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November 18, 2020

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Attention: Tracy Tucker  
[Tracy.Tucker@ibigroup.com](mailto:Tracy.Tucker@ibigroup.com)

**VIA E-MAIL**

**Re: Addendum to the Environmental Noise Feasibility Study  
323 Rymal Road East  
Hamilton, Ontario  
VCL File: 118-0658**

Dear Ms. Tucker:

## **1.0 INTRODUCTION**

Valcoustics Canada Ltd. (VCL) previously prepared an Environmental Noise Feasibility Study (herein referred to as the "Noise Report"), dated April 25, 2019, for the proposed residential development. The Hamilton Public Library and YMCA building is to the south of the site, on the opposite side of Rymal Road. At the time the report was prepared, access to this facility could not be obtained and sound measurements of the noise sources (rooftop mechanical units) could not be completed. The assessment in the Noise Report was therefore based on assumptions.

VCL has now been able to access the Hamilton Public Library and YMCA building and complete sound measurements of the roof top sources. This Addendum has been prepared to update the assessment using the measurement data. The analysis has also been updated to account for the latest Site Plan, Floor Plans and Elevations. The results of the assessment are outlined herein.

This Addendum is based on:

- The Site Plan, prepared by IBI Group, last revised December 16, 2019.
- The Floor Plans, prepared by KNYMH Inc., received June 19, 2020; and
- The Elevations, prepared by KNYMH Inc., dated December 16, 2020.

The Site Plan is shown as Figure 1. The Floor Plans and Elevations are included as Appendix A.

## **2.0 TRANSPORTATION NOISE**

### **2.1 ASSESMENT**

The transportation noise source with the potential for impact at the subject site is road traffic on

Rymal Road East. In the previous assessment, the year 2016 road traffic volume on Rymal Road East was escalated to the year 2029 (a 10-year projection from the date of the Noise Report). For this assessment, the road traffic volumes were escalated to the year 2030 (a 10-year projection from the date of this Addendum). Note the extra 1-year projection results in a 0.1 dB increase in sound levels, which is considered acoustically insignificant. In addition, the building setback from Rymal Road East remains unchanged. Thus, the predicted sound levels at the building facades due to road traffic noise on Rymal Road East remain unchanged.

## **2.2 NOISE ABATEMENT REQUIREMENTS**

### **2.2.1 Indoors**

#### **2.2.1.1 Architectural Elements**

At the time the Noise Report was prepared, building elevations were not available. The exterior wall and window STC requirements were therefore assessed using assumed wall and window heights. The analysis has been updated using the latest floor plan and elevation drawings.

The assessment was done at a first-floor bedroom on the south facade and a second-floor living room at the southeast corner of the building. At the bedroom, the wall and window areas on the south facade were calculated to be 52% and 37%, respectively, of the associated floor area. The wall area on the west facade was calculated to be 14% of the associated floor area. For the living room, the wall and window areas on the south facade were calculated to be 37% and 31%, respectively, of the associated floor area. The wall and window areas on the east facade were calculated to be 59% and 14%, respectively, of the associated floor area.

With the predicted sound levels and the wall/window areas above, exterior wall and window construction meeting the minimum non-acoustical requirements of the OBC will be sufficient to meet the indoor noise criteria.

The requirements should be confirmed if the architectural drawings are revised.

#### **2.2.1.2 Ventilation Requirements**

Since the predicted sound levels at the building facades remain unchanged, the ventilation requirements for the development remain unchanged. All suites in the development require mandatory air conditioning to allow windows to remain closed for noise control purposes.

### **2.2.2 Outdoors**

All balconies in the development are less than 4 m in depth and therefore do not qualify as OLA's under the MECP guidelines. There are no grade-level common outdoor amenity spaces. Thus, sound barriers are not required for noise control purposes.

## **3.0 STATIONARY NOISE**

### **3.1 NOISE SOURCES AND OPERATING SCENARIOS**

The main noise sources with the potential for impact at the subject site are the rooftop mechanical units at the Turner Park Branch of the Hamilton Public Library and the Les Charter Family YMCA facilities. Sound measurements of the rooftop mechanical units at these facilities were done by VCL staff on July 23, 2020.

The rooftop units consisted of HVAC units and exhaust fans. The noise source locations and source ID's are shown on Figure 2. The source sound levels, heights and operating times are summarized in Table 4.

### **3.2 ANALYSIS METHOD AND RECEPTORS**

The analysis method remains unchanged from the Noise Report.

The same three receptors from the Noise Report, representing the worst-case locations on the exterior of the subject building, were used in this assessment. All receptors were assessed at a height of 7.5 m above grade. The receptors are:

- R01 – representing the 3<sup>rd</sup> floor plane of windows on the south facade;
- R02 – representing the 3<sup>rd</sup> floor plane of windows on the east facade, toward the front of the building; and
- R03 – representing the 3<sup>rd</sup> floor plane of windows on the east facade, toward the rear of the building.

The receptor locations are shown on Figures 3 to 5.

The ambient sound levels at these receptors, due to road traffic noise, remain unchanged from the Noise Report. Thus, the noise guideline limits at each receptor remain unchanged from the Noise Report.

### **3.3 SOUND LEVEL ASSESSMENT**

Figure 3 and Table 5 show the predicted unmitigated sound levels due to the HVAC units, together with the applicable guideline limits.

