PATERSON GROUP

Environmental Noise Control Study

Proposed Commercial Development

3700 Twin Falls Place, Block 2
Ottawa, Ontario

Prepared for Gastops c/o CSV Architects

Report PG7255-1, Dated November 20, 2024

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Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Gastops c/o CSV Architects to conduct an environmental noise control study for the proposed residential development to be located at 3700 Twin Falls Place Block 2, in the City of Ottawa.

The objective of the current study is to:

- ❑ Determine the primary noise sources impacting the site and compare the projected sound levels to guidelines set out by the Ministry of Environment, Conservation and Parks (MOECP) 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 residential development as they are understood at the time of writing this report.

This study has been conducted according to the 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 warehouse development. Associated at-grade roadways and parking areas are also anticipated as a part of the proposed commercial development.

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

The City of Ottawa's Official Plan, in addition to the ENCG, dictate that the influence area must contain any of the 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 NPC-300 outlines the limitations of the stationary and environmental noise levels in relation to the location of the receptors. These can be found below in the following tables:

Table 1 - Sound Level Limits for Outdoor Living Areas	
Time Period	**Required $L_{eq(16)}$ (dBA)**
16-hour, 7:00-23:00	55
I. Standards taken from Table 2.2a; Sound Level Limit for Outdoor Living Areas - Road and Rail	

Table 2 - Sound Level Limits for Indoor Living Area			
Type of Space	**Time Period**	**Required L_{eq} (dBA)**	
		Road	**Rail**
Living/Dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc	7:00-23:00	45	40
Theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms	23:00-7:00	45	40
Sleeping quarters	7:00-23:00	45	40
	23:00-7:00	40	35
I. Standards taken from Table 2.2b; Sound Level Limit for Indoor Living Areas - Road and Rail			

It is noted in ENCG that the limits outlined in Table 2 are for the sound levels on the interior of the glass pane. The ENCG further goes on to state that the limit for the exterior of the pane of glass will be 55 dBA.

If the sound level limits are exceeded at the window panes for the indoor living areas, the following Warning Clauses may be referenced:

Table 3 - Warning Clauses for Sound Level Exceedances	
Warning Clause	**Description**
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."
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."
Warning Clause Type C	"This building 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."
Warning Clause Type D	"This building 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."
I. Clauses taken from section C8 Warning Clauses; Environmental Noise Guidelines - 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 proposed development is not in proximity to any existing or approved stationary sources of noise. Therefore, a stationary noise analysis will not be required with respect to off-site stationary noise sources impacting the proposed development.

Aircraft/Airport Noise

Aircraft noise is distinct as compared to surface transportation noise or stationary noise, as it is typically a lower frequency for longer durations. The sound level may also differ between different types of aircraft creating an unknown spectrum of noise. Due to these differences, the analysis of aircraft noise is performed separately from both the stationary and surface traffic noise studies.

For aircraft noise, the levels are defined by the Noise Exposure Forecast (NEF), which measures the sound produced by all types of aircraft at an airport, taking into consideration the number of flights, the duration of the noise, the time of day and the frequency components of the sound (pure tones). The Noise Exposure Projection (NEP) is similar to the NEF but takes into consideration a long-term projection beyond 10 years. Annexe 10 - Land Use Constraints Due to Aircraft Noise located with the City of Ottawa's Official Plan outlines the NEF/NEP boundaries in addition to the Airport Vicinity Development Zone (AVDZ).

The limitations for the aircraft/airport noise are dictated by the local airport in collaboration with the City of Ottawa. It is stated within the ENCG that there is no development within the 30 NEF/NEP contour, but that a detailed noise analysis with respect to aircraft/airport noise study is required any time the property is located within the AVDZ. The NPC-300 stipulates that an aircraft/airport noise analysis is required where the sensitive land use is located at or above the NEF/NEP contour of 25. Reference can be made to Drawing 6 in Appendix 1.

The following table from the City of Ottawa Environmental Noise Control Guidelines outlines the limitations for indoor aircraft noise for commercial buildings:

Table 4.2b: Supplementary Indoor Sound Level Limits for Aircraft Noise (adopted from NPC-300 table C-10) * Applicable over a 24-hour period *	
Type of Space	**Indoor NEF/NEP**
General offices, reception areas, retail stores, etc.	15
Individual or semi-private offices, conference rooms, etc.	10
Sleeping quarters of hotels/motels, theatres, libraries, places of worship.	5

4.0 Analysis

4.1 Surface Transportation Noise

The subject site is currently undeveloped and bordered by Limebank Road to the northeast, Leitrim Road to the northwest and Spratt Road to the south. Limebank Road was identified within the 100 m radius. Based on City of Ottawa Documents and Client Drawings it is understood that Leitrim Road is to be realigned for future airport construction. The future realignment of Leitrim Road will fall within the 100 m radius of the proposed commercial development; therefore, it was included as part of the current investigation.

Based on the new City of Ottawa Official Plan, Schedule F, Limebank Road is considered a 4-Lane Urban Arterial Divided (4-UAD). The proposed realignment of Leitrim Road was modelled as a 2-lane Urban Arterial (2-UAU) as per information provided in the Transportation Committee Report 32 dated May 9, 2018. Other roads within the 100 m radius of the proposed development are not classified as either arterial, collector or major collector roads and therefore are not included in this study.

All noise sources are presented in Drawing PG7255-1-Site Geometry located in Appendix 1.

The noise levels from road traffic are provided by the City of Ottawa which takes 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 4 - Traffic and Road Parameters

Road	Implied Roadway	AADT (Veh/day)	Posted Speed (km/h)	Day/Night Split %	Medium Truck %	Heavy Truck %
Limebank Road	4 Lane Urban Arterial Divided	35,000	80	92/8	7	5
Realigned - Leitrim Road	2 Lane Urban Arterial	15,000	80	92/8	7	5
Data obtained from the City of Ottawa document ENCG or City of Ottawa Officials						

Two (2) levels of reception points were selected for this analysis. The following elevations were selected from the heights provided on the survey plan for the subject buildings.

Table 5 - Elevation of Reception Points			
Floor Number	**Elevation at the Centre of Window / Ground Surface (m)**	**Floor Use**	**Daytime/Nighttime Analysis**
Ground Floor	1.5	Office Area	Daytime/Nighttime
Second Floor	9.5	Office Area	Daytime/Nighttime

For this analysis, a reception point was taken at the approximate centre of each floor of the structure. Reception points are detailed in Drawing PG7255-2-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 roadways were analyzed where they intersected the 100 m buffer zone, which is reflected in the local angles described in Paterson Drawings PG7255-3A to 3D-Site Geometry in Appendix 1.

Table 7 - Summary of Reception Points and Geometry, located in Appendix 1, provides a summary of the points of reception and their geometry concerning the noise sources. The analysis is completed so that no effects of sound reflection off the building facade are considered, as stipulated by the ENGC. It should be noted that one receptor is assigned to the side of the building affected by noise. The anticipated noise at each receptor represents the worst-case scenario for the proposed building.

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 relatively level and at grade with the neighbouring roads within a 100 m radius.

4.2 Aircraft/Airport Noise

Due to the proximity to the Ottawa International Airport (YOW), an aircraft/airport noise study will be required. The subject site is located (3700 Twin Falls Place) within the Airport Operating Influence Zone, NEF/NEP boundary as stated on the Ottawa Official Plan Schedule C14 - Land Use Constraints Due to Aircraft Noise.

IBANA-Calc Version 1.2 Revision 122, provided by Transport Canada, the Department of National Defense and the National Research Council was utilized for this analysis. IBANA-Calc contains a large database of typical building materials and sound insulation designs. When completing the analysis, it was determined based on project construction specifications that the roof structure was to consist of a steel deck and the windows were to be double-paned. For the purposes of this analysis, a conservative cross-section previously designed in IBANA-Calc was utilized. The cross-section chosen contained a steel deck with the lowest value of noise reduction insulation. While the final room layouts have not yet been finalized, a preliminary floor plan was provided and is attached in Appendix 3. The approximate floor area and wall area were utilized in the calculations.

When performing the noise analysis, it is critical to determine both the noise source and the insulating properties of the proposed building. Three types of aircraft produce different noise: jet-turbine powered aircraft, propeller aircraft and rotary wing helicopters. Jet-turbine-powered aircraft departures and arrivals are typically the primary noise source of airports. IBANA-Calc contains the information for the noise levels and frequency of “Standard Aircraft”.

The top floor was selected as the ‘worst case’ scenario for aircraft noise. It is understood that the roof will consist of the following construction based on the :

- Concrete topping per structural or DensDeck Roof Sheathing, glued and screwed
- Steel deck
- OWSJ
- 22 mm furring hat channel at max 610 mm o.c at u/s of OWSJ
- 13 mm gypsum board, painted

While this exact scenario is not pre-loaded into IBANA-Calc, a similar, but conservative, roofing was selected as follows:

- Granular membrane and peel and stick membranes
- 13 mm wood fiberboard
- 70 mm thick polyisocyanurate insulation
- kraft paper
- 0.7 mm steel decking
- Steel joists on 1610 mm center

- 16 mm ceiling tiles hung from steel decking.

Additionally, the exterior walls and windows were included in the analysis. Based on the provided construction drawings, the following is the typical construction of an exterior wall:

- 1 layer of 16mm Type X Gypsum board
- 125 mm sprayed-on urethane insulation
- 6 mm poly vapour barrier
- 203 mm steel studs @ 610 mm o/c
- 203 mm batt insulation
- 13mm exterior grade gypsum board
- Vapour permeable self-adhered air barrier
- 102mm semi-rigid rockwool continuous insulation (RSI 2.88c.i.)
- 25 mm air space
- Exterior cladding
- Exterior cladding per elevation

5.0 Results

5.1 Surface Transportation

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

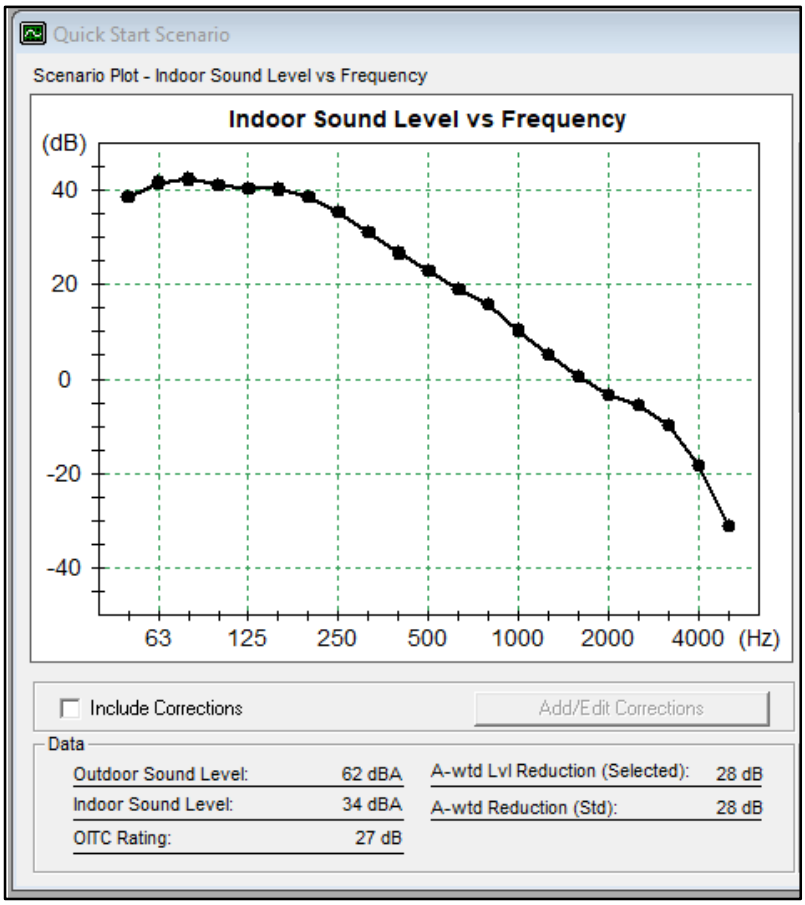
The proposed traffic noise levels were analyzed at all reception points. The results of the STAMSON software are located in Appendix 2, and the summary of the results is noted in Table 6 below.

