptors. These can be found in the following tables:

Time Period	L _{eq} Level (dBA)
Daytime, 7:00-23:00	55
➤ Standard taken from Table 2.2a; Sound Level Limit for Outdoor Living Areas – Road and Rail	

Type of Space	Time Period	L _{eq} Level (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	Daytime 7:00-23:00	50	45
Theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	Daytime 7:00-23:00	45	40
Living/dining/den areas of residences , hospitals, nursing/retirement homes, schools, day-care centres	Daytime 7:00-23:00	45	40
Living/dining/den areas of residences , hospitals, nursing/retirement homes etc. (except schools or day-care centres)	Nighttime 23:00-7:00	45	40
Sleeping quarters of hotels/motels	Nighttime 23:00-7:00	45	40
Sleeping quarters of residences , hospitals, nursing/retirement homes, etc.	Nighttime 23:00-7:00	40	35
➤ Standards taken from Table 2.2b, Sound Level Limit for Indoor Living Areas – Road and Rail and Table 2.2c, Supplementary Sound Level Limits for Indoor Spaces – Road and Rail			

Predicted noise levels at the pane of window dictate the action required to achieve recommended noise levels. It is noted in ENCG that the limits outlined in Table 2 are for the noise levels on the interior of the window glass pane. An open window is considered to provide a 10 dBA noise reduction, while a standard closed window is capable to provide a minimum 20 dBA noise reduction. The noise level limits of residential building are 45 dBA daytime and 40 dBA nighttime. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, central air conditioning will be required, and the building components will require higher levels of sound attenuation.

When the noise levels are equal to or less than the specified criteria, no noise attenuation (control) measures are required.

When the exceedance of the recommended noise level limits is between 1 dBA and 5 dBA for outdoor living areas ($55 \text{ dBA} < L_{eq} \leq 60 \text{ dBA}$), the proposed development can be completed with no noise control measures incorporated into the site, but the prospective purchasers / tenants should be made aware by suitable Warning Clauses. When the exceedance of recommended noise level limits is more than 5 dBA for outdoor living areas ($L_{eq} > 60 \text{ dBA}$), noise control measures are required to reduce L_{eq} to below 60 dBA and as close as 55 dBA as it is technically and economically feasible.

Noise attenuation (control) measures include any or all of the following:

- Noise attenuation barrier
- Provisions for the installation of central air conditioning
- Central air conditioning
- Architectural components designed to provide additional acoustic insulation

In addition to the implementation of noise attenuation features, if required, the following Warning Clauses may be recommended to advise the prospective purchasers / tenants of affected units of potential environmental noise problem:

Leq (dBA)	Warning Clause	Description
$55 \text{ dBA} < L_{eq(16)} \leq 60 \text{ dBA}$	Warning Clause Type A	"Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air traffic) may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."
$60 \text{ dBA} < L_{eq(16)}$	Warning Clause Type B	"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic (rail traffic) (air traffic) may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."
➤ Clauses taken from section C8 Warning Clauses; Environmental Noise Guidelines for Stationary and Transportation Sources - NPC-300		

Table 4 – Warning Clauses for Indoor Living Areas		
Leq (dBA)	Warning Clause	Description
$55 \text{ dBA} < L_{\text{eq}(16)} \leq 65 \text{ dBA}$ $50 \text{ dBA} < L_{\text{eq}(8)} \leq 60 \text{ dBA}$	Warning Clause Type C	"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning 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."
$65 \text{ dBA} < L_{\text{eq}(16)}$ $60 \text{ dBA} < L_{\text{eq}(8)}$	Warning Clause Type D	"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."
➤ Clauses taken from section C8 Warning Clauses; Environmental Noise Guidelines for Stationary and Transportation Sources - NPC-300		

Stationary Noise

Stationary noise sources include sources or facilities that are fixed or mobile and can cause a combination of sound and vibration levels emitted beyond the property line. These sources may include commercial air conditioner units, generators, and fans. Facilities that may contribute to stationary noise may include car washes, snow disposal sites, transit stations and manufacturing facilities.

The subject site is not in proximity to existing or approved stationary sources of noise. Therefore, a stationary noise analysis will not be required.

Aircraft / Airport Noise

The subject site is not located within the Airport Vicinity Development Zone. Therefore this project will not require an aircraft/airport noise analysis. No warning clauses regarding aircraft or airport noise will be required.

4.0 Methodology and Vibration Assessment Criteria

Due to the locations of the existing VIA-Train Railway Alexandria-Ottawa Corridor, O-train Railway Confederation Line, and O-train Railway Maintenance and Storage Facility (MSF) Connector Tunnel, a ground vibration and ground-borne noise review was also performed for this building.

Effects of the Rail Corridor on the Proposed Development

The human body can be affected by exposure to vibration, in particular ground-borne vibrations occurring at low frequencies. These can be caused by the surrounding vibration sources previously identified, such as wheels on a road or rail system. These ground-borne vibrations can cause the building to shake (ground-borne vibration) and/or cause rumbling sounds (ground-borne noise).

The methods of defining and measuring vibrations has its own challenges, based on the oscillatory motion identified as a vibration. Due to the nature of the oscillatory motion of the vibration, there is no net movement of the vibration element, and therefore motion descriptors are zero.

There are two (2) main methods of defining the magnitude of the overall vibration. The main one utilized in construction activities is the peak particle velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration signal and is often used when monitoring blasting vibrations and is ideal for evaluating the potential for building damage.

However, human responses require a different method of analysis as the human body requires time to respond to vibration signals. The average vibration amplitude would be an applicable method of reporting the ground-borne vibrations that humans would respond to, however, with the vibration being represented as a sine wave, the average vibration amplitude would be zero. Therefore, the root mean square (RMS) amplitude, typically calculated over a 1 second interval, is utilized for the analysis. The RMS value is always less than the PPV.

General factors that could affect the magnitude of the created vibrations include, but are not limited to, whether the rail is above grade or below grade, speed, vehicle suspension, wheel and track condition, track support system, depth of system and soil conditions. It should be noted that vibrations that travel through the bedrock surface should be minimal, but can travel a further distance.

The Federal Transit Administration’s Transit Noise and Vibration Impact Assessment Manual: FTA Report No. 0123 dated September 2018 outlines the vibration standards caused by rail sources. Upon review of this document, the following standards were obtained that are applicable to this analysis.

Screening distances are set based on land-use categories and the type of project vehicles. VIA-Train Railway Alexandria-Ottawa Corridor is considered Locomotive Powered Passenger or Freight Vehicle, and O-Train Railway Confederation Line and O-Train Railway MSF Connector Tunnel are considered Rapid Transit or Light Rail Vehicle. The proposed building would be classified as a Vibration Category 2 - Residential. Therefore, the screening distance is 61 metres (200 ft) for Locomotive Powered Vehicle and 46 metres (150 ft) for Light Rail Vehicle. Vibration assessment is required only when the proposed building is located within the screening distance from the railway.

The criteria for the environmental impact from vibrations are based on the RMS vibration levels for repeated events. The proposed building would be classified as a Vibration Category 2 - Residential. The following table outlines the limits for ground-borne vibrations.

Table 5 - Ground-Borne Vibration (GBV) for General Assessment			
Land Use Category	GBV Impact Levels (VdB re 1 micro-inch/sec)		
	Frequent Events	Occasional Events	Infrequent Events
Category 2	72 VdB	75 VdB	80 VdB
Notes: <ul style="list-style-type: none"> ➤ Standards taken from Table 6.3; Indoor Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for General Vibration Assessment. ➤ Frequent events is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category. ➤ Occasional events is define as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations. ➤ Infrequent events is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines. 			

Ground-borne vibration can also result in ground-borne noise. This is separate from the noise caused by the trains directly, and instead focuses on the vibration of objects to emit noise. Similar to ground-borne vibration, the noise impacts are based on a criteria for human annoyance and activity interference. For residential buildings, the criteria for acceptability is given in the table on the following page:

Table 6 - Ground-Borne Noise (GBN) for General Assessment			
Land Use Category	GBN Impact Levels (dBA re 20 micro Pascals)		
	Frequent Events	Occasional Events	Infrequent Events
Category 2	35 dBA	38 dBA	43 dBA
Notes: <ul style="list-style-type: none"> ➤ Standards taken from Table 6.3; Indoor Ground-Borne Vibration and Ground-Borne Noise Impact Criteria for General Vibration Assessment. ➤ Frequent events is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category. ➤ Occasional events is define as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations. ➤ Infrequent events is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines. 			

5.0 Analysis

Surface Transportation Noise

The proposed development is bordered to the north by Tremblay Road followed by a rail corridor and Highway 417, to the east by Belfast Road followed by an underground rail connector tunnel, residential dwellings, and roadways, to the west by a parking lot, commercial buildings, and roadways, and to the south by residential dwellings, commercial buildings, and a rail corridor. Tremblay Road, Belfast Road, Avenue N, Avenue L, and Avenue K are identified within the 100 m radius of the proposed building.

Based on the City of Ottawa Official Plan, Schedule C4, Tremblay Road is considered a 2-lane major collector road (2-UMCU). The section of Belfast Road north of Tremblay Road is also considered a 2-lane major collector road (2-UMCU). The section of Belfast Road south of Tremblay Road is considered a 2-lane urban collector road (2-UCU). All other roads within the 100 m radius are not classified as either arterial, collector or major collector roads and are therefore not included in this study. Additionally, the 4-lane Highway 417 Westbound, 4-lane Highway 417 Eastbound are located within the 500 m radius of the proposed building.

The VIA-Train Railway Alexandria-Ottawa Corridor and O-Train Railway Confederation Line are identified within 300 m of the proposed development. It is understood that the Alexandria-Ottawa Corridor is used by VIA-Train Rail, and Confederation Line is used by O-Train Rail. The volume of trains along the VIA rail line is provided in the email discussion with Mr. Paul Charbachi, P.Eng. of VIA Rail Canada. Based on a phone discussion with OC Transpo personnel, the method to determine the volume of trains along the rail line is to count the number of departures off of the rail schedules. The copies of train schedules are included in Appendix 3. It was further confirmed by VIA Rail Canada and OC Transpo, respectively, that each VIA train consists of two diesel locomotives pulling 8 cars and each O-train consists of an electronic locomotive pulling 1 car. An email confirming the Alexandria-Ottawa Rail Line information is included in Appendix 3.

The O-Train Railway MSF Connector Tunnel is also located within 300 m of the proposed building. It is understood that the MSF Connector Tunnel is a bored railway located below ground surface and therefore a surface transportation noise assessment is not required for the MSF Connector Tunnel.

All noise sources are presented in Drawing PG5406-3 - Site Geometry, located in Appendix 1.

The noise levels from road traffic are provided by the City of Ottawa, taking into consideration the right-of-way width and the implied roadway class. It is understood that these values represent the maximum allowable capacity of the proposed roadways. The parameters to be used for sound level predictions can be found below.

Table 7 – Traffic and Road Parameters						
Road	Implied Roadway	AADT (Veh/day)	Posted Speed (km/h)	Day/Night Split %	Medium Truck %	Heavy Truck %
Highway 417 Eastbound	4-Queensway	73,332	100	92/8	7	5
Highway 417 Westbound	4-Queensway	73,332	100	92/8	7	5
Tremblay Road	2-UMCU	12,000	50	92/8	7	5
Belfast Road (North of Tremblay Road)	2-UMCU	12,000	50	92/8	7	5
Belfast Road (South of Tremblay Road)	2-UCU	8,000	50	92/8	7	5

➤ Data obtained from the City of Ottawa document ENCG

Table 8 - Rail Parameters - Daytime (0700-2300)				
Rail Line	Engine Type	Maximum Speed (km/hr)	Number of Trips/day	Length of Train
VIA Train Rail	Diesel	160	16	10
O-Train Rail	Electric	80	352	2

Table 9 - Rail Parameters - Daytime (2300-0700)				
Rail Line	Engine Type	Maximum Speed (km/hr)	Number of Trips/day	Length of Train
VIA Train Rail	Diesel	160	0	10
O-Train Rail	Electric	80	58	2

Three (3) levels of reception points were selected for this analysis. The following elevations were selected from the heights provided on the building elevation plans for the subject building.

Floor Number	Elevation at Centre of Window (m)	Floor Use	Daytime / Nighttime Analysis
First Floor	1.5	Living Area/Bedroom	Daytime / Nighttime
Sixth Floor	18.0	Living Area/Bedroom	Daytime / Nighttime
Rooftop Amenity Area	21.5	--	Outdoor Living Area

For this analysis, a reception point was taken at the centre of each floor, at the first floor and top floor. Outdoor living area – rooftop amenity area is anticipated at the proposed building. Reception points are detailed on Drawing PG5406-2 - Receptor Locations presented in Appendix 1.

All horizontal distances have been measured from the reception point to the edge of the right-of-way. The highway was analyzed where it intersected the 500 m buffer zone, the rail lines were analyzed where they intersected the 300 m buffer zone, and the roadways were analyzed where they intersected the 100 m buffer zone, which are reflected in the local angles described in Paterson Drawings PG5406-3A to 3E - Site Geometry in Appendix 1.

Table 12 - Summary of Reception Points and Geometry, located in Appendix 1, provides a summary of the points of reception and their geometry with respect to the noise sources. The analysis is completed so that no effects of sound reflection off of the building facade are considered, as stipulated by the ENGC.

The analysis was completed using STAMSON version 5.04, a computer program which uses the road and rail traffic noise prediction methods using ORNAMENT (Ontario Road Noise Analysis Method for Environment and Transportation) and STEAM (Sound from Trains Environment Analysis Method), publications from the Ontario Ministry of Environment and Energy.

The subject site is generally levelled and at grade with the neighbouring roads within the 500 m radius.

Ground-borne vibration assessment is required for the O-Train Railway MSF Connector Tunnel. However, it is noted that the distance between the VIA Railway Alexandria-Ottawa Corridor and the proposed building is 240 m (787 ft), and the distance between the O-Train Railway Confederation Line and the proposed building is 50 m (164 ft). These two distances are greater than the screening distances specified in The Federal Transit Administration's Transit Noise and Vibration Impact Assessment Manual. Therefore, ground-borne vibration assessment is not required for these two railways.

Ground-Borne Noise and Vibration

Details of rail traffic along the O-Train Railway MSF Connector Tunnel are available in the Ottawa Light Rail Transit (OLRT) Project document – Schedule 15-2 Design and Construction.

The O-Train Railway MSF Connector Tunnel is located along the eastern property line. Schedule 15-2, Part 2, Article 2 states that the maximum train speed is designed to be 30 km/hr (19 mph). The train frequency is not provided in Schedule 15-2. Based on the correspondence with City of Ottawa official, the train frequency at MSF Connector Tunnel is approximated to be the same as the train frequency between St. Laurent station to Tremblay station, which is 410 trains a day. It is understood that there will be a 30 m (98 ft) buffer zone from the centerline of MSF Connector Tunnel to the closest possible location of the proposed building.

The following figure is a base curve for ground surface vibration levels, assuming the equipment is in good condition and speeds of 80 km/hr (50 mph). Due to the nature of the Rail Line, identified as rapid transit vehicle, this figure is applicable for the proposed building.

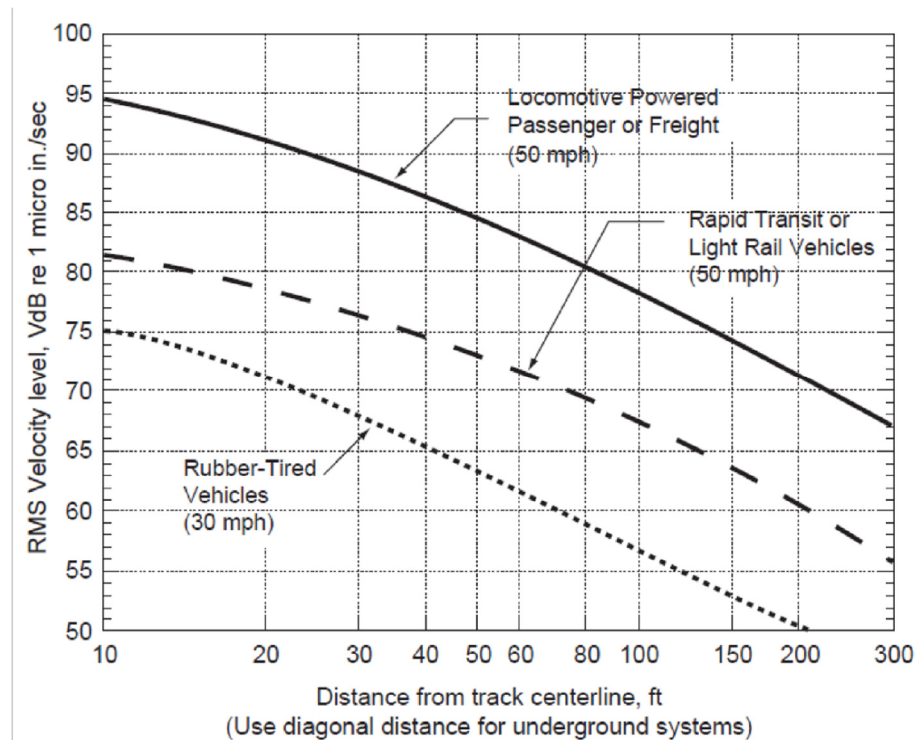


Figure 1 – Generalized Ground Surface Vibration Curve

Figure 1 provides the generalized ground surface vibration curve, but adjustments, noted in Tables 6-11, 6-12 and 6-13 of the Transit Noise and Vibration Impact Assessment, can be made to the ground-borne vibration parameters. The most common adjustments are noted below:

Speed:	Vehicle speed - 30 km/hr (19 mph)	-8.4 dB
Vehicle Parameter:	Stiff primary suspension	+8 dB
Track Treatments:	Ballast mats	-10 dB
	High-resistance fasteners	-5 dB
	Resiliently supported ties	-10 dB
Track Structure:	Bored subway tunnel in soil; Station	-5 dB
	Bored subway tunnel in soil; Cut and Cover	-3 dB
	Bored subway tunnel in soil; Rock-based	-15 dB
Ground-borne Propagation Effects:		
Geologic Conditions:	in Soil	+10 dB
	in Rock layer (50 ft bgs.)	+2 dB
Building Foundation:	1-2 Storey Masonry	-7 dB
	3-4 Storey Masonry	-10 dB
	Large Masonry on Spread Footings	-13 dB
	Foundation in rock	0 dB
Floor-to-Floor Attenuation:	1 to 5 Floors above Grade	-2 dB/Floor
	5 to 10 Floors above Grade	-1 dB/Floor
Amplification due to Resonances:		+6 dB

Details of track treatment are available in Schedule 15-2, Part 2, Article 3.
 From the review of document, the following conditions were confirmed:

- Vehicle speed - 30 km/hr (19 mph)
- Soft Primary Suspension (resonance around 8-10 Hz)
- Applied track treatment: Ballast Mats
- No track treatment: Floating slab trackbed
- No track treatment: High resilience fasteners
- No track treatment: Resiliently supported ties
- No Worn or Corrugated Track
- Track is a bored subway tunnel in soil

From a review of the geotechnical founding conditions and the proposed building, the following conditions were confirmed:

- No bedrock within 10 m below ground surface
- Proposed building to be founded on compacted sandy silt and/or glacial till
- The rail line to be constructed on (assumed) glacial till and/or bedrock
- Proposed building to be 6-storey masonry with 1-storey basement

6.0 Results

Surface Transportation Noise

The primary descriptors are the 16-hour daytime (7:00-23:00) and the 8-hour nighttime (23:00-7:00) equivalent sound levels, $L_{eq(16)}$ and $L_{eq(8)}$ for City roads.

The exterior noise levels due to roadway traffic sources were analyzed with the STAMSON version 5.04 software at all reception points. The input and output data of the STAMSON modeling can be found in Appendix 2, and the summary of the results can be found in Table 11.

Reception Point	Height Above Grade (m)	Receptor Location	Daytime $L_{eq(16)}$ (dBA)	Nighttime $L_{eq(8)}$ (dBA)
REC 1-1	1.5	Northern Elevation, 1st Floor	71	64
REC 1-6	18.0	Northern Elevation, 6th Floor	75	68
REC 2-1	1.5	Eastern Elevation, 1st Floor	69	61
REC 2-6	18.0	Eastern Elevation, 6th Floor	72	64
REC 3-1	1.5	Southern Elevation, 1st Floor	56	48
REC 3-6	18.0	Southern Elevation, 6th Floor	58	50
REC 4-1	1.5	Western Elevation, 1st Floor	67	59
REC 4-6	18.0	Western Elevation, 6th Floor	71	64
REC 5	21.5	Rooftop Amenity Area	62	--

Ground-Borne Noise and Vibration

Based on the site proximity to the rail line, the closest location of proposed building was selected for the analysis at 30 m (98'). Therefore, based on Figure 1, the ground-borne vibration before adjustments will be 68 VdB. The following adjustments are to be applied for this baseline calculation:

vehicle speed of 30 km/hr:	-8.4 dB
track treatment of ballast mats:	-10 dB
efficient propagation in soil:	+10 dB
construction of a 6-storey masonry:	-13 dB for coupling loss; -2 dB/floor for the propagation from 1 to 5 floors above grade and -1 dB/floor for the propagation from 5 to 6 floors above grade; +6 dB for the floor amplification

The result in the estimated ground-borne vibration will range between 53 VdB and 42 VdB, respectively, for the receivers at the basement floor and the sixth floor of proposed building. These values are below the 72 VdB for frequent event that is specified by the FTA and outlined in Table 5. Therefore, the ground-borne vibration satisfies the industry standards for residential uses at the proposed building.

Ground-borne noise is a common concern for buildings in close proximity to a rail line. The vibration of the transit structure excites the adjacent ground, creating vibration waves that propagate through the subsurface materials, and into the foundation of neighbouring buildings. This vibration will then be transferred throughout the building, often at the resonance frequency of the various components of the building. This ground-borne vibration of floors and walls may cause items to rattle, or it may manifest itself as a rumble, defined as ground-borne noise.

A conservative conversion from ground-borne vibration to ground-borne noise noted in Table 6-14 of the Transit Noise and Vibration Impact Assessment, can be made to the adjusted ground-borne vibration parameters. The conversion is as follow:

Low frequency (<30 Hz): -50 dB
Typical (peak 30 to 60 Hz): -35 dB
High frequency (>60 Hz): -20 dB

The proposed building will be founded on compacted sandy silt and/or glacial till, and the railway is assumed to be founded on glacial till and/or bedrock. Therefore, the peak frequency of ground vibration will be of low frequency (<30 Hz). The conservation from ground-borne vibration to ground-borne noise will result in an estimated ground-borne noise of 3 dB and 0 dB, respectively, for the receivers at the basement floor and the sixth floor of proposed building. These are below the 35 dBA for frequent event that is specified by the FTA and outlined in Table 6. Therefore, the ground-borne noise satisfies the industry standards for residential uses at the proposed building.

7.0 Discussion and Recommendations

7.1 Outdoor Living Areas

Outdoor living area – rooftop amenity area is anticipated at the proposed building. One receptor (REC 5) was selected in the centre of rooftop amenity area, 21.5 m. It is assumed that the rooftop amenity area will only be utilized as an outdoor living area provided that the proposed building is constructed. Based on the roof plan and the elevation plans presented in Appendix 4, it was understood that the stairwell and mechanical housing will be located on the northern part of the building rooftop, providing a noise shielded area for the rooftop amenity area. With the consideration of the stairwell and mechanical housing as a noise shielded zone, the proposed noise level at the rooftop amenity area will be 62 dBA, which exceeds the 55 dBA threshold value specified by the ENCG. Therefore, noise attenuation feature is required to reduce the noise level at the rooftop amenity area.

Upon review of the aforementioned result for the proposed building, a noise attenuation feature consisting of a 1 m high solid railing that will extend around the rooftop perimeter was considered. The 1 m high solid railing, in addition to utilizing the exteriors of the buildings as noise barriers, were completed as REC 5TR which is included in Appendix 2. The result of STAMSON modeling indicates that the combination of the application of exterior cladding and the 1 m high noise barrier could reduce the anticipated noise level at rooftop amenity area to 58 dBA during the daytime period (7:00-23:00), which slightly exceeds the 55 dBA threshold value specified by the ENCG. This exceedance is acceptable provided that a Warning Clause Type A is included on all deeds of sale.

7.2 Indoor Living Areas and Ventilation

The results of the STAMSON modeling indicate that the noise levels at proposed building will range between 56 dBA and 75 dBA during the daytime period (07:00-23:00) and between 48 dBA and 68 dBA during the nighttime period (23:00-07:00). The noise levels on the northern, western, southern, and eastern elevations of proposed building will exceed the limit for the exterior of the pane of glass (55 dBA) specified by the ENCG. It is also noted that the noise levels on the northern, western, and eastern elevations will exceed 65 dBA. Therefore, all units of proposed building should be supplied with a central air conditioning unit, along with the warning clause Type D, as outlined in Table 3.

This building does exceed the 65 dBA threshold for noise on the northern, western, and eastern elevations. Therefore, an analysis of the building materials is required. Based on the exterior wall and typical wall construction details received from the client, it is understood that the exterior cladding will consist of brick veneer on the first and second floor, and fibre cement panel on the third, fourth, fifth, and sixth floor. The brick veneer will consist of 90 mm brick, 25 mm air space, mortar dropping control, 102 mm semi-rigid board insulation, self-adhering air moisture barrier membrane, 13 to 16 mm glass-mat gypsum sheathing, and 13 to 16 mm Type X gypsum board. Fibre cement panel cladding will consist of 13 mm fibre cement panels, 22 mm sub-girts, 102 mm semi-rigid board insulation, 102 mm z-girts @ 400 mm O.C. MAX, self-adhering air moisture barrier membrane, 13 to 16 mm glass-mat gypsum sheathing, and 13 to 16 mm Type X gypsum board. The analysis for the acoustical properties of the proposed building was completed with all windows consisting of double pane glass, and the exterior cladding consisting of brick veneer on the first and second floor, and fibre cement panel on the third, fourth, fifth, and sixth floor. If alternative construction materials are proposed, a review will be required.

The exterior wall and typical wall construction details are presented in Appendix 4.

Proposed Construction Specifications

It is understood that typical window and wall details are proposed for the residential buildings. The effectiveness of the noise insulation can be expressed as the Acoustical Insulation Factor (AIF), calculated as follows:

$$\text{AIF} = L_{\text{eq}(16)}(\text{Exterior}) - L_{\text{eq}(16)}(\text{Interior}) + 10 \log_{10}(N) + 2 \text{ dBA}$$

Where:

$L_{\text{eq}(16)}(\text{Exterior})$ = Calculated value at the window pane

$L_{\text{eq}(16)}(\text{Interior})$ = 45 dBA

N = number of components in the room

No floor plans or detailed design drawings were provided for this portion of the review. A conservative approach is to assume that there are 2 components per room. Therefore, the AIF would need to be at least 35 dBA.

A conversion from AIF to a Standard Transmission Class (STC) rating will require the knowledge of room dimensions in addition to the wall and window dimensions. However, a conservative approach would be to increase the AIF factor by 3. **Therefore, provided the building materials of either the windows and/or exterior walls have an STC rating of 38 or higher, this would be a sufficient noise attenuation device.**

Exterior wall and typical wall construction details have been provided to Paterson and are included in Appendix 4. A review of these details indicate that the exterior cladding will consist of brick veneer on the first and second floor, and fibre cement panel on the third, fourth, fifth, and sixth floor. A review of these construction materials indicates that the exterior cladding exceeds the STC rating of 38 and is suitable for proposed noise attenuation. If alternative construction materials are proposed, a review will be required.

8.0 Summary of Findings

The subject site is located at 294 to 300 Tremblay Road, in the City of Ottawa. It is understood that the proposed development will consist of a six (6) storey mixed-use apartment building with one (1) basement level. The building will rise 20 metres above grade. There are six major sources of surface transportation noise to the proposed building: 4-lane Highway 417 Westbound, 4-lane Highway 417 Eastbound, Tremblay Road, Belfast Road, VIA-Train Railway Alexandria-Ottawa Corridor, and O-Train Railway Confederation Line. It is noted that O-Train Railway Maintenance and Storage Facility (MSF) Connector Tunnel is a bored subway tunnel. Therefore, the MSF Connector Tunnel is not a major source of surface transportation noise.

Ground-borne vibration and noise assessment is required for O-Train Railway MSF Connector Tunnel. However, VIA-Train Railway Alexandria-Ottawa Corridor and O-Train Railway Confederation Line are located at distances greater than the screening distances specified in The Federal Transit Administration's Transit Noise and Vibration Impact Assessment Manual. Therefore, ground-borne vibration and noise assessment is not required for these two railways.

Several reception points were selected for the analysis, consisting of pane of glass reception points on both the first and top level of proposed building. The anticipated ground-borne vibrations for the receivers at the first floor and the sixth floor are below the 72 VdB threshold for frequent event that is specified by the FTA. The anticipated ground-borne noises for the receivers at the first floor and the sixth floor are below the 35 dBA threshold for frequent event that is specified by the FTA. Therefore, the anticipated ground-borne noises and vibrations of the proposed building are considered acceptable without additional mitigation measures.

Outdoor living area – rooftop amenity area is anticipated at the proposed building. Utilizing the exteriors of proposed residential building and the staircase and mechanical housing at the northern part of building rooftop as noise barrier, the result of STAMSON modeling indicates that the noise level at the rooftop amenity area is expected to be 62 dBA during daytime period, which exceeds the 55 dBA threshold value specified by the ENCG. An investigation including noise barriers, which included the exterior cladding of proposed building and the staircase and mechanical housing in addition to the installation of a solid 1.0 m solid railing around the rooftop perimeter found that the anticipated noise level at the rooftop amenity area will be 58 dBA, which slightly exceeds the 55 dBA threshold. This exceedance in noise level is considered acceptable provided that the warning clause Type A is included on all deeds of sale.

Several reception points were selected for the surface transportation noise analysis, consisting of the centre of first level and top level. The results of STAMSON modeling indicate that the noise levels at the northern, eastern, southern, and western elevations of proposed building are expected to exceed the 55 dBA threshold specified by the ENCG. Also, the noise levels at the northern, eastern, and western elevations of proposed building are expected to exceed 65 dBA. Therefore, the installation of a central air conditioning unit, along with a warning clause Type D, will be required for all units of the proposed building.

The results of the surface transportation noise indicates that the noise levels will be above 65 dBA on the northern, eastern, and western elevations. A review of the building materials was completed. Paterson reviewed the exterior wall and typical wall construction details. It was determined that the exterior cladding being brick veneer on the first and second floor, and fibre cement panel on the third, fourth, fifth, and sixth floor would be suitable for proposed noise attenuation. If alternative construction materials are proposed, a review will be required.

The following warning clause is to be included on all Offers of Purchase and Sale and/or lease agreements:

" 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."

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

9.0 Statement of Limitations

The recommendations made in this report are in accordance with our present understanding of the project. Our recommendations should be reviewed when the project drawings and specifications are complete.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than TC United Development Corporation c/o ZW Project Management or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.



Yolanda Tang, M.A.Sc



Stephanie A. Boisvenue, P.Eng.

