ENVIRONMENTAL NOISE ASSESSMENT REPORT

For 3055 Richmond Road, Ottawa

Prepared by:

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Revision 1 July 2022

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1. INTRODUCTION

W. Elias & Associates Consulting Engineers was retained by Soma Studio Architect Inc. to investigate the potential impact of environmental noise on proposed development located at 3055 Richmond Road, Ottawa, Ontario. The development is situated close to the intersection of Dumaurier Avenue and Richmond Road, Ottawa, Ontario. The noise assessment is requested as part of site plan application for proposed development. The proposed development consists of four story, residential building, located at 3055 Richmond Road, Ottawa, Ontario. The site is bounded by residential to the east and south. Refer to appendixes for site detail including the surrounding area, zoning, etc.

2. TERMS OF REFERENCE

Our assessment is based on the proposed development architectural drawings prepared by Soma Studio Architect Inc., existing and future noise and vibration sources, and based on the environmental noise and vibration guidelines of the Ministry of Environment and Climate Change ("MOECC") and The City of Ottawa Environmental Noise Control Guideline ("ENCG") which is more stringent version of MOECC.

3. OBJECTIVES

The principal objectives of this study are to

- (i) Calculate the future noise levels on the study buildings produced by local transportation traffic,
- (ii) Ensure that interior and exterior noise levels do not exceed the allowable limits specified by the Ministry of Environment and Climate Change ("MOECC"), and

4. TRAFFIC NOISE ASSESSMENT

4.1. CRITERIA FOR TRANSPORTATION TRAFIC NOISE

The City of Ottawa Environmental Noise Control Guideline ("ENCG") for transportation noise impacting residential developments was utilized for this study. A summary of the City of Ottawa noise requirements is provided Table below.

T 46	Time Booked	L _{eq} (dBA)	
Type of Space	Time Period	Road	
General offices, reception areas, retail stores, etc.	07:00 - 23:00	50	
Living/dining/den areas of residences, hospitals, schools, nursing/retirement homes, day-care centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, etc.	07:00 – 23:00	45	
Sleeping quarters of hotels/motels	23:00 - 07:00	45	
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	23:00 – 07:00	40	

Predicted noise levels at the plane of window (POW) dictate the action required to achieve the recommended sound levels. As per MOECP, Environmental Noise Guidelines, NPC 300 – Part C, an open window is considered to provide a 10 dBA reduction in noise, while a standard closed window is capable of providing a minimum 20 dBA noise reduction. A closed window due to a ventilation requirement will bring noise levels down to achieve an acceptable indoor environment. Therefore, where noise levels exceed 55 dBA daytime and 50 dBA nighttime, the ventilation for the building should consider the need for having windows and doors closed, which triggers the need for forced air heating with provision for central air conditioning. Where noise levels exceed 65 dBA daytime and 60 dBA nighttime, air conditioning will be required and building components will require higher levels of sound attenuation.

The sound level criterion for outdoor living areas is 55 dBA, which applies during the daytime (07:00 to 23:00). When noise levels exceed 55 dBA, mitigation must be provided to reduce noise levels where technically feasible to acceptable levels at or below the criterion.

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4.2. Traffic Noise Predictions

The proposed development will be primarily subjected to roadway noise from Richmond Road which is considered artillery road based on the City of Ottawa Transportation Master Plan.

4.2.1. Road Traffic

The traffic counts for Richmond Road were obtained based on the City of Ottawa Environmental Noise Study Guideline. Based on the physical location and residential density of the street, it was conservatively assumed that Richmond Road is an artillery road and the minimum traffic counts available in modeling software as recommended by the City of Ottawa "Environmental Noise Control Guidelines." In addition, a yearly growth rate of 2.5% was used to calculate the traffic data. In order to calculate the fully developed road traffic volumes, numbers were grown to the year 2030. Traffic data was split into daytime/nighttime and autos/medium/heavy using City of Ottawa "Environmental Noise Control Guidelines." Posted speed limits were used in the analysis. Data used in the noise modelling are found in Table 1.

Table 1: Road Traffic Data Used in Analysis

Street	Time of the Day	Vehicles	Medium Trucks	Heavy Trucks
Richmond Road	0700-2300	15000	7%	5%

4.2.2. Air Traffic

Proposed project is located out of the zone of influence from the Airport Operating Influence Zone (AOIZ) and NEF/NEP contours lines. Therefore, no further assessment was performed.

4.2.3. Stationary Noise Sources

Based on investigation of the surrounding areas, there are no potential stationary industrial sources of noise in the vicinity of the proposed development. The City of Ottawa Environmental Noise Control Guideline ("ENCG") were utilized as guidance for recommended separation distances and other control measures for land use planning proposals to prevent or minimize 'adverse effects' from the encroachment of incompatible land uses where a facility either exists or is proposed. Since

no industrial sources are located in the vicinity of the proposed development, it was not considered further in this study.

