

ENVIRONMENTAL NOISE ASSESSMENT REPORT

For
10 Garrison Street, Ottawa

Prepared by:

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Revision 0
March 2024

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1. INTRODUCTION

W. Elias & Associates Consulting Engineers was retained by AS Design Company Inc. to investigate the potential impact of environmental noise on proposed development located at 10 Garrison Street, Ottawa, Ontario. The development is situated close to the intersection of Western Avenue and Garrison Street, Ottawa, Ontario. The noise assessment is requested as part of site plan application for proposed development. The proposed development consists of three story, residential building, located at 10 Garrison Street, Ottawa, Ontario. The property is surrounded by commercial properties to the west and south and is surrounded by residential properties to the east. Refer to appendixes for site details including the surrounding area, zoning, etc.

2. TERMS OF REFERENCE

Our assessment is based on the proposed development architectural drawings prepared by AS Design Company 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 the City of Ottawa’s Environmental Noise Control Guidelines.

4. TRAFFIC NOISE ASSESSMENT

4.1. CRITERIA FOR TRANSPORTATION TRAFFIC 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.

Type of Space	Time Period	L _{eq} (dBA)
		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.

4.2. Traffic Noise Predictions

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

4.2.1. Road Traffic

The traffic counts for Wellington Street were obtained based on the City of Ottawa Environmental Noise Study Guideline. The minimum traffic counts available in modeling software as recommended by the City of Ottawa “Environmental Noise Control Guidelines.”

Traffic data was split into daytime/nighttime and autos/medium/heavy using City of Ottawa “Environmental Noise Control Guidelines.” Posted speed limits, as per the ENCG 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
Wellington Street	0700-2300	30000	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. A stationary noise assessment is required to assess the noise impact of the proposed sources of stationary noise (mechanical HVAC system/equipment) of the development onto the surrounding residential area to ensure the noise levels do not exceed allowable limits

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specified in the City Environmental Noise Control Guidelines. Since no mechanical HVAC system/equipment was chosen for this development, no assessment could be made. A warning clause is added to cover this section for the present.

5. Noise Impact Assessment

$\text{Leq}_{\text{night}}$ and Leq_{day} attributable to Wellington Street were calculated using STAMSON v5.0, the computerized road, rail, and transit traffic noise prediction model of the MOE. The sound exposure levels were based on the future road traffic predictions, since the City of Ottawa official requires upcoming ultimate volume (AADT) for a 4 lanes arterial road of Wellington Street based on the City of Ottawa Transportation Master Plan. Screening due to surrounding buildings and terrain was accounted for in the analysis.

The noise impact was calculated for the ground and third level of the building. It was assumed, that if the summation of noise impact levels at first & third floor on south face is acceptable (the face with larger closest exposure to Road traffic), the other faces will be satisfied as well. Point of the receptor is located at the most exposed center of window (the height of the vertical midpoint of the nearest and most exposed story). In STAMSON modeling, Wellington Street 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 south. Sample sound exposure calculation and analysis assumptions are included in Appendix.

Table 3: Predicted Unmitigated Road Traffic Sound Exposures

Floor	Façade	Sound Level (dBA)	STC Requirement = 45 dBA	Total Sound Level (dBA)	STC Requirement = 40 dBA
		0700-2300		2300-0700	
1 st floor	South	57	12	50	10
3 rd floor	South	59	14	51	11



Receptor Locations, Angle of Exposure and Source Distances

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 $(59 - 45) = 14$

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 25, 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 59 dBA during the daytime period (07:00-23:00) and 51 dBA during the nighttime period (23:00-07:00).

The highest noise levels (i.e. 59 dBA) occur along the development's south façade, which is nearest and most exposed to Wellington Street. 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

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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:

- STC rated for all facades : STC 14*

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.

Stationary noise created by mechanical HVAC unit for this development shall NOT generate beyond 40dBA threshold as per the The City of Ottawa Environmental Noise Control Guideline (ENCG). "

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

Sincerely,



Yours truly,
Wissam Elias, P. Eng
Senior Project Manager

Appendix A

Stampson Calculation

STAMSON 5.0 NORMAL REPORT Date: 10-03-2024 10:36:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: garr3rd.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 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) : 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Wellington (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 70 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 45.00 / 45.00 m
Receiver height : 9.20 / 9.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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Results segment # 1: Wellington (day)

Source height = 1.50 m

ROAD (0.00 + 58.98 + 0.00) = 58.98 dBA

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

-90	90	0.43	71.49	0.00	-6.82	-1.04	0.00	-4.65
0.00	58.98							

Segment Leq : 58.98 dBA

Total Leq All Segments: 58.98 dBA

Results segment # 1: Wellington (night)

Source height = 1.50 m

ROAD (0.00 + 51.39 + 0.00) = 51.39 dBA

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

-90	90	0.43	63.89	0.00	-6.82	-1.04	0.00	-4.65
0.00	51.39							

Segment Leq : 51.39 dBA

Total Leq All Segments: 51.39 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.98

(NIGHT): 51.39

Noise Assessment Report

STAMSON 5.0 NORMAL REPORT Date: 10-03-2024 10:34:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: garrlst.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 24288/2112 veh/TimePeriod *
Medium truck volume : 1932/168 veh/TimePeriod *
Heavy truck volume : 1380/120 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) : 30000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: Wellington (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 70 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 45.00 / 45.00 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Noise Assessment Report

Results segment # 1: Wellington (day)

Source height = 1.50 m

ROAD (0.00 + 57.46 + 0.00) = 57.46 dBA

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

-90	90	0.66	71.49	0.00	-7.92	-1.46	0.00	-4.65
0.00	57.46							

Segment Leq : 57.46 dBA

Total Leq All Segments: 57.46 dBA

Results segment # 1: Wellington (night)

Source height = 1.50 m

ROAD (0.00 + 49.87 + 0.00) = 49.87 dBA

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

-90	90	0.66	63.89	0.00	-7.92	-1.46	0.00	-4.65
0.00	49.87							

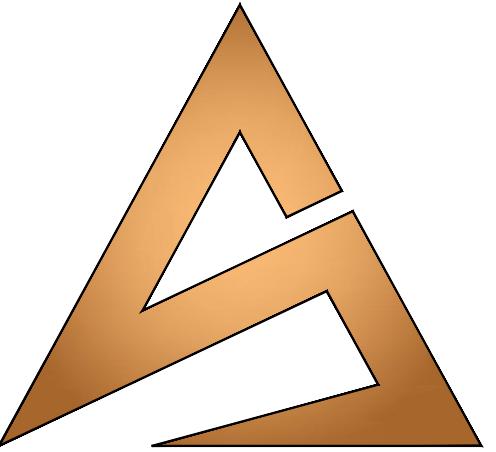
Segment Leq : 49.87 dBA

Total Leq All Segments: 49.87 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.46
(NIGHT): 49.87

Appendix B

Architectural Drawings



AS Design Company Inc.
The Passion of Design

AS DESIGN
COMPANY
32 HACKETT STREET,
OTTAWA, ON, K1V 0P7
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www.ASDesignCompany.com



10 GARRISON ST
LOW-RISE APARTMENT BUILDING

8

2023-01

2023-10-04

10 GARRISON ST
R1MM TO R4-UC

REV. NO.