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- TC United Development Corporation c/o ZW Project Management (email copy)
- Paterson Group (1 copy)

APPENDIX 1

TABLE 12 - SUMMARY OF RECEPTION POINTS AND GEOMETRY

DRAWING PG5406-1 - SITE PLAN

DRAWING PG5406-2 - RECEPTOR LOCATION PLAN

DRAWING PG5406-3 - SITE GEOMETRY

DRAWING PG5406-3A - SITE GEOMETRY (REC 1-1 AND REC 1-6)

DRAWING PG5406-3B - SITE GEOMETRY (REC 2-1 AND REC 2-6)

DRAWING PG5406-3C - SITE GEOMETRY (REC 3-1 AND REC 3-6)

DRAWING PG5406-3D - SITE GEOMETRY (REC 4-1 AND REC 4-6)

DRAWING PG5406-3E - SITE GEOMETRY (REC 5)

DRAWING PG5406-3F - SITE GEOMETRY (REC 5) - ENLARGED

**Table 8 - Summary of Reception Points and Geometry
294 - 300 Tremblay Road**

Point of Reception	Location	Leq Day (dBA)	Belfast Road (North of Tremblay Road)						Belfast Road (South of Tremblay Road)					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)	Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)
REC 1-1	Northern Elevation, 1st Floor	71	35	1.5	35.0	-77, 0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 1-6	Northern Elevation, 6th Floor	75	35	18.0	39.4	-77, 0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 2-1	Eastern Elevation, 1st Floor	69	25	1.5	25.0	-84, -49	n/a	n/a	15	1.5	15.1	-49, 74	n/a	n/a
REC 2-6	Eastern Elevation, 6th Floor	72	25	18.0	30.8	-84, -49	n/a	n/a	15	18.0	23.4	-49, 74	n/a	n/a
REC 3-1	Southern Elevation, 1st Floor	56	n/a	n/a	n/a	n/a	n/a	n/a	30	1.5	30.0	0, 64	n/a	n/a
REC 3-6	Southern Elevation, 6th Floor	58	n/a	n/a	n/a	n/a	n/a	n/a	30	18.0	35.0	0, 64	n/a	n/a
REC 4-1	Western Elevation, 1st Floor	67	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 4-6	Western Elevation, 6th Floor	72	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 5	Rooftop Amenity Area	62	n/a	n/a	n/a	n/a	n/a	n/a	30	21.5	36.9	-32, 68	n/a	n/a

**Table 8 - Summary of Reception Points and Geometry
294 - 300 Tremblay Road**

Point of Reception	Location	Leq Day (dBA)	Tremblay Road									
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)				
REC 1-1	Northern Elevation, 1st Floor	71	5	1.5	5.2	-87, 79	n/a	n/a				
REC 1-6	Northern Elevation, 6th Floor	75	5	18.0	18.7	-87, 79	n/a	n/a				
REC 2-1	Eastern Elevation, 1st Floor	69	20	1.5	20.1	0, 72	n/a	n/a				
REC 2-6	Eastern Elevation, 6th Floor	72	20	18.0	26.9	0, 72	n/a	n/a				
REC 3-1	Southern Elevation, 1st Floor	56	n/a	n/a	n/a	n/a	n/a	n/a				
REC 3-6	Southern Elevation, 6th Floor	58	n/a	n/a	n/a	n/a	n/a	n/a				
REC 4-1	Western Elevation, 1st Floor	67	20	1.5	20.1	-84, 0	n/a	n/a				
REC 4-6	Western Elevation, 6th Floor	72	20	18.0	26.9	-84, 0	n/a	n/a				
REC 5	Rooftop Amenity Area	62	85	21.5	87.7	-85, -73 58, 74	n/a	n/a				

Table 8 - Summary of Reception Points and Geometry
294 - 300 Tremblay Road

Point of Reception	Location	Leq Day (dBA)	Highway 417 Westbound						Highway 417 Eastbound					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)	Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)
REC 1-1	Northern Elevation, 1st Floor	71	110	1.5	110.0	-82, 72	n/a	n/a	85	1.5	85.0	-89, 74	n/a	n/a
REC 1-6	Northern Elevation, 6th Floor	75	110	18.0	111.5	-82, 72	n/a	n/a	85	18.0	86.9	-89, 74	n/a	n/a
REC 2-1	Eastern Elevation, 1st Floor	69	120	1.5	120.0	0, 70	n/a	n/a	100	1.5	100.0	0, 73	n/a	n/a
REC 2-6	Eastern Elevation, 6th Floor	72	120	18.0	121.3	0, 70	n/a	n/a	100	18.0	101.6	0, 73	n/a	n/a
REC 3-1	Southern Elevation, 1st Floor	56	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 3-6	Southern Elevation, 6th Floor	58	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
REC 4-1	Western Elevation, 1st Floor	67	120	1.5	120.0	5, 90	n/a	n/a	100	1.5	100.0	2, 90	n/a	n/a
REC 4-6	Western Elevation, 6th Floor	72	120	18.0	121.3	5, 90	n/a	n/a	100	18.0	101.6	2, 90	n/a	n/a
REC 5	Rooftop Amenity Area	62	400	21.5	400.6	-87, -73 58, 71	n/a	n/a	330	21.5	330.7	-90, -73 58, 72	n/a	n/a

Point of Reception	Location	Leq Day (dBA)	VIA-Train Alexandria Rail Corridor						O-Train Confederation Line					
			Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Barrier Height (m)	Distance (m)	Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Barrier Height (m)	Distance (m)
REC 1-1	Northern Elevation, 1st Floor	71	n/a	n/a	n/a	n/a	n/a	n/a	50	1.5	50.0	-90, 73	n/a	n/a
REC 1-6	Northern Elevation, 6th Floor	75	n/a	n/a	n/a	n/a	n/a	n/a	50	18.0	53.1	-90, 73	n/a	n/a
REC 2-1	Eastern Elevation, 1st Floor	69	255	1.5	255.0	-43, 0	3	60	70	1.5	70.0	0, 72	n/a	n/a
REC 2-6	Eastern Elevation, 6th Floor	72	255	18.0	255.6	-43, 0	3	60	70	18.0	72.3	0, 72	n/a	n/a
REC 3-1	Southern Elevation, 1st Floor	56	240	1.5	240.0	-45, 30	3	60	n/a	n/a	n/a	n/a	n/a	n/a
REC 3-6	Southern Elevation, 6th Floor	58	240	18.0	240.7	-45, 30	3	60	n/a	n/a	n/a	n/a	n/a	n/a
REC 4-1	Western Elevation, 1st Floor	67	255	1.5	255.0	0, 31	3	60	70	1.5	70.0	-10, 90	n/a	n/a
REC 4-6	Western Elevation, 6th Floor	72	255	18.0	255.6	0, 31	3	60	70	18.0	72.3	-10, 90	n/a	n/a
REC 5	Rooftop Amenity Area	62	247	21.5	247.9	-43, 31	3	60	250	21.5	250.9	-10, 17	2	40

TREMBLAY ROAD

AVENUE L

BELFAST ROAD

MH

294 TREMBLAY ROAD
EXISTING BUILDING

300 TREMBLAY ROAD
EXISTING BUILDING

MECH ROOM

ELEC. ROOM

MECH. ROOM

CORRIDOR

STAIR

ELEC. CLOSET

ELEV.

STAIR

294 AND 300 TREMBLAY ROAD
PROPOSED MULTI-STOREY BUILDING

EXISTING ASPHALTIC CONCRETE
PARKING LOT

AMENITY AREA

SCALE: 1:150



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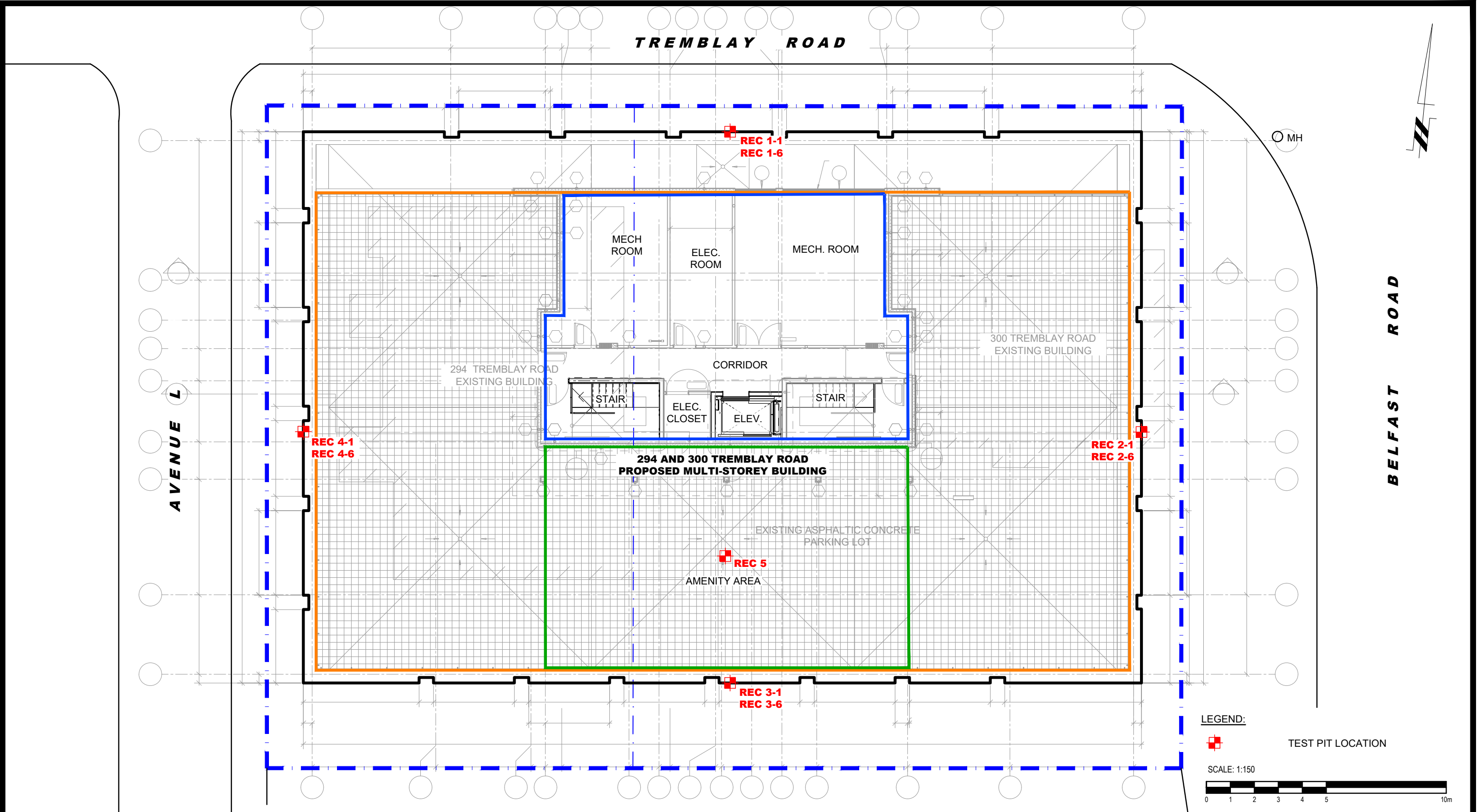
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NOISE ATTENUATION STUDY
PROPOSED MULTI-STOREY BUILDING - 294 AND 300 TREMBLAY ROAD
OTTAWA, ONTARIO
Title: **SITE PLAN**

Scale: 1:150
Drawn by: YA
Checked by: SB
Approved by: DJG

Date: 09/2020
Report No.: PG5406-1
Dwg. No.: **PG5406-1**
Revision No.: 1

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LEGEND:
 TEST PIT LOCATION

SCALE: 1:150

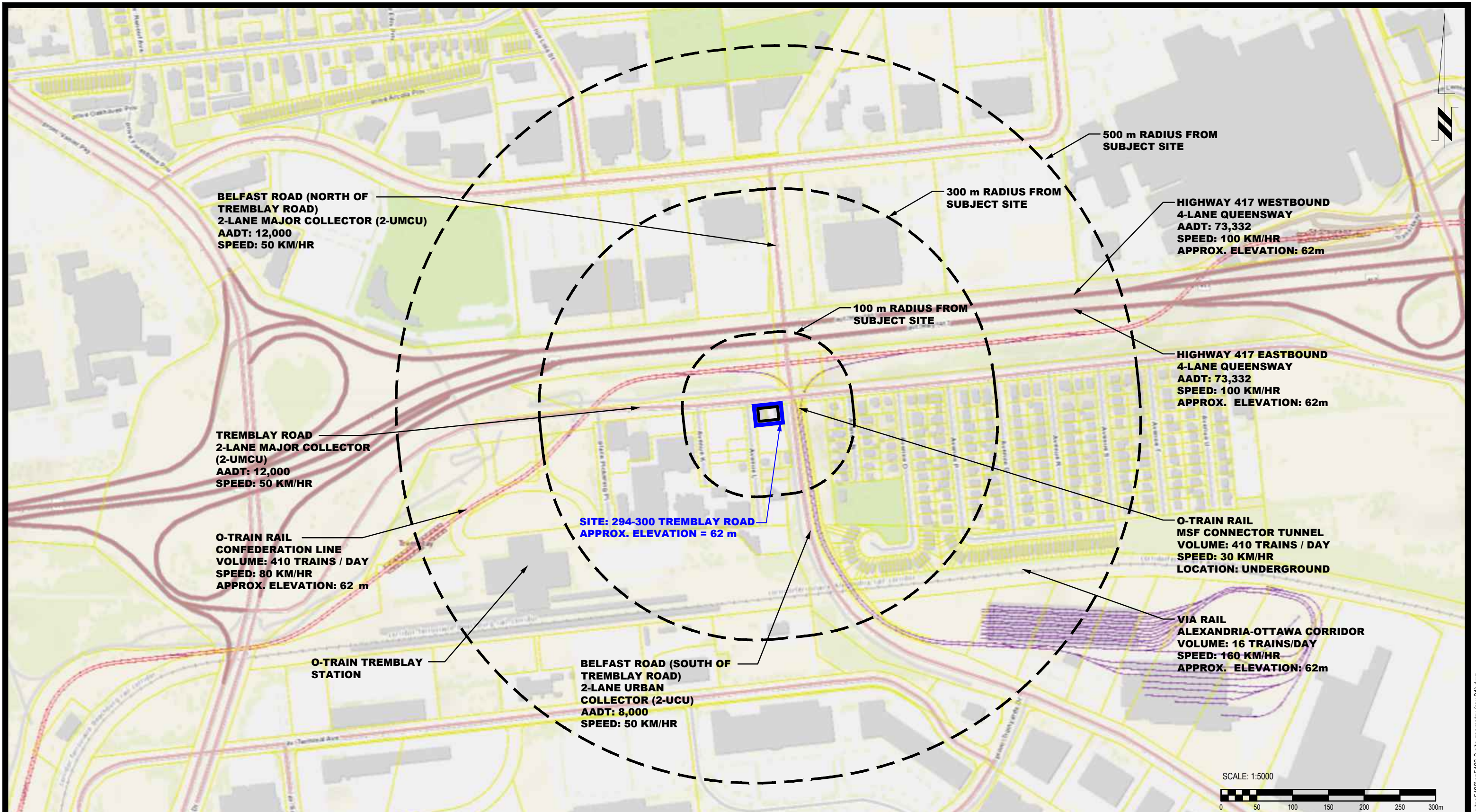
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PROPOSED MULTI-STOREY BUILDING - 294 AND 300 TREMBLAY ROAD
 OTTAWA, ONTARIO
 Title: **RECEPTOR LOCATION PLAN**

Scale:	1:150	Date:	09/2020
Drawn by:	YA	Report No.:	PG5406-1
Checked by:	SB	Dwg. No.:	PG5406-2
Approved by:	DJG	Revision No.:	1

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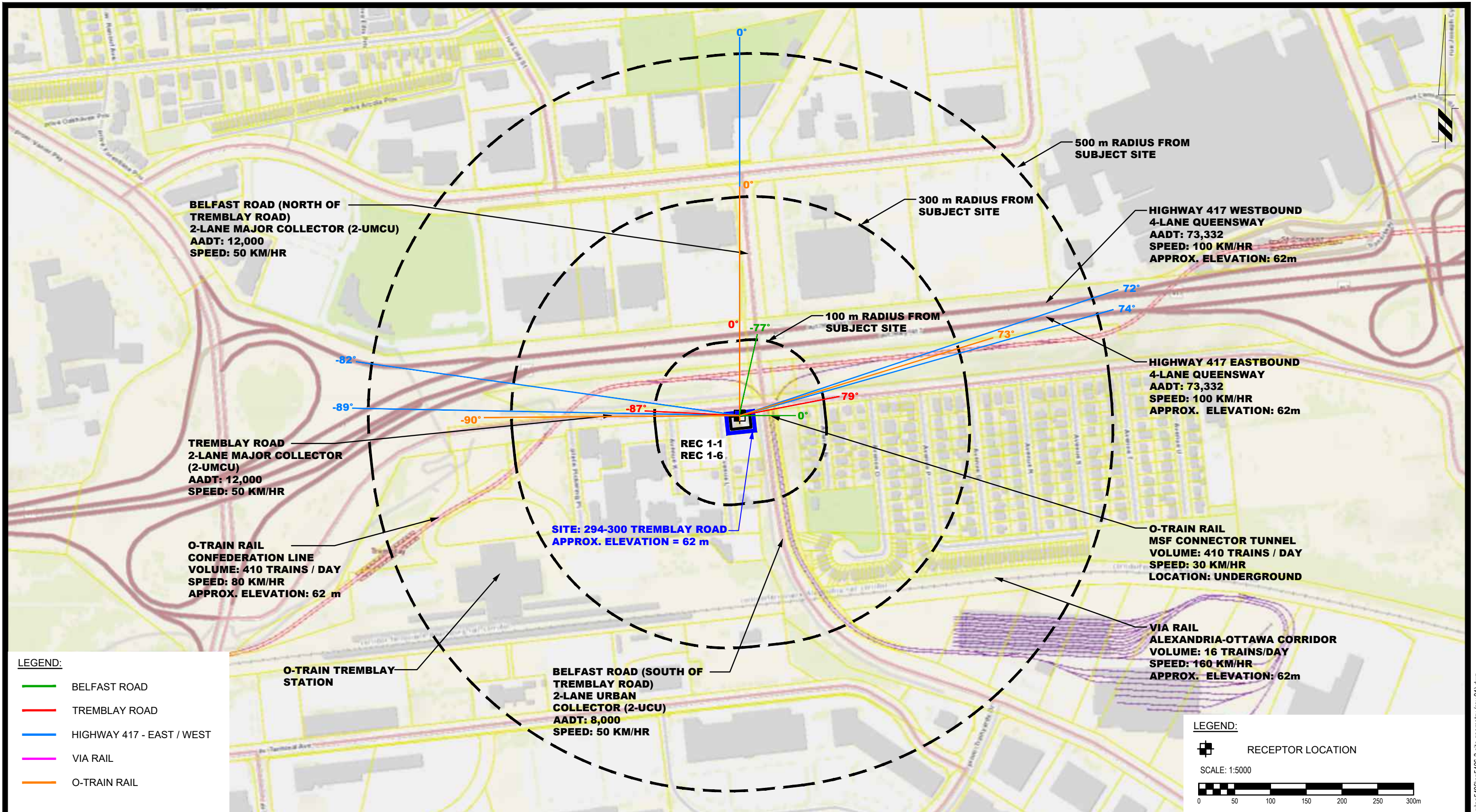
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OTTAWA, ONTARIO
Title:
SITE GEOMETRY

Scale:	1:5000	Date:	09/2020
Drawn by:	YA	Report No.:	PG5406-1
Checked by:	SB	Dwg. No.:	PG5406-3
Approved by:	DJG	Revision No.:	1

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LEGEND:

- BELFAST ROAD
- TREMBLAY ROAD
- HIGHWAY 417 - EAST / WEST
- VIA RAIL
- O-TRAIN RAIL

LEGEND:

RECEPTOR LOCATION

SCALE: 1:5000

0 50 100 150 200 250 300m

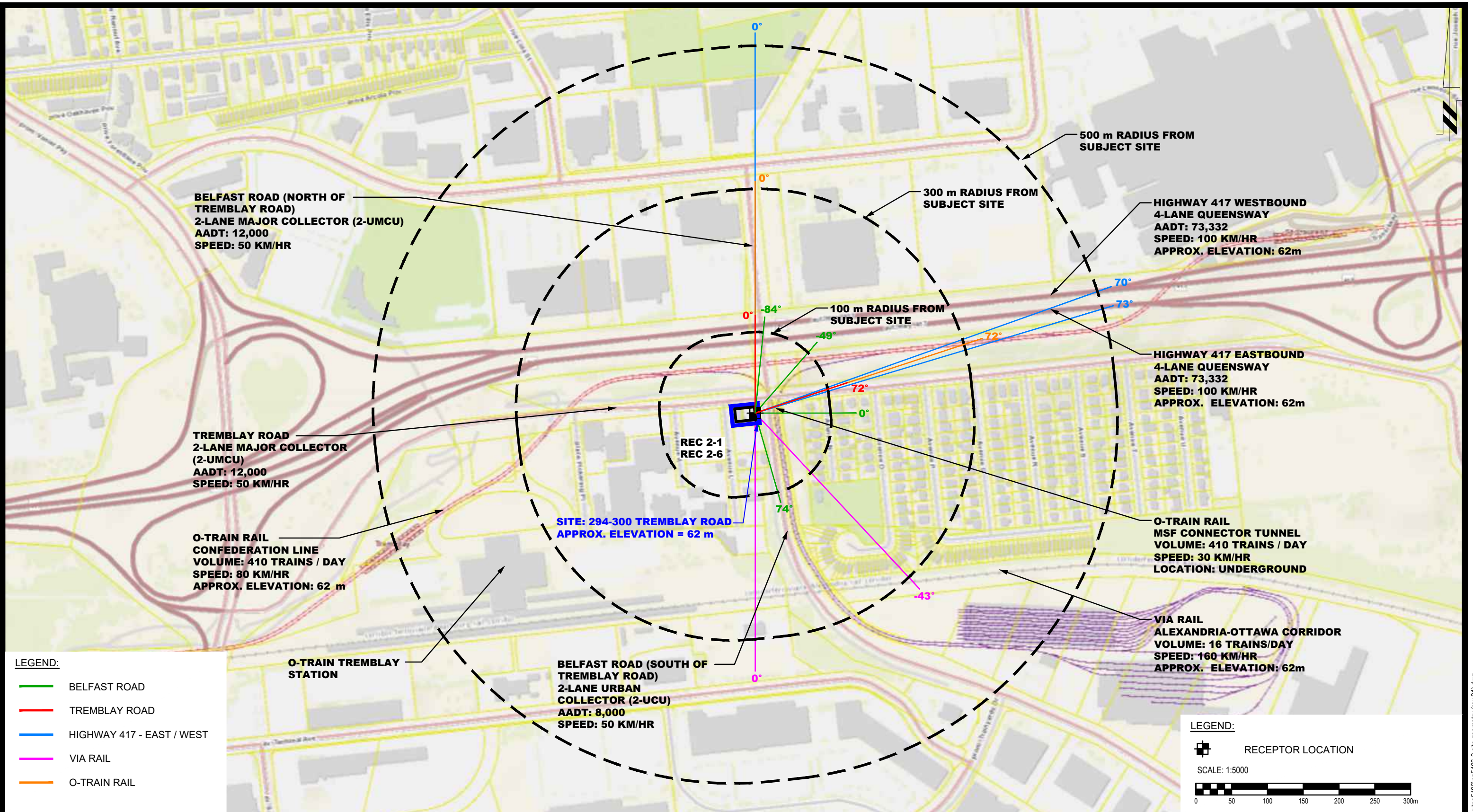
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 PROPOSED MULTI-STOREY BUILDING - 294 AND 300 TREMBLAY ROAD
 OTTAWA, ONTARIO
 Title: **SITE GEOMETRY REC 1-1 AND REC 1-6**

Scale:	1:5000	Date:	09/2020
Drawn by:	YA	Report No.:	PG5406-1
Checked by:	SB	Dwg. No.:	PG5406-3A
Approved by:	DJG	Revision No.:	1

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BELFAST ROAD (NORTH OF TREMBLAY ROAD)
 2-LANE MAJOR COLLECTOR (2-UMCU)
 AADT: 12,000
 SPEED: 50 KM/HR

TREMBLAY ROAD
 2-LANE MAJOR COLLECTOR (2-UMCU)
 AADT: 12,000
 SPEED: 50 KM/HR

O-TRAIN RAIL
 CONFEDERATION LINE
 VOLUME: 410 TRAINS / DAY
 SPEED: 80 KM/HR
 APPROX. ELEVATION: 62 m

O-TRAIN TREMBLAY STATION

BELFAST ROAD (SOUTH OF TREMBLAY ROAD)
 2-LANE URBAN COLLECTOR (2-UCU)
 AADT: 8,000
 SPEED: 50 KM/HR

SITE: 294-300 TREMBLAY ROAD
 APPROX. ELEVATION = 62 m

REC 2-1
REC 2-6

300 m RADIUS FROM SUBJECT SITE

100 m RADIUS FROM SUBJECT SITE

500 m RADIUS FROM SUBJECT SITE

HIGHWAY 417 WESTBOUND
 4-LANE QUEENSWAY
 AADT: 73,332
 SPEED: 100 KM/HR
 APPROX. ELEVATION: 62m

HIGHWAY 417 EASTBOUND
 4-LANE QUEENSWAY
 AADT: 73,332
 SPEED: 100 KM/HR
 APPROX. ELEVATION: 62m

O-TRAIN RAIL
 MSF CONNECTOR TUNNEL
 VOLUME: 410 TRAINS / DAY
 SPEED: 30 KM/HR
 LOCATION: UNDERGROUND

VIA RAIL
 ALEXANDRIA-OTTAWA CORRIDOR
 VOLUME: 16 TRAINS/DAY
 SPEED: 160 KM/HR
 APPROX. ELEVATION: 62m

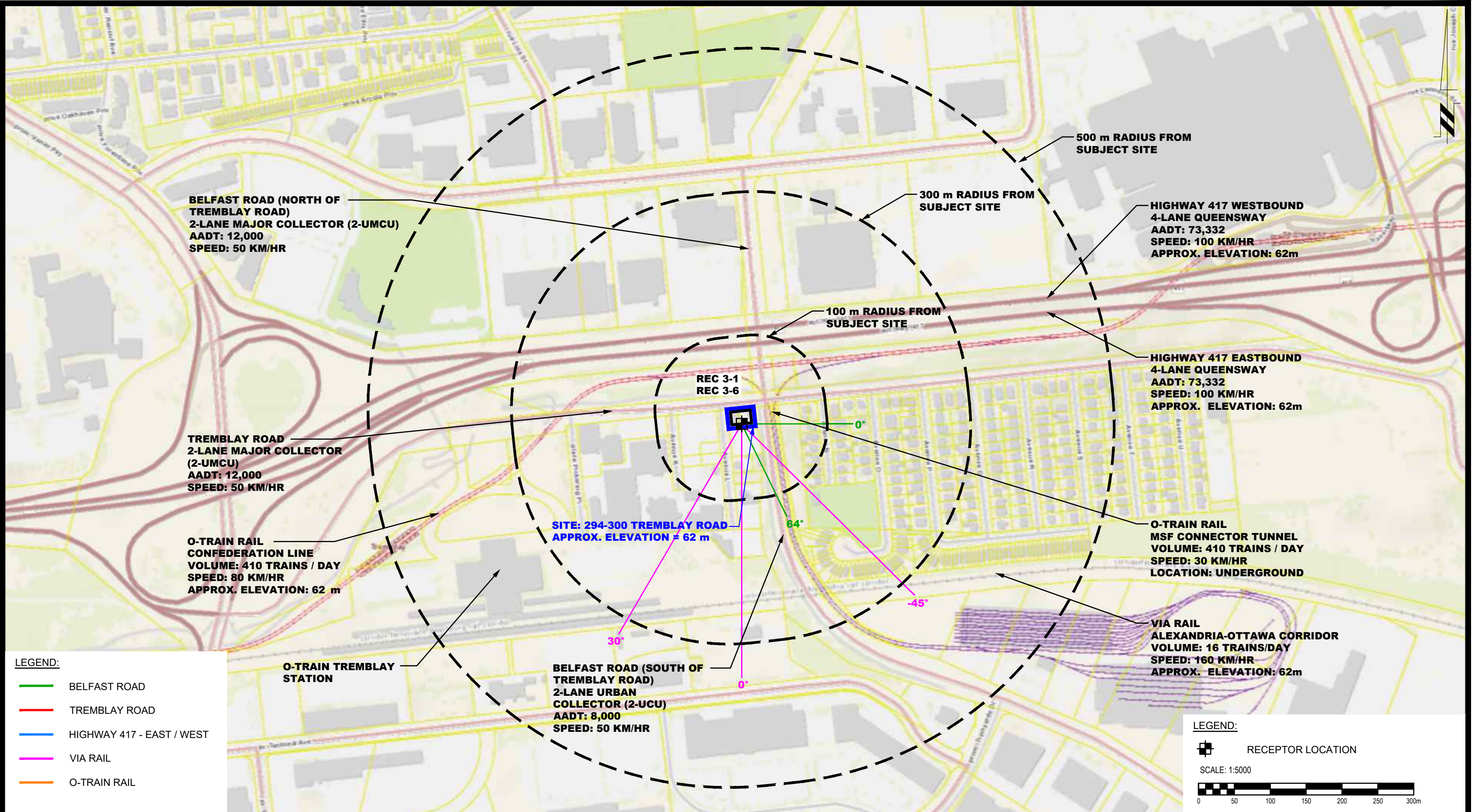


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 PROPOSED MULTI-STOREY BUILDING - 294 AND 300 TREMBLAY ROAD
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 Title: **SITE GEOMETRY REC 2-1 AND REC 2-6**

Scale:	1:5000	Date:	09/2020
Drawn by:	YA	Report No.:	PG5406-1
Checked by:	SB	Dwg. No.:	PG5406-3B
Approved by:	DJG	Revision No.:	1

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BELFAST ROAD (NORTH OF TREMBLAY ROAD)
2-LANE MAJOR COLLECTOR (2-UMCU)
AADT: 12,000
SPEED: 50 KM/HR