5. Noise Impact Assessment

Leq,night and Leq,day attributable to Richmond Road were calculated using STAMSON v5.0, the computerized road, rail, and transit traffic noise prediction model of the MOE. Since the City of Ottawa requires projected sound exposures be based on ultimate traffic volumes for roadways, sound exposure levels were based on 2030 (future) road traffic predictions. Screening due to surrounding buildings and terrain was accounted for in the analysis.

The noise impact was calculated for the ground level of the building. It was assumed, that if the summation of noise impact levels at first floor on south face is acceptable (the face with larger closest exposure to Road traffic), the other faces will be satisfied as well. In STAMSON modeling, Richmond Road was considered as one segment. List of the receivers information are shown in table below.



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Table 3 summarizes the predicted unmitigated daytime and nighttime sound exposures levels at predictable worst-case locations at the proposed development which is the first floor facing southeast. Sample sound exposure calculation and analysis assumptions are included in Appendix.

Table 3: Predicted Unmitigated Road Traffic Sound Exposures

Floor	Façade	Sound Level (dBA) 0700-2300	STC Requirement = 45 dBA	Total Sound Level (dBA) 2300-0700	STC Requirement = 40 dBA
1 st floor	South	68	23	60	20

6. Noise Control Measures

The noise levels predicted due to roadway traffic exceed the criteria listed in Section 4 for building components. As discussed the anticipated STC requirements for windows have been estimated based on the overall noise reduction required for each intended use of space (STC = outdoor noise level – targeted indoor noise levels). As per city of Ottawa requirements, detailed STC calculations will be required to be completed prior to building permit application for each unit type. The STC requirements for the windows are summarized below:

STC Requirement for all windows

• Windows will require a minimum STC of (68 - 45) = 23

The STC requirements would apply to windows, doors, panels and curtainwall elements. Exterior wall components on these façades are recommended to have a minimum STC of 23, where a window /wall system is used. A review of window supplier literature indicates that the specified STC ratings can be achieved by a variety of window systems having a combination of glass thickness and inter-pane spacing.

We have specified an example window configuration, however several manufacturers and various combinations of window components, such as those proposed, will offer the necessary sound attenuation rating. It is the responsibility of the manufacturer to ensure that the specified window achieves the required STC. This can only be assured by using window configurations that have been certified by laboratory testing. The requirements for STC ratings assume that the remaining

components of the building are constructed and installed according to the minimum standards of the Ontario Building Code.

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. In addition to ventilation requirements, Warning Clauses will also be required and placed on all Lease, Purchase and Sale Agreements, as summarized in Section 7.

7. CONCLUSIONS AND RECOMMENDATIONS

The results of the current analysis indicate that noise levels will range around 68 dBA during the daytime period (07:00-23:00) and 60 dBA during the nighttime period (23:00-07:00).

The highest noise levels (i.e. 68 dBA) occur along the development's southeast façade, which is nearest and most exposed to Richmond Raod. Building components with a higher Sound Transmission Class (STC) rating will be required where exterior noise levels exceed 45 dBA.

Results of the calculations also indicate that the development will require central air conditioning, which will allow occupants to keep windows closed and maintain a comfortable living environment. The following Warning Clause will also be required and placed on all Lease, Purchase and Sale Agreements, as summarized below:

"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 roadway traffic may, on occasion, interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the City and the Ministry of the Environment and Climate Change. To help address the need for sound attenuation, this development includes:

 \square STC rated for all facades : STC 23

This dwelling unit has also been designed with air conditioning. Air conditioning will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the city of Ottawa and the Ministry of the Environment and Climate Change. To ensure that provincial sound level limits are not exceeded, it is important to maintain these sound attenuation features "

This concludes our assessment and report. Should you have any questions or concerns, please do not hesitate to contact us.