The sound levels are predicted to exceed the Class 1 noise guideline limits at all receptors. The excesses occur mainly during the nighttime, with a minor 1 dB excess over the evening limit at R03. The predicted sound levels comply with the guideline limits during the day.

## **4.0 MITIGATION**

### **4.1 CLASS 1 RECEPTOR STATUS**

Two options to mitigate the sound levels to the Class 1 guideline limits have been investigated.

#### Option 1: Rooftop Acoustic Screens

To mitigate the sound levels to the noise guideline limits, rooftop acoustic screens could be used:

- Four 3.5 m high acoustic screens would be required at the units toward the front of the building; and
- A 2.7 m high acoustic screen is required at RTU05.

All acoustic screens are required to have acoustically absorptive material meeting NRC 0.8 on the inner surface. The locations of the screens and the predicted sound levels are shown on Figure 4.

It is noted that the acoustic screen heights are primarily driven by the heights of the HVAC units. (To be effective, the acoustic screen must at least break the line of sight between the HVAC unit and the upper floors of the proposed residential building. Some of the HVAC units are very high relative to the top of roof.)

#### Option 2: Custom Acoustic Enclosures

If acoustic screens are not feasible, another mitigation option would be to add custom acoustic enclosures to five of the units. The required approximate sound level reduction is:

- RTU01 and RTU02 – 12 dB reduction (maximum sound power level: 85 dBA)
- RTU03 – 15 dB reduction (maximum sound power level: 86 dBA)
- RTU07 – 10 dB reduction (maximum sound power level: 84 dBA)
- RTU08 – 10 dB reduction (maximum sound power level: 81 dBA)

The units could also be replaced with quieter units meeting the maximum sound power levels outlined above.

The predicted sound levels are shown on Figure 5.

## **4.2 CLASS 4 RECEPTOR STATUS**

Due to the heights of the units and the high sound emission levels, significant mitigation measures would be required to meet the Class 1 guideline limits. The required sound level reductions can be achieved using acoustic screens or custom acoustic enclosures. Note that there may be structural implications with both options that will need to be reviewed and addressed by others in order to determine the feasibility.

If the mitigation measures are not feasible to implement, changing classification of the subject site from Class 1 to Class 4 could be considered. A Class 4 area is subject to less stringent sound level limits. The limits are similar to those in a Class 1 area in that they are the higher of the minimum exclusion limits or the ambient due to road traffic. However, the Class 4 minimum exclusion limits for plane of window receptors are 10 dBA higher than the Class 1. The outdoor point of reception minimum exclusion limits are 5 dBA higher than the Class 1 limits. As shown on Figure 6, the unmitigated sound levels at the subject site due to the noise sources at the library and YMCA meet the Class 4 sound level limits without the need for any physical mitigation measures.

In addition:

- It is important to note that only the land use approval authority (the City of Hamilton in this case) can deem the site "Class 4".
- If the proposed development is deemed Class 4, warning clauses must be registered to make future occupants aware of the noise situation.

- As part of the Class 4 status, it is also required that the proposed development be provided with air conditioning. This will allow windows to remain closed for noise control purposes. (Note that air conditioning is required regardless, to mitigate noise from road traffic sources).
- It is noted that the sound levels from the library/YMCA facility are predicted to exceed the Class 1 sound level limits at the existing two-storey residential dwellings to the east and west of the subject site.
  - Custom acoustic enclosures at RTU01 (8 dB reduction) and RTU03 (15 dB reduction) would mitigate the sound levels at the existing dwellings to the Class 1 guideline limits.
  - If the facility were brought into compliance with the noise limits at the existing receptors, minor 2-3 dBA excesses over the Class 1 guideline limits would result at the subject site during the nighttime hours only, on the east façade only.
  - A 2 to 3 dBA excess is considered minor and insignificant in practice. A change in sound level of 3 dB would be just noticeable to human ear. As such, the substantial mitigation measures that would be needed to achieve the additional 3 dB attenuation may not be warranted. The use of Class 4 would allow the development to proceed without the need for these additional measures.

## 5.0 CONCLUSIONS

With appropriate acoustical design of the development as outlined herein, a suitable acoustical environment can be provided and the applicable MECP noise guideline requirements met.

To meet the Class 1 guideline limits, mitigation measures are required at the library/YMCA building. The sound levels meet the Class 4 guideline limits without the need for physical noise control measures. Given the presence of existing noise sensitive uses with elevated sound levels due to the HVAC units at the library/YMCA building, and the significant mitigation measures that would be required to meet the Class 1 limits at the existing dwellings and proposed development, a Class 4 classification is recommended for the subject site.

Yours truly,

**VALCOUSTICS CANADA LTD.**

Per:

*Seema Nagaraj*  
**Seema Nagaraj, P.Eng.**



November 18, 2020

Per:

*Mark Levkoe*  
**Mark Levkoe, P.Eng.**



November 18, 2020

**TABLE 1: ROAD TRAFFIC DATA**

Roadway	Year	24-Hour Volume	% Trucks		Day/Night Split (%)	Speed Limit (kph)
			Medium	Heavy		
Rymal Road East <sup>(1)</sup>	2016	19 828	5.1	1.2	90/10	60

Note:

- (1) Year 2016 volumes were provided by the City of Hamilton in the form of a TMC at Republic Avenue. Year 2030 volumes were calculated using a growth rate of 2%, compounded annually. Overall truck and bus volumes were provided in the TMC. Buses were counted as medium trucks. The medium/heavy truck split was assumed to be 40%/60% of the total truck volume. The day/night split was assumed.