Table 6 – Proposed Noise Levels

Reception Point	Description	OLA (dBA)	Daytime at Facade $L_{eq(16)}$ (dBA)	Nighttime at Facade $L_{eq(8)}$ (dBA)
REC 1-1	Northern Elevation – Ground Level	-	61	54
REC 2-1	Eastern Elevation – Ground Level	-	66	59
REC 3-1	Southern Elevation – Ground Level	-	68	60
REC 3-2	Southern Elevation – Second Level	-	69	62
REC 4-1	Western Elevation – Ground Level	-	54	47

5.2 Aircraft/Airplane Noise

The following figure demonstrates the indoor sound level versus frequency for the scenario of the top floor. This analysis is considered the worst-case scenario for the building. The results of the IBANA-Calc are presented in Appendix 3.



6.0 Discussion and Recommendations

6.1 Outdoor Living Areas

No outdoor living areas were identified as part of the commercial development.

6.2 Indoor Living Areas and Ventilation

Surface Transportation Noise

The results of the STAMSON modelling indicate that the $L_{eq(16)}$ for the proposed development ranges between 54 dBA and 69 dBA. The noise values calculated exceed the limit of 65 dBA as specified by the ENGCC and therefore **Warning Clause Type D** will be required to be stated on any deeds of sale and an analysis of the building materials will be required.

Warning Clause Type D: "This building 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."

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:

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

Where:

$L_{eq(16)(Exterior)}$ = Calculated value at the window pane
$L_{eq(16)(Interior)}$ = 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 29 dBA.

A conversion from AIF to a Standard Transmission Class (STC) rating will require 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 32 or higher, this would be a sufficient noise attenuation device.** Reference can be made to Appendix 4 for building material industry standards.

Aircraft/Airport Noise

An indoor noise value of 34 dBA was calculated using conservative values in a worst-case scenario analysis. Therefore, utilizing the formula $NEF = L_{eq(24)} - 32\ dBA$, the NEF for the bedroom is determined to be 2 dBA. Therefore, the insulating factor of the proposed building is considered acceptable for the proposed aircraft/airport noise.

7.0 Summary of Findings

The subject site is located at 3700 Twin Falls Place, Block 2 within the City of Ottawa. It is understood that the proposed development will consist of a two-storey commercial building. The associated analysis identified two surface transportation noise sources: Limebank Road, and Leitrim Road (re-alignment). The proposed commercial development was additionally located within the Airport Operating Influence Zone.

Several reception points were selected for the analysis, consisting of panes of glass reception points at each ground floor elevation.

All elevations excluding the southern elevation exceeded the 65 dBA guideline specified by the ENGCC and will require Warning Clause Type D.

Warning Clause Type D: "This building 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."

A review of building materials was completed as part of this analysis, and provided the building materials of either the windows and/or exterior walls have an STC rating of 32 or higher, this would be a sufficient noise attenuation device

An aircraft/airport noise analysis was completed on the subject site due to the proximity of the subject site to the Airport Operating Influence Zone contour identified by the Ottawa Airport (YOW). The analysis indicates that the noise source does not exceed 2 NEF/NEP within the building.

8.0 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 Gastops c/o CSV Architects 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.

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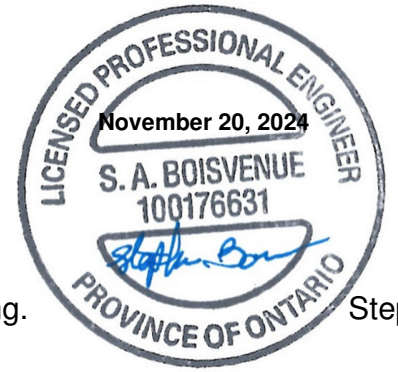

Otillia McLaughlin, B.Eng. Stephanie A. Boisvenue, P.Eng.

Report Distribution:

- ❑ Gastops c/o CSV Architects.
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APPENDIX 1

TABLE 7 – SUMMARY OF RECEPTION POINTS AND GEOMETRY

DRAWING PG7255-3 – SITE PLAN

DRAWING PG7255-4 – RECEPTOR LOCATION PLAN

DRAWING PG7255-5 – SITE GEOMETRY

DRAWING PG7255-5A- SITE GEOMETRY (REC 1-1)

DRAWING PG7255-5B- SITE GEOMETRY (REC 2-1)

DRAWING PG7255-5C- SITE GEOMETRY (REC 3-1 & REC 3-2)

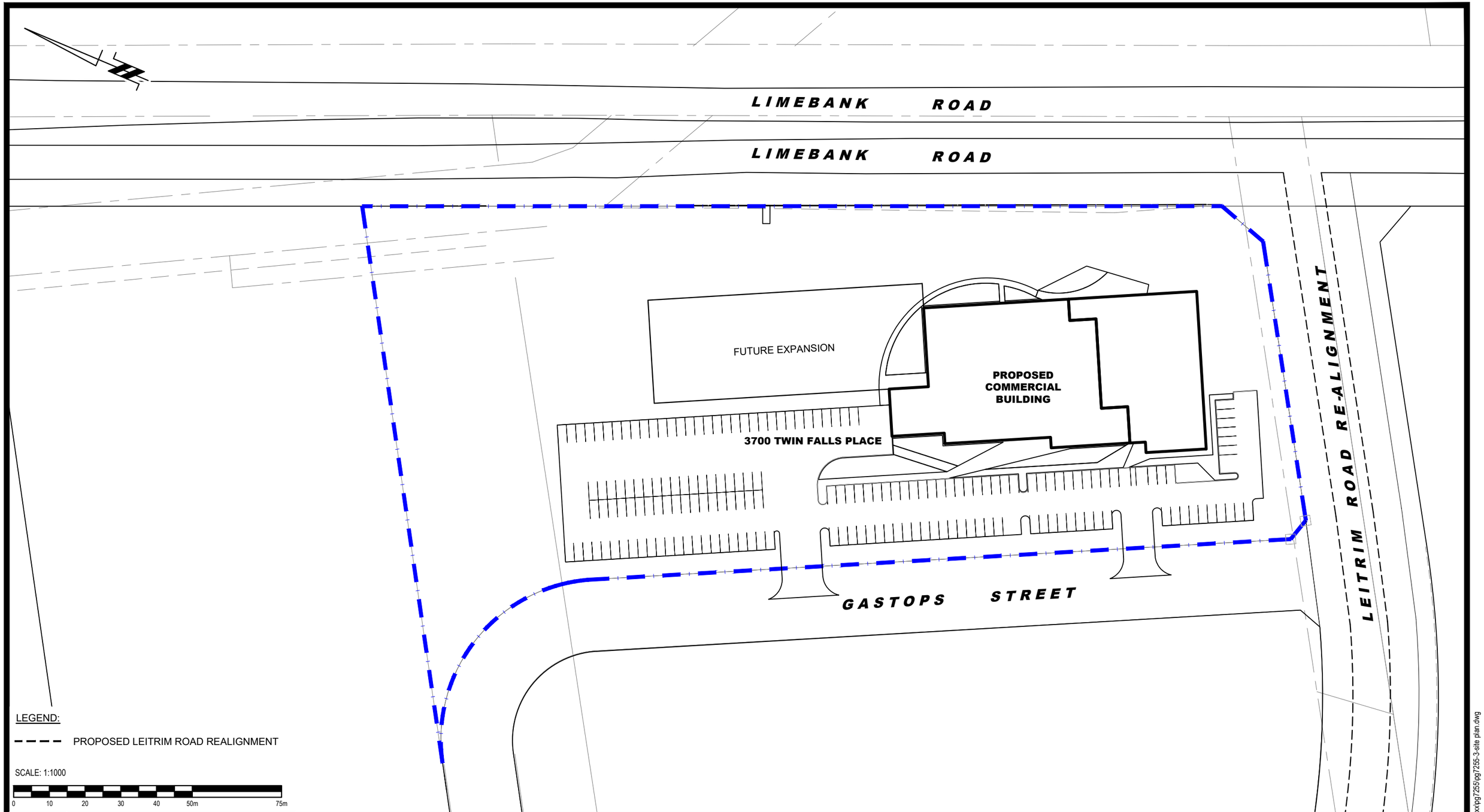
DRAWING PG7255-5D- SITE GEOMETRY (REC 4-1)

DRAWING PG7255-6-AIRCRAFT NOISE LIMITATIONS

Table 7 - Summary of Reception Points and Geometry

3700 Twin Falls Place - Block 2

Point of Reception	Location	Leq Day (dBA)	Leq Night (dBA)	Limebank Road									Leitrim Road (re-alignment)									
				Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)	Barrier Height (m)	Barrier Distance (m)	Barrier Distance (m)	Horizontal (m)	Vertical (m)	Total (m)	Local Angle (degree)	Number of Rows of Houses	Density (%)	Barrier Height (m)	Barrier Distance (m)	Barrier Height (m)	Barrier Distance (m)
REC 1-1	Northern Elevation, 1st Floor	61	54	73	1.5	73.0	-70, 26	n/a	n/a	n/a	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 2-1	Eastern Elevation, 1st Floor	66	59	47	1.5	47.0	-78, 66	n/a	n/a	n/a	n/a	n/a	67	1.5	67.0	0, 65	n/a	n/a	n/a	n/a	n/a	n/a
REC 3-1	Southern Elevation, 1st Floor	68	60	67	1.5	67.0	0, 50	n/a	n/a	n/a	n/a	n/a	30	1.5	30.0	-83, 80	n/a	n/a	n/a	n/a	n/a	n/a
REC 3-2	Southern Elevation, 2nd Floor	69	62	67	9.5	67.7	0, 50	n/a	n/a	n/a	n/a	n/a	30	9.5	31.5	-83, 80	n/a	n/a	n/a	n/a	n/a	n/a
REC 4-1	Western Elevation, 1st Floor	54	47	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	75	1.5	75.0	0, 49	n/a	n/a	n/a	n/a	n/a	n/a



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NO.	REVISIONS	DATE	INITIAL

GASTOPS C.O. CSV
NOISE ATTENUATION STUDY
PROPOSED COMMERCIAL DEVELOPMENT
3700 TWIN FALLS PLACE - BLOCK 2
OTTAWA, ONTARIO

Title:
SITE PLAN

Scale: 1:1000	Date: 11/2024
Drawn by: YA	Report No.: PG7255-2
Checked by: OM	Dwg. No.: PG7255-3
Approved by: SB	Revision No.:

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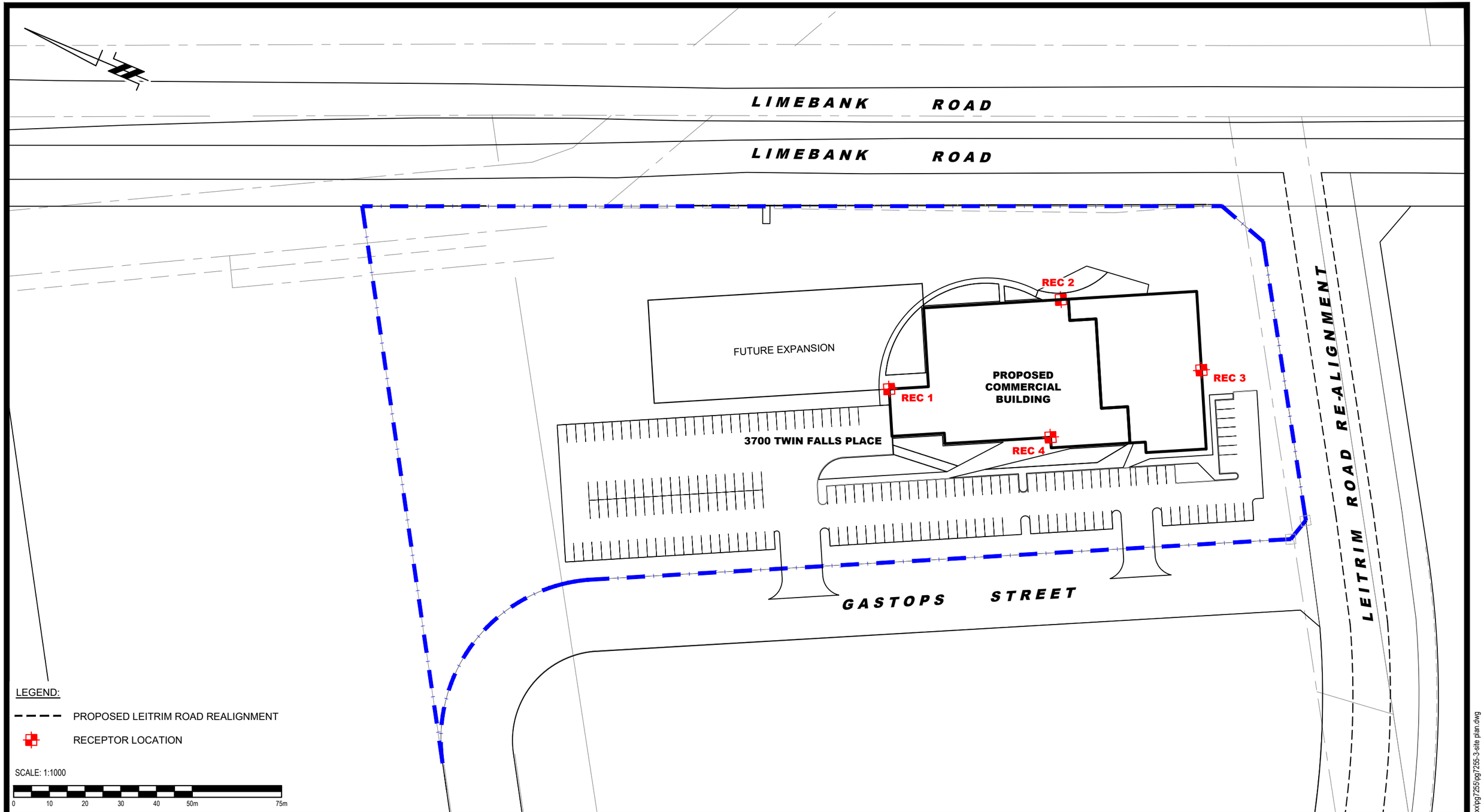

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Title:

RECEPTOR LOCATION PLAN

Scale: 1:1000	Date: 11/2024
Drawn by: YA	Report No.: PG7255-2
Checked by: OM	Dwg. No.: PG7255-4
Approved by: SB	Revision No.:

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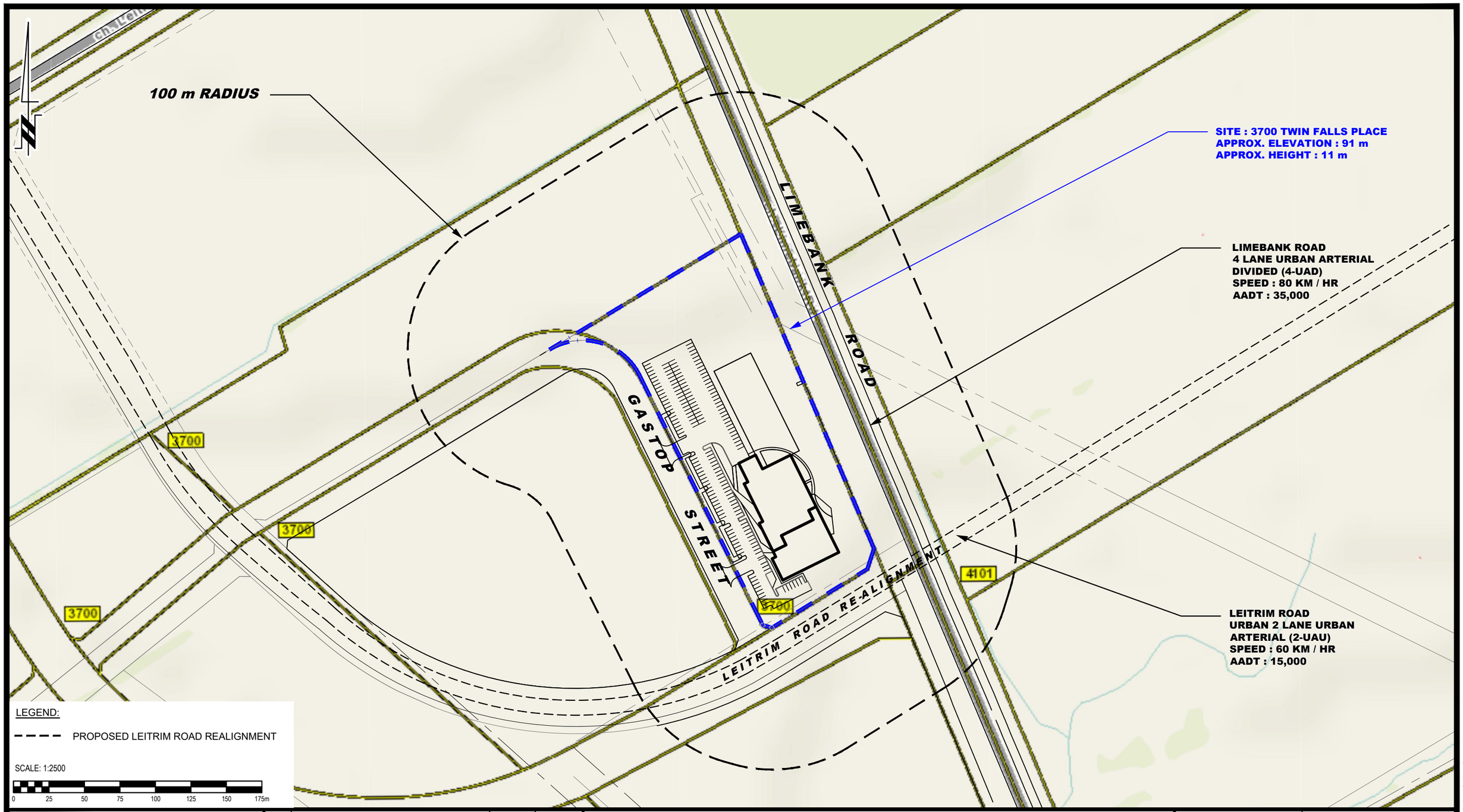

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GASTOPS C.O. CSV
NOISE ATTENUATION STUDY
PROPOSED COMMERCIAL DEVELOPMENT
3700 TWIN FALLS PLACE - BLOCK 2
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Title:
SITE GEOMETRY

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Drawn by: YA	Report No.: PG7255-2
Checked by: OM	Dwg. No.: PG7255-5
Approved by: SB	Revision No.:

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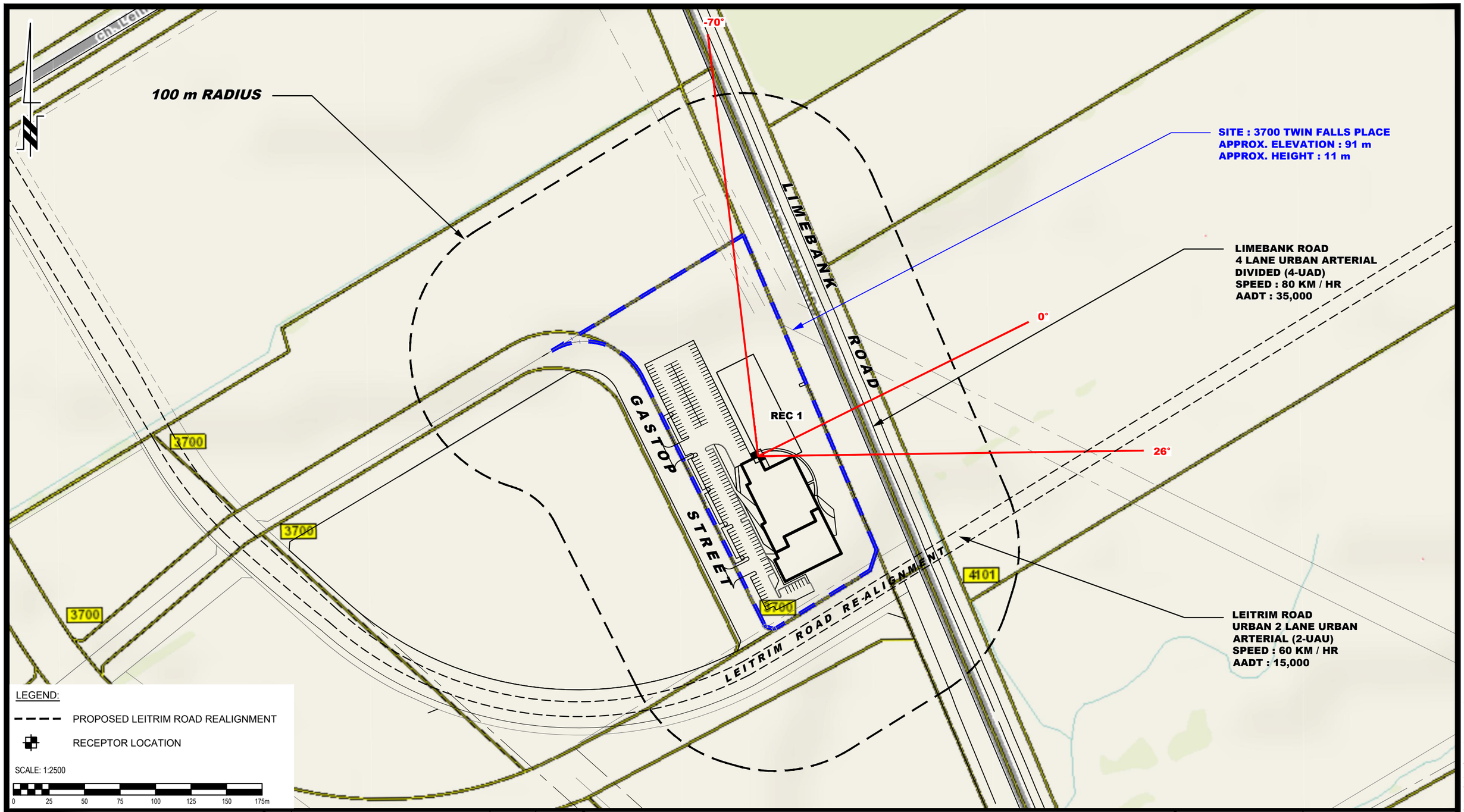

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OTTAWA, ONTARIO

Title:
SITE GEOMETRY - REC 1

Scale: 1:2500	Date: 11/2024
Drawn by: YA	Report No.: PG7255-2
Checked by: OM	Dwg. No.: PG7255-5A
Approved by: SB	Revision No.:

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100 m RADIUS

SITE : 3700 TWIN FALLS PLACE
APPROX. ELEVATION : 91 m
APPROX. HEIGHT : 11 m

LIMEBANK ROAD
4 LANE URBAN ARTERIAL
DIVIDED (4-UAD)
SPEED : 80 KM / HR
AADT : 35,000

LEITRIM ROAD
URBAN 2 LANE URBAN
ARTERIAL (2-UAU)
SPEED : 60 KM / HR
AADT : 15,000

-78°
0°
-65°
66°
0°

REC 2

LIMEBANK ROAD

GASTOPS STREET

LEITRIM ROAD REALIGNMENT

3700
3700
3700
3700
4101

LEGEND:

PROPOSED LEITRIM ROAD REALIGNMENT

RECEPTOR LOCATION

SCALE: 1:2500

0 25 50 75 100 125 150 175m

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NO.	REVISIONS	DATE	INITIAL

GASTOPS C.O. CSV
NOISE ATTENUATION STUDY
PROPOSED COMMERCIAL DEVELOPMENT
3700 TWIN FALLS PLACE - BLOCK 2
OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 2

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Checked by: OM	Dwg. No.: PG7255-5B
Approved by: SB	Revision No.:

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11x17

100 m RADIUS

SITE : 3700 TWIN FALLS PLACE
APPROX. ELEVATION : 91 m
APPROX. HEIGHT : 11 m

LIMEBANK ROAD
4 LANE URBAN ARTERIAL
DIVIDED (4-UAD)
SPEED : 80 KM / HR
AADT : 35,000

LEITRIM ROAD
URBAN 2 LANE URBAN
ARTERIAL (2-UAU)
SPEED : 60 KM / HR
AADT : 15,000

LIMEBANK ROAD

GASTOPS STREET

LEITRIM ROAD RE-ALIGNMENT

REC 3

3700

4101

0°

-83°

50°

80°

0°

LEGEND:

PROPOSED LEITRIM ROAD REALIGNMENT

RECEPTOR LOCATION

SCALE: 1:2500

0 25 50 75 100 125 150 175m

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NO.	REVISIONS	DATE	INITIAL

GASTOPS C.O. CSV
NOISE ATTENUATION STUDY
PROPOSED COMMERCIAL DEVELOPMENT
3700 TWIN FALLS PLACE - BLOCK 2
OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 3

Scale: 1:2500	Date: 11/2024
Drawn by: YA	Report No.: PG7255-2
Checked by: OM	Dwg. No.: PG7255-5C
Approved by: SB	Revision No.:

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11x17

100 m RADIUS

SITE : 3700 TWIN FALLS PLACE
APPROX. ELEVATION : 91 m
APPROX. HEIGHT : 11 m

LIMEBANK ROAD
4 LANE URBAN ARTERIAL
DIVIDED (4-UAD)
SPEED : 80 KM / HR
AADT : 35,000

LEITRIM ROAD
URBAN 2 LANE URBAN
ARTERIAL (2-UAU)
SPEED : 60 KM / HR
AADT : 15,000

LIMEBANK ROAD

GASTOPS STREET

LEITRIM ROAD RE-ALIGNMENT

REC 4

3700

4101

49°

0°

LEGEND:

PROPOSED LEITRIM ROAD REALIGNMENT

RECEPTOR LOCATION

SCALE: 1:2500

0 25 50 75 100 125 150 175m

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

NO.	REVISIONS	DATE	INITIAL

GASTOPS C.O. CSV
NOISE ATTENUATION STUDY
PROPOSED COMMERCIAL DEVELOPMENT
3700 TWIN FALLS PLACE - BLOCK 2
OTTAWA, ONTARIO

Title:

SITE GEOMETRY - REC 4

Scale: 1:2500	Date: 11/2024
Drawn by: YA	Report No.: PG7255-2
Checked by: OM	Dwg. No.: PG7255-5D
Approved by: SB	Revision No.:

11x17

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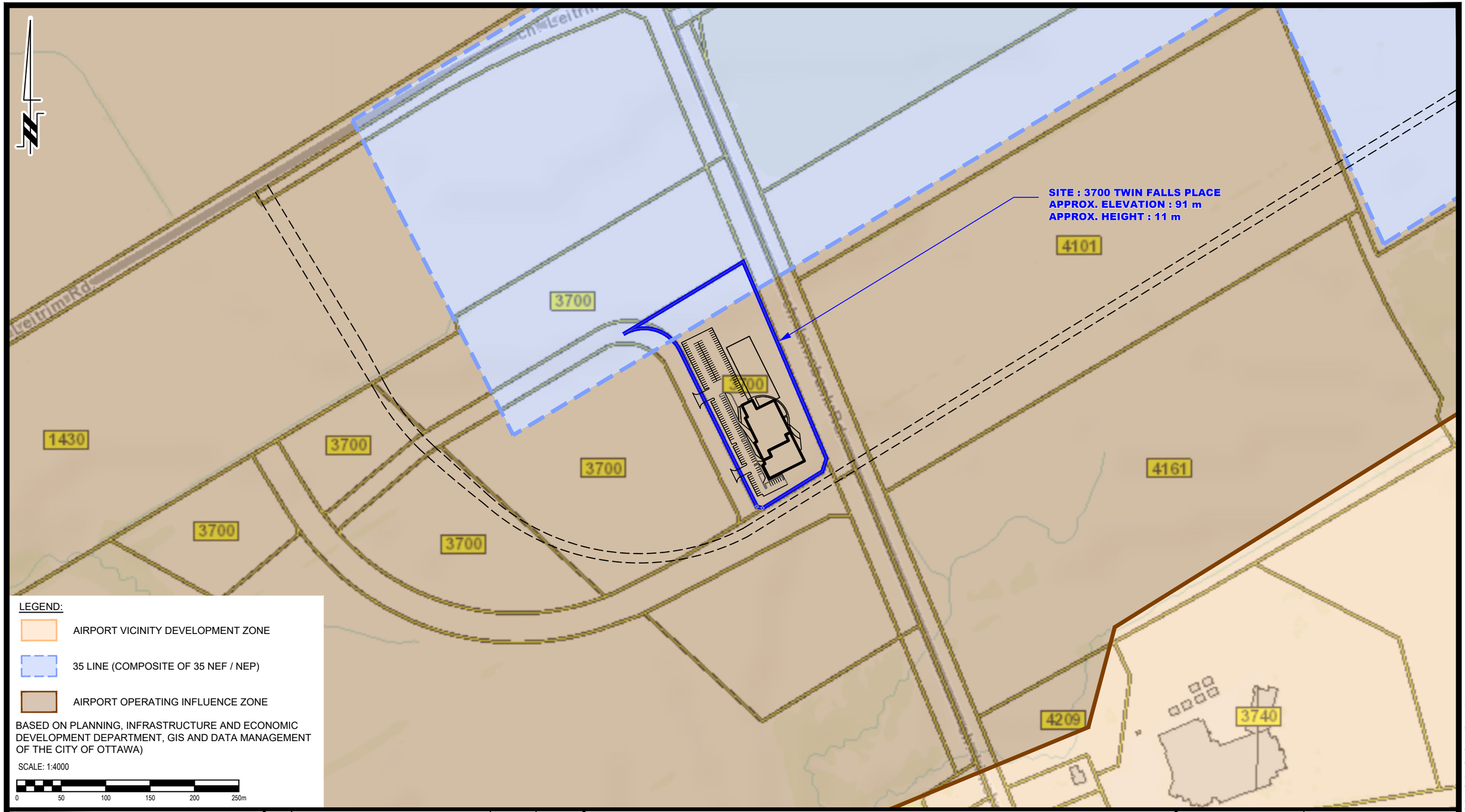

PATERSON GROUP
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K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

GASTOPS C.O. CSV
NOISE ATTENUATION STUDY
PROPOSED COMMERCIAL DEVELOPMENT
3700 TWIN FALLS PLACE - BLOCK 2
OTTAWA, ONTARIO

Title:
AIRCRAFT NOISE LIMITATIONS

Scale: 1:2500	Date: 11/2024
Drawn by: YA	Report No.: PG7255-2
Checked by: OM	Dwg. No.: PG7255-6
Approved by: SB	Revision No.:

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11x17

APPENDIX 2

STAMSON RESULTS

STAMSON 5.0 NORMAL REPORT Date: 06-11-2024 16:21:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC11.te Time Period: Day/Night 16/8 hours
Description: REC 1-1 Northern Elevation

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 35000
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: Limebank (day/night)

Angle1 Angle2 : -70.00 deg 26.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 73.00 / 73.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Results segment # 1: Limebank (day)

Source height = 1.50 m

ROAD (0.00 + 61.44 + 0.00) = 61.44 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-70	26	0.66	76.17	0.00	-11.41	-3.32	0.00	0.00	0.00	61.44

Segment Leq : 61.44 dBA

Total Leq All Segments: 61.44 dBA

↟
Results segment # 1: Limebank (night)

Source height = 1.50 m

ROAD (0.00 + 53.84 + 0.00) = 53.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-70	26	0.66	68.57	0.00	-11.41	-3.32	0.00	0.00	0.00	53.84

Segment Leq : 53.84 dBA

Total Leq All Segments: 53.84 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.44
(NIGHT): 53.84

STAMSON 5.0 NORMAL REPORT Date: 06-11-2024 18:37:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC21.te Time Period: Day/Night 16/8 hours
Description: REC 2-1 Eastern Elevation

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 35000
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: Limebank (day/night)

Angle1 Angle2 : -78.00 deg 66.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 47.00 / 47.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: Leitrim (day/night)

Angle1 Angle2	:	0.00 deg 65.00 deg
Wood depth	:	0 (No woods.)
No of house rows	:	0 / 0
Surface	:	1 (Absorptive ground surface)
Receiver source distance	:	67.00 / 67.00 m
Receiver height	:	1.50 / 1.50 m
Topography	:	1 (Flat/gentle slope; no barrier)
Reference angle	:	0.00

↟

Results segment # 1: Limebank (day)

Source height = 1.50 m

ROAD (0.00 + 66.10 + 0.00) = 66.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	66	0.66	76.17	0.00	-8.23	-1.83	0.00	0.00	0.00	66.10

Segment Leq : 66.10 dBA

↟

Results segment # 2: Leitrim (day)

Source height = 1.50 m

ROAD (0.00 + 58.62 + 0.00) = 58.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	65	0.66	74.50	0.00	-10.79	-5.09	0.00	0.00	0.00	58.62

Segment Leq : 58.62 dBA

Total Leq All Segments: 66.81 dBA

↟

Results segment # 1: Limebank (night)

Source height = 1.50 m

ROAD (0.00 + 58.50 + 0.00) = 58.50 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	66	0.66	68.57	0.00	-8.23	-1.83	0.00	0.00	0.00	58.50

Segment Leq : 58.50 dBA

↟
Results segment # 2: Leitrim (night)

Source height = 1.50 m

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
0	65	0.66	66.91	0.00	-10.79	-5.09	0.00	0.00	0.00	51.03

Segment Leq : 51.03 dBA

Total Leq All Segments: 59.22 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 66.81
(NIGHT): 59.22

↟
↟

STAMSON 5.0 NORMAL REPORT Date: 06-11-2024 19:07:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC31.te Time Period: Day/Night 16/8 hours
Description: REC 3-1 Southern Elevation

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 35000
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: Limebank (day/night)

Angle1 Angle2 : 0.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 67.00 / 67.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: Leitrim (day/night)

Angle1 Angle2	: -83.00 deg	80.00 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: Limebank (day)

Source height = 1.50 m

ROAD (0.00 + 59.43 + 0.00) = 59.43 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.66	76.17	0.00	-10.79	-5.94	0.00	0.00	0.00	59.43

Segment Leq : 59.43 dBA

↑

Results segment # 2: Leitrim (day)

Source height = 1.50 m

ROAD (0.00 + 67.95 + 0.00) = 67.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-83	80	0.66	74.50	0.00	-5.00	-1.56	0.00	0.00	0.00	67.95