Sincerely,

Yours truly.
Wissam Biras Porting
Senior Project Manager

Appendix A

Stampson Calculation

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STAMSON 5.0 NORMAL REPORT
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT
Filename: Drum1.te Time Period: Day/Night 16/8 hours
Description:
Road data, segment # 1: Richmond Raod (day/night)
______
Car traffic volume : 15545/1352 veh/TimePeriod *
Medium truck volume: 1237/108 veh/TimePeriod *
Heavy truck volume : 883/77 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
* Refers to calculated road volumes based on the following input:
    24 hr Traffic Volume (AADT or SADT): 15000
    Percentage of Annual Growth : 2.50
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00
Data for Segment # 1: Richmond Raod (day/night)
_____
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no
Topography
barrier)
Reference angle : 0.00
Results segment # 1: Richmond Raod (day)
Source height = 1.50 \text{ m}
ROAD (0.00 + 68.10 + 0.00) = 68.10 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj
SubLeq
______
```

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-90 90 0.66 69.55 0.00 0.00 -1.46 0.00 0.00 0.00 68.10

Segment Leq: 68.10 dBA

Total Leq All Segments: 68.10 dBA

Results segment # 1: Richmond Raod (night)

Source height = 1.50 m

ROAD (0.00 + 60.51 + 0.00) = 60.51 dBA

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

SubLeq

-90 90 0.66 61.97 0.00 0.00 -1.46 0.00 0.00 0.00

00.51

Segment Leq: 60.51 dBA

Total Leq All Segments: 60.51 dBA

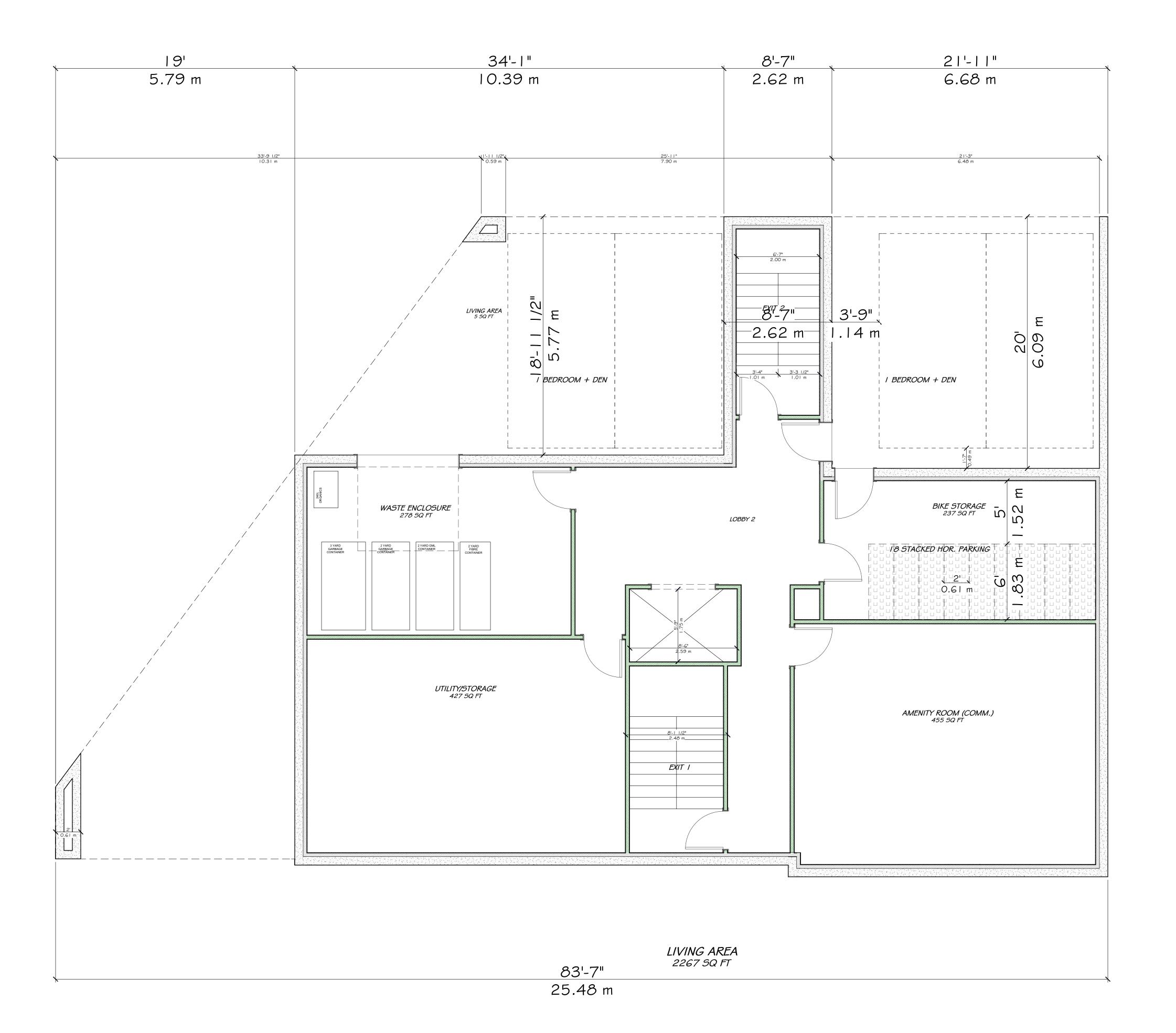
TOTAL Leq FROM ALL SOURCES (DAY): 68.10

(NIGHT): 60.51

Appendix B

Architectural Drawings





