

July 30, 2020

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**Re: Impact of Stationary Noise Sources, Proposed Mixed-Use/Residential Development,
31 Huron Street, Collingwood, Ontario**

1.0 Introduction and Summary

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by 31 Huron Street Inc. to investigate the potential impact of stationary noise from the surrounding existing commercial uses and to determine the impact of the proposed rooftop mechanical equipment associated with the development site on the neighbouring sensitive uses.

A 6-storey mixed-use/residential building is proposed on the site with mechanical on the roof. There are existing commercial uses in the area of the development site. This analysis is based on a review of the preliminary architectural drawings and estimates of rooftop mechanical unit locations and tonnages, sound data from HGC Engineering project files, aerial photos and information pertaining to business hours based on experience with similar past projects. The analysis has been completed in accordance with Ministry of the Environment, Conservation and Parks (MECP) guidelines.

A computer model of the area was created, using acoustic modelling software, in order to predict the sound levels at the proposed development site. The results indicate that the sound emissions of the nearby commercial uses will be within the applicable noise guideline limits of the MECP at the proposed residential receptors due to elevated background sound levels due to road traffic noise on Huron Street. The results are summarized in this report.

2.0 Site Description

Figure 1 represents a key plan of the area. Figure 2 shows the proposed ground floor plan. A proposed 6-storey mixed use/residential building is proposed at 31 Huron Street. The building is proposed to include a rooftop mechanical equipment enclosed in a mechanical room on the 6th floor and 6th floor mezzanine as indicated in Figure 3. The site is proposed to include retail uses on the ground floor with an indoor amenity and residential dwellings at the north and above. There are two levels of underground parking.

The development lands are bound by Side Launch Way to the north, Heritage Drive to the east, Huron Street to the south and existing commercial uses to the west.

2.1 Description

A review of aerial photography indicates that the subject site is vacant. Figure 1 indicates the key land uses in the area. The lands to the north are proposed to include a mixed-use development (Perfect World) approximately 6-storeys in height. To the east of the site are existing 2-storey townhouses. To the southeast is a 3-storey office building. To the south is the Collingwood Museum (1-storey). To the south is an existing facility (The Oil Shop) that performs express lube, oil changes, auto detailing, and oil changes including two service bays facing east/west. To the southwest are existing 2-storey and 3-storey buildings with commercial uses on the ground floor and residences above. To the west of the site is a Bank of Montreal (BMO) building (1-storey) with a drive-thru on the west side of the building and a Rexall building to the further west with a medical lab (3-storeys). The BMO drive-thru is shielded by the BMO building itself and has not been included in the analysis. To the northwest of the subject site are 2-storey townhouses.

Side Launch Way is a two-lane roadway (one lane in each direction). Heritage Drive is a two-lane roadway (one lane in each direction) with a centre turning lane. Huron Street is a four-lane roadway (two lanes in each direction) with a centre turning lane and a median in some areas. The subject site is located in a Class 1 (urban) acoustical environment where the background sound is primarily made up of the sounds of road traffic and human activity (the urban hum) in the daytime and nighttime hours.

2.2 Stationary Noise Source Description

The primary sources of sound associated with the existing commercial uses are the rooftop mechanical equipment and activities at the garage bays associated with The Oil Shop. Any trucks used for deliveries will be on an infrequent basis and these are not included in the analysis. Aerial photography was used to estimate the location and size of the rooftop HVAC units along with experience with past similar projects. Sound levels have been taken from manufacturers data and HGC Engineering project files for similar projects.

3.0 Criteria for Noise from Commercial Facilities

MECP Guideline NPC-300, “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning” is the MECP guideline for use in investigating Land Use Compatibility issues with regard to noise. An industrial or commercial facility is classified in MECP guidelines as a stationary source of sound (as compared to sources such as traffic or construction, for example) for noise assessment purposes. Noise from the existing commercial uses may potentially impact neighbouring noise sensitive land uses. In terms of background sound, the development is located in an urban (Class I) acoustical environment which is characterized by an acoustical environment dominated by road traffic and human activity.