**TABLE 2: PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS - ROAD TRAFFIC**

Location <sup>(1)</sup>	Source	Distance (m) <sup>(2)</sup>	L <sub>eq</sub> Day (dBA)	L <sub>eq</sub> Night (dBA)
South Facade	Rymal Road East	22	66	59
East / West Facades	Rymal Road East	22	63	56

Notes:

- (1) See Figure 2.  
(2) Distance indicated is taken from the centreline of the noise source to the point of reception.

**TABLE 3: NOISE ABATEMENT MEASURES**

Location	Air Conditioning <sup>(1)</sup>	Exterior Wall <sup>(2)</sup>	Exterior Window <sup>(3)</sup>	Sound Barrier <sup>(4)</sup>	Warning Clauses <sup>(5)</sup>
All dwelling units	Mandatory	No special acoustical requirements			A + B + C (+ D if Class 4)

**Notes:**

- (1) Provision for adding air conditioning typically takes the form of a ducted ventilation system suitably sized to permit the addition of central air conditioning by the occupant.
- (2) STC - Sound Transmission Class Rating (Reference ASTM-E413).  
The requirements are based on the floor plans (received June 19, 2020) and elevation drawings (dated December 16, 2019) both prepared by KNYMH Inc. and should be reviewed if the plans are significantly different.
- (3) STC - Sound Transmission Class Rating (Reference ASTM-E413). A sliding glass walkout door should be considered as a window and be included in the percentage of glazing.  
The requirements are based on the floor plans (received June 19, 2020) and elevation drawings (dated December 16, 2019) both prepared by KNYMH Inc. and should be reviewed if the plans are significantly different.
- (4) Sound barriers must be of solid construction having a minimum face density of 20 kg/m<sup>2</sup> with no gaps or cracks. The acoustic fence height shown is taken relative to grade.
- (5) Warning clauses to be registered on title and be included in Offers of Purchase and Sale for designated lots:
  - A. "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 may occasionally interfere with some activities of the dwelling occupants as the sound level may exceed the noise criteria of the Ministry of the Environment and/or the municipality."
  - B. "This dwelling unit has been supplied with a central air conditioning system which will allow windows and 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."
  - C. "Purchasers/tenants are advised that due to the proximity of the Hamilton Public Library, YMCA, police station and works yard, noise from these facilities may at times be audible."
  - D. "Purchasers/tenants are advised that sound levels due to the adjacent library/YMCA building are required to comply with the sound level limits at are protective of the indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."
- (6) All exterior doors shall be fully weatherstripped

**TABLE 4: SOURCE SOUND POWER LEVELS**

Source ID	Make and Model	Height (m) <sup>(1)</sup>	Sound Power Level (dBA)	Operating Time (min/hour)	
				Daytime / Evening (0700 to 2300)	Nighttime (2300 to 0700)
RTU01	AAON CL-045-4-0-0A04-000	3.1	97	60	30
RTU02	AAON CL-045-4-0-0A04-000	3.1	97	60	30
RTU03	Haakon Pentpak	1.7	101	60	30
RTU04	McQuay ACZ090BCS37-ER11	2.9	89	60	30
RTU05	Haakon Pentpak	1.7	89	60	30
RTU06 <sup>(2)</sup>	Haakon Pentpak	1.7	89	60	30
RTU07	McQuay ACZ030BCS37-ER11	3.1	94	60	30
RTU08	McQuay ACZ040BCS37-ER11	3.2	91	60	30
EF1	Greenheck GB-141-5-X	0.8	79	60	60
EF2 <sup>(3)</sup>	Greenheck GB-091-4-X	0.8	-	-	-
EF3 <sup>(4)</sup>	Greenheck GB-091-4-X	0.8	82	60	60
EF4 <sup>(4)</sup>	Greenheck GB-101HP-4-X	0.8		60	60

Notes:

- (1) Source heights are relative to the tops of the roofs.
- (2) Unit was not operating during the measurement. Source was modelled using the measurements of RTU5.
- (3) This fan was not a significant noise source and was therefore not included in the assessment.
- (4) EF3 and EF4 were measured together and modelled as a single source.
- (5) Assumed (typical) operating times.



**TABLE 5: UNMITIGATED SOUND LEVELS DUE TO LIBRARY/YMCA BUILDING**

Receptor <sup>(1)</sup>	Predicted Hourly Sound Level (dBA)			Class 1 Guideline Limit (dBA) <sup>(2)</sup>			Class 4 Guideline Limit <sup>(4)</sup>		
	Daytime (0700 to 1900)	Evening (1900 to 2300)	Nighttime (2300 to 0700)	Daytime (0700 to 1900)	Evening (1900 to 2300)	Nighttime (2300 to 0700)	Daytime (0700 to 1900)	Evening (1900 to 2300)	Nighttime (2300 to 0700)
R01	58	58	55	62 <sup>(3)</sup>	61 <sup>(3)</sup>	49 <sup>(3)</sup>	62 <sup>(3)</sup>	61 <sup>(3)</sup>	55
R02	58	58	55	59 <sup>(3)</sup>	58 <sup>(3)</sup>	45	60	60	55
R03	56	56	53	56 <sup>(3)</sup>	55 <sup>(3)</sup>	45	60	60	55

Notes:

- (1) See Figures 3 and 6.
- (2) Minimum exclusion limits for a Class 1 area unless otherwise noted.
- (3) Ambient sound level due to road traffic on Rymal Road East.
- (4) Minimum exclusion limits for a Class 4 area unless otherwise noted.