Segment Leq : 67.95 dBA

Total Leq All Segments: 68.52 dBA

↑

Results segment # 1: Limebank (night)

Source height = 1.50 m

ROAD (0.00 + 51.84 + 0.00) = 51.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.66	68.57	0.00	-10.79	-5.94	0.00	0.00	0.00	51.84

Segment Leq : 51.84 dBA

↟
Results segment # 2: Leitrim (night)

Source height = 1.50 m

ROAD (0.00 + 60.35 + 0.00) = 60.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-83	80	0.66	66.91	0.00	-5.00	-1.56	0.00	0.00	0.00	60.35

Segment Leq : 60.35 dBA

Total Leq All Segments: 60.92 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 68.52
(NIGHT): 60.92
↟
↟

STAMSON 5.0 NORMAL REPORT Date: 06-11-2024 19:40:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC32.te Time Period: Day/Night 16/8 hours
Description: REC 3-2 Southern Elevation

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 35000
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: Limebank (day/night)

Angle1 Angle2 : 0.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 67.00 / 67.00 m
Receiver height : 9.50 / 9.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 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): 15000
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: Leitrim (day/night)

Angle1 Angle2 : -83.00 deg 80.00 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 : 9.50 / 9.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Results segment # 1: Limebank (day)

Source height = 1.50 m

ROAD (0.00 + 61.13 + 0.00) = 61.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.42	76.17	0.00	-9.23	-5.81	0.00	0.00	0.00	61.13

Segment Leq : 61.13 dBA

↟
Results segment # 2: Leitrim (day)

Source height = 1.50 m

ROAD (0.00 + 69.04 + 0.00) = 69.04 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-83	80	0.42	74.50	0.00	-4.28	-1.19	0.00	0.00	0.00	69.04

Segment Leq : 69.04 dBA

Total Leq All Segments: 69.69 dBA

↟
Results segment # 1: Limebank (night)

Source height = 1.50 m

ROAD (0.00 + 53.53 + 0.00) = 53.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.42	68.57	0.00	-9.23	-5.81	0.00	0.00	0.00	53.53

Segment Leq : 53.53 dBA

↟
Results segment # 2: Leitrim (night)

Source height = 1.50 m

ROAD (0.00 + 61.44 + 0.00) = 61.44 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-83	80	0.42	66.91	0.00	-4.28	-1.19	0.00	0.00	0.00	61.44

Segment Leq : 61.44 dBA

Total Leq All Segments: 62.09 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 69.69
(NIGHT): 62.09

↟
↟

STAMSON 5.0 NORMAL REPORT Date: 06-11-2024 19:43:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: REC41.te Time Period: Day/Night 16/8 hours
Description: REC 4-1 Western Elevation

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

Car traffic volume : 12144/1056 veh/TimePeriod *
Medium truck volume : 966/84 veh/TimePeriod *
Heavy truck volume : 690/60 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 15000
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: Leitrim (day/night)

Angle1 Angle2 : 0.00 deg 49.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 75.00 / 75.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Results segment # 1: Leitrim (day)

Source height = 1.50 m

ROAD (0.00 + 54.87 + 0.00) = 54.87 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	49	0.66	72.49	0.00	-11.60	-6.02	0.00	0.00	0.00	54.87

Segment Leq : 54.87 dBA

Total Leq All Segments: 54.87 dBA

↟
Results segment # 1: Leitrim (night)

Source height = 1.50 m

ROAD (0.00 + 47.27 + 0.00) = 47.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	49	0.66	64.89	0.00	-11.60	-6.02	0.00	0.00	0.00	47.27

Segment Leq : 47.27 dBA

Total Leq All Segments: 47.27 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.87
(NIGHT): 47.27

APPENDIX 3

IBANA-CALC RESULTS

Aircraft Noise Sound Insulation Scenario Calculation Results

Project: PG7255
ProjectID: PG7255
Date:2024-11-06
Outdoor level: NEF 30 or Leq24 62 or Ldn 63 dBA

Source Spectrum details:

100% Standard Aircraft
Corrections:

Receiving room:

Floor Area: 49480.00 ft²
Absorbtion: 100% of floor area

Construction Description:

Element 1: GMEM4_PSMEM0.2_WFB13_POLYISO70_PAP0.3_STE0.8_SJ254(1610)

Construction Type: Steel Deck
Area: 47071.00 ft²
Test ID: TLF-99-007a
Test Date: 1999-03-30

Granular membrane and peel and stick membranes, 13 mm wood fibre board, 70 mm thick polyisocyanurate insulation, kraft paper, 0.7 mm steel decking, steel j oists on 1610 mm centre, no vents installed.

Element 2: VIN1_OSB11_WS140(610)_GFB152_G13

Construction Type: 2by6 Wall
Area: 17405.00 ft²
Test ID: TLA-99-121a
Test Date: 1999-03-15

Vinyl siding, 11 mm OSB, 140 mm wood studs on 610 mm centre with glass fibr e cavity insulation, 1 of 13 mm gypsum board.

Sound Level vs. Frequency - Spectrum Values:

Frequency(Hz)	Indoor Sound Level(dB)
50	38.6
63	41.6
80	42.4
100	41.2
125	40.5
160	40.3
200	38.7

250	35.5
315	31.1
400	26.7
500	23.0
630	18.9
800	15.8
1000	10.3
1250	5.2
1600	0.6
2000	-3.3
2500	-5.5
3150	-9.8
4000	-18.3
5000	-31.2

A-Weighted Sound Level vs. Frequency - Spectrum Values:

Frequency(Hz)	A-Wtd Sound Level(dBA)
50	8.4
63	15.4
80	19.9
100	22.1
125	24.4
160	26.9
200	27.8
250	26.9
315	24.5
400	21.9
500	19.8
630	17.0
800	15.0
1000	10.3
1250	5.8
1600	1.6
2000	-2.1
2500	-4.2
3150	-8.6
4000	-17.3
5000	-30.7

Transmission Loss vs. Frequency - Spectrum Values:

Frequency(Hz)	Transmission Loss(dB)
50	16.7
63	15.0
80	15.7
100	18.3
125	19.3
160	19.3
200	20.3

250	22.5
315	25.9
400	29.6
500	32.8
630	36.2
800	38.5
1000	42.7
1250	46.6
1600	49.5
2000	51.3
2500	51.7
3150	53.5
4000	58.8
5000	65.6

Source Sound Level vs. Frequency - Spectrum Values:

Frequency(Hz)	Source Sound Level(dB)
50	54.8
63	56.0
80	57.5
100	58.9
125	59.3
160	59.0
200	58.5
250	57.5
315	56.5
400	55.8
500	55.2
630	54.6
800	53.7
1000	52.5
1250	51.2
1600	49.6
2000	47.4
2500	45.6
3150	43.3
4000	40.2
5000	34.3

Single Number Ratings

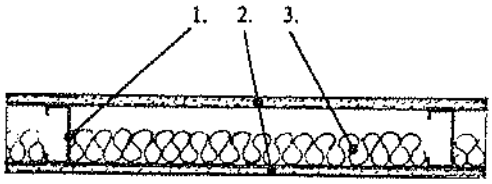
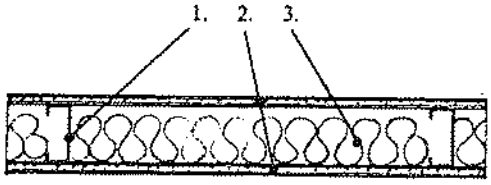
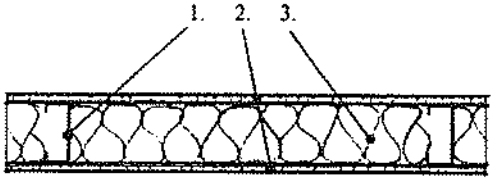
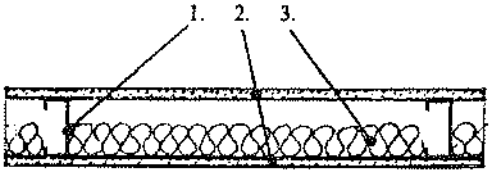
Outdoor Sound Level:	62	dBA
Indoor Sound Level:	34	dBA
A-wtd Level Reduction:	28	dB
A-wtd Reduction re Standard Source:	28	dB
OITC Rating:	27	dB

APPENDIX 4

INDUSTRY STANDARDS

CONSTRUCTION DRAWINGS

CONSTRUCTION SPECIFICATIONS

Sketch	Brief Description	...	Laboratory Test Number Year Frequencies Tested Source of Data	STC	Section Number
	1. 3 5/8" metal studs, 24"o.c. 2. 5/8" gypsum board screwed to studs. 3. 2" thick sound attenuation blanket.	...	National Research Council of Canada NRC #66 1968 16f National Research Council of Canada	47	1.3.3.1.5.7
	1. 3 5/8" metal studs, 24"o.c. 2. 5/8" type X gypsum board screwed to studs. 3. 3" thick sound attenuation blanket.	...	Owens/Corning Fiberglas OCF 469 1967 16f Owens/Corning Fiberglas	44	1.3.3.1.5.8
	1. 3 5/8" metal studs, 24"o.c. 2. 5/8" gypsum board screwed to studs. 3. 4" thick sound attenuation blanket compressed to fit in stud space.	...	National Research Council of Canada NRC #66 1968 16f National Research Council of Canada	45	1.3.3.1.5.9
	1. 3 5/8" metal studs, 24"o.c. 2. 5/8" type X gypsum board spot-laminated to studs with daubs of adhesive 12"o.c. drywall screws at third points along joints and ends. 3. 2" thick sound attenuation blanket.	...	Riverbank Acoustical Labs. TL66-253 1966 16f Celotex Corp.	51	1.3.3.1.5.10

GASTOPS NEW FACILITY

3700 Twin Falls Place

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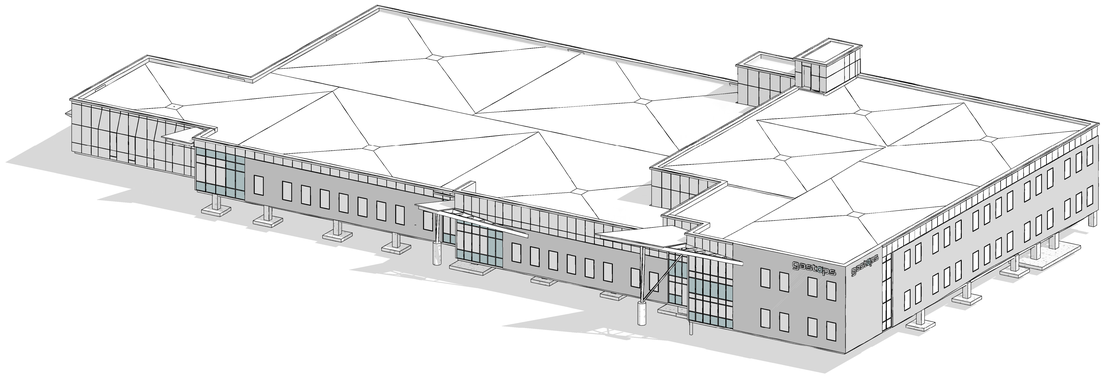
ARCHITECTURAL