PR. NO.

DATE

LOCATION

ZONING

PROJECT TITLE

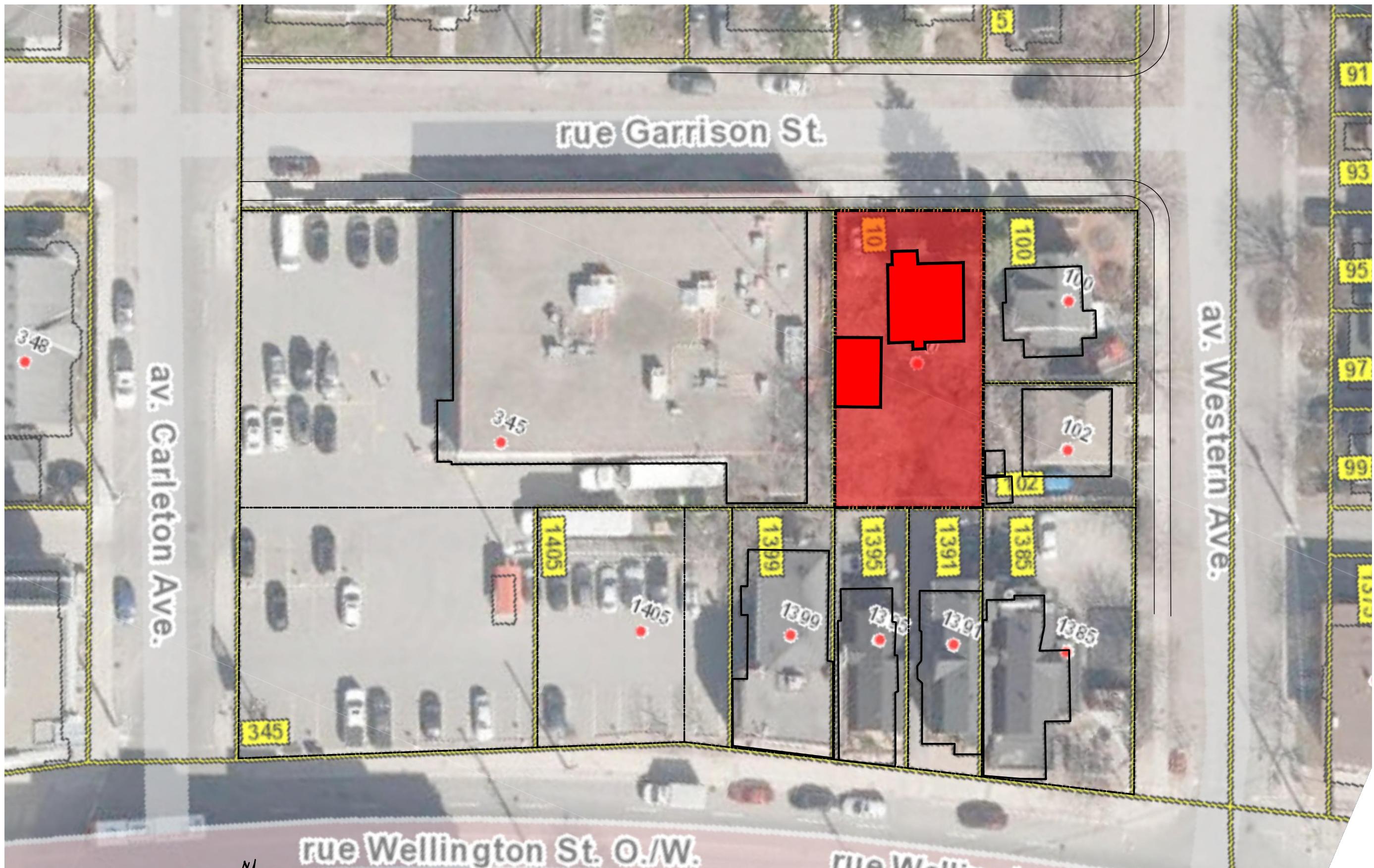
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6	FLR. PLANS REVIEW	2023-08-31
5	FLR. PLANS REVIEW	2023-08-29
4	FLR. PLANS REVIEW	2023-07-18
3	FLR. PLANS REVIEW	2023-07-10
2	SITE PLAN REVIEW	2023-06-23