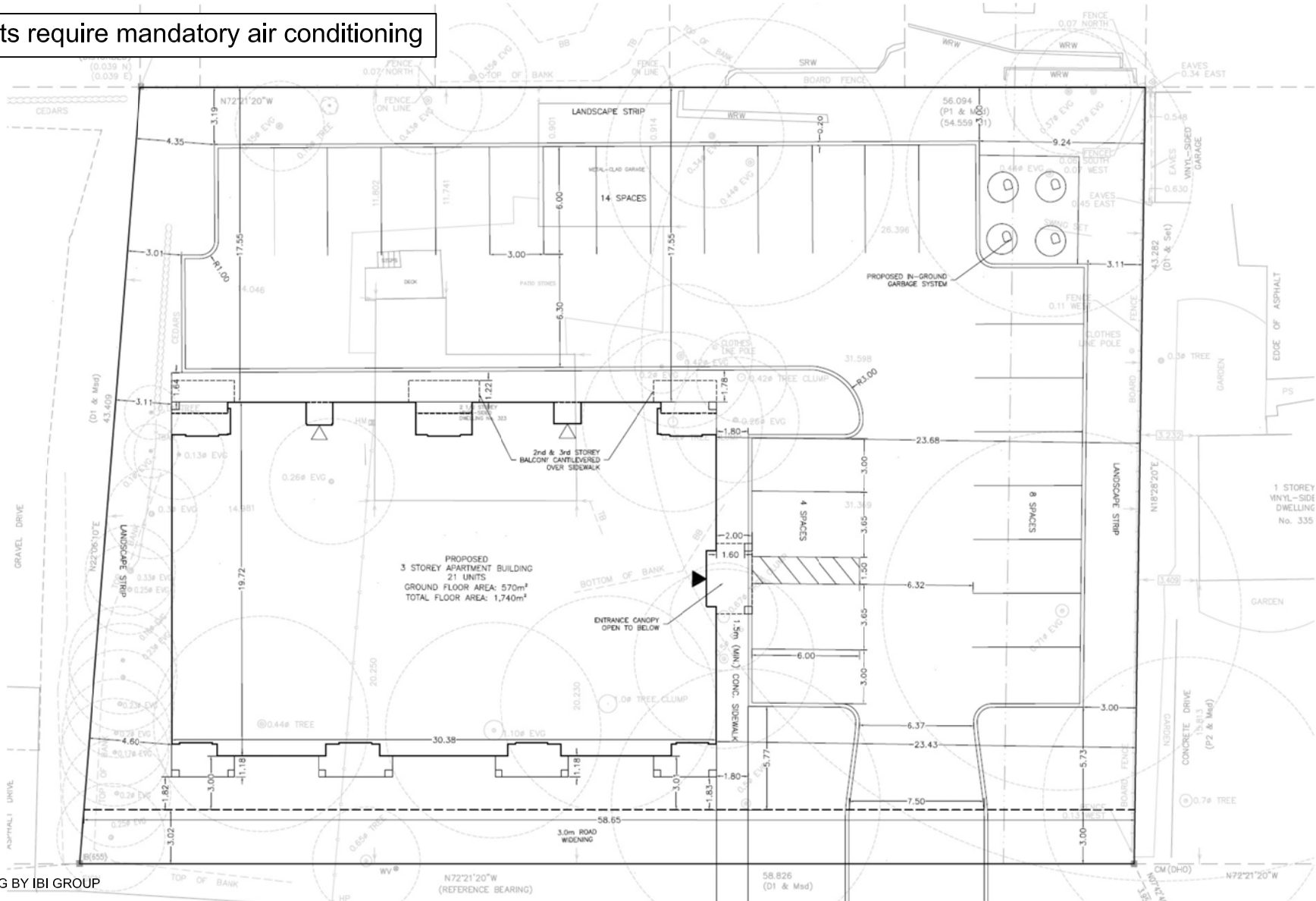
**TABLE 6: MITIGATED SOUND LEVELS DUE TO LIBRARY/YMCA BUILDING**

Receptor <sup>(1)</sup>	Predicted Hourly Sound Level (dBA) Mitigation Option 1			Predicted Hourly Sound Level (dBA) Mitigation Option 2			Class 1 Guideline Limit (dBA) <sup>(2)</sup>		
	Daytime (0700 to 1900)	Evening (1900 to 2300)	Nighttime (2300 to 0700)	Daytime (0700 to 1900)	Evening (1900 to 2300)	Nighttime (2300 to 0700)	Daytime (0700 to 1900)	Evening (1900 to 2300)	Nighttime (2300 to 0700)
R01	48	48	46	48	48	45	62 <sup>(3)</sup>	61 <sup>(3)</sup>	49 <sup>(3)</sup>
R02	48	48	45	48	48	45	59 <sup>(3)</sup>	58 <sup>(3)</sup>	45
R03	47	47	44	47	47	44	56 <sup>(3)</sup>	55 <sup>(3)</sup>	45

Notes:

- (1) See Figures 4 and 5.
- (2) Minimum exclusion limits for a Class 1 area unless otherwise noted.
- (3) Due to road traffic on Rymal Road East.

All units require mandatory air conditioning



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Title

Site Plan

Project Name

323 Rymal Road East, Hamilton

Project No.