NPC-300 is intended for use in the planning of both residential and commercial/industrial land uses and provides the acceptability limits for sound due to commercial operations in that regard. The facade of a residence (i.e., in the plane of a window), or any associated usable outdoor area is considered a sensitive point of reception. NPC-300 stipulates that the exclusionary sound level limit for a stationary noise source in an urban Class 1 area is taken to be 50 dBA during daytime hours (07:00 to 23:00), and 45 dBA during nighttime hours (23:00 to 07:00). If the background sound levels due to road traffic exceed the exclusionary limits, then the background sound level becomes the criterion. The background sound level is defined as the sound level that occurs when the source under consideration is not operating, and may include traffic noise and natural sounds.

Typical ambient sound levels can be determined through prediction of road traffic volumes in areas where traffic sound is dominant. Average daily traffic (ADT) volumes were obtained from the “Collingwood Transportation Study Update, Town of Collingwood” prepared by RJ Burnside & Associates Limited dated August 2019. Since hourly data was not available for Huron Street, a generic 24-hour traffic pattern was applied to the roadway. This generic pattern was developed by the US Department of Transportation, Federal Highways Administration contained in the report titled “Summary of National and Regional Travel Trends 1970 – 1995”, dated May 1996. Criteria for the respective facades of the proposed building are included in Table I.

Table I: Predicted Minimum Hourly Sound Levels and Noise Level Criteria at Receptors [dBA]

Receptor	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
West facade	56	50
South facade	59	53
North facade	50	45
East facade	55	49

In each case, the limits apply at any point on the property, and at residential window locations. Consequently, the most stringent receptor location is the windows of the closest dwellings, as these locations are most exposed to the rooftop sound sources.

Commercial activities such as the occasional movement of customer vehicles, occasional deliveries, and garbage collection are not of themselves considered to be significant noise sources in the MECF guidelines. Accordingly, these sources have not been considered in this study. Noise from safety equipment (e.g. back-up beepers) is also exempt from consideration. Frequent truck movements at a warehouse or busy shipping/receiving docks at an industry must generally be assessed. Trucking activities have not been included in this assessment since they will occur on an infrequent basis.

The MECF guidelines stipulate that the sound level impact during a “predictable worst-case hour” be considered. This is defined to be an hour when a typically busy “planned and predictable mode of operation” occurs at the subject facility, coincident with a period of minimal background sound.

Compliance with MECP criteria generally results in acceptable levels of sound at residential receptors although there may still be residual audibility during periods of low background sound.

4.0 Stationary Source Assessment

Predictive noise modelling was used to assess the potential sound impact of the commercial uses at the proposed development site. The noise prediction model was based on sound emission levels for mechanical equipment, assumed operational profiles (during the daytime and nighttime), and established engineering methods for the prediction of outdoor sound propagation. These methods include the effects of distance, air absorption, and acoustical screening by barrier obstacles.

There are expected to be no significant noise sources associated with the neighbouring commercial uses beyond the rooftop mechanical equipment, (i.e. deliveries, would be occasional, light and during daytime hours only).

The source levels associated with the equipment and activities are listed in Table II below in terms of sound power level.

Table II: Source Sound Power Levels [dB re 10-12 W]

Source	Octave Band Centre Frequency [Hz]							
	63	125	250	500	1k	2k	4k	8k
Carrier48HCDD12	86	88	86	84	83	79	75	73
Compressor	71	73	77	81	74	70	63	58
Airtool	88	77	78	84	84	86	89	90
Exhaust fan	78	85	79	69	64	63	58	54
Lennox LGA060 (5 Tons)	--	72	70	71	68	63	57	48
Lennox LGH120 (10 Tons)	--	92	88	87	73	78	72	67

The above outlined sound levels and site features were used as input to a predictive computer model. The software used for this purpose Cadna-A Version 2020 MR 1 build: 177.5010) is a computer implementation of ISO Standard 9613-2.2 "Acoustics - Attenuation of Sound During Propagation Outdoors." The ISO method accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as barriers.

The following information and assumptions were used in the analysis.

- Typical hours of operation for the commercial uses were assumed to be daytime only (07:00 to 23:00).

Commercial Buildings

- The height of the BMO was assumed to be 5.5 m.
- The rooftop units of the BMO were assumed to be located as shown in Figure 4. The rooftop equipment was assumed to include four 10 Ton Carrier models.
- The height of the Rexall was assumed to be 10 m.