UNPOISED ARCHITECTURE INC. 5-16 SWEETLAND AVE. OTTAWA, ON. K1N-7T6

AZUL DESIGNS OTTAWA, ON. K1H-7G2

The undersigned has reviewed and takes responsibility for this design, and has the qualifications and meets the requirements set out in the Ontario Building Code to be a designer.

RESPONSIBILITIES: OO NOT SCALE DRAWINGS

ALL DESIGN AND CONSTRUCTION TO BE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE 2006

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GENERAL NOTES:

3055 RICHMOND ROAD SCOPE OF WORK: NEW 4 STOREY LOW RIS RENTAL BUILDING - 16 UNITS

CONSULTANTS:

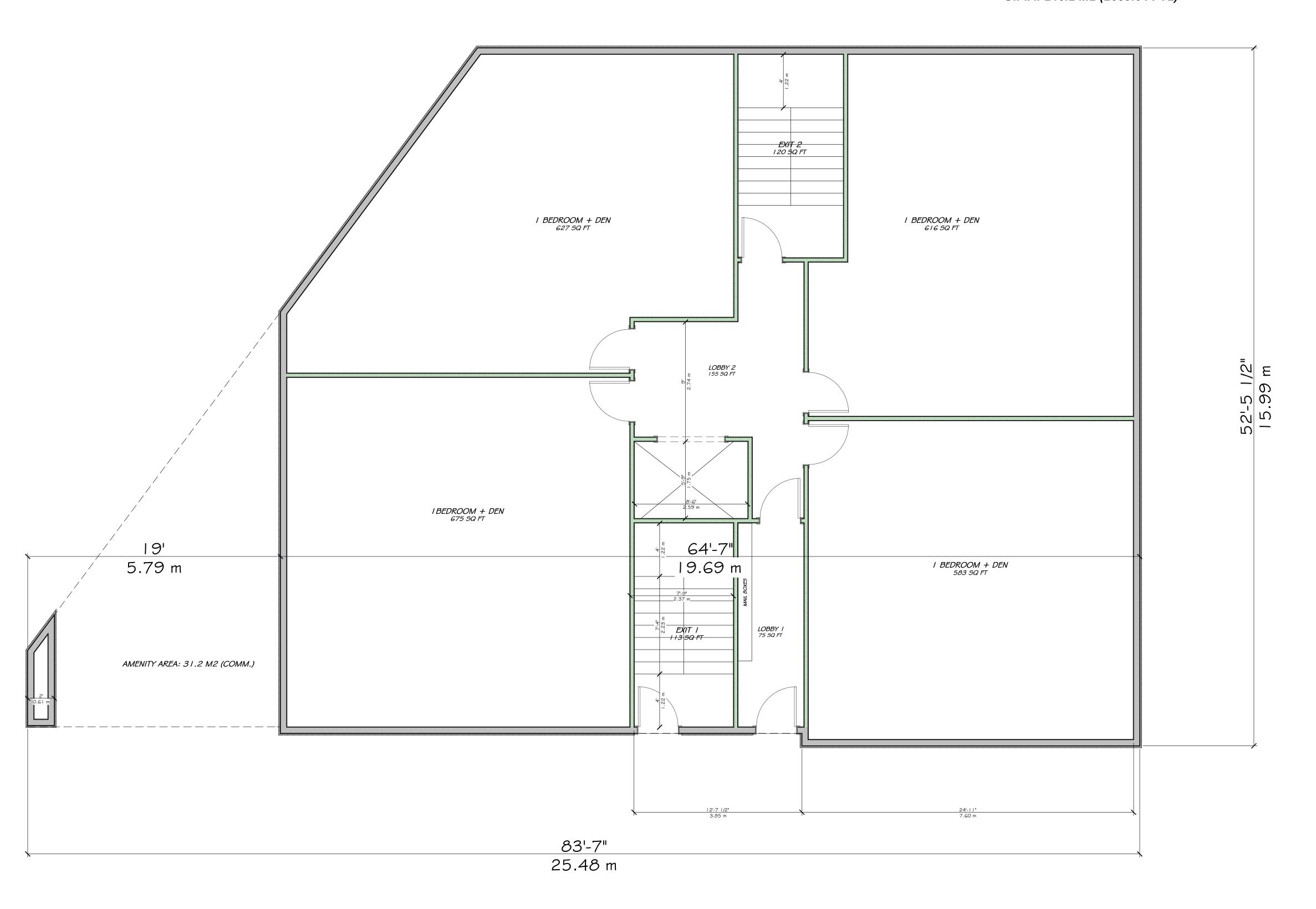
STRUCTURAL - TBD
MECHANICAL - TBD
ELECTRICAL - TBD

REVISED SITE PLAN REVISED SITE PLAN REVISION/ISSUE T: 3055 RICHMOND RD. 3055 RICHMOND RD. OTTAWA, ON K2B 6S6 613-000-0

FLOOR PLANS DATE: APRIL 12, 2022
SCALE: AS NOTED

1 BASEMENT PLAN A2 SCALE 1/4" = 1'-0"