118-0658

Scale

N.T.S.

Date

Oct. 19, 2020

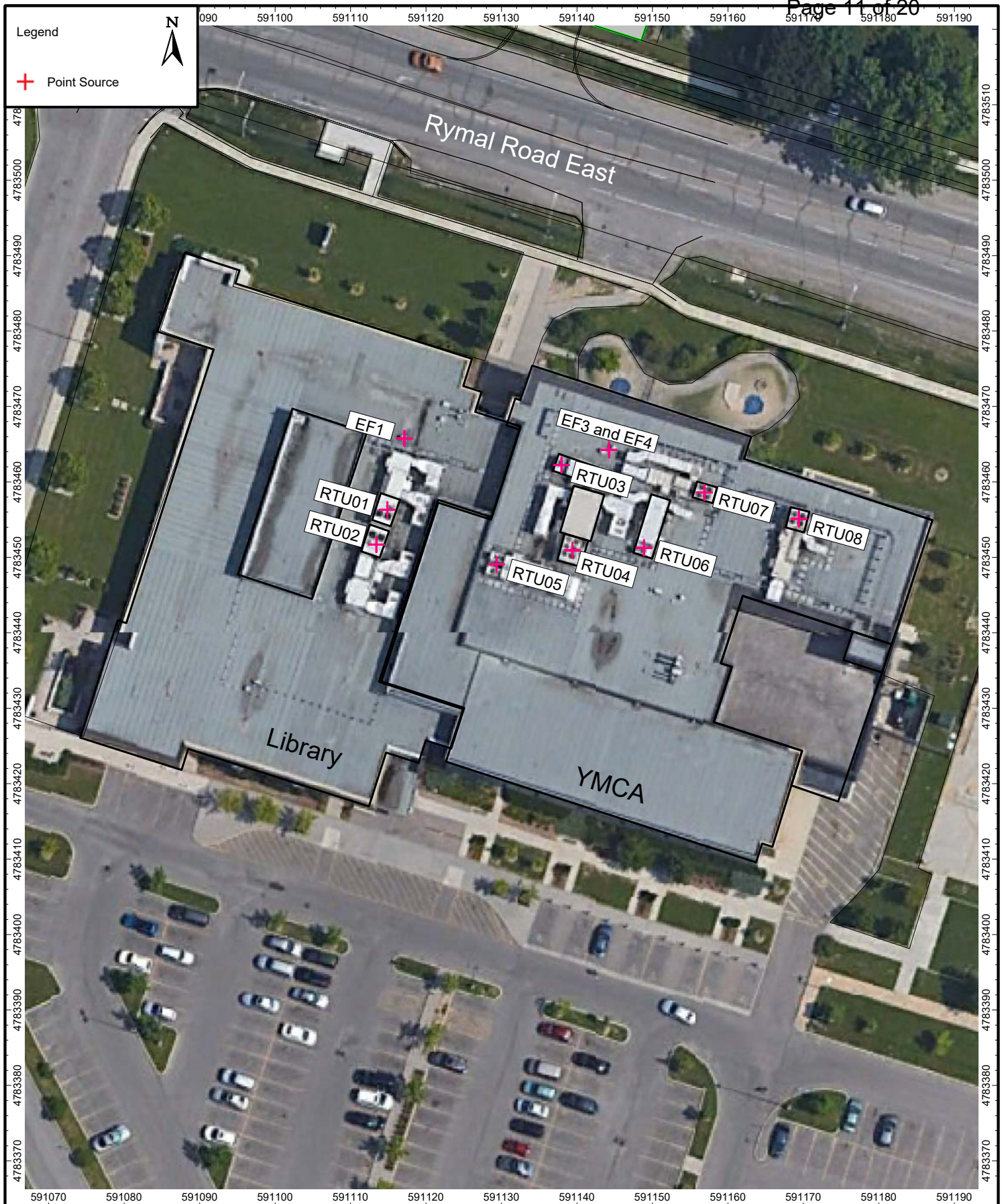
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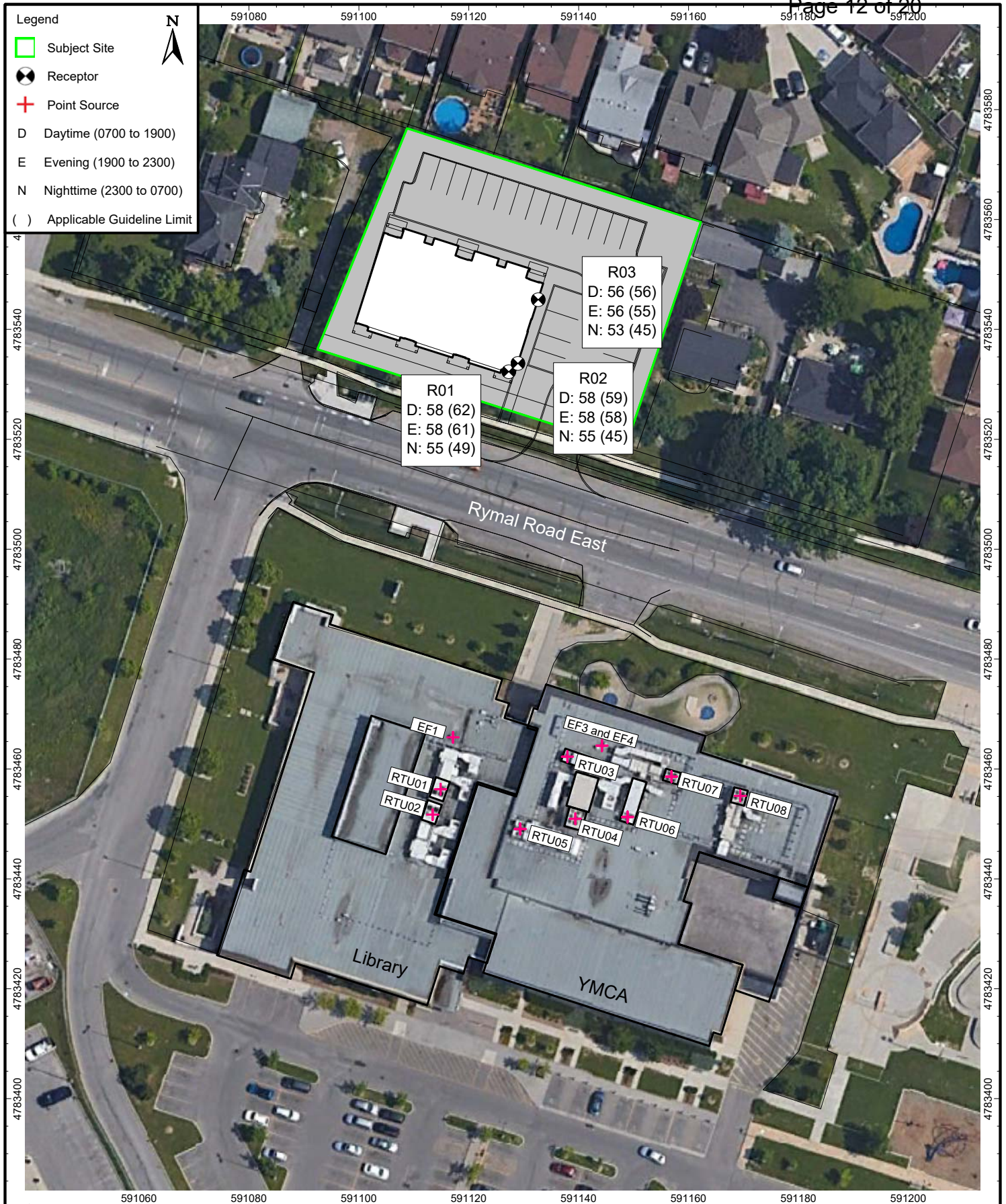
Revision/Issue

