Environmental Noise Study
390 Bank Street
Ottawa, ON

Novus Reference No. 19-0172 Version No. 2 (Final) September 18, 2019

NOVUS PROJECT TEAM:

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1.0 Introduction

Novus Environmental Inc. (Novus) now a part of SLR Consulting was retained by Urban Capital Property Group to conduct an environmental noise assessment for the 390 Bank Street development in Ottawa, Ontario. The noise study is used to support the Zoning By-law Amendment and Site Plan Approval application for the proposed development and supports the planning requirements for the City of Ottawa.

1.1 Focus of Report

In keeping with the City of Ottawa and the Ontario Ministry of the Environment, Conservation and Parks (MECP) requirements, this report examines the potential for:

- Impacts of the environment on the proposed development;
- Impacts of the proposed development on itself; and
- Impacts of the proposed development on the surrounding environment.

1.2 Nature of the Subject Lands

The subject lands are located in the Centretown neighbourhood between James and Florence Street on the west side of Bank Street. The site is situated directly across from Waverley Street West a one-way roadway. Current designs for the proposed development include a 9-storey structure, with a single storey retail /common indoor amenity space as the base for the residential units above.

There are two outdoor amenity spaces proposed, one at ground level and another on the rooftop with an outdoor pool and mechanical penthouse.

The proposed layout of the future development is provided in **Figure 1**. A copy of the site plan is provided in **Appendix A**.

1.3 Nature of the Surroundings

The surrounding area consists of mostly commercial space along Bank Street with some residential areas spread throughout. In all surrounding areas to the north, south, east and west, there are residential zones. 390 Bank Street is situated roughly 500m to the north of Highway 417, and roughly 900m to the west of the Rideau Canal. There are no significant railway corridors within 300m of the future development.

PART 1: IMPACTS OF THE ENVIRONMENT ON THE DEVELOPMENT

2.0 Impacts of the Environment on the Development

In assessing potential impacts of the environment on the proposed development, the focus of this report is to assess the potential for transportation noise impacts from roadways and potential impacts from industrial sources.

2.1 Transportation Noise Impacts

Noise impacts from transportation sources were investigated in detail. Transportation noise sources of interest with the potential to produce noise at the proposed development are Bank Street.

Sound exposure levels at the development due to these sources have been predicted, and this information has been used to identify façade, ventilation, and warning clause requirements.

2.2 Surface Transportation Noise Criteria

2.2.1 Ministry of the Environment Publication NPC-300

Noise Sensitive Developments

MECP Publication NPC-300 provides sound level criteria for noise sensitive developments. The applicable portions of NPC-300 are Part C – Land Use Planning and the associated definitions outlined in Part A – Background. **Tables 1 to 4** below summarizes the applicable surface transportation (road and rail) criteria limits.

Location Specific Criteria

Table 1 summarizes criteria in terms of energy equivalent sound exposure (L_{eq}) levels for specific noise-sensitive locations. Both outdoor and indoor locations are identified, with the focus of outdoor areas being amenity spaces. Indoor criteria vary with sensitivity of the space. As a result, sleep areas have more stringent criteria than Living / Dining room space.

Table 1: MECP Publication NPC-300 Sound Level Criteria for Road and Rail Noise

Type of Space	Time Period	Equivalent Sound Exposure Level - L_{eq} (dBA)		Assessment Location
		Road	Rail [1]	
Outdoor Living Area (OLA)	Daytime (0700-2300h)	55	55	Outdoors [2]
Living / Dining Room [3]	Daytime (0700-2300h)	45	40	Indoors [4]
	Night-time (2300-0700h)	45	40	Indoors [4]
Sleeping Quarters	Daytime (0700-2300h)	45	40	Indoors [4]
	Night-time (2300-0700h)	40	35	Indoors [4]

Notes: [1] Whistle noise is excluded for OLA noise assessments, and included for Living / Dining Room and Sleeping Quarter assessments

[2] Road and Rail noise impacts are to be combined for assessment of OLA impacts.

