ST. PATRICK'S HOME OF OTTAWA

ST. PATRICK'S HOME AFFORDABLE HOUSING
NOISE IMPACT ASSESSMENT
2865 RIVERSIDE DRIVE OTTAWA

APRIL 05, 2024

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PROJECT NO.: CA0007873.2332

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WSP
SUITE 300
2611 QUEENSVIEW DRIVE
OTTAWA, ON, CANADA K2B 8K2

T: +1 613 829-2800
F: +1 613 829-8299

WSP.COM

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SIGNATURES

PREPARED BY

Megan Beauchamp, B.Eng., EIT.
Acoustics, Noise & Vibration Specialist

REVIEWED BY

Cris delos Santos, M.Eng., P.Eng.
Senior Engineer, Acoustics, Noise & Vibration

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1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by St. Patrick's Home of Ottawa to prepare a Noise Impact Assessment (NIA) for the proposed residential development to be located at 2865 Riverside Drive in the city of Ottawa, Ontario (the Site). This report was prepared in support of the Site Plan Control application.

This report was conducted in accordance with the City of the Ottawa's (the City) *Environmental Noise Control Guideline* (ENCG) and the Ministry of Environment, Conservation and Parks (MECP) Noise Pollution Control (NPC) Publication NPC-300 "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning" (NPC-300), dated August 2013. Noise mitigations needed to comply with the noise guidelines are provided herein.

1.1 SITE AND SURROUNDING AREA

The Site is zoned residential R5A[2753] H(24), residential fifth density zone, as per the City of Ottawa Zoning By-law and is currently bordered by the following:

- Offices of Canadian Labour, Sunbelt, War Amps, to the north;
- Existing residential developments to the east;
- Existing St. Patrick's Home long-tern care facility to the south and;
- Riverside Drive to the west.

Figure 1 shows the location of the Site in relation to the surrounding area and **Figure 2** shows the land use designation of the area.

1.2 THE PROPOSED DEVELOPMENT

The Site will consist of a 7-storey apartment building and a surface parking lots as shown on the Geometry & General Layout Plan, dated January 23, 2024 ("Issued for Site Plan Control"), prepared by WSP Canada Inc. The Geometry & General Layout Plan is included in **Appendix A**.

2 IMPACT OF SURROUNDING ENVIRONMENT ON THE SITE

The environmental noise sources with potential to impact the Proposed Development are discussed and assessed in this section. The following sources are identified:

- Transportation noise impacts from nearby roads
- Stationary noise impacts from nearby residential and office land uses.

2.1 TRANSPORTATION NOISE IMPACT ASSESSMENT

2.1.1 NOISE SOURCES

Road Traffic

The transportation noise source that has the potential to create a significant noise impact at the proposed development is road traffic on Riverside Drive, located to the west of the Site. Vehicular traffic on other roads are not expected to substantially impact the Proposed Development due to increased setback distance and screening from multiple rows of intervening structures.

2.1.2 ROAD TRAFFIC DATA

Riverside Drive was classified as a 4-lane urban arterial divided road for this assessment and the ENCG ultimate traffic data for a 4-lane urban arterial divided road was used in the assessment. This road traffic data is summarized in **Table 2-1** and included in **Appendix B.**

Table 2-1 Summary of Future Road Traffic Data

ROAD	ROAD CLASSIFICATION	ULTIMATE AADT(1)	DAY/NIGHT SPLIT (%)	MEDIUM TRUCK (%)	HEAVY TRUCK (%)	POSTED SPEED LIMIT (KM/H)
Riverside Drive	4-Lane Urban Arterial Divided	35,000(2)	92/8	7	5	60

(1) Average Annual Daily Traffic (AADT).

2.1.3 ENVIRONMENTAL NOISE GUIDELINES

Noise is recognized as a pollutant in the Environmental Protection Act, as uncontrolled noise can affect human activities. Ontario provincial noise control guidelines require that potential noise impacts be addressed in the planning of any new development.

The noise assessment criteria are based on Section "Part C – Land Use Planning**"** of the MECP Publication NPC-300 and ENCG. The ENCG criteria references and are consistent with the NPC-300. Unless otherwise noted, the City requires development to be consistent with the NPC-300 guidelines. This section of the guideline is intended to provide

a common framework for land use planning authorities, developers, and consultants to address environmental noise in the land use planning process.

Sound level criteria for acceptable levels of road traffic noise on sensitive living spaces are provided in the MECP NPC-300. The sound level limits are summarized in **Table 2-2.**

Table 2-2 MECP Sound Level Limits for Road Noise

AREA	TIME PERIOD	SOUND LEVEL, L_{EQ} (DBA)
Outdoor Living Area (OLA)	Daytime (0700 – 2300h)	55
Indoor Living/Dining Room	Daytime (0700 – 2300h)	45
	Nighttime (2300 – 0700h)	45
Indoor Sleeping Quarters (i.e. bedroom)	Daytime (0700 – 2300h)	45
	Nighttime (2300 – 0700h)	40

As defined in the MECP Publication NPC-300 and ENCG, an Outdoor Living Area (OLA) is part of noise sensitive land use intended for the quiet enjoyment of the outdoor environment. OLA can include recreational areas such as backyards, terraces, patios and common outdoor living areas associated with high-rise multi-unit buildings. Based on the MECP's defining characteristics of an OLA, other outdoor areas such as balconies and elevated terraces of individual residential units, which are less than four metres in depth, are not considered noise sensitive OLA in the context of this noise study. Balconies and elevated terraces that are more than four metres in depth would be considered as noise sensitive OLA, provided they are the only OLA for the occupants.

Indoor living environments considered sensitive to noise include living/dining rooms and bedrooms. These areas are represented by the building façade noise receptor locations at the plane-of-window (POW) of indoor living spaces.

2.1.3.1 *NOISE CONTROL REQUIREMENTS AND WARNING CLAUSES*

The MECP Publication NPC-300 provides guidance on selecting appropriate noise control measures to achieve the sound level limits summarized in **Table 2-2.**

OUTDOOR REQUIREMENTS

When the daytime outdoor sound levels exceed the objective sound level of 55 dBA by up to 5 dBA, physical noise control measures are not mandatory under the MECP policy. Noise control measure are not required only in cases where the noise control measures are not technically, economically and administratively feasible. If noise control measures are not implemented, prospective purchasers/tenants must be informed of the potential noise disturbance by means of a warning clause registered in offers/agreements of purchase and sales/leases or tenancy agreements.

If the daytime sound levels exceed the objective sound level of 55 dBA by more than 5 dBA, physical noise control measures are mandatory under the MECP policy along with a warning clause registered in offers/agreements of purchase and sales/leases or tenancy agreements. Noise control measures should be investigated in terms of technical, economic, and administrative feasibility. The warning clause will inform prospective purchasers/tenants of the potential noise disturbance if the physical noise control measures were removed.

Table 2-3 summarizes the noise control and warning clause requirements for OLAs.

Table 2-3 Outdoor Noise Control and Warning Clause Requirements

AREA	TIME PERIOD	L_{EQ} (DBA)	POTENTIAL NOISE CONTROL	WARNING CLAUSE REQUIREMENTS
Outdoor Living Area (OLA)	Daytime (0700 – 2300h)	≤ 55	• None	• None
		> 55 and ≤ 60	• None	• Type A required
		> 60	• Distance setback with Soft Ground • Insertion of insensitive land use between source and receptor • Orientation of buildings to provide sheltered zones in rear yards • Shared outdoor amenity areas • Berm or barrier	• Type B required

INDOOR REQUIREMENTS

Noise sensitive indoor living environments include bedrooms and living/dining rooms. These areas are represented by receptors at the building façade noise at the POW. To comply with the indoor sound level criteria listed in **Table 2-2,** NPC-300 provides guidelines based on predicted sound level at the façade/POW. If the predicted sound level at the POW exceeds the applicable limits, additional considerations such as the type of ventilation; type of windows, exterior walls, and doors that can provide noise attenuation must be selected. In addition, warning clauses to inform the future occupants are also required.

Ventilation Requirements

Table 2-4 summarizes the requirements for ventilation and the requirement for warning clauses to inform the future occupants of the exceedances.

Table 2-4 Noise Control and Warning Clause Requirements

AREA	TIME PERIOD	EQUIVALENT SOUND LEVEL (DBA)[2]	VENTILATION REQUIREMENTS	WARNING CLAUSE
Plane of Window[1]	Daytime (0700 – 2300h)	≤ 55	None	None
		> 55 and ≤ 65	Forced air heating systems with provisions for the future installation of central air conditioning	Type C required
		> 65	Central air conditioning	Type D required
	Night time (2300 – 0700h)	≤ 50	None	None
		> 50 and ≤ 60	Forced air heating systems with provisions for the future installation of central air conditioning	Type C required
		> 60	Central air conditioning	Type D required

Note:

(1) Plane of Window of living/dining room and bedroom.
(2) Daytime: $L_{EQ\ 16HR}$; Nighttime: $L_{EQ\ 8\text{-}HR}$.

Building Component Requirements

Table 2-5 summarizes the requirements for ventilation and the requirement for warning clauses to inform the future occupants of the exceedances.

Table 2-5 Noise Control and Warning Clause Requirements

AREA	TIME PERIOD	EQUIVALENT SOUND EXPOSURE LEVEL (dBA) ROAD[2]	BUILDING COMPONENT REQUIREMENTS
Plane of Window[1]	Daytime (0700 – 2300h)	≤ 65	Building components compliant with Ontario Building Code (OBC)
		> 65	Building components designed/selected to meet Indoor Requirements
	Night time (2300 – 0700h)	≤ 60	Building components compliant with Ontario Building Code (OBC)
		> 60	Building components designed/selected to meet Indoor Requirements

Note:

(1) Plane of Window of living/dining room and bedroom.
(2) Daytime: $L_{EQ\ 16HR}$; Nighttime: $L_{EQ\ 8\text{-}HR}$.

Warning Clauses

Warning clauses referred in **Table 2-4** and **Table 2-5** are defined in **Table 2-6**. Applicable clauses are to be included in offers/agreements of purchase and sales/leases or tenancy agreements to notify prospective purchasers/tenants of the environmental concerns to make informed decisions.

Table 2-6 MECP Warning Clauses

TYPE	WARNING CLAUSES
Type A	"Purchasers/tenants are advised that sound levels due to increasing (road) (transitway) (rail) (air) traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the Ministry of the Environment's noise criteria."
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) (transitway) (rail) (air) traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the Ministry of the Environment's noise criteria."
Type C	"This dwelling unit has been fitted with a forced air heating system and ducting, etc. and was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Ministry of the Environment's noise criteria." (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MECP Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.)
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 Ministry of the Environment's noise criteria."