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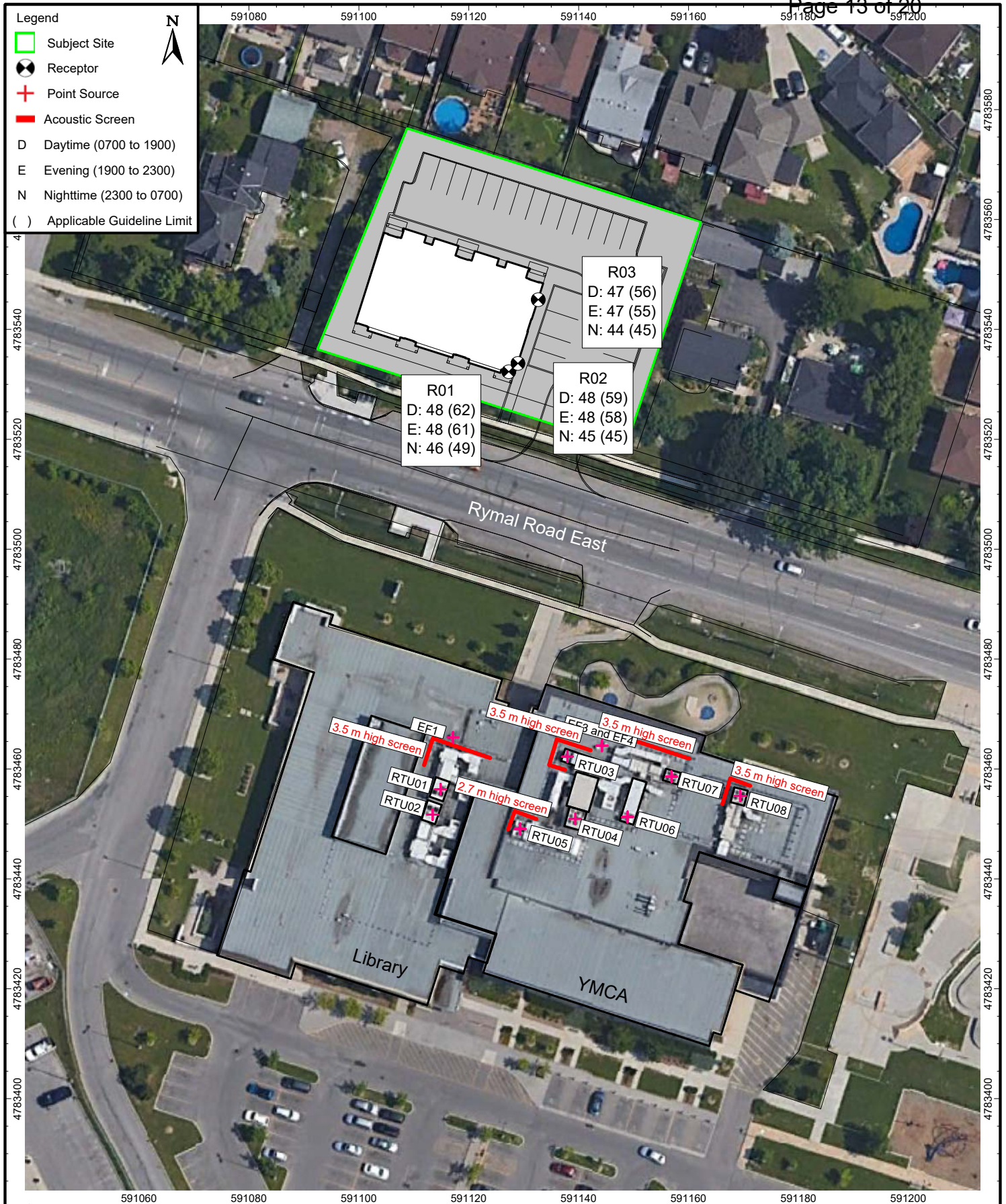
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	Project Name		Project No.	2
	323 Rymal Road East, Hamilton		118-0658	