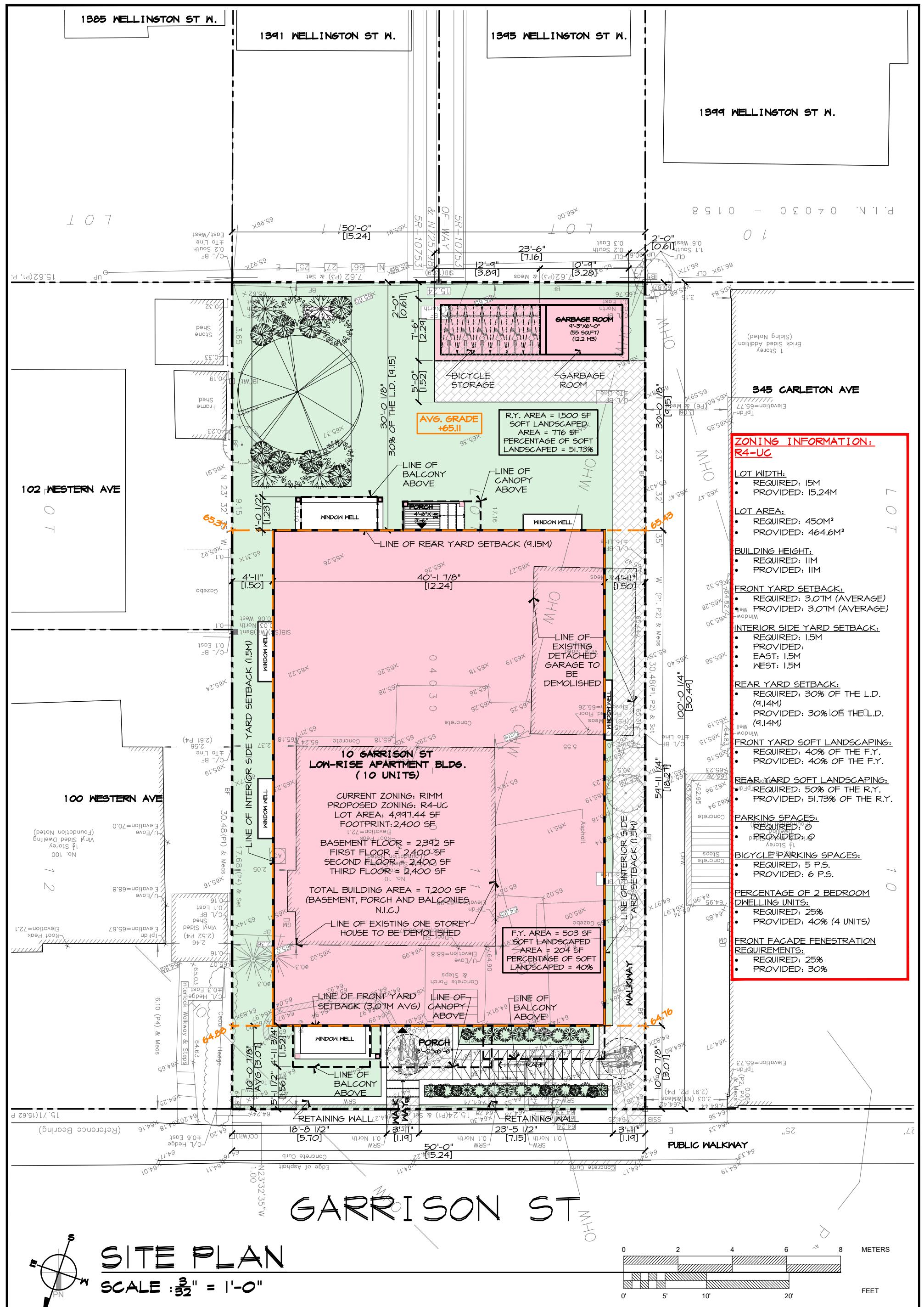
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2023-01

DATE: 2023-06-05
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DWG No.: A1



8 6 4 2 0 4 8
16 METERS
20' 10' 5' 0" 25' 50' FEET



GARRISON ST

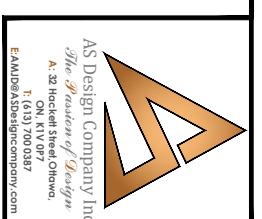
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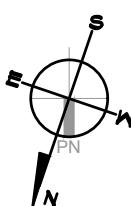
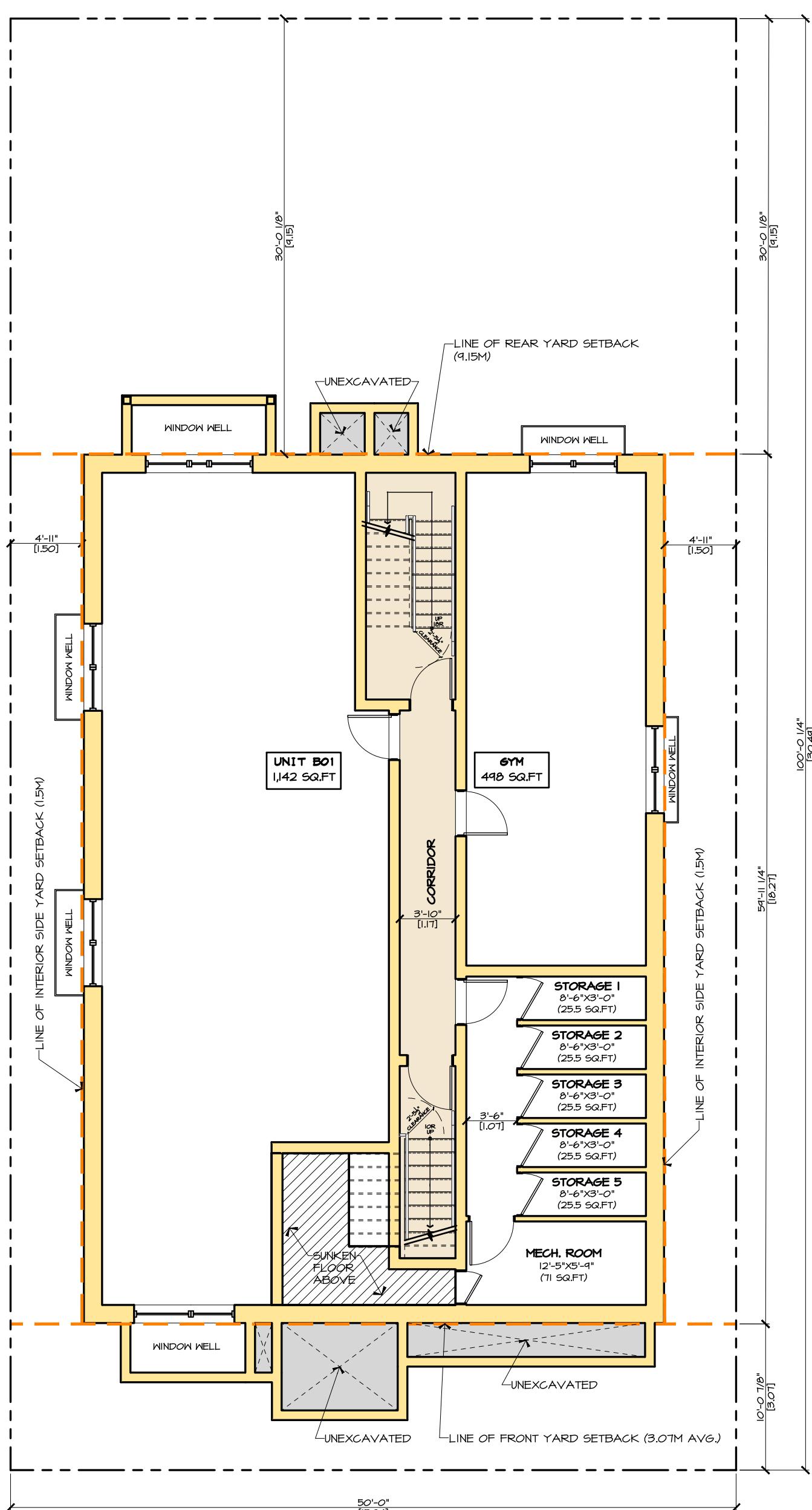
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DATE:	2023-
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2	SITE PLAN REVIEW	2025-06-29