[3] Residence area Dens, Hospitals, Nursing Homes, Schools, Daycares are also included. During the night-time period, Schools and Daycares are excluded.

[4] An assessment of indoor noise levels is required only if the criteria in **Table 4** are exceeded.

Outdoor Amenity Areas

Table 2 summarizes the noise mitigation requirements for communal outdoor amenity areas ("Outdoor Living Areas" or "OLAs"). This would include the common amenity area on the tenth floor of the proposed development. MECP Publication NPC-300 states that any amenity space less than 4m in depth is not considered in noise impact assessments. Therefore, the ground level amenity area will not be assessed due to the depth being less than 4m.

For the assessment of outdoor sound levels, the surface transportation noise impact is determined by combining road and rail traffic sound levels.

Table 2: MECP Publication NPC-300 Outdoor Living Area Mitigation Requirements

Time Period	Equivalent Sound Level in Outdoor Living Area (dBA)	Ventilation Requirements
Daytime (0700-2300h)	≤ 55	• None
	55 to 60 incl.	• Noise barrier **OR** • Warning Clause A
	> 60	• Noise barrier to reduce noise to 55 dBA **OR** • Noise barrier to reduce noise to 60 dBA and Warning Clause B

Ventilation and Warning Clauses

Table 3 summarizes recommendations for ventilation where windows potentially would have to remain closed as a means of noise control. Despite implementation of ventilation measures where recommended, if sound exposure levels exceed the guideline limits in **Table 1** and **Table 2**, warning clauses advising future occupants of the potential excesses should be included. Warning clauses also apply to OLAs.

Table 3: MECP Publication NPC-300 Ventilation & Warning Clause Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (dBA)		Ventilation and Warning Claus Requirements [2]
		Road	Rail [1]	
Outdoor Living Area	Daytime (0700-2300h)	56 to 60 incl.		Type A Warning Clause
Plane of Window	Daytime (0700-2300h)	≤ 55		None
		56 to 65 incl.		Forced Air Heating with provision to add air conditioning + Type C Warning Clause
		> 65		Central Air Conditioning + Type D Warning Clause
	Night-time (2300-0700h)	51 to 60 incl.		Forced Air Heating with provision to add air conditioning + Type C Warning Clause
		> 60		Central Air Conditioning + Type D Warning Clause

Notes: [1] Rail whistle noise is excluded.
[2] Road and Rail noise is combined for determining Ventilation and Warning Clause requirements.

Building Shell Requirements

Table 4 provides sound level thresholds which if exceeded, require the building shell and components (i.e., wall, windows) to be designed and selected accordingly to ensure that the **Table 3 and 4** indoor sound criteria are met.

Table 4: MECP Publication NPC-300 Building Component Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - Leq (dBA)		Component Requirements
		Road	Rail [1]	
Plane of Window	Daytime (0700-2300h)	> 65	> 60	Designed/ Selected to Meet Indoor Requirements [2]
	Night-time (2300-0700h)	> 60	> 55	

Notes: [1] Including whistle noise.
[2] Building component requirements are assessed separately for Road and Railway noise, then combined for an overall acoustic parameter.

2.3 Traffic Data and Future Projections

2.3.1 Roadway Traffic Data

Ultimate AADT volumes for Bank Street, were obtained directly from the City of Ottawa Official Environmental Noise Control Guidelines. Copies of all traffic data used can be found in **Appendix B**. The following **Table 5** summarizes the road traffic volumes used in the analysis.

Commercial traffic breakdowns (medium/heavy trucks) were assumed based on the City of Ottawa specifications for arterial 2-lane undivided roadways.