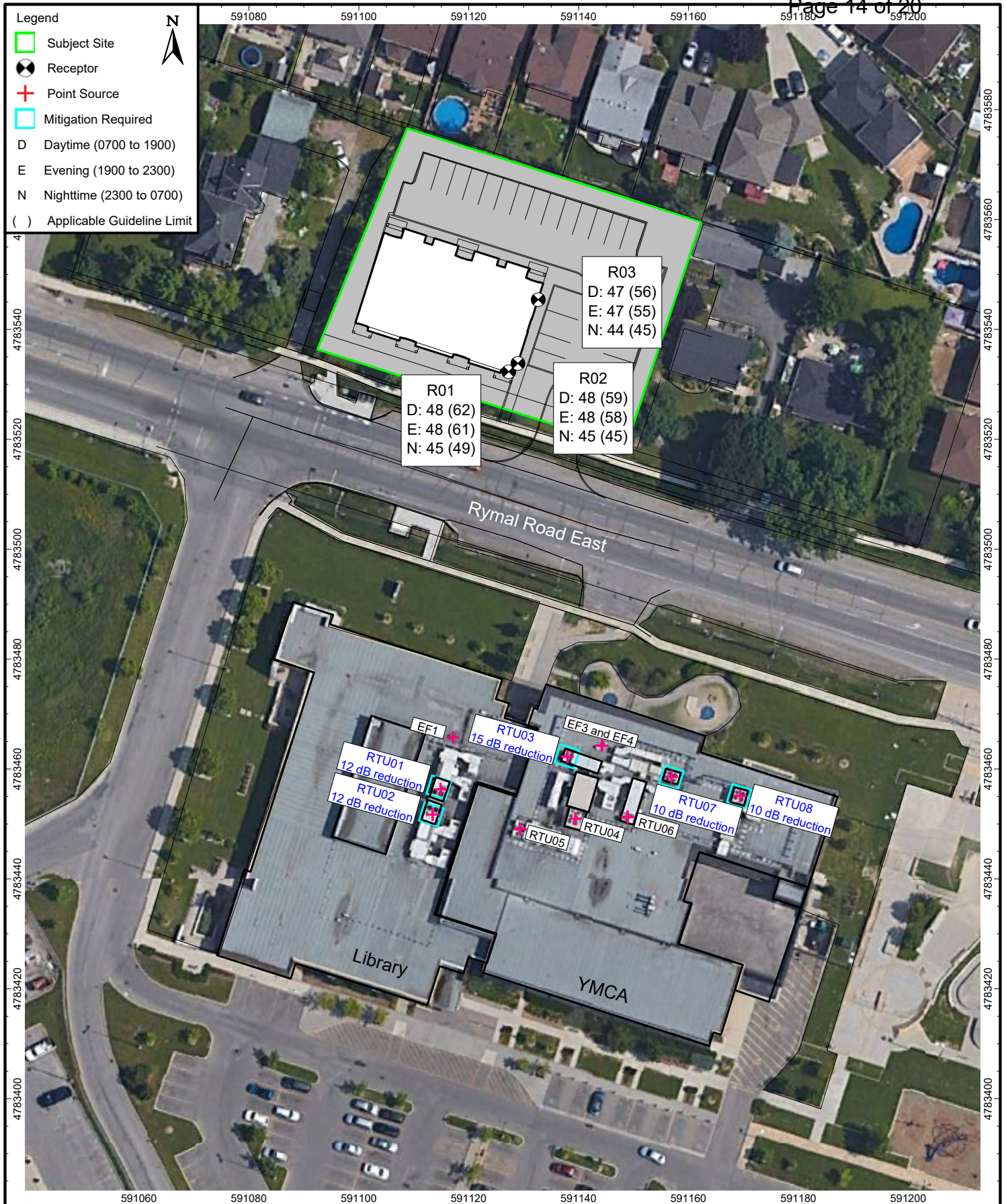
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	Project Name		Project No.	3
	323 Rymal Road East, Hamilton		118-0658	






