JLR No.: 31383
Revision: 0

December 15, 2023

Prepared for:

SMART LIVING PROPERTIES
226 Argyle Avenue
Ottawa, ON
K2P 1B9

Prepared by:

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Ottawa, ON
K1S 1N4
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Noise Control Detailed Study

280 Laurier Avenue East

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

Value through **service** and **commitment**

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1.0 INTRODUCTION

J.L. Richards & Associates Limited (JLR) was retained by Smart Living Properties (SLP) to prepare a Noise Control Detailed Study in support of a four-storey residential building addition beside an existing 6 storey building located at 280 Laurier Avenue East, within the City of Ottawa. The legal description of the subject property is Lot 5 and Part of Lot 6 (South Laurier Avenue) Registered Plan 14349, City of Ottawa. The purpose of this study is to assess the potential environmental noise impact on the proposed four storey residential building addition, due to vehicular traffic on Laurier Avenue East.

This report is prepared to satisfy the Ministry of the Environment (MOE) Environmental Noise Guidelines NPC-300 and the City of Ottawa Environmental Noise Control Guidelines (approved by City Council January 2016) and in particular Part 4 Section 3.1 Noise Control Feasibility Study Requirements.

2.0 PROJECT DESCRIPTION

The subject property is located within the urban limits of the City of Ottawa. The subject parcel is ±903 m^2 that is bounded by Laurier Avenue to the north, existing residential to the east and south, and Sweetland Avenue to the west, as shown on Figure 1 - Location Plan.

SLP's proposed residential development will consist of a four-storey building of 18 apartment units. In addition, the development will have an outdoor amenity area located at the rear of the property, as shown on the Site Plan provided in Appendix 'A'.

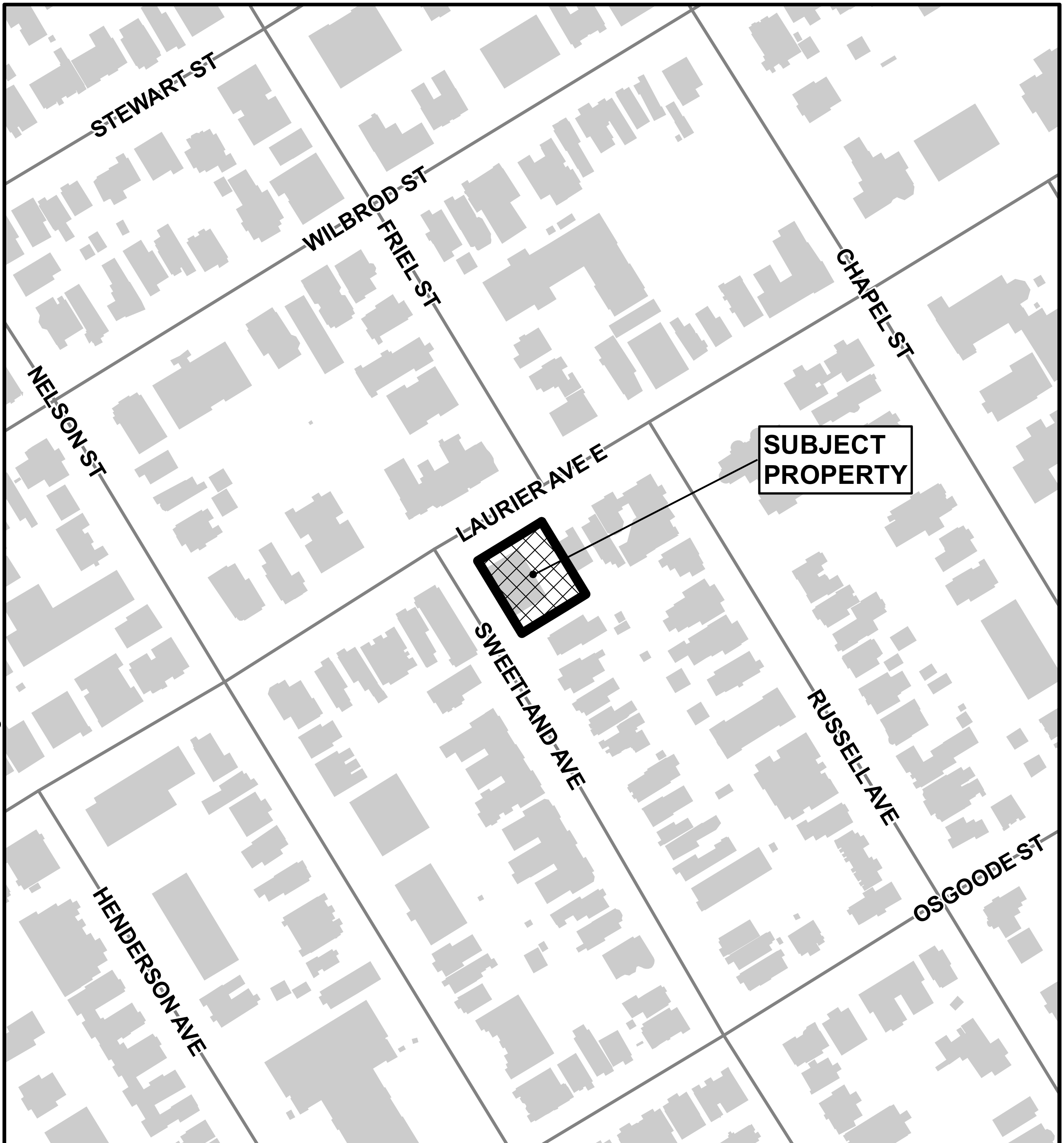
3.0 TRANSPORTATION NOISE SOURCE

The sole transportation noise source for 280 Laurier is Laurier Ave E. Sweetland Avenue is considered a local street that does not require noise analysis. Drawing N1 shows the location of the existing roadways in relation to the proposed development.

3.1 Transportation Sound Level Criteria

For the purpose of determining the predicted noise levels, and based on the sound level criteria established by the City of Ottawa Environmental Noise Control Guidelines (ENCG), the following will be used as the maximum acceptable sound levels (Leq) for residential development and other land uses, such as nursing homes, schools and daycare centres:

Receiver Location	Criteria	Time Period
Outdoor Living Area:	55 dBA	Daytime (0700 - 2300 hrs.)
Indoor Living/Dining Rooms (inside):	45 dBA	Daytime (0700 - 2300 hrs.)
General Office, Reception Area (inside):	50 dBA	Daytime (0700 - 2300 hrs.)
Sleeping Quarters (inside):	40 dBA	Nighttime (2300 - 0700 hrs.)



PROJECT:

SMART LIVING PROPERTIES - 280 LAURIER AVE. E.

280 LAURIER AVE. E., OTTAWA, ON

DRAWING:

LOCATION PLAN

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

DESIGN:	TB
DRAWN:	TB
CHECKED:	LJ
JLR #:	31383

DRAWING #:

FIGURE 1

File Location: P:\31000\31383-000 - Site Plan - 280 Laurier\5-Production\1-Civil\Figures\31383-LocationPlan.mxd

Plot Date: Wednesday, July 21, 2021 2:04:28 PM

Outdoor Living Areas (OLA) are defined as that portion of the outdoor amenity area of a dwelling for the quiet enjoyment of the outdoor environment during the daytime period. Typically, the point of assessment in an OLA is 3.0 m from the building façade mid-point and 1.5 m above the ground within the designated OLA for each individual unit. OLAs commonly include backyards, balconies (with a minimum depth of 4 m as per NPC-300), common outdoor living areas, and passive recreational areas.

3.2 Transportation Noise Attenuation Requirements

When the sound levels are equal to or less than the specified criteria, per the City of Ottawa ENCG and/or MOE NPC-300, no noise attenuation (control) measures are required.

The following tables outline noise attenuation measures to achieve required dBA Leq for surface transportation noise, per the City of Ottawa ENCG.

Table 1: Outdoor Noise Control Measures for Surface Transportation Noise

<table>
<tr><th rowspan="2">Primary Mitigation Measure
(in order of preference)</th><th colspan="2">Secondary Mitigation Measures</th></tr>
<tr><th>Landscape Plantings and/or Non-acoustic Fence to Obscure Noise Source</th><th>Warning Clauses</th></tr>
<tr><td>Distance setback with soft ground</td><td rowspan="2">Recommended</td><td rowspan="2"></td></tr>
<tr><td>Insertion of Noise insensitive land uses between the source and receiver receptor</td></tr>
<tr><td>Orientation of buildings to provide sheltered zones in rear yards</td><td rowspan="4">Required</td><td rowspan="4">Warning Clauses necessary and to include:
- Reference to specific noise mitigation measures in the development.
- Whether noise is expected to increase in the future.
- That there is a need to maintain mitigation.</td></tr>
<tr><td>Shared outdoor amenity areas</td></tr>
<tr><td>Earth berms (sound barriers)</td></tr>
<tr><td>Acoustic barriers (acoustic barriers)</td></tr>
</table>

Table 2: Indoor Noise Control Measures for Surface Transportation Noise

<table>
<tr><th rowspan="2">Primary Mitigation Measure
(in order of preference)</th><th colspan="2">Secondary Mitigation Measures</th></tr>
<tr><th>Landscape Plantings and/or Non-acoustic Fence to Obscure Noise Source</th><th>Warning Clauses</th></tr>
<tr><td>Distance setback with soft ground</td><td rowspan="2">Recommended</td><td rowspan="2">Not necessary</td></tr>
<tr><td>Insertion of Noise insensitive land uses between the source and receiver receptor</td></tr>
<tr><td>Orientation of buildings to provide sheltered zones or modified interior spaces and amenity areas</td><td rowspan="4">Required</td><td rowspan="4">Warning Clauses necessary and to include:
- Reference to specific noise mitigation measures in the development.
- Whether noise is expected to increase in the future.
- That there is a need to maintain mitigation.</td></tr>
<tr><td>Enhanced construction techniques and construction quality</td></tr>
<tr><td>Earth berms (sound barriers)</td></tr>
<tr><td>Indoor isolation – air conditioning and ventilation, enhanced dampening materials (indoor isolation)</td></tr>
</table>

The following tables outline the noise level limits per the MOE NPC-300 and City of Ottawa ENCG.

Table 3: Outdoor Living Area (OLA) Noise Limit for Surface Transportation

Time Period	Leq (16 hr) (dBA)
16 hr., 07:00 am - 23:00	55

Table 4: Indoor Noise Limit for Surface Transportation

<table>
<tr><th rowspan="2">Type of Space</th><th rowspan="2">Time Period</th><th colspan="2">Leq (dBA)</th></tr>
<tr><th>Road</th><th>Rail</th></tr>
<tr><td>Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.</td><td>07:00-23:00</td><td>45</td><td>40</td></tr>
<tr><td>Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)</td><td>23:00-07:00</td><td>45</td><td>40</td></tr>
<tr><td rowspan="2">Sleeping quarters</td><td>07:00-23:00</td><td>45</td><td>40</td></tr>
<tr><td>23:00-07:00</td><td>40</td><td>35</td></tr>
</table>

In addition to the implementation of noise attenuation features, if required, and depending on the severity of the noise problem, warning clauses may be recommended to advise the prospective purchasers/tenants of affected units of the potential environmental noise. These warning clauses should be included in the Site Plan and Subdivision Agreements, in the Offers of Purchase and Sale, and should be registered on Title. Warning clauses may be included for any development, irrespective of whether it is considered a noise sensitive land use.