2.1.4 ROAD TRAFFIC ANALYSIS METHOD

The MECP updated their guidance requiring the use of up-to-date noise prediction methods and software for determining the impacts of noise from roads and railways (Publication NPC-306 "*Methods to Determine Sound Levels Due to Road and Rail Traffic*" December 2021). The Publication NPC-306 replaces Publication NPC-206 "*Sound Levels Due to Road Traffic*", dated October 1995, which referenced the use of ORNAMENT calculation procedures. Previous noise prediction methods using STAMSON, and MECP prediction software implementation of ORNAMENT, were based on a 1995 DOS program which is a modification of the U.S. Federal Highway Administration (FHWA) FHWA-RD-77-108 algorithm to simplify calculations with inherent limitations. Based on the MECP's draft guidance, the new methods will lead to more accurate noise predictions, effective control measures and based on current science.

Although Publication NPC-306 is in circulation for comments as draft, further clarifications from the MECP to Noise Practitioners and Stakeholders suggests that the methods and software will not change. This assessment therefore uses the updated guidance set out in NPC-306 to account for complex features of the development and provide more accurate noise predictions. This is also in line with the recent trends in industry best practices which recommend the use of other enhancements and procedures in noise assessments.

In order to estimate the sound levels from the various transportation sources to the proposed residential receptors, a predictive analysis was completed using a commercially available software package Cadna/A, a computer implementation which takes into account the following:

- Source sound power levels;
- Distance attenuation;
- Source-receptor geometry;
- Screening provided by intervening structures.
- Ground and air (atmospheric) attenuation; and,
- Temperature and humidity effects on noise propagation.

The road noise sources have been included in the model using the Traffic Noise Model prediction algorithm by Federal Highway Administration (TNM, 2004). The model was used to predict traffic noise levels at each of the building facades using CadnaA's building evaluation feature. To assess the potential impacts of transportation noise on the buildings, the maximum sound level on each façade were chosen and summarized in the next section. The following parameters were used in the transportation noise analysis:

- Order of Reflection: 0 (this is consistent with MECP's noise prediction method); and
- Ground absorption coefficients for the following:
  - Soft ground: 1
  - Hard ground: 0

The analysis method in the National Research Council (NRC) document, BPN56 "*Controlling Sound Transmissions into Buildings*", dated September 1985, were used to estimate the acoustical requirements for the building components. The assessment of indoor sound levels and the acoustical requirements for building components were assessed for road noise.

2.1.5 ROAD TRAFFIC RESULTS

Overall future sound levels due to road traffic were predicted. The maximum sound levels are summarized in **Table 2-7** for the Proposed Development at the respective façades and OLAs using the road traffic data.

Table 2-7 Summary of Predicted Sound Levels Onto the Proposed Development - Transportation

NOISE RECEPTOR	DAYTIME SOUND LEVEL $L_{EQ\ DAY}$ (dBA)	NIGHTTIME SOUND LEVEL $L_{EQ\ NIGHT}$ (dBA)
West Façade (closest to Riverside Drive)	67	59
North Façade	63	56
East Façade	43	36
South Façade	61	54
Patio	55	-
Gazebo Area	58	-

As summarized in **Table 2-7** the highest daytime and nighttime sound levels of 66 dBA and 59 dBA, respectively.

2.1.6 TRANSPORTATION NOISE CONTROL REQUIREMENTS

The following discussions outline the recommendations for outdoor, building façade constructions, ventilation requirements and warning clauses to comply with the applicable noise guidelines.

2.1.6.1 *OUTDOOR LIVING AREA*

A patio and gazebo area are planned for the development. Any shielding from fencing for both these noise sensitive areas were conservatively not included in the model as it has not been finalized. Both OLA locations were greater than 55 dBA and less than 60 dBA; therefore, a Type A warning clause is required.

2.1.6.2 *VENTILATION REQUIREMENTS*

Based on the predicted sound levels (as presented in **Table 2-7)** along the facades of the building are predicted to be up to 67 dBA during the daytime and up to 59 dBA during the nighttime for the worst-case. Therefore, central air conditioning is mandatory for this building. This will allow occupants to keep windows closed and maintain a comfortable indoor living environment.

As required by the MECP, warning clauses Type D should be included in all offers of purchase and sales, and lease or rental agreements.

It is understood that a central air conditioning system is included in the building design, and therefore meets the ventilation requirement for the Site.

2.1.6.3 *BUILDING REQUIREMENTS*

As shown on **Table 2-7**, the sound levels along the west façade with exposure to Riverside Road are predicted to exceed 65 dBA during the daytime. Accordingly, this façade will require upgraded door and window glazing assemblies as described below.

The indoor sound level limits can be achieved by using appropriate construction assembly for exterior walls, windows and doors. To estimate the acoustical requirements for the building components, wall, window and floor areas were obtained from the received architectural drawing set, prepared by Edward J.Cuhaci & Associates Architects Inc. For the purpose of this analysis, doors were included in the window area calculations.

Based on the results shown in **Table 2-7**, residential suites located on the west end of the proposed development will require upgraded exterior wall and window/door constructions:

- Exterior wall: Sound transmission class (STC) rating of at least 38; and
- Exterior doors and windows: STC rating of at least 30.

For the remaining suites, wall, window and door assemblies meeting the minimum non-acoustical requirements of the Ontario Building Code (OBC) will be sufficient to comply with the indoor sound level limits.

2.1.6.4 *WARNING CLAUSES*

All dwelling units requiring noise control measures or that may potentially be affected by the noise sources will warrant formal notification to the purchasers or occupants by means of a warning clause included in pertinent offers/agreements of purchase and sales/leases or tenancy agreements.

Type A

"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 Ministry of the Environment's noise criteria."

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."

2.2 STATIONARY NOISE IMPACT ASSESSMENT

2.2.1 NOISE SOURCES

The Site is surrounded by mixed-use, residential, and office land uses. The buildings taken into consideration were The Canadian Labour Congress, The War Amps, Sunbelt Business Brokerage, Riverview Medical Centre, and the existing long term care facility directly south of the new development.

Noise sources from the locations mentioned above include:

- Make-Up Air Units
- Rooftop HVAC units

A site layout plan showing the Proposed Development and the nearby stationary noise source locations are shown in **Figure 3**.

2.2.1.1 ROOFTOP HVAC UNITS

Aerial imagery was used to determine the number of fans on the rooftop ventilation and air conditioning (HVAC) units from nearby buildings. WSP database sound data was used and is summarized in **Appendix C**. It was assumed that these HVAC units operate continuously at 100% duty cycle during the daytime and evening hours; and due to low ambient temperature and unoccupied spaces, and low cooling load during nighttime hours, these units were assumed to operate at 50% duty cycle during the nighttime periods.

2.2.1.2 MAKE-UP AIR UNITS

Make-up air units were included on the surrounding residential buildings in the model. These rooftop units were also assumed to operate continuously at 100% duty cycle during the daytime and evening hours; and due to low ambient temperature and unoccupied spaces, and low cooling load during nighttime hours, these units were assumed to operate at 50% duty cycle during the nighttime periods. WSP database sound data was used and is summarized in **Appendix C**.

2.2.2 NOISE SOURCE DATA

Based on aerial imagery and based on previous studies of similar facilities, a summary of sources that were identified is provided in **Table 2-8**. A list of the noise sources, heights above ground, and the octave band sound data used in the assessment are included in **Appendix C**. The source locations and receptors placed on the Proposed Development are provided in **Figure 3.**

Table 2-8 Summary of Existing Stationary Noise Sources

SOURCE ID	DESCRIPTION	OVERALL SOUND POWER LEVEL [dBA]	OPERATION	
			DAY/EVE	NIGHT
Existing_HVAC01	Carrier 48TC12, 10-ton unit	81	60 min/hr	30 min/hr
Existing_HVAC02				
Existing_HVAC03				
Existing_HVAC04				
Existing_HVAC05				
Existing_HVAC06				
Existing_HVAC07				
Existing_MUA01	Carrier 48TC18, 15-ton unit	84		
Existing_MUA02				
Existing_MUA03				
Existing_MUA04				
Existing_MUA05				
Existing_MUA06				
Existing_MUA07				
Existing_MUA08				

2.2.3 Noise Guidelines and Assessment Criteria

For stationary sources, the MECP Publication NPC-300 and ENCG provides criteria based on one-hour equivalent sound level. In order to comply with the noise impact from stationary sources, the predicted sound level must comply with the noise guidelines stipulated in the MECP publication, NPC-300 and ENCG.

WSP identified the noise sources in the vicinity of the development through a review of aerial imagery. The acoustical environment surrounding the Site is best described as a Class 1 area where the ambient environment is dominated by anthropogenic sound during the daytime, evening and nighttime periods. This is due to the urban environment surrounding the Site which is directly at the right of way of an arterial road.

This classification depends on the local land use and the existing ambient sound environment. **Table 2-9** summarizes the MECP and ENCG exclusionary limits for Class 1 areas.

Table 2-9 MECP's Exclusion Limits in dBA

	CLASS 1	
PERIOD	**PLANE OF WINDOW[1]**	**OUTDOOR POR[2]**
Daytime / Evening (07:00 – 23:00)	50	50
Night-time (23:00-07:00)	45	-

Notes:
1 Plane of window means a point in space corresponding with the location of the centre of a window of a noise sensitive space. The noise effects assessment excludes the effect of sound reflection from the plane of the window on which it is located. In general, the plane of a window is a point used for prediction (including extrapolation), rather than measurement, of sound levels (MOE 2013).

2 PoR means point of reception; representing a point in a receptor location as defined by MECP.A warning clause for stationary sources should be included in offers/agreements of purchase and sale or leases or rental agreements, to notify potential purchasers and tenants of the environmental concerns to make an informed decision.

Table 2-10 NPC-300 Warning Clause for Stationary Sources

TYPE	WARNING CLAUSES
Type E	"Purchasers/tenants are advised that due to the proximity of adjacent industry (facility) (utility), noise from the industry (facility) (utility) may at times be audible."

2.2.4 ANALYSIS METHOD

In order to estimate the sound levels from the local industrial and commercial activities onto the Proposed Development a predictive analysis was completed using a commercially available software package CADNA/A, a computer implementation of the ISO Standard 9613-2 "Acoustics – Attenuation of Sound During Propagation Outdoors", which takes into account the following:

- Source sound power levels;
- Distance attenuation;
- Source-receptor geometry;
- Ground and air (atmospheric) attenuation; and,
- Temperature and humidity effects on noise propagation.

Key parameters used in the model and sample calculations are located in **Appendix C**.

2.2.5 RESULTS

The overall sound levels at the proposed development using assumed predictable worst-case operations for the existing long-term care facility and office locations nearby are summarized in Error! Reference source not found..