TREMBLAY ROAD
2-LANE MAJOR COLLECTOR (2-UMCU)
AADT: 12,000
SPEED: 50 KM/HR

O-TRAIN RAIL
CONFEDERATION LINE
VOLUME: 410 TRAINS / DAY
SPEED: 80 KM/HR
APPROX. ELEVATION: 62 m

O-TRAIN TREMBLAY STATION

SITE: 294-300 TREMBLAY ROAD
APPROX. ELEVATION = 62 m

BELFAST ROAD (SOUTH OF TREMBLAY ROAD)
2-LANE URBAN COLLECTOR (2-UCU)
AADT: 8,000
SPEED: 50 KM/HR

500 m RADIUS FROM SUBJECT SITE

300 m RADIUS FROM SUBJECT SITE

100 m RADIUS FROM SUBJECT SITE

REC 3-1
REC 3-6

HIGHWAY 417 WESTBOUND
4-LANE QUEENSWAY
AADT: 73,332
SPEED: 100 KM/HR
APPROX. ELEVATION: 62m

HIGHWAY 417 EASTBOUND
4-LANE QUEENSWAY
AADT: 73,332
SPEED: 100 KM/HR
APPROX. ELEVATION: 62m

O-TRAIN RAIL
MSF CONNECTOR TUNNEL
VOLUME: 410 TRAINS / DAY
SPEED: 30 KM/HR
LOCATION: UNDERGROUND

VIA RAIL
ALEXANDRIA-OTTAWA CORRIDOR
VOLUME: 16 TRAINS/DAY
SPEED: 160 KM/HR
APPROX. ELEVATION: 62m



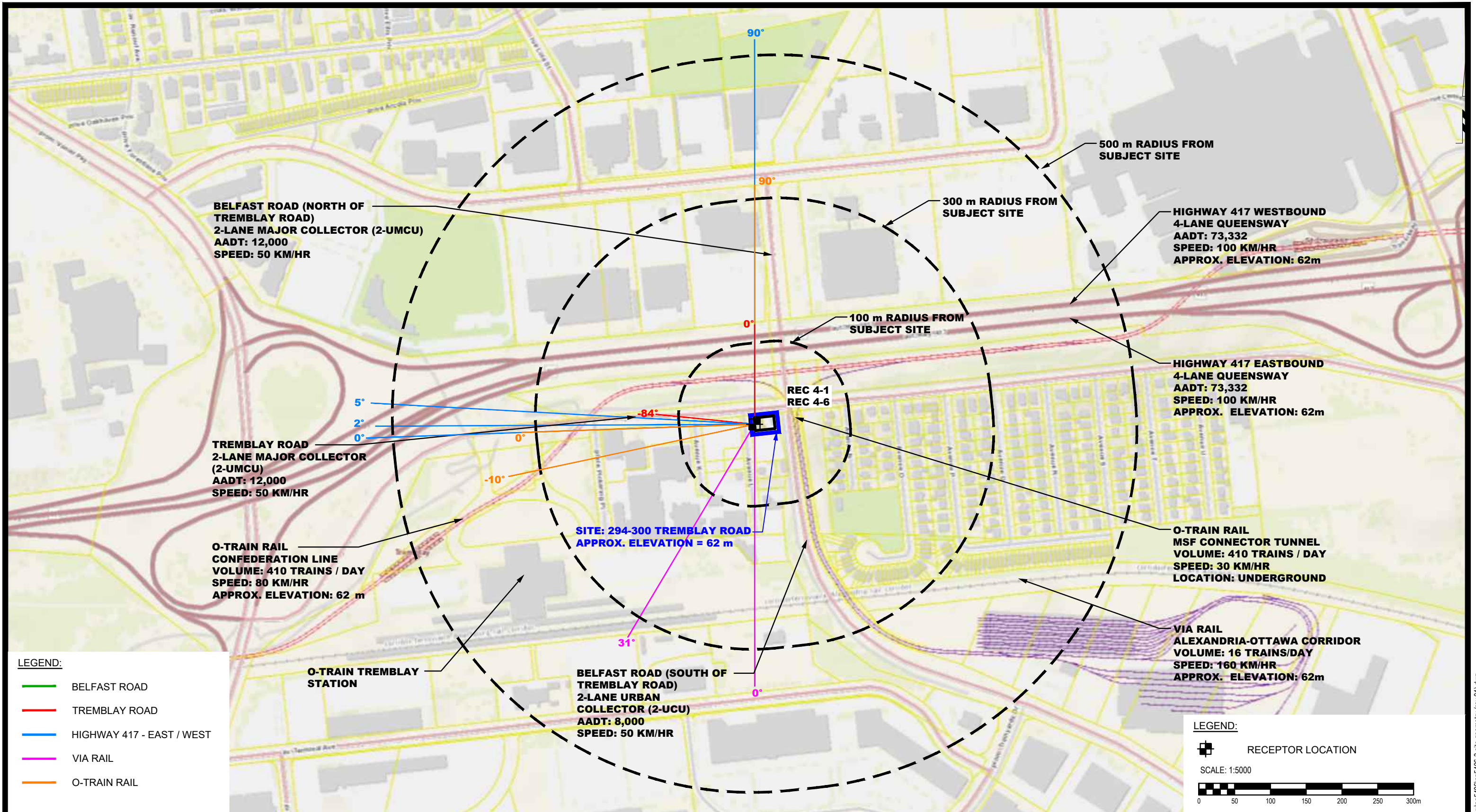
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 PROPOSED MULTI-STOREY BUILDING - 294 AND 300 TREMBLAY ROAD
 OTTAWA, ONTARIO
 Title: **SITE GEOMETRY REC 3-1 AND REC 3-6**

Scale:	1:5000	Date:	09/2020
Drawn by:	YA	Report No.:	PG5406-1
Checked by:	SB	Dwg. No.:	PG5406-3C
Approved by:	DJG	Revision No.:	1

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LEGEND:

- BELFAST ROAD
- TREMBLAY ROAD
- HIGHWAY 417 - EAST / WEST
- VIA RAIL
- O-TRAIN RAIL

LEGEND:

RECEPTOR LOCATION

SCALE: 1:5000



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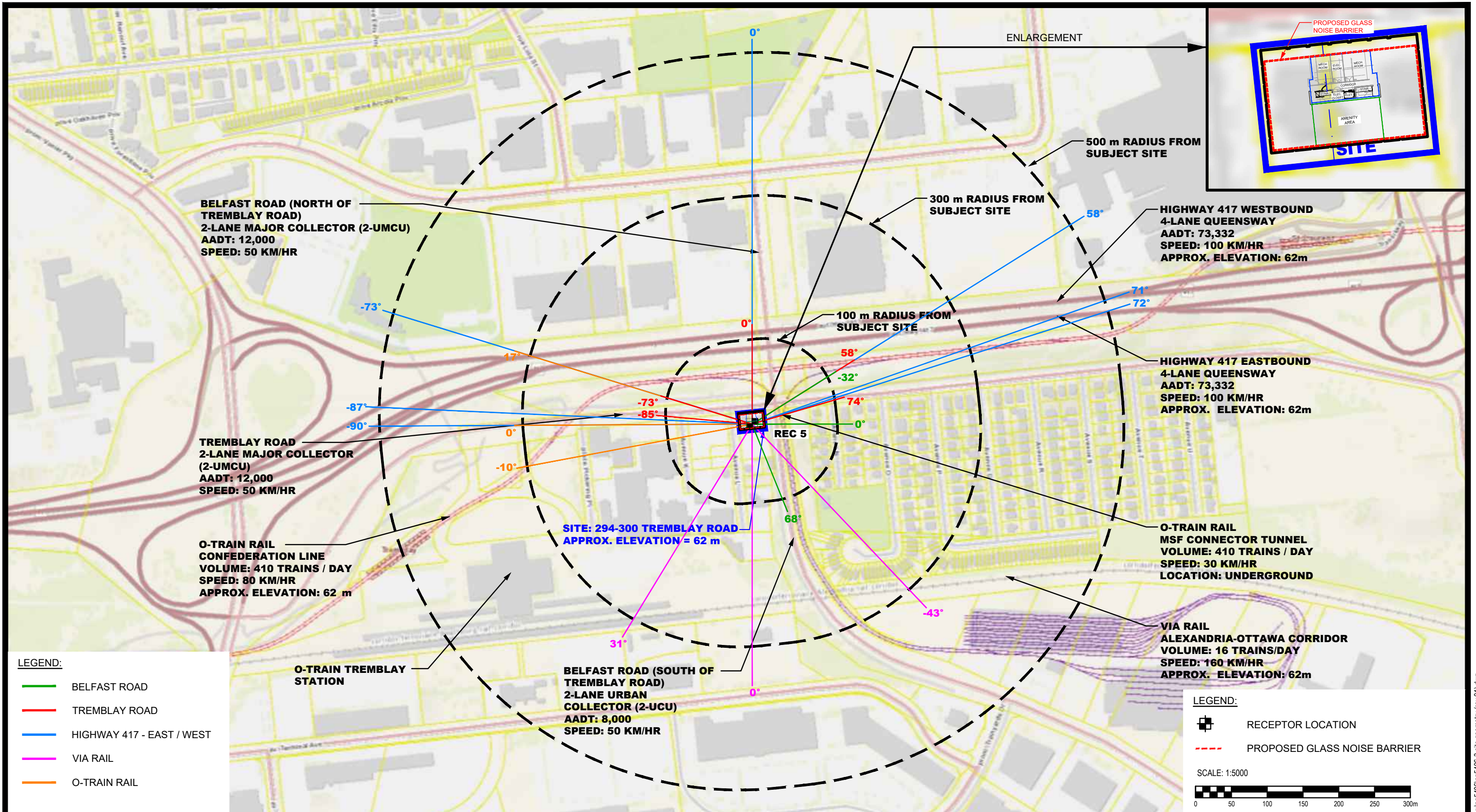
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1	REVISED AS PER CITY COMMENTS	27/09/2023	YT

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NOISE ATTENUATION STUDY
PROPOSED MULTI-STOREY BUILDING - 294 AND 300 TREMBLAY ROAD
OTTAWA, ONTARIO

Title: **SITE GEOMETRY REC 4-1 AND REC 4-6**

Scale:	1:5000	Date:	09/2020
Drawn by:	YA	Report No.:	PG5406-1
Checked by:	SB	Dwg. No.:	PG5406-3D
Approved by:	DJG	Revision No.:	1

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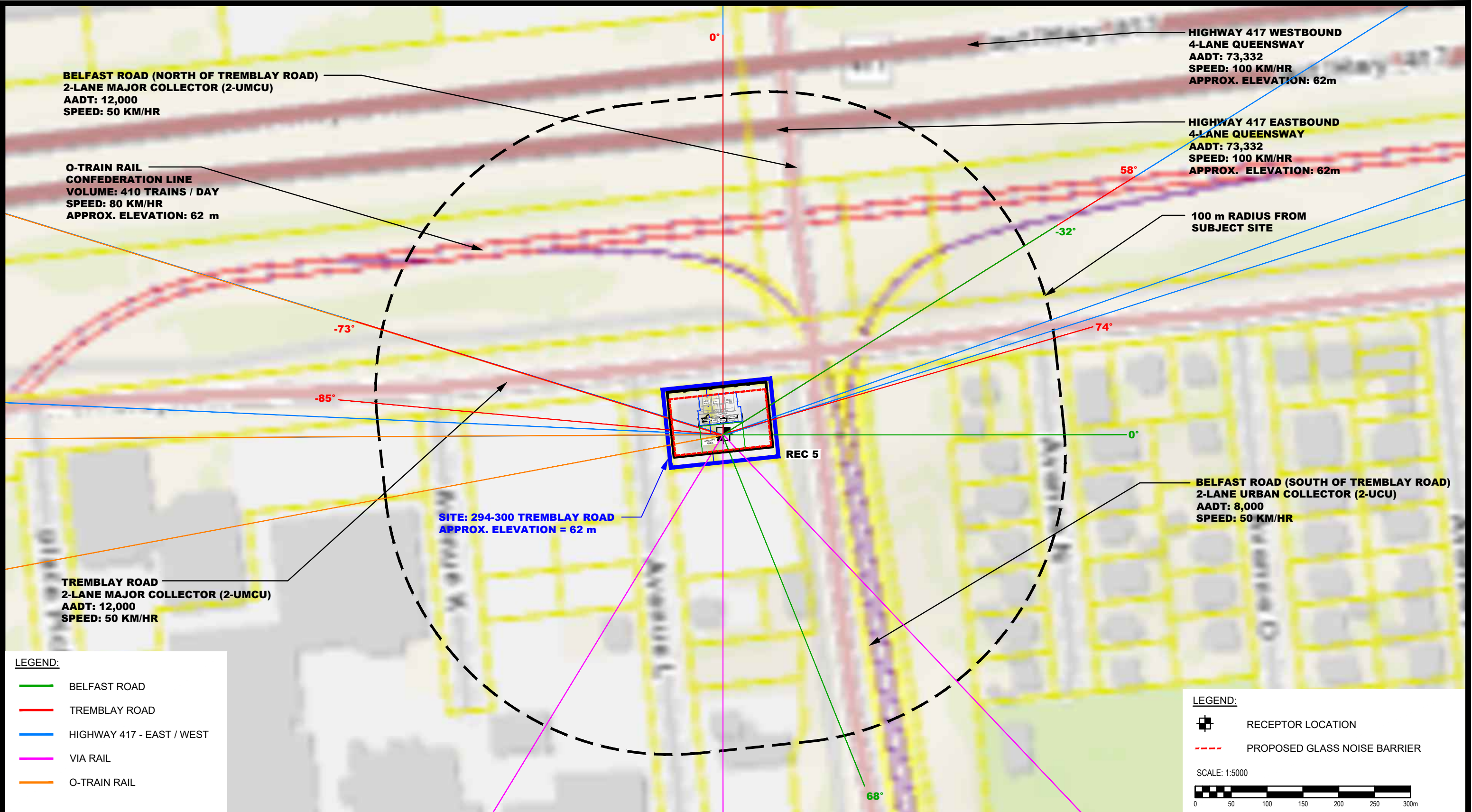


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NOISE ATTENUATION STUDY
PROPOSED MULTI-STOREY BUILDING - 294 AND 300 TREMBLAY ROAD
OTTAWA, ONTARIO
Title:
SITE GEOMETRY REC 5

Scale:	1:5000	Date:	09/2020
Drawn by:	YA	Report No.:	PG5406-1
Checked by:	SB	Dwg. No.:	PG5406-3E
Approved by:	DJG	Revision No.:	1

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BELFAST ROAD (NORTH OF TREMBLAY ROAD)
 2-LANE MAJOR COLLECTOR (2-UMCU)
 AADT: 12,000
 SPEED: 50 KM/HR

O-TRAIN RAIL
 CONFEDERATION LINE
 VOLUME: 410 TRAINS / DAY
 SPEED: 80 KM/HR
 APPROX. ELEVATION: 62 m

HIGHWAY 417 WESTBOUND
 4-LANE QUEENSWAY
 AADT: 73,332
 SPEED: 100 KM/HR
 APPROX. ELEVATION: 62m

HIGHWAY 417 EASTBOUND
 4-LANE QUEENSWAY
 AADT: 73,332
 SPEED: 100 KM/HR
 APPROX. ELEVATION: 62m

100 m RADIUS FROM
 SUBJECT SITE

SITE: 294-300 TREMBLAY ROAD
 APPROX. ELEVATION = 62 m

REC 5

BELFAST ROAD (SOUTH OF TREMBLAY ROAD)
 2-LANE URBAN COLLECTOR (2-UCU)
 AADT: 8,000
 SPEED: 50 KM/HR

TREMBLAY ROAD
 2-LANE MAJOR COLLECTOR (2-UMCU)
 AADT: 12,000
 SPEED: 50 KM/HR

LEGEND:

- BELFAST ROAD
- TREMBLAY ROAD
- HIGHWAY 417 - EAST / WEST
- VIA RAIL
- O-TRAIN RAIL

LEGEND:

- RECEPTOR LOCATION
- - - PROPOSED GLASS NOISE BARRIER

SCALE: 1:5000

9 AURIGA DRIVE
 OTTAWA, ON
 K2E 7T9
 TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
1	REVISED AS PER CITY COMMENTS	27/09/2023	YT

TC UNITED DEVELOPMENT CORP.
NOISE ATTENUATION STUDY
PROPOSED MULTI-STOREY BUILDING - 294 AND 300 TREMBLAY ROAD
 OTTAWA, ONTARIO

Title: SITE GEOMETRY REC 5 - ENLARGEMENT

Scale:	1:1250	Date:	09/2020
Drawn by:	YA	Report No.:	PG5406-1
Checked by:	SB	Dwg. No.:	PG5406-3F
Approved by:	DJG	Revision No.:	1

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APPENDIX 2

STAMSON RESULTS

Filename: rec11.te Time Period: Day/Night 16/8 hours
 Description: Receptor Point 1-1

Rail data, segment # 1: 0-train Rail (day/night)

Train Type	! Trains	! Speed !(km/h)	!# loc !/Train!	!# Cars !/Train!	Eng type	!Cont !weld
1. 0-train Rail	352.0/58.0	80.0	1.0	1.0	Elec	Yes

Data for Segment # 1: 0-train Rail (day/night)

Angle1 Angle2 : -90.00 deg 73.00 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 : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

↑
 Results segment # 1: 0-train Rail (day)

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
-90	73	0.58	63.20	-8.29	-1.50	0.00	0.00	0.00	53.41

WHEEL (0.00 + 52.92 + 0.00) = 52.92 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	73	0.66	63.22	-8.68	-1.61	0.00	0.00	0.00	52.92

Segment Leq : 56.18 dBA

Total Leq All Segments: 56.18 dBA

↑
 Results segment # 1: 0-train Rail (night)

LOCOMOTIVE (0.00 + 48.59 + 0.00) = 48.59 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	73	0.58	58.38	-8.29	-1.50	0.00	0.00	0.00	48.59

WHEEL (0.00 + 48.10 + 0.00) = 48.10 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	73	0.66	58.39	-8.68	-1.61	0.00	0.00	0.00	48.10

Segment Leq : 51.36 dBA

Total Leq All Segments: 51.36 dBA

↑

Road data, segment # 1: Belfast Rd N (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *

Medium truck volume : 773/67 veh/TimePeriod *

Heavy truck volume : 552/48 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Belfast Rd N (day/night)

Angle1 Angle2 : -77.00 deg 0.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)

Receiver source distance : 35.00 / 35.00 m

Receiver height : 1.50 / 1.50 m

Topography : 1 (Flat/gentle slope; no barrier)

Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *

Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Tremblay Rd (day/night)

Angle1 Angle2 : -87.00 deg 79.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 3: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Hwy 417 West (day/night)

Angle1 Angle2 : -82.00 deg 72.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)
Receiver source distance : 110.00 / 110.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 4: Hwy 417 East (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: Hwy 417 East (day/night)

Angle1 Angle2 : -89.00 deg 74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 85.00 / 85.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Belfast Rd N (day)

Source height = 1.50 m

ROAD (0.00 + 56.73 + 0.00) = 56.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-77	0	0.66	67.51	0.00	-6.11	-4.67	0.00	0.00	0.00	56.73

Segment Leq : 56.73 dBA

↑
Results segment # 2: Tremblay Rd (day)

Source height = 1.50 m

ROAD (0.00 + 65.97 + 0.00) = 65.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-87	79	0.66	67.51	0.00	0.00	-1.54	0.00	0.00	0.00	65.97

Segment Leq : 65.97 dBA

↑
Results segment # 3: Hwy 417 West (day)

Source height = 1.50 m

ROAD (0.00 + 65.36 + 0.00) = 65.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	72	0.66	81.40	0.00	-14.36	-1.68	0.00	0.00	0.00	65.36

Segment Leq : 65.36 dBA

↑
Results segment # 4: Hwy 417 East (day)

Source height = 1.50 m

ROAD (0.00 + 67.29 + 0.00) = 67.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-89	74	0.66	81.40	0.00	-12.51	-1.60	0.00	0.00	0.00	67.29

Segment Leq : 67.29 dBA

Total Leq All Segments: 71.21 dBA

↑
Results segment # 1: Belfast Rd N (night)

Source height = 1.50 m

ROAD (0.00 + 49.13 + 0.00) = 49.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-77	0	0.66	59.91	0.00	-6.11	-4.67	0.00	0.00	0.00	49.13

Segment Leq : 49.13 dBA

↑
Results segment # 2: Tremblay Rd (night)

Source height = 1.50 m

ROAD (0.00 + 58.37 + 0.00) = 58.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-87	79	0.66	59.91	0.00	0.00	-1.54	0.00	0.00	0.00	58.37

Segment Leq : 58.37 dBA

↑
Results segment # 3: Hwy 417 West (night)

Source height = 1.49 m

ROAD (0.00 + 57.76 + 0.00) = 57.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	72	0.66	73.80	0.00	-14.36	-1.68	0.00	0.00	0.00	57.76

Segment Leq : 57.76 dBA

↑
Results segment # 4: Hwy 417 East (night)

Source height = 1.49 m

ROAD (0.00 + 59.69 + 0.00) = 59.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-89	74	0.66	73.80	0.00	-12.51	-1.60	0.00	0.00	0.00	59.69

Segment Leq : 59.69 dBA

Total Leq All Segments: 63.61 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 71.35
(NIGHT): 63.86



Filename: rec16.te Time Period: Day/Night 16/8 hours
 Description: Receptor Point 1-6

Rail data, segment # 1: 0-train Rail (day/night)

Train Type	! Trains !	! Speed !(km/h) !	!# loc !/Train!	!# Cars! /Train!	Eng type	!Cont !weld
1. 0-train Rail	352.0/58.0	80.0	1.0	1.0	Elec	Yes

Data for Segment # 1: 0-train Rail (day/night)

Angle1 Angle2 : -90.00 deg 73.00 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 : 18.00 / 18.00 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

↑
 Results segment # 1: 0-train Rail (day)

LOCOMOTIVE (0.00 + 56.88 + 0.00) = 56.88 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	73	0.09	63.20	-5.70	-0.63	0.00	0.00	0.00	56.88

WHEEL (0.00 + 56.12 + 0.00) = 56.12 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	73	0.19	63.22	-6.25	-0.84	0.00	0.00	0.00	56.12

Segment Leq : 59.53 dBA

Total Leq All Segments: 59.53 dBA

↑
 Results segment # 1: 0-train Rail (night)

LOCOMOTIVE (0.00 + 52.05 + 0.00) = 52.05 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	73	0.09	58.38	-5.70	-0.63	0.00	0.00	0.00	52.05

WHEEL (0.00 + 51.30 + 0.00) = 51.30 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	73	0.19	58.39	-6.25	-0.84	0.00	0.00	0.00	51.30

Segment Leq : 54.70 dBA

Total Leq All Segments: 54.70 dBA

↑

Road data, segment # 1: Belfast Rd N (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *

Medium truck volume : 773/67 veh/TimePeriod *

Heavy truck volume : 552/48 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Belfast Rd N (day/night)

Angle1 Angle2 : -77.00 deg 0.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)

Receiver source distance : 35.00 / 35.00 m

Receiver height : 18.00 / 18.00 m

Topography : 1 (Flat/gentle slope; no barrier)

Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *

Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Tremblay Rd (day/night)

Angle1 Angle2 : -87.00 deg 79.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 3: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Hwy 417 West (day/night)

Angle1 Angle2 : -82.00 deg 72.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)
Receiver source distance : 110.00 / 110.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 4: Hwy 417 East (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: Hwy 417 East (day/night)

Angle1 Angle2 : -89.00 deg 74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 85.00 / 85.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Belfast Rd N (day)

Source height = 1.50 m

ROAD (0.00 + 59.27 + 0.00) = 59.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-77	0	0.17	67.51	0.00	-4.29	-3.96	0.00	0.00	0.00	59.27

Segment Leq : 59.27 dBA

↑

Results segment # 2: Tremblay Rd (day)

Source height = 1.50 m

ROAD (0.00 + 66.82 + 0.00) = 66.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-87	79	0.17	67.51	0.00	0.00	-0.70	0.00	0.00	0.00	66.82

Segment Leq : 66.82 dBA

↑

Results segment # 3: Hwy 417 West (day)

Source height = 1.50 m

ROAD (0.00 + 70.36 + 0.00) = 70.36 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	72	0.17	81.40	0.00	-10.08	-0.96	0.00	0.00	0.00	70.36

Segment Leq : 70.36 dBA

↑

Results segment # 4: Hwy 417 East (day)

Source height = 1.50 m

ROAD (0.00 + 71.84 + 0.00) = 71.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-89	74	0.17	81.40	0.00	-8.78	-0.77	0.00	0.00	0.00	71.84

Segment Leq : 71.84 dBA

Total Leq All Segments: 75.02 dBA

↑

Results segment # 1: Belfast Rd N (night)

Source height = 1.50 m

ROAD (0.00 + 51.67 + 0.00) = 51.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-77	0	0.17	59.91	0.00	-4.29	-3.96	0.00	0.00	0.00	51.67

Segment Leq : 51.67 dBA

↑

Results segment # 2: Tremblay Rd (night)

Source height = 1.50 m

ROAD (0.00 + 59.22 + 0.00) = 59.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-87	79	0.17	59.91	0.00	0.00	-0.70	0.00	0.00	0.00	59.22

Segment Leq : 59.22 dBA

↑

Results segment # 3: Hwy 417 West (night)

Source height = 1.49 m

ROAD (0.00 + 62.76 + 0.00) = 62.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-82	72	0.17	73.80	0.00	-10.08	-0.96	0.00	0.00	0.00	62.76

Segment Leq : 62.76 dBA

↑

Results segment # 4: Hwy 417 East (night)

Source height = 1.49 m

ROAD (0.00 + 64.25 + 0.00) = 64.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-89	74	0.17	73.80	0.00	-8.78	-0.77	0.00	0.00	0.00	64.25

Segment Leq : 64.25 dBA

Total Leq All Segments: 67.43 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 75.14
(NIGHT): 67.65



Filename: rec21.te Time Period: Day/Night 16/8 hours
 Description: Receptor Point 2-1

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type           !             !(km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----
  1. VIA Rail  ! 16.0/0.0   ! 150.0 ! 2.0 ! 8.0 !Diesel! Yes
  
```

Data for Segment # 1: VIA Rail (day/night)

```

-----
Angle1  Angle2      : -43.00 deg  0.00 deg
Wood depth      :          0   (No woods.)
No of house rows :          3 / 3
House density    :          60 %
Surface         :          1   (Absorptive ground surface)
Receiver source distance : 255.00 / 255.00 m
Receiver height  :          1.50 / 1.50 m
Topography      :          1   (Flat/gentle slope; no barrier)
No Whistle
Reference angle  :          0.00
  
```

↑
 Rail data, segment # 2: O-train Rail (day/night)

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type           !             !(km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----
  1. O-train Rail! 352.0/58.0   ! 80.0 ! 1.0 ! 1.0 ! Elec! Yes
  
```

Data for Segment # 2: O-train Rail (day/night)

```

-----
Angle1  Angle2      :   0.00 deg  72.00 deg
Wood depth      :          0   (No woods.)
No of house rows :          0 / 0
Surface         :          1   (Absorptive ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height  :          1.50 / 1.50 m
Topography      :          1   (Flat/gentle slope; no barrier)
No Whistle
Reference angle  :          0.00
  
```

↑
 Results segment # 1: VIA Rail (day)

LOCOMOTIVE (0.00 + 38.83 + 0.00) = 38.83 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.58	70.99	-19.50	-6.47	0.00	-6.19	0.00	38.83

WHEEL (0.00 + 27.96 + 0.00) = 27.96 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.66	61.07	-20.43	-6.50	0.00	-6.19	0.00	27.96

Segment Leq : 39.17 dBA

↑
Results segment # 2: O-train Rail (day)

LOCOMOTIVE (0.00 + 47.87 + 0.00) = 47.87 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.58	63.20	-10.60	-4.73	0.00	0.00	0.00	47.87

WHEEL (0.00 + 47.29 + 0.00) = 47.29 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.66	63.22	-11.11	-4.82	0.00	0.00	0.00	47.29

Segment Leq : 50.60 dBA

Total Leq All Segments: 50.90 dBA

↑
Results segment # 1: VIA Rail (night)

LOCOMOTIVE (0.00 + -32.16 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.58	0.00	-19.50	-6.47	0.00	-6.19	0.00	-32.16

WHEEL (0.00 + -33.11 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.66	0.00	-20.43	-6.50	0.00	-6.19	0.00	-33.11

Segment Leq : 0.00 dBA

↑
Results segment # 2: O-train Rail (night)

LOCOMOTIVE (0.00 + 43.05 + 0.00) = 43.05 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.58	58.38	-10.60	-4.73	0.00	0.00	0.00	43.05

WHEEL (0.00 + 42.47 + 0.00) = 42.47 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.66	58.39	-11.11	-4.82	0.00	0.00	0.00	42.47

Segment Leq : 45.78 dBA

Total Leq All Segments: 45.78 dBA

↑
Road data, segment # 1: Belfast Rd N (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *

Medium truck volume : 773/67 veh/TimePeriod *

Heavy truck volume : 552/48 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Belfast Rd N (day/night)

Angle1 Angle2 : -84.00 deg -49.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)

Receiver source distance : 25.00 / 25.00 m

Receiver height : 1.50 / 1.50 m

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 2: Belfast Rd S (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Belfast Rd S (day/night)

Angle1 Angle2 : -49.00 deg 74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 3: Tremblay Rd (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Tremblay Rd (day/night)

Angle1 Angle2 : 0.00 deg 72.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 4: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: Hwy 417 West (day/night)

Angle1 Angle2 : 0.00 deg 70.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 120.00 / 120.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 5: Hwy 417 East (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h

Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 5: Hwy 417 East (day/night)

 Angle1 Angle2 : 0.00 deg 73.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 100.00 / 100.00 m
 Receiver height : 1.50 / 1.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑
 Results segment # 1: Belfast Rd N (day)

 Source height = 1.50 m

ROAD (0.00 + 53.94 + 0.00) = 53.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	-49	0.66	67.51	0.00	-3.68	-9.88	0.00	0.00	0.00	53.94

Segment Leq : 53.94 dBA

↑
 Results segment # 2: Belfast Rd S (day)

 Source height = 1.50 m

ROAD (0.00 + 63.42 + 0.00) = 63.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	74	0.66	65.75	0.00	0.00	-2.33	0.00	0.00	0.00	63.42

Segment Leq : 63.42 dBA

↑
Results segment # 3: Tremblay Rd (day)

Source height = 1.50 m

ROAD (0.00 + 60.62 + 0.00) = 60.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.66	67.51	0.00	-2.07	-4.82	0.00	0.00	0.00	60.62

Segment Leq : 60.62 dBA

↑
Results segment # 4: Hwy 417 West (day)

Source height = 1.50 m

ROAD (0.00 + 61.51 + 0.00) = 61.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	70	0.66	81.40	0.00	-14.99	-4.89	0.00	0.00	0.00	61.51

Segment Leq : 61.51 dBA

↑
Results segment # 5: Hwy 417 East (day)

Source height = 1.50 m

ROAD (0.00 + 62.93 + 0.00) = 62.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	73	0.66	81.40	0.00	-13.68	-4.79	0.00	0.00	0.00	62.93

Segment Leq : 62.93 dBA

Total Leq All Segments: 68.44 dBA

↑
Results segment # 1: Belfast Rd N (night)

Source height = 1.50 m

ROAD (0.00 + 46.35 + 0.00) = 46.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	-49	0.66	59.91	0.00	-3.68	-9.88	0.00	0.00	0.00	46.35

Segment Leq : 46.35 dBA

↑
Results segment # 2: Belfast Rd S (night)

Source height = 1.50 m

ROAD (0.00 + 55.83 + 0.00) = 55.83 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	74	0.66	58.16	0.00	0.00	-2.33	0.00	0.00	0.00	55.83

Segment Leq : 55.83 dBA

↑
Results segment # 3: Tremblay Rd (night)

Source height = 1.50 m

ROAD (0.00 + 53.02 + 0.00) = 53.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.66	59.91	0.00	-2.07	-4.82	0.00	0.00	0.00	53.02

Segment Leq : 53.02 dBA

↑
Results segment # 4: Hwy 417 West (night)

Source height = 1.49 m

ROAD (0.00 + 53.92 + 0.00) = 53.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	70	0.66	73.80	0.00	-14.99	-4.89	0.00	0.00	0.00	53.92

Segment Leq : 53.92 dBA

↑

Results segment # 5: Hwy 417 East (night)

Source height = 1.49 m

ROAD (0.00 + 55.33 + 0.00) = 55.33 dBA

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

0	73	0.66	73.80	0.00	-13.68	-4.79	0.00	0.00	0.00	55.33
---	----	------	-------	------	--------	-------	------	------	------	-------

Segment Leq : 55.33 dBA

Total Leq All Segments: 60.84 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 68.51
(NIGHT): 60.98