Where site measures are required to mitigate noise levels, the City of Ottawa requires that notices be placed on Title informing potential buyers and/or tenants of the site conditions.

3.3 Prediction of Noise Levels

3.3.1 Road Traffic Data

The following traffic data was used to predict noise levels:

Table 5: Road Traffic Data to Predict Noise Levels

	Laurier Avenue East
Total Traffic Volume (AADT)	12,000
Day/Night Split (%)	92/8
Medium Trucks (%)	7
Heavy Trucks (%)	5
Posted Speed (km/hr.)	50
Road Gradient (%)	1
Road Classification	2-Lane Major Collector (2-UMCU)

Schedule 'F' and Table 1 of Annex 1 of the City of Ottawa Official Plan (May 2003) were utilized to determine the road classification and protected right-of-way. These road classifications were compared to Map 6 of the City of Ottawa Transportation Master Plan (Road Network – Urban). All findings were then compared to Table B1 (Part 4, Appendix 'B') of the City of Ottawa Environmental Noise Control Guidelines in order to determine an appropriate AADT value.

3.3.2 Noise Level Calculations (Transportation)

The noise levels for the daytime and nighttime periods were calculated for a number of representative receivers described in Table 6 and shown on Drawing N1, using the MOE Road Traffic Noise Computer program STAMSON, Version 5.03.

Computer printouts are included in Appendix 'B'.

Table 6: Predicted Noise Levels (Transportation)

Receiver No. and File Names	Receiver Description and Location	Noise Levels (dBA) Daytime	Nighttime
R1 280_R1	Plane of Window (Ground Floor Unit, 101) fronting on Laurier Avenue East at a distance of 14.3 m from the centreline of Laurier Avenue East.	66.13	58.53
R2 280_R2	Plane of Window (Third Floor Unit, 301) fronting on Laurier Avenue East at a distance of 14.3 m from the centreline of Laurier Avenue East.	66.43	58.83
R3 280_R3	Plane of Window (Forth Floor Unit, 401) fronting on Laurier Avenue East at a distance of 14.3 m from the centreline of Laurier Avenue East.	66.70	59.10

3.4 Summary of Findings (Transportation)

A summary of the minimum noise requirements and required Warning Clauses is shown on Table 7. The units will require notices to be registered on Title, advising the occupants of the environmental noise problems and/or of the noise attenuation measures being implemented.

Table 7: Minimum Required Control Features/Warning Clauses (Transportation)

Receiver Location	Noise Attenuation Barrier	Central Air Conditioning	Forced Air Heating	Warning Clauses	Building Components Study
Plane of Window (Units B01, 101, 201, 301, 401)	n/a	Yes	Yes	B	Yes

3.5 Summary of Findings (Building Component)

JLR completed preliminary building component analyses of a typical unit for SLP's proposed four-storey residential building to determine if sufficient acoustical insulation is provided with a 'typical' building construction to mitigate interior noise levels to MOECC and City of Ottawa criteria. The Acoustical Insulation Factor (AIF) Method, as described in the Ministry of the Environment Ontario, Ontario Publication, Environmental Noise Assessment in Land Use Planning (ENALUP) 1987 (Page 10-29), was used; to assess the building construction required to mitigate exterior noise to meet interior noise criteria. Exterior freefield noise levels at the plane of the windows were calculated for the first and top floors. A freefield noise level of 67 dBA was utilized to determine wall and window construction.

SLP provided floor plan and building elevation drawings, for the four-storey residential building units. Floor and elevation drawings are included in Appendix 'C'. These units are considered representative units. Using SLP's drawings, JLR calculated the window areas, floor areas and wall areas for each of the rooms within the units. This data was then used to calculate the window to floor area ratios and wall to floor area ratios. Design tables provided in ENALUP were then utilized to identify minimum window construction and wall construction requirements to mitigate the plane of window noise levels. Table 11 in Appendix 'D' present the working calculations for the window and wall requirements necessary to acoustically insulate each of the noise sensitive rooms within each of the representative units. The following table presents a summary of the analysis with the minimum standard window and wall construction required per unit type.

Table 8: Minimum Window and Wall Construction Types

Unit Type	Representative Window Type Glass Thickness (Spacing) Glass Thickness	Representative Exterior Wall Type
Apartment Unit (B01, 101, 201, 301, 401)	3(20)3 Double Pane	EW1

For this analysis, sliding glass doors identified on the plans are treated as a window. The acoustic insulation factor methodology does not account for sliding glass doors as a door type. It is noted that no additional doors are identified with a connection to the noise sensitive interior rooms such as the living room, bedroom or kitchen area.

For units not subject to a detailed building component study, a standard wall construction detail with a 38 x 89 mm wall construction complete with siding, sheathing, insulation and 12.7 mm gypsum board will provide satisfactory acoustic insulation to achieve indoor noise requirements.

Exterior wall type construction notes:

- EW1 – Standard wall construction (noted above), with sheathing, wood or metal siding and fibre backer board.
- EW2 – Standard wall construction (noted above), with rigid insulation (25-30 mm), wood or metal siding, and fibre backer board.
- EW3 – Standard wall construction (noted above), with sheathing, 28 x 89 mm framing, sheathing and asphalt roofing material.
- EW4 – Standard wall construction (noted above), with sheathing and 20 mm stucco.

It should be noted that other types of window and wall construction could be chosen to achieve the same minimum noise mitigation. These details will be established during the detailed building component study in consultation with SLP.

Tables A2 and A3 from Canada Mortgage and Housing's (CMHC) publication, Airport Noise, revised 1981 were used to convert AIF values to the more widely recognized Sound Transmission Class (STC) values. Appendix 'F' presents these CMHC tables.

AIF and equivalent STC values are presented in Table 9 for the town unit bedroom with the highest AIF requirement. It is recommended that at the time of building permit application that the AIF/STC be confirmed to suit the specific unit proposed for the Block.

Table 9: AIF Value Conversion to STC Value

Type of Unit	AIF Required	Windows			Walls		
		Window/Floor Area Ratio	AIF Conversion Formula	STC	Wall/Floor Area Ratio	AIF Conversion Formula	STC
Apartment (B01, 101, 201, 301, 401)	32	23%	STC	32	63%	STC - 4	36

4.0 OPINION OF PROBABLE COSTS (OPC) FOR MITIGATION MEASURES

Based on consultation with SLP, the following table summarizes our opinion of probable costs for the mitigation measures identified in this report.

Table 10: Opinion of Probable Costs for Mitigation Measures

Item	Cost per Unit	Estimated Quantity	Estimated Sub-Total
Central Air Conditioning (where required)	$3,000/unit	5	$15,000
Windows with STC Rating 33	$2,250/unit	12	$27,000
Estimated Total			**$42,000**

5.0 CONCLUSION AND RECOMMENDATIONS

Predicted noise levels are expected to exceed the City of Ottawa ENCG and MOE criteria at the plane of window for the façade facing Laurier Avenue East. For the Units fronting Laurier Avenue East, air conditioning will be required as well as windows with a STC rating of 33 or greater. The front wall construction must meet the minimum requirements of an EW1.

5.1 Indoor Noise Control Features

5.1.1 Heating System

The following Units/Lots shall be fitted with a forced air heating system or equivalent system:

- Units B01, 101, 201, 301, 401.

5.1.2 Cooling System

The following Units/Lots shall be fitted with central air conditioning or equivalent system:

- Units B01, 101, 201, 301, 401.

5.2 Warning Clauses

5.2.1 Warning Clause Type B

- Clause B is to be registered on Title for Units B01, 101, 201, 301, 401 inclusive:

“Purchasers/tenants are advised that despite the inclusion of noise control features within the building units, sound levels due to increasing road/transitway 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.

To help address the need for sound attenuation this dwelling unit includes:

- *single/multi-pane glass windows;*
- *provision for central air conditioning.*

To ensure that provincial sound level limits are not exceeded it is important to maintain these sound attenuation features.

This dwelling unit has also been designed with the provision for adding central air conditioning at the occupant’s discretion. Installation of central 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 and the Ministry of the Environment.“

5.3 Site Plan Agreement and Notices on Title

It is recommended that the previous recommendations and Warning Clauses are to be included in the Site Plan Agreement and in the Offers of Purchase and Sale and/or lease of the affected units and be registered on Title.

5.4 Building Permit Requirements

A report prepared and stamped by a Professional Engineer / Acoustical Consultant detailing building components (e.g., glazing/window, wall sections) to provide acoustical insulation to satisfy the City of Ottawa Environmental Noise Control Guidelines for indoor noise levels is required prior to the issuance of a Building Permit for the following units subject to this Report:

- Units B01, 101, 201, 301, 401.

This report has been prepared for the exclusive use of Smart Living Properties, for the stated purpose, for the named facility. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of Smart Living Properties and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

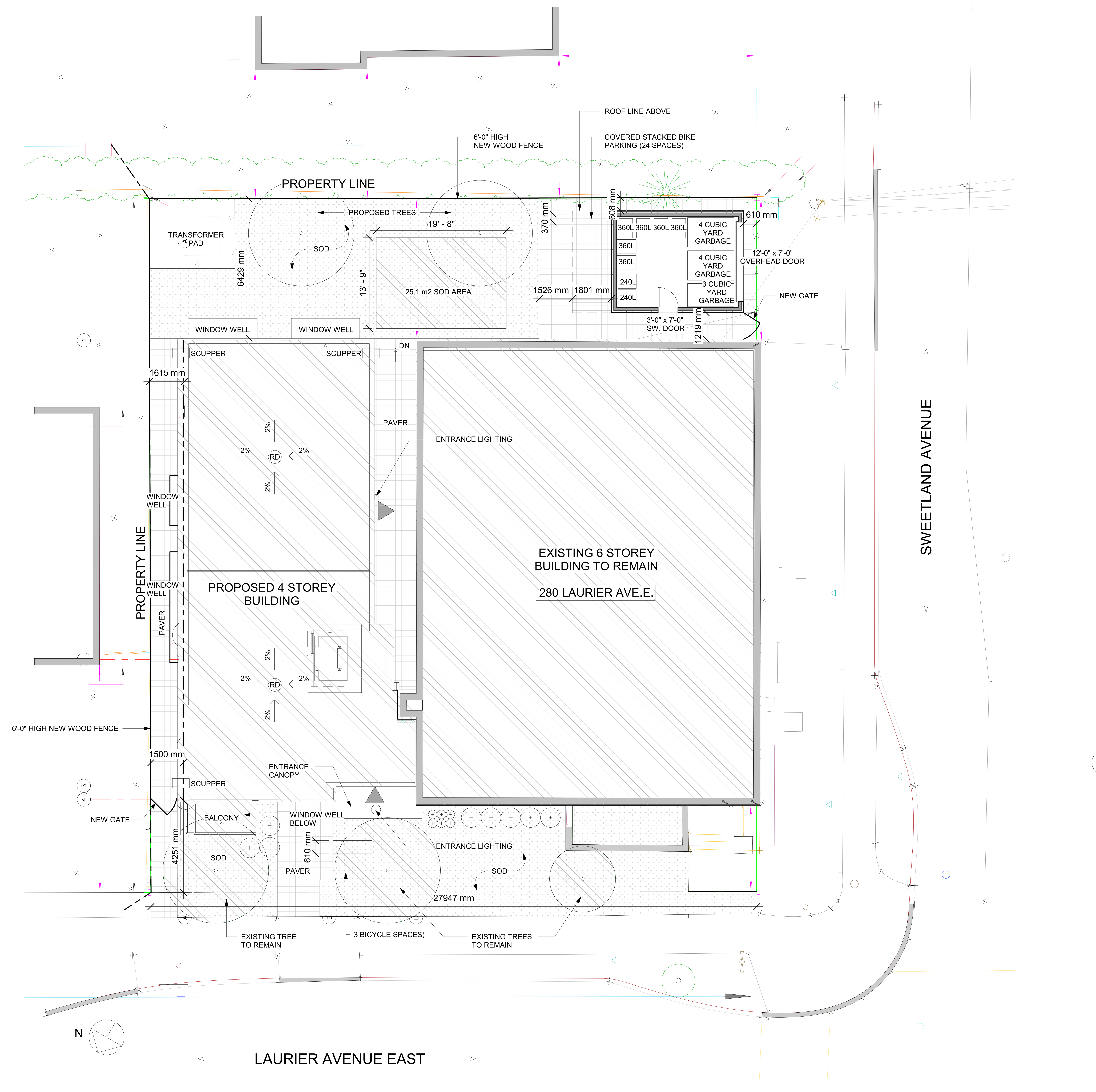
Thomas Blais, A.Sc.T
Senior Technologist