Table 5: Summary for Road Traffic Data Used in the Transportation Noise Analysis

Roadway Link	Ultimate Levels (AADT) [1]	# of Lanes	Day/Night Volume Split [1]		Commercial Traffic Breakdown [1]		Vehicle Speed (km/h)
			Day	Night	% Medium Trucks	% Heavy Trucks	
Bank Street	15000	2	92	8	7	5	50

Notes: [1] Based on traffic data obtained from the City of Ottawa ENCG, Road type assumed to be 2-lane arterial

2.4 Projected Sound Levels

Traffic sound levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software. Roadways were modelled as

line sources of sound, with sound emission rates calculated using ORNAMENT algorithms, the road traffic noise model of the MECP. These predictions are equivalent to those made using the MECP's ORNAMENT, RT/Custom or STAMSON v5.04 road traffic noise models.

Sound levels were predicted along the façades of the proposed development using the "building evaluation" feature of Cadna/A. This feature allows for noise levels to be predicted across the entire façade of a structure. Façades considered to be non-noise sensitive were excluded from the analysis.

Ground absorption was assessed as a reflective surface, as the majority of the intervening ground is considered to be paved or concrete.

2.4.1 Façade Sound Levels

Predicted worst-case façade sound levels are presented in **Table 6**. The transportation façade sound levels of the development, showing the ranges of predicted daytime and night-time sound levels are shown in **Figure 2** and **Figure 3,** respectively. **Figure D1** found in **Appendix D** summarizes a comparison of the Cadna/A implementation and STAMSON modelling at one (1) location along the east façade, where results are within 0.1 dBA of each other. All required STAMSON modelling output files are attached in **Appendix D**.

Table 6: Summary of Transportation Façade Sound Levels

Façade	Roadway Sound Levels [1]	
	L_{eq} Day (dBA)	L_{eq} Night (dBA)
North	66	58
East	70	62
South	66	58
West	46	8

Notes: [1] Sound levels shown represent the worst-case impact on all of the structure's façades.

2.4.2 Outdoor Living Areas

Outdoor living areas of the proposed development include one (1) outdoor amenity area located on the rooftop of the development, as shown in **Figure 4**.

The predicted noise impacts from the adjacent roadway are summarized in the table below:

Table 7: Summary of Unmitigated Road Noise Impacts - OLAs

Location [1]	Transportation Noise Level L_{eq} Day (dBA)	Applicable Guideline Limit L_{eq} Day (dBA) [2]	Meets Criteria? (Yes/No)
Rooftop	41	60	Yes

Notes: [1] Outdoor amenity area locations are shown in **Figure 4**.
[2] Sound levels up to 60 dBA are allowed with the use of a Type A Warning Clause.

The projected sound levels of the outdoor sensitive points of reception are predicted to be at, or below 60 dBA. Noise control measures are not required for the outdoor amenity areas.

As the development includes common amenity spaces for all occupants, the private terraces are not considered to be the only outdoor amenity space available. Therefore, an assessment of private terraces was excluded based on the definitions outlined in NPC-300.

2.5 Façade Recommendations

2.5.1 Glazing Requirements

An assessment of indoor noise levels is required providing the façade sound levels due to road traffic exceed 65 dBA during the daytime and 60 dBA during the night-time, as indicated in **Table 4**. Based on the roadway noise levels shown in **Table 6**, façade sound levels were predicted to exceed 65 dBA and 60 dBA during the daytime and night-time, respectively, on the north, east and south façades of the development. Therefore, an assessment of glazing requirements is necessary for meeting the indoor sound level requirements.

For the analysis, detailed floor plans were available and used to estimate the percentage of glazing for living and bedrooms. However, the non-glazing portions of the structure are unknown and therefore assumed to have an STC rating of 54.

Preliminary acoustical requirements are provided below in **Table 8**. Detailed Façade Calculations are included in **Appendix C**.