TOTAL 1ST FLOOR AREA: 297.6 M2 (3203.28 FT2) G.F.A: 245.2 M2 (2639.54 FT2)



LIVING AREA 3204 SQ FT

2 FIRST FLOOR PLAN
A3 SCALE 1/4" = 1'-0"

UNPOISED ARCHITECTURE INC. 5-16 SWEETLAND AVE. OTTAWA, ON. K1N-7T6

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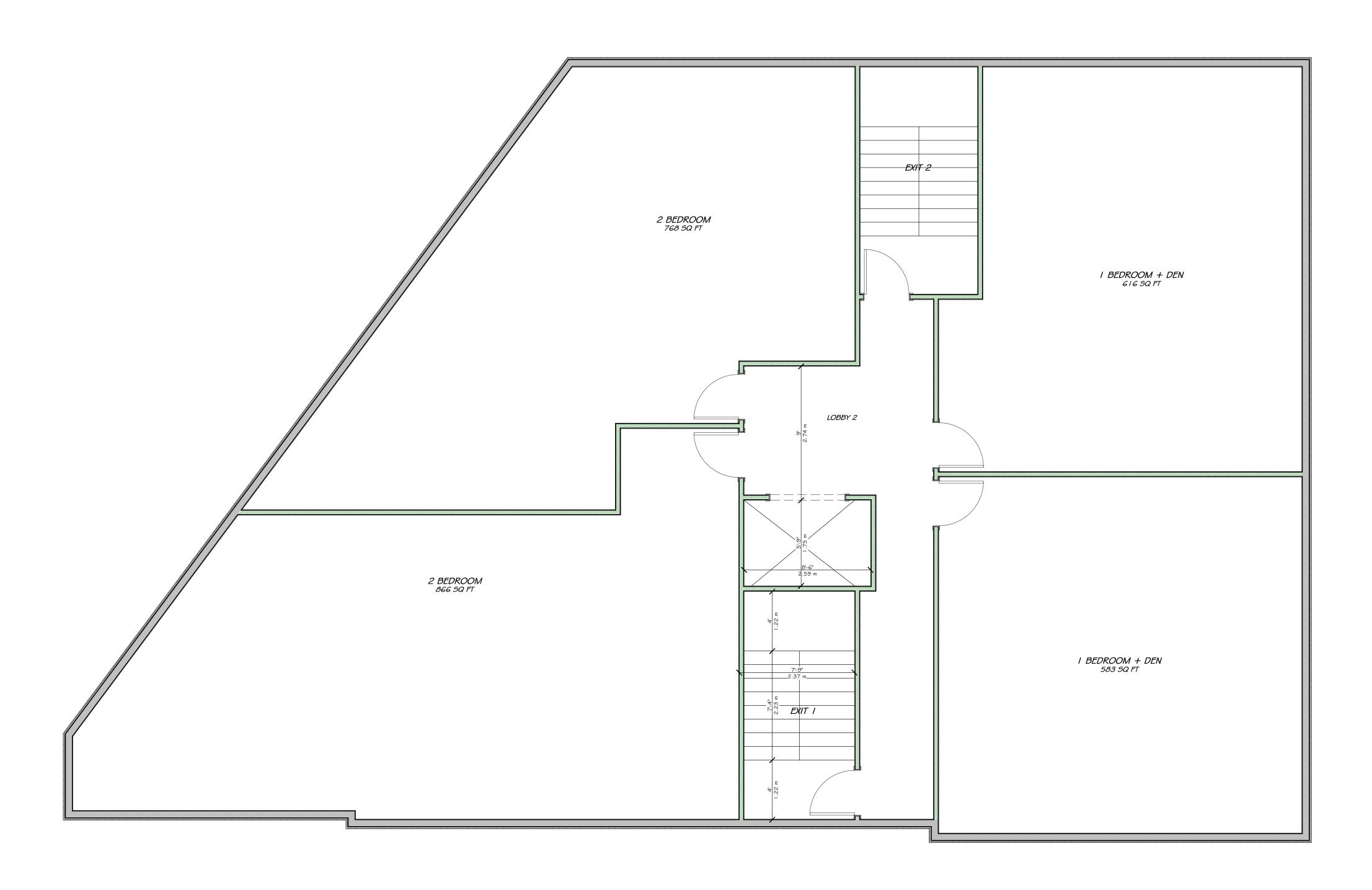
CONSULTANTS:
STRUCTURAL - TBD
MECHANICAL - TBD
ELECTRICAL - TBD

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3055 RICHMOND RD. OTTAWA, ON K2B 6S6 613-000-0

FLOOR PLANS

DRAWN BY: --DATE: APRIL 12, 2022
SCALE: AS NOTED



LIVING AREA 3553 SQ FT

UNPOISED ARCHITECTURE INC. 5-16 SWEETLAND AVE. OTTAWA, ON. K1N-7T6

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CONSULTANTS:
STRUCTURAL - TBD
MECHANICAL - TBD
ELECTRICAL - TBD

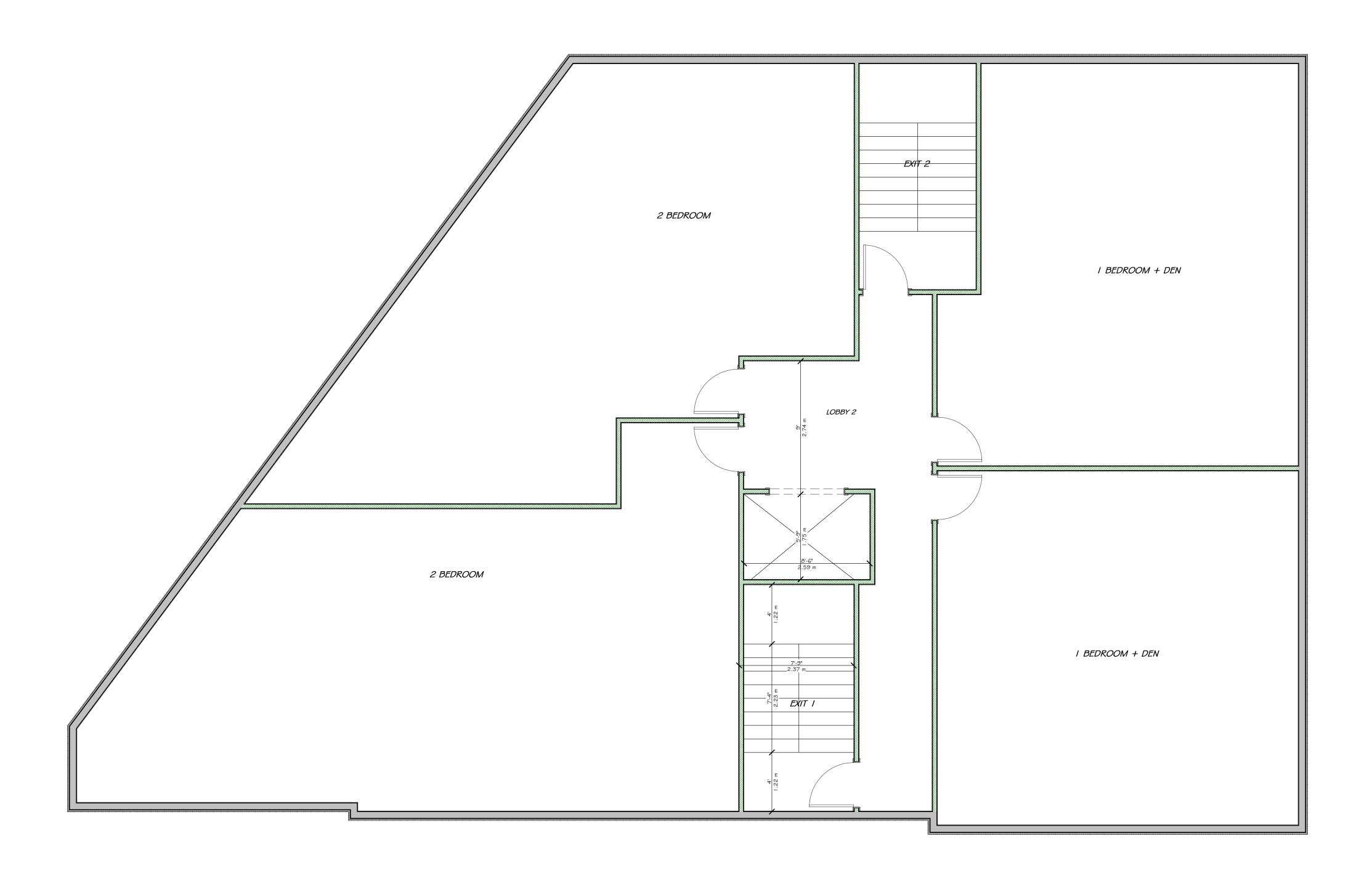
REVISED SITE PLAN REVISED SITE PLAN