Reviewed by:

Lee Jablonski, P.Eng.
Associate
Senior Civil Engineer

Appendix A

Drawings



SITE PLAN
SCALE: 1:100

280 LAURIER AVE. E.			
SITE PLAN OF SURVEY LOT 5 AND PART OF LOT 6 (SOUTH LAURIER AVENUE) REGISTERED PLAN 14349, CITY OF OTTAWA	SURVEY INFO TAKEN FROM LOT 5 AND PART OF LOT 6 (SOUTH LAURIER AVENUE) REGISTERED PLAN 14349, CITY OF OTTAWA PREPARED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. COMPLETED FEBRUARY 5, 2021		
R4UD [480]- RESIDENTIAL FOURTH DENSITY ZONE (SEC. 161-162) CITY OF OTTAWA; DWELLING TYPE: NEW ADDITION TO EXISTING 6 STOREY MID RISE APARTMENT BUILDING (RENTALS)			
ZONING MECHANISMS	**REQUIREMENT**	**PROVIDED**	**NOTES**
A) MINIMUM LOT AREA	450 m²	895.5 m²	
B) MINIMUM LOT WIDTH	15 m	27.95 m	
C) MINIMUM LOT DEPTH	N/A	32 m	
D) MINIMUM FRONT YARD SET BACK	AVERAGE (4.5m+4.01m) /2 =4.255m	4.25 m	
E) MINIMUM CORNER YARD SET BACK	AVERAGE (3m+0m) /2 =1.5m	0 m (EXISTING)	
F) MINIMUM INTERIOR SIDE YARD SETBACK	1.5 m	1.5 m	
G) MINIMUM REAR YARD SET BACK	8 m	6.43 m	BY-LAW 2022-291
H) MINIMUM REAR YARD AREA	25% of 895.5 m² = 223.875 m²	180.16 m²	BY-LAW 2022-291
I) MAXIMUM BUILDING HEIGHT	14.5 m	14.46 m	
J) VEHICULE PARKING (RESIDENTS)	44x0.5=22	0	BY-LAW 2022-291
VEHICULE PARKING (VISITOR)	44x0.1=4.4	0	BY-LAW 2022-291
VEHICULE PARKING (TOTAL)	26.4	0	BY-LAW 2022-291
K) BIKE SPACES	56x0.5=28	30 (STACKED) INDOOR +24 (STACKED) OUTDOOR +3 STANDARD OUTDOOR	
	REQUIREMENT	**PROVIDED**	**EXISTING**
L) AMENITY AREA	0	104.2 m² @ BACK & 20.8 m² BALCONIES TOTAL = 125 m²	
M) FRONT YARD, SOFTSCAPING PERCENTAGE	40%	60.8%	
N) REAR YARD, SOFTSCAPING PERCENTAGE	50%	53.6%	

BUILDING AREA

FLOOR NAME	**EXISTING**	**PROPOSED ADDITION**	**TOTAL**
BASEMENT	341 m²	193.6 m²	534.6 m²
GROUND FLOOR	341 m²	193.6 m²	534.6 m²
SECOND FLOOR	341 m²	193.6 m²	534.6 m²
THIRD FLOOR	341 m²	193.6 m²	534.6 m²
FOURTH FLOOR	341 m²	193.6 m²	534.6 m²
FIFTH FLOOR	341 m²	0 m²	341 m²
SIXTH FLOOR	341 m²	0 m²	341 m²
TOTAL	2387 m²	968 m²	3355 m²

	BACHELOR	**1 BED**	**2 BED**	**3 BED**	**4 BED**	**TOTAL**
EXISTING BUILDING	**29**	**11**	**0**	**0**	**0**	**40**
PROPOSED NEW UNIT @EXISTING BUILDING	**0**	**0**	**0**	**0**	**0**	**0**
PROPOSED ADDITION	**12**	**0**	**2**	**3**	**1**	**18**
TOTAL	**41**	**11**	**2**	**3**	**1**	**58**
REQUIRED 2+ BEDROOM			**4**			
PROPOSED 2+ BEDROOM			**6**			

AVERAGE GRADE:

CALCULATED FROM EXISTING ELEVATION POINTS AT A DISTANCE EQUAL TO THE MINIMUM FRONT YARD & REAR YARD SETBACKS, AT THE INTERIOR SIDE PROPERTY LINES

AVERAGE GRADE : 70.045m (69.87m + 70.13m + 69.85m + 70.33m) /4

REDLINE ARCHITECTURE INC.
Tel: 613-612-2232
info@redlinearchitecture.ca
www.redlinearchitecture.ca

RESPONSIBILITIES:

DO NOT SCALE DRAWINGS

ALL DESIGN AND CONSTRUCTION TO BE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE 2012

ALL CONTRACTORS MUST WORK IN ACCORDANCE WITH ALL LAWS, REGULATIONS AND BYLAWS HAVING JURISDICTION

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT/DESIGNER

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED BY THE ARCHITECT

GENERAL NOTES:

280 LAURIER AVE. E.
NEW ADDITION TO EXISTING 6 STOREY BUILDING

CONSULTANTS:
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
9		
8		
7		
6		
5		
4		
3		
2		
1	ISSUED FOR SPA	08/11/23

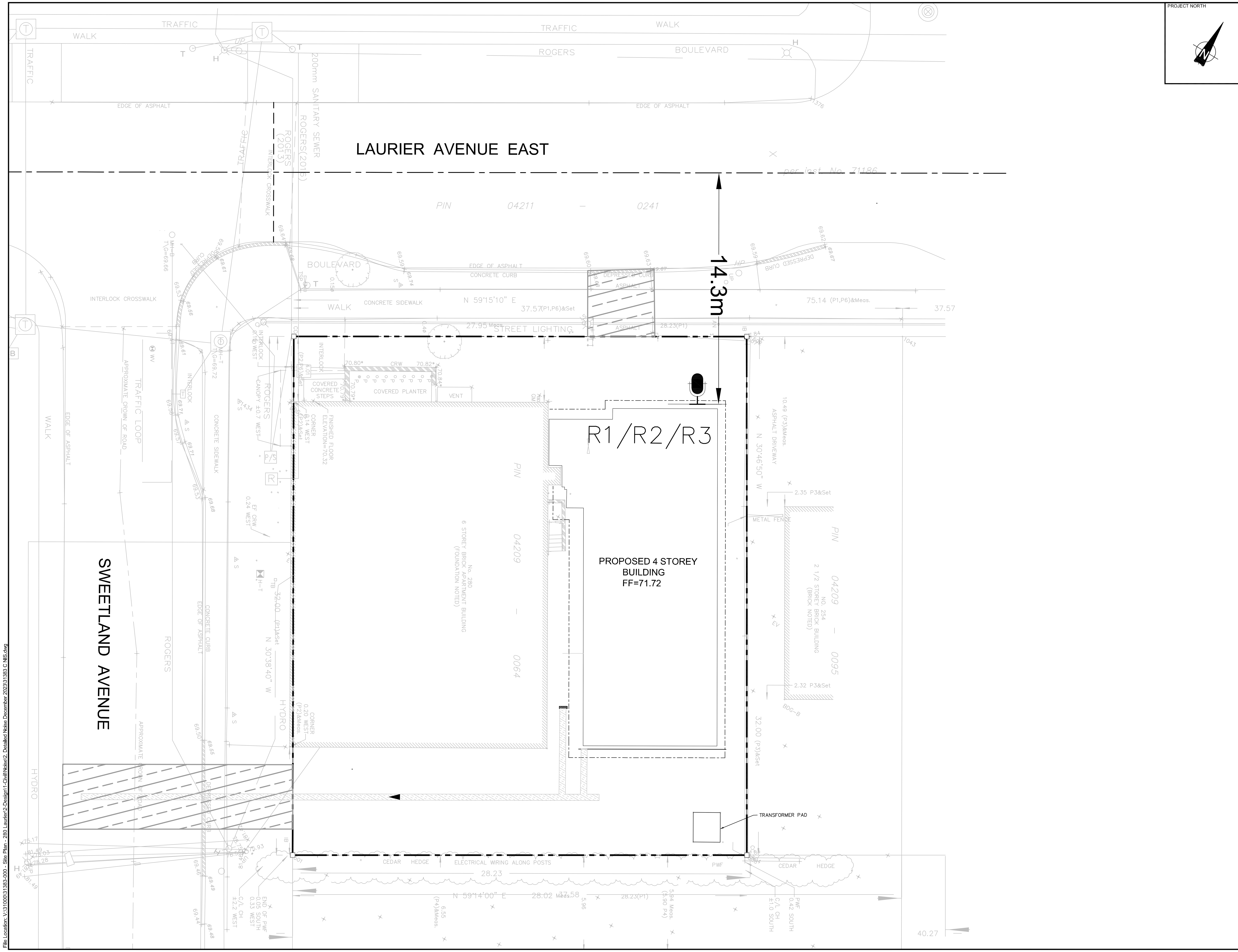
PROJECT:
280 LAUREER AVE. E.
NEW ADDITION TO
EXISTING 6 STOREY BUILDING
280 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

SITE PLAN

DRAWN BY:
DATE: MARCH 29, 2021
SCALE: AS NOTED
SHEET: A0

D07-12-21-0133

18571



LEGEND

PLANE OF WINDOW RECEIVER

ANGLE OF NOISE SOURCE TO RECEIVER 45°

No.	ISSUE / REVISION	DD/MM/YY

VERIFY SHEET SIZE AND SCALES. THE BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 1:100

CLIENT: SMART LIVING PROPERTIES

CONSULTANT: www.jlrichards.ca
J.L.Richards ENGINEERS · ARCHITECTS · PLANNERS

CONSULTANT:

PROFESSIONAL STAMP | PROFESSIONAL STAMP

PROJECT: 280 LAURIER AVENUE EAST

DRAWING: NOISE CONTROL DETAILED STUDY RECEIVER LOCATIONS

DESIGN: TB
DRAWN: TB
CHECKED: LJ
JLR #: 31383
DRAWING #: N1

File Location: V:\31000\31383-000 - Site Plan - 280 Laurier\2-Design\1-Civil\Noise\2. Detailed Noise December 2023\31383 C NIS.dwg

PLOT DATE: December 14, 2023 10:31:46 AM

Appendix B

Transportation Noise Source Predictions

```
STAMSON 5.0        NORMAL REPORT        Date: 21-07-2021 15:25:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 280_R1.te            Time Period: Day/Night 16/8 hours
Description: 280 Laurier Ave E Ground floor plane of window r1


Road data, segment # 1: laurier (day/night)
-------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     1 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  12000
    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: laurier (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           :   2.90 / 2.90   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: laurier (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 66.13 + 0.00) = 66.13 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
--------------------------------------------------------------------------------
   -90     90   0.62  67.51   0.00   0.00  -1.39   0.00   0.00   0.00  66.13
--------------------------------------------------------------------------------

Segment Leq : 66.13 dBA
```

```
Total Leq All Segments: 66.13 dBA

↑
Results segment # 1: laurier (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.53 + 0.00) = 58.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.62  59.91   0.00   0.00  -1.39   0.00   0.00   0.00  58.53
----------------------------------------------------------------------------

Segment Leq : 58.53 dBA

Total Leq All Segments: 58.53 dBA

↑



TOTAL Leq FROM ALL SOURCES (DAY): 66.13
                         (NIGHT): 58.53
↑
↑
STAMSON 5.0        NORMAL REPORT        Date: 21-07-2021 15:34:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 280_r2.te            Time Period: Day/Night 16/8 hours
Description: 280 laurier Ave E Second floor plane of window r2


Road data, segment # 1: laurier (day/night)
-------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     1 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  12000
    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: laurier (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           :   8.40 / 8.40   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

↑

```
Results segment # 1: laurier (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 66.43 + 0.00) = 66.43 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.45  67.51   0.00   0.00  -1.09   0.00   0.00   0.00  66.43
----------------------------------------------------------------------------

Segment Leq : 66.43 dBA

Total Leq All Segments: 66.43 dBA
```

↑

```
Results segment # 1: laurier (night)
------------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.83 + 0.00) = 58.83 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.45  59.91   0.00   0.00  -1.09   0.00   0.00   0.00  58.83
----------------------------------------------------------------------------

Segment Leq : 58.83 dBA

Total Leq All Segments: 58.83 dBA
```

↑

```
TOTAL Leq FROM ALL SOURCES (DAY): 66.43
                         (NIGHT): 58.83
```

```
STAMSON 5.0        NORMAL REPORT        Date: 14-12-2023 13:28:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 280_r3.te            Time Period: Day/Night 16/8 hours
Description: 280 Laurier Forth floor addition POW R3


Road data, segment # 1: laurier (day/night)
-------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     1 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):  12000
    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: laurier (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           :  12.80 / 12.80  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↑
Results segment # 1: laurier (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 66.70 + 0.00) = 66.70 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.32  67.51   0.00   0.00  -0.81   0.00   0.00   0.00  66.70
----------------------------------------------------------------------------