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NOTES

CLIENT

GASTOPS

OTTAWA
ONTARIO, CANADA

PROJECT

GASTOPS NEW FACILITY

3700 Twin Falls Place

TITLE

COVER PAGE

PROJECT NO:	2023-2260
DRAWN:	KM
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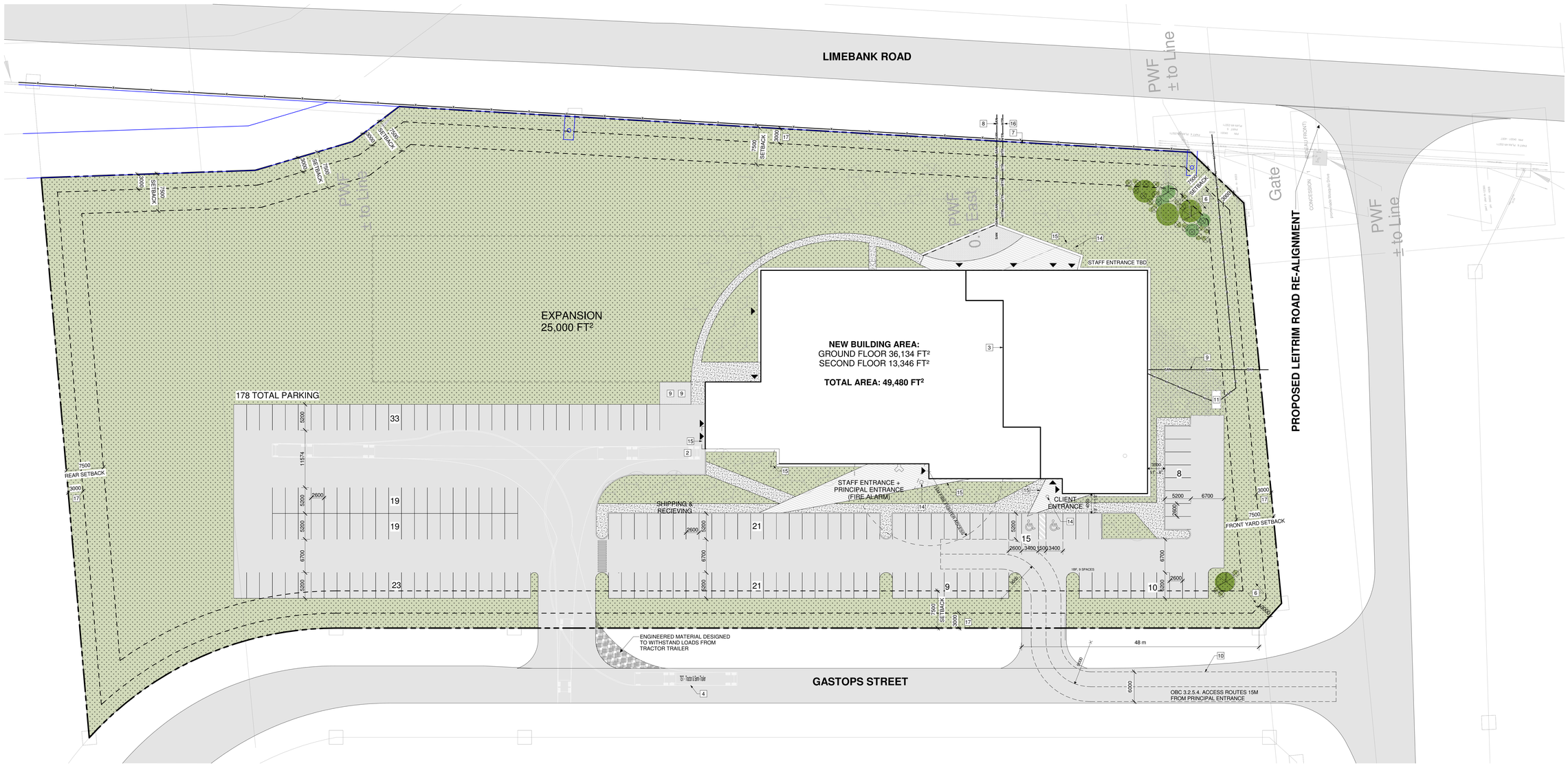
REV 3

DRAWING NO. A000



1 PHASE 1 - SITE PLAN 20241001 SM
A100 | 1 : 300

SITE PLAN LEGEND:

- EXISTING BUILDING & SITE ELEMENTS
- DEMOLISHED BUILDING & SITE ELEMENTS
- ASPHALT PAVING
- GRASS
- CONCRETE SIDEWALK
- CONCRETE PAD
- MULCH/PLANTING
- GRAVEL/ RIVERSTONE/ MAINTENANCE STRIP
- STONE DUST/ SAND
- PAVER TYPE 1
- PAVER TYPE 2
- PAVER TYPE 3
- ENTRANCE/ BARRIER-FREE ENTRANCE
- MAIN ENTRANCE
- VEHICLE ACCESS
- PROPERTY LINE
- FENCE PER SURVEY
- DOMESTIC WATER PER CIVIL
- SANITARY PER CIVIL
- NEW STORM PER CIVIL
- NEW ELECTRICAL SERVICE (BELOW GRADE) PER CIVIL
- GAS PER CIVIL
- OVERHEAD WIRE
- SUBJECT TO EASEMENT
- CATCH BASIN
- LIGHT STANDARD
- FIRE HYDRANT
- MAINTENANCE HOLE
- UTILITY POLE
- SIAMESE CONNECTION
- DROPPED CURB
- TREE
- SHRUB

SITE PLAN GENERAL NOTES:

1. ALL GENERAL SITE INFORMATION AND CONDITIONS COMPILED FROM EXISTING PLANS AND SURVEYS
2. DO NOT SCALE THIS DRAWING
3. REPORT ANY DISCREPANCIES PRIOR TO COMMENCING WORK. NO RESPONSIBILITY IS BORN BY THE CONSULTANT FOR UNKNOWN SUBSURFACE CONDITIONS
4. CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ANY ERRORS AND/OR OMISSIONS TO THE CONSULTANT
5. REINSTATE ALL AREAS AND ITEMS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO THE SATISFACTION OF THE CONSULTANT
6. CONTRACTOR TO LAYOUT PLANTING BEDS, PATHWAYS ETC. TO APPROVAL OF CONSULTANT PRIOR TO ANY JOB EXCAVATION
7. THE ACCURACY OF THE POSITION OF UTILITIES IS NOT GUARANTEED - CONTRACTOR TO VERIFY PRIOR TO EXCAVATION
8. INDIVIDUAL UTILITY COMPANY MUST BE CONTACTED FOR CONFIRMATION OF UTILITY EXISTENCE AND LOCATION PRIOR TO DIGGING
9. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER UNLESS OTHERWISE NOTED

SITE PLAN KEYNOTES:

1 FIRE ROUTE
2 DROP OFF / LOADING BAY
3 OUTLINE OF SECOND STOREY
4 TRUCK TURNING RADIUS
5 OUTLINE OF SECOND STOREY
6 CULVERT
7 STORM DITCH
8 EXISTING SANITARY CONNECTION
9 NEW SANITARY CONNECTION
10 FIRE TRUCK ROUTE
11 TRANSFORMER
12 GARBAGE
13 SOCCER
14 CANOPY COLUMN
15 CANOPY ABOVE
16 DOMESTIC WATER
17 3M LANDSCAPE BUFFER

LEGAL DESCRIPTION:

BLOCK 2 4R-8033

REFERENCE SURVEY:

BASED ON INFORMATION FROM A SURVEY RECEIVED

MUNICIPAL ADDRESS:

NOT ESTABLISHED

DEVELOPMENT INFORMATION:

SITE AREA:	24076 m²
BUILDING AREA:	3358 m²
GROSS FLOOR AREA:	4597 m²
BUILDING HEIGHT:	9754 m / (2) STORIES
ZONE:	IL
SCHEDULE 1:	AREA [C]
SCHEDULE 1A:	AREA [C]
SCHEDULE 2:	

ZONING PROVISION:	REQUIRED:	PROVIDED:
MIN. LOT WIDTH:	NO MINIMUM	
MIN. LOT AREA:	2000 m²	
MIN. LOT COVERAGE:	65%	
MIN. FRONT YARD SETBACK:	7.5 m	
MIN. CORNER YARD SETBACK:	7.5 m	
MIN. REAR YARD SETBACK:	7.5 m	
MIN. INTERIOR YARD SETBACK:	7.5 m	
MAXIMUM FLOOR SPACE INDEX:	2	
MAXIMUM BUILDING HEIGHT:	18 m	
MINIMUM LANDSCAPE AREA:	NO MINIMUM	
MINIMUM LANDSCAPE BUFFER:	3M	

PARKING QUEUING + LOADING	REQUIRED:	PROVIDED:
TOTAL SPACES:		178
TYPICAL SPACES:		176
ACCESSIBLE PARKING:	2	2
BICYCLE PARKING:	1 PER 1000 m2 OF GROSS FLOOR AREA (5)	0
REFUSE COLLECTION:		
GARBAGE COLLECTION:		

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3	2024-11-01	ISSUED FOR SPC REVIEW
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OTTAWA
ONTARIO, CANADA

PROJECT
GASTOPS NEW FACILITY
3700 Twin Falls Place

TITLE
SITE PLAN

PROJECT NO: 2023-2260
DRAWN: KM, RR
APPROVED: DH
SCALE: As indicated
DATE PRINTED: 11/1/2024 3:21:13 PM

REV 3 DRAWING NO. A100

1 GROUND FLOOR
A201 | 1 : 125

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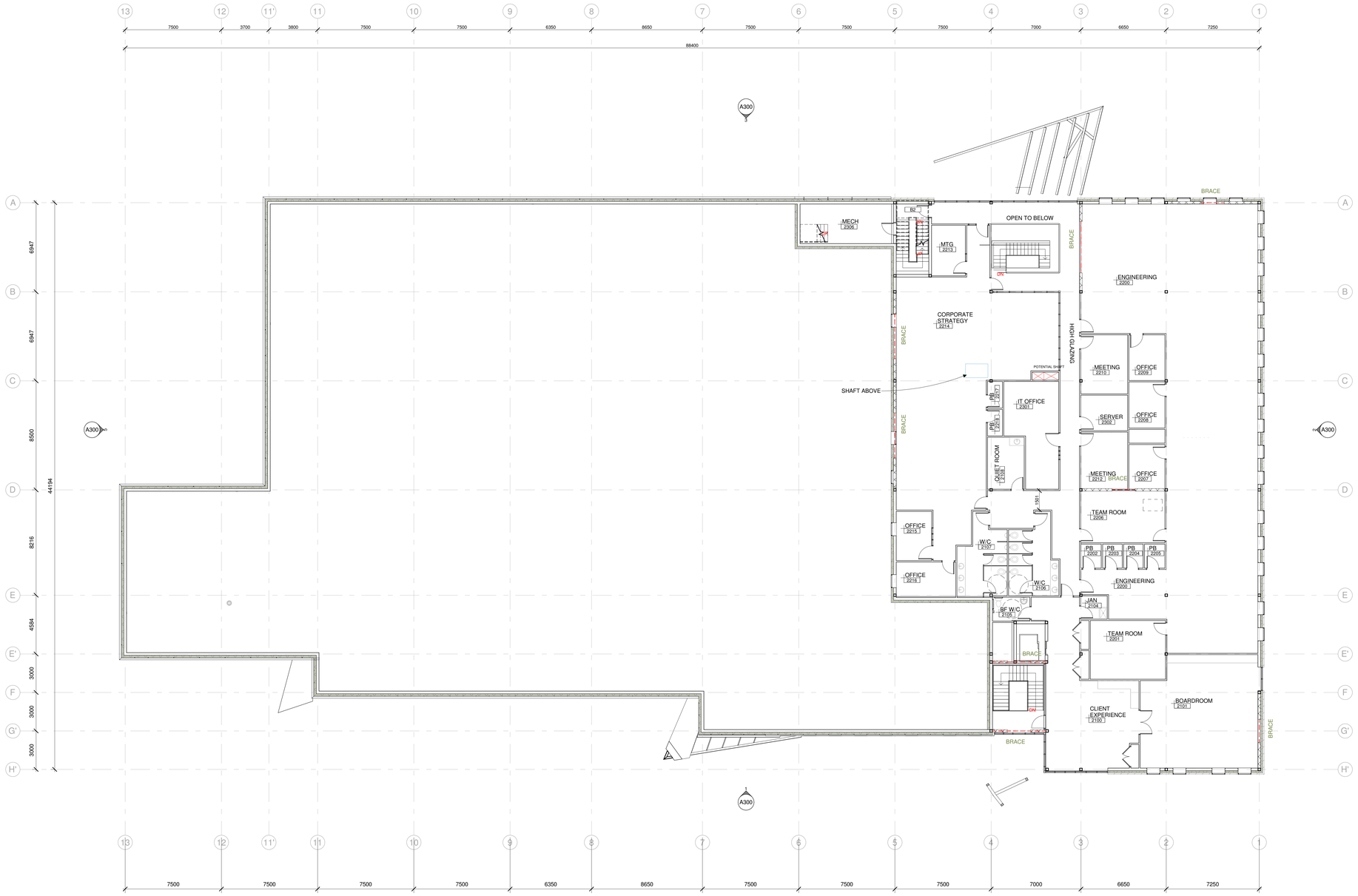
TITLE