Table 2-11 Predicted Sound Levels from Existing Stationary Sources Onto the Proposed Development

	PREDICTED HOURLY SOUND LEVELS, DBA		CLASS 1 MECP SOUND LEVEL LIMITS, DBA		COMPLIANCE WITH MECP LIMIT
NOISE RECEPTOR	**DAY/ EVENING**	**NIGHT**	**DAY/ EVENING**	**NIGHT**	
West Façade (closest to Riverside Drive)	34	31	50	45	Yes
North Façade	41	38	50	45	Yes
East Façade	48	45	50	45	Yes
South Façade	48	45	50	45	Yes
Patio	25	-	50	-	Yes
Gazebo Area	39	-	50	-	Yes

The nearest receptor locations at the Proposed Development meet required the limits with the estimated day Leq (1 hour).

3 IMPACT OF THE DEVELOPMENT ON THE SURROUNDING ENVIRONMENT

3.1 STATIONARY NOISE IMPACT ASSESSMENT

3.1.1 NON-EMERGENCY

The proposed on-site stationary noise includes a make-up air unit (MUA) as provided by the design team. The location of the MUA, and surrounding noise sensitive residential homes to the east of site, are shown in **Figure 4**. The Manufacturers data for the unit is included in **Appendix D**. The unit was conservatively assessed while operating at 100% duty load for both day and night. The predicted noise impacts at both the outdoor backyards and plane of window of the residential homes are summarized in **Table 3-1**. Applicable limits are consistent with **Section 2.2.3** of the report that defines stationary noise assessment criteria in a Class 1 area**.**

Table 3-1 Predicted Sound Levels at Surrounding – On-Site Steady-State Sources

		PREDICTED SOUND LEVEL (DBA)		CLASS 1 EXCLUSION LIMIT (DBA)		COMPLIANCE WITH MECP & ENCG LIMITS?
NOISE RECEPTOR	**DESCRIPTION**	**DAY/ EVE**	**NIGHT**	**DAY/ EVE**	**NIGHT**	**CLASS 1**
R01_O	Backyard of Residential Home	23	-	50	-	Yes
R01_W	Window of Residential Home	23	23	50	45	Yes
R02_O	Backyard of Residential Home	24	-	50	-	Yes
R02_W	Window of Residential Home	24	24	50	45	Yes
R03_O	Backyard of Residential Home	21	-	50	-	Yes
R03_W	Window of Residential Home	21	21	50	45	Yes
R04_O	Backyard of Residential Home	21	-	50	-	Yes
R04_W	Window of Residential Home	21	21	50	45	Yes
R05_O	Backyard of Residential Home	21	-	50	-	Yes
R05_W	Window of Residential Home	18	18	50	45	Yes

Based on equipment information provided the on-site non-emergency stationary source sound levels are predicted to comply at off-site receptors as shown in **Table 3-1**.

3.1.2 EMERGENCY SOURCES

Emergency Equipment Testing

The proposed emergency equipment on-site includes an emergency generator the planned location of the genset is shown in **Figure 4** as per preliminary site plans. The manufacturer data for the genset is in **Appendix D** and a Level 3 enclosure was used in this assessment. It is understood that the emergency generator will only be tested during daytime or evening hours only.

The noise impact of the emergency generator testing is summarized in **Table 3-2.** Applicable limits are 5 dBA higher than **Section 2.2.3** of the report that defines stationary noise assessment criteria in a Class 1 area, as a 5 dBA tolerance is allowed for emergency equipment.

Table 3-2 Predicted Sound Levels at Surrounding– Emergency Generator Testing

		PREDICTED SOUND LEVEL (DBA)	CLASS 1 EXCLUSION LIMIT (DBA)		COMPLIANCE WITH MECP & ENCG LIMITS?
LOCATION	DESCRIPTION	DAY/ EVE/NIGHT	DAY/ EVE	NIGHT[1]	CLASS 1
R01_O	Backyard of Residential Home	44	55	-	Yes
R01_W	Window of Residential Home	45	55	-	Yes
R02_O	Backyard of Residential Home	46	55	-	Yes
R02_W	Window of Residential Home	46	55	-	Yes
R03_O	Backyard of Residential Home	46	55	-	Yes
R03_W	Window of Residential Home	47	55	-	Yes
R04_O	Backyard of Residential Home	48	55	-	Yes
R04_W	Window of Residential Home	47	55	-	Yes
R05_O	Backyard of Residential Home	46	55	-	Yes
R05_W	Window of Residential Home	44	55	-	Yes

[1] Testing of emergency generator will not occur in the nighttime hours (2300 – 0700h).

The testing of the emergency generator is predicted to comply with the exclusion limits at the off-site receptors.

4 IMPACT OF THE DEVELOPMENT ON ITSELF

4.1 STATIONARY NOISE IMPACT ASSESSMENT

4.1.1 NON-EMERGENCY

The proposed on-site stationary source is a make-up air unit (MUA) as provided by the design team. The location of the MUA with respect to site is shown **Figure 4**. The Manufacturers data for the unit is included in **Appendix D**. The predicted noise impacts at the outdoor and plane of window of the residential homes are summarized in **Table 4-1**. Applicable limits are consistent with **Section 2.2.3** of the report that defines stationary noise assessment criteria in a Class 1 area.

Table 4-1 Predicted Sound Levels On-Site from On-Site Steady-State Sources

	PREDICTED SOUND LEVEL (DBA)	CLASS 1 EXCLUSION LIMIT (DBA)		COMPLIANCE WITH MECP & ENCG LIMITS?
NOISE RECEPTOR	DAY/ EVE/NIGHT	DAY/ EVE	NIGHT	CLASS 1
West Façade (closest to Riverside Drive)	20	50	45	Yes
North Façade	33	50	45	Yes
East Façade	28	50	45	Yes
South Façade	33	50	45	Yes
Patio	21	50	-	Yes
Gazebo	17	50	-	Yes
Existing 5-Storey Building within the Site	22	50	45	Yes

Based on equipment information provided the on-site non-emergency stationary source sound levels are predicted to comply at off-site receptors as shown in **Table 4-1**.

4.1.2 EMERGENCY SOURCES

Emergency Equipment Testing

The proposed emergency equipment on-site includes an emergency generator the planned location of the genset is shown in **Figure 4** as per preliminary site plans. The manufacturer data for the genset is in **Appendix D** and a Level 3 enclosure was used for this assessment with a sound power of 71 dBA at 7 meters. The noise impact of the emergency generator testing is summarized in **Table 4-2.** Applicable limits are 5 dBA higher than **Section 2.2.3** of the report that defines stationary noise assessment criteria in a Class 1 area, as a 5 dBA tolerance is allowed for emergency equipment.

Table 4-2 Predicted Sound Levels On-Site– Emergency Generator Testing

	PREDICTED SOUND LEVEL (DBA)	CLASS 1 EXCLUSION LIMIT (DBA)		COMPLIANCE WITH MECP & ENCG LIMITS?
LOCATION	DAY/ EVE/NIGHT	DAY/ EVE	NIGHT[1]	CLASS 1
West Façade (closest to Riverside Drive)	36	55	-	Yes
North Façade	65	55	-	No
East Façade	44	55	-	Yes
South Façade	34	55	-	Yes
Patio	33	55	-	Yes
Gazebo Area	28	55	-	Yes
Existing 5-Storey Building within the Site	30	55	-	Yes

[1] Testing of emergency generator will not occur in the nighttime hours (2300 – 0700h).

The testing of the emergency generator is predicted to exceed the exclusion limits at the North Façade of the proposed development. To comply with the applicable sound level limit, an emergency generator with upgraded acoustic enclosure would be needed. The required sound rating for the emergency equipment is sound pressure level of 61 dBA at 7 meters. With the recommended sound rating for the emergency generator, the predicted sound levels are summarized in **Table 4-3**.

Table 4-3 Predicted Sound Levels On-Site from Mitigated Emergency Generator Testing

LOCATION	PREDICTED SOUND LEVEL (DBA)	CLASS 1 EXCLUSION LIMIT (DBA)		COMPLIANCE WITH MECP & ENCG LIMITS?
	DAY/ EVE/NIGHT	DAY/ EVE	NIGHT[1]	DAY/EVE
West Façade (closest to Riverside Drive)	26	55	-	Yes
North Façade	55	55	-	Yes
East Façade	34	55	-	Yes
South Façade	24	55	-	Yes
Patio	23	55	-	Yes
Gazebo Area	18	55	-	Yes
Existing 5-Storey Building within the Site	20	55	-	Yes

[1] Testing of emergency generator will not occur in the nighttime hours (2300 – 0700h).

Based on a required sound rating of 61 dBA at 7 meters, the emergency generator is predicted to comply at on-site receptors as shown in Table 4 3 for daytime and evening time periods. Should be noted the testing of the emergency generator will not take place at night.

5 RECOMMENDATIONS AND CONCLUSIONS

5.1 CONCLUSIONS

The predicted sound levels from transportation noise sources were assessed as per the MECP publication NPC-300 and ENCG. It was determined with appropriate acoustical design of the building components, a suitable indoor acoustical environment can be achieved.

Stationary noise sources from the surrounding properties onto the Site is also predicted to comply with applicable guidelines with a Type E warning clause.

Stationary noise sources from the development onto both onsite and off-site noise sensitive land uses are also predicted to comply with applicable noise guidelines, provided a sound rating of 61 dBA at 7 meters will be implemented for the emergency generator. It is understood the emergency generator will be tested during the daytime and evening only.

5.2 SUMMARY OF RECOMMENDATIONS

Table 5-1 summarizes the recommendations made in this detailed noise assessment regarding noise control measures in the form of ventilation, building components, warning clauses.

Table 5-1 Summary of Noise Control Requirements and Noise Warning Clauses

LOCATION	NOISE CONTROL REQUIREMENT FOR OLA	VENTILATION REQUIREMENTS	BUILDING COMPONENT (WALLS)	BUILDING COMPONENT (WINDOW)	WARNING CLAUSES
West Façade (Closest to Riverside Drive)	N/A	Mandatory A/C	STC 38	STC 30	A + D
North, East, South Façade			OBC	OBC	A + D
Emergency Generator	Maximum Sound Power Level of 86 dBA Or Maximum Sound Pressure Level of 61 dBA at 7 m				

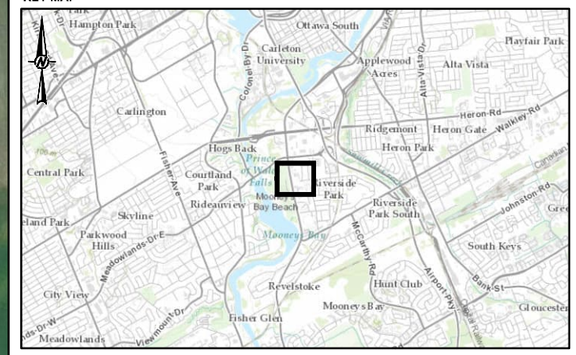
* OBC – meeting the minimum requirements of the Ontario Building Code.