Segment Leq : 66.70 dBA

Total Leq All Segments: 66.70 dBA

↑
Results segment # 1: laurier (night)
```

Source height = 1.50 m

ROAD (0.00 + 59.10 + 0.00) = 59.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.32	59.91	0.00	0.00	-0.81	0.00	0.00	0.00	59.10

Segment Leq : 59.10 dBA

Total Leq All Segments: 59.10 dBA

↑

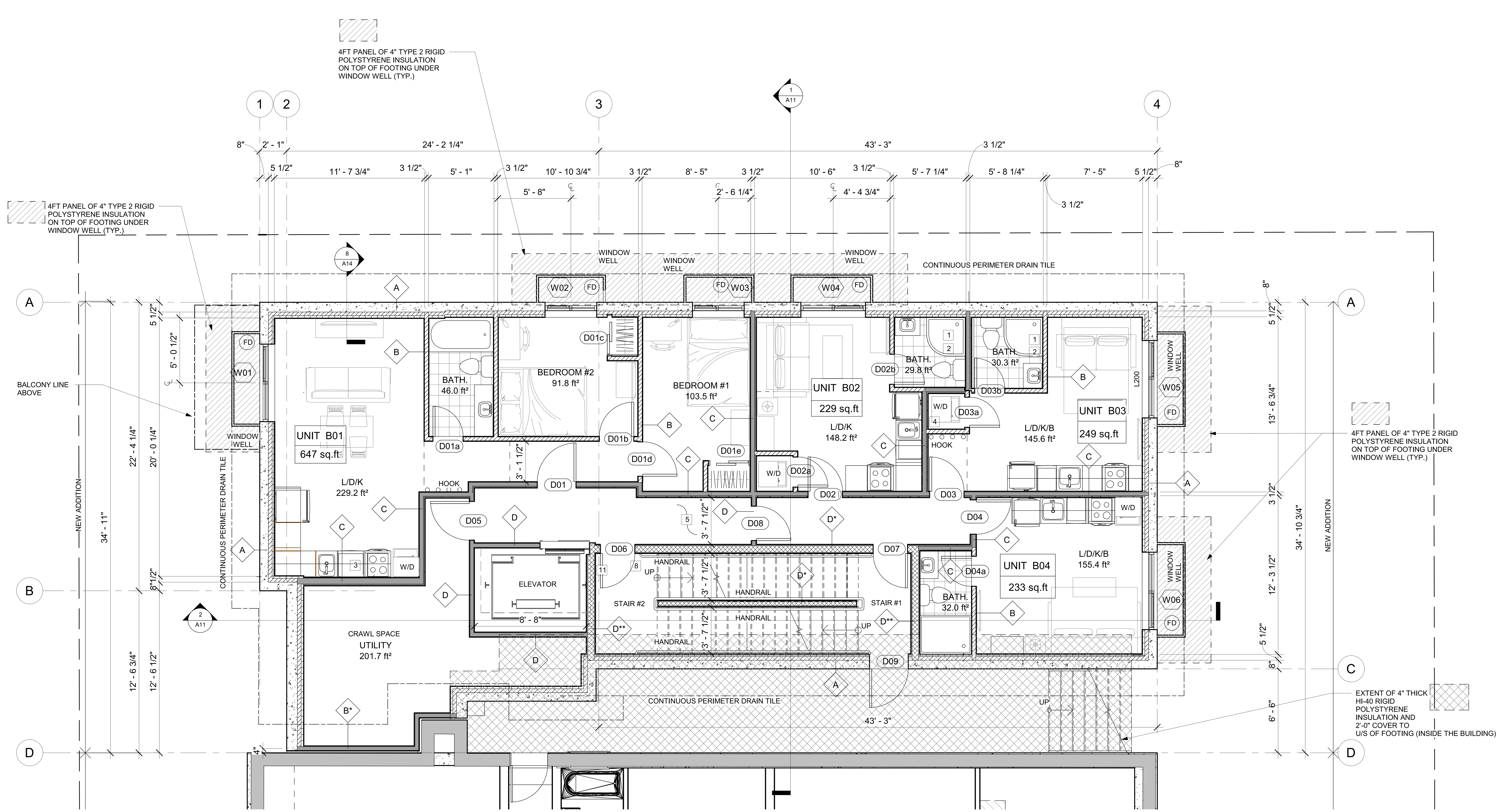
TOTAL Leq FROM ALL SOURCES (DAY): 66.70
(NIGHT): 59.10

↑

↑

Appendix C

Floor Plan & Building
Elevation Drawings



1 Basement
1/4" = 1'-0"

DIM* PROVIDE MIN. 1100mm CLEAR WIDTH BETWEEN FINISHED WALL SURFACES (PUBLIC CORRIDORS)

ROUGH OPENINGS FOR WINDOWS, SEE WINDOW SHOP DRAWINGS

PLAN NOTES, SEE PLAN CONST. LEGEND /A1

WALL LEGEND

1.5 HR FRR NONCOMBUSTIBLE WALL

1HR FRR WALL

NON FIRE RATED WALL

ALL BEAMS ARE FLUSH TO THE FLOOR JOIST UNLESS NOTED AS "DROPPED"

IF STEEL / WOOD POSTS AND BEAMS ARE UNPROTECTED, WRAP WITH 2 LAYERS OF 5/8" TYPE "X" GYPSUM BOARD.

282 LAURIER AVE. E.

NEW ADDITION TO
EXISTING 6 STOREY BUILDING

RA | REDLINE ARCHITECTURE

REDLINE ARCHITECTURE INC.

Tel: 613-612-2232
info@redlinearchitecture.ca
www.redlinearchitecture.ca

RESPONSIBILITIES:

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GENERAL NOTES:

CONSULTANTS
:
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
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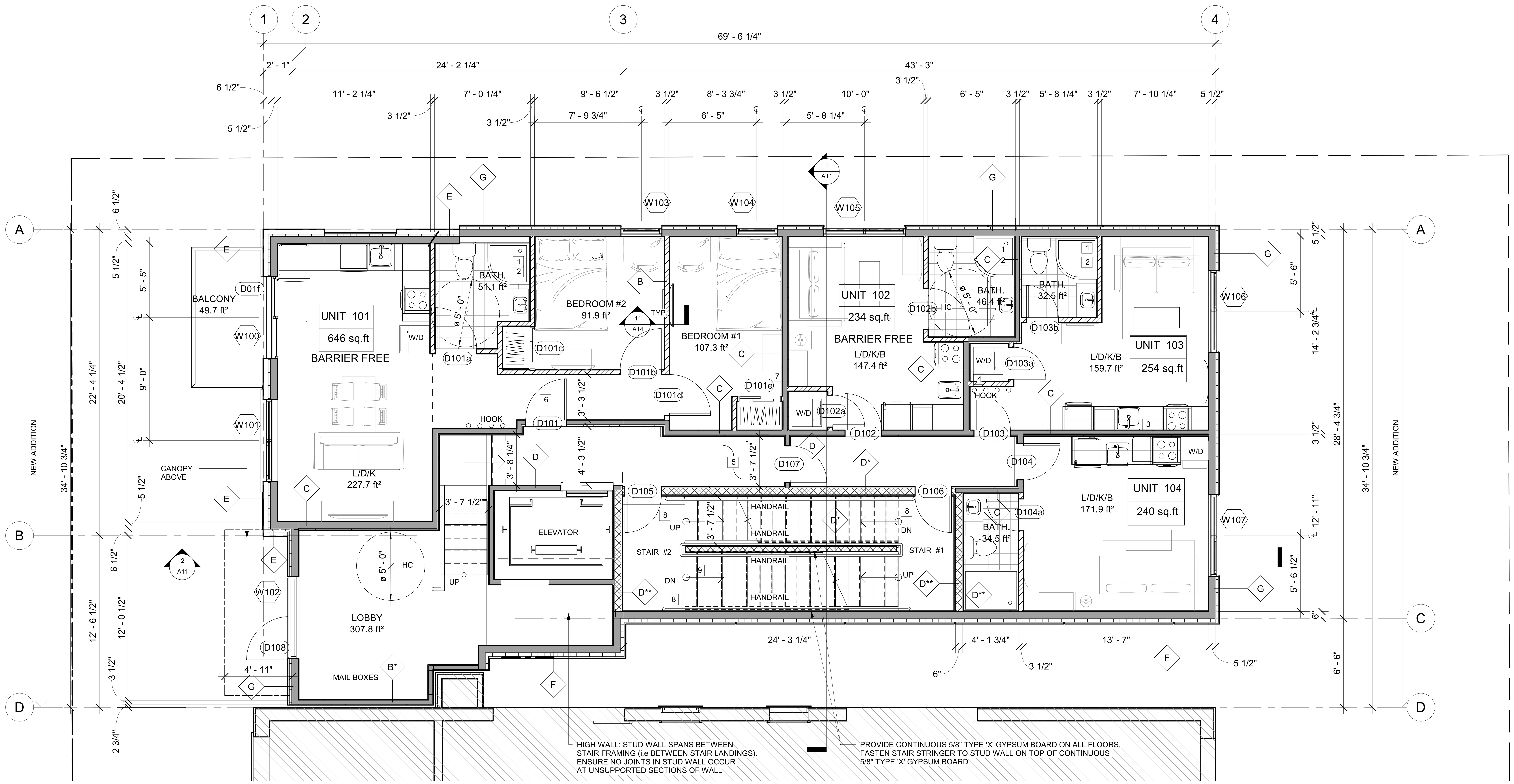
PROJECT:
282 LAURIER AVE. E.
NEW ADDITION TO
EXISTING 6 STOREY BUILDING
282 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

FLOOR PLANS

DRAWN BY:
DATE: MARCH 29, 2021
SCALE: AS NOTED
SHEET: A2



1 Ground Floor
1/4" = 1'-0"

WALL LEGEND

- 1.5 HR FRR NONCOMBUSTIBLE WALL
- 1HR FRR WALL
- NON FIRE RATED WALL

DIM* PROVIDE MIN. 1100mm CLEAR WIDTH BETWEEN FINISHED WALL SURFACES (PUBLIC CORRIDORS)

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PLAN NOTES, SEE PLAN CONST. LEGEND /A1

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GENERAL NOTES:

282 LAURIER AVE. E.
NEW ADDITION TO EXISTING 6 STOREY BUILDING

CONSULTANTS
:
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
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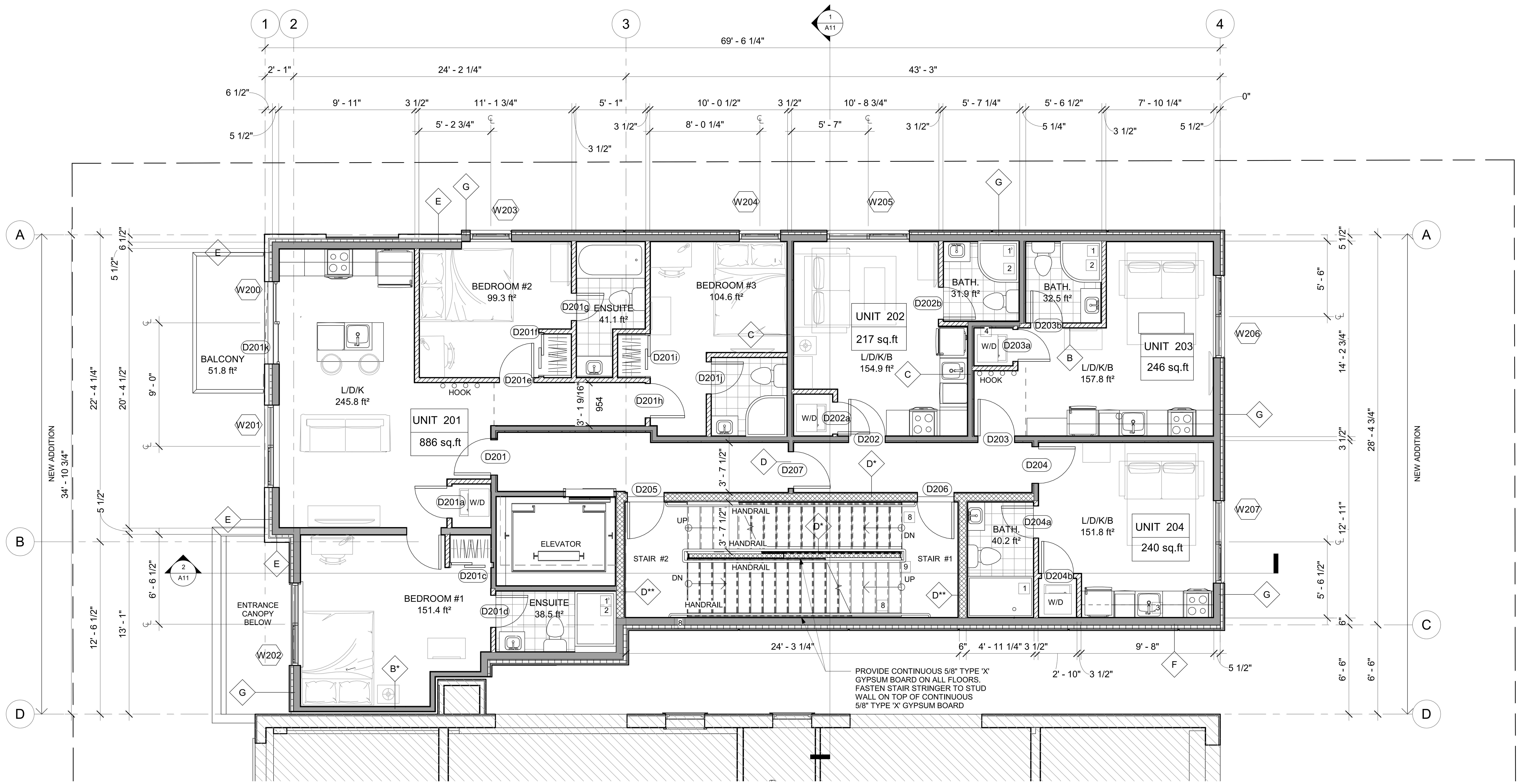
1	ISSUED FOR SPA	08/11/23

PROJECT:
282 LAURIER AVE. E.
NEW ADDITION TO
EXISTING 6 STOREY BUILDING
282 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

FLOOR PLANS

DRAWN BY:
DATE: MARCH 29, 2021
SCALE: AS NOTED
SHEET: A3



1 **Second Floor**
1/4" = 1'-0"

WALL LEGEND

- 1.5 HR FRR NONCOMBUSTIBLE WALL
- 1HR FRR WALL
- NON FIRE RATED WALL

DIM* PROVIDE MIN. 1100mm CLEAR WIDTH BETWEEN FINISHED WALL SURFACES (PUBLIC CORRIDORS)

ROUGH OPENINGS FOR WINDOWS, SEE WINDOW SHOP DRAWINGS

PLAN NOTES, SEE PLAN CONST. LEGEND /A1

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282 LAURIER AVE. E.
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GENERAL NOTES:

CONSULTANTS
:
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
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PROJECT:
282 LAURIER AVE. E.
NEW ADDITION TO
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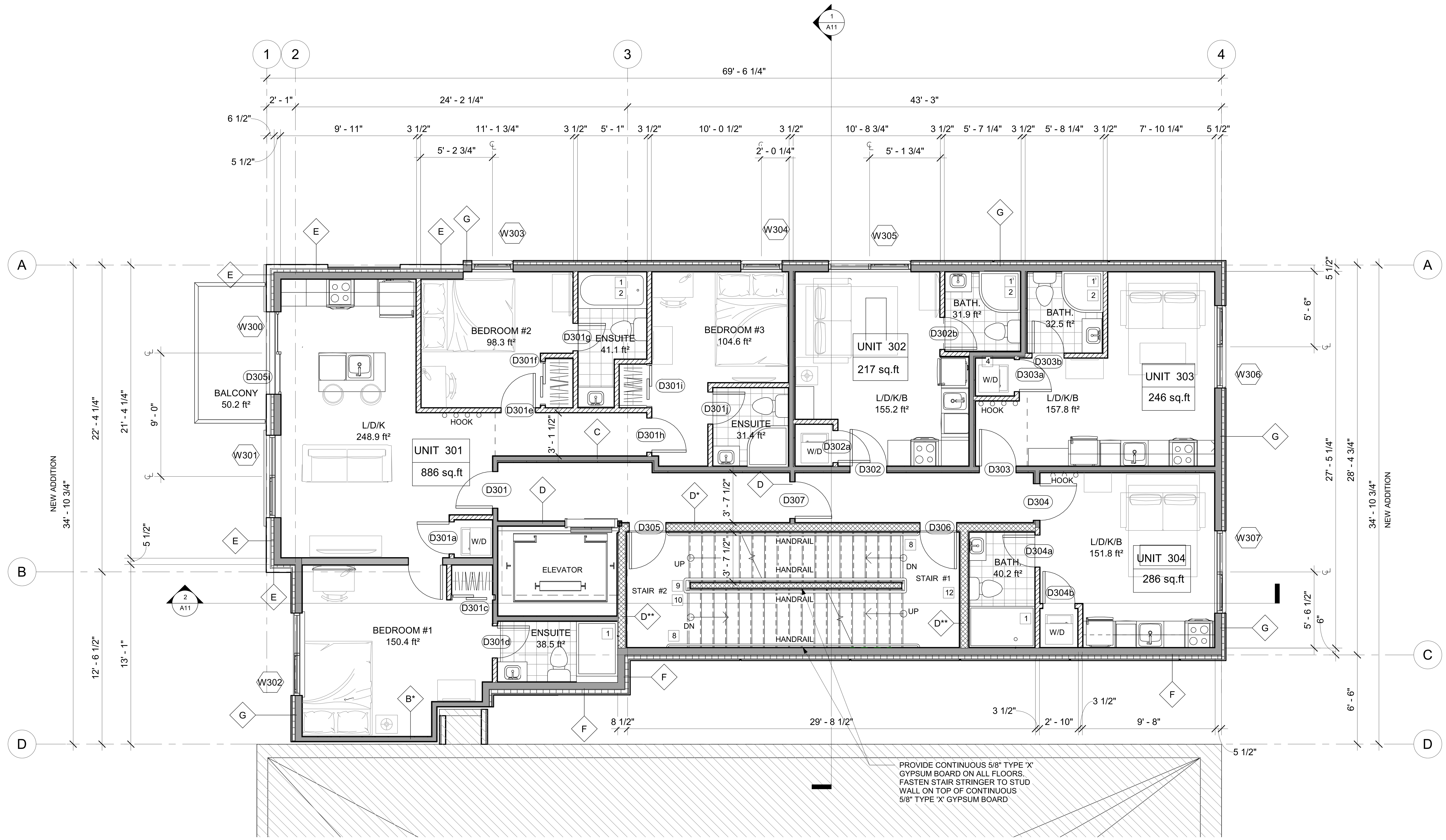
282 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

FLOOR PLANS

DRAWN BY:
DATE: MARCH 29, 2021
SCALE: AS NOTED
SHEET: A4



1 Third Floor.
1/4" = 1'-0"

WALL LEGEND

1.5 HR FRR NONCOMBUSTIBLE WALL

1HR FRR WALL

NON FIRE RATED WALL

DIM* PROVIDE MIN. 1100mm CLEAR WIDTH BETWEEN FINISHED WALL SURFACES (PUBLIC CORRIDORS)

ROUGH OPENINGS FOR WINDOWS, SEE WINDOW SHOP DRAWINGS

PLAN NOTES, SEE PLAN CONST. LEGEND /A1

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ONTARIO ASSOCIATION OF ARCHITECTS
LEVENT TATAR
LICENCE
9642

282 LAURIER AVE. E.
NEW ADDITION TO EXISTING 6 STOREY BUILDING

CONSULTANTS:
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
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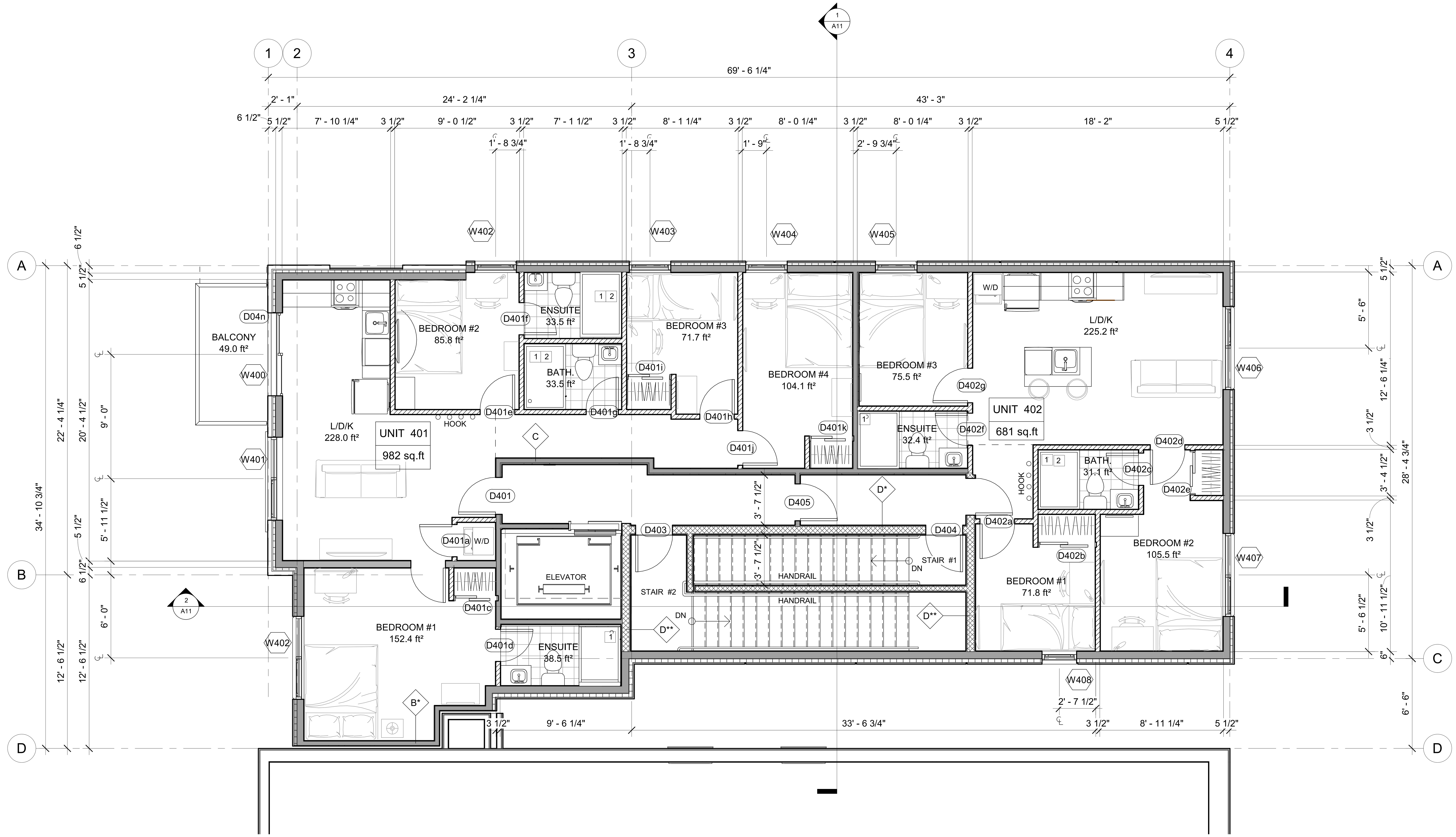