PRELIMINARIES NO. REVISION/ISSUE ROJECT: 3055 RICHMOND RD.

3055 RICHMOND RD. OTTAWA, ON K2B 6S6 613-000-01

PLANS

DATE: APRIL 12, 2022
SCALE: AS NOTED

1 SECOND FLOOR PLAN
A4 SCALE 1/4" = 1'-0"



LIVING AREA 3553 SQ FT

UNPOISED ARCHITECTURE INC. 5-16 SWEETLAND AVE. OTTAWA, ON. K1N-7T6

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CONSULTANTS:
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MECHANICAL - TBD
ELECTRICAL - TBD

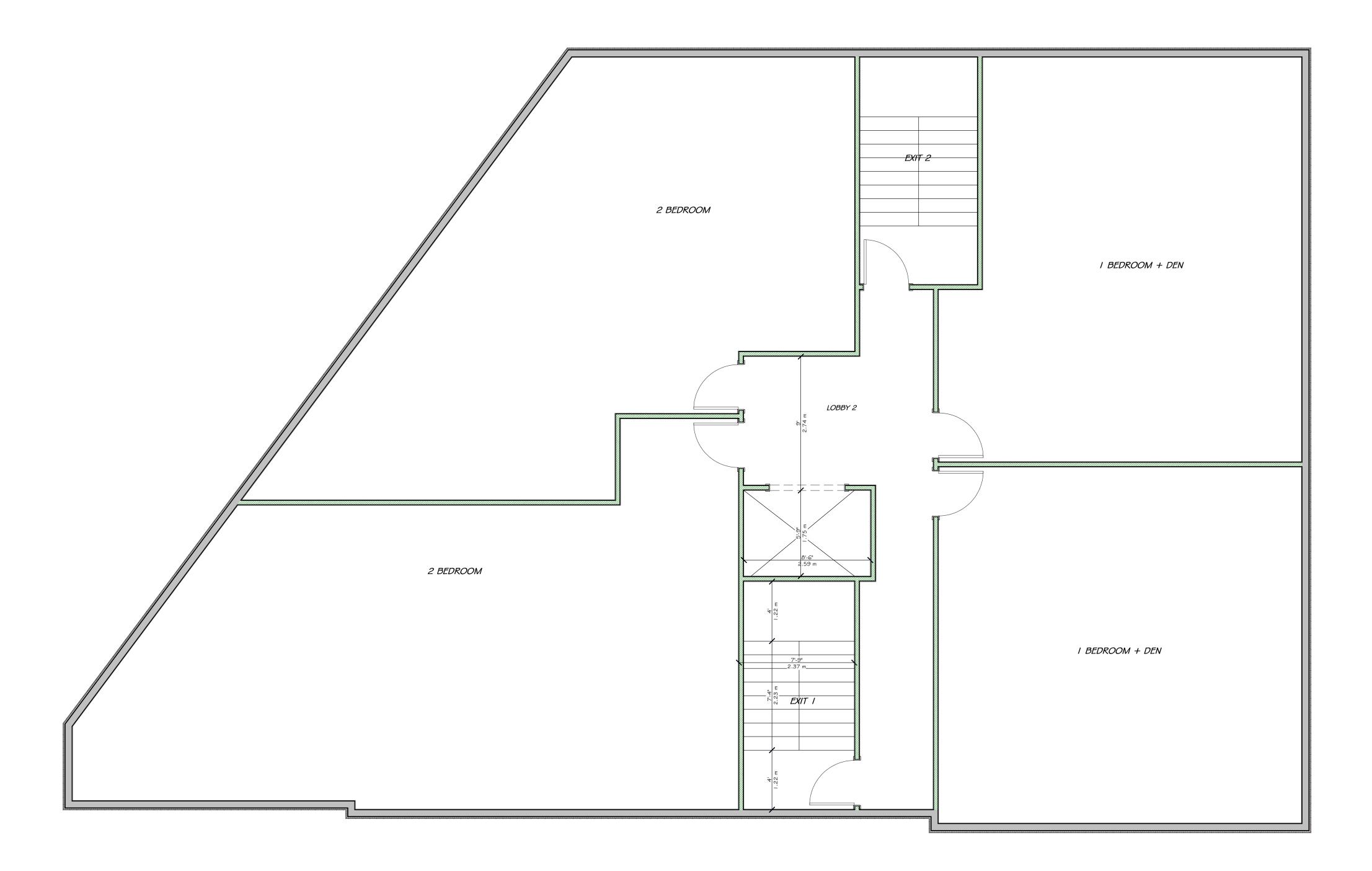
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PRELIMINARIES NO. REVISION/ISSUE PROJECT: 3055 RICHMOND RD.

3055 RICHMOND RD. OTTAWA, ON K2B 6S6 613-000-01

ELEVATIONS

DRAWN
BY: --
DATE: APRIL 12, 2022

SCALE: AS NOTED



LIVING AREA 3553 SQ FT

1 FOURTH FLOOR PLAN
A6 SCALE 1/4" = 1'-0"

UNPOISED ARCHITECTURE INC. 5-16 SWEETLAND AVE. OTTAWA, ON. K1N-7T6