Table 8: Summary of Façade STC Requirements

Building Facade	Living Room (STC)	Bedroom (STC)
North	OBC (24)	OBC (28)
East	OBC (29)	32
North-East Corner	OBC (29)	32
South	OBC (27)	OBC (27)
South-East Corner	OBC (29)	N/A
West	OBC (29)	OBC (29)

Notes: Windows meeting OBC minimum structural and safety requirements will provide a minimum STC 29 rating.

The combined glazing and frame assembly must be designed to ensure the overall sound isolation performance for the entire window unit meets the sound isolation requirements. It is recommended window manufacturers test data be reviewed to confirm acoustical performance is met. As detailed floor and façade plans are considered preliminary at this time, the glazing requirements should be re-assessed and reviewed by an Acoustical Consultant as changes are made to the design.

Providing the necessary requirements listed above are met, the facility is expected to meet the Supplementary NPC-300 guidelines listed in **Table 1** for the current designed bedroom and living room layouts provided in **Appendix A**.

2.5.2 Ventilation and Warning Clause Requirements

The requirements regarding warning clauses are summarized in **Table 3**. Where required, the Warning Clauses should be included in agreements registered on Title and included in all agreements of purchase and sale or lease, and all rental agreements.

Based on the predicted façade noise levels, mandatory central air conditioning and a **Type D** Warning Clause will be required for the north, east and south facing facades. The warning clauses mentioned are included in **Appendix C**.

2.6 Outdoor Amenity Area Requirements

As the predicted roadway noise impacts are below 55 dBA, Outdoor Amenity Area warning clauses are not required for the development.

2.7 Stationary Source Noise Impacts on the Development

A review has been conducted for the potential impacts on the development from stationary industrial noise sources.

Novus completed an aerial review of the available aerial photography of the development lands and surrounding area. No major industrial facilities were identified within 1000m of the development. The site was found to be primarily surrounded by mixture of commercial and residential buildings. As no significant industries are located within the surrounding area, a detailed assessment of stationary noise was not completed.

PART 2: IMPACTS OF THE DEVELOPMENT ON ITSELF

3.0 Outdoor Noise Impacts from Ventilation Sources

The building ventilation and potential emergency systems associated with the development have not been designed at this time. Such equipment has the potential to result in noise impacts on residential spaces within the development itself.

3.1 Applicable Guideline Limits

On- and off-site noise impacts from all mechanical equipment, including but not limited to any required chillers, cooling towers, exhaust fans, and make up air handling units, should comply with the guideline limits contained in MECP Publication NPC-300.

3.2 Building Equipment

The proposed development will require mechanical ventilation and emergency power systems. Based on our experience, the type and size of the units which will likely be required, and their probable location (tower rooftops well removed from on-site and off-site noise sensitive receptors), adverse noise impacts are not anticipated.

Regardless, potential impacts should be assessed as part of the final building design. The criteria can be met at all surrounding and on-site receptors by the appropriate selection of mechanical equipment, by locating equipment with sufficient setback from noise sensitive locations, and by incorporating control measures (e.g., silencers) into the design.

If required, appropriate environmental approvals should be sought through the MECP at the site plan approval stage, once building mechanical systems are fully designed. The equipment should be designed to meet the requirements of the applicable Environmental Activity and Sector Registry (EASR), and be registered with the MECP or be evaluated to determine if the associated equipment is exempt from the applicable regulations.

PART 3: IMPACTS OF THE DEVELOPMENT ON THE SURROUNDING AREA

4.0 Impacts of the Development on the Surrounding Area

In terms of the noise environment of the area, it is expected that the project will have a negligible effect on the neighbouring properties.

The traffic related to the proposed development will be small relative to the existing traffic volumes within the area and is not of concern with respect to noise impact.

Other possible development noise sources with potentially adverse impacts on the surrounding neighbourhood are the mechanical roof-top equipment (make up air unit, air-cooled condenser, generator, etc.). This equipment is required to meet MECP Publication NPC-300 requirements at the worst-case off-site noise sensitive receptors. Given the requirement for the systems to meet the applicable noise guideline at closer on-site receptors, off-site impacts are not anticipated.