GROUND FLOOR PLAN

PROJECT NO:	2023-2260
DRAWN:	KM, RR
APPROVED:	PM
SCALE:	1 : 125
DATE PRINTED:	11/1/2024 3:21:16 PM

REV 3

DRAWING NO. A201



1 SECOND FLOOR
A202 | 1 : 125

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PROJECT

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TITLE

SECOND FLOOR PLAN

PROJECT NO:	2023-2260
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APPROVED:	PM
SCALE:	1 : 125
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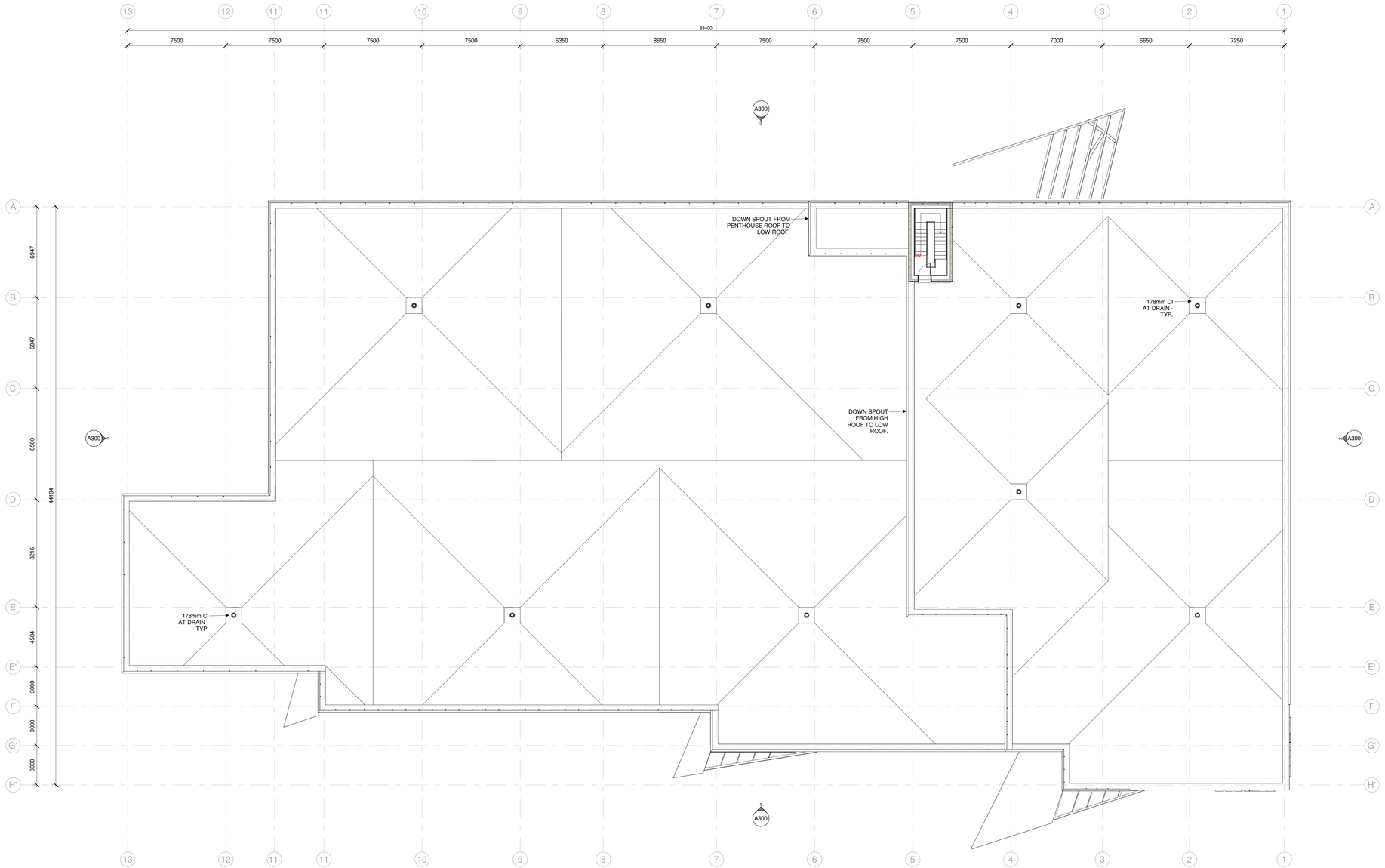
REV 3

DRAWING NO. A202



1 ROOF PLAN
A203 | 1 : 125

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PROJECT

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TITLE

ROOF PLAN

PROJECT NO:	2023-2260
DRAWN:	RR
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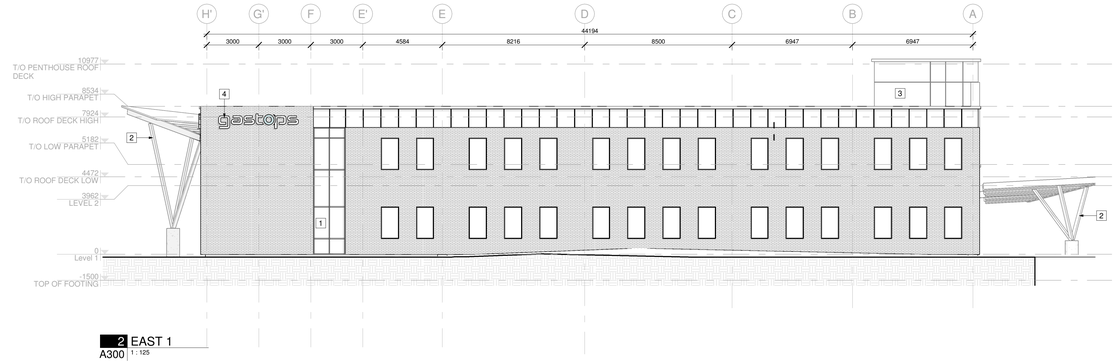
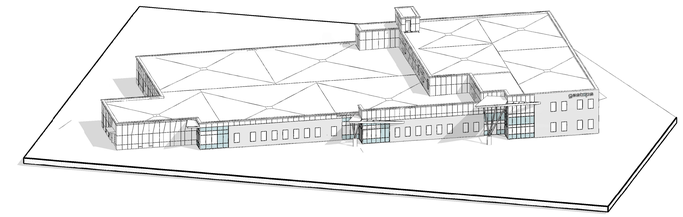
DATE PRINTED:	11/1/2024 3:21:19 PM

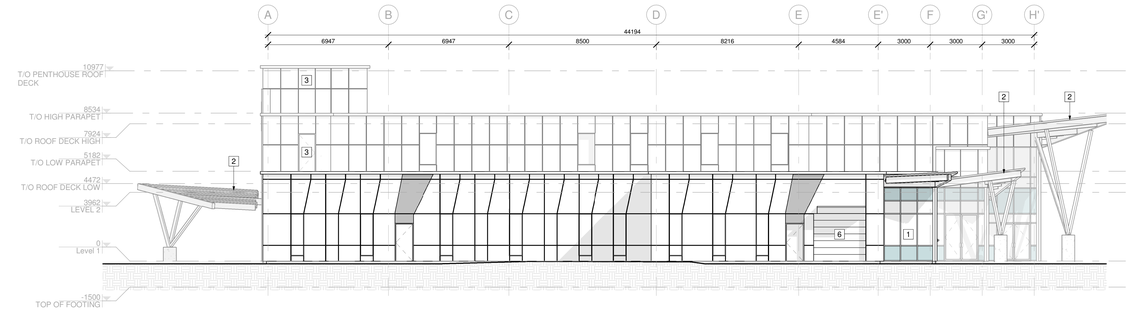
REV 3

DRAWING NO. A203

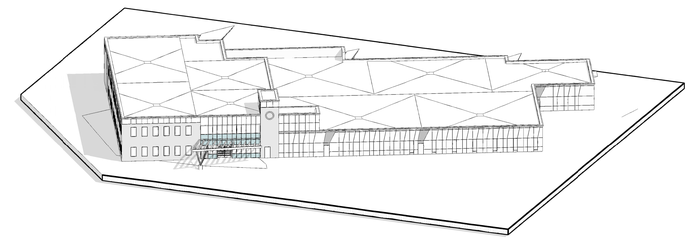


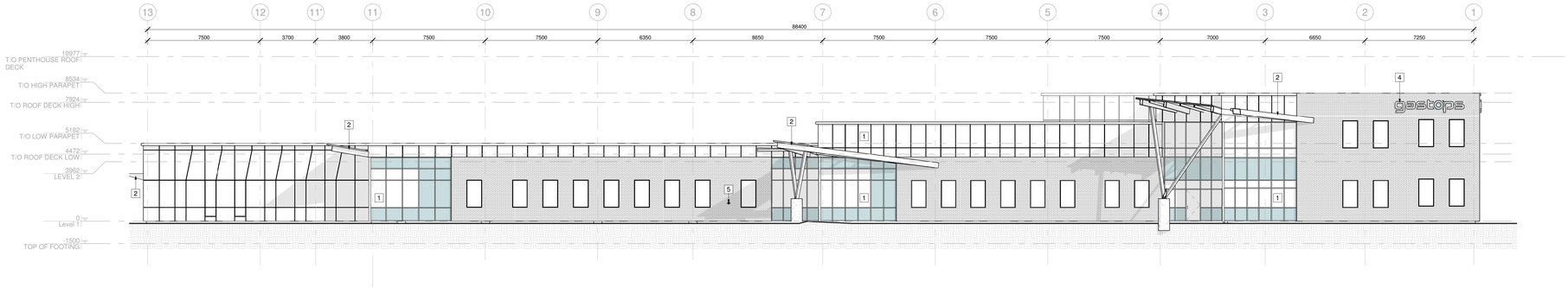
2 EAST 1
A300 | 1 : 125



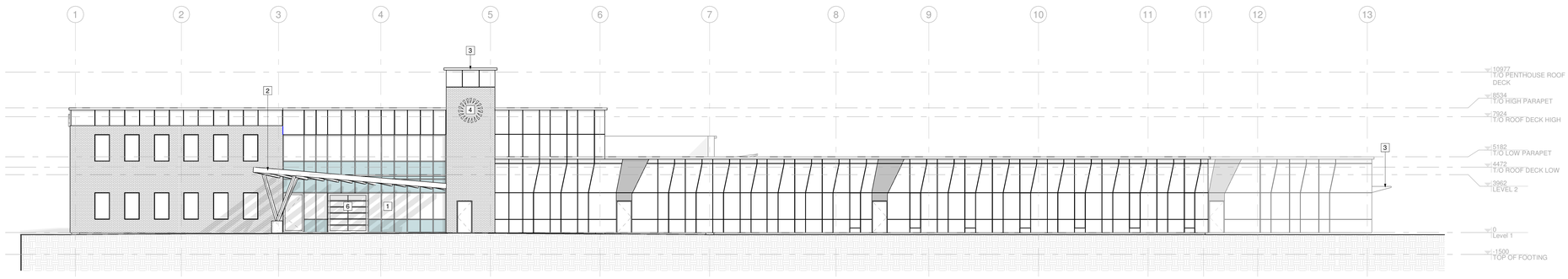


5 Elevation 1 - c
A300 | 1 : 125





1 SOUTH 4
A300 | 1 : 125



3 NORTH 1
A300 | 1 : 125

ELEVATION NOTES:

1. CONTRACTOR TO COORDINATE WITH MANUFACTURER'S SPECIFICATIONS AND INSTALLATIONS GUIDELINES FOR ALL MATERIAL SEALING, TRANSITIONS, SEPARATIONS, FLASHING DETAILS, CONNECTIONS, ANCHORAGES, ETC. CONTRACTOR TO PROVIDE DETAIL DRAWINGS OR MOCK-UP FOR ARCHITECT'S REVIEW AND APPROVAL FOR ALL SPECIAL CONDITIONS NOT SHOWN IN THE CONTRACT DOCUMENTS.