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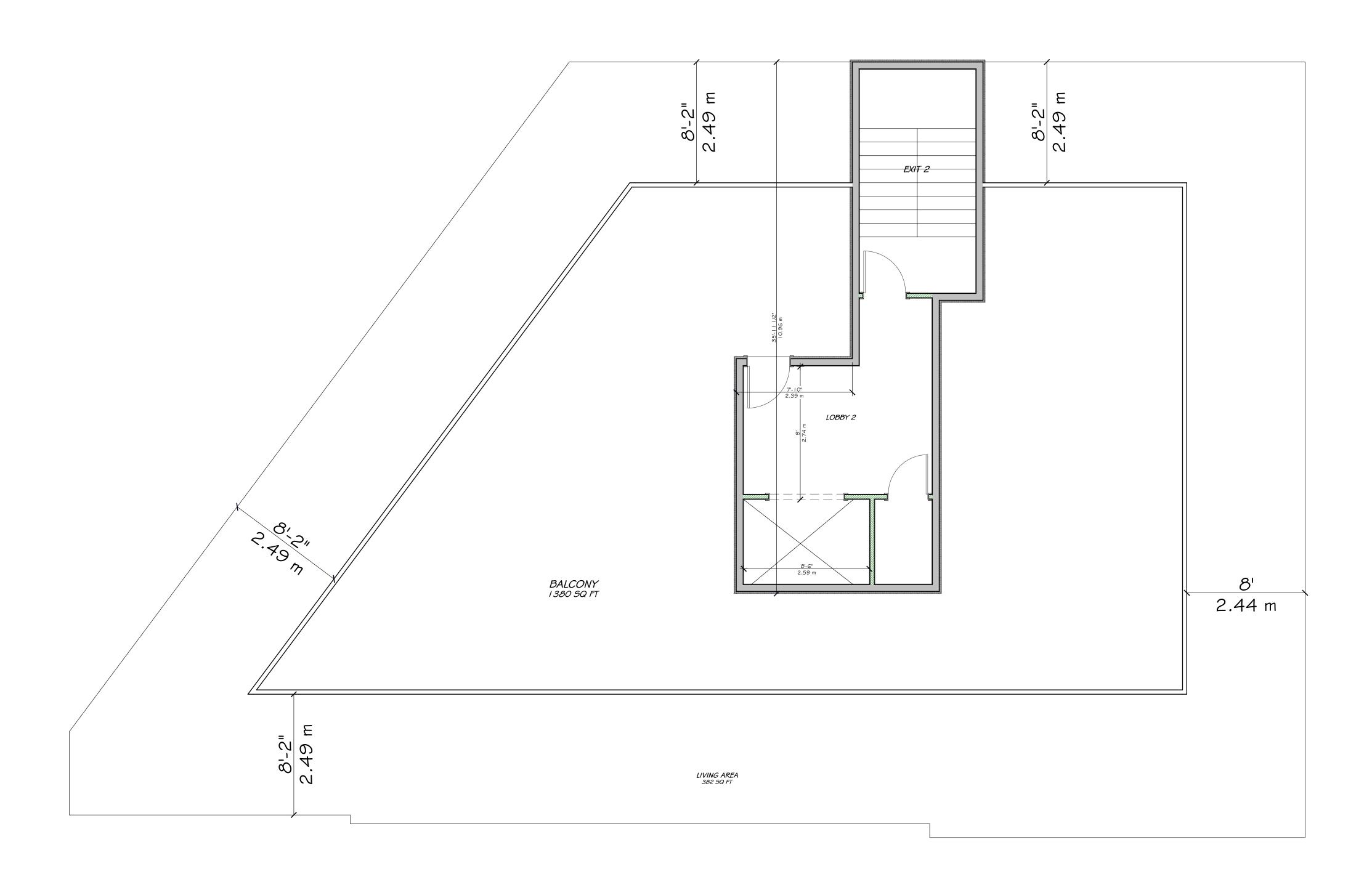
CONSULTANTS:
STRUCTURAL - TBD
MECHANICAL - TBD
ELECTRICAL - TBD

REVISED SITE PLAN REVISED SITE PLAN
PRELIMINARIES NO. REVISION/ISSUE PROJECT: 3055 RICHMOND RD.

3055 RICHMOND RD. OTTAWA, ON K2B 6S6 613-000-0

DETAILS & SECTIONS

DRAWN
BY: --DATE: APRIL 12, 2022
SCALE: AS NOTED
SHEET:
A6



LIVINGARREA

UNPOISED ARCHITECTURE INC. 5-16 SWEETLAND AVE. OTTAWA, ON. K1N-7T6

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CONSULTANTS:
STRUCTURAL - TBD
MECHANICAL - TBD
ELECTRICAL - TBD

4 REVISED SITE PLAN
3 REVISED SITE PLAN REVISED SITE PLAN
PRELIMINARIES NO. REVISION/ISSUE ROJECT: 3055 RICHMOND RD.

3055 RICHMOND RD. OTTAWA, ON K2B 6S6 613-000-00

FLOOR PLANS

DRAWN
BY: --
DATE: APRIL 12, 2022

SCALE: AS NOTED

1 ROOF PLAN A7 SCALE 1/4" = 1'-0"