PROJECT:
282 LAURIER AVE. E.
NEW ADDITION TO
EXISTING 6 STOREY BUILDING
282 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

FLOOR PLANS

DRAWN BY:
DATE: MARCH 29, 2021
SCALE: AS NOTED
SHEET: A5



1 Fourth Floor
1/4" = 1'-0"

DIM*
PROVIDE MIN. 1100mm CLEAR WIDTH BETWEEN FINISHED WALL SURFACES (PUBLIC CORRIDORS)

ROUGH OPENINGS FOR WINDOWS, SEE WINDOW SHOP DRAWINGS

PLAN NOTES, SEE PLAN CONST. LEGEND /A1

WALL LEGEND

1.5 HR FRR NONCOMBUSTIBLE WALL

1HR FRR WALL

NON FIRE RATED WALL

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GENERAL NOTES:

282 LAURIER AVE. E.
NEW ADDITION TO
EXISTING 6 STOREY BUILDING

CONSULTANTS:
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
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PROJECT:
282 LAURIER AVE. E.
NEW ADDITION TO
EXISTING 6 STOREY BUILDING
282 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

FLOOR PLANS

DRAWN BY:
DATE: MARCH 29, 2021
SCALE: AS NOTED
SHEET: A4

1 Front (North) Elevation
3/16" = 1'-0"

MATERIAL LEGEND & NOTES

1 BRICK VENEER

2 CEMENT BOARD

EXISTING BUILDING TO REMAIN

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GENERAL NOTES:

280 LAURIER AVE. E.
NEW ADDITION TO EXISTING 6 STOREY BUILDING

CONSULTANTS:
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
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1	ISSUED FOR SPA	08/11/23

PROJECT:
280 LAURIER AVE. E.
NEW ADDITION TO
EXISTING 6 STOREY BUILDING
280 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

ELEVATIONS

DRAWN BY:
DATE: MARCH 21, 2021
SCALE: AS NOTED
SHEET: A7

D07-12-21-0133

18571

MATERIAL LEGEND & NOTES

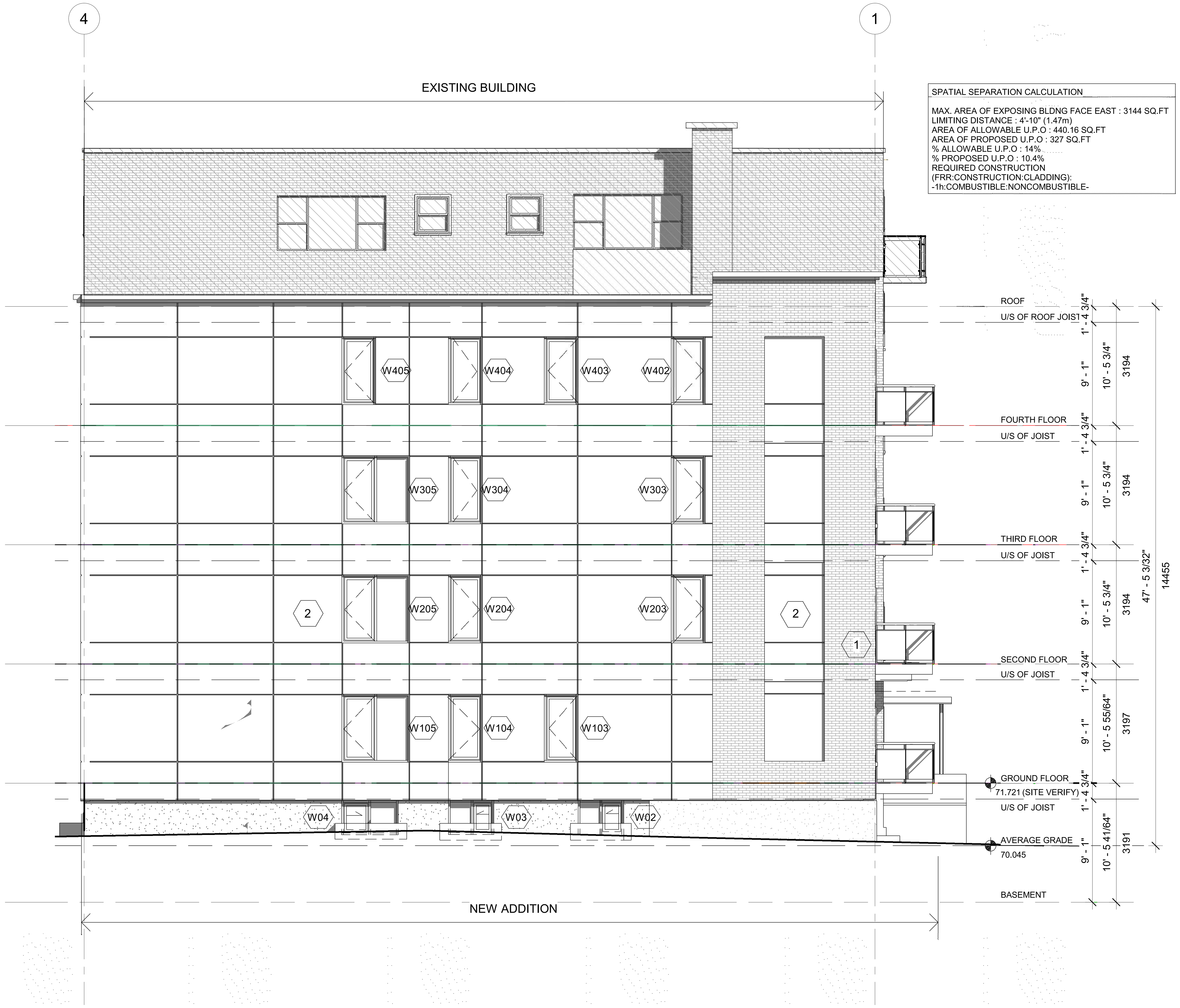
1 BRICK VENEER

2 CEMENT BOARD

SPATIAL SEPARATION CALCULATION

MAX. AREA OF EXPOSING BLDNG FACE EAST : 3144 SQ.FT
LIMITING DISTANCE : 4'-10" (1.47m)
AREA OF ALLOWABLE U.P.O : 440.16 SQ.FT
AREA OF PROPOSED U.P.O : 327 SQ.FT
% ALLOWABLE U.P.O : 14%
% PROPOSED U.P.O : 10.4%
REQUIRED CONSTRUCTION
(FRR:CONSTRUCTION:CLADDING):
-1h:COMBUSTIBLE:NONCOMBUSTIBLE-

EXISTING BUILDING TO REMAIN



1 Side (East) Elevation
3/16" = 1'-0"

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GENERAL NOTES:

280 LAURIER AVE. E.

NEW ADDITION TO
EXISTING 6 STOREY BUILDING

CONSULTANTS :
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
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1	ISSUED FOR SPA	08/11/23

PROJECT:
280 LAURIER AVE. E.
NEW ADDITION TO
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280 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

ELEVATIONS

DRAWN BY:	
DATE: MARCH 21, 2021	SHEET: A8
SCALE: AS NOTED	

D07-12-21-0133

18571

1 Rear (South) Elevation
3/16" = 1'-0"

MATERIAL LEGEND & NOTES

1 BRICK VENEER

2 CEMENT BOARD

EXISTING BUILDING TO REMAIN

280 LAURIER AVE. E.

NEW ADDITION TO
EXISTING 6 STOREY BUILDING

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CONSULTANTS
:
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
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1	ISSUED FOR SPA	08/11/23

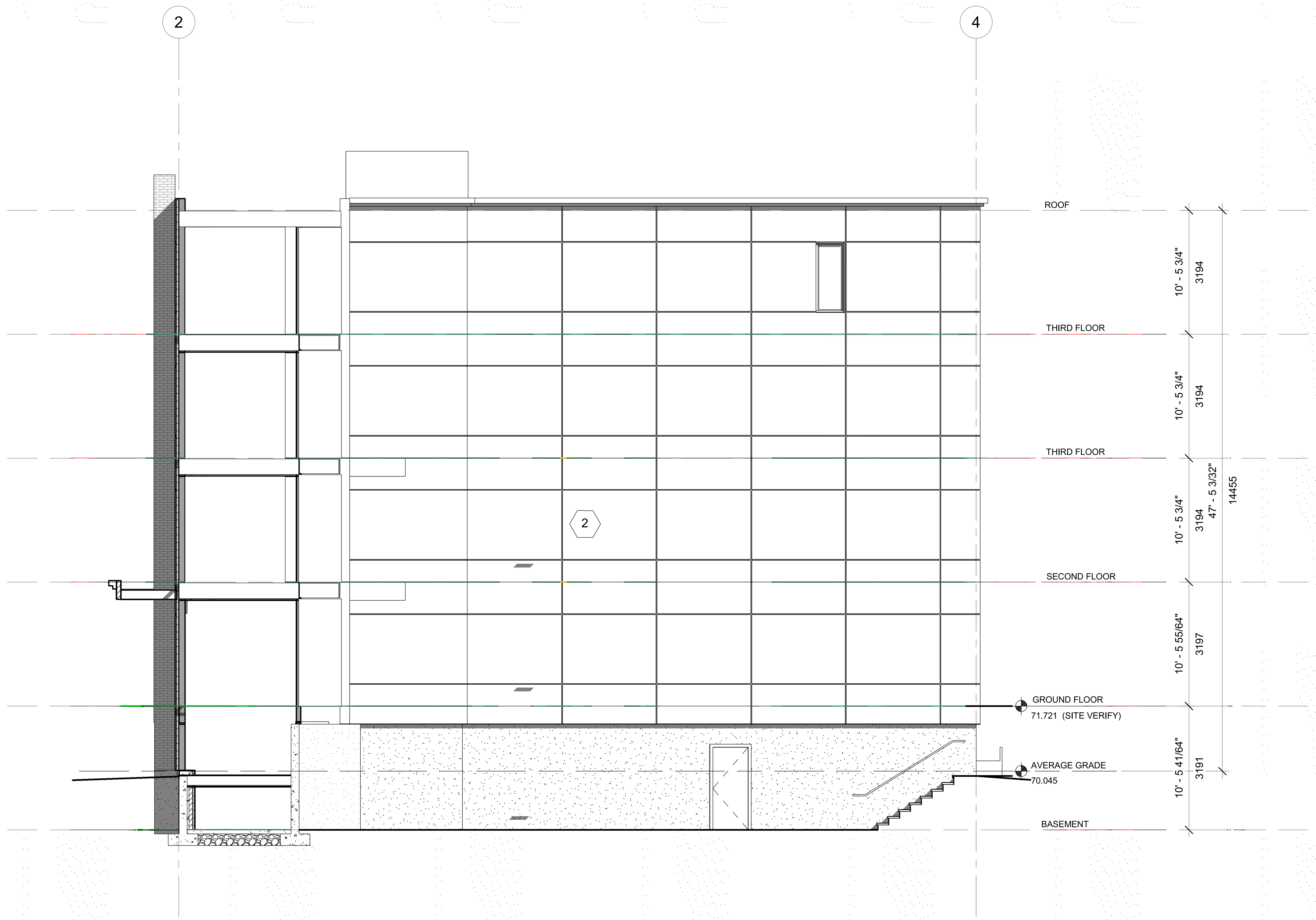
PROJECT:
280 LAURIER AVE. E.
NEW ADDITION TO
EXISTING 6 STOREY BUILDING
280 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

ELEVATIONS

DRAWN BY:
DATE: MARCH 21, 2021
SCALE: AS NOTED
SHEET: A9

D07-12-21-0133

18571



1 Side (West) Elevation
3/16" = 1'-0"

MATERIAL LEGEND & NOTES

1. BRICK VENEER
2. CEMENT BOARD

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GENERAL NOTES:

280 LAURIER AVE. E.
NEW ADDITION TO EXISTING 6 STOREY BUILDING

CONSULTANTS
:
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
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1	ISSUED FOR SPA	08/11/23

PROJECT:
280 LAURIER AVE. E.
NEW ADDITION TO
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280 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