10 GARRISON ST





BASEMENT FLOOR PLAN

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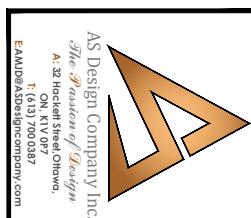
10 GARRISON ST

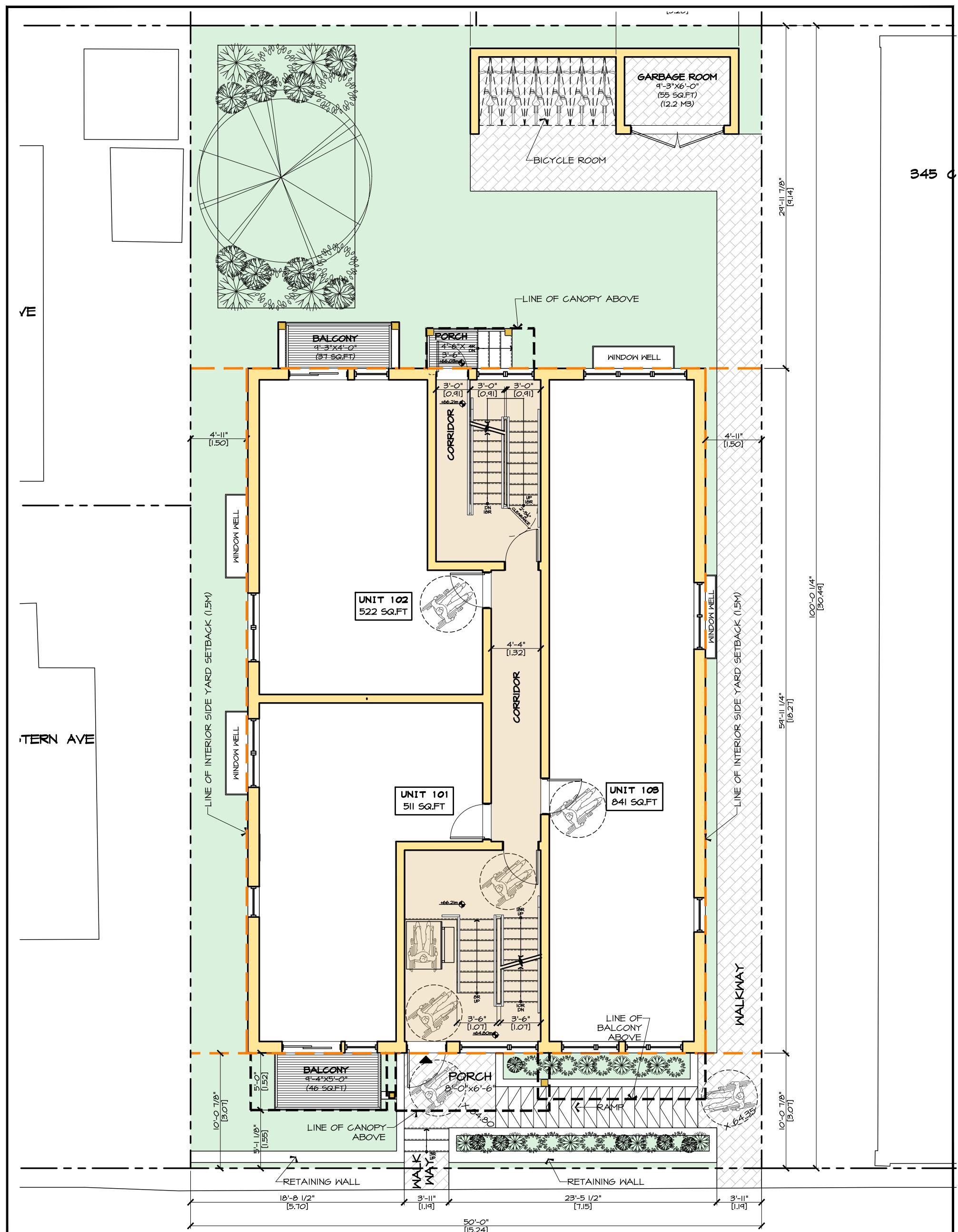
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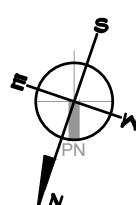
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FIRST FLOOR PLAN

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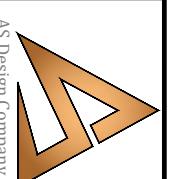
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FIRST FLOOR PLAN