↑

↑

Filename: rec26.te Time Period: Day/Night 16/8 hours
 Description: Receptor Point 2-6

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type           !              !(km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----
  1. VIA Rail  ! 16.0/0.0   ! 150.0 !  2.0 !  8.0 !Diesel! Yes
  
```

Data for Segment # 1: VIA Rail (day/night)

```

-----
Angle1  Angle2      : -43.00 deg  0.00 deg
Wood depth      :          0   (No woods.)
No of house rows :          3 / 3
House density   :          60 %
Surface         :          1   (Absorptive ground surface)
Receiver source distance : 255.00 / 255.00 m
Receiver height :  18.00 / 18.00 m
Topography      :          1   (Flat/gentle slope; no barrier)
No Whistle
Reference angle :          0.00
  
```

↑

Rail data, segment # 2: O-train Rail (day/night)

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type           !              !(km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----
  1. O-train Rail! 352.0/58.0   !  80.0 !  1.0 !  1.0 ! Elec! Yes
  
```

Data for Segment # 2: O-train Rail (day/night)

```

-----
Angle1  Angle2      :   0.00 deg  72.00 deg
Wood depth      :          0   (No woods.)
No of house rows :          0 / 0
Surface         :          1   (Absorptive ground surface)
Receiver source distance :  70.00 /  70.00 m
Receiver height :  18.00 / 18.00 m
Topography      :          1   (Flat/gentle slope; no barrier)
No Whistle
Reference angle :          0.00
  
```

↑

Results segment # 1: VIA Rail (day)

LOCOMOTIVE (0.00 + 45.13 + 0.00) = 45.13 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.09	70.99	-13.41	-6.26	0.00	-6.19	0.00	45.13

WHEEL (0.00 + 33.87 + 0.00) = 33.87 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.19	61.07	-14.70	-6.30	0.00	-6.19	0.00	33.87

Segment Leq : 45.44 dBA

↑
Results segment # 2: O-train Rail (day)

LOCOMOTIVE (0.00 + 51.81 + 0.00) = 51.81 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.09	63.20	-7.29	-4.10	0.00	0.00	0.00	51.81

WHEEL (0.00 + 50.97 + 0.00) = 50.97 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.19	63.22	-7.99	-4.25	0.00	0.00	0.00	50.97

Segment Leq : 54.42 dBA

Total Leq All Segments: 54.94 dBA

↑
Results segment # 1: VIA Rail (night)

LOCOMOTIVE (0.00 + -25.86 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.09	0.00	-13.41	-6.26	0.00	-6.19	0.00	-25.86

WHEEL (0.00 + -27.19 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	0	0.19	0.00	-14.70	-6.30	0.00	-6.19	0.00	-27.19

Segment Leq : 0.00 dBA

↑
Results segment # 2: O-train Rail (night)

LOCOMOTIVE (0.00 + 46.99 + 0.00) = 46.99 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.09	58.38	-7.29	-4.10	0.00	0.00	0.00	46.99

WHEEL (0.00 + 46.15 + 0.00) = 46.15 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.19	58.39	-7.99	-4.25	0.00	0.00	0.00	46.15

Segment Leq : 49.60 dBA

Total Leq All Segments: 49.60 dBA

↑
Road data, segment # 1: Belfast Rd N (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *

Medium truck volume : 773/67 veh/TimePeriod *

Heavy truck volume : 552/48 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Belfast Rd N (day/night)

Angle1 Angle2 : -84.00 deg -49.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)

Receiver source distance : 25.00 / 25.00 m

Receiver height : 18.00 / 18.00 m

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 2: Belfast Rd S (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Belfast Rd S (day/night)

Angle1 Angle2 : -49.00 deg 74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 3: Tremblay Rd (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Tremblay Rd (day/night)

Angle1 Angle2 : 0.00 deg 72.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 4: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: Hwy 417 West (day/night)

Angle1 Angle2 : 0.00 deg 70.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 120.00 / 120.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Road data, segment # 5: Hwy 417 East (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h

Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 5: Hwy 417 East (day/night)

 Angle1 Angle2 : 0.00 deg 73.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 100.00 / 100.00 m
 Receiver height : 18.00 / 18.00 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

↑
 Results segment # 1: Belfast Rd N (day)

 Source height = 1.50 m

ROAD (0.00 + 57.08 + 0.00) = 57.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	-49	0.17	67.51	0.00	-2.58	-7.84	0.00	0.00	0.00	57.08

Segment Leq : 57.08 dBA

↑
 Results segment # 2: Belfast Rd S (day)

 Source height = 1.50 m

ROAD (0.00 + 63.91 + 0.00) = 63.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	74	0.17	65.75	0.00	0.00	-1.84	0.00	0.00	0.00	63.91

Segment Leq : 63.91 dBA

↑

Results segment # 3: Tremblay Rd (day)

Source height = 1.50 m

ROAD (0.00 + 61.85 + 0.00) = 61.85 dBA

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

0	72	0.17	67.51	0.00	-1.46	-4.21	0.00	0.00	0.00	61.85
---	----	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 61.85 dBA

↑

Results segment # 4: Hwy 417 West (day)

Source height = 1.50 m

ROAD (0.00 + 66.56 + 0.00) = 66.56 dBA

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

0	70	0.17	81.40	0.00	-10.52	-4.31	0.00	0.00	0.00	66.56
---	----	------	-------	------	--------	-------	------	------	------	-------

Segment Leq : 66.56 dBA

↑

Results segment # 5: Hwy 417 East (day)

Source height = 1.50 m

ROAD (0.00 + 67.64 + 0.00) = 67.64 dBA

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

0	73	0.17	81.40	0.00	-9.60	-4.16	0.00	0.00	0.00	67.64
---	----	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 67.64 dBA

Total Leq All Segments: 71.71 dBA

↑

Results segment # 1: Belfast Rd N (night)

Source height = 1.50 m

ROAD (0.00 + 49.48 + 0.00) = 49.48 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	-49	0.17	59.91	0.00	-2.58	-7.84	0.00	0.00	0.00	49.48

Segment Leq : 49.48 dBA

↑

Results segment # 2: Belfast Rd S (night)

Source height = 1.50 m

ROAD (0.00 + 56.32 + 0.00) = 56.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-49	74	0.17	58.16	0.00	0.00	-1.84	0.00	0.00	0.00	56.32

Segment Leq : 56.32 dBA

↑

Results segment # 3: Tremblay Rd (night)

Source height = 1.50 m

ROAD (0.00 + 54.25 + 0.00) = 54.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	72	0.17	59.91	0.00	-1.46	-4.21	0.00	0.00	0.00	54.25

Segment Leq : 54.25 dBA

↑

Results segment # 4: Hwy 417 West (night)

Source height = 1.49 m

ROAD (0.00 + 58.96 + 0.00) = 58.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	70	0.17	73.80	0.00	-10.52	-4.31	0.00	0.00	0.00	58.96

Segment Leq : 58.96 dBA

↑

Results segment # 5: Hwy 417 East (night)

Source height = 1.49 m

ROAD (0.00 + 60.04 + 0.00) = 60.04 dBA

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

0	73	0.17	73.80	0.00	-9.60	-4.16	0.00	0.00	0.00	60.04
---	----	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 60.04 dBA

Total Leq All Segments: 64.12 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 71.80

(NIGHT): 64.27

↑

↑

Filename: rec31.te Time Period: Day/Night 16/8 hours
 Description: Receptor Point 3-1

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !             !(km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----
  1. VIA Rail  ! 16.0/0.0   ! 150.0 ! 2.0 ! 8.0 !Diesel! No
  
```

Data for Segment # 1: VIA Rail (day/night)

```

-----
Angle1  Angle2      : -45.00 deg  30.00 deg
Wood depth      :          0   (No woods.)
No of house rows :          3 / 3
House density    :          60 %
Surface         :          1   (Absorptive ground surface)
Receiver source distance : 240.00 / 240.00 m
Receiver height  :          1.50 / 1.50 m
Topography      :          1   (Flat/gentle slope; no barrier)
No Whistle
Reference angle  :          0.00
  
```

↑
 Results segment # 1: VIA Rail (day)

```

-----
LOCOMOTIVE (0.00 + 41.69 + 0.00) = 41.69 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----
  -45    30    0.58  70.99 -19.09  -4.01   0.00  -6.20   0.00  41.69
  
```

```

-----
WHEEL (0.00 + 33.84 + 0.00) = 33.84 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-----
  -45    30    0.66  64.07 -19.99  -4.04   0.00  -6.20   0.00  33.84
  
```

Segment Leq : 42.35 dBA

Total Leq All Segments: 42.35 dBA

↑
 Results segment # 1: VIA Rail (night)

LOCOMOTIVE (0.00 + -29.30 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	30	0.58	0.00	-19.09	-4.01	0.00	-6.20	0.00	-29.30

WHEEL (0.00 + -30.23 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	30	0.66	0.00	-19.99	-4.04	0.00	-6.20	0.00	-30.23

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA

↑

Road data, segment # 1: Belfast Rd S (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *

Medium truck volume : 515/45 veh/TimePeriod *

Heavy truck volume : 368/32 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Belfast Rd S (day/night)

Angle1 Angle2 : 0.00 deg 64.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)

Receiver source distance : 30.00 / 30.00 m

Receiver height : 1.50 / 1.50 m

Topography : 1 (Flat/gentle slope; no barrier)

Reference angle : 0.00

↑

Results segment # 1: Belfast Rd S (day)

Source height = 1.50 m

ROAD (0.00 + 55.62 + 0.00) = 55.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	64	0.66	65.75	0.00	-5.00	-5.14	0.00	0.00	0.00	55.62

Segment Leq : 55.62 dBA

Total Leq All Segments: 55.62 dBA

↑

Results segment # 1: Belfast Rd S (night)

Source height = 1.50 m

ROAD (0.00 + 48.02 + 0.00) = 48.02 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	64	0.66	58.16	0.00	-5.00	-5.14	0.00	0.00	0.00	48.02

Segment Leq : 48.02 dBA

Total Leq All Segments: 48.02 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 55.82
(NIGHT): 48.02

↑

↑

Filename: rec36.te Time Period: Day/Night 16/8 hours
 Description: Receptor Point 3-6

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

Train Type	! Trains	! Speed !(km/h)	!# loc !/Train!	!# Cars !/Train!	Eng type	!Cont !weld
1. VIA Rail	16.0/0.0	150.0	2.0	8.0	Diesel	No

Data for Segment # 1: VIA Rail (day/night)

Angle1 Angle2 : -45.00 deg 30.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 3 / 3
 House density : 60 %
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 240.00 / 240.00 m
 Receiver height : 18.00 / 18.00 m
 Topography : 1 (Flat/gentle slope; no barrier)
 No Whistle
 Reference angle : 0.00

↑
 Results segment # 1: VIA Rail (day)

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
-45	30	0.09	70.99	-13.12	-3.84	0.00	-6.20	0.00	47.83

WHEEL (0.00 + 39.60 + 0.00) = 39.60 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	30	0.19	64.07	-14.39	-3.87	0.00	-6.20	0.00	39.60

Segment Leq : 48.44 dBA

Total Leq All Segments: 48.44 dBA

↑
 Results segment # 1: VIA Rail (night)

LOCOMOTIVE (0.00 + -23.16 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	30	0.09	0.00	-13.12	-3.84	0.00	-6.20	0.00	-23.16

WHEEL (0.00 + -24.46 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-45	30	0.19	0.00	-14.39	-3.87	0.00	-6.20	0.00	-24.46

Segment Leq : 0.00 dBA

Total Leq All Segments: 0.00 dBA

↑

Road data, segment # 1: Belfast Rd S (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *

Medium truck volume : 515/45 veh/TimePeriod *

Heavy truck volume : 368/32 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Belfast Rd S (day/night)

Angle1 Angle2 : 0.00 deg 64.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)

Receiver source distance : 30.00 / 30.00 m

Receiver height : 18.00 / 18.00 m

Topography : 1 (Flat/gentle slope; no barrier)

Reference angle : 0.00

↑

Results segment # 1: Belfast Rd S (day)

Source height = 1.50 m

ROAD (0.00 + 57.58 + 0.00) = 57.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	64	0.17	65.75	0.00	-3.51	-4.66	0.00	0.00	0.00	57.58

Segment Leq : 57.58 dBA

Total Leq All Segments: 57.58 dBA

↑

Results segment # 1: Belfast Rd S (night)

Source height = 1.50 m

ROAD (0.00 + 49.99 + 0.00) = 49.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	64	0.17	58.16	0.00	-3.51	-4.66	0.00	0.00	0.00	49.99

Segment Leq : 49.99 dBA

Total Leq All Segments: 49.99 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 58.08
(NIGHT): 49.99

↑

↑

Filename: rec41.te Time Period: Day/Night 16/8 hours
 Description: Receptor Point 4-1

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !             !(km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----
  1. VIA Rail  ! 16.0/0.0   ! 150.0 ! 2.0 ! 8.0 !Diesel! No
  
```

Data for Segment # 1: VIA Rail (day/night)

```

-----
Angle1  Angle2      : 0.00 deg  31.00 deg
Wood depth      : 0         (No woods.)
No of house rows : 3 / 3
House density   : 60 %
Surface         : 1         (Absorptive ground surface)
Receiver source distance : 255.00 / 255.00 m
Receiver height : 1.50 / 1.50 m
Topography      : 1         (Flat/gentle slope; no barrier)
No Whistle
Reference angle : 0.00
  
```

↑
 Rail data, segment # 2: O-train Rail (day/night)

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !             !(km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----
  1. O-train Rail! 352.0/58.0 ! 80.0 ! 1.0 ! 1.0 ! Elec! Yes
  
```

Data for Segment # 2: O-train Rail (day/night)

```

-----
Angle1  Angle2      : -10.00 deg  90.00 deg
Wood depth      : 0         (No woods.)
No of house rows : 0 / 0
Surface         : 1         (Absorptive ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 1.50 / 1.50 m
Topography      : 1         (Flat/gentle slope; no barrier)
No Whistle
Reference angle : 0.00
  
```

↑
 Results segment # 1: VIA Rail (day)

LOCOMOTIVE (0.00 + 37.53 + 0.00) = 37.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	31	0.58	70.99	-19.50	-7.77	0.00	-6.19	0.00	37.53

WHEEL (0.00 + 29.67 + 0.00) = 29.67 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	31	0.66	64.07	-20.43	-7.78	0.00	-6.19	0.00	29.67

Segment Leq : 38.19 dBA

↑
Results segment # 2: O-train Rail (day)

LOCOMOTIVE (0.00 + 48.87 + 0.00) = 48.87 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.58	63.20	-10.60	-3.73	0.00	0.00	0.00	48.87

WHEEL (0.00 + 48.27 + 0.00) = 48.27 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.66	63.22	-11.11	-3.84	0.00	0.00	0.00	48.27

Segment Leq : 51.59 dBA

Total Leq All Segments: 51.78 dBA

↑
Results segment # 1: VIA Rail (night)

LOCOMOTIVE (0.00 + -33.46 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	31	0.58	0.00	-19.50	-7.77	0.00	-6.19	0.00	-33.46

WHEEL (0.00 + -34.39 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	31	0.66	0.00	-20.43	-7.78	0.00	-6.19	0.00	-34.39

Segment Leq : 0.00 dBA

↑
Results segment # 2: O-train Rail (night)

LOCOMOTIVE (0.00 + 44.05 + 0.00) = 44.05 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.58	58.38	-10.60	-3.73	0.00	0.00	0.00	44.05

WHEEL (0.00 + 43.45 + 0.00) = 43.45 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.66	58.39	-11.11	-3.84	0.00	0.00	0.00	43.45

Segment Leq : 46.77 dBA

Total Leq All Segments: 46.77 dBA

↑
Road data, segment # 1: Tremblay Rd (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *

Medium truck volume : 773/67 veh/TimePeriod *

Heavy truck volume : 552/48 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Tremblay Rd (day/night)

Angle1 Angle2 : -84.00 deg 0.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)

Receiver source distance : 20.00 / 20.00 m

Receiver height : 1.50 / 1.50 m

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 2: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Hwy 417 West (day/night)

Angle1 Angle2 : 5.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 120.00 / 120.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 3: Hwy 417 East (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Hwy 417 East (day/night)

Angle1 Angle2 : 2.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Tremblay Rd (day)

Source height = 1.50 m

ROAD (0.00 + 60.91 + 0.00) = 60.91 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	0	0.66	67.51	0.00	-2.07	-4.52	0.00	0.00	0.00	60.91

Segment Leq : 60.91 dBA

↑

Results segment # 2: Hwy 417 West (day)

Source height = 1.50 m

ROAD (0.00 + 61.59 + 0.00) = 61.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
5	90	0.66	81.40	0.00	-14.99	-4.82	0.00	0.00	0.00	61.59

Segment Leq : 61.59 dBA

↑

Results segment # 3: Hwy 417 East (day)

Source height = 1.50 m

ROAD (0.00 + 63.12 + 0.00) = 63.12 dBA

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

2 90 0.66 81.40 0.00 -13.68 -4.60 0.00 0.00 0.00 63.12

Segment Leq : 63.12 dBA

Total Leq All Segments: 66.75 dBA

↑

Results segment # 1: Tremblay Rd (night)

Source height = 1.50 m

ROAD (0.00 + 53.32 + 0.00) = 53.32 dBA

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

-84	0	0.66	59.91	0.00	-2.07	-4.52	0.00	0.00	0.00	53.32
-----	---	------	-------	------	-------	-------	------	------	------	-------

Segment Leq : 53.32 dBA

↑

Results segment # 2: Hwy 417 West (night)

Source height = 1.49 m

ROAD (0.00 + 53.99 + 0.00) = 53.99 dBA

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

5	90	0.66	73.80	0.00	-14.99	-4.82	0.00	0.00	0.00	53.99
---	----	------	-------	------	--------	-------	------	------	------	-------

Segment Leq : 53.99 dBA

↑

Results segment # 3: Hwy 417 East (night)

Source height = 1.49 m

ROAD (0.00 + 55.52 + 0.00) = 55.52 dBA

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

2	90	0.66	73.80	0.00	-13.68	-4.60	0.00	0.00	0.00	55.52
---	----	------	-------	------	--------	-------	------	------	------	-------

Segment Leq : 55.52 dBA

Total Leq All Segments: 59.15 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 66.88
(NIGHT): 59.39

↑

↑

Filename: rec46.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 4-6

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

Train Type	! Trains !	! Speed !(km/h) !	!# loc !/Train!	!# Cars! /Train!	Eng type	!Cont !weld
1. VIA Rail	! 16.0/0.0	! 150.0	! 2.0	! 8.0	!Diesel!	No

Data for Segment # 1: VIA Rail (day/night)

Angle1 Angle2 : 0.00 deg 31.00 deg
Wood depth : 0 (No woods.)
No of house rows : 3 / 3
House density : 60 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 255.00 / 255.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
No Whistle
Reference angle : 0.00

↑
Rail data, segment # 2: O-train Rail (day/night)

Train Type	! Trains !	! Speed !(km/h) !	!# loc !/Train!	!# Cars! /Train!	Eng type	!Cont !weld
1. O-train Rail	! 352.0/58.0	! 80.0	! 1.0	! 1.0	! Elec!	Yes

Data for Segment # 2: O-train Rail (day/night)

Angle1 Angle2 : -10.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 70.00 / 70.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
No Whistle
Reference angle : 0.00

↑
Results segment # 1: VIA Rail (day)

LOCOMOTIVE (0.00 + 43.73 + 0.00) = 43.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	31	0.09	70.99	-13.41	-7.66	0.00	-6.19	0.00	43.73

WHEEL (0.00 + 35.49 + 0.00) = 35.49 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	31	0.19	64.07	-14.70	-7.68	0.00	-6.19	0.00	35.49

Segment Leq : 44.34 dBA

↑
Results segment # 2: O-train Rail (day)

LOCOMOTIVE (0.00 + 53.13 + 0.00) = 53.13 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.09	63.20	-7.29	-2.78	0.00	0.00	0.00	53.13

WHEEL (0.00 + 52.20 + 0.00) = 52.20 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.19	63.22	-7.99	-3.02	0.00	0.00	0.00	52.20

Segment Leq : 55.70 dBA

Total Leq All Segments: 56.01 dBA

↑
Results segment # 1: VIA Rail (night)

LOCOMOTIVE (0.00 + -27.26 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	31	0.09	0.00	-13.41	-7.66	0.00	-6.19	0.00	-27.26

WHEEL (0.00 + -28.57 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	31	0.19	0.00	-14.70	-7.68	0.00	-6.19	0.00	-28.57

Segment Leq : 0.00 dBA

↑
Results segment # 2: O-train Rail (night)

LOCOMOTIVE (0.00 + 48.31 + 0.00) = 48.31 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.09	58.38	-7.29	-2.78	0.00	0.00	0.00	48.31

WHEEL (0.00 + 47.38 + 0.00) = 47.38 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	90	0.19	58.39	-7.99	-3.02	0.00	0.00	0.00	47.38

Segment Leq : 50.88 dBA

Total Leq All Segments: 50.88 dBA

↑
Road data, segment # 1: Tremblay Rd (day/night)

Car traffic volume : 9715/845 veh/TimePeriod *

Medium truck volume : 773/67 veh/TimePeriod *

Heavy truck volume : 552/48 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Tremblay Rd (day/night)

Angle1 Angle2 : -84.00 deg 0.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)

Receiver source distance : 20.00 / 20.00 m

Receiver height : 18.00 / 18.00 m

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 2: Hwy 417 West (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: Hwy 417 West (day/night)

Angle1 Angle2 : 5.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 120.00 / 120.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 3: Hwy 417 East (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Hwy 417 East (day/night)

Angle1 Angle2 : 2.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 100.00 / 100.00 m
Receiver height : 18.00 / 18.00 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑

Results segment # 1: Tremblay Rd (day)

Source height = 1.50 m

ROAD (0.00 + 62.40 + 0.00) = 62.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	0	0.17	67.51	0.00	-1.46	-3.66	0.00	0.00	0.00	62.40

Segment Leq : 62.40 dBA

↑

Results segment # 2: Hwy 417 West (day)

Source height = 1.50 m

ROAD (0.00 + 67.14 + 0.00) = 67.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
5	90	0.17	81.40	0.00	-10.52	-3.74	0.00	0.00	0.00	67.14

Segment Leq : 67.14 dBA

↑

Results segment # 3: Hwy 417 East (day)

Source height = 1.50 m

ROAD (0.00 + 68.23 + 0.00) = 68.23 dBA

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

2 90 0.17 81.40 0.00 -9.60 -3.57 0.00 0.00 0.00 68.23

Segment Leq : 68.23 dBA

Total Leq All Segments: 71.32 dBA

↑
Results segment # 1: Tremblay Rd (night)

Source height = 1.50 m

ROAD (0.00 + 54.80 + 0.00) = 54.80 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-84	0	0.17	59.91	0.00	-1.46	-3.66	0.00	0.00	0.00	54.80

Segment Leq : 54.80 dBA

↑
Results segment # 2: Hwy 417 West (night)

Source height = 1.49 m

ROAD (0.00 + 59.54 + 0.00) = 59.54 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
5	90	0.17	73.80	0.00	-10.52	-3.74	0.00	0.00	0.00	59.54

Segment Leq : 59.54 dBA

↑
Results segment # 3: Hwy 417 East (night)

Source height = 1.49 m

ROAD (0.00 + 60.63 + 0.00) = 60.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
2	90	0.17	73.80	0.00	-9.60	-3.57	0.00	0.00	0.00	60.63

Segment Leq : 60.63 dBA

Total Leq All Segments: 63.72 dBA



TOTAL Leq FROM ALL SOURCES (DAY): 71.45
(NIGHT): 63.94



Filename: rec5.te Time Period: Day/Night 16/8 hours
Description: Receptor Point 5

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

Train Type	! Trains	! Speed !(km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng type !	!Cont !weld
1. VIA Rail	! 16.0/0.0	! 150.0	! 2.0	! 8.0	!Diesel!	No

Data for Segment # 1: VIA Rail (day/night)

Angle1 Angle2 : -43.00 deg 31.00 deg
Wood depth : 0 (No woods.)
No of house rows : 3 / 3
House density : 60 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 247.00 / 247.00 m
Receiver height : 21.50 / 21.50 m
Topography : 2 (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1 : -43.00 deg Angle2 : 31.00 deg
Barrier height : 20.00 m
Barrier receiver distance : 7.00 / 7.00 m
Source elevation : 62.00 m
Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle : 0.00

↑
Rail data, segment # 2: O-train Rail (day/night)

Train Type	! Trains	! Speed !(km/h)	!# loc !/Train!	!# Cars !/Train!	! Eng type !	!Cont !weld
1. O-train Rail	! 352.0/58.0	! 80.0	! 1.0	! 1.0	! Elec!	Yes

Data for Segment # 2: O-train Rail (day/night)

Angle1 Angle2 : -10.00 deg 17.00 deg
Wood depth : 0 (No woods.)
No of house rows : 2 / 2
House density : 40 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 250.00 / 250.00 m
Receiver height : 21.50 / 21.50 m

Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -10.00 deg Angle2 : 17.00 deg
 Barrier height : 20.00 m
 Barrier receiver distance : 15.00 / 15.00 m
 Source elevation : 62.00 m
 Receiver elevation : 62.00 m
 Barrier elevation : 62.00 m
 Reference angle : 0.00

↑

Results segment # 1: VIA Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	21.50	21.00	83.00
0.50	21.50	20.90	82.90

LOCOMOTIVE (0.00 + 48.77 + 0.00) = 48.77 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	31	0.00	70.99	-12.17	-3.86	0.00	-6.19	0.00	48.77
-43	31	0.00	70.99	-12.17	-3.86	0.00	0.00	-0.16	54.81*
-43	31	0.00	70.99	-12.17	-3.86	0.00	0.00	0.00	54.96

* Bright Zone !

WHEEL (0.00 + 40.72 + 0.00) = 40.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	31	0.09	64.07	-13.26	-3.89	0.00	-6.19	0.00	40.72
-43	31	0.00	64.07	-12.17	-3.86	0.00	0.00	-1.14	46.90*
-43	31	0.09	64.07	-13.26	-3.89	0.00	0.00	0.00	46.91

* Bright Zone !

Segment Leq : 49.40 dBA

↑

Results segment # 2: O-train Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	21.50	20.45	82.45
0.50	21.50	20.24	82.24

LOCOMOTIVE (0.00 + 39.35 + 0.00) = 39.35 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	17	0.00	63.20	-12.22	-8.24	0.00	-3.40	0.00	39.35
-10	17	0.00	63.20	-12.22	-8.24	0.00	0.00	-4.62	38.13*
-10	17	0.00	63.20	-12.22	-8.24	0.00	0.00	0.00	42.75

* Bright Zone !

WHEEL (0.00 + 38.26 + 0.00) = 38.26 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	17	0.09	63.22	-13.32	-8.24	0.00	-3.40	0.00	38.26
-10	17	0.00	63.22	-12.22	-8.24	0.00	0.00	-4.89	37.86*
-10	17	0.09	63.22	-13.32	-8.24	0.00	0.00	0.00	41.65

* Bright Zone !

Segment Leq : 41.85 dBA

Total Leq All Segments: 50.10 dBA

↑

Results segment # 1: VIA Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	21.50	21.00	83.00
0.50	21.50	20.90	82.90

LOCOMOTIVE (0.00 + -22.22 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	31	0.00	0.00	-12.17	-3.86	0.00	-6.19	0.00	-22.22
-43	31	0.00	0.00	-12.17	-3.86	0.00	0.00	-0.16	-16.18*
-43	31	0.00	0.00	-12.17	-3.86	0.00	0.00	0.00	-16.03

* Bright Zone !

WHEEL (0.00 + -23.35 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	31	0.09	0.00	-13.26	-3.89	0.00	-6.19	0.00	-23.35
-43	31	0.00	0.00	-12.17	-3.86	0.00	0.00	-1.14	-17.17*
-43	31	0.09	0.00	-13.26	-3.89	0.00	0.00	0.00	-17.15

* Bright Zone !

Segment Leq : 0.00 dBA

↑

Results segment # 2: 0-train Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00 !	21.50 !	20.45 !	82.45
0.50 !	21.50 !	20.24 !	82.24

LOCOMOTIVE (0.00 + 34.53 + 0.00) = 34.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	17	0.00	58.38	-12.22	-8.24	0.00	-3.40	0.00	34.53
-10	17	0.00	58.38	-12.22	-8.24	0.00	0.00	-4.62	33.31*
-10	17	0.00	58.38	-12.22	-8.24	0.00	0.00	0.00	37.93

* Bright Zone !

WHEEL (0.00 + 33.44 + 0.00) = 33.44 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	17	0.09	58.39	-13.32	-8.24	0.00	-3.40	0.00	33.44
-10	17	0.00	58.39	-12.22	-8.24	0.00	0.00	-4.89	33.04*
-10	17	0.09	58.39	-13.32	-8.24	0.00	0.00	0.00	36.83

* Bright Zone !

Segment Leq : 37.03 dBA

Total Leq All Segments: 37.03 dBA

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: TremblayRd A (day/night)

Angle1 Angle2 : -85.00 deg -73.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 85.00 / 85.00 m
Receiver height : 21.50 / 21.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -85.00 deg Angle2 : -73.00 deg
Barrier height : 20.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation : 62.00 m
Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: TremblayRd B (day/night)

Angle1 Angle2 : 58.00 deg 74.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 85.00 / 85.00 m
 Receiver height : 21.50 / 21.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 58.00 deg Angle2 : 74.00 deg
 Barrier height : 20.00 m
 Barrier receiver distance : 15.00 / 15.00 m
 Source elevation : 62.00 m
 Receiver elevation : 62.00 m
 Barrier elevation : 62.00 m
 Reference angle : 0.00

↑

Road data, segment # 3: Belfast S (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
 Medium truck volume : 515/45 veh/TimePeriod *
 Heavy truck volume : 368/32 veh/TimePeriod *
 Posted speed limit : 50 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Belfast S (day/night)

Angle1 Angle2 : -32.00 deg 68.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 30.00 / 30.00 m
 Receiver height : 21.50 / 21.50 m
 Topography : 2 (Flat/gentle slope; with barrier)

Barrier angle1 : -32.00 deg Angle2 : 68.00 deg
Barrier height : 20.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation : 62.00 m
Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle : 0.00

↑

Road data, segment # 4: Hwy417 W A (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: Hwy417 W A (day/night)

Angle1 Angle2 : -87.00 deg -73.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 400.00 / 400.00 m
Receiver height : 21.50 / 21.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -87.00 deg Angle2 : -73.00 deg
Barrier height : 20.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation : 62.00 m
Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle : 0.00

↑

Road data, segment # 5: Hwy417 W B (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *

Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 5: Hwy417 W B (day/night)

Angle1 Angle2 : 58.00 deg 71.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 400.00 / 400.00 m
Receiver height : 21.50 / 21.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 58.00 deg Angle2 : 71.00 deg
Barrier height : 20.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation : 62.00 m
Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle : 0.00

↑

Road data, segment # 6: Hwy417 E A (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 6: Hwy417 E A (day/night)

```

-----
Angle1   Angle2       : -90.00 deg   -73.00 deg
Wood depth      :          0       (No woods.)
No of house rows :          0 / 0
Surface         :          1       (Absorptive ground surface)
Receiver source distance : 330.00 / 330.00 m
Receiver height  :  21.50 / 21.50 m
Topography      :          2       (Flat/gentle slope; with barrier)
Barrier angle1   : -90.00 deg   Angle2 : -73.00 deg
Barrier height   :  20.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation :  62.00 m
Receiver elevation :  62.00 m
Barrier elevation :  62.00 m
Reference angle  :    0.00

```

↑

Road data, segment # 7: Hwy417 E B (day/night)