ELEVATIONS

DRAWN BY:
DATE: MARCH 21, 2021
SCALE: AS NOTED
SHEET: A10

D07-12-21-0133

18571

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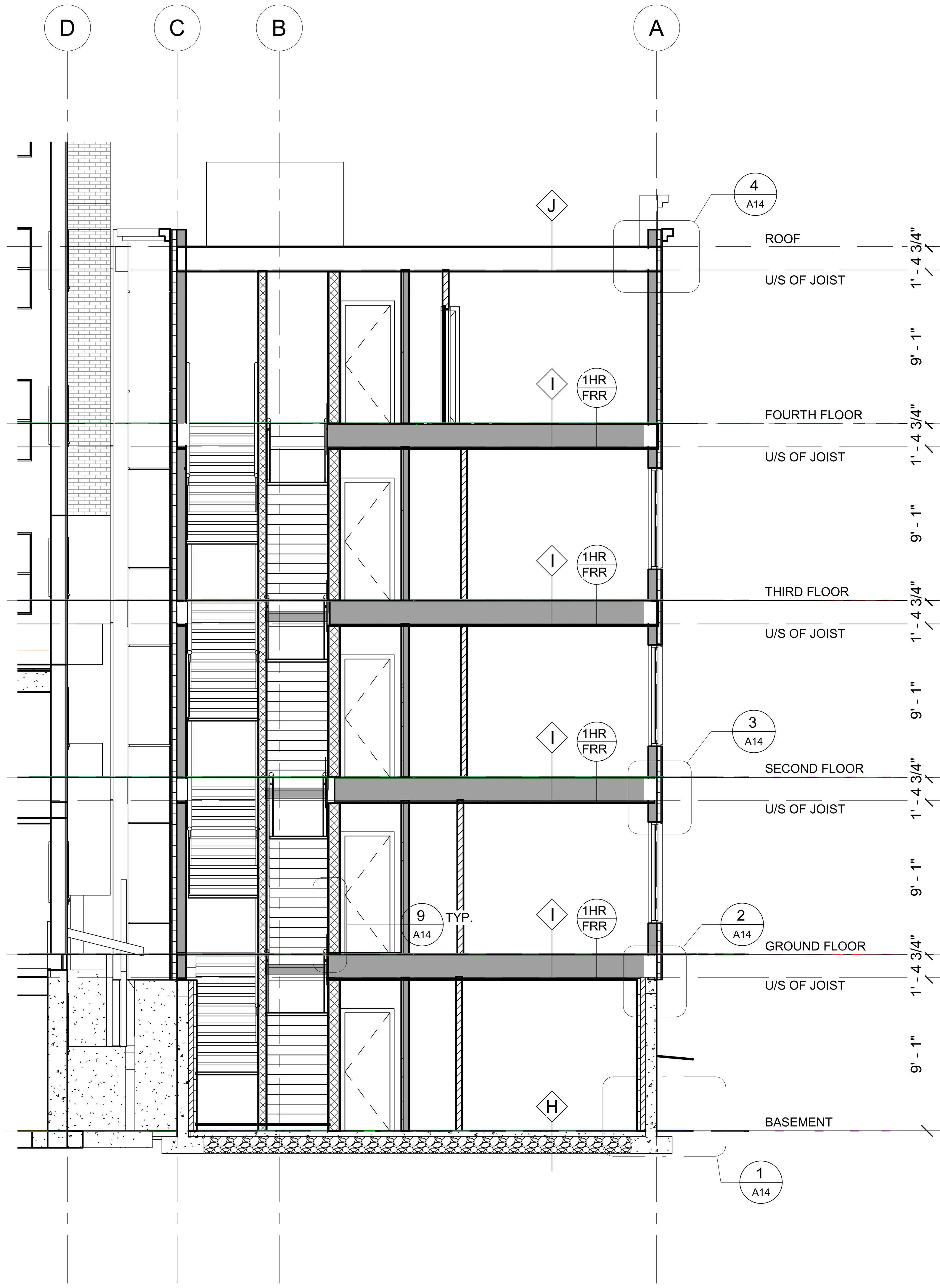
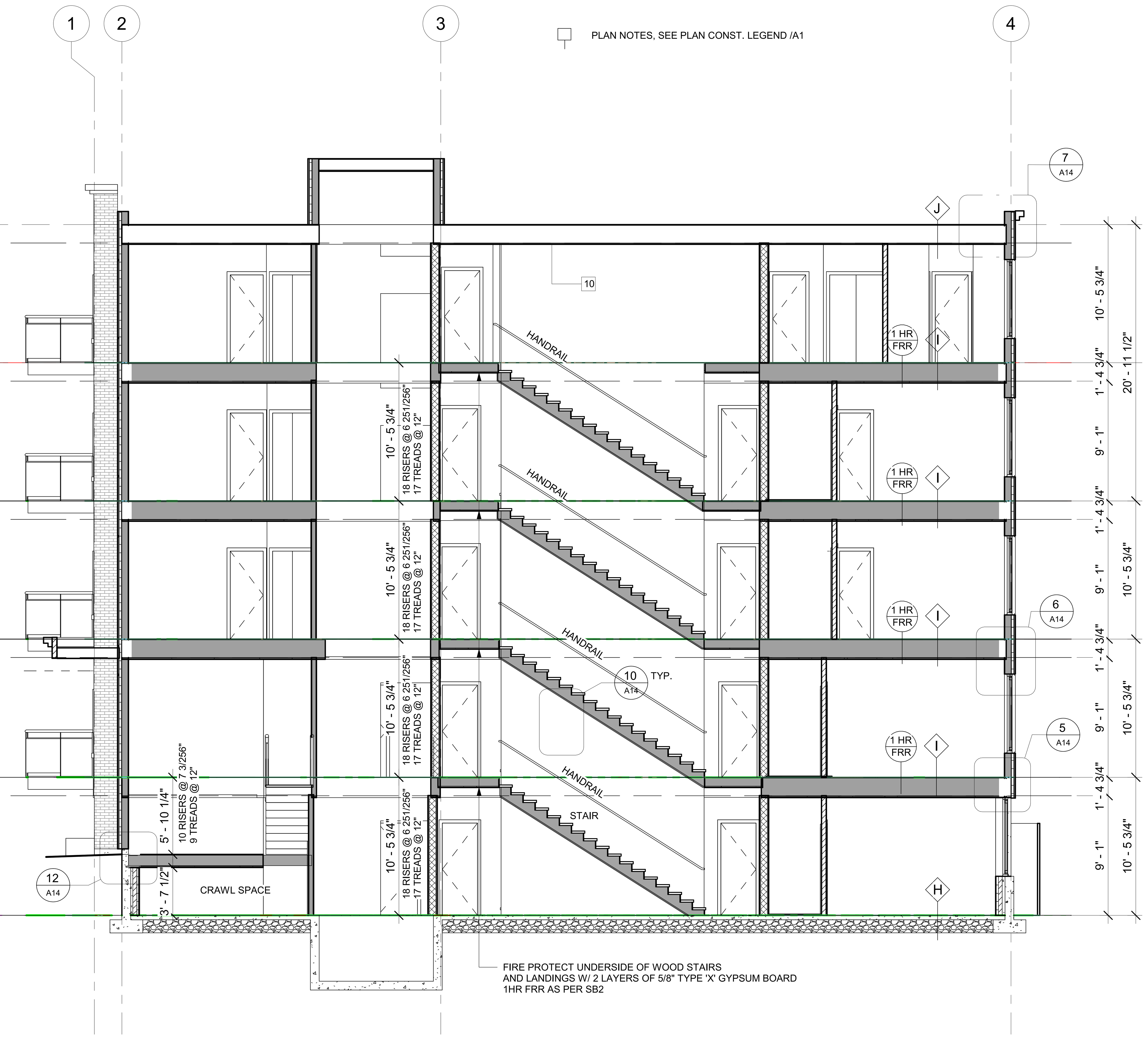
280 LAURIER AVE. E.

NEW ADDITION TO
EXISTING 6 STOREY BUILDING



1 Section 1
3/16" = 1'-0"



2 Section 2
3/16" = 1'-0"

CONSULTANTS
:
STRUCTURAL -
MECHANICAL -
ELECTRICAL -

NO.	REVISION/ISSUE	DATE (M/D/Y)
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PROJECT:
282 LAURIER AVE. E.
NEW ADDITION TO
EXISTING 6 STOREY BUILDING
282 LAURIER AVE. E.
OTTAWA, ON K1N 6P7

SECTIONS

DRAWN BY:
DATE: MARCH 21, 2021
SCALE: AS NOTED
SHEET: A11

Appendix D

Building Component Calculations

ROOM BY ROOM CALCULATIONS - Unit 401

Note: Ceiling Height 10.5'

Kitchen / Breakfast / Great Room / Dining Room

Floor Area (sq.m) 91

	Width	Height	Area
Window 1 (Patio door)	1.8	2.4	4.3
Window 2 (front)	1.8	1.8	3.3

7.60 Total Window Area
8.36% % of Floor Area

	Width	Height	Area
Exterior Door	0	0	0

0 Total Door Area
0.00% % of Floor Area

	Width	Height	Area	Area minus windows/doors
Exterior Wall (front)	6.8	3.2	21.76	14.16
Exterior Wall (side)	4.6	3.2	14.72	14.72

28.88 Total Exterior Wall Area
31.73% % of Floor Area

Bedroom 1

Floor Area (sq.m) 14.2

	Width	Height	Area
Window 1 (front)	1.8	1.8	3.24

3.24 Total Window Area
22.82% % of Floor Area

Exterior Door	0	0	0

0 Total Door Area
0.00% % of Floor Area

	Width	Height	Area	Area minus windows/doors
Exterior Wall (front)	3.8	3.2	12.16	8.92

8.92 Total Exterior Wall Area
62.82% % of Floor Area

TABLE 11: BUILDING COMPONENT TEMPLATE

Architect:
Location: 280 Laurier Ave. E.
Building Type: Apartment
Unit Number: B01, 101, 201, 301, 401
Front Façade Noise Level (dBA) 67

JLR No: 31383
Prepared by: Thomas Blais
Checked by: Lee Jablonski

ROOM	# OF COMPONENTS	ROOM FLOOR AREA (M^2)	WINDOW AREA (M^2)	W/RFA %	DOOR AREA (M^2)	D/RFA %	EXT. WALL AREA (M^2)	EW/RFA %	REQUIRED AIF*	WINDOW		EXT. DOOR		EXT. WALL		CEILING/ROOF	
										Type	AIF**	Type	AIF***	Type	AIF****	Type	AIF*****
Bedroom 1	2	14.2	3.2	23%	-	-	8.9	63%	32	3(20)3	32	-	-	EW1	33	-	-
Kitchen / Breakfast / Great Room / Dining Room	3	91.0	7.6	8%	-	-	28.9	32%	29	2(6)2	32	-	-	EW1	36	-	-

** Taken from Table 10.5: AIF required for Road and Rail Traffic Noise Cases*
*** Taken from Table 10.6: Acoustic Insulation Factor for various types of windows (example: 2(100)2 denotes 2 mm glass (100 mm space) 2 mm glass).*
**** Taken from Table 10.9: Acoustic Insulation Factor for various types of exterior doors*
***** Taken from Table 10.7: Acoustic Insulation Factor for various types of exterior walls*
****** Taken from Table 10.8: Acoustic Insulation Factor for various ceiling-roof combinations (only for aircraft noise)*

Exterior Door Details
All prime doors should be fully weatherstripped. Except as noted specifically below, doors shall not have inset glazing:
D1 denotes 44 mm hollow-core wood door (up to 20% of area glazed).
D2 denotes 44 mm glass-fibre reinforced plastic door with foam or glass-fibre insulated core (up to 20% area glazed).
D3 denotes 35 mm in solid slab wood door.
D4 denotes 44 mm steel door with foam or glass-fibre insulated core.
D5 denotes 44 mm solid slab door.
sd denotes storm door of wood or aluminum with openable glazed sections.

Exterior Wall Details
The common structure of walls EW1 to EW5 is composed of 12.7 mm gypsum board, vapour barrier, and 38x89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in the inter-stud cavities.
EW1 denotes the above plus sheathing, plus wood siding or metal siding and fibre backer board.
EW2 denotes the above plus rigid insulation (25-50mm), and wood siding or metal siding and fibre backer board.
EW2 also denotes exterior wall described in EW1 with the addition of rigid insulation (25-50mm) between the sheathing and the external finish.