- The rooftop units of the Rexall building and the buildings to the south were assumed to be located as shown in Figure 4. The rooftop equipment was assumed to include numerous 5 Ton Lennox models.
- The rooftop units of the office building (Crozier) were assumed to be located as shown in Figure 4. The rooftop equipment was assumed to include four 10 Ton Lennox models.
- All of the rooftop units were assumed to be 1.2 m high.

Receptors

- The proposed mixed-use/residential building has potential residential dwellings on the west and south facades starting from a height of 4.5 m and higher. These are the facades located closest to the stationary noise sources.

In this impact assessment, we have considered typical worst-case (busiest hour) scenarios for each time period to be as follows:

Assumed daytime worst-case scenario:

- All rooftop equipment operating continuously for 40 minutes out of an hour to account for on/off duty cycling.

Assumed night-time worst-case scenario:

- All rooftop equipment operating on a 20% duty cycle;

4.1 Results

The calculations consider the acoustical effects of distance and shielding by the buildings. The unmitigated sound levels due to the rooftop mechanical equipment at the closest neighbouring residences are summarized in the following table. Daytime and nighttime sound level contours are provided in Figures 5 and 6 at 4.5 m in height.

Table IIIII: Predicted Sound Levels from the Existing Commercial Uses at Residential Receptors [dBA], Without Mitigation

Receptor	Criteria Day/Night	*Daytime	*Nighttime
West façade	56/50	51	45
South façade	59/53	49	41
North facade	50/45	35	31
East facade	55/49	47	43

These results indicate that sound levels under the worst-case operational scenario will be within MECP criteria at the closest proposed residential receptors.

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4.2 Impact of Proposed Rooftop Mechanical Equipment at Neighbouring Sensitive Receptors.

From a review of the preliminary architectural drawings, it is understood that the mechanical equipment associated with the development site is to be located in the 6th floor mechanical room and in the 6th floor mezzanine level. There are no outdoor rooftop mechanical equipment proposed. There is expected to be minimal impact from rooftop mechanical equipment on the neighbouring sensitive receptors.

5.0 Conclusions

Assuming typical worst-case equipment and operating scenarios as described above, the analysis indicates that the noise impact of the existing commercial uses in the area will comply with MECP criteria at the nearest proposed mixed-use/residential development site at 31 Huron Street. There is expected to be minimal impact from rooftop mechanical equipment on the neighbouring sensitive receptors. The reader is referred to previous sections of this report where the recommendations are discussed in detail.

We trust that the above information satisfies your current needs. Please do not hesitate to call if you have any questions or require further assistance.