```

-----
Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient      :    0 %
Road pavement     :    1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth       : 0.00
Number of Years of Growth         : 0.00
Medium Truck % of Total Volume    : 7.00
Heavy Truck % of Total Volume     : 5.00
Day (16 hrs) % of Total Volume    : 92.00

```

Data for Segment # 7: Hwy417 E B (day/night)

```

-----
Angle1   Angle2       :  58.00 deg   72.00 deg
Wood depth      :          0       (No woods.)
No of house rows :          0 / 0
Surface         :          1       (Absorptive ground surface)
Receiver source distance : 330.00 / 330.00 m
Receiver height  :  21.50 / 21.50 m
Topography      :          2       (Flat/gentle slope; with barrier)
Barrier angle1   :  58.00 deg   Angle2 : 72.00 deg
Barrier height   :  20.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation :  62.00 m
Receiver elevation :  62.00 m
Barrier elevation :  62.00 m

```

Reference angle : 0.00

↑
Results segment # 1: TremblayRd A (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	21.50	17.97	79.97

ROAD (0.00 + 41.84 + 0.00) = 41.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	-73	0.00	67.51	0.00	-7.53	-11.76	0.00	0.00	-6.38	41.84

Segment Leq : 41.84 dBA

↑
Results segment # 2: TremblayRd B (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	21.50	17.97	79.97

ROAD (0.00 + 41.82 + 0.00) = 41.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
58	74	0.00	67.51	0.00	-7.53	-10.51	0.00	0.00	-7.65	41.82

Segment Leq : 41.82 dBA

↑
Results segment # 3: Belfast S (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	21.50	11.50	73.50

ROAD (0.00 + 40.35 + 0.00) = 40.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-32	68	0.00	65.75	0.00	-3.01	-2.55	0.00	0.00	-19.83	40.35

Segment Leq : 40.35 dBA

↑
Results segment # 4: Hwy417 W A (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	21.50	20.75	82.75

ROAD (0.00 + 54.71 + 0.00) = 54.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-87	-73	0.00	81.40	0.00	-14.26	-11.09	0.00	0.00	-4.82	51.23*
-87	-73	0.06	81.40	0.00	-15.12	-11.57	0.00	0.00	0.00	54.71

* Bright Zone !

Segment Leq : 54.71 dBA

↑
Results segment # 5: Hwy417 W B (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	21.50		

1.50 ! 21.50 ! 20.75 ! 82.75

ROAD (0.00 + 54.64 + 0.00) = 54.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
58	71	0.00	81.40	0.00	-14.26	-11.41	0.00	0.00	-4.54	51.18*
58	71	0.06	81.40	0.00	-15.12	-11.64	0.00	0.00	0.00	54.64

* Bright Zone !

Segment Leq : 54.64 dBA

↑

Results segment # 6: Hwy417 E A (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50 !	21.50 !	20.59 !	82.59

ROAD (0.00 + 56.35 + 0.00) = 56.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-73	0.00	81.40	0.00	-13.42	-10.25	0.00	0.00	-4.90	52.82*
-90	-73	0.06	81.40	0.00	-14.23	-10.82	0.00	0.00	0.00	56.35

* Bright Zone !

Segment Leq : 56.35 dBA

↑

Results segment # 7: Hwy417 E B (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50 !	21.50 !	20.59 !	82.59

58 74 0.00 59.91 0.00 -7.53 -10.51 0.00 0.00 -7.65 34.22

Segment Leq : 34.22 dBA

↑
Results segment # 3: Belfast S (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
1.50 !	21.50 !	11.50 !	73.50

ROAD (0.00 + 32.76 + 0.00) = 32.76 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-32	68	0.00	58.16	0.00	-3.01	-2.55	0.00	0.00	-19.83	32.76

Segment Leq : 32.76 dBA

↑
Results segment # 4: Hwy417 W A (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)
1.49 !	21.50 !	20.75 !	82.75

ROAD (0.00 + 47.11 + 0.00) = 47.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-87	-73	0.00	73.80	0.00	-14.26	-11.09	0.00	0.00	-4.82	43.63*
-87	-73	0.06	73.80	0.00	-15.12	-11.57	0.00	0.00	0.00	47.11

* Bright Zone !

Segment Leq : 47.11 dBA

↑

Results segment # 5: Hwy417 W B (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	21.50	20.75	82.75

ROAD (0.00 + 47.05 + 0.00) = 47.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
58	71	0.00	73.80	0.00	-14.26	-11.41	0.00	0.00	-4.54	43.58*
58	71	0.06	73.80	0.00	-15.12	-11.64	0.00	0.00	0.00	47.05

* Bright Zone !

Segment Leq : 47.05 dBA

↑

Results segment # 6: Hwy417 E A (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	21.50	20.59	82.59

ROAD (0.00 + 48.75 + 0.00) = 48.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-73	0.00	73.80	0.00	-13.42	-10.25	0.00	0.00	-4.90	45.22*
-90	-73	0.06	73.80	0.00	-14.23	-10.82	0.00	0.00	0.00	48.75

* Bright Zone !

Segment Leq : 48.75 dBA

↑

Results segment # 7: Hwy417 E B (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.49 ! 21.50 ! 20.59 ! 82.59

ROAD (0.00 + 48.25 + 0.00) = 48.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
58	72	0.00	73.80	0.00	-13.42	-11.09	0.00	0.00	-4.72	44.56*
58	72	0.06	73.80	0.00	-14.23	-11.32	0.00	0.00	0.00	48.25

* Bright Zone !

Segment Leq : 48.25 dBA

Total Leq All Segments: 54.00 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 61.89
(NIGHT): 54.09

↑

↑

Filename: rec5tr.te Time Period: Day/Night 16/8 hours
 Description: Receptor Point 5tr

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

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !             !(km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----
  1. VIA Rail  ! 16.0/0.0   ! 150.0 ! 2.0 ! 8.0 !Diesel! No
  
```

Data for Segment # 1: VIA Rail (day/night)

```

-----
Angle1  Angle2      : -43.00 deg   31.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      3 / 3
House density   :      60 %
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 247.00 / 247.00 m
Receiver height : 21.50 / 21.50 m
Topography      :      2      (Flat/gentle slope; with barrier)
No Whistle
Barrier angle1  : -43.00 deg   Angle2 : 31.00 deg
Barrier height   : 21.00 m
Barrier receiver distance : 7.00 / 7.00 m
Source elevation : 62.00 m
Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle  : 0.00
  
```

↑
 Rail data, segment # 2: O-train Rail (day/night)

```

-----
Train          ! Trains      ! Speed !# loc !# Cars! Eng !Cont
Type          !             !(km/h) !/Train!/Train! type !weld
-----+-----+-----+-----+-----+-----
  1. O-train Rail! 352.0/58.0   ! 80.0 ! 1.0 ! 1.0 ! Elec! Yes
  
```

Data for Segment # 2: O-train Rail (day/night)

```

-----
Angle1  Angle2      : -10.00 deg   17.00 deg
Wood depth      :      0      (No woods.)
No of house rows :      2 / 2
House density   :      40 %
Surface         :      1      (Absorptive ground surface)
Receiver source distance : 250.00 / 250.00 m
Receiver height : 21.50 / 21.50 m
  
```

Topography : 2 (Flat/gentle slope; with barrier)
 No Whistle
 Barrier angle1 : -10.00 deg Angle2 : 17.00 deg
 Barrier height : 21.00 m
 Barrier receiver distance : 15.00 / 15.00 m
 Source elevation : 62.00 m
 Receiver elevation : 62.00 m
 Barrier elevation : 62.00 m
 Reference angle : 0.00

↑

Results segment # 1: VIA Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	21.50	21.00	83.00
0.50	21.50	20.90	82.90

LOCOMOTIVE (0.00 + 48.77 + 0.00) = 48.77 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	31	0.00	70.99	-12.17	-3.86	0.00	-6.19	0.00	48.77
-43	31	0.00	70.99	-12.17	-3.86	0.00	0.00	-5.00	49.96*
-43	31	0.00	70.99	-12.17	-3.86	0.00	0.00	0.00	54.96

* Bright Zone !

WHEEL (0.00 + 40.72 + 0.00) = 40.72 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	31	0.09	64.07	-13.26	-3.89	0.00	-6.19	0.00	40.72
-43	31	0.00	64.07	-12.17	-3.86	0.00	0.00	-5.03	43.01

Segment Leq : 49.40 dBA

↑

Results segment # 2: O-train Rail (day)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)

4.00 ! 21.50 ! 20.45 ! 82.45
 0.50 ! 21.50 ! 20.24 ! 82.24

LOCOMOTIVE (0.00 + 37.21 + 0.00) = 37.21 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	17	0.00	63.20	-12.22	-8.24	0.00	-3.40	0.00	39.35
-10	17	0.00	63.20	-12.22	-8.24	0.00	0.00	-5.54	37.21

WHEEL (0.00 + 36.77 + 0.00) = 36.77 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	17	0.09	63.22	-13.32	-8.24	0.00	-3.40	0.00	38.26
-10	17	0.00	63.22	-12.22	-8.24	0.00	0.00	-5.98	36.77

Segment Leq : 40.01 dBA

Total Leq All Segments: 49.87 dBA

↑
 Results segment # 1: VIA Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00 !	21.50 !	21.00 !	83.00
0.50 !	21.50 !	20.90 !	82.90

LOCOMOTIVE (0.00 + -22.22 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	31	0.00	0.00	-12.17	-3.86	0.00	-6.19	0.00	-22.22
-43	31	0.00	0.00	-12.17	-3.86	0.00	0.00	-5.00	-21.03*
-43	31	0.00	0.00	-12.17	-3.86	0.00	0.00	0.00	-16.03

* Bright Zone !

WHEEL (0.00 + -23.35 + 0.00) = 0.00 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-43	31	0.09	0.00	-13.26	-3.89	0.00	-6.19	0.00	-23.35
-43	31	0.00	0.00	-12.17	-3.86	0.00	0.00	-5.03	-21.06

Segment Leq : 0.00 dBA

↑

Results segment # 2: 0-train Rail (night)

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
4.00	21.50	20.45	82.45
0.50	21.50	20.24	82.24

LOCOMOTIVE (0.00 + 32.39 + 0.00) = 32.39 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	17	0.00	58.38	-12.22	-8.24	0.00	-3.40	0.00	34.53
-10	17	0.00	58.38	-12.22	-8.24	0.00	0.00	-5.54	32.39

WHEEL (0.00 + 31.95 + 0.00) = 31.95 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	17	0.09	58.39	-13.32	-8.24	0.00	-3.40	0.00	33.44
-10	17	0.00	58.39	-12.22	-8.24	0.00	0.00	-5.98	31.95

Segment Leq : 35.19 dBA

Total Leq All Segments: 35.19 dBA

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *

Medium truck volume : 773/67 veh/TimePeriod *

Heavy truck volume : 552/48 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 7.00

Heavy Truck % of Total Volume : 5.00

Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: TremblayRd A (day/night)

Angle1 Angle2 : -85.00 deg -73.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 85.00 / 85.00 m
Receiver height : 21.50 / 21.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -85.00 deg Angle2 : -73.00 deg
Barrier height : 21.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation : 62.00 m
Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle : 0.00

↑

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 12000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: TremblayRd B (day/night)

Angle1 Angle2 : 58.00 deg 74.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 85.00 / 85.00 m
Receiver height : 21.50 / 21.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 58.00 deg Angle2 : 74.00 deg
Barrier height : 21.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation : 62.00 m

Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle : 0.00

↑
Road data, segment # 3: Belfast S (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 3: Belfast S (day/night)

Angle1 Angle2 : -32.00 deg 68.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 21.50 / 21.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -32.00 deg Angle2 : 68.00 deg
Barrier height : 21.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation : 62.00 m
Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle : 0.00

↑
Road data, segment # 4: Hwy417 W A (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 4: Hwy417 W A (day/night)

Angle1 Angle2 : -87.00 deg -73.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 400.00 / 400.00 m
Receiver height : 21.50 / 21.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -87.00 deg Angle2 : -73.00 deg
Barrier height : 21.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation : 62.00 m
Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle : 0.00

↑

Road data, segment # 5: Hwy417 W B (day/night)

Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 5: Hwy417 W B (day/night)

Angle1 Angle2 : 58.00 deg 71.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)
 Receiver source distance : 400.00 / 400.00 m
 Receiver height : 21.50 / 21.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : 58.00 deg Angle2 : 71.00 deg
 Barrier height : 21.00 m
 Barrier receiver distance : 15.00 / 15.00 m
 Source elevation : 62.00 m
 Receiver elevation : 62.00 m
 Barrier elevation : 62.00 m
 Reference angle : 0.00

↑

Road data, segment # 6: Hwy417 E A (day/night)

 Car traffic volume : 59370/5163 veh/TimePeriod *
 Medium truck volume : 4723/411 veh/TimePeriod *
 Heavy truck volume : 3373/293 veh/TimePeriod *
 Posted speed limit : 100 km/h
 Road gradient : 0 %
 Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 73332
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 7.00
 Heavy Truck % of Total Volume : 5.00
 Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 6: Hwy417 E A (day/night)

 Angle1 Angle2 : -90.00 deg -73.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 330.00 / 330.00 m
 Receiver height : 21.50 / 21.50 m
 Topography : 2 (Flat/gentle slope; with barrier)
 Barrier angle1 : -90.00 deg Angle2 : -73.00 deg
 Barrier height : 21.00 m
 Barrier receiver distance : 15.00 / 15.00 m
 Source elevation : 62.00 m
 Receiver elevation : 62.00 m
 Barrier elevation : 62.00 m
 Reference angle : 0.00

↑

Road data, segment # 7: Hwy417 E B (day/night)

```

-----
Car traffic volume : 59370/5163 veh/TimePeriod *
Medium truck volume : 4723/411 veh/TimePeriod *
Heavy truck volume : 3373/293 veh/TimePeriod *
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

```

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

```

24 hr Traffic Volume (AADT or SADT): 73332
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

```

Data for Segment # 7: Hwy417 E B (day/night)

```

-----
Angle1 Angle2 : 58.00 deg 72.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 330.00 / 330.00 m
Receiver height : 21.50 / 21.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 58.00 deg Angle2 : 72.00 deg
Barrier height : 21.00 m
Barrier receiver distance : 15.00 / 15.00 m
Source elevation : 62.00 m
Receiver elevation : 62.00 m
Barrier elevation : 62.00 m
Reference angle : 0.00

```

↑

Results segment # 1: TremblayRd A (day)

Source height = 1.50 m

Barrier height for grazing incidence

```

-----
Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.50 ! 21.50 ! 17.97 ! 79.97

```

ROAD (0.00 + 40.52 + 0.00) = 40.52 dBA

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

-85 -73 0.00 67.51 0.00 -7.53 -11.76 0.00 0.00 -7.70 40.52

Segment Leq : 40.52 dBA

↑
Results segment # 2: TremblayRd B (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50 !	21.50 !	17.97 !	79.97

ROAD (0.00 + 39.68 + 0.00) = 39.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
58	74	0.00	67.51	0.00	-7.53	-10.51	0.00	0.00	-9.79	39.68

Segment Leq : 39.68 dBA

↑
Results segment # 3: Belfast S (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver ! Height (m)	! Barrier ! Height (m)	! Elevation of ! Barrier Top (m)
1.50 !	21.50 !	11.50 !	73.50

ROAD (0.00 + 40.23 + 0.00) = 40.23 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-32	68	0.00	65.75	0.00	-3.01	-2.55	0.00	0.00	-19.96	40.23

Segment Leq : 40.23 dBA

↑
Results segment # 4: Hwy417 W A (day)

Source height = 1.50 m

Barrier height for grazing incidence

```
-----  
Source      ! Receiver      ! Barrier      ! Elevation of  
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)  
-----+-----+-----+-----  
          1.50 !          21.50 !          20.75 !          82.75
```

ROAD (0.00 + 51.03 + 0.00) = 51.03 dBA

```
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq  
-----  
   -87    -73   0.00  81.40   0.00 -14.26 -11.09   0.00   0.00  -5.02  51.03  
-----
```

Segment Leq : 51.03 dBA

↑
Results segment # 5: Hwy417 W B (day)

Source height = 1.50 m

Barrier height for grazing incidence

```
-----  
Source      ! Receiver      ! Barrier      ! Elevation of  
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)  
-----+-----+-----+-----  
          1.50 !          21.50 !          20.75 !          82.75
```

ROAD (0.00 + 50.67 + 0.00) = 50.67 dBA

```
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq  
-----  
    58    71   0.00  81.40   0.00 -14.26 -11.41   0.00   0.00  -5.05  50.67  
-----
```

Segment Leq : 50.67 dBA

↑
Results segment # 6: Hwy417 E A (day)

Source height = 1.50 m

Barrier height for grazing incidence

```
-----  
Source      ! Receiver      ! Barrier      ! Elevation of  
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)  
-----+-----+-----+-----
```

1.50 ! 21.50 ! 20.59 ! 82.59

ROAD (0.00 + 52.68 + 0.00) = 52.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-73	0.00	81.40	0.00	-13.42	-10.25	0.00	0.00	-5.05	52.68

Segment Leq : 52.68 dBA

↑

Results segment # 7: Hwy417 E B (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50 !	21.50 !	20.59 !	82.59

ROAD (0.00 + 51.75 + 0.00) = 51.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
58	72	0.00	81.40	0.00	-13.42	-11.09	0.00	0.00	-5.13	51.75

Segment Leq : 51.75 dBA

Total Leq All Segments: 57.85 dBA

↑

Results segment # 1: TremblayRd A (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50 !	21.50 !	17.97 !	79.97

ROAD (0.00 + 32.92 + 0.00) = 32.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-85	-73	0.00	59.91	0.00	-7.53	-11.76	0.00	0.00	-7.70	32.92

Segment Leq : 32.92 dBA

↑
Results segment # 2: TremblayRd B (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)			
1.50	!	21.50	!	17.97	!	79.97

ROAD (0.00 + 32.08 + 0.00) = 32.08 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

58 74 0.00 59.91 0.00 -7.53 -10.51 0.00 0.00 -9.79 32.08

Segment Leq : 32.08 dBA

↑
Results segment # 3: Belfast S (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	! Receiver Height (m)	! Barrier Height (m)	! Elevation of Barrier Top (m)			
1.50	!	21.50	!	11.50	!	73.50

ROAD (0.00 + 32.63 + 0.00) = 32.63 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-32 68 0.00 58.16 0.00 -3.01 -2.55 0.00 0.00 -19.96 32.63

Segment Leq : 32.63 dBA

↑
Results segment # 4: Hwy417 W A (night)

Source height = 1.49 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.49 !       21.50 !       20.75 !       82.75

```

ROAD (0.00 + 43.43 + 0.00) = 43.43 dBA

```

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
   -87   -73   0.00  73.80   0.00 -14.26 -11.09   0.00   0.00  -5.02  43.43
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```

Segment Leq : 43.43 dBA

↑
Results segment # 5: Hwy417 W B (night)

Source height = 1.49 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.49 !       21.50 !       20.75 !       82.75

```

ROAD (0.00 + 43.08 + 0.00) = 43.08 dBA

```

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
   58   71   0.00  73.80   0.00 -14.26 -11.41   0.00   0.00  -5.05  43.08
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```

Segment Leq : 43.08 dBA

↑
Results segment # 6: Hwy417 E A (night)

Source height = 1.49 m

Barrier height for grazing incidence

```

-----
Source      ! Receiver      ! Barrier      ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
          1.49 !       21.50 !       20.59 !       82.59

```


ROAD (0.00 + 45.08 + 0.00) = 45.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-73	0.00	73.80	0.00	-13.42	-10.25	0.00	0.00	-5.05	45.08

Segment Leq : 45.08 dBA

↑
Results segment # 7: Hwy417 E B (night)

Source height = 1.49 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.49	21.50	20.59	82.59

ROAD (0.00 + 44.15 + 0.00) = 44.15 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
58	72	0.00	73.80	0.00	-13.42	-11.09	0.00	0.00	-5.13	44.15

Segment Leq : 44.15 dBA

Total Leq All Segments: 50.25 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 58.49
(NIGHT): 50.39

↑
↑

APPENDIX 3

VIA-RAIL TRAIN COUNT

VIA-RAIL CORRESPONDENCE

O-TRAIN RAIL TRAIN COUNT

**OLRT SCHEDULE 15-2 DESIGN AND CONSTRUCTION REQUIREMENTS
– PART 2 GUIDEWAY**

Train Schedule:

Ottawa - Montréal - Sainte Foy - Québec

- Locations in bold indicate a possible connection.
- No local service between Montréal and Saint-Lambert
- No local service between Québec City, Sainte-Foy and Charny
- For a stop at this station, reservations are required at least 40 minutes before the train departs from its station of origin. Train 22 stops in Saint-Hyacinthe on Saturdays and Sundays only.
- No local service between Montreal and Dorval
- No local service between Dorval and Montreal

# Train	22	22	20	622	622	24	26	28	38	38
Business class	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Baggage check-in	Yes	Yes	No	No	No	No	No	No	No	No
Dates	From 2022-06-19 to 2023-06-18	From 2023-06-19 to 2033-05-01	All year round	From 2022-06-19 to 2023-06-18	From 2023-06-19 to 2033-05-01	All year round	All year round	All year round	From 2022-06-19 to 2023-06-18	From 2023-06-19 to 2033-05-01

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# Train		22	22	20	622	622	24	26	28	38	38
		Time	Time				Time	Time	Time	Time	Time
Casselman, ON Reservations are required at least 40 minutes before the train departure from its original station for a stop at Casselman.	Departure	06:56	06:35	-	-	-	-	-	16:37	19:22	18:27
Alexandria, ON	Departure	07:18	06:58	-	-	-	11:07	15:08	16:59	19:46	18:51
Coteau, QC Fridays only	Departure	07:46	07:23	-	-	-	11:33	15:29	17:19	-	19:12
Dorval, QC Shuttle service runs between the station and the airport. Stops to disembark. Conditional stop	Departure	08:11	07:51	-	-	-	11:55	15:55	17:44	20:37	19:27
Days		-	-	Day 1 MTWTFSS	Day 1 MTWTFSS	Day 1 MTWTFSS	-	-	-	-	-
Montreal, QC	Arrival	08:31	08:11	-	-	-	12:15	16:15	18:04	20:57	19:57

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Saturdays and #Tuesdays only		22	22	20	622	622	24	26	28	38	38
Drummondville, QC	Departure	10:12	09:54	07:38	10:12	09:52	14:03	18:15	19:45	-	-
Charny, QC	Departure	-	-	-	-	-	15:46	19:54	21:24	-	-
Sainte-Foy, QC Shuttle operates between Ste-Foy and Québec city (Gare du Palais) in both directions. Reservations are required. Conditional stop	Arrival	11:55	11:25	-	11:54	11:24	-	-	-	-	-
	Departure	11:58	11:28	09:19	11:57	11:27	15:54	20:03	21:32	-	-
Québec, QC	Arrival	12:22 Eastern Time	11:52 Eastern Time	09:43 Eastern Time	12:22 Eastern Time	11:52 Eastern Time	16:18 Eastern Time	20:26 Eastern Time	21:56 Eastern Time	-	-

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Train Schedule:

Québec - Sainte Foy - Montréal - Ottawa

- Locations in bold indicate a possible connection.
- No local service between Québec City, Sainte-Foy and Charny
- No local service between Ottawa and Fallowfield

# Train	51	31	33	35	35	633	37	37	39	39	29
Business class	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Baggage check-in	No	No	No	No	No	No	No	No	No	No	Yes
Dates	From 2022-06-19 to 2023-06-18	From 2023-06-19 to 2032-04-25	All year round	From 2022-06-19 to 2023-06-18	From 2023-06-19 to 2033-05-01	All year round	From 2022-06-19 to 2023-06-18	From 2023-06-19 to 2033-05-01	All year round	From 2023-06-19 to 2033-05-01	All year round
Days	-	-	Day 1 MTWTFSS	Day 1 MTWTFSS	Day 1 MTWTFSS	-	Day 1 MTWTFSS	Day 1 MTWTFSS	Day 1 MTWTFSS	Day 1 MTWTFSS	Day 1 MTWTFSS

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Shuttle operates between Ste-Foy and Québec city (Gare du Palais) in both directions. Reservations are required.		51	31	33	35	35	633	37	37	39	39	29
Charny, QC	Departure	-	-	06:00	08:44	08:44	-	-	-	-	-	-
Drummondville, QC	Arrival	-	-	-	10:12	10:12	-	-	-	-	-	-
	Departure	-	-	07:28	10:15	10:15	-	14:45	14:45	16:54	16:54	19:43
Saint-Hyacinthe, QC	Departure	-	-	08:00	10:48	10:48	-	15:16	15:16	-	-	20:21
Saint-Lambert, QC Conditional stop No local service between Saint-Lambert and Montreal.	Departure	-	-	08:26	11:15	11:15	-	15:43	15:44	18:00	18:00	20:49
Days		Day 1 MTWTFSS	Day 1 MTWTFSS	-	-	-	Day 1 MTWTFSS	-	-	-	-	-
Montréal, QC	Arrival	-	-	08:37	11:26	11:26	-	15:54	15:54	18:11	18:11	21:00
	Departure	06:20 Eastern Time	06:20 Eastern Time	09:00	11:54	11:54	09:00 Eastern Time	16:30	16:30	18:50	18:50	- Eastern Time

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# Train		51	31	33	35	35	633	37	37	39	39	29
Coteau, QC	Departure	-	07:07	-	12:53	12:53	-	17:29	17:29	19:51	19:51	-
Alexandria, ON	Departure	07:28	07:33	10:22	13:17	13:18	10:11	17:51	17:51	20:18	20:13	-
Casselman, ON Conditional stop For a stop at this station, reservations are required at least 40 minutes before the train departs from its station of origin.	Departure	07:55	07:55	10:44	13:40	13:41	10:33	-	-	-	-	-
Ottawa, ON	Arrival	08:20	08:20	11:14	14:05	14:07	11:04	18:35	18:40	21:02	20:57	-
	Departure	08:35	- Eastern Time	- Eastern Time	- Eastern Time	- Eastern Time	- Eastern Time	- Eastern Time	- Eastern Time	- Eastern Time	- Eastern Time	- Eastern Time
Fallowfield, ON	Arrival	08:52	-	-	-	-	-	-	-	-	-	-
	Departure	08:55 Eastern Time	-	-	-	-	-	-	-	-	-	-

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Yolanda Tang

From: Paul Charbachi <Paul_Charbachi@viarail.ca>
Sent: Friday, June 9, 2023 11:24 AM
To: Yolanda Tang
Cc: Stephanie Boisvenue
Subject: RE: Request For Rail Information

Hello,
My answers are below, and please keep in mind it's based on current operations and could change any time.
Pc

From: Yolanda Tang <YTang@patersongroup.ca>
Sent: Friday, June 9, 2023 11:11 AM
To: Paul Charbachi <Paul_Charbachi@viarail.ca>
Cc: Stephanie Boisvenue <SBoisvenue@patersongroup.ca>
Subject: Request For Rail Information

EXPÉDITEUR EXTERNE: Faites preuve de prudence avec les liens et les pièces jointes provenant d'un expéditeur externe.
EXTERNAL SENDER: Use caution with links and attachments from an external sender.

Good morning Paul,

Paterson is currently working on the noise study for the proposed development at 1346 Avenue Q, Ottawa, Ontario, in close proximity to the VIA's mainline track at Ottawa.
It is located at the rail line that connects the Alexandria and Ottawa Train Stations. I was wondering if you could fill in some information for me.

Rail Line: Alexandria - Ottawa Rail Corridor (Ottawa, Ontario)
Number of trains a day: **16 trains**
Number of Engines: **2 engines**
Type of Engine: **P42 , Charger Siemens**
Number of Cars: **6 to 8 cars , welded rail**
Approximate Speed: **100 MPH**

Thanks for your time.