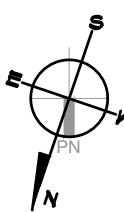
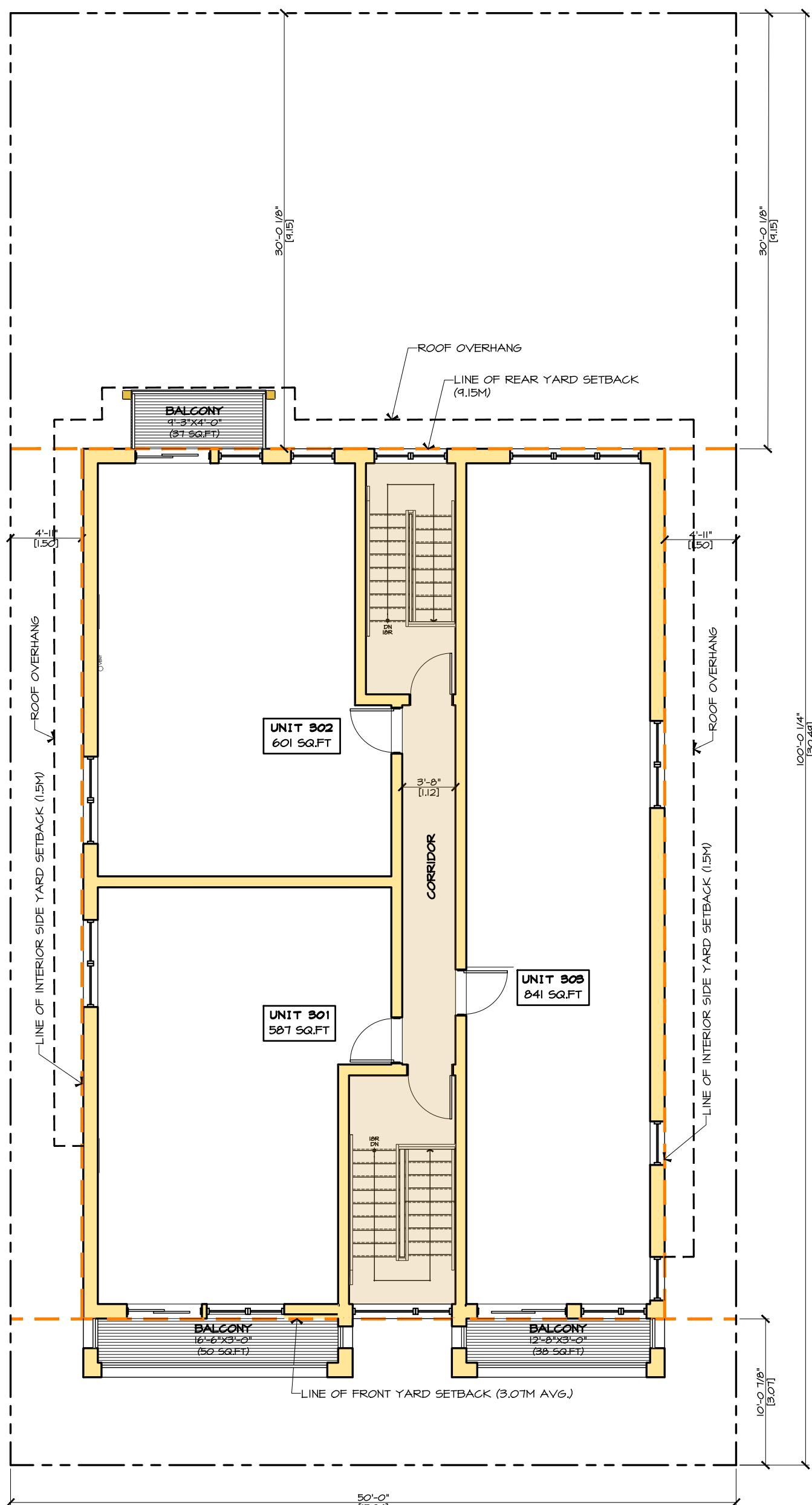
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7	ELEV. REVIEW	2023-09-29
6	FLR. PLANS	2023-08-31
5	FLR. PLANS REVIEW	2023-08-29
4	FLR. PLANS REVIEW	2023-07-18
3	FLR. PLANS REVIEW	2023-07-10
2	SITE PLAN RFV/FW	2023-06-23

10 GARRISON ST

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The Passion of Design
A: 32 Hackett Street, Ottawa,
ON K1V 0P7
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THIRD FLOOR PLAN

SCALE : $\frac{1}{8}$ " = 1'-0"