Yours truly,

Howe Gastmeier Chapnik Limited

Prepared by



Ms. Sheeba Paul, MEng, PEng



ACOUSTICS



NOISE



VIBRATION

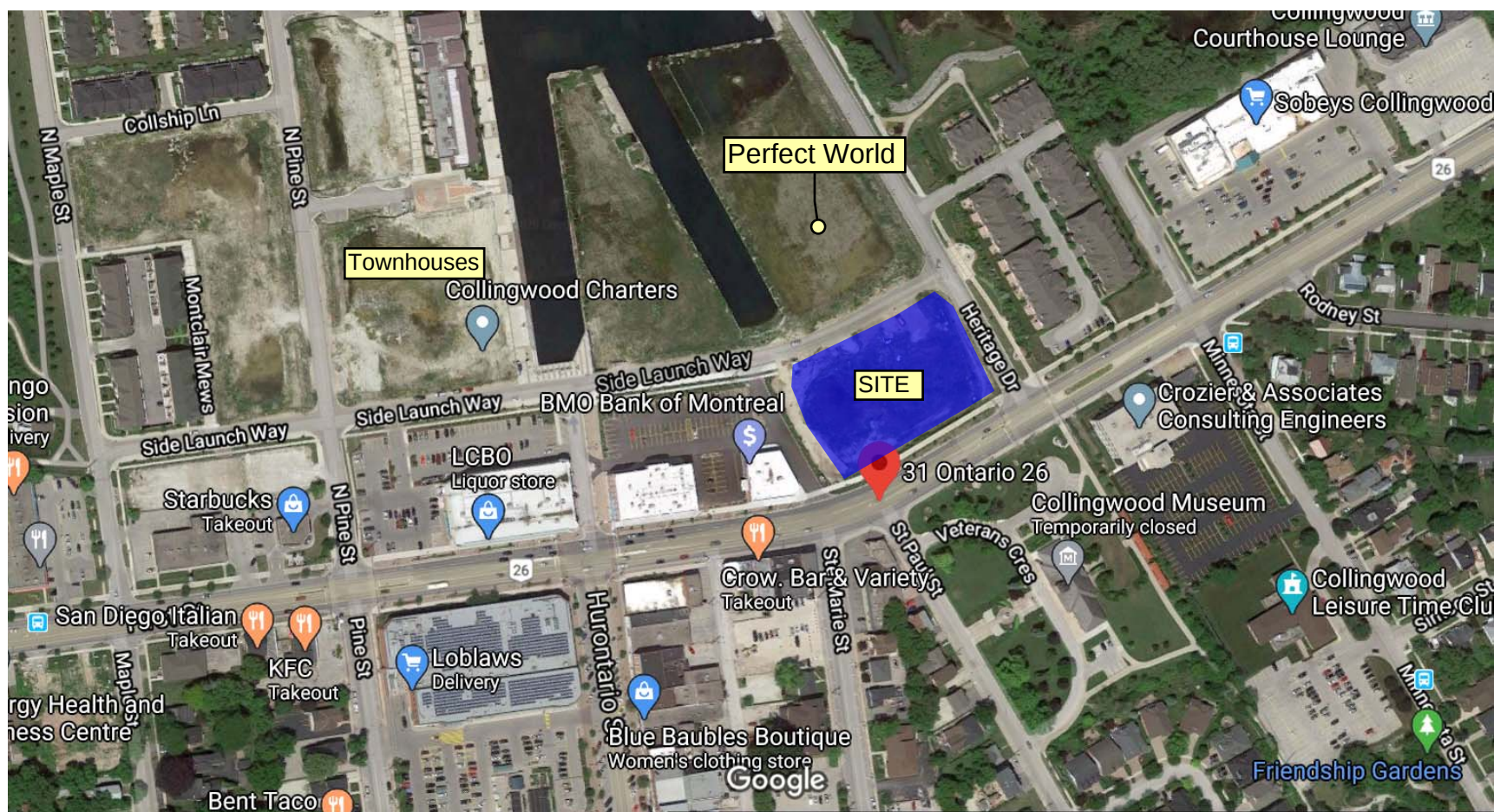


Figure 1 - Key Plan

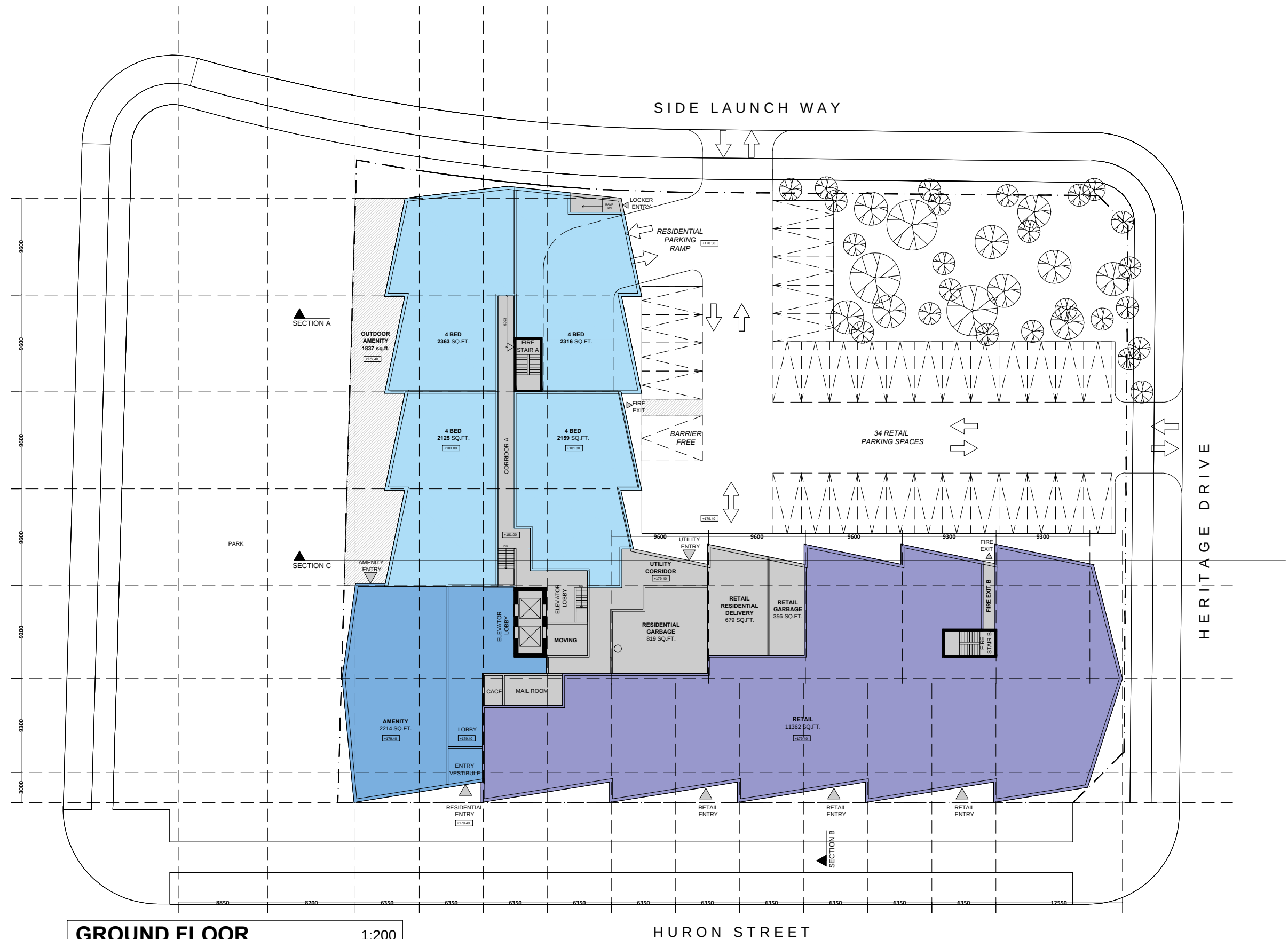


Figure 2 - Proposed Ground Floor