1. The findings and recommendations of this noise study was based on the Geometry & General Layout Plan dated January 23, 2024 (“Issued for Site Plan Control”)prepared by WSP Canada Inc. and architectural drawing set prepared by Edward J. Cuhaci & Associates Architects Inc. The analysis will need to be reviewed if changes to these drawings are made.
2. The development will require central air conditioning as an alternate means of open window for Blocks/Buildings identified in **Table 5-1**. Based on the predicted future sound levels at the Site, central air conditioning system is required for this building as per applicable noise guidelines (ENCG & NPC-300). It is understood that a central air conditioning system is included in the building design, and therefore meets the ventilation requirement for the Site.

3. Buildings requiring warning clauses are identified in **Table 5-1**. The warning clauses should be included in pertinent Offers of Purchase or Sales and Lease or Rental Agreements. Wording of the appropriate clauses is provided in **Section 2.1.6.4** above;
4. It is recommended that an acoustical engineer registered to practice in the province of Ontario or approved professional from City's building department must confirm that the building plan includes the noise control discussed within this report.

FIGURES

KEY MAP



SCALE 1:100,000

LEGEND

- EXISTING FIVE STOREY BUILDING
- PROPOSED SEVEN STOREY BUILDING
- PROPERTY BOUNDARY

0 20 40 80

1:2,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
   SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 18N

CLIENT

ST. PATRICK'S HOME OF OTTAWA

PROJECT

ST. PATRICK'S HOME AFFORDABLE HOUSING
2865 RIVERSIDE DRIVE, OTTAWA

TITLE

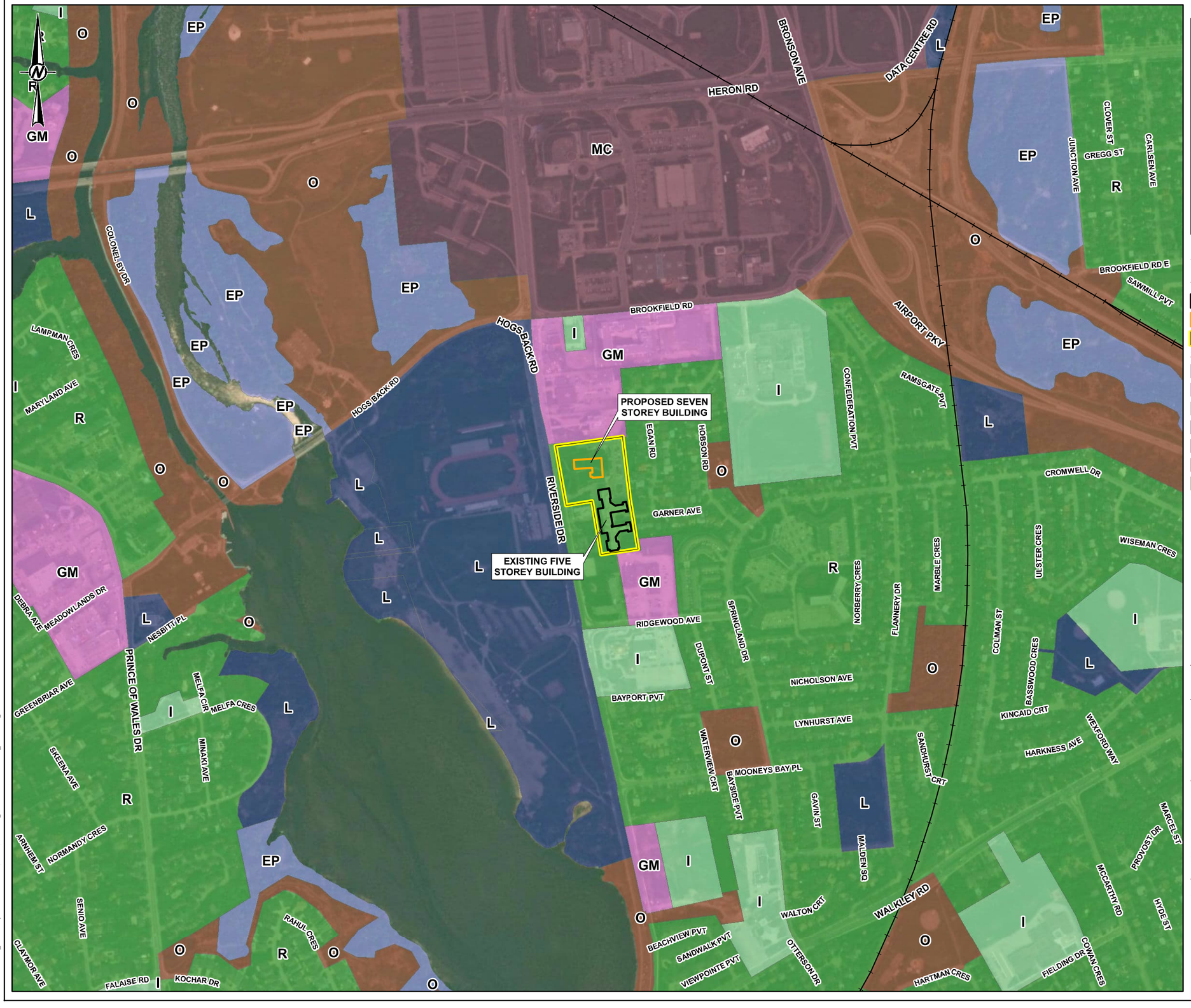
SITE LOCATION PLAN

CONSULTANT

wsp

YYYY-MM-DD	2023-09-20
DESIGNED	SO
PREPARED	PS
REVIEWED	SO
APPROVED	---

PROJECT NO.	CONTROL	REV.	FIGURE
CA0007873.2332	0001	A	1



NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP, GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
   SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 18N

CLIENT
ST. PATRICK'S HOME OF OTTAWA

PROJECT
ST. PATRICK'S HOME AFFORDABLE HOUSING
2865 RIVERSIDE DRIVE, OTTAWA

TITLE
ZONING MAP

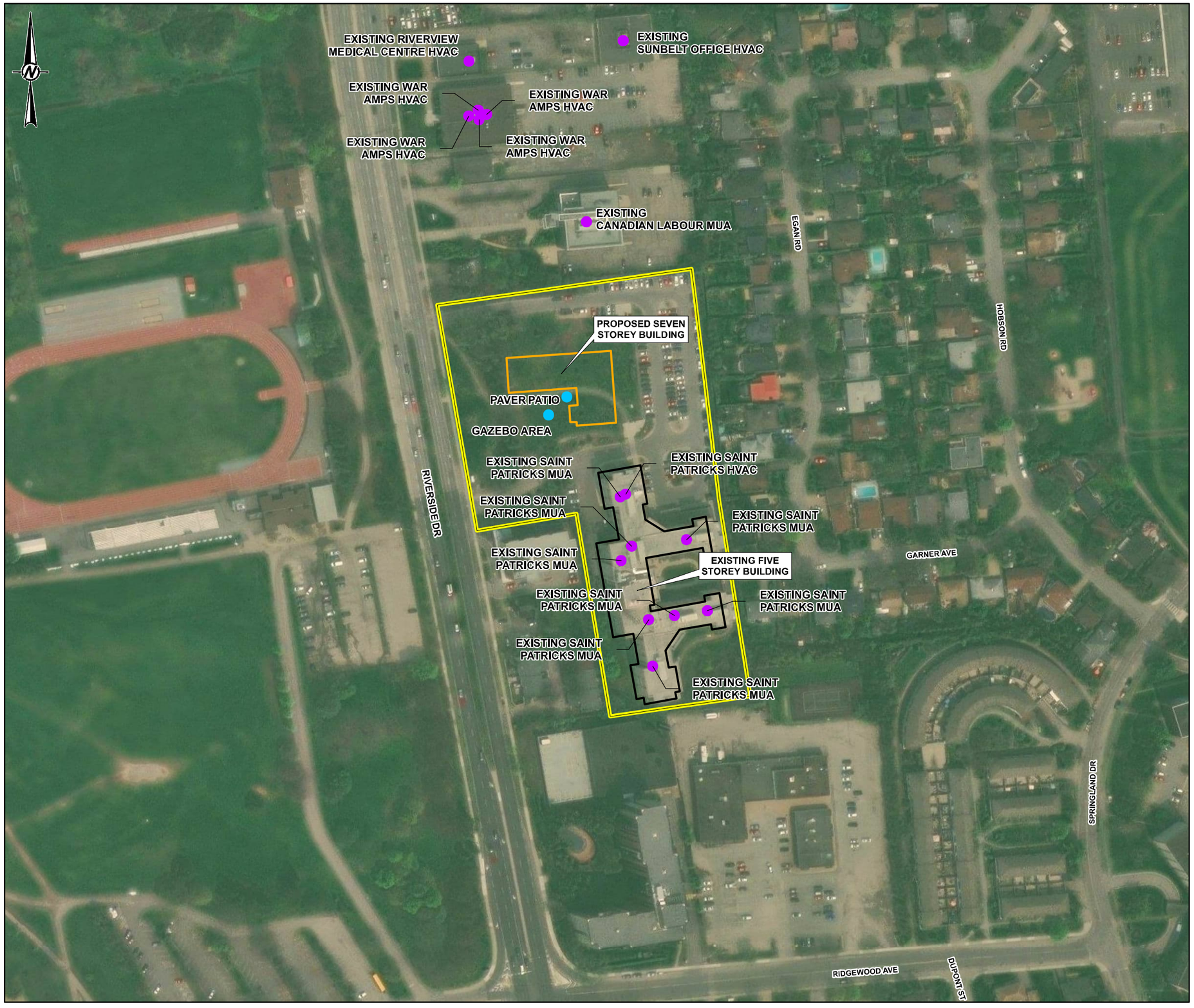
CONSULTANT

YYYY-MM-DD	2023-09-20
DESIGNED	SO
PREPARED	PS
REVIEWED	SO
APPROVED	---

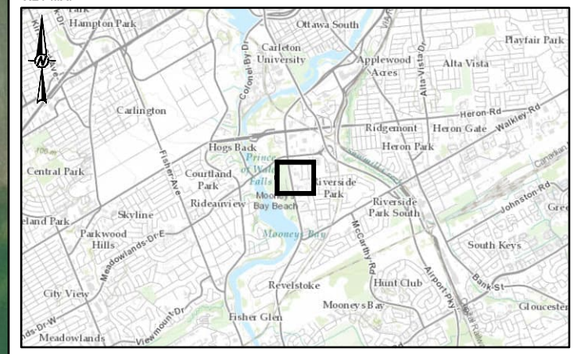
PROJECT NO.	CONTROL	REV.	FIGURE
CA0007873.2332	0001	A	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: S:\Clients\BTY_Consultancy\02865 Riverside Drive, Ottawa, Ontario\06_PRO\ACAD\07873.2332\040_PRO\DWG\001_Noise\CA0007873_2332-D001-RNA002.mxd PRINTED ON: 2023-09-20 AT: 1:30:06 PM