Regardless, potential impacts should be assessed as part of the final building design. The criteria can be met at all surrounding and on-site receptors by the appropriate selection of mechanical equipment, by locating equipment with sufficient setback from noise sensitive locations, and by incorporating control measures (e.g., silencers, barriers) into the design.

It is recommended the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment.

5.0 Conclusions and Recommendations

The potential for noise impacts on and from the proposed development have been assessed. Impacts of the environment on the proposed development can be adequately controlled through the feasible mitigation measures, façade designs, and warning clauses detailed in Part 1 of this report. Based on the results of our studies, the following conclusions have been reached:

5.1 Transportation Noise

- An assessment of transportation noise impacts has been completed for the surrounding roadways.

- Based on transportation façade sound levels, windows will require acoustical upgrades on the east, northeast and southeast corner units, as outlined in **Section 2.5**. Façade STC requirements should be reviewed by an acoustical consultant as the design progresses.

- Noise impacts in the rooftop outdoor amenity space meet the applicable guideline limits.

- Mandatory air conditioning and a **Type D** Warning Clause will be required for the north and east facing façade units as outlined in **Section 2.5.2**. The south facing façade units will require forced air heating and the provision for air conditioning and a **Type C** Warning Clause. Warning clauses to be included are found in **Appendix C.**

- STAMSON output validation files for Cadna/a modelling results are found in **Appendix D** and detailed in **Figure 4**.

5.2 Stationary Noise

- A review has been conducted for the potential impacts on the development from stationary industrial noise sources. No major industrial facilities were identified within 1000m of the development. Details are outlined in **Section 2.7**

5.3 Overall Assessment

- Impacts of the environment on the proposed development can be adequately controlled through upgrades to the building construction, and the inclusion of ventilation and warning clause requirements, detailed in **Part 1** of this report.

- Impacts of the proposed development on itself are not anticipated and can be adequately controlled by following the design guidance outlined in **Part 2** of this report.

- Impacts of the proposed development on the surroundings are expected to meet the applicable guideline limits, and can be adequately controlled by following the design guidance outlined **Part 3** of this report.

- Glazing requirements above are approximated, based on the generic room, façade and glazing dimensions. Once detailed floor plans and façade plans are further along in the design phase, the glazing requirements should be re-assessed and reviewed by an Acoustical Consultant.

- As the mechanical systems for the proposed development have not been designed at the time of this assessment, the acoustical requirements above should be confirmed by an Acoustical Consultant as part of the final building design.

6.0 REFERENCES

City of Ottawa: *Environmental Noise Control Guidelines*, Canada January 2016.

International Organization for Standardization, ISO 9613-2: *Acoustics – Attenuation of Sound During Propagation Outdoors Part 2: General Method of Calculation*, Geneva, Switzerland, 1996.

National Research Council, Building Practice Note 56: *Controlling Sound Transmission into Buildings*, Canada 1985.

Ontario Ministry of the Environment, Conservation and Parks (MECP), 1989, Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT).

Ontario Ministry of the Environment, Conservation and Parks (MECP), 2013, Publication NPC-300: Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning

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Figures

Figure No. **1**

Context Plan

390 Bank Street
Ottawa, Ontario

Project North

Scale: 1:3000
Date: 09/09/2019
File No.: 19-0172
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