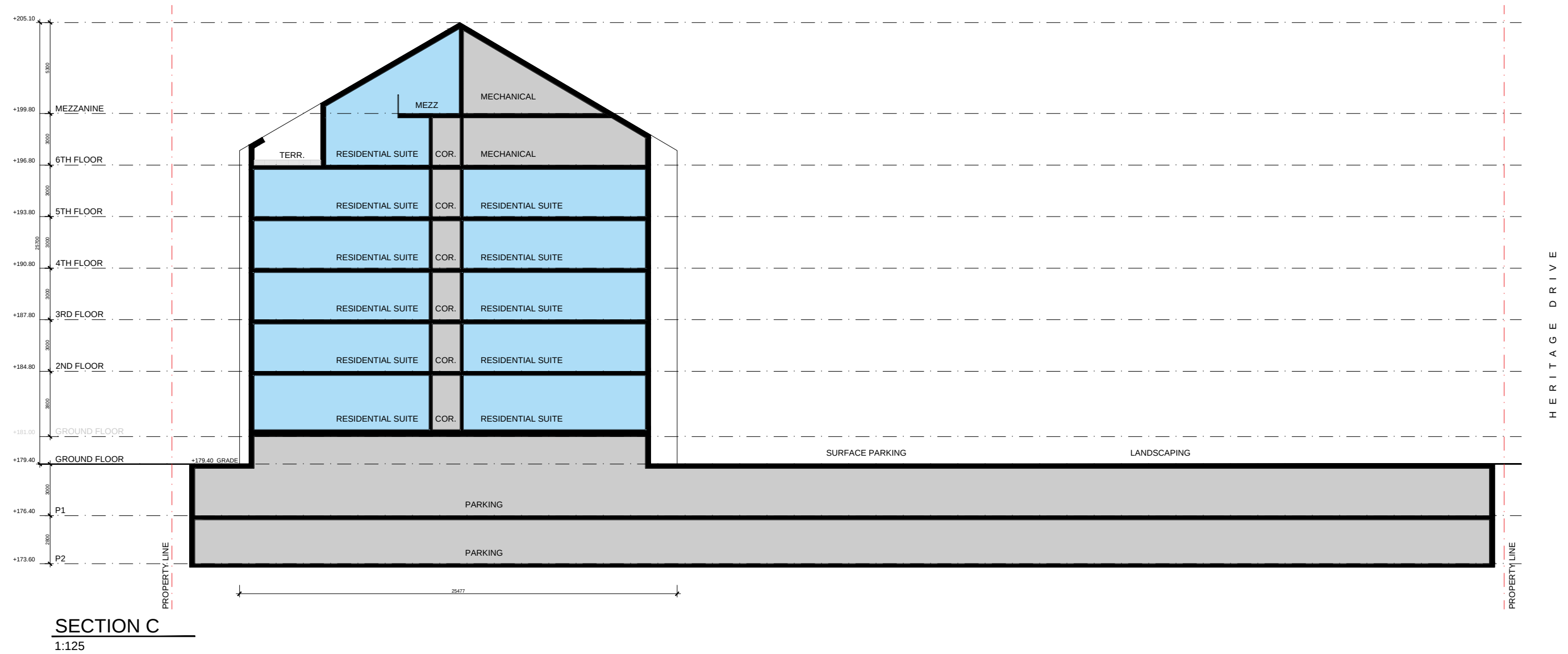


Figure 3 - Proposed Mechanical Rooms

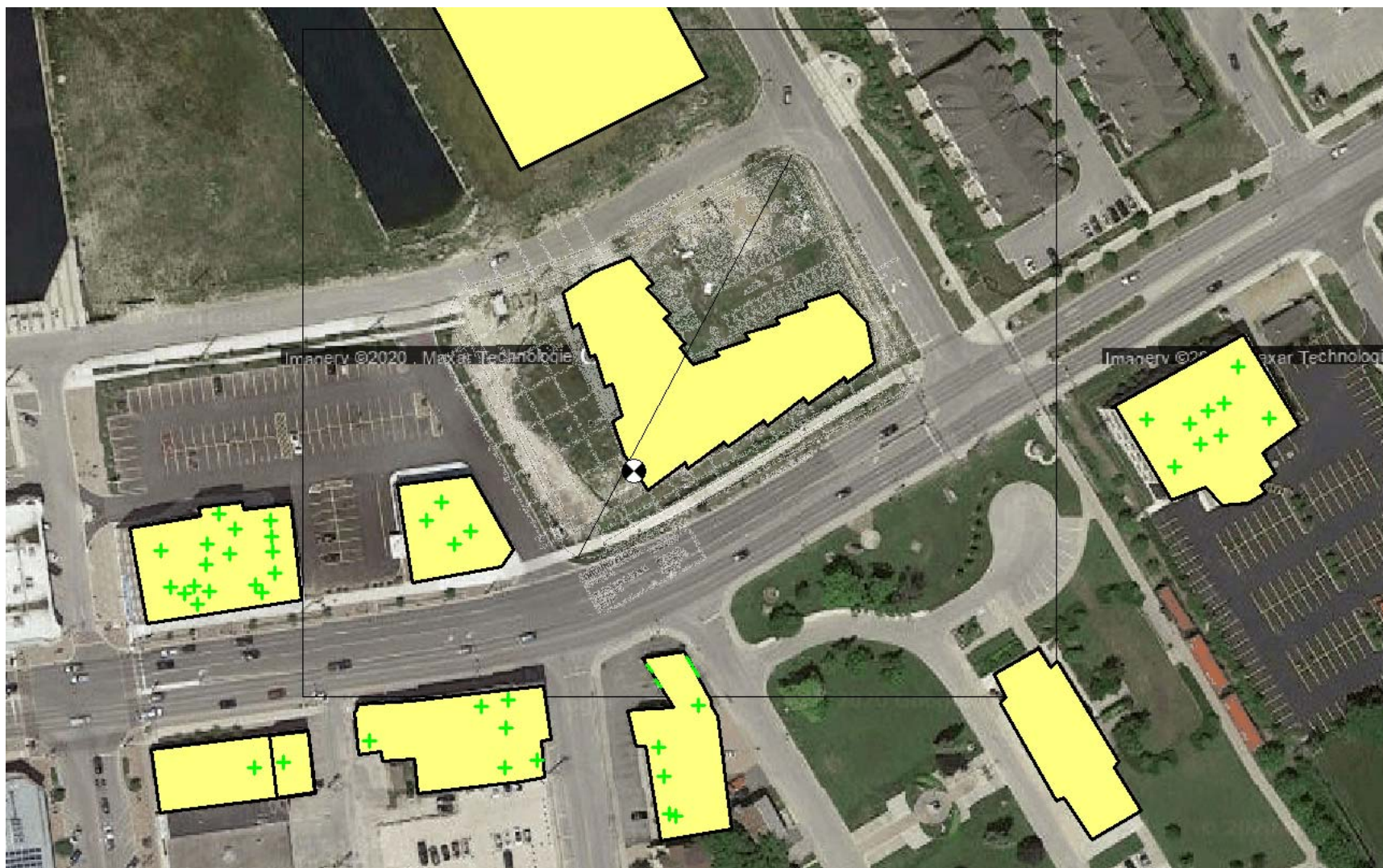