KEY MAP



SCALE 1:100,000

LEGEND

- RECEPTORS PART 2
- STATIONARY SOURCE SURROUNDING AREA EXISTING SOURCES
- EXISTING FIVE STOREY BUILDING
- PROPOSED SEVEN STOREY BUILDING
- SITE BOUNDARY

0 20 40 80

1:2,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
   SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 18N

CLIENT

ST. PATRICK'S HOME OF OTTAWA

PROJECT

ST. PATRICK'S HOME AFFORDABLE HOUSING
2865 RIVERSIDE DRIVE, OTTAWA

TITLE

SURROUNDING STATIONARY SOURCES

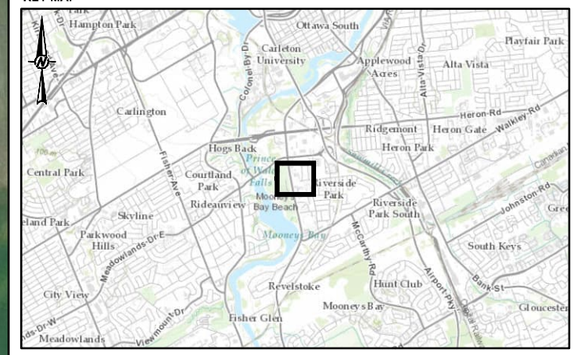
CONSULTANT

wsp

YYYY-MM-DD	2023-09-20
DESIGNED	SO
PREPARED	PS
REVIEWED	SO
APPROVED	---

PROJECT NO.	CONTROL	REV.	FIGURE
CA0007873.2332	0001	A	3

KEY MAP



SCALE 1:100,000

LEGEND

- RECEPTORS
- RECEPTORS PART 2
- PROPOSED STATIONARY SOURCE
- EMERGENCY SOURCE
- EXISTING FIVE STOREY BUILDING
- PROPOSED SEVEN STOREY BUILDING
- PROPERTY BOUNDARY

0 12.5 25 50 75

1:2,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
   SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 18N

CLIENT

ST. PATRICK'S HOME OF OTTAWA

PROJECT

ST. PATRICK'S HOME AFFORDABLE HOUSING
2865 RIVERSIDE DRIVE, OTTAWA

TITLE

PROPOSED STATIONARY SOURCES & RECEPTOR LOCATIONS

CONSULTANT

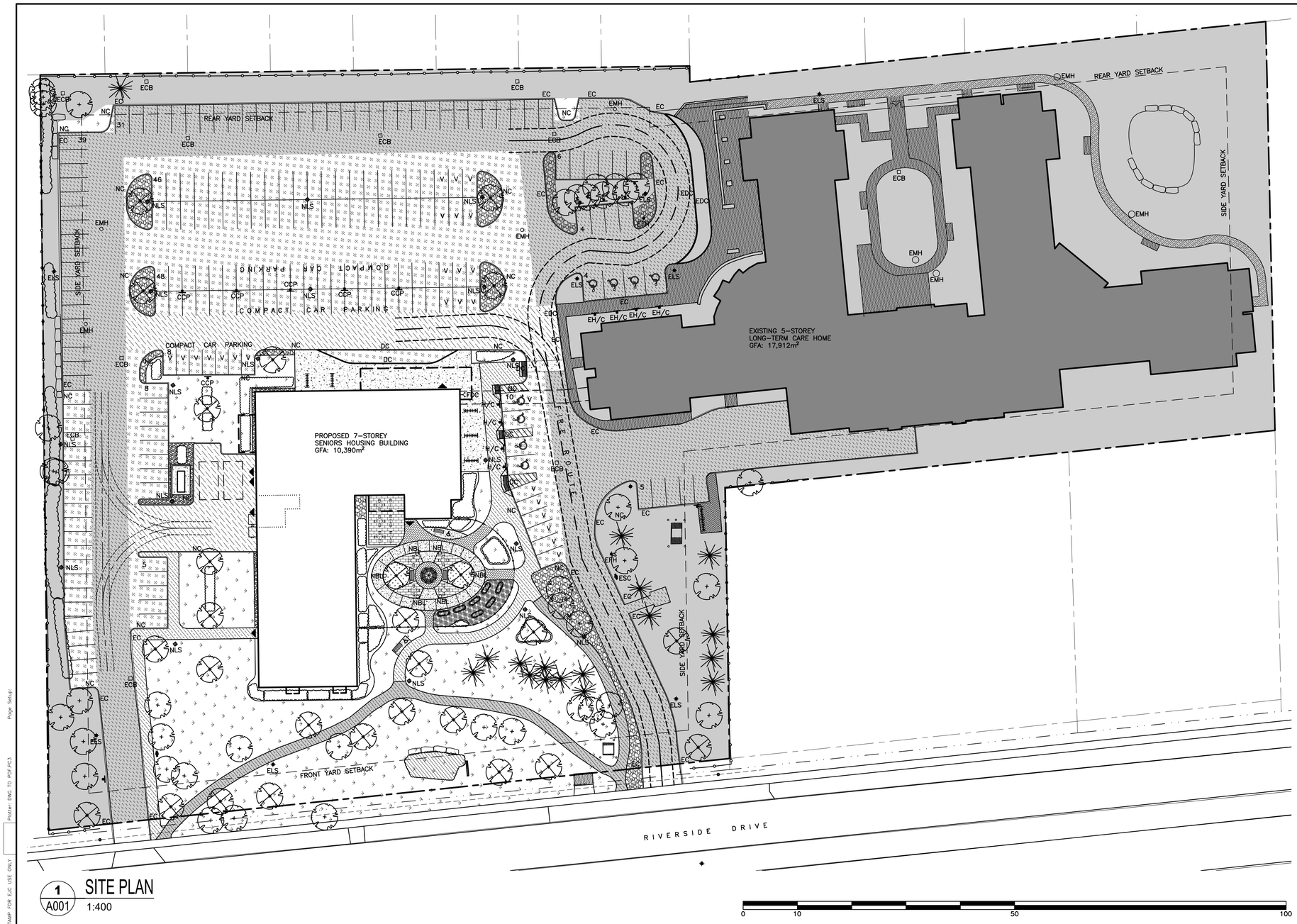
wsp

YYYY-MM-DD	2023-09-20
DESIGNED	SO
PREPARED	PS
REVIEWED	SO
APPROVED	---

PROJECT NO.	CONTROL	REV.	FIGURE
CA0007873.2332	0001	A	4

APPENDIX

A DRAWINGS



1 SITE PLAN
A001 1:400

0 10 50 100

LEGEND

- EXISTING TO REMAIN
- EXISTING ASPHALT PAVING
- EXISTING ASPHALT WALK
- EXISTING CONCRETE WALK
- NEW LIGHT DUTY ASPHALT PAVING
- NEW HEAVY DUTY ASPHALT PAVING
- NEW CONCRETE WALK
- NEW ASPHALT WALK
- NEW GRASS
- NEW PRECAST CONCRETE PAVERS TYPE 1
- NEW PRECAST CONCRETE PAVERS TYPE 2
- NEW ENGINEERED WOOD FIBER
- NEW 50-150mm RIVERSTONE
- NEW 25-50mm RIVERSTONE

LEGEND

- BARRIER FREE PARKING
- BUILDING ENTRANCE/EXIT
- EC — EXISTING CURB
- EDC — EXISTING DEPRESSED CURB
- PROPERTY LOT LINE
- SET BACK LINE
- ROAD CENTERLINE
- ROAD WIDENING
- FIRE ROUTE
- EXISTING CHAIN LINK FENCE TO REMAIN
- EH/C — EXISTING BARRIER FREE PARKING SIGN
- ELS — EXISTING LIGHT STANDARD
- EFH — EXISTING FIRE HYDRANT
- EMH — EXISTING MAN HOLE
- ECB — EXISTING CATCH BASIN
- ESC — EXISTING SECURITY CAMERA
- NC — NEW CURB
- DC — NEW DEPRESSED CURB
- MH — NEW MAN HOLE
- CB — NEW CATCH BASIN
- NLS — NEW LIGHT STANDARD
- FDC — NEW FIRE DEPARTMENT CONNECTION
- H/C — NEW BARRIER FREE PARKING SIGN
- CCP — NEW COMPACT CAR PARKING SIGN
- NBL — NEW BOLLARD LIGHT

St. Patrick's Home of Ottawa Inc.

ISSUE NO.	REV. NO.	DATE YY/MM/DD	ISSUE
2	0	24/01/23	ISSUED FOR SITE PLAN CONTROL
1	1	23/09/12	ISSUED FOR DESIGN DEVELOPMENT REVIEW

TRUE NORTH | PLAN NORTH

EDWARD J. CUHACI
& ASSOCIATES ARCHITECTS Inc.
171 Slater St, Suite 100, Ottawa, Ontario, K1P 5H7
Fax: (613) 236-1944 Telephone: (613) 236-7135 E-mail: info@cuhaci.com

PROJECT TITLE/TITRE DU PROJET
ST PATRICK'S HOME
NEW SENIOR APARTMENT BUILDING
2865 RIVERSIDE DR. #226
OTTAWA, ONTARIO

ST PATRICK'S HOME OF OTTAWA
OTTAWA, ONTARIO
2865 RIVERSIDE DR. #226

DRAWING TITLE/TITRE DU DESSIN
GEOMETRY & GENERAL LAYOUT

SCALE / ÉCHELLE	AS SHOWN	PROJ. No	ISSUE No	REV. No
		2235	2	0
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CHECKED BY / VÉRIFIÉ PAR	DB	C1		
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Plot Date: 2022-06-27 Plot Time: 15:04:03 Plot By: EILEEN ABBEY | PLOT STAMP FOR E.C. USE ONLY | Plotter: DWG TO PDF.PC3 | Page Setup:

APPENDIX

B SUPPORTING DOCUMENTS

Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions

Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % [1]
NA [2]	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6 UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
23-34	4-Lane Major Collector (4-UMCU)	24,000	40-60	92/8	7	5
30-35.5	2-Lane Rural Arterial (2-RAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Urban Arterial (2-UAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Major Collector (2-UMCU)	12,000	40-60	92/8	7	5
30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

[1] The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

[2] The number of lanes is determined by the future mature state of the roadway.