Best Regards
Yolanda



YOLANDA TANG, M.A.Sc.
JUNIOR PROJECT MANAGER

DIRECT: (613) 800-0148

9 AURIGA DRIVE
OTTAWA ON K2E 7T9

patersongroup.ca

Schedules & Maps

The next service change is on Sunday, April 23.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Mon, Jun 12

1 Blair

[S] Ends at Parliament

[a] O-Train Line 1 will experience partial closures from June 5-19 for planned maintenance. [Read more](#)

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN
04:56[S]	04:59[S]	05:01[S]	05:03[S]	05:05[S]					
05:04[S]	05:07[S]	05:09[S]	05:11[S]	05:13[S]					
							05:06	05:08	05:10
05:12[S]	05:15[S]	05:17[S]	05:19[S]	05:21[S]					
					05:14	05:17	05:20	05:22	05:24
05:22[S]	05:25[S]	05:27[S]	05:29[S]	05:31[S]					
					05:22	05:25	05:28	05:30	05:32
					05:30	05:33	05:36	05:38	05:40
05:32[S]	05:35[S]	05:37[S]	05:39[S]	05:41[S]					
					05:40	05:43	05:46	05:48	05:50
05:41[S]	05:44[S]	05:46[S]	05:48[S]	05:50[S]					
05:50[S]	05:53[S]	05:55[S]	05:57[S]	05:59[S]					
					05:50	05:53	05:56	05:58	06:00
					05:59	06:02	06:05	06:07	06:09
06:00[S]	06:03[S]	06:05[S]	06:07[S]	06:09[S]					
06:09[S]	06:12[S]	06:14[S]	06:16[S]	06:18[S]					
							06:09	06:11	06:13
					06:08	06:11	06:14	06:16	06:18
06:15[S]	06:18[S]	06:20[S]	06:22[S]	06:24[S]					
							06:20	06:22	06:24
					06:18	06:21	06:24	06:26	06:28
06:22[S]	06:25[S]	06:27[S]	06:29[S]	06:31[S]					
06:28[S]	06:31[S]	06:33[S]	06:35[S]	06:37[S]					
							06:29	06:31	06:33
					06:27	06:30	06:33	06:35	06:37
06:31[S]	06:34[S]	06:36[S]	06:38[S]	06:40[S]					
					06:33	06:36	06:40	06:42	06:44

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN
06:36[S]	06:39[S]	06:41[S]	06:43[S]	06:45[S]					
					06:40	06:43	06:47	06:49	06:51
06:41[S]	06:44[S]	06:46[S]	06:48[S]	06:50[S]					
06:46[S]	06:49[S]	06:51[S]	06:53[S]	06:55[S]					
					06:46	06:49	06:53	06:55	06:57
					06:49	06:52	06:56	06:58	07:00
06:51[S]	06:54[S]	06:56[S]	06:58[S]	07:00[S]					
					06:54	06:57	07:01	07:03	07:05
06:56[S]	06:59[S]	07:01[S]	07:03[S]	07:05[S]					
					06:59	07:02	07:06	07:08	07:10
07:01[S]	07:04[S]	07:06[S]	07:08[S]	07:10[S]					
					07:04	07:07	07:11	07:13	07:15
07:06[S]	07:09[S]	07:11[S]	07:13[S]	07:15[S]					
					07:09	07:12	07:16	07:18	07:20
07:11[S]	07:14[S]	07:16[S]	07:18[S]	07:20[S]					
					07:14	07:17	07:21	07:23	07:25
07:16[S]	07:19[S]	07:21[S]	07:23[S]	07:25[S]					
					07:19	07:22	07:26	07:28	07:30
07:21[S]	07:24[S]	07:26[S]	07:28[S]	07:30[S]					
					07:24	07:27	07:31	07:33	07:35
07:26[S]	07:29[S]	07:31[S]	07:33[S]	07:35[S]					
					07:29	07:32	07:36	07:38	07:40
07:31[S]	07:34[S]	07:36[S]	07:38[S]	07:40[S]					
					07:34	07:37	07:41	07:43	07:45
07:36[S]	07:39[S]	07:41[S]	07:43[S]	07:45[S]					
					07:39	07:42	07:46	07:48	07:50
07:41[S]	07:44[S]	07:46[S]	07:48[S]	07:50[S]					
					07:44	07:47	07:51	07:53	07:55
07:46[S]	07:49[S]	07:51[S]	07:53[S]	07:55[S]					
					07:49	07:52	07:56	07:58	08:00
07:51[S]	07:54[S]	07:56[S]	07:58[S]	08:00[S]					
					07:54	07:57	08:01	08:03	08:05
07:56[S]	07:59[S]	08:01[S]	08:03[S]	08:05[S]					
					07:59	08:02	08:06	08:08	08:10
08:01[S]	08:04[S]	08:06[S]	08:08[S]	08:10[S]					
					08:04	08:07	08:11	08:13	08:15
08:06[S]	08:09[S]	08:11[S]	08:13[S]	08:15[S]					
					08:09	08:12	08:16	08:18	08:20
08:11[S]	08:14[S]	08:16[S]	08:18[S]	08:20[S]					
					08:14	08:17	08:21	08:23	08:25
08:16[S]	08:19[S]	08:21[S]	08:23[S]	08:25[S]					
					08:19	08:22	08:26	08:28	08:30
08:21[S]	08:24[S]	08:26[S]	08:28[S]	08:30[S]					
					08:24	08:27	08:31	08:33	08:35
08:26[S]	08:29[S]	08:31[S]	08:33[S]	08:35[S]					
					08:29	08:32	08:36	08:38	08:40
08:31[S]	08:34[S]	08:36[S]	08:38[S]	08:40[S]					
					08:34	08:37	08:41	08:43	08:45
08:36[S]	08:39[S]	08:41[S]	08:43[S]	08:45[S]					

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN
					08:39	08:42	08:46	08:48	08:50
08:41[S]	08:44[S]	08:46[S]	08:48[S]	08:50[S]					
					08:44	08:47	08:51	08:53	08:55
08:46[S]	08:49[S]	08:51[S]	08:53[S]	08:55[S]					
					08:49	08:52	08:56	08:58	09:00
08:51[S]	08:54[S]	08:56[S]	08:58[S]	09:00[S]					
					08:54	08:57	09:01	09:03	09:05
08:56[S]	08:59[S]	09:01[S]	09:03[S]	09:05[S]					
					08:59	09:02	09:06	09:08	09:10
09:01[S]	09:04[S]	09:06[S]	09:08[S]	09:10[S]					
					09:04	09:07	09:11	09:13	09:15
09:06[S]	09:09[S]	09:11[S]	09:13[S]	09:15[S]					
					09:09	09:12	09:16	09:18	09:20
09:11[S]	09:14[S]	09:16[S]	09:18[S]	09:20[S]					
					09:14	09:17	09:21	09:23	09:25
09:16[S]	09:19[S]	09:21[S]	09:23[S]	09:25[S]					
					09:19	09:22	09:26	09:28	09:30
09:22[S]	09:25[S]	09:27[S]	09:29[S]	09:31[S]					
					09:24	09:27	09:31	09:33	09:35
09:28[S]	09:31[S]	09:33[S]	09:35[S]	09:37[S]					
					09:29	09:32	09:36	09:38	09:40
					09:34	09:37	09:40	09:42	09:44
09:35[S]	09:38[S]	09:40[S]	09:42[S]	09:44[S]					
					09:40	09:43	09:46	09:48	09:50
09:42[S]	09:45[S]	09:47[S]	09:49[S]	09:51[S]					
					09:46	09:49	09:52	09:54	09:56
09:47[S]	09:50[S]	09:52[S]	09:54[S]	09:56[S]					
09:53[S]	09:56[S]	09:58[S]	10:00[S]	10:02[S]					
					09:53	09:56	09:59	10:01	10:03
09:59[S]	10:02[S]	10:04[S]	10:06[S]	10:08[S]					
					10:00	10:03	10:06	10:08	10:10
10:04[S]	10:07[S]	10:09[S]	10:11[S]	10:13[S]					
					10:05	10:08	10:11	10:13	10:15
10:10[S]	10:13[S]	10:15[S]	10:17[S]	10:19[S]					
					10:11	10:14	10:17	10:19	10:21
10:16[S]	10:19[S]	10:21[S]	10:23[S]	10:25[S]					
					10:17	10:20	10:23	10:25	10:27
10:21[S]	10:24[S]	10:26[S]	10:28[S]	10:30[S]					
					10:22	10:25	10:28	10:30	10:32
10:27[S]	10:30[S]	10:32[S]	10:34[S]	10:36[S]					
					10:28	10:31	10:34	10:36	10:38
10:33[S]	10:36[S]	10:38[S]	10:40[S]	10:42[S]					
					10:34	10:37	10:40	10:42	10:44
10:38[S]	10:41[S]	10:43[S]	10:45[S]	10:47[S]					
					10:39	10:42	10:45	10:47	10:49
10:44[S]	10:47[S]	10:49[S]	10:51[S]	10:53[S]					
					10:45	10:48	10:51	10:53	10:55
10:50[S]	10:53[S]	10:55[S]	10:57[S]	10:59[S]					
					10:51	10:54	10:57	10:59	11:01

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN
10:55[S]	10:58[S]	11:00[S]	11:02[S]	11:04[S]					
					10:56	10:59	11:02	11:04	11:06
11:01[S]	11:04[S]	11:06[S]	11:08[S]	11:10[S]					
					11:02	11:05	11:08	11:10	11:12
11:07[S]	11:10[S]	11:12[S]	11:14[S]	11:16[S]					
					11:08	11:11	11:14	11:16	11:18
11:12[S]	11:15[S]	11:17[S]	11:19[S]	11:21[S]					
					11:13	11:16	11:19	11:21	11:23
11:18[S]	11:21[S]	11:23[S]	11:25[S]	11:27[S]					
					11:19	11:22	11:25	11:27	11:29
11:24[S]	11:27[S]	11:29[S]	11:31[S]	11:33[S]					
					11:25	11:28	11:31	11:33	11:35
11:29[S]	11:32[S]	11:34[S]	11:36[S]	11:38[S]					
					11:30	11:33	11:36	11:38	11:40
11:35[S]	11:38[S]	11:40[S]	11:42[S]	11:44[S]					
					11:36	11:39	11:42	11:44	11:46
11:41[S]	11:44[S]	11:46[S]	11:48[S]	11:50[S]					
					11:42	11:45	11:48	11:50	11:52
11:46[S]	11:49[S]	11:51[S]	11:53[S]	11:55[S]					
					11:47	11:50	11:53	11:55	11:57
11:52[S]	11:55[S]	11:57[S]	11:59[S]	12:01[S]					
					11:53	11:56	11:59	12:01	12:03
11:58[S]	12:01[S]	12:03[S]	12:05[S]	12:07[S]					
					11:59	12:02	12:05	12:07	12:09
12:03[S]	12:06[S]	12:08[S]	12:10[S]	12:12[S]					
					12:04	12:07	12:10	12:12	12:14
12:09[S]	12:12[S]	12:14[S]	12:16[S]	12:18[S]					
					12:10	12:13	12:16	12:18	12:20
12:15[S]	12:18[S]	12:20[S]	12:22[S]	12:24[S]					
					12:16	12:19	12:22	12:24	12:26
12:20[S]	12:23[S]	12:25[S]	12:27[S]	12:29[S]					
					12:21	12:24	12:27	12:29	12:31
12:26[S]	12:29[S]	12:31[S]	12:33[S]	12:35[S]					
					12:27	12:30	12:33	12:35	12:37
12:32[S]	12:35[S]	12:37[S]	12:39[S]	12:41[S]					
					12:33	12:36	12:39	12:41	12:43
12:37[S]	12:40[S]	12:42[S]	12:44[S]	12:46[S]					
					12:38	12:41	12:44	12:46	12:48
12:43[S]	12:46[S]	12:48[S]	12:50[S]	12:52[S]					
					12:44	12:47	12:50	12:52	12:54
12:49[S]	12:52[S]	12:54[S]	12:56[S]	12:58[S]					
					12:50	12:53	12:56	12:58	13:00
12:54[S]	12:57[S]	12:59[S]	13:01[S]	13:03[S]					
					12:55	12:58	13:01	13:03	13:05
13:00[S]	13:03[S]	13:05[S]	13:07[S]	13:09[S]					
					13:01	13:04	13:07	13:09	13:11
13:06[S]	13:09[S]	13:11[S]	13:13[S]	13:15[S]					
					13:07	13:10	13:13	13:15	13:17
13:11[S]	13:14[S]	13:16[S]	13:18[S]	13:20[S]					

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN
					13:12	13:15	13:18	13:20	13:22
13:17[S]	13:20[S]	13:22[S]	13:24[S]	13:26[S]					
					13:18	13:21	13:24	13:26	13:28
13:23[S]	13:26[S]	13:28[S]	13:30[S]	13:32[S]					
					13:24	13:27	13:30	13:32	13:34
13:28[S]	13:31[S]	13:33[S]	13:35[S]	13:37[S]					
					13:29	13:32	13:35	13:37	13:39
13:34[S]	13:37[S]	13:39[S]	13:41[S]	13:43[S]					
					13:35	13:38	13:41	13:43	13:45
13:40[S]	13:43[S]	13:45[S]	13:47[S]	13:49[S]					
					13:41	13:44	13:47	13:49	13:51
13:45[S]	13:48[S]	13:50[S]	13:52[S]	13:54[S]					
					13:46	13:49	13:52	13:54	13:56
13:51[S]	13:54[S]	13:56[S]	13:58[S]	14:00[S]					
					13:52	13:55	13:58	14:00	14:02
13:56[S]	13:59[S]	14:01[S]	14:03[S]	14:05[S]					
					13:58	14:01	14:04	14:06	14:08
14:02[S]	14:05[S]	14:07[S]	14:09[S]	14:11[S]					
					14:03	14:06	14:09	14:11	14:13
14:08[S]	14:11[S]	14:13[S]	14:15[S]	14:17[S]					
					14:09	14:12	14:15	14:17	14:19
					14:14	14:17	14:20	14:22	14:24
14:15[S]	14:18[S]	14:20[S]	14:22[S]	14:24[S]					
14:19[S]	14:22[S]	14:24[S]	14:26[S]	14:28[S]					
					14:20	14:23	14:26	14:28	14:30
14:25[S]	14:28[S]	14:30[S]	14:32[S]	14:34[S]					
					14:26	14:29	14:32	14:34	14:36
14:31[S]	14:34[S]	14:36[S]	14:38[S]	14:40[S]					
							14:35	14:37	14:39
					14:33	14:36	14:39	14:41	14:43
14:36[S]	14:39[S]	14:41[S]	14:43[S]	14:45[S]					
					14:37	14:40	14:43	14:45	14:47
14:42[S]	14:45[S]	14:47[S]	14:49[S]	14:51[S]					
					14:43	14:46	14:49	14:51	14:53
14:48[S]	14:51[S]	14:53[S]	14:55[S]	14:57[S]					
					14:49	14:52	14:55	14:57	14:59
14:53[S]	14:56[S]	14:58[S]	15:00[S]	15:02[S]					
					14:54	14:57	15:00	15:02	15:04
14:58[S]	15:01[S]	15:03[S]	15:05[S]	15:07[S]					
					15:00	15:03	15:07	15:09	15:11
15:02[S]	15:05[S]	15:07[S]	15:09[S]	15:11[S]					
15:06[S]	15:09[S]	15:11[S]	15:13[S]	15:15[S]					
					15:06	15:09	15:13	15:15	15:17
15:11[S]	15:14[S]	15:16[S]	15:18[S]	15:20[S]					
					15:11	15:14	15:18	15:20	15:22
15:16[S]	15:19[S]	15:21[S]	15:23[S]	15:25[S]					
					15:16	15:19	15:23	15:25	15:27
					15:20	15:23	15:27	15:29	15:31
15:21[S]	15:24[S]	15:26[S]	15:28[S]	15:30[S]					

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN
					15:24	15:27	15:31	15:33	15:35
15:26[S]	15:29[S]	15:31[S]	15:33[S]	15:35[S]					
					15:29	15:32	15:36	15:38	15:40
15:31[S]	15:34[S]	15:36[S]	15:38[S]	15:40[S]					
					15:34	15:37	15:41	15:43	15:45
15:36[S]	15:39[S]	15:41[S]	15:43[S]	15:45[S]					
					15:39	15:42	15:46	15:48	15:50
15:41[S]	15:44[S]	15:46[S]	15:48[S]	15:50[S]					
					15:44	15:47	15:51	15:53	15:55
15:46[S]	15:49[S]	15:51[S]	15:53[S]	15:55[S]					
					15:49	15:52	15:56	15:58	16:00
15:51[S]	15:54[S]	15:56[S]	15:58[S]	16:00[S]					
					15:54	15:57	16:01	16:03	16:05
15:56[S]	15:59[S]	16:01[S]	16:03[S]	16:05[S]					
					15:59	16:02	16:06	16:08	16:10
16:01[S]	16:04[S]	16:06[S]	16:08[S]	16:10[S]					
					16:04	16:07	16:11	16:13	16:15
16:06[S]	16:09[S]	16:11[S]	16:13[S]	16:15[S]					
					16:09	16:12	16:16	16:18	16:20
16:11[S]	16:14[S]	16:16[S]	16:18[S]	16:20[S]					
					16:14	16:17	16:21	16:23	16:25
16:16[S]	16:19[S]	16:21[S]	16:23[S]	16:25[S]					
					16:19	16:22	16:26	16:28	16:30
16:21[S]	16:24[S]	16:26[S]	16:28[S]	16:30[S]					
					16:24	16:27	16:31	16:33	16:35
16:26[S]	16:29[S]	16:31[S]	16:33[S]	16:35[S]					
					16:29	16:32	16:36	16:38	16:40
16:31[S]	16:34[S]	16:36[S]	16:38[S]	16:40[S]					
					16:34	16:37	16:41	16:43	16:45
16:36[S]	16:39[S]	16:41[S]	16:43[S]	16:45[S]					
					16:39	16:42	16:46	16:48	16:50
16:41[S]	16:44[S]	16:46[S]	16:48[S]	16:50[S]					
					16:44	16:47	16:51	16:53	16:55
16:46[S]	16:49[S]	16:51[S]	16:53[S]	16:55[S]					
					16:49	16:52	16:56	16:58	17:00
16:51[S]	16:54[S]	16:56[S]	16:58[S]	17:00[S]					
					16:54	16:57	17:01	17:03	17:05
16:56[S]	16:59[S]	17:01[S]	17:03[S]	17:05[S]					
					16:59	17:02	17:06	17:08	17:10
17:01[S]	17:04[S]	17:06[S]	17:08[S]	17:10[S]					
					17:04	17:07	17:11	17:13	17:15
17:06[S]	17:09[S]	17:11[S]	17:13[S]	17:15[S]					
					17:09	17:12	17:16	17:18	17:20
17:11[S]	17:14[S]	17:16[S]	17:18[S]	17:20[S]					
					17:14	17:17	17:21	17:23	17:25
17:16[S]	17:19[S]	17:21[S]	17:23[S]	17:25[S]					
					17:19	17:22	17:26	17:28	17:30
17:21[S]	17:24[S]	17:26[S]	17:28[S]	17:30[S]					
					17:24	17:27	17:31	17:33	17:35

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN
17:26[S]	17:29[S]	17:31[S]	17:33[S]	17:35[S]					
					17:29	17:32	17:36	17:38	17:40
17:31[S]	17:34[S]	17:36[S]	17:38[S]	17:40[S]					
					17:34	17:37	17:41	17:43	17:45
17:36[S]	17:39[S]	17:41[S]	17:43[S]	17:45[S]					
					17:39	17:42	17:46	17:48	17:50
17:41[S]	17:44[S]	17:46[S]	17:48[S]	17:50[S]					
					17:44	17:47	17:51	17:53	17:55
17:46[S]	17:49[S]	17:51[S]	17:53[S]	17:55[S]					
					17:49	17:52	17:56	17:58	18:00
17:51[S]	17:54[S]	17:56[S]	17:58[S]	18:00[S]					
					17:54	17:57	18:01	18:03	18:05
17:56[S]	17:59[S]	18:01[S]	18:03[S]	18:05[S]					
					17:59	18:02	18:06	18:08	18:10
18:01[S]	18:04[S]	18:06[S]	18:08[S]	18:10[S]					
					18:04	18:07	18:11	18:13	18:15
18:06[S]	18:09[S]	18:11[S]	18:13[S]	18:15[S]					
					18:09	18:12	18:16	18:18	18:20
18:11[S]	18:14[S]	18:16[S]	18:18[S]	18:20[S]					
					18:14	18:17	18:21	18:23	18:25
18:16[S]	18:19[S]	18:21[S]	18:23[S]	18:25[S]					
					18:19	18:22	18:26	18:28	18:30
18:22[S]	18:25[S]	18:27[S]	18:29[S]	18:31[S]					
					18:24	18:27	18:31	18:33	18:35
18:28[S]	18:31[S]	18:33[S]	18:35[S]	18:37[S]					
					18:29	18:32	18:36	18:38	18:40
18:34[S]	18:37[S]	18:39[S]	18:41[S]	18:43[S]					
					18:34	18:37	18:40	18:42	18:44
18:40[S]	18:43[S]	18:45[S]	18:47[S]	18:49[S]					
					18:40	18:43	18:46	18:48	18:50
					18:46	18:49	18:52	18:54	18:56
18:47[S]	18:50[S]	18:52[S]	18:54[S]	18:56[S]					
					18:52	18:55	18:58	19:00	19:02
18:53[S]	18:56[S]	18:58[S]	19:00[S]	19:02[S]					
					18:58	19:01	19:04	19:06	19:08
18:59[S]	19:02[S]	19:04[S]	19:06[S]	19:08[S]					
19:04[S]	19:07[S]	19:09[S]	19:11[S]	19:13[S]					
					19:05	19:08	19:11	19:13	19:15
19:10[S]	19:13[S]	19:15[S]	19:17[S]	19:19[S]					
					19:11	19:14	19:17	19:19	19:21
19:16[S]	19:19[S]	19:21[S]	19:23[S]	19:25[S]					
					19:17	19:20	19:23	19:25	19:27
19:21[S]	19:24[S]	19:26[S]	19:28[S]	19:30[S]					
					19:22	19:25	19:28	19:30	19:32
19:27[S]	19:30[S]	19:32[S]	19:34[S]	19:36[S]					
					19:28	19:31	19:34	19:36	19:38
19:33[S]	19:36[S]	19:38[S]	19:40[S]	19:42[S]					
					19:34	19:37	19:40	19:42	19:44
19:38[S]	19:41[S]	19:43[S]	19:45[S]	19:47[S]					

TUNNEY'S PASTURE O-TRAIN EAST / EST	BAYVIEW O-TRAIN EAST / EST	PIMISI O-TRAIN EAST / EST	LYON O-TRAIN EAST / EST	PARLIAMENT / PARLEMENT O-TRAIN EAST / EST	HURDMAN O-TRAIN EAST / EST	TREMBLAY O-TRAIN EAST / EST	ST-LAURENT O-TRAIN EAST / EST	CYRVILLE O-TRAIN EAST / EST	BLAIR O-TRAIN
					19:39	19:42	19:45	19:47	19:49
19:44[S]	19:47[S]	19:49[S]	19:51[S]	19:53[S]					
					19:45	19:48	19:51	19:53	19:55
19:50[S]	19:53[S]	19:55[S]	19:57[S]	19:59[S]					
					19:51	19:54	19:57	19:59	20:01
19:55[S]	19:58[S]	20:00[S]	20:02[S]	20:04[S]					
					19:56	19:59	20:02	20:04	20:06
					20:02	20:05	20:08	20:10	20:12
					20:08	20:11	20:14	20:16	20:18
					20:13	20:16	20:19	20:21	20:23
					20:19	20:22	20:25	20:27	20:29
					20:25	20:28	20:31	20:33	20:35
					20:30	20:33	20:36	20:38	20:40
					20:36	20:39	20:42	20:44	20:46
					20:42	20:45	20:48	20:50	20:52
					20:47	20:50	20:53	20:55	20:57
					20:53	20:56	20:59	21:01	21:03
					20:59	21:02	21:05	21:07	21:09
					21:04	21:07	21:10	21:12	21:14
					21:10	21:13	21:16	21:18	21:20
					21:16	21:19	21:22	21:24	21:26
					21:21	21:24	21:27	21:29	21:31
					21:27	21:30	21:33	21:35	21:37
					21:33	21:36	21:39	21:41	21:43
					21:38	21:41	21:44	21:46	21:48
					21:44	21:47	21:50	21:52	21:54
					21:50	21:53	21:56	21:58	22:00
					21:55	21:58	22:01	22:03	22:05
					22:01	22:04	22:07	22:09	22:11
					22:07	22:10	22:13	22:15	22:17
					22:12	22:15	22:18	22:20	22:22
					22:19	22:22	22:25	22:27	22:29
					22:29	22:32	22:35	22:37	22:39
					22:38	22:41	22:44	22:46	22:48
					22:47	22:50	22:53	22:55	22:57
					22:57	23:00	23:03	23:05	23:07
					23:06	23:09	23:12	23:14	23:16
					23:15	23:18	23:21	23:23	23:25
					23:25	23:28	23:31	23:33	23:35
					23:34	23:37	23:40	23:42	23:44
					23:43	23:46	23:49	23:51	23:53
					23:55	23:58	00:01	00:03	00:05
					00:08	00:11	00:14	00:16	00:18
					00:22	00:25	00:28	00:30	00:32
					00:40	00:43	00:46	00:48	00:50
					01:03	01:06	01:09	01:11	01:13
					01:18	01:21	01:24	01:26	01:28

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Schedules & Maps

The next service change is on Sunday, April 23.

Schedule times are based on typical driving conditions and may vary. Please arrive at your stop a few minutes early to allow for any fluctuations in schedule.

Mon, Jun 12

1 Tunney's Pasture

[S] Ends at Hurdman

[a] O-Train Line 1 will experience partial closures from June 5-19 for planned maintenance. [Read more](#)

BLAIR O-TRAIN WEST / OUEST	CYRVILLE O-TRAIN WEST / OUEST	ST-LAURENT O-TRAIN WEST / OUEST	TREMBLAY O-TRAIN WEST / OUEST	HURDMAN O-TRAIN WEST / OUEST	PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST	LYON O-TRAIN WEST / OUEST	PIMISI O-TRAIN WEST / OUEST	BAYVIEW O-TRAIN WEST / OUEST	TUNNEY'S PASTURE O-TRAIN
			05:00[S]	05:03[S]					
05:00[S]	05:02[S]	05:04[S]	05:07[S]	05:10[S]					
					05:02	05:04	05:06	05:08	05:10
05:09[S]	05:11[S]	05:13[S]	05:16[S]	05:19[S]					
					05:13	05:15	05:17	05:19	05:21
05:18[S]	05:20[S]	05:22[S]	05:25[S]	05:28[S]					
					05:20	05:22	05:24	05:26	05:28
05:28[S]	05:30[S]	05:32[S]	05:35[S]	05:38[S]					
					05:29	05:31	05:33	05:35	05:37
05:37[S]	05:39[S]	05:41[S]	05:44[S]	05:47[S]					
					05:38	05:40	05:42	05:44	05:46
05:44[S]	05:46[S]	05:48[S]	05:51[S]	05:54[S]					
					05:48	05:50	05:52	05:54	05:56
					05:57	05:59	06:01	06:03	06:05
			05:59[S]	06:02[S]					
05:56[S]	05:58[S]	06:00[S]	06:03[S]	06:06[S]					
					06:04	06:06	06:08	06:10	06:12
			06:08[S]	06:11[S]					
06:05[S]	06:07[S]	06:09[S]	06:12[S]	06:15[S]					
					06:12	06:14	06:16	06:18	06:20
					06:16	06:18	06:20	06:22	06:24
			06:18[S]	06:21[S]					
06:15[S]	06:17[S]	06:19[S]	06:22[S]	06:25[S]					
06:19[S]	06:21[S]	06:23[S]	06:26[S]	06:29[S]					
					06:21	06:23	06:25	06:27	06:29
					06:25	06:27	06:29	06:31	06:33
06:25[S]	06:27[S]	06:29[S]	06:32[S]	06:35[S]					

BLAIR O-TRAIN WEST / OUEST	CYRVILLE O-TRAIN WEST / OUEST	ST-LAURENT O-TRAIN WEST / OUEST	TREMBLAY O-TRAIN WEST / OUEST	HURDMAN O-TRAIN WEST / OUEST	PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST	LYON O-TRAIN WEST / OUEST	PIMISI O-TRAIN WEST / OUEST	BAYVIEW O-TRAIN WEST / OUEST	TUNNEY'S PASTURE O-TRAIN
06:29[S]	06:31[S]	06:33[S]	06:36[S]	06:39[S]					
					06:31	06:33	06:35	06:37	06:39
					06:35	06:37	06:39	06:41	06:43
06:35[S]	06:37[S]	06:39[S]	06:42[S]	06:45[S]					
					06:39	06:41	06:43	06:45	06:47
06:39[S]	06:41[S]	06:43[S]	06:46[S]	06:49[S]					
					06:45	06:47	06:49	06:51	06:53
06:45[S]	06:47[S]	06:49[S]	06:52[S]	06:55[S]					
					06:49	06:51	06:53	06:55	06:57
06:49[S]	06:51[S]	06:53[S]	06:56[S]	06:59[S]					
					06:55	06:57	06:59	07:01	07:03
06:55[S]	06:57[S]	06:59[S]	07:02[S]	07:05[S]					
					06:59	07:01	07:03	07:05	07:07
07:00[S]	07:02[S]	07:04[S]	07:07[S]	07:10[S]					
					07:05	07:07	07:09	07:11	07:13
07:05[S]	07:07[S]	07:09[S]	07:12[S]	07:15[S]					
					07:09	07:11	07:13	07:15	07:17
07:10[S]	07:12[S]	07:14[S]	07:17[S]	07:20[S]					
					07:15	07:17	07:19	07:21	07:23
07:15[S]	07:17[S]	07:19[S]	07:22[S]	07:25[S]					
					07:20	07:22	07:24	07:26	07:28
07:20[S]	07:22[S]	07:24[S]	07:27[S]	07:30[S]					
					07:25	07:27	07:29	07:31	07:33
07:25[S]	07:27[S]	07:29[S]	07:32[S]	07:35[S]					
					07:30	07:32	07:34	07:36	07:38
07:30[S]	07:32[S]	07:34[S]	07:37[S]	07:40[S]					
					07:35	07:37	07:39	07:41	07:43
07:35[S]	07:37[S]	07:39[S]	07:42[S]	07:45[S]					
					07:40	07:42	07:44	07:46	07:48
07:40[S]	07:42[S]	07:44[S]	07:47[S]	07:50[S]					
					07:45	07:47	07:49	07:51	07:53
07:45[S]	07:47[S]	07:49[S]	07:52[S]	07:55[S]					
					07:50	07:52	07:54	07:56	07:58
07:50[S]	07:52[S]	07:54[S]	07:57[S]	08:00[S]					
					07:55	07:57	07:59	08:01	08:03
07:55[S]	07:57[S]	07:59[S]	08:02[S]	08:05[S]					
					08:00	08:02	08:04	08:06	08:08
08:00[S]	08:02[S]	08:04[S]	08:07[S]	08:10[S]					
					08:05	08:07	08:09	08:11	08:13
08:05[S]	08:07[S]	08:09[S]	08:12[S]	08:15[S]					
					08:10	08:12	08:14	08:16	08:18
08:10[S]	08:12[S]	08:14[S]	08:17[S]	08:20[S]					
					08:15	08:17	08:19	08:21	08:23
08:15[S]	08:17[S]	08:19[S]	08:22[S]	08:25[S]					
					08:20	08:22	08:24	08:26	08:28
08:20[S]	08:22[S]	08:24[S]	08:27[S]	08:30[S]					
					08:25	08:27	08:29	08:31	08:33
08:25[S]	08:27[S]	08:29[S]	08:32[S]	08:35[S]					

BLAIR O-TRAIN WEST / OUEST	CYRVILLE O-TRAIN WEST / OUEST	ST-LAURENT O-TRAIN WEST / OUEST	TREMBLAY O-TRAIN WEST / OUEST	HURDMAN O-TRAIN WEST / OUEST	PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST	LYON O-TRAIN WEST / OUEST	PIMISI O-TRAIN WEST / OUEST	BAYVIEW O-TRAIN WEST / OUEST	TUNNEY'S PASTURE O-TRAIN
					08:30	08:32	08:34	08:36	08:38
08:30[S]	08:32[S]	08:34[S]	08:37[S]	08:40[S]					
					08:35	08:37	08:39	08:41	08:43
08:35[S]	08:37[S]	08:39[S]	08:42[S]	08:45[S]					
					08:40	08:42	08:44	08:46	08:48
08:40[S]	08:42[S]	08:44[S]	08:47[S]	08:50[S]					
					08:45	08:47	08:49	08:51	08:53
08:45[S]	08:47[S]	08:49[S]	08:52[S]	08:55[S]					
					08:50	08:52	08:54	08:56	08:58
08:50[S]	08:52[S]	08:54[S]	08:57[S]	09:00[S]					
					08:55	08:57	08:59	09:01	09:03
08:56[S]	08:58[S]	09:00[S]	09:03[S]	09:06[S]					
					09:00	09:02	09:04	09:06	09:08
09:03[S]	09:05[S]	09:07[S]	09:10[S]	09:13[S]					
					09:05	09:07	09:09	09:11	09:13
					09:10	09:12	09:14	09:16	09:18
09:10[S]	09:12[S]	09:14[S]	09:17[S]	09:20[S]					
					09:16	09:18	09:20	09:22	09:24
09:16[S]	09:18[S]	09:20[S]	09:23[S]	09:26[S]					
					09:22	09:24	09:26	09:28	09:30
09:22[S]	09:24[S]	09:26[S]	09:29[S]	09:32[S]					
					09:29	09:31	09:33	09:35	09:37
09:29[S]	09:31[S]	09:33[S]	09:36[S]	09:39[S]					
09:34[S]	09:36[S]	09:38[S]	09:41[S]	09:44[S]					
					09:35	09:37	09:39	09:41	09:43
09:39[S]	09:41[S]	09:43[S]	09:46[S]	09:49[S]					
					09:41	09:43	09:45	09:47	09:49
09:45[S]	09:47[S]	09:49[S]	09:52[S]	09:55[S]					
					09:48	09:50	09:52	09:54	09:56
09:51[S]	09:53[S]	09:55[S]	09:58[S]	10:01[S]					
					09:53	09:55	09:57	09:59	10:01
09:56[S]	09:58[S]	10:00[S]	10:03[S]	10:06[S]					
					09:58	10:00	10:02	10:04	10:06
10:02[S]	10:04[S]	10:06[S]	10:09[S]	10:12[S]					
					10:04	10:06	10:08	10:10	10:12
10:08[S]	10:10[S]	10:12[S]	10:15[S]	10:18[S]					
					10:10	10:12	10:14	10:16	10:18
10:13[S]	10:15[S]	10:17[S]	10:20[S]	10:23[S]					
					10:15	10:17	10:19	10:21	10:23
10:19[S]	10:21[S]	10:23[S]	10:26[S]	10:29[S]					
					10:21	10:23	10:25	10:27	10:29
10:25[S]	10:27[S]	10:29[S]	10:32[S]	10:35[S]					
					10:27	10:29	10:31	10:33	10:35
10:30[S]	10:32[S]	10:34[S]	10:37[S]	10:40[S]					
					10:32	10:34	10:36	10:38	10:40
10:36[S]	10:38[S]	10:40[S]	10:43[S]	10:46[S]					
					10:38	10:40	10:42	10:44	10:46
10:42[S]	10:44[S]	10:46[S]	10:49[S]	10:52[S]					