ELEVATION KEYNOTES:

1	CURTAIN WALL
2	CANOPY
3	ELEVATOR OVERRUN & ROOFTOP ACCESS
4	SIGNAGE
5	SIAMESE CONNECTION
6	OVERHEAD GARAGE DOOR

ELEVATION LEGEND:

HATCH PATTERNS SHOWN ARE FOR GRAPHIC PURPOSES ONLY AND SHOULD BE COORDINATED WITH ACTUAL SPECIFIED MATERIALS.

HATCH	SYMBOL	DESCRIPTION
		BRICK VENEER MANUFACTURER: COLOUR:
		METAL SIDING MANUFACTURER: COLOUR:

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SPC APPLICATION #:

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GASTOPS

OTTAWA
ONTARIO, CANADA

PROJECT

GASTOPS NEW FACILITY

3700 Twin Falls Place

TITLE

ELEVATIONS

PROJECT NO:	2023-2260
DRAWN:	RR
APPROVED:	PM
SCALE:	As indicated
DATE PRINTED:	11/1/2024 3:22:06 PM

REV 3

DRAWING NO. A300

OUTLINE SPECIFICATION 01

Gastops New Head Office

Project Address:	Gastops Way	**Date:**	2024-11-01
Owner:	Gastops	**CSV Project No.:**	2023-2260

GENERAL PROJECT DESCRIPTION

- New construction of a 2-storey office and manufacturing facility.
- Building area +/- 36,134 ft2
- Gross floor area +/- 49, 480 ft2
- OBC 3.2.2.68.A. Group F, Division 2, up to 6 storeys:
  - Non-combustible construction
  - Floor assemblies as fire separation with 1h FRR
  - Mezzanine 1h FRR
  - Supporting structures 1h FRR
- Building is sprinklered

SUBSTRUCTURE

A10 FOUNDATIONS

Refer to Geotechnical Report for additional Detail

A1010 STANDARD FOUNDATIONS

- Poured-in-place strip footings and pad footings; t/o footing at depth of 1800mm.

A1013 PERIMETER DRAINAGE & INSULATION

- Perimeter weeping tile and granular, gravity drained to street.

A1030 SLAB ON GRADE

- 125mm wire mesh reinforced poured concrete slab
- 15mil polyethylene vapour and gas barrier
- 76mm rigid EPS insulation below slab (RSI 2.4 full slab)
- 200mm granular subbase

B SHELL

B10 SUPERSTRUCTURE

B1010 FLOOR CONSTRUCTION

- *Floors to be 1 H FRR*
- Concrete topping
- OWSJ per structural
- 22mm furring hat channel at max. 610mm o.c. at u/s of OWSJ
- 13mm gypsum board, painted fire code Type C

STRUCTURAL COMPONENTS

- Steel columns per structural completed with FRR 1h fire protection
- Steel beams per structural completed with FRR 1h fire protection
- Steel stairs with concrete treads in stairwells

B1020 ROOF CONSTRUCTION

- Concrete toping per structural or DensDeck Roof Sheathing, glued and screwed
- Steel deck per structural

- OWSJ per structural
- 22mm furring hat channel at max. 610mm o.c. at u/s of OWSJ
- 13mm gypsum board, painted

B1023 CANOPIES

Entrances + Amenity Canopy

- Exposed sloped steel feature

B20 EXTERIOR ENCLOSURE

B2011 EXTERIOR WALLS CONSTRUCTION

Combination of Brick Veneer and Metal Panels exterior walls:

- 1 layer of 16mm Type X Gypsum board at interior side. Applied vertically with joints between layers staggered.
- 6mil poly vapour barrier
- 203 mm steel studs' corrosion protected cold formed steel studs. The max stud spacing of wall assemblies per structural but shall not exceed 610mm OC.
- 203 mm Batt insulation placed in stud cavity of a thickness to completely fill stud cavity
- 13mm exterior grade gypsum board at exterior side
- Vapour permeable self-adhered air barrier
- 102mm semi-rigid rockwool continuous insulation (RSI 2.88c.i.)
- 25mm air space
- Exterior cladding completed with thermally broken support system per manufacturer
- Exterior Cladding per elevation

B2021 WINDOWS & ENTRANCES

Aluminium/Fibreglass High-Performance frames (similar to Inline).

- Double glazed IGU with Low-E coating
- Door operators at main entrance and vestibule
- Insulated steel doors with thermally broken frames at stairwell exits
- Insulated overhead rolling door at shipping/receiving
- High-performance double-glazed curtain wall sections (similar to Kawneer 7500)

B2030 EXTERIOR DOORS

Main Entrance:

- Aluminium entrance doors

Exit Door:

- Insulated Steel Doors

Garage Door:

- Four-fold or similar
- Remote Control access

Access Control

- Keycard entry system
- Intercom @ front door

B30 ROOFING

B3010 ROOF COVERINGS

- Modified bitumen roofing, high albedo
- Sloped rigid mineral wool insulation, average depth of 90 mm, minimum thickness of 51mm (Min RSI 1.44c.i.)
- 203mm rigid mineral wool insulation (RSI 5.76c.i.)
- Self-adhering membrane air and vapour retarder

B3020 PROJECTIONS
- Scuppers
- Parapets

C INTERIORS

C10 INTERIOR CONSTRUCTION

C1010 NON-LOAD BEARING WALLS
- 16mm Type X gypsum board at both sides of wall
- Min. 92mm steel studs fabricated from Min. 25 MSG carrion-protected steel, spaced a max of 610mm OC. Studs to be cut 19mm. less than assembly height.
- Optional - Batt insulation can be placed in stud cavities for acoustics

C1020 INTERIOR DOORS

Manufacturing Area:
- Hollow metal doors - Painted
- Pressed steel frames - Painted

Office Area:
- Solid core wood doors – Clear Stained
- Pressed Steel frames - Painted

ACCESS CONTROL
- Keycard entry OR keyed system

C20 STAIRS

C2010 STAIRCASES

Exit Stair:
- Steel stair frame of structural section with closed risers; pan to receive concrete fill stair treads; integral balusters and hand-railing.

Feature Stair (Entry & Hanger):
- Steel stair frame of structural section with closed risers; pan to receive concrete fill stair treads; glass guards and wood hand-railing.

C30 INTERIOR FINISHES

Low maintenance, durable finishes

C3010 WALL FINISHES
- No-VOC Paint
- Ceramic tile in washrooms to 1200mm AFF
- Ceramic tile in showers in washrooms to underside of ceiling.

C3020 FLOOR FINISHES

<u>Manufacturing & Lab Areas</u>
- Sealed Concrete
- Painted Lines

<u>Office Areas</u>
- Carpet Tile in Offices and Dorm Areas
- Ceramic Tile in Main Lobby and all washrooms
- Polished Concrete in all public spaces

<u>Mechanical Spaces</u>
- Sealed Concrete

<u>Lab & IT Room</u>
- Anti-Static resilient flooring

C3030 **CEILING FINISHES**

Exposed Structure with Dry Fall paint system:

- Manufacturing & Lab & Shipping/Receiving
- Mechanical spaces
- Hanger

Suspended ACT:

- Kitchen/Dining Areas
- Quiet Rooms/Offices/Meeting Room
- Corridors
- Storage Rooms

D SERVICES

D20 **PLUMBING**
See attached Mechanical Design Brief for additional detail

D2010 **PLUMBING FIXTURES**

- Emergency Showers and Eye Wash – combined units

D30 **HVAC**
See attached Mechanical Design Brief for additional detail

SYSTEM DESCRIPTION

D3010 **ENERGY SUPPLY**

- Hydro and Natural Gas

D3020 **HEAT GENERATING SYSTEMS**
See attached Mechanical Design Brief

D3030 **COOLING GENERATING SYSTEMS**
See attached Mechanical Design Brief

D3040 **DISTRIBUTION SYSTEMS**
See attached Mechanical Design Brief

D3060 **CONTROLS & INSTRUMENTATION**

- BAS

D50 **ELECTRICAL**
See attached Electrical Design Brief for additional detail

D5010 **ELECTRICAL SERVICE AND DISTRIBUTION**
See attached Mechanical Design Brief

D5022 **LIGHTING EQUIPMENT**
LED type light fixtures.

D5030 **COMMUNICATION & SECURITY SYSTEMS**

- Card reader/electric strike access control system

D5037 **FIRE ALARM SYSTEM**

- Fire alarm system required

D5092 **EMERGENCY LIGHT AND POWER**
Natural Gas Emergency Generator sized to provide backup power for limited building use

E	**EQUIPMENT & FURNISHINGS**
E10	**EQUIPMENT**
E1020	**INSTITUTIONAL EQUIPMENT** A/V equipment – coordinate requirements with Program Data Sheets.
E1094	**APPLIANCES** •
E1099	**OTHER EQUIPMENT** •
E20	**FURNISHINGS** Refer to details below.
E2010	**FIXED FURNITURE** • Gear Lockers – wall and floor mounted – 44 total (24”x24” Ready Rack)
E2012	**FIXED CASEWORK** • Custom Millwork in Kitchens • Washroom Vanities
E2013	**BLINDS AND OTHER WINDOW TREATMENT** Blackout blinds: • Boardroom Window Shades: • All areas
E2022	**FURNITURE AND ACCESSORIES** Storage Shelving
F	**SPECIAL CONSTRUCTION & SELECTIVE DEMOLITION**
F10	**SPECIAL CONSTRUCTION**
F20	**SELECTIVE DEMOLITION**
G	**BUILDING SITEWORK**
G10	**SITE PREPARATION**
G1030	**SITE EARTHWORK:**
G20	**SITE IMPROVEMENTS**
G2010	**DRIVEWAYS AND VECHILE APRONS** Heavy-duty asphalt at Vehicle Aprons (front and rear) and driveways
G2020	**PARKING LOTS** Light-duty asphalt at parking spaces only.
G2030	**PEDESTRIAN PAVING** Concrete walks.
G30	**SITE MECHANCIAL UTILITIES**
G3010	**WATER SERVICE** See attached Civil Design Brief

G3020 **SANITARY SERVICE**
See attached Civil Design Brief

G3030 **STORM SERVICE**
See attached Civil Design Brief

G3060 **GAS SERVICE**
See attached Mechanical Design Brief

G40 **SITE ELECTRICAL UTILITIES**

See attached Electrical Design Brief