APPENDIX

C SAMPLE CALCULATIONS

St. Patricks Affordable Housing CA0007873.2332

Configuration	
Parameter	Value
General	
Max. Error (dB)	0
Max. Search Radius (#(Unit,LEN))	5000
Min. Dist Src to Rcvr	0
Partition	
Raster Factor	0.5
Max. Length of Section (#(Unit,LEN))	1000
Min. Length of Section (#(Unit,LEN))	1
Min. Length of Section (%)	0
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	0
Reference Time Night (min)	0
Daytime Penalty (dB)	0
Recr. Time Penalty (dB)	0
Night-time Penalty (dB)	0
DTM	
Standard Height (m)	0
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	1
Search Radius Src	100
Search Radius Rcvr	100
Max. Distance Source - Rcvr	1000.00 5000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.1
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	1
Wind Speed for Dir. (#(Unit,SPEED))	3
Roads (TNM)	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Point Source Table

Name	ID	Result. PWL Day (dBA)	Result. PWL Evening (dBA)	Result. PWL Night (dBA)	Lw / Li Type	Value	Attenuation	Operating Time Day (min)	Operating Time Special (min)	Operating Time Night (min)	K0 (dB)	Freq. (Hz)	Height (m)		Coordinates X (m)	Coordinates Y (m)	Coordinates Z (m)
Proposed Development MUA	Proposed_MUA01	76.5	76.5	76.5	Lw	MAU01					0		2.5	g	446022.1	5024343	25.7
Mitigated Emergency Generator	MIT_EMERG_GEN	86	86	86	Lw	96	10	60	0	0	0	500	2.5	r	446020.3	5024366	2.5
Existing Saint Patricks MUA	Existing_MUA01	84.1	84.1	84.1	Lw	Existing_MUA		60	0	30	0		2.5	g	446059.1	5024189	2.5
Existing Saint Patricks MUA	Existing_MUA02	84.1	84.1	84.1	Lw	Existing_MUA		60	0	30	0		2.5	g	446087.7	5024217	2.5
Existing Saint Patricks MUA	Existing_MUA03	84.1	84.1	84.1	Lw	Existing_MUA		60	0	30	0		2.5	g	446070.4	5024215	2.5
Existing Saint Patricks MUA	Existing_MUA04	84.1	84.1	84.1	Lw	Existing_MUA		60	0	30	0		2.5	g	446057	5024213	2.5
Existing Saint Patricks MUA	Existing_MUA05	84.1	84.1	84.1	Lw	Existing_MUA		60	0	30	0		2.5	g	446042.7	5024243	2.5
Existing Saint Patricks MUA	Existing_MUA06	84.1	84.1	84.1	Lw	Existing_MUA		60	0	30	0		2.5	g	446048.2	5024251	2.5
Existing Saint Patricks MUA	Existing_MUA07	84.1	84.1	84.1	Lw	Existing_MUA		60	0	30	0		2.5	g	446042.3	5024277	2.5
Existing Saint Patricks MUA	Existing_MUA08	84.1	84.1	84.1	Lw	Existing_MUA		60	0	30	0		2.5	g	446076.7	5024254	2.5
Existing Canadian Labour MUA	Existing_MUA09	84.1	84.1	84.1	Lw	Existing_MUA		60	0	30	0		2.5	g	446024.6	5024420	2.5
Existing War Amps HVAC	Existing_HVAC01	81.1	81.1	81.1	Lw	Two_Fan_10T		60	0	30	0		1.8	g	445963.3	5024475	1.8
Existing War Amps HVAC	Existing_HVAC02	81.1	81.1	81.1	Lw	Two_Fan_10T		60	0	30	0		1.8	g	445968.2	5024478	1.8
Existing War Amps HVAC	Existing_HVAC03	81.1	81.1	81.1	Lw	Two_Fan_10T		60	0	30	0		1.8	g	445972.6	5024476	1.8
Existing War Amps HVAC	Existing_HVAC04	81.1	81.1	81.1	Lw	Two_Fan_10T		60	0	30	0		1.8	g	445968.6	5024473	1.8
Existing Riverview Medical Centre HVAC	Existing_HVAC05	81.1	81.1	81.1	Lw	Two_Fan_10T		60	0	30	0		1.8	g	445963.4	5024504	1.8
Existing Sunbelt Office HVAC	Existing_HVAC06	81.1	81.1	81.1	Lw	Two_Fan_10T		60	0	30	0		1.8	g	446043.7	5024514	1.8
Existing Saint PAtricks HVAC	Existing_HVAC07	81.1	81.1	81.1	Lw	Two_Fan_10T		60	0	30	0		1.8	g	446045.1	5024278	1.8
Emergency Generator	EMERG_GEN	96	96	96	Lw	96		60	0	0	0	500	2.5	r	446020.3	5024366	2.5

St. Patricks Affordable Housing CA0007873.2332

Sound Power Spectra												
Name	ID	Type	1/3 Oktave Spectrum (dB)									
			63	125	250	500	1000	2000	4000	8000	A	lin
MAU01	MAU01	Lw	51.0	62	71	73	74	67	61	52	76.5	78.2
Carrier 48TC12, 10T	Two_Fan_10T	Lw	89.0	83.1	80.5	78.5	75.5	71.6	69.6	69.3	81.1	91
Carrier 48TC18, 15T	Existing_MUA	Lw	92.2	83.9	80.4	81.8	78.7	76.5	72.2	65.4	84.1	93.6

Receiver
Name: R01_O
ID: R01_O
X: 446088.67 m
Y: 5024466.64 m
Z: 1.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
1	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	54.4	0.7	-0.9	0.0	0.0	0.0	0.0	0.0	22.3
2	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	60.5	1.3	0.3	0.0	0.0	0.0	0.0	2.0	12.4

Receiver
Name: R01_W
ID: R01_W
X: 446096.09 m
Y: 5024467.22 m
Z: 4.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
3	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	54.6	0.7	-1.7	0.0	0.0	0.0	0.0	0.0	22.9
5	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	63.1	1.7	-1.9	0.0	0.0	18.4	0.0	2.0	-6.8
7	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	60.8	1.3	-1.7	0.0	0.0	8.4	0.0	2.0	5.7

Receiver
Name: R02_O
ID: R02_O
X: 446093.17 m
Y: 5024434.90 m
Z: 1.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
4	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	52.9	0.6	-1.2	0.0	0.0	0.0	0.0	0.0	24.2

Receiver
Name: R02_W
ID: R02_W
X: 446100.14 m
Y: 5024435.83 m
Z: 4.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
6	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	53.2	0.6	-1.8	0.0	0.0	0.0	0.0	0.0	24.5

Receiver
Name: R03_O
ID: R03_O
X: 446096.69 m
Y: 5024405.65 m
Z: 1.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
8	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	51.6	0.5	-1.0	0.0	0.0	5.8	0.0	0.0	19.6
10	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	52.6	0.6	0.1	0.0	0.0	5.5	0.0	2.2	15.4

Receiver
Name: R03_W
ID: R03_W
X: 446105.22 m
Y: 5024403.14 m
Z: 4.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
9	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	51.9	0.5	-2.0	0.0	0.0	4.8	0.0	0.0	21.2

Receiver
Name: R04_O
ID: R04_O
X: 446099.00 m
Y: 5024361.53 m
Z: 1.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
11	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	50.0	0.4	-1.6	0.0	0.0	9.2	0.0	0.0	18.5
13	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	57.2	0.9	0.3	0.0	0.0	4.4	0.0	2.0	11.6
18	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	51.3	0.5	-0.5	0.0	0.0	6.9	0.0	2.0	16.4

Receiver
Name: R04_W
ID: R04_W
X: 446106.36 m
Y: 5024360.44 m
Z: 4.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
12	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	50.6	0.5	-2.0	0.0	0.0	6.4	0.0	0.0	21.1

Receiver
Name: R05_O
ID: R05_O
X: 446100.89 m
Y: 5024316.56 m
Z: 1.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
14	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	50.2	0.4	-1.8	0.0	0.0	9.7	0.0	0.0	18.0
21	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	54.9	0.7	-0.7	0.0	0.0	6.2	0.0	2.2	13.1
23	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	51.5	0.5	-0.6	0.0	0.0	7.0	0.0	2.0	16.1
24	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	57.4	1.0	-0.4	0.0	0.0	0.0	0.0	21.3	-2.7

Receiver
Name: R05_W
ID: R05_W
X: 446108.71 m
Y: 5024315.29 m
Z: 1.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
15	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	50.9	0.5	-1.2	0.0	0.0	8.4	0.0	0.0	18.0
22	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	58.1	1.0	0.2	0.0	0.0	20.0	0.0	4.8	-7.6

Receiver
Name: Paver Patio
ID: Patio
X: 446010.23 m
Y: 5024323.92 m
Z: 1.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
16	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	40.4	0.2	-3.0	0.0	0.0	19.8	0.0	0.0	19.2
19	446016.14	5024339.70	25.70	1	DEN	A	76.5	0.0	0.0	0.0	0.0	41.5	0.2	-3.0	0.0	0.0	19.4	0.0	2.0	16.4

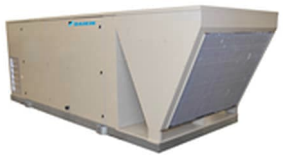
Receiver
Name: Gazebo Area
ID: Gazebo Area
X: 446000.47 m
Y: 5024315.61 m
Z: 1.50 m

Point Source, ISO 9613, Name: "", ID: "Proposed_MUA01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
17	446016.14	5024339.70	25.70	0	DEN	A	76.5	0.0	0.0	0.0	0.0	42.5	0.2	-1.8	0.0	0.0	19.1	0.0	0.0	16.5

APPENDIX

D MANUFACTURERS SPECS

Job Information	*Technical Data Sheet*
Job Name	22306017 - St Patricks Home LTC
Date	7/31/2023
Submitted By	David Michelin
Software Version	12.10
Unit Tag	MUA



Unit Overview

Model Number	Voltage V/Hz/Phase	Design Cooling Capacity Btu/hr	EER@95/75 EAT & 200 CFM/ton		ISMRE Per AHRI 920-2016
			EER	IEER	
DPS020A	575/60/3	262575	11.1	Not Available	ASHRAE 90.1-2019 compliant

Unit

Model Number:	DPS020A
Model Type:	Cooling
Heat Type:	Gas
Energy Recovery:	ERW-Large Cab-Econ: 5145cfm max, 100% OA: 8820 cfm max
Application:	Variable Air Volume, Single Zone (Mixed Air or 100% OA)
Controls:	Microtech III
Outside Air:	100% Outside Air
Altitude:	0 ft
Approval	cETLus

Physical

Dimensions and Weight			
Length	Height*	Width	Weight*
182.3 in	82.5 in	76.5 in	4413 lb

Corner Weights			
L1	L2	L3	L4
1329 lb	1010 lb	896 lb	1179 lb

Construction			
Exterior	Insulation and Liners	Air Opening Location	
		Return	Supply
Painted Galvanized Steel	2" Injected Foam, R13, Galvanized Steel Liner	Bottom	Bottom

Electrical

Unit FLA	MCA	MROPD	SCCR
45.9 A	52.0 A	70 A	10 kAIC

Note:	Use only copper supply wires with ampacity based on 75° C conductor rating. Connections to terminals must be made with copper lugs and copper wire.