BLAIR O-TRAIN WEST / OUEST	CYRVILLE O-TRAIN WEST / OUEST	ST-LAURENT O-TRAIN WEST / OUEST	TREMBLAY O-TRAIN WEST / OUEST	HURDMAN O-TRAIN WEST / OUEST	PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST	LYON O-TRAIN WEST / OUEST	PIMISI O-TRAIN WEST / OUEST	BAYVIEW O-TRAIN WEST / OUEST	TUNNEY'S PASTURE O-TRAIN
					10:44	10:46	10:48	10:50	10:52
10:47[S]	10:49[S]	10:51[S]	10:54[S]	10:57[S]					
					10:49	10:51	10:53	10:55	10:57
10:53[S]	10:55[S]	10:57[S]	11:00[S]	11:03[S]					
					10:55	10:57	10:59	11:01	11:03
10:59[S]	11:01[S]	11:03[S]	11:06[S]	11:09[S]					
					11:01	11:03	11:05	11:07	11:09
11:04[S]	11:06[S]	11:08[S]	11:11[S]	11:14[S]					
					11:06	11:08	11:10	11:12	11:14
11:10[S]	11:12[S]	11:14[S]	11:17[S]	11:20[S]					
					11:12	11:14	11:16	11:18	11:20
11:16[S]	11:18[S]	11:20[S]	11:23[S]	11:26[S]					
					11:18	11:20	11:22	11:24	11:26
11:21[S]	11:23[S]	11:25[S]	11:28[S]	11:31[S]					
					11:23	11:25	11:27	11:29	11:31
11:27[S]	11:29[S]	11:31[S]	11:34[S]	11:37[S]					
					11:29	11:31	11:33	11:35	11:37
11:33[S]	11:35[S]	11:37[S]	11:40[S]	11:43[S]					
					11:35	11:37	11:39	11:41	11:43
11:38[S]	11:40[S]	11:42[S]	11:45[S]	11:48[S]					
					11:40	11:42	11:44	11:46	11:48
11:44[S]	11:46[S]	11:48[S]	11:51[S]	11:54[S]					
					11:46	11:48	11:50	11:52	11:54
11:50[S]	11:52[S]	11:54[S]	11:57[S]	12:00[S]					
					11:52	11:54	11:56	11:58	12:00
11:55[S]	11:57[S]	11:59[S]	12:02[S]	12:05[S]					
					11:57	11:59	12:01	12:03	12:05
12:01[S]	12:03[S]	12:05[S]	12:08[S]	12:11[S]					
					12:03	12:05	12:07	12:09	12:11
12:07[S]	12:09[S]	12:11[S]	12:14[S]	12:17[S]					
					12:09	12:11	12:13	12:15	12:17
12:12[S]	12:14[S]	12:16[S]	12:19[S]	12:22[S]					
					12:14	12:16	12:18	12:20	12:22
12:18[S]	12:20[S]	12:22[S]	12:25[S]	12:28[S]					
					12:20	12:22	12:24	12:26	12:28
12:24[S]	12:26[S]	12:28[S]	12:31[S]	12:34[S]					
					12:26	12:28	12:30	12:32	12:34
12:29[S]	12:31[S]	12:33[S]	12:36[S]	12:39[S]					
					12:31	12:33	12:35	12:37	12:39
12:35[S]	12:37[S]	12:39[S]	12:42[S]	12:45[S]					
					12:37	12:39	12:41	12:43	12:45
12:41[S]	12:43[S]	12:45[S]	12:48[S]	12:51[S]					
					12:43	12:45	12:47	12:49	12:51
12:46[S]	12:48[S]	12:50[S]	12:53[S]	12:56[S]					
					12:48	12:50	12:52	12:54	12:56
12:52[S]	12:54[S]	12:56[S]	12:59[S]	13:02[S]					
					12:54	12:56	12:58	13:00	13:02
12:58[S]	13:00[S]	13:02[S]	13:05[S]	13:08[S]					

BLAIR O-TRAIN WEST / OUEST	CYRVILLE O-TRAIN WEST / OUEST	ST-LAURENT O-TRAIN WEST / OUEST	TREMBLAY O-TRAIN WEST / OUEST	HURDMAN O-TRAIN WEST / OUEST	PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST	LYON O-TRAIN WEST / OUEST	PIMISI O-TRAIN WEST / OUEST	BAYVIEW O-TRAIN WEST / OUEST	TUNNEY'S PASTURE O-TRAIN
					13:00	13:02	13:04	13:06	13:08
13:03[S]	13:05[S]	13:07[S]	13:10[S]	13:13[S]					
					13:05	13:07	13:09	13:11	13:13
13:09[S]	13:11[S]	13:13[S]	13:16[S]	13:19[S]					
					13:11	13:13	13:15	13:17	13:19
13:15[S]	13:17[S]	13:19[S]	13:22[S]	13:25[S]					
					13:17	13:19	13:21	13:23	13:25
13:20[S]	13:22[S]	13:24[S]	13:27[S]	13:30[S]					
					13:22	13:24	13:26	13:28	13:30
13:26[S]	13:28[S]	13:30[S]	13:33[S]	13:36[S]					
					13:28	13:30	13:32	13:34	13:36
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BLAIR O-TRAIN WEST / OUEST	CYRVILLE O-TRAIN WEST / OUEST	ST-LAURENT O-TRAIN WEST / OUEST	TREMBLAY O-TRAIN WEST / OUEST	HURDMAN O-TRAIN WEST / OUEST	PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST	LYON O-TRAIN WEST / OUEST	PIMISI O-TRAIN WEST / OUEST	BAYVIEW O-TRAIN WEST / OUEST	TUNNEY'S PASTURE O-TRAIN
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15:40[S]	15:42[S]	15:44[S]	15:47[S]	15:50[S]					
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15:45[S]	15:47[S]	15:49[S]	15:52[S]	15:55[S]					
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15:50[S]	15:52[S]	15:54[S]	15:57[S]	16:00[S]					
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15:55[S]	15:57[S]	15:59[S]	16:02[S]	16:05[S]					
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18:51[S]	18:53[S]	18:55[S]	18:58[S]	19:01[S]					
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18:56[S]	18:58[S]	19:00[S]	19:03[S]	19:06[S]					
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19:02[S]	19:04[S]	19:06[S]	19:09[S]	19:12[S]					
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19:13[S]	19:15[S]	19:17[S]	19:20[S]	19:23[S]					
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BLAIR O-TRAIN WEST / OUEST	CYRVILLE O-TRAIN WEST / OUEST	ST-LAURENT O-TRAIN WEST / OUEST	TREMBLAY O-TRAIN WEST / OUEST	HURDMAN O-TRAIN WEST / OUEST	PARLIAMENT / PARLEMENT O-TRAIN WEST / OUEST	LYON O-TRAIN WEST / OUEST	PIMISI O-TRAIN WEST / OUEST	BAYVIEW O-TRAIN WEST / OUEST	TUNNEY'S PASTURE O-TRAIN
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01:00[S]	01:02[S]	01:04[S]	01:07[S]	01:10[S]					

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TABLE OF CONTENTS

SCHEDULE 15-2 DESIGN AND CONSTRUCTION REQUIREMENTS 1

PART 2 DESIGN AND CONSTRUCTION REQUIREMENTS – GUIDEWAY 1

ARTICLE 1 INTRODUCTION 1

 1.1 General Description of the Guideway and Guideway Requirements 1

ARTICLE 2 ALIGNMENT AND GEOMETRIC DESIGN CRITERIA 3

 2.1 Horizontal Alignment 3

 2.2 Vertical Alignment 4

 2.3 Special Trackwork 5

 2.4 Other Alignment Requirements 6

 2.5 Clearances 6

ARTICLE 3 TRACKWORK 8

 3.1 Order of Precedence 8

 3.2 General Requirements 8

 3.3 Track Types 8

 3.4 Track Materials 9

 3.5 Special Trackwork 12

 3.6 Track Construction Tolerances 13

**SCHEDULE 15-2
DESIGN AND CONSTRUCTION REQUIREMENTS****PART 2
DESIGN AND CONSTRUCTION REQUIREMENTS – GUIDEWAY****ARTICLE 1 INTRODUCTION****1.1 General Description of the Guideway and Guideway Requirements**

- (a) The Guideway shall:
- (i) Provide for two Tracks for approximately 12.5km from Tunney's Pasture Station in the west to Blair Station in the east; between Train Station and St. Laurent Station provide two tracks that shall branch off the mainline for approximately 0.8km to provide connections to the proposed MSF;
 - (ii) Generally follow the existing BRT alignment between Tunney's Pasture Station and Blair Station, the exception being for approximately 2.7km through the Downtown Area between Lebreton Station and Campus Station where the Guideway will descend underground and be in a Tunnel below Queen Street, Rideau Street and Waller Street crossing under the Rideau Canal near the National Arts Centre and the Rideau Centre, the Alignment shall be within the right of way of Queen Street from Bronson Avenue to Metcalfe Street; and
 - (iii) Provide an MSF connection that shall branch off of the mainline west and east of Belfast Road crossing Tremblay Road at the intersection with Belfast Road. The two Tracks shall stay within the Lands of Belfast Road from Tremblay to the Bridge over the VIA railroad, then cross the VIA rail tracks adjacent to the Bridge Structure and connect to the yard Tracks in the MSF.
- (b) The Guideway shall consist of:
- (i) Track sections built on the existing BRT;
 - (ii) Track sections built off the existing BRT;
 - (iii) Track sections on Bridge Structures and Tunnel Structures; and
 - (iv) Track sections through Stations.
- (c) The Guideway shall include components for:
- (i) Traction Power;
 - (ii) OCS;
 - (iii) Communications ductbanks;

- (iv) Signal and control Systems;
 - (v) Drainage systems and Stormwater Management; and
 - (vi) Other appurtenances as required by Project Co's design.
- (d) The Guideway shall be fenced or otherwise enclosed for security.
- (e) The Guideway shall not have continuous lighting. Lighting shall be limited to areas of Passenger interactions with buses and Stations and in other areas requiring lighting for Safety or operational needs.
- (f) The property limits for the Guideway are defined as the Lands.

ARTICLE 2 ALIGNMENT AND GEOMETRIC DESIGN CRITERIA**2.1 Horizontal Alignment****(a) General**

- (i) The horizontal Track Alignment shall be designed in accordance with the requirements of Schedule 15 – Output Specifications, and shall be such that all of the Works is contained within the OLRT Lands.
- (ii) The maximum Track design speed for the mainline and the MSF connection shall be 100km/h and 30km/h, respectively. Project Co shall Design the mainline Track so as to maximize the operating speed.
- (iii) The horizontal alignment shall be tangent through station platform limits and for a minimum of 15m beyond the end of platforms. If site conditions do not provide sufficient length, then the spiral transition curve may begin closer to the platform provided sufficient running clearances between the selected LRV and Platform are achieved.
- (iv) All non-track related construction details shall be related to or dimensioned from the centreline of the eastbound Track, unless otherwise noted.

(b) Track Centres

- (i) The typical Track centre spacing is 4500mm. The mainline Track centre spacing may be reduced to an absolute minimum based on the selected LRV dynamic envelope and provided sufficient running clearances and tolerances under all operating conditions are maintained.

(c) Horizontal Curves

- (i) Circular curves shall be defined by the arc definition of curvature and specified by their radius in metres to three decimal places.
- (ii) For mainline Tracks, the curves shall be designed to maintain the maximum possible operating speed as dictated by existing topography, permanent physical features, property, and Alignment constraints. The absolute minimum radius used shall accommodate the turning capability of the selected LRV.

(d) Reverse Curves

- (i) All locations that require a reversal in alignment shall be separated by a tangent.
- (ii) The minimum tangent length between reversing curves shall be 25m.

- (e) Compound Curves
- (i) Compound curves may be used on the mainline Track Design.
 - (ii) Where two or more circular curves will be connected into a compound curve, the circular curves shall be joined by a spiral curve. The superelevation of each circular curve shall be adjusted to ensure that the maximum permissible speeds for all parts of the compound curve are identical.
- (f) Spirals
- (i) Spiral transition curves shall be used on all mainline and MSF connection Tracks to connect circular curves to tangents, with the exception that spirals are not required where both actual superelevation is zero and unbalanced superelevation is less than 50mm.
 - (ii) The minimum length of a spiral transition curve (L, m) shall be calculated using the actual superelevation (Ea, mm), unbalanced superelevation (Eu, mm), and design speed (V, km/h) and shall be determined by selecting the greater value of the following formulas:
 - A. $L = EaV/108$; and
 - B. $L = EuV/180$.
 - (iii) The absolute minimum length of spiral shall be 10m.
- (g) Superelevation
- (i) Superelevation shall be linearly attained throughout the full length of the spiral curve by raising the rail farthest from the curve centre, while maintaining the top of the inside rail at profile grade.
 - (ii) For mainline Tracks, the maximum actual superelevation shall be 150mm for ballasted Track and direct fixation or embedded Track. The maximum unbalanced superelevation shall be 115mm. These values may be modified for the selected LRV provided the 0.1g limit that passengers can tolerate comfortably is achieved. The total superelevation (E, mm) shall be based on the design speed (V, km/h) and equivalent radius (R, m), per the formula $E = 11.83V^2/R$.

2.2 Vertical Alignment

- (a) General
- (i) The vertical Track Alignment shall be set to respect constraints such as clearances over roads and fixed elevations such as at Station Platforms and other adjacent Infrastructure. The vertical Track Alignment shall be designed in accordance with the requirements of this Schedule 15 – Output Specifications. All references

to profile in the vertical Alignment shall represent the top of the low rail for a given Track.

(b) Grades

- (i) The maximum allowable grade through Stations shall be 1.5%.
- (ii) No changes in grade or vertical curves shall encroach within the limits of Station Platforms.
- (iii) A minimum distance of 15m shall be maintained between Platform limits and any point of vertical curvature. If site conditions do not provide sufficient length, then the spiral transition curve may begin closer to the Platform provided sufficient running clearances between the selected LRV and Platform are achieved.
- (iv) The maximum grade for mainline and MSF connection Tracks shall be 4.5%, where unachievable the absolute maximum grade for mainline and MSF connection Tracks shall be no greater than 6%.

(c) Vertical Curves

- (i) Parabolic vertical curves shall be provided for all grade changes.
- (ii) The length of a vertical curve shall be as long as practicable, but no less than shown below.
- (iii) The minimum length of vertical curve (LVC, m) for mainline and connection Tracks shall be determined by the following equations:
 - A. $LVC = 0.005AV^2$, for crest curves; and
 - B. $LVC = 0.003AV^2$, for sag curves.

2.3 Special Trackwork

- (a) Special trackwork shall conform to AREMA requirements.
- (b) The horizontal Alignment shall be tangent through special trackwork and for a minimum of 5m ahead of the point of switch and beyond the last long ties. In constrained conditions, the tangent shall extend a minimum of 2m beyond the heel of frog.
- (c) For profile Design, all turnouts shall be located on a constant grade that shall extend a minimum of 3m beyond the point of switch and beyond the last long ties.
- (d) A minimum tangent length of 20m shall be inserted between the back to back switch points where the turnout arrangement may entail a reverse movement through turnouts.
- (e) Special trackwork shall not be located within 15m from the end of the Station Platform and not within a Station Platform.

- (f) Special trackwork shall not be located within 50m of the transition between ballasted and direct fixation Track as outlined in the TCRP Light Rail Handbook. Project Co shall provide for special accommodations to mitigate the effects of different Track modulus under various geometric conditions.

2.4 Other Alignment Requirements

- (a) Combined horizontal and vertical curvature: Overlapping horizontal and vertical curvature shall be avoided where possible. Where this situation is unavoidable, Project Co shall include justification in its Trackwork Design Report with reference to alignment Safety at the design speed.

2.5 Clearances

- (a) Vehicle Clearances
 - (i) Horizontal clearance dimensions shall always be measured perpendicular to the Track centreline accounting for any superelevation in the Track.
 - (ii) On tangent Track the typical side clearance shall be a minimum of 1690mm measured perpendicular from the Track centreline. The mainline Track side clearance may be reduced to an absolute minimum based on the selected LRV dynamic envelope and provided sufficient running clearances and tolerances under all operating conditions are maintained.
 - (iii) Where no walkway is present, a typical minimum side clearance of 1890mm from Track centreline to any physical feature shall be maintained on tangent at-grade and retained cut Track. The mainline Track side clearance may be reduced to an absolute minimum based on the selected LRV dynamic envelope and provided sufficient running clearances and tolerances under all operating conditions are maintained.
 - (iv) Under cut-and-cover conditions, a typical minimum side clearance of 2150mm shall be provided from Track centreline. The mainline Track side clearance may be reduced to an absolute minimum based on the selected LRV dynamic envelope and provided sufficient running clearances and tolerances under all operating conditions are maintained.
 - (v) Where emergency walkways are present, tangent Track shall maintain minimum typical side clearances of 2300mm from the Track centreline to an outbound curb, railing fence, or other physical feature. The mainline Track side clearance may be reduced to an absolute minimum based on the selected LRV dynamic envelope and provided sufficient running clearances and tolerances under all operating conditions are maintained.
 - (vi) Additional clearances shall be provided on the inside of curves due to superelevation effects at the rate of 18mm for every 10mm of superelevation, to provide clearance for tilt-in. On curved Track the Vehicle side clearance shall be

measured perpendicular to the superelevated Track centreline (axis of the Track measured perpendicular to the plan of the top of rails).

- (vii) The typical horizontal clearance distance from the centreline of Track to the finished edge of Station Platform shall be 1405mm, or as otherwise required for the selected LRV such that a gap no greater than 75mm is maintained.
 - (viii) Vertical clearance dimensions shall always be measured in a vertical plane irrespective of any superelevation or profile grade. When superelevation is present, the top of low rail shall be used as the reference elevation when calculating vertical clearance.
- (b) Other Clearance Requirements
- (i) Signal and trackwork equipment mounted on Track slab along the Alignment shall be kept clear of the under car clearance envelope of the Vehicle.
 - (ii) Temporary clearance requirements for construction shall be assessed on an individual basis.

ARTICLE 3 TRACKWORK**3.1 Order of Precedence**

(a) General

(i) The Design and Construction of trackwork shall be in accordance with the criteria contained in this Article, and all standards, regulations, policies, Applicable Law, guidelines or practices applicable to the Project, including but not limited to each of the following Reference Documents. If the event of a conflict between the criteria, commitments or requirements contained within one document when compared with another, the more stringent shall apply:

- A. Requirements of this Article;
- B. AREMA Track Standards, or equivalent; and
- C. The criteria in TCRP Report 57.

3.2 General Requirements

- (a) The scope of the trackwork includes all Works related to the Construction of a complete LRT System as specified herein.
- (b) The scope of the special trackwork consists of all Works related to the complete Construction of special trackwork as described in this Schedule 15 – Output Specifications. This includes, but is not limited to, the Design, supply, installation, and testing of special trackwork, including all turnouts, crossover components, adjoining trackwork, fastening components, and all other Track materials.
- (c) Project Co shall be responsible for control and any mitigation which may be a result of wheel-rail noise throughout the OLRT System in accordance with Schedule 17- Environmental Obligations.

3.3 Track Types

(a) General

- (i) The Track structure shall be built to 1435mm Track gauge. Direct fixation Track shall be used in Tunnels, on aerial structures. Ballasted Track or direct fixation Track shall be permissible through Station Platforms and at all other locations on the Alignment where performance is not compromised and maintenance can be achieved.
- (ii) The running rails of all mainline Track, including special trackwork, shall be electrically isolated from the ground.

(b) Ballasted Track

- (i) Ballasted Track shall utilize timber or precast concrete crossties with a resilient rail fastening system.
 - (ii) Crushed stone or other material shall conform to AREMA ballast specifications.
 - (iii) The particle size requirements shall conform to AREMA requirements in relation to the crushed stone ballast, class number 4A.
 - (iv) Minimum depth of ballast below the bottom of ties under the running rail shall be 225mm. Shoulder ballast shall extend a minimum of 300mm beyond the ends of ties before sloping at 2:1 to the sub-ballast.
 - (v) Ballast shall be well drained and shall not contact the running rails for mitigation of stray current and loss of shunting or calibration with signal systems.
 - (vi) Track bed shall be of sufficient stability to permit operation of track circuits under all climatic conditions.
- (c) Direct Fixation Track
- (i) Direct Fixation Track
 - A. Direct fixation Track shall consist of a resilient direct fixation rail fastener system anchored or embedded into a concrete plinth or base slab.
 - B. The direct fixation Track fastening system shall be designed to support required loading and avoid accumulation of runoff in the rail support areas.
 - (ii) Track Transition Area
 - A. Transitions from ballasted Track sections to direct fixation Track shall use a 6m long variable-depth reinforced concrete approach slab to accommodate the change from the solid support of the Track slab to the semi-solid support of the change in Track modulus of the ballast.

3.4 Track Materials

- (a) General
 - (i) Materials identified in the following sections shall be used for all Track Construction.
- (b) Rail/115 lb RE
 - (i) Supply rail that meets:
 - A. AREMA Volume 1, Chapter 4, Part 2; and

- B. ASTM A1.
- (ii) Rail Lengths
 - A. Standard rail lengths shall be used wherever possible.
 - B. All rail shall be CWR.
- (c) Restraining Rails
 - (i) Project Co shall install restraining rails along the gauge side of the low rail for all mainline horizontal curves with a radius of 145m or less.
 - (ii) Restraining rail shall be electrically isolated from running rail in order to maintain broken rail protection.
- (d) Direct Fixation Fasteners
 - (i) Project Co shall provide DFF that shall meet the requirements of this Schedule 15 – Output Specification.
 - (ii) The DFF shall be part of an engineered direct fixation system and shall be designed to meet the required rail loading.
 - (iii) Project Co shall design the DFF system to resist all slip forces as determined by design.
 - (iv) The DFF shall:
 - A. Provide vertical and lateral stability to the rail;
 - B. Restrain the rail movement during rail break incidents limiting the rail break gap to 50mm;
 - C. Distribute rail loadings to the concrete support structures;
 - D. Electrically insulate the rail from the Guideway;
 - E. Accommodate CWR and structural interface forces;
 - F. Prevent rail buckling under high temperature conditions; and
 - G. Provide means for achieving a minimum of 12mm rail lateral adjustment in 3mm maximum increments.
- (e) Rail Joints
 - (i) Project Co shall supply insulated glued joints for 115lb RE rail manufactured to AREMA standards.

- (ii) Rail joints shall be electrically tested prior to and after placement in Track.
- (f) Rail Bonding
 - (i) Project Co shall supply and install rail bonds that meet AREMA specifications in Volume 3, Chapter 33, Part 7 and 12.
 - (ii) Rails shall be welded in continuous lengths and bolted joints shall be electrically bonded.
 - (iii) At locations requiring insulated joints, the Traction Power direct current continuity of negative rails shall be maintained by use of impedance bonds.
- (g) Switch Clearing Device
 - (i) Switch clearing devices shall be supplied and installed by Project Co at special trackwork locations. Project Co shall also provide conduits and junction boxes and other supporting Infrastructure for these devices.
 - (ii) Project Co shall provide switch clearing devices that are proven in similar climatic conditions and meet accepted industry standards and do not compromise safety.
 - (iii) No gas powered switch heaters shall be permitted in tunnels or enclosed areas.
- (h) Switch Machines and other Turnout Appliances
 - (i) Switch machines and other associated equipment shall be provided and installed by Project Co.
 - (ii) Project Co shall provide for the location of trackside terminal boxes, which shall be located near the switch machine. Terminal boxes shall not be located within a position that would constrict the ability of Maintenance personnel to maintain or manually throw the switch.
 - (iii) Switch machines shall be able to be manually operated with minimal physical effort, as a backup to powered operation.
- (i) End-of-Track Devices (Buffer Stops)
 - (i) End-of-Track shock-absorbing devices for use at terminal station Tracks shall be included in the Trackwork Design Report and be which shall be submitted as part of the Works Submittals according to Schedule 10 – Review Procedure. These devices shall be mounted near the end of Track on both Station Platform Tracks. Project Co shall procure and install the approved end-of-Track devices as part of the Works.

- (j) Rail Expansion Joints
 - (i) The anticipated rail movement within the full range of rail temperatures shall be handled by the direct fixation assembly.
- (k) Noise and Vibration Mitigation
 - (i) Project Co shall install a site-specific Track structure where it is required to control levels of noise and vibration, as described in Schedule 17 – Environmental Obligations.

3.5 Special Trackwork

- (a) General
 - (i) All special trackwork shall be supplied and installed by Project Co. Special trackwork assemblages include all materials necessary for Construction.
 - (ii) All special trackwork joints shall be butt welded in-field except where Project Co can demonstrate that space does not permit. At these locations thermite welds performed in accordance with manufacturer's weld procedures are acceptable. Compromise welds shall be considered part of the mainline Track conditions and installation. No holes, for temporary joint installation, or otherwise, shall be permitted within 150mm of the weld location. All thermite welds shall be tested ultrasonically.
 - (iii) All turnouts shall utilize tangential geometry with curved switch points. All mainline special trackwork shall be configured with 115lb RE rail.
 - (iv) Special trackwork components shall be based on AREMA specifications for turnout.
 - (v) All components shall be designed so that the specified tolerances can be maintained throughout the operating life of the special trackwork with minimal Maintenance.
 - (vi) Crossover locations shall be integrated with signaling and OCS system designs.
 - (vii) All mainline turnouts and crossovers shall be optimized to meet or exceed the Operations Performance Requirements outlined in Schedule 15-2 Part 1 Article 2.
 - (viii) Locations for OCS poles shall be provided at all crossover locations.
 - (ix) Tail Tracks and pocket Tracks shall be maximized to accommodate at least a minimum length consistent with additional length to improve approach speeds where feasible.

- (b) Project Co shall undertake the Design of the OLRT Project and systems and shall provide the following minimum required operational Track facilities:
- (i) Tail Tracks west of Tunney's Pasture Station sufficient to facilitate the reversing of trains and to maximize approach speeds into the Terminal Station;
 - (ii) Optimized crossovers adjacent to the MSF west and MSF east connecting tracks that maximize operational flexibility into and out of the yard and minimize operational impacts to mainline revenue operations during loading and unloading of the line;
 - (iii) Tail Tracks east of Blair Station sufficient to facilitate the reversing of trains and to maximize approach speeds into the Terminal Station; and
 - (iv) Interlockings and special trackwork at locations necessary to meet or exceed the requirements of the Operations Performance Requirements (Schedule 15-2 Part 1, Article 2).

3.6 Track Construction Tolerances

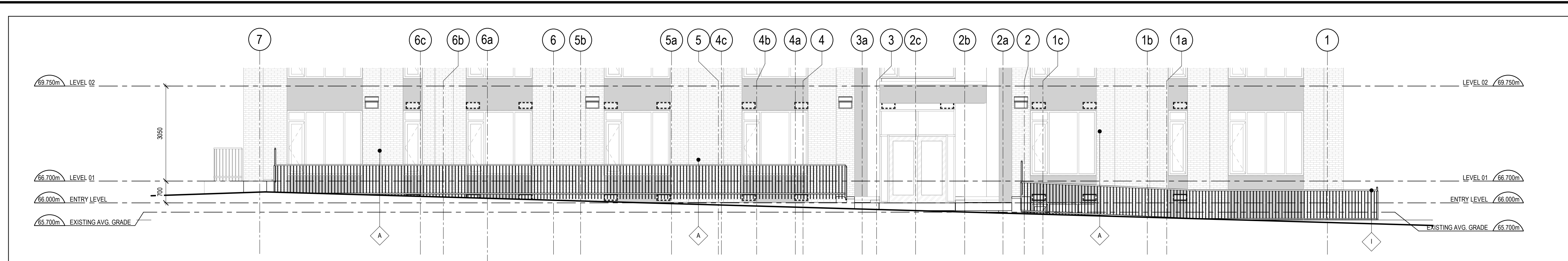
- (a) Verification of the Track installation shall include a Trackstar Geometry Test (or equivalent).
- (b) Clearances shall be verified by laser measurement using an L-Kopia vehicle (or equivalent).