EW3 denotes simulated mansard with structure as the above plus sheathing, 38 x 89 mm framing, sheathing and asphalt roofing material.
EW4 denotes the above plus sheathing and 20 mm stucco.
EW5 denotes the above plus sheathing, 25 mm air space, 100 mm brick veneer.
EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50mm), 100 mm back-up block, 100 mm face brick.
EW6 also denotes an exterior wall conforming to rainscreen design principles and composed of same gypsum board and rigid insulation with 100 mm concrete block, 25 mm air space, and 100 mm brick veneer.
EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50mm), 140 mm back-up block, 100 mm face brick.
EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50mm), 200 mm concrete.
R denotes the mounting of the interior gypsum board on resilient clips

Appendix E

Canada Mortgage and Housing (CMHC) Table A2 and Table A3

Table A1: Standard source spectrum for calculating Acoustic Insulation Factor (AIF)

Frequency (Hz)	Source Sound Pressure Level	A-weighted Source Sound Pressure Level
100	66.1	47
125	69.1	53
160	71.4	58
200	71.9	61
250	71.6	63
315	71.6	65
400	71.8	67
500	71.2	68
630	70.9	69
800	70.8	70
1000	70.0	70
1250	69.4	70
1600	69.0	70
2000	68.8	70
2500	68.7	70
3150	67.8	69
4000	67.0	68
5000	65.5	66

Note: Values in the second and third columns of this table are $\frac{1}{3}$-octave band sound pressure levels expressed in dB.

Table A2: Approximate conversion from STC to AIF for windows and doors

Window (or door) Area Expressed as Percentage of Room Floor Area	Acoustic Insulation Factor (AIF)
80.0	STC-5
63.0	STC-4
50.0	STC-3
40.0	STC-2
32.0	STC-1
25.0	STC
20.0	STC+1
16.0	STC+2
12.5	STC+3
10.0	STC+4
8.0	STC+5
6.3	STC+6
5.0	STC+7
4.0	STC+8

Note: For area percentages not listed in the table, use the nearest listed value.

Examples: For a window whose area = 20% of the room floor area and STC = 32, the AIF is 32 + 1 = 33.
For a window whose area = 60% of the room floor area and STC = 29, the AIF is 29 - 4 = 25.

Table A3: Approximate conversion from STC to AIF for exterior walls and ceiling-roof systems.

Exterior Wall Area Expressed as Percentage of Room Floor Area	Acoustic Insulation Factor (AIF)
200.0	STC-10
160.0	STC-9
125.0	STC-8
100.0	STC-7
80.0	STC-6
63.0	STC-5
50.0	STC-4
40.0	STC-3
32.0	STC-2
25.0	STC-1
20.0	STC
16.0	STC+1
12.5	STC+2
10.0	STC+3
8.0	STC+4

Note: For area percentages not listed in the table, use the nearest listed value.

Example: For a wall whose area = 120% of room floor area and STC = 48, the AIF is 48 - 8 = 40.

Note: For ceiling-roof systems, AIF = STC - 7.

Figure A1: Worksheet for Calculating AIF from Transmission Loss Data

Frequency (Hz)	A-weighted Source Sound Pressure Level (dB)	Sound Transmission Loss (dB)	A-weighted Indoor Sound Pressure Level (dB)	Energy Equivalent of Indoor SPL
	(A)	(B)	(C = A-B)	($D = 10^{c/10}$)
100	47	24	23	200
125	53	26	27	501
160	58	19	39	7 943
200	61	21	40	10 000
250	63	20	43	19 953
315	65	20	45	31 623
400	67	25	42	15 849
500	68	30	38	6 310
630	69	33	36	3 981
800	70	37	33	1 995
1000	70	39	31	1 259
1250	70	41	29	794
1600	70	43	27	501
2000	70	44	26	398
2500	70	45	25	316
3150	89	43	26	398
4000	68	37	31	1 259
5000	88	35	31	1 259
		Sum of values in column D:		104 539=E

Calculated indoor A-weighted sound level: $10 \log_{10}$ (E) = 50.2 = F

AIF (component area = 80% of floor area): (77 - F) = 26.8 = G

Component Area as a Percentage of Room Floor Area	Acoustic Insulation Factor (AIF)
6.3	(G + 11) = 38
8.0	(G + 10) = 37
10.0	(G + 9) = 36
12.5	(G + 8) = 35
16.0	(G + 7) = 34
20.0	(G + 6) = 33
25.0	(G + 5) = 32
32.0	(G + 4) = 31
40.0	(G + 3) = 30
50.0	(G + 2) = 29
63.0	(G + 1) = 28
80.0	(G) = 27
100.0	(G - 1) = 26
125.0	(G - 2) = 25
160.0	(G - 3) = 24

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