Return/Outside/Exhaust Air

Outside Air Option

Type	Damper Pressure Drop	Exhaust Air Type
None	0.17 inH_2O	Airfoil Power Exhaust Fan

Type	Drive Type	Wheel Diameter	Fan Series
SWSI AF	Direct Drive	14 in	Series II

Motor

(Qty) Horsepower	Type	Efficiency	Full Load Current (Each)
(2) 4.0 HP	ECM - Series II	Premium	3.8 A

Performance

Air Flow CFM	External Static Pressure inH_2O	Fan Speed RPM	Brake Horsepower HP
8000	0.50	3148	5.50

Energy Recovery

Design OA Volume	Design Exhaust Volume	Wheel Pressure Drop	Motor HP	Motor FLA
8000 CFM	8000 CFM	1.02 inH_2O	0.17 HP	0.4 A

Summer Conditions

Temperature								Recovered Capacity Btu/hr	Effectiveness	
Outside Air		Return Air		Wheel Leaving		Mixed Air			Total	Sensible
Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F			
87.0	71.0	75.0	62.0	80.3	66.4	80.3	66.4	130933	0.53	0.55

Winter Conditions

Temperature								Recovered Capacity Btu/hr	Effectiveness	
Outside Air		Return Air		Wheel Leaving		Mixed Air			Total	Sensible
Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F			
-17.0	-17.6	72.0	56.0	35.2	31.7	35.2	31.7	474786	0.54	0.55

Bypass Damper:	No

Energy Recovery Filters

Efficiency	Quantity/Size		Face Area		Face Velocity		Air Pressure Drop	
	Outdoor	Exhaust	Outdoor ft^2	Exhaust ft^2	Outdoor ft/min	Exhaust ft/min	Outdoor inH_2O	Exhaust inH_2O
2 in. MERV 8	(3) 20 in. X 25 in.	(3) 20 in. X 25 in.	10.4	10.4	769.2	769.2	0.93	0.93

Combined Efficiency Factor

Application Specific CEF:	10.5

Filter Section

Physical

Type	Quantity / Size	Face Area	Face Velocity	Air Pressure Drop
COMBO RACK - 2" MERV8 filters from factory & blank 4" rack	9 / 18 in x 24 in x 2 in	27.0 ft^2	296.3 ft/min	0.13

DX Cooling Coil

Physical

Coil Type	Refrigerant Type	Fins per Inch	Rows	Face Area	Face Velocity	Air Pressure drop	Drain Pan Material
Cu Tube/ Al Fin	R410A	15	4	21.4 ft²	373.8 ft/min	0.42 inH_2O	Stainless Steel

Cooling Performance

Capacity			Indoor Air Temperature					Ambient air Temperature °F
			Entering		Leaving			
Total Btu/hr	Sensible Btu/hr	Moisture Removal lb/h	Dry Bulb °F	Wet Bulb °F	Dry Bulb °F	Wet Bulb °F	Dewpoint °F	
262575	212793	42.2	80.3	66.4	56.0	55.9	55.8	95.0

Condensate Connection Size: 1.0 in. Male NPT

Fan Section

Fan

Type	Fan Wheel Diameter	Fan Series	Fan Isolation
SWSI AF	24 in	Series I	Spring Isolation

Performance

Airflow	Total Static Pressure	Fan Speed	Brake Horsepower	Altitude
8000 CFM	4.7 inH_2O	1709 rpm	9.10 HP	0 ft

Motor

Type	Horsepower	Efficiency	FLA
premium Eff Induction Motor with Shaft Grounding	10.0	Premium	10.0 A

Drive

Type
Direct Drive

Gas Heat Section

Physical

Airflow	Max Allowable Burner Temp Rise	Size	Connection (Qty) Size	Heat Exchanger Material
8000 CFM	100.0 °F	600 MBH	(2) 0.75 in. Female NPT	Stainless Steel

Performance

Capacity Btu/hr	Air Temperature Dry Bulb		Air Pressure Drop inH_2O	Gas Pressure		Modulation
	Entering °F	Leaving °F		Minimum inH_2O	Maximum inH_2O	
480000	35.2	90.5	0.31	5	14	Modulating 12:1 Turndown

: Two gas connections inside the unit. Single pipe enters unit and splits to two manifolds. Refer to IM 1125 for details on piping.

Unit Discharge Conditions

AirTemperature

Motor Heat Btu/hr	Moisture Removal lb/h	Unit Leaving Dry Bulb °F	Unit Leaving Wet Bulb °F	Unit Leaving Dewpoint °F
25716	42.2	59.0	56.8	55.8

Minimum Airflows

Notes: Refer to fan curve for applicability of approximate airflows

Condensing Section

Compressor

Type	Quantity	Refrigerant Charge lb	Total Power	Capacity Control	Compressor Isolation
Inverter Scroll	1	32.5	17.97 kW	Mod Control with Inverter Compressor	Rubber in Shear

Compressor Amps:	
Compressor 1	24.2 A
Compressor Options:	Suction and Discharge Isolation Valves

Condenser Coil

Type	Fins per Inch	Fin Material
Aluminum Microchannel	23	Aluminum

Condenser Fan Motors

Number of Motors*	Full Load Current (Total)
1 or 2	4.2 A

Internal Pressure Drop Calculation

External Static Pressure:	1.50 inH_2O
Filter:	0.13 inH_2O
Dirty Filter:	0.25 inH_2O
Outside Air:	0.17 inH_2O
Energy Recovery:	1.95 inH_2O
DX Coil:	0.42 inH_2O
Gas Heat:	0.31 inH_2O
Total Static Pressure:	4.73 inH_2O

Sound

	Sound Power (db)							
Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Inlet	79	78	86	78	73	72	67	64
Discharge	85	84	89	84	82	79	74	69
Radiated*	51	62	71	73	74	67	61	52

Options

Electrical

Field Connection:	Non-Fused Disconnect Switch
Power Options:	Phase Failure Monitor

Controls

Communication Card:	BACnet/IP card, Factory installed

Factory Installed Sensors

Leaving Coil/Entering Fan Temperature Sensor
Duct High Limit Switch
BACnet/IP Card
Return Air Temperature Sensor
Discharge Air Temperature sensor – Wired in unit, mounted in supply duct
Outside Air Temperature Sensor
Dirty Filter On/Off Switch
Supply Fan Air Proving Via Modbus
Building Static Pressure Sensor
Supply Leaving Wheel Temperature Sensor
Exhaust Leaving Wheel Temperature Sensor
Return Air Relative Humidity Sensor
Energy Wheel VFD

Warranty

Parts:	Standard One Year
Compressor:	Standard One Year
Gas Heat Exchanger:	Standard one Year

Notes

* TWO CONDENSER FAN SOLUTIONS ARE DESIGNED FOR THIS UNIT TO PREVENT DELAYS IN SHIPMENTS RELATED TO GLOBAL SUPPLY CHAIN. ONE DESIGN USES TWO SMALLER CONDENSER FANS, THE OTHER USES ONE LARGER FAN. THERE ARE SUBTLE DIFFERENCES, BUT SUBMITTAL DATA PROVIDED HERE APPLIES TO BOTH DESIGNS BY ENSURING THE FOLLOWING:

- UNIT ELECTRICAL (TOTAL UNIT FLA, MCA, AND MROPD) ARE IDENTICAL ACROSS BOTH DESIGNS (I.E. NO CHANGE ACROSS DESIGNS)
- AHRI EFFICIENCY (EER/IEER) ARE IDENTICAL ACROSS BOTH DESIGNS (NO CHANGE ACROSS DESIGNS)
- CONDENSER DECK HEIGHT DOES CHANGE, BUT HEIGHT DIMENSION PROVIDED HERE THE LARGER OF THE TWO, SO THE UNIT WILL BE AT OR LESS IN HEIGHT OF DIMENSION SHOWN. (ONE DESIGNS'S HEIGHT IS 82.5", THE OTHER IS 70.5")
- THE TWO FAN DESIGN IS 52 LBS HEAVIER THAN THE OTHER DEIGN, BUT DOES NOT IMPACT UNIT COG, AND LARGER VALUE IS WHAT IS DISPLAYED IN SUBMITTAL.
- RADIATED SOUND FOR THE SINGLE FAN DESIGN IS SLIGHTLY HIGHER, BUT THE HIGHER VALUE IS DISPLAYED ON THE SUBMITTAL
- BOTH DESIGNS MATCH THE CONDENSER FAN MECHANICAL SPECIFICATION PROVIDED

Unit is to be lifted with proper rigging practices outlined in IOM. Forklifting the unit is not allowed.

Accessories

Optional	
Part Number	Description
910143408	DDC Space Sensor with Setpoint Adj and Tenant Over

BLUE STAR
Power Systems Inc.