APPENDIX 4

ROOF PLAN

ELEVATION PLANS

EXTERIOR WALL AND TYPICAL WALL CONSTRUCTION DETAILS



2 NORTH ELEVATION - GUARD
A201 SCALE: 1 : 75



1 NORTH ELEVATION
A201 SCALE: 1 : 75

CLADDING LEGEND:

◆ A	BRICK MASONRY COLOUR: RED TYPE: 1
◆ B	ALUMINUM COMPOSITE PANEL COLOUR: CHARCOAL TYPE: ACM-1
◆ C	CORRUGATED METAL SIDING COLOUR: GREY TYPE: SS-1
◆ D	FIBER CEMENT PANEL COLOUR: LIGHT GREY TYPE: FC-2
◆ E	FIBER CEMENT PANEL COLOUR: CHARCOAL TYPE: FC-1
◆ F	METAL SIDING WITH PERFORATED PANEL SCREEN COLOUR: GREY SIDING TYPE: SS-2 SCREEN TYPE: MP-1 (50% OPEN)
◆ G	RETAINING WALL TYPE: CAST IN PLACE CONCRETE
◆ H	METAL FRAME AND CLEAR GLASS GUARD COLOUR: DARK GREY
◆ I	METAL PICKET GUARD COLOUR: CHARCOAL TYPE: STEEL
◆ J	WOOD FENCE

CLADDING LEGEND

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7	ISSUED FOR TENDER	2023-07-05
3	RE-ISSUED FOR BUILDING PERMIT	2023-05-25
2	ISSUED FOR COORDINATION	2023-05-03
1	ISSUED FOR BUILDING PERMIT	2021-06-12

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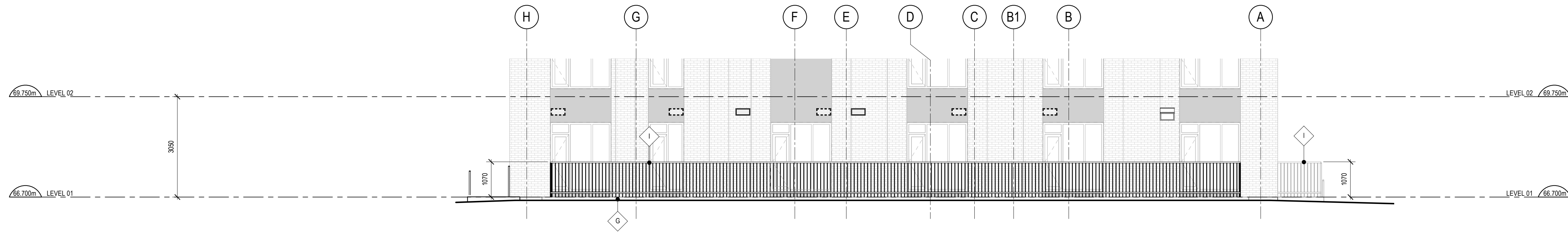
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Ottawa, ON

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2008	NOTED	DM	RMK

NORTH ELEVATION

A201



2 EAST ELEVATION - GUARD
SCALE: 1 : 75



1 EAST ELEVATION
SCALE: 1 : 75

CLADDING LEGEND:

- ◇ A BRICK MASONRY
COLOUR: RED
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- ◇ B ALUMINUM COMPOSITE PANEL
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COLOUR: GREY
TYPE: SS-1
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COLOUR: LIGHT GREY
TYPE: FC-2
- ◇ E FIBER CEMENT PANEL
COLOUR: CHARCOAL
TYPE: FC-1
- ◇ F METAL SIDING WITH PERFORATED PANEL SCREEN
COLOUR: GREY
SIDING TYPE: SS-2
SCREEN TYPE: MP-1 (50% OPEN)
- ◇ G RETAINING WALL
TYPE: CAST IN PLACE CONCRETE
- ◇ H METAL FRAME AND CLEAR GLASS GUARD
COLOUR: DARK GREY
- ◇ I METAL PICKET GUARD
COLOUR: CHARCOAL
TYPE: STEEL
- ◇ J WOOD FENCE

○ CLADDING LEGEND

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1	ISSUED FOR BUILDING PERMIT	2021-06-12

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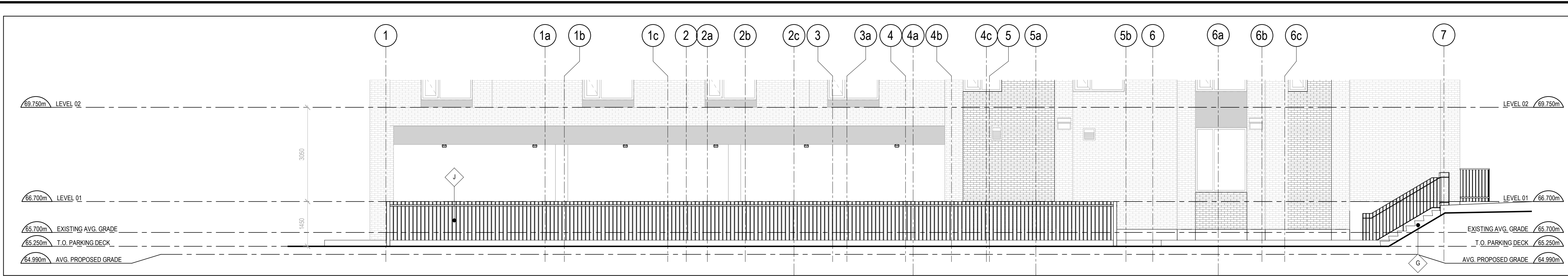
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2008	NOTED	DM	RMK

EAST ELEVATION

A202

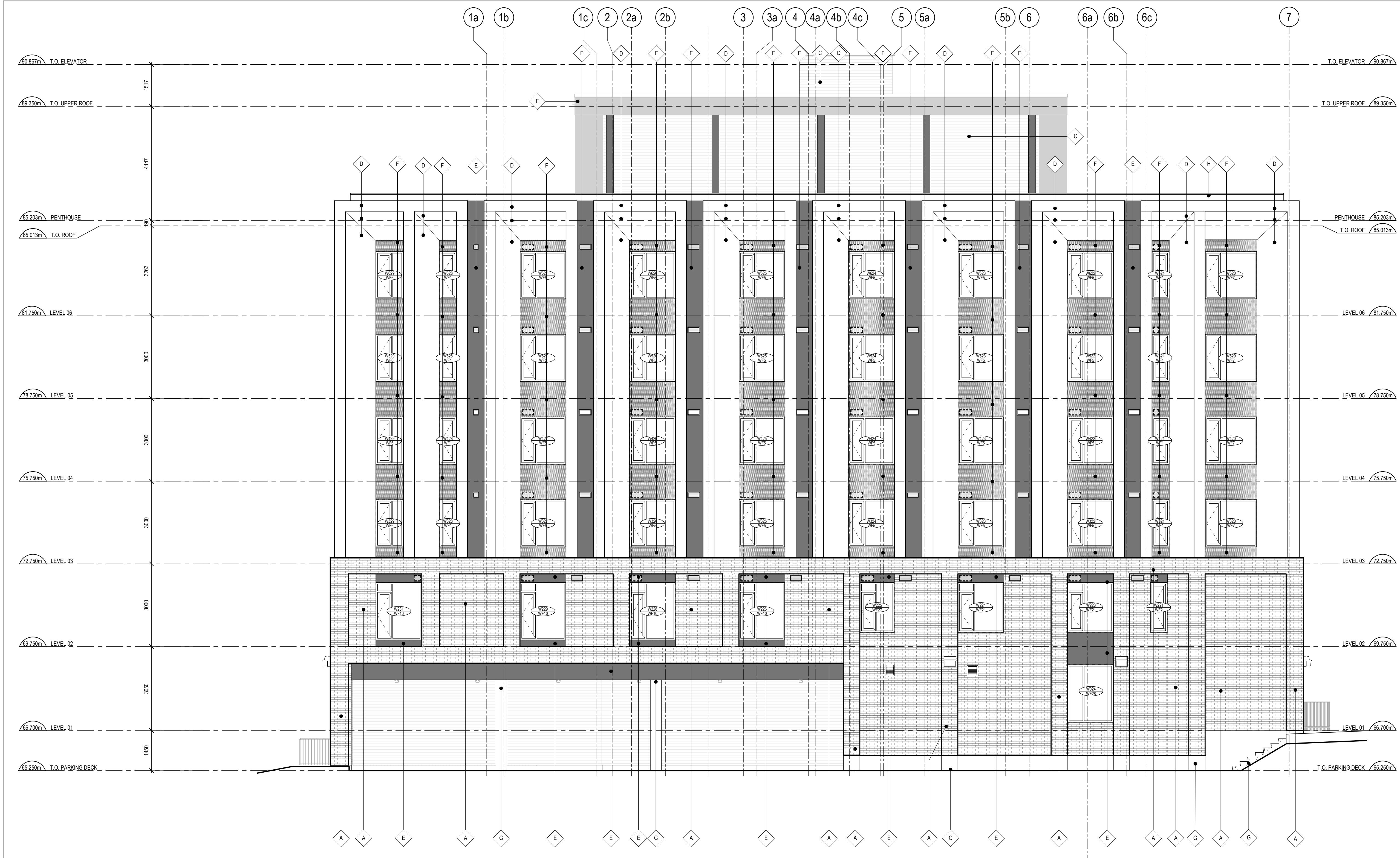


2 SOUTH ELEVATION - FENCE
SCALE: 1 : 75

CLADDING LEGEND:

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C	CORRUGATED METAL SIDING COLOUR: GREY TYPE: SS-1
D	FIBER CEMENT PANEL COLOUR: LIGHT GREY TYPE: FC-2
E	FIBER CEMENT PANEL COLOUR: CHARCOAL TYPE: FC-1
F	METAL SIDING WITH PERFORATED PANEL SCREEN COLOUR: GREY SIDING TYPE: SS-2 SCREEN TYPE: MP-1 (50% OPEN)
G	RETAINING WALL TYPE: CAST IN PLACE CONCRETE
H	METAL FRAME AND CLEAR GLASS GUARD COLOUR: DARK GREY
I	METAL PICKET GUARD COLOUR: CHARCOAL TYPE: STEEL
J	WOOD FENCE

CLADDING LEGEND



1 SOUTH ELEVATION
SCALE: 1 : 75

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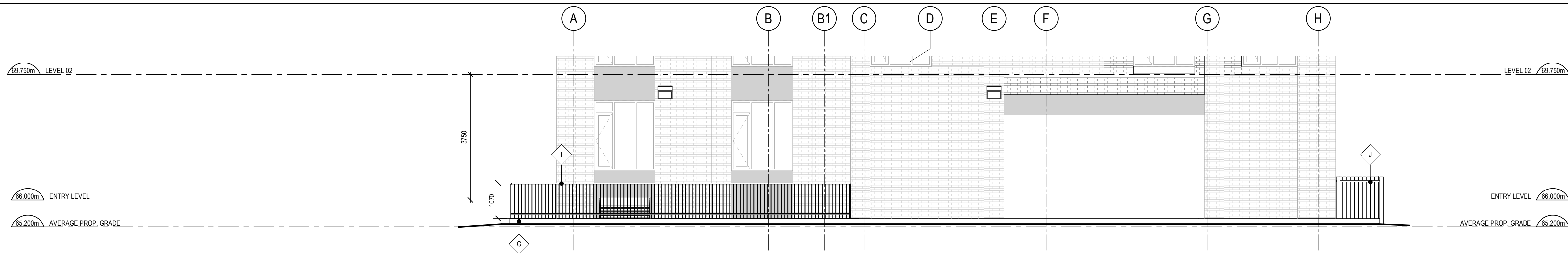
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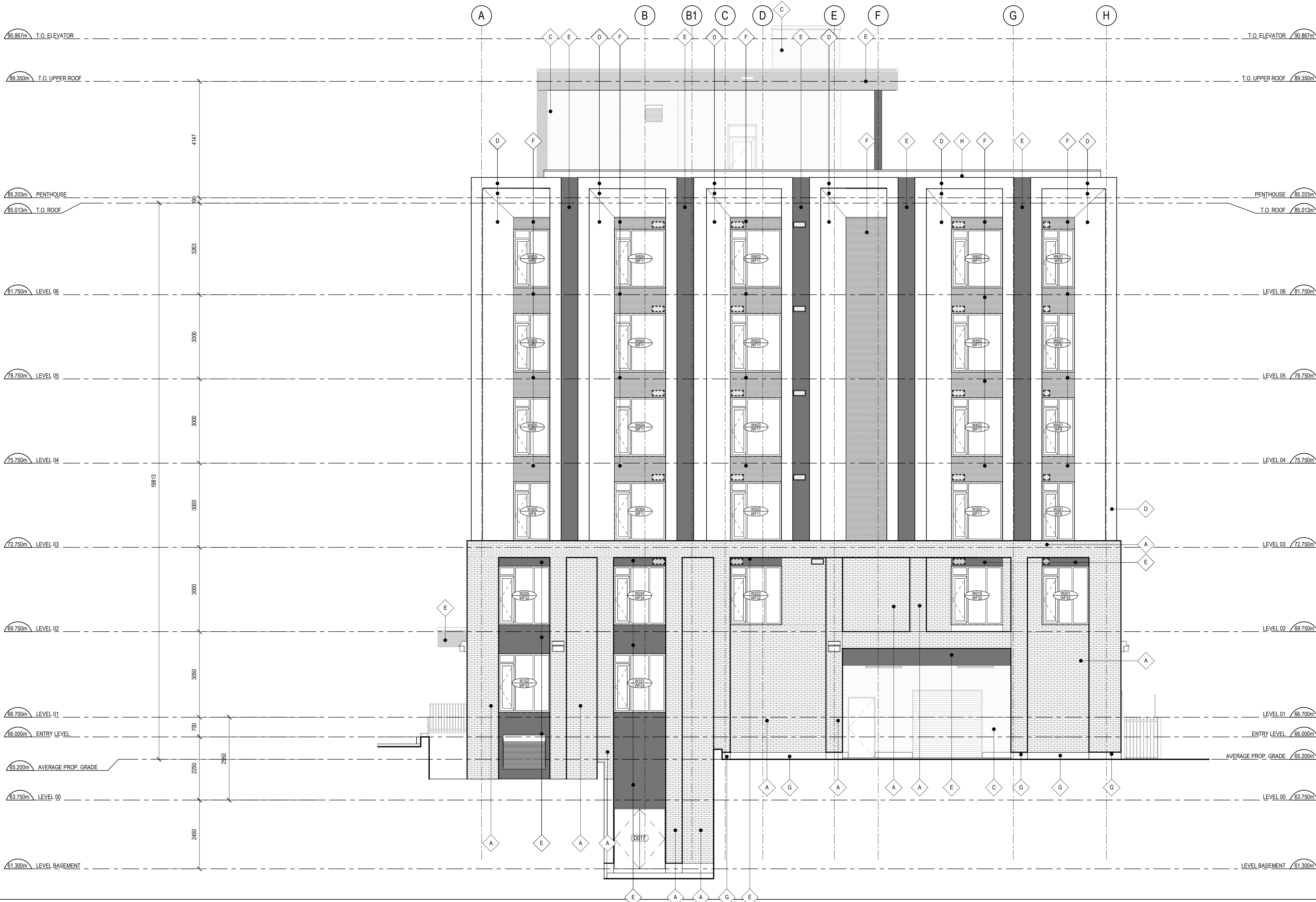
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2008	NOTED	DM	RMK

SOUTH ELEVATION

A203



2 WEST ELEVATION - GUARD
A204 SCALE: 1 : 75



1 WEST ELEVATION
A204 SCALE: 1 : 75

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- ◆ B ALUMINUM COMPOSITE PANEL
COLOUR: CHARCOAL
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- ◆ C CORRUGATED METAL SIDING
COLOUR: GREY
TYPE: SS-1
- ◆ D FIBER CEMENT PANEL
COLOUR: LIGHT GREY
TYPE: FC-2
- ◆ E FIBER CEMENT PANEL
COLOUR: CHARCOAL
TYPE: FC-1
- ◆ F METAL SIDING WITH PERFORATED PANEL SCREEN
COLOUR: GREY
SIDING TYPE: SS-2
SCREEN TYPE: MP-1 (50% OPEN)
- ◆ G RETAINING WALL
TYPE: CAST IN PLACE CONCRETE
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COLOUR: DARK GREY
- ◆ I METAL PICKET GUARD
COLOUR: CHARCOAL
TYPE: STEEL
- ◆ J WOOD FENCE

○ CLADDING LEGEND

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1	ISSUED FOR BUILDING PERMIT	2021-06-12

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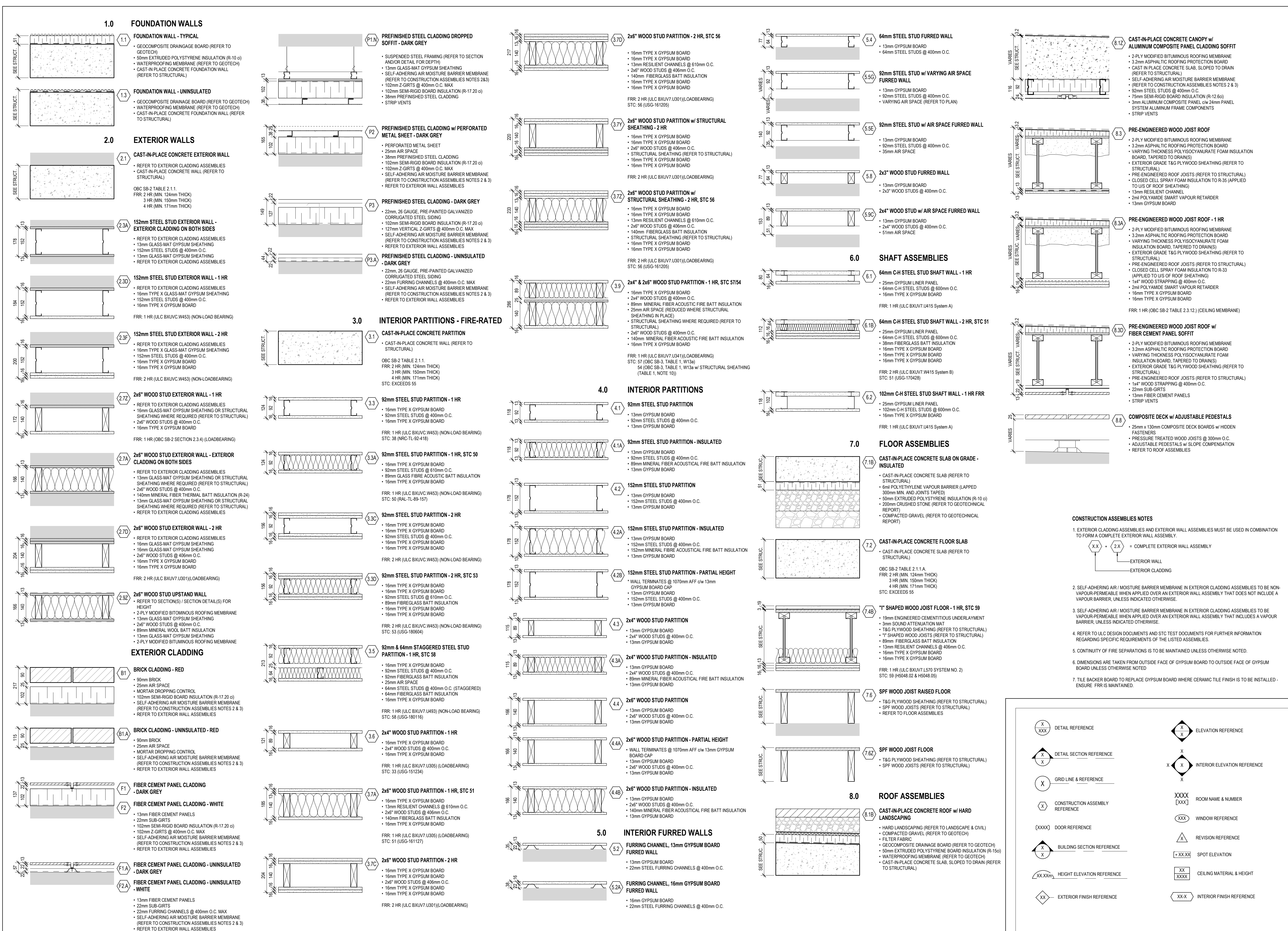
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WEST ELEVATION

A204



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2 ISSUED FOR COORDINATION 2023-05-03

1 ISSUED FOR BUILDING PERMIT 2021-06-12

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CONSTRUCTION ASSEMBLIES

NOTATION LEGEND



SCALE

2008 NOTED DM RMK

CONSTRUCTION ASSEMBLIES

NOTATION LEGEND



SCALE

2008 NOTED DM RMK

CONSTRUCTION ASSEMBLIES

NOTATION LEGEND

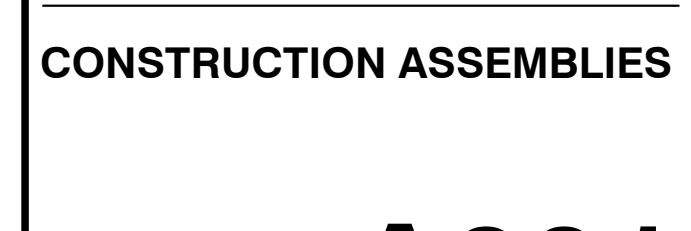


SCALE

2008 NOTED DM RMK

CONSTRUCTION ASSEMBLIES

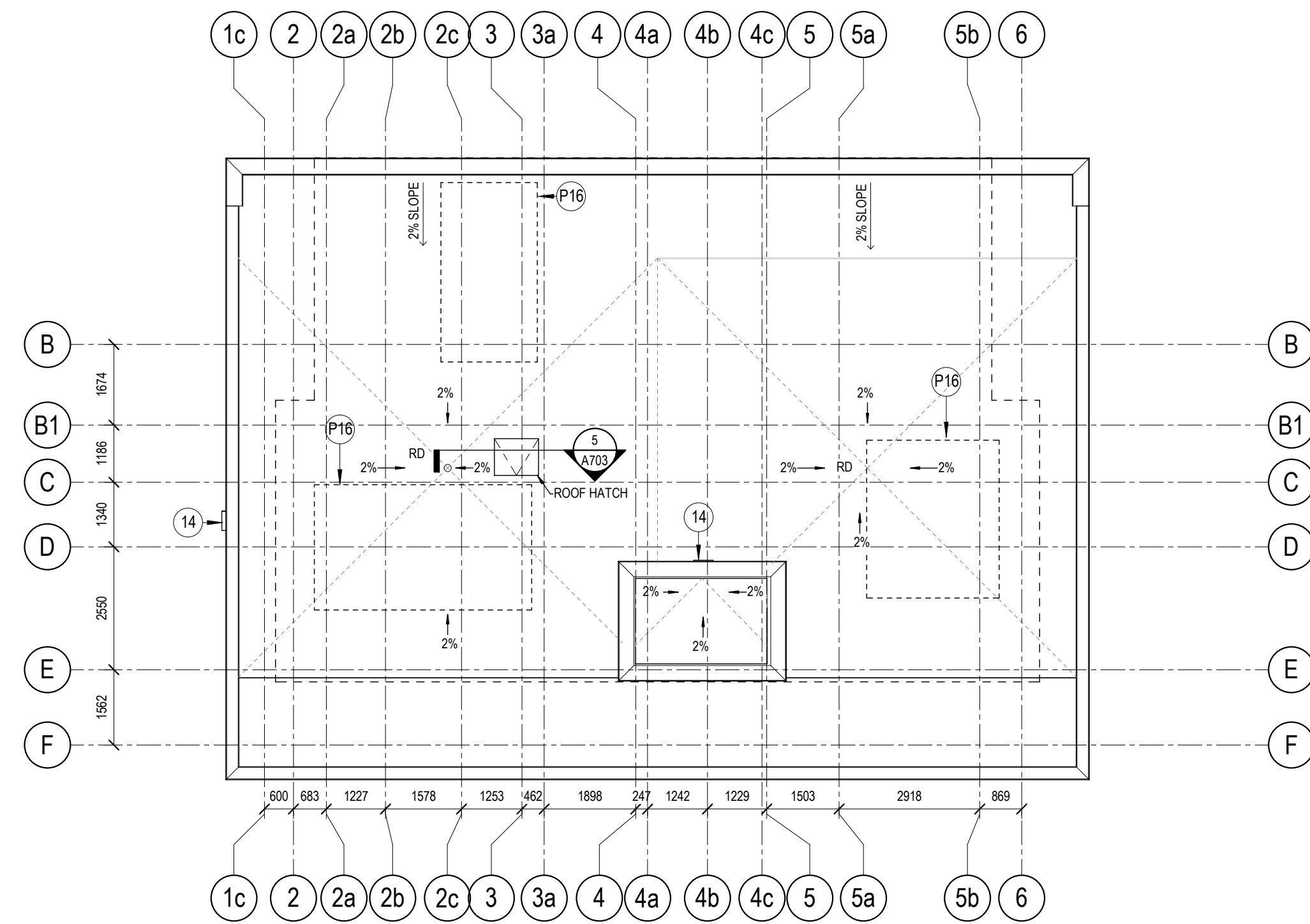
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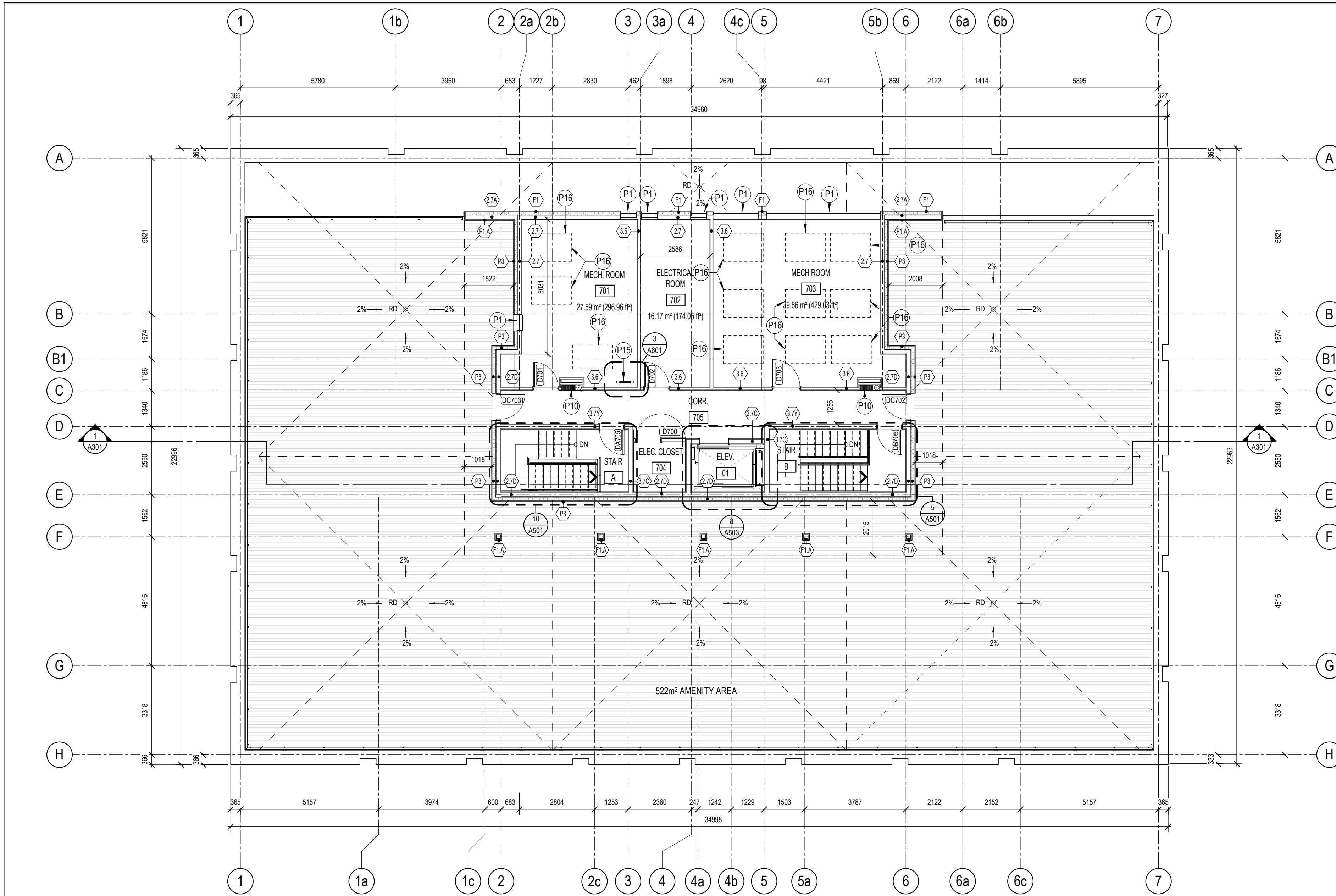
SCALE

2008 NOTED DM RMK





2 UPPER ROOF PLAN
A107 SCALE: 1 : 100



1 ROOF PLAN
A107 SCALE: 1 : 100

GENERAL FLOOR PLAN NOTES

- ALL DIMENSIONS ARE FROM THE FINISH FACE OF WALL OR OPENING. UNLESS OTHERWISE NOTED.
- UNLESS OTHERWISE NOTED, ALL DIMENSIONS MARKED 'CLEAR OR 'CLR' SHALL BE MAINTAINED AND SHALL ALLOW FOR THICKNESS OF THE COMPLETE WALL ASSEMBLY INCLUDING FINISHES. SHALL BE ACCURATELY MAINTAINED AND SHALL NOT VARY MORE THAN ±3mm WITHOUT WRITTEN CONSENT FROM THE ARCHITECT.
- ALL DOORS TO BE 100mm FROM THE ADJACENT PERPENDICULAR PARTITION, UNLESS OTHERWISE NOTED.
- ALL EQUIPMENT IS SUPPLIED AND INSTALLED BY CONTRACTOR, UNLESS OTHERWISE NOTED. CONTRACTOR TO COORDINATE AND SUPPLY REQUIRED SERVICES FOR EQUIPMENT.
- CONTRACTOR RESPONSIBLE TO COORDINATE DIMENSIONS OF OPENINGS WITH SPECIFICATIONS FOR EQUIPMENT SUPPLIED AND INSTALLED BY OTHERS.
- TILE BACKER BOARD TO REPLACE GYPSUM BOARD WHERE CERAMIC TILE FINISH IS TO BE INSTALLED. ENSURE FIRE RESISTANCE RATING IS MAINTAINED.
- ALL WASHROOMS TO HAVE WATER-RESISTANT GYPSUM BOARD, UNLESS OTHERWISE NOTED (EX. TILE BACKER BOARD).
- MAXIMUM DISTANCE OF 910mm BETWEEN CONTROL JOINTS IN GYPSUM SURFACES.
- CAULK AND SEAL AT ALL MECHANICAL AND ELECTRICAL PENETRATIONS.
- ALL PARTITIONS THAT EXTEND FROM SLAB TO SLAB ARE TO BE ALIGNED WITH GEOMETRY OF THE SLABS IN ORDER TO ENSURE THAT THE ENTIRE PERIMETER BE APPROPRIATELY SEALED AS REQUIRED TO ATTAIN THE NECESSARY FIRE RESISTANCE RATING AND ACOUSTICAL PERFORMANCE.
- SUPPLY AND INSTALL NON-COMBUSTIBLE BLOCKING AND NAILERS FOR ALL PARTITIONS SUPPORTING ELECTRICAL PANELS, ELECTRICAL & MECHANICAL DEVICES, MILLWORK, SHELVING, SIGNAGE, ACCESSORIES, EQUIPMENT, ETC.

GENERAL NOTES
SCALE: 1 : 75

- (Px) FLOOR PLAN KEYNOTE TAG, REFER TO KEYNOTE LEGEND
- DOOR TYPE REFERENCE
- (XX) CONSTRUCTION ASSEMBLY REFERENCE

SYMBOLS
SCALE: 1 : 75

KEYNOTE LEGEND - FLOOR PLANS

- P1 MECHANICAL LOUVER - REFER TO MECHANICAL DRAWINGS
- P10 FIRE HOSE CABINET
- P15 ROOF ACCESS LADDER
- P16 HOUSEKEEPING PAD, REFER TO MECHANICAL SPECIFICATIONS

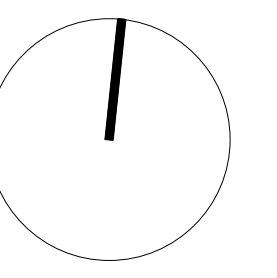
GENERAL ARCHITECTURAL NOTES:

- This drawing is the property of the Architect and may not be reproduced or used without the expressed consent of the Architect.
- Drawings are not to be scaled. The Contractor is responsible for checking and verifying all levels and dimensions and shall report all discrepancies to the Architect and obtain clarification prior to commencing work.
- Upon notice in writing, the Architect will provide written graphic clarification or supplementary information regarding the intent of the Contract Documents.
- The Architectural drawings are to be read in conjunction with all other Contract Documents including Project Manuals and the Structural, Mechanical and Electrical Drawings.
- Positions of exposed or finished Mechanical or Electrical devices, fittings and fixtures are indicated on the Architectural Drawings. Locations shown on the Architectural Drawings shall govern over Mechanical and Electrical Drawings. Mechanical and Electrical items not clearly located will be located as directed by the Architect.
- These documents are not to be used for construction unless specifically noted for such purpose.



7	ISSUED FOR TENDER	2023-07-05
3	RE-ISSUED FOR BUILDING PERMIT	2023-05-25
2	ISSUED FOR COORDINATION	2023-05-03
1	ISSUED FOR BUILDING PERMIT	2021-06-12

ISSUE RECORD



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PROJ	SCALE	DRAWN	REVIEWED
2008	NOTED	GS	RMK

ROOF PLANS

A107