Figure 4 – Sketch Indicating the Location of Noise Sources

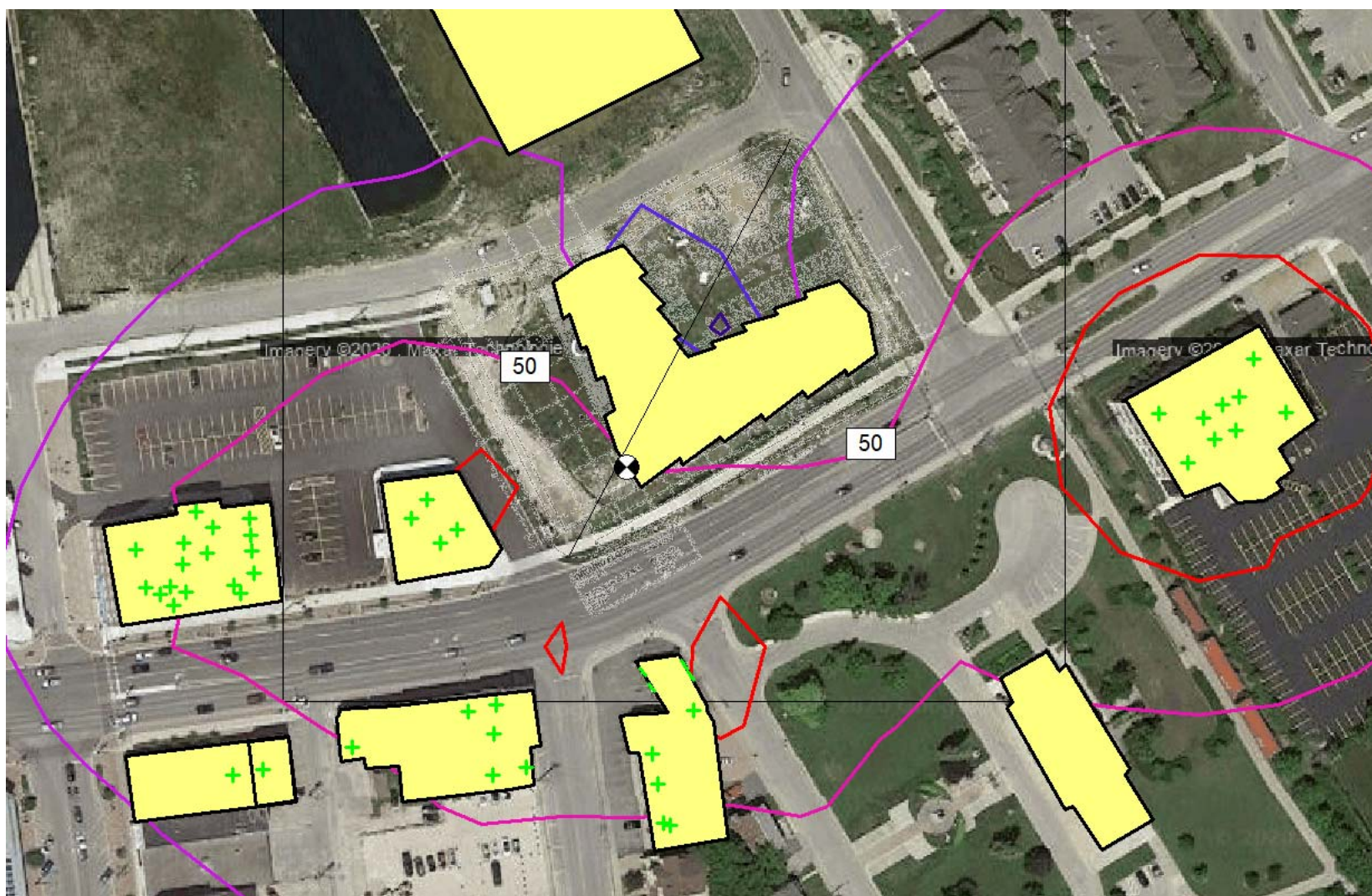