Gaseous Product Line

NG200-01

200 kWe

208-600 Volt

60 Hz / 1800 RPM

Standby

Ratings

	240V	208V	240V	480V	600V
Phase	1	3	3	3	3
PF	1	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60
Generator Model	S4L1D-E41	UCDI274J1	UCDI274J1	UCI274H	UCI274H
Connection	12 LEAD DD	12 LEAD WYE	12 LEAD DELTA	12 LEAD WYE	4 LEAD WYE
kWe Nat (LP)	200 (130)	200 (130)	200 (130)	200 (130)	200 (130)
AMPS Nat (LP)	833 (542)	695 (452)	602 (391)	301 (196)	241 (157)
Temp Rise	125˚C / 40˚C	125˚C / 40˚C	125˚C / 40˚C	125˚C / 40˚C	125˚C / 40˚C

Standard Equipment

Engine

- Radiator Cooled Unit Mounted (50˚C)
- Radiator Duct Flange (OPU Only)
- Blower Fan & Fan Drive
- Starter & Alternator
- Oil Pump & Filter
- Oil Drain Extension w/Valve
- Governor - Electronic Isochronous
- 24V Battery System & Cables
- Air Cleaner (Dry Single Stage)
- Catalyst / Silencer Mounted
- Flexible Fuel Connector
- EPA Certified

Generator

- Brushless Single Bearing
- Automatic Voltage Regulator
- ± 1% Voltage Regulation
- 4 Pole, Rotating Field
- 125˚C Standby Temperature Rise
- 100% of Rated Load - One Step
- 5% Maximum Harmonic Content
- NEMA MG 1, IEEE and ANSI Standards Compliance for Temperature Rise

Additional

- Single Source Supplier
- UL 2200 & cUL Listed
- CSA Certified
- Seismic Certified to IBC 2021
- NFPA 110 / CSA C282 Compliant
- Microprocessor Based Digital Control Panel Mounted in NEMA 12 Enclosure
- Base - Formed Steel
- Main Line Circuit Breaker Mounted & Wired
- Battery Charger 24V 5 Amp
- Jacket Water Heater -20˚F 3000W 240V w/Isolation Valves
- Vibration Isolation Mounts
- 2 Year / 2000 Hour Standby Warranty
- Standard Colors - White / Gray

Application Data

Engine

Manufacturer:	Power Solutions International	Displacement - Cu. In. (lit):	673 (11.1)
Model:	11.1L	Bore - in. (cm) x Stroke - in. (cm):	4.84 (12.3) x 6.1 (15.5)
Type:	4-Cycle	Compression Ratio:	10.5 : 1
Aspiration:	Turbo Charged, CAC	Rated RPM:	1800
Cylinder Arrangement:	6 Cylinder Inline	Max HP Stby (kWm):	315 (235)

Exhaust System	Standby
Gas Temp. (Stack): °F (°C)	1,382 (750)
Gas Volume at Stack Temp: CFM (m³/min)	1,425 (40.3)
Maximum Allowable Exhaust Restriction (Post Catalyst): in. H_2O (kPa)	20.4 (5.10)
Cooling System	
Ambient Capacity of Radiator: °F (°C)	122 (50.0)
Maximum Allowable Static Pressure on Rad. Exhaust: in. H_2O (kPa)	0.50 (0.12)
Water Pump Flow Rate: GPM (lit/min)	82.0 (310)
Heat Rejection to Coolant: BTUM (kW)	11,071 (194)
Heat Rejection to CAC: BTUM (kW)	1,460 (25.7)
Heat Radiated to Ambient: BTUM (kW)	3,987 (69.8)
Air Requirements	
Aspirating: CFM (m³/min)	448 (12.7)
Air Flow Required for Rad. Cooled Unit: CFM (m³/min)	18,000 (509)
Air Flow Required for Heat Exchanger/Rem. Rad. CFM (m³/min)	Consult Factory For Remote Cooled Applications

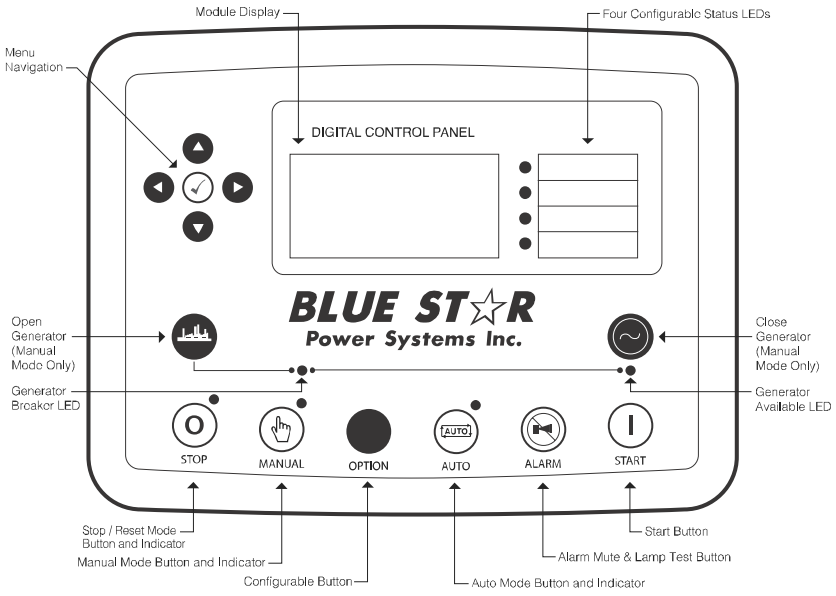
	Standby	
Fuel Consumption	**Natural Gas**	**LP**
At 100% of Power Rating: ft3/hr (m3/hr)	2,076 (58.8)	620 (17.5)
At 75% of Power Rating: ft3/hr (m3/hr)	1,622 (45.9)	475 (13.4)
At 50% of Power Rating: ft3/hr (m3/hr)	1,174 (33.2)	355 (10.0)
Fuel Inlet Size: NPT		2.00"
Fuel Pressure Required: in. H_2O (kPa)		11.0 (2.75)
Fluids Capacity		
Total Oil System: gal (lit)		6.60 (25.0)
Engine Jacket Water Capacity: gal (lit)		6.60 (25.0)
System Coolant Capacity: gal (lit)		27.7 (105)

All calculations based on natural gas fuel.
Deration Factors: Temperature: Derate 1.5% Per 10°F Over 77°F Air Inlet Temperature | Altitude: Derate 2.5% Per 1,000 ft Over 1,200 ft

DCP7310 Control Panel

Standard Features

- Digital Metering
- Engine Parameters
- Generator Protection Functions
- Engine Protection
- CAN Bus (J1939) ECU Communications
- Windows-Based Software
- Multilingual Capability
- Remote Communications to DSE2548 Remote Annunciator
- 8 Programmable Contact Inputs
- 10 Contact Outputs
- RS485 Communicator Interface
- cULus Listed, CE Approved
- Event Recording
- IP 65 rating (with supplied gasket) offers increased resistance to water ingress
- NFPA 110 Level 1 Compatible

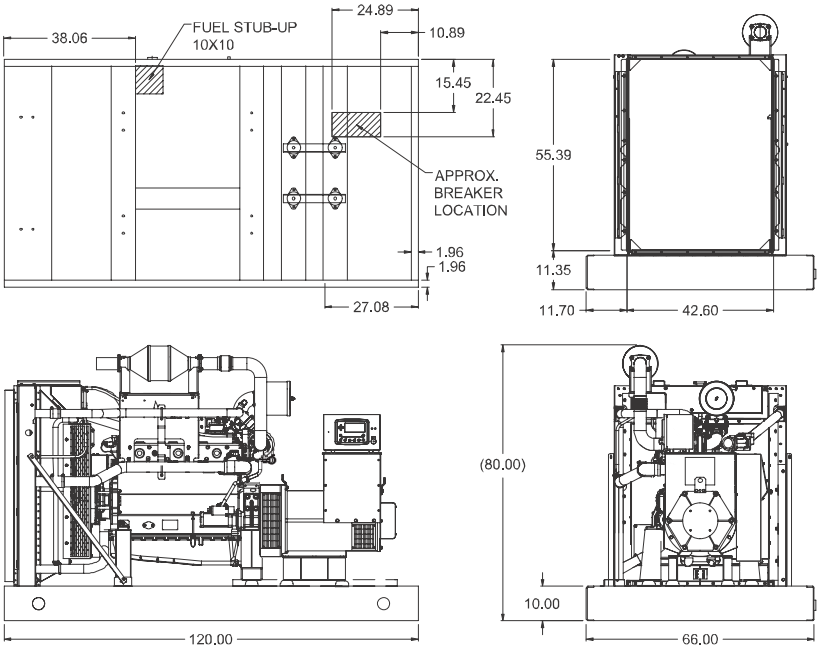


Weights / Dimensions / Sound Data

	L x W x H	Weight lbs
OPU	120 x 66 x 80 in	6,550
Level 1	156 x 66 x 94 in	7,800
Level 2	156 x 66 x 94 in	7,875
Level 3	196 x 66 x 94 in	8,200

Please allow 6-12 inches for height of exhaust stack.

	No Load	Full Load
OPU	82 dBA	84 dBA
Level 1	80 dBA	82 dBA
Level 2	75 dBA	77 dBA
Level 3	69 dBA	71 dBA



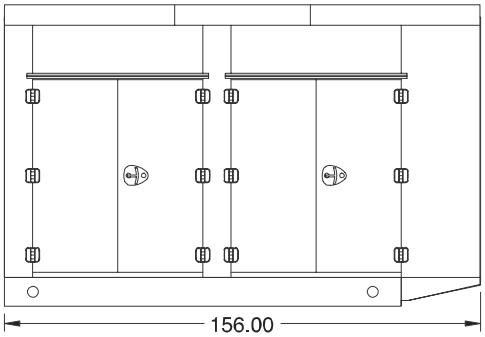
Gaseous Product Line

200 kWe

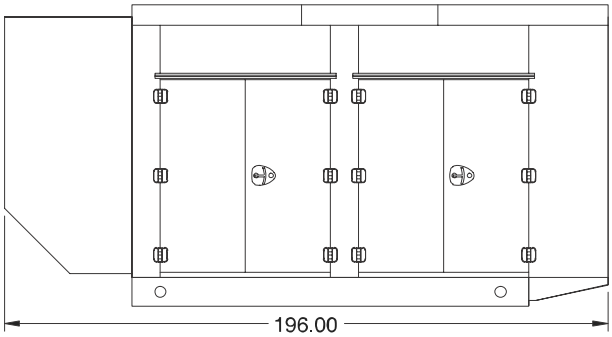
BLUE STAR Power Systems Inc.

Enclosures

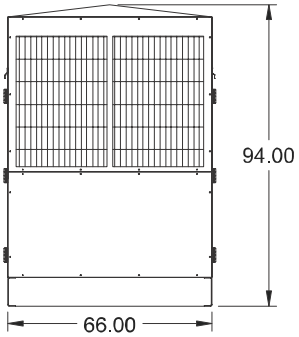
Level 1 & 2 | Side View (Weather Proof)



Level 3 | Side View (Sound Attenuated)



Level 1, 2 & 3 | Intake View



- All enclosure models are 200 MPH wind rating certified in accordance with IBC2021 and ASCE/SEI 7-16 standards.
- Level 2 & 3 enclosures include sound attenuation foam
- Level 3 enclosure includes frontal sound & exhaust hood.
- Enclosure height does not include exhaust stack.

American Owned

American Made

Notes

- All specification sheet dimensions are represented in inches.
- All drawings based on standard 480 volt standby generator. Lengths may vary with other voltages. All drawings and dimensions subject to change without notice.
- All enclosures are based on the standard unit configuration. Any requested deviation can change dimensions.
- Sound data is measured at 23 feet (7 meters) in accordance with ISO 8528-10.
- All materials and specifications subject to change without notice.

Blue Star Power Systems, Inc.
2250 Carlson Drive
North Mankato, Minnesota 56003
Phone + 1 507 345 1776
bluestarps.com
quote.bluestarps.com
sales@bluestarps.com