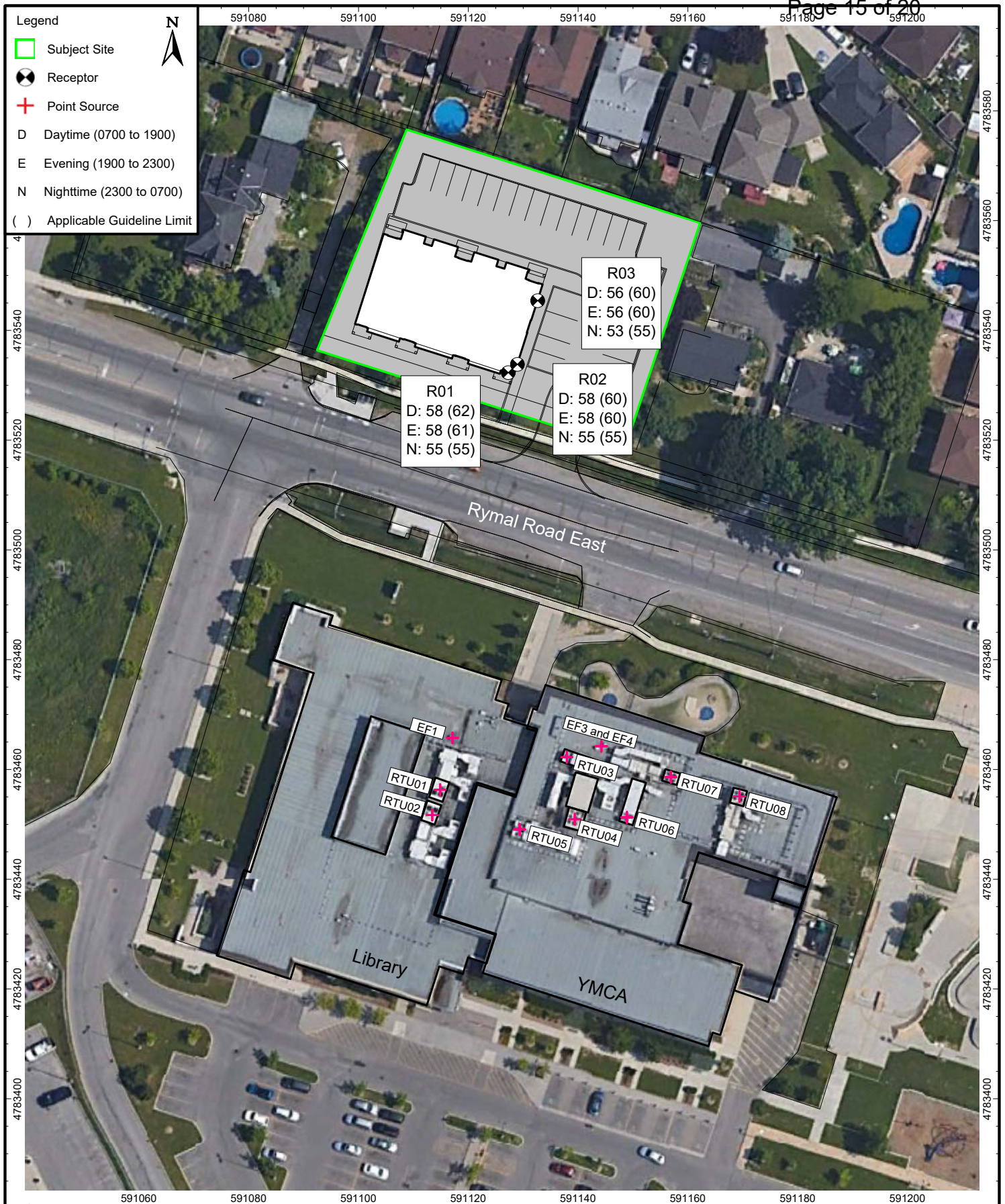
	Title		Date	Figure
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	Project Name		Project No.	4
	323 Rymal Road East, Hamilton		118-0658	







	<b>Title</b> Mitigated Hourly Sound Levels (dBA) - Option 2		<b>Date</b> Oct. 19, 2020	<b>Figure</b> 5
	<b>Project Name</b> 323 Rymal Road East, Hamilton		<b>Project No.</b> 118-0658	





	Title		Date	Figure
	Unmitigated Hourly Sound Levels (dBA) - Class 4 Guideline Limits		Oct. 19, 2020	
	Project Name		Project No.	6
	323 Rymal Road East, Hamilton		118-0658	

# **APPENDIX A**

## **FLOOR PLANS AND ELEVATIONS**





ALL DRAWINGS MAY BE TO BE SUBJECT TO CHANGE DUE TO COMMENTS FROM MUNICIPAL DEPARTMENTS AND OTHER AGENCIES WITH AUTHORITY.

ALL DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE ARCHITECTS AND MUST BE RETURNED AT THE COMPLETION OF THE WORK.

THE CONTRACTOR WORKING FROM DRAWINGS NOT SPECIFICALLY MARKED "FOR CONSTRUCTION" MUST ASSUME FULL RESPONSIBILITY AND BEAR COSTS FOR ANY CORRECTIONS OR DAMAGES RESULTING FROM HIS/HER WORK.

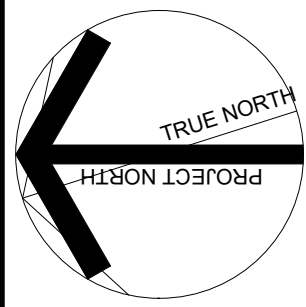
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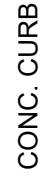
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PROJECT NUMBER:  
19003

DRAWING SHEET NUMBER:  
A201



# SIDEWALK

## SIDEWALK

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