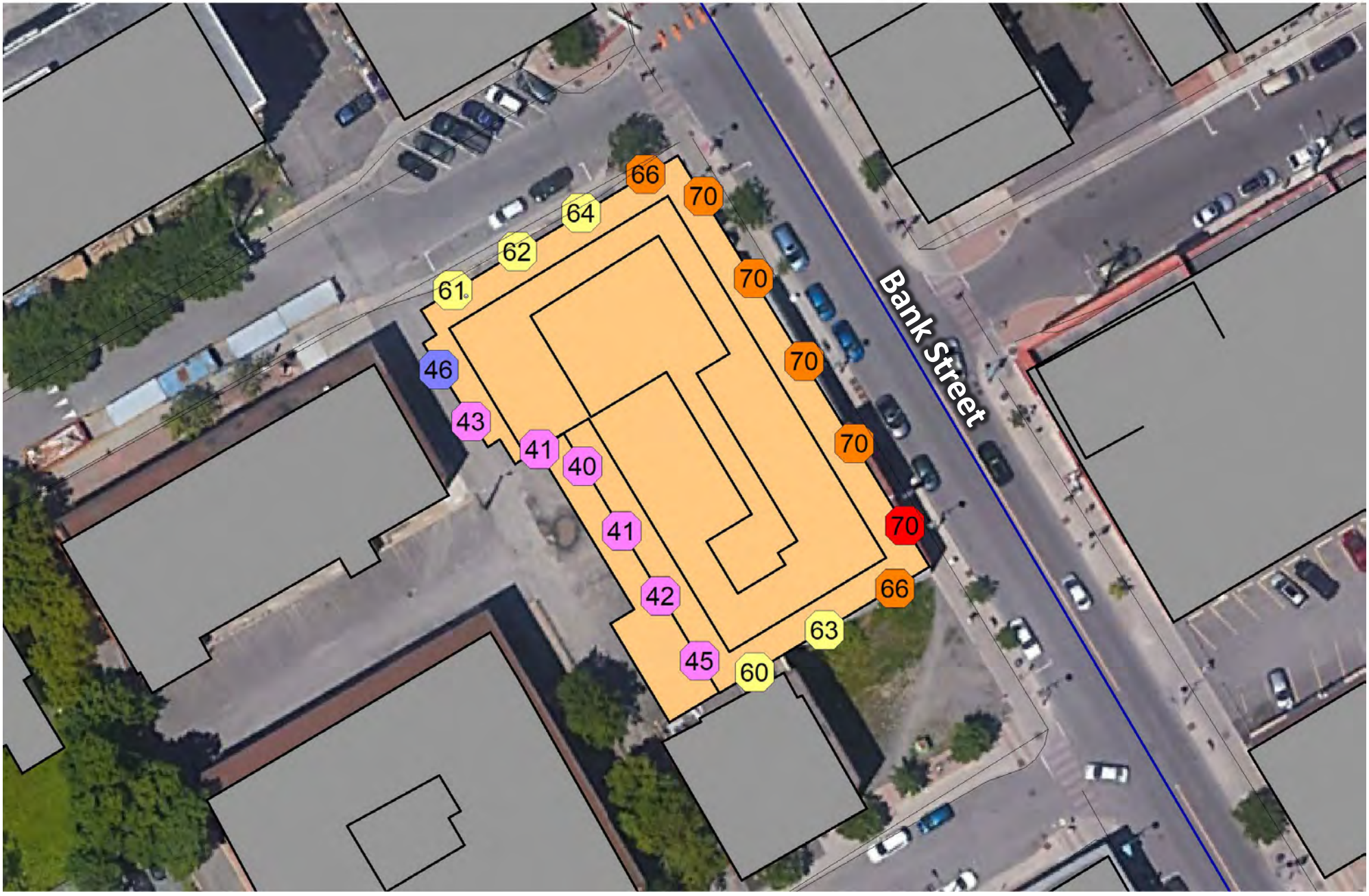

Figure No. **2**

Façade Sound Levels – Roadway - Daytime

390 Bank Street
Ottawa, Ontario

Project North

Scale: 1:500
Date: 09/09/2019
File No.: 19-0172
Drawn By: JWD

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