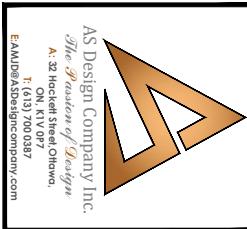
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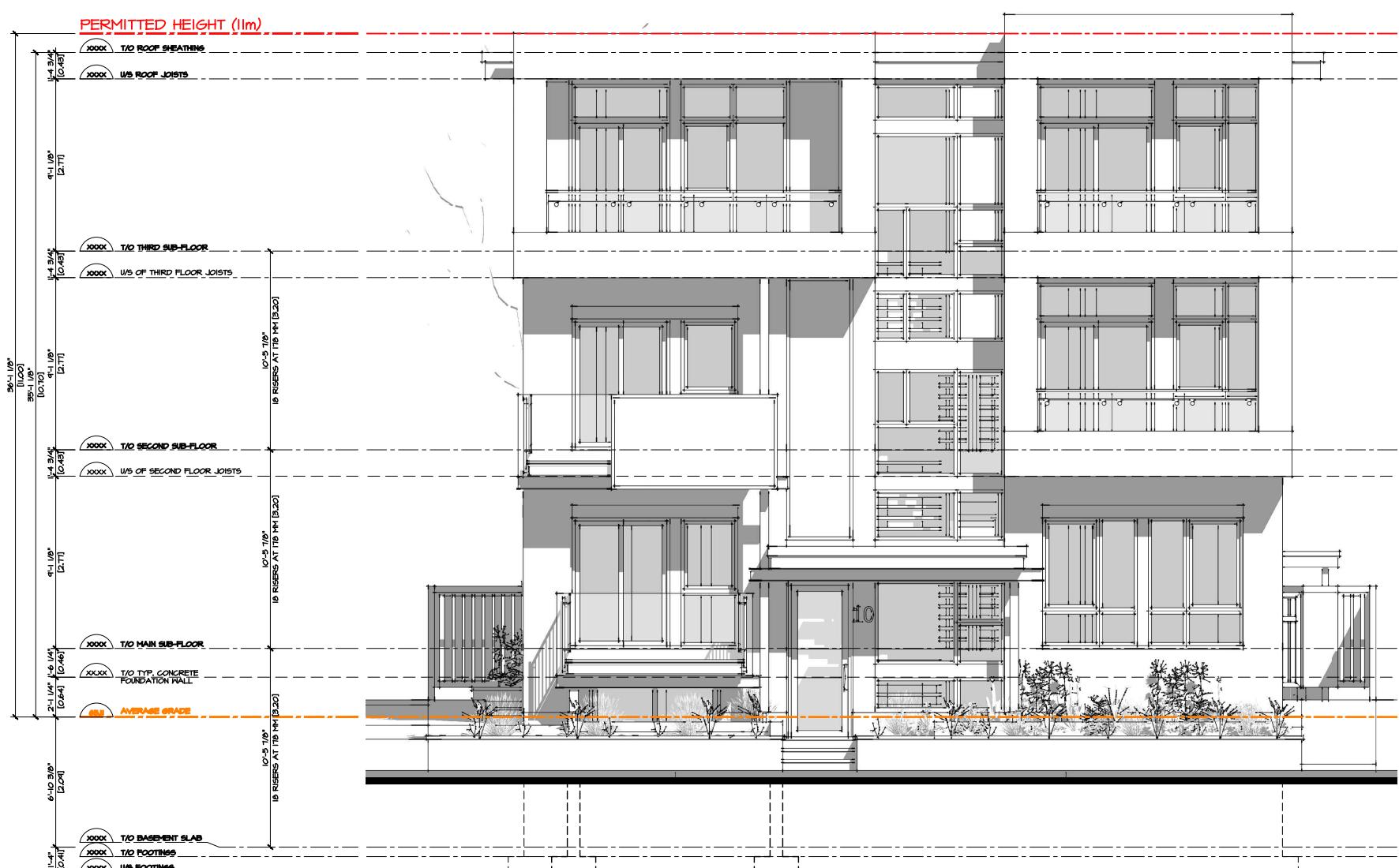
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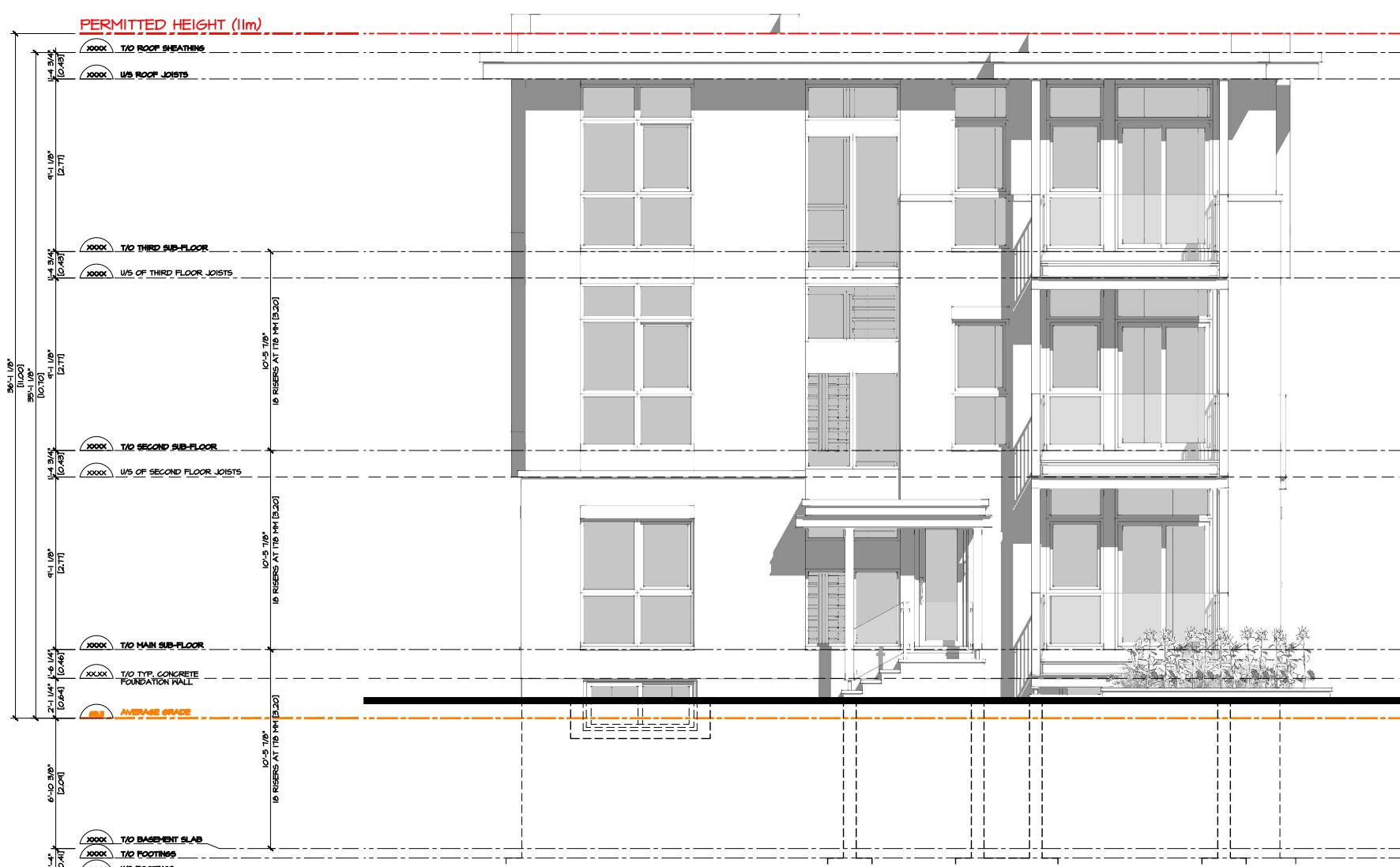
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NORTH ELEVATION

SCALE : $\frac{1}{8}$ " = 1'-0"



SOUTH ELEVATION

SCALE : $\frac{1}{8}$ " = 1'-0"