Figure 5 - Predicted Daytime Sound Level Contours

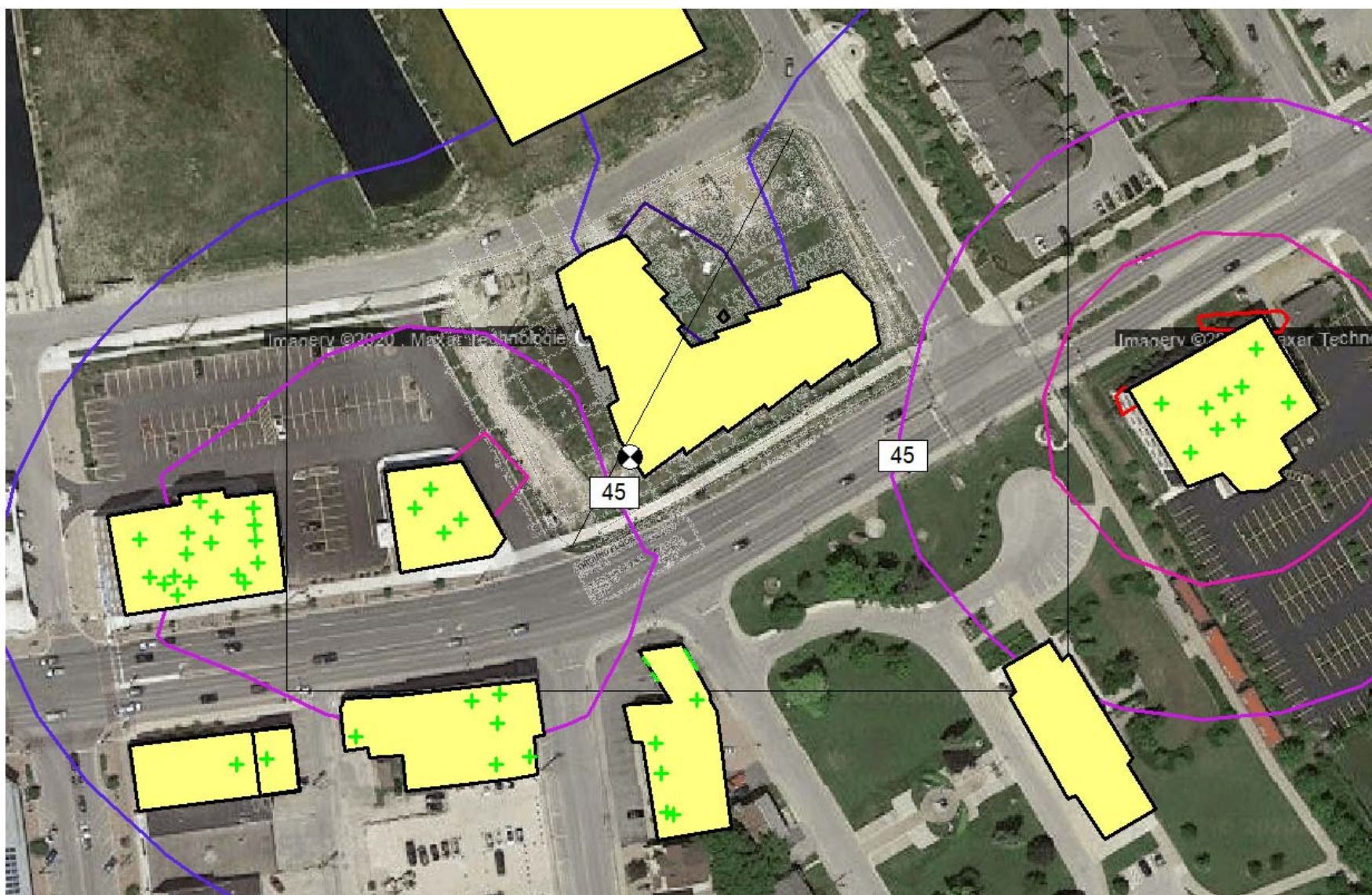


Figure 6 - Predicted Nighttime Sound Level Contours