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2023-06-05

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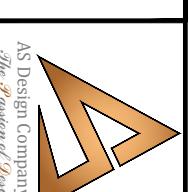
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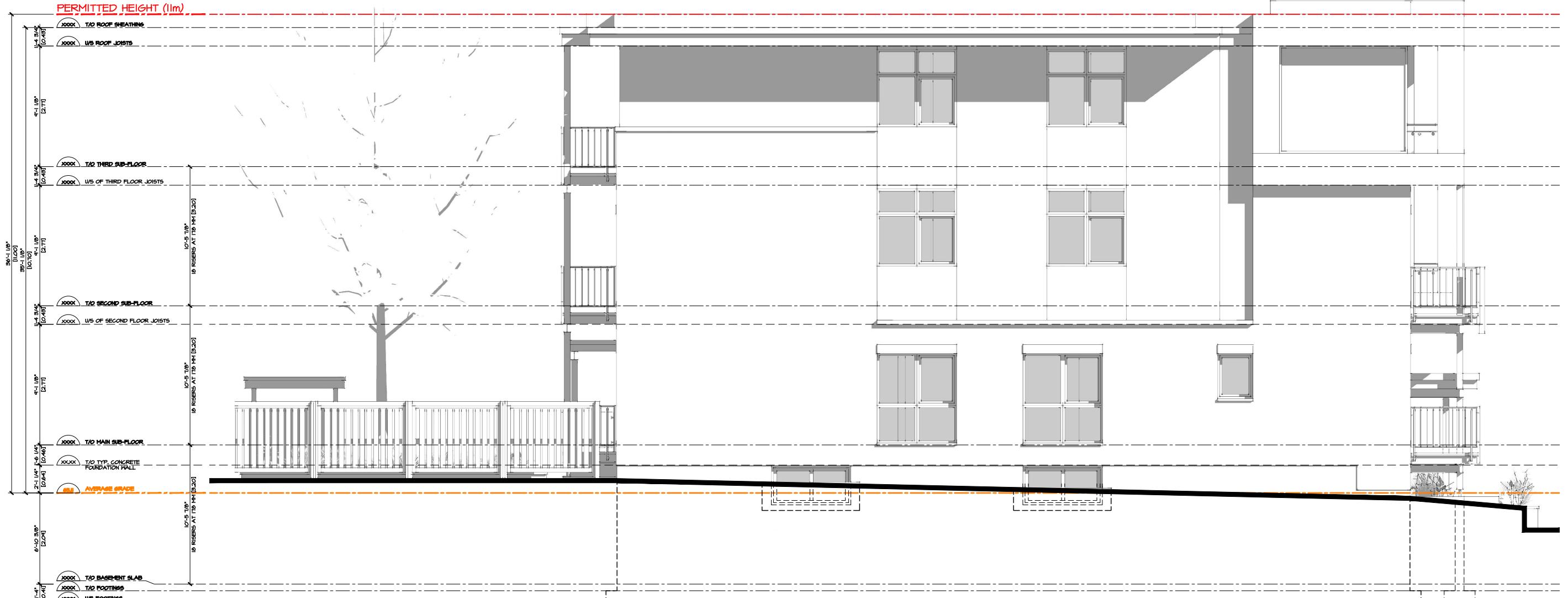
PROJECT TITLE

AS Design Company Inc.
The Practice of Design
A-32 Hock Kent Street Ottawa,
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T: (613) 780-0387
E: ASDesignCompany.com



PROJECT TITLE

10 GARRISON ST



8	PRE-CONSULT.	2023-10-04
7	ELEV. REVIEW	2023-09-22
6	FLR. PLANS REVIEW	2023-08-31
5	FLR. PLANS REVIEW	2023-08-29
4	FLR. PLANS REVIEW	2023-07-18
3	FLR. PLANS REVIEW	2023-07-10
2	SITE PLAN REVIEW	2023-06-23

PROJECT No.:
2023-01

DATE: 2023-06-05
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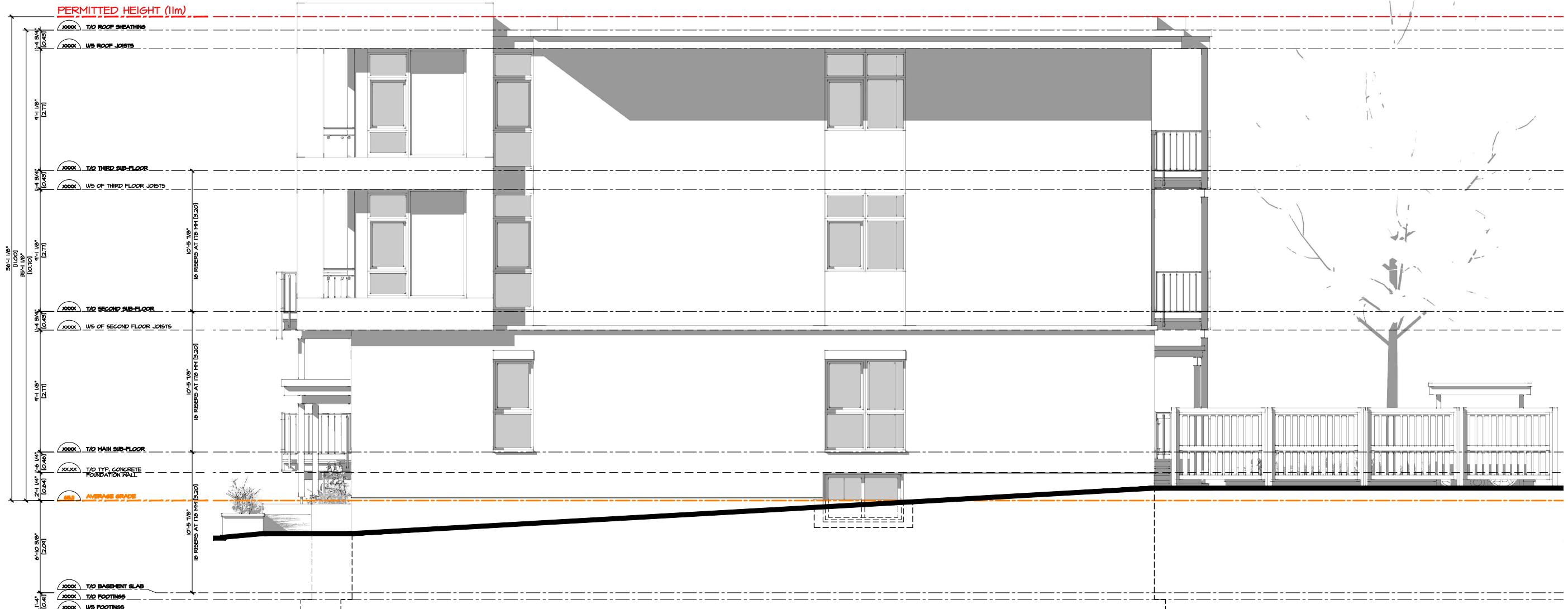
DWG No:
A8



AS Design Company Inc.
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E:AMJD@ASDesigncompany.com

PROJECT TITLE

10 GARRISON ST



WEST ELEVATION

SCALE : $\frac{1}{8}$ " = 1'-0"

3	PRE-CONSULT.	2023 10-04
7	ELEV. REVIEW	2023 09-22
6	FLR. PLANS REVIEW	2023 08-31
5	FLR. PLANS REVIEW	2023 08-29
4	FLR. PLANS REVIEW	2023 07-18
3	FLR. PLANS REVIEW	2023 07-10
2	SITE PLAN REVIEW	2023 06-23

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2023-01

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NORTH PERSPECTIVE



SOUTH PERSPECTIVE

10 GARRISON ST



NORTH EAST PERSPECTIVE



NORTH WEST PERSPECTIVE

10 GARRISON ST

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SOUTH EAST PERSPECTIVE



SOUTH WEST PERSPECTIVE

10 GARRISON ST

PROJECT No.:

2023-01

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PROJECT TITLE

10 GARRISON ST



8	PRE-CONSULT.	2023-10-04
7	ELEV. REVIEW	2023-09-22
6	FLR. PLANS REVIEW	2023-08-31
5	FLR. PLANS REVIEW	2023-08-29
4	FLR. PLANS REVIEW	2023-07-18
3	FLR. PLANS REVIEW	2023-07-10
2	SITE PLAN REVIEW	2023-06-23

PROJECT No. :
2023-01

DATE: 2023-06-05
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A|3

NORTH STREET CONTEXT PERSPECTIVE

PROPOSED FUTURE PERMITTED SIX STOREY BUILDING

PROJECT TITLE

10 GARRISON ST



8	PRE-CONSULT.	2023-10-04
7	ELEV. REVIEW	2023-09-22
6	FLR. PLANS REVIEW	2023-08-31
5	FLR. PLANS REVIEW	2023-08-29
4	FLR. PLANS REVIEW	2023-07-18
3	FLR. PLANS REVIEW	2023-07-10
2	SITE PLAN REVIEW	2023-06-23

PROJECT No. :
 2023-01

DATE:	2023-06-05
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DWG BY:	AS

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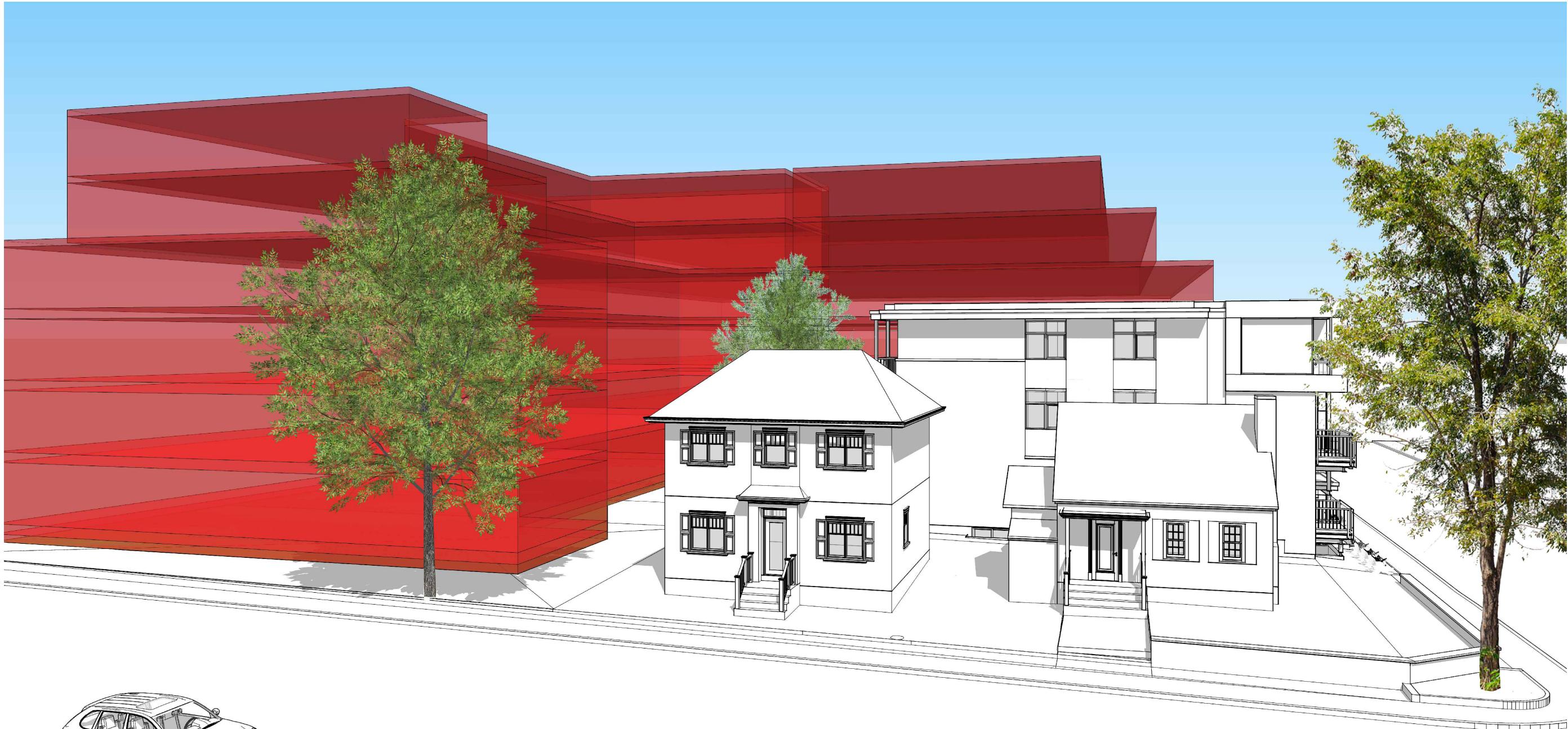
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NORTH EAST STREET CONTEXT PERSPECTIVE

PROPOSED FUTURE PERMITTED SIX STOREY BUILDING

PROJECT TITLE

10 GARRISON ST



EAST STREET CONTEXT PERSPECTIVE

PROPOSED FUTURE PERMITTED SIX STOREY BUILDING

8	PRE-CONSULT.	2023-10-04
7	ELEV. REVIEW	2023-09-22
6	FLR. PLANS REVIEW	2023-08-31
5	FLR. PLANS REVIEW	2023-08-29
4	FLR. PLANS REVIEW	2023-07-18
3	FLR. PLANS REVIEW	2023-07-10
2	SITE PLAN REVIEW	2023-06-23

PROJECT No.:
2023-01

DATE: 2023-06-05
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DWG No.:
A15

PROJECT TITLE

10 GARRISON ST



AERIAL STREET CONTEXT PERSPECTIVE

PROPOSED FUTURE PERMITTED SIX STOREY BUILDING

8	PRE-CONSULT.	2023-10-04
7	ELEV. REVIEW	2023-09-22
6	FLR. PLANS REVIEW	2023-08-31
5	FLR. PLANS REVIEW	2023-08-29
4	FLR. PLANS REVIEW	2023-07-18
3	FLR. PLANS REVIEW	2023-07-10
2	SITE PLAN REVIEW	2023-06-23

PROJECT No. :
 2023-01

DATE:	2023-06-05
CHECKED:	AS
DWG BY:	AS

DWG No:

A16