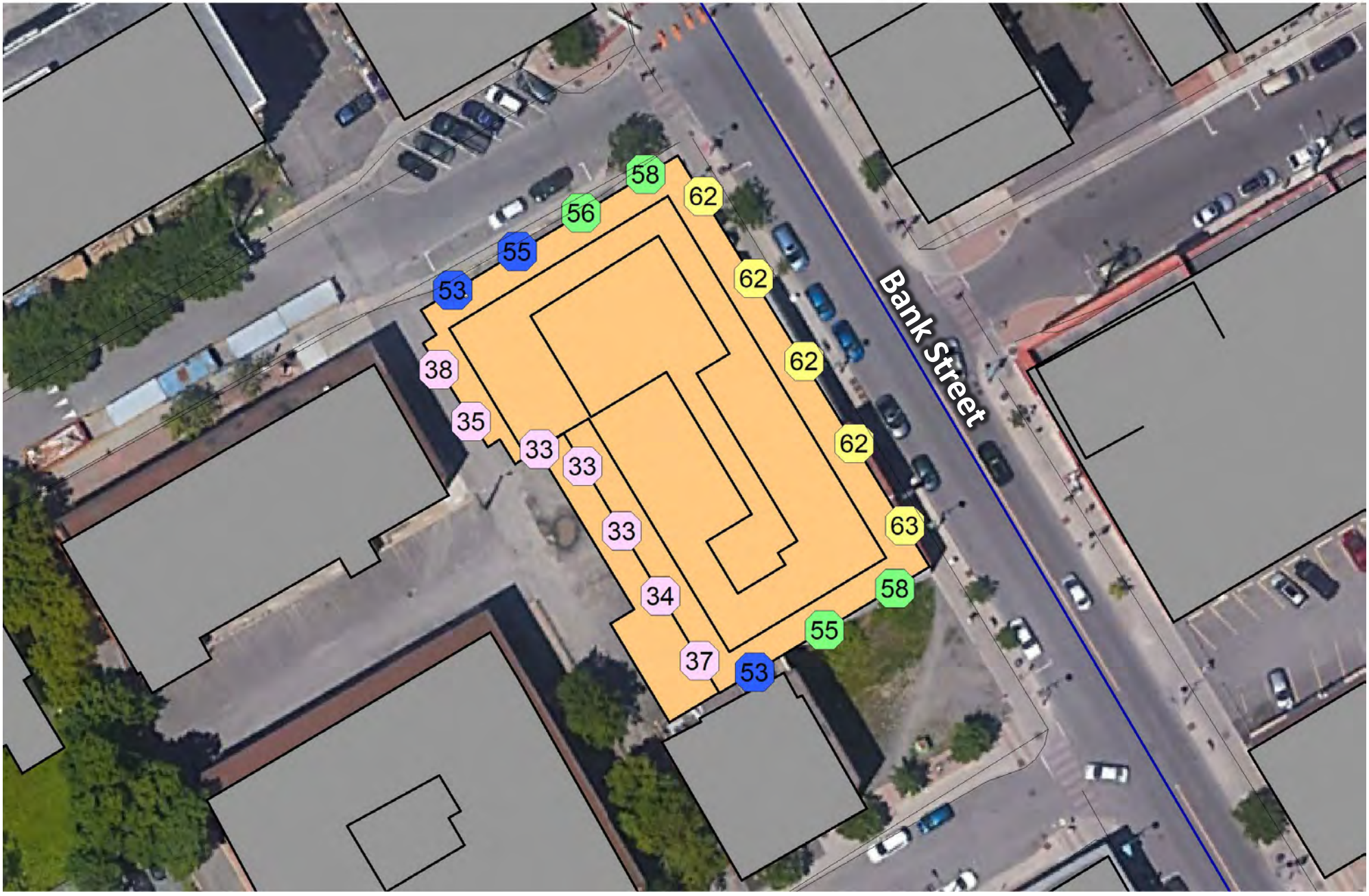

Figure No. **3**

Façade Sound Levels – Roadway – Night-time

390 Bank Street
Ottawa, Ontario

Project North

Scale: 1:500
Date: 09/09/2019
File No.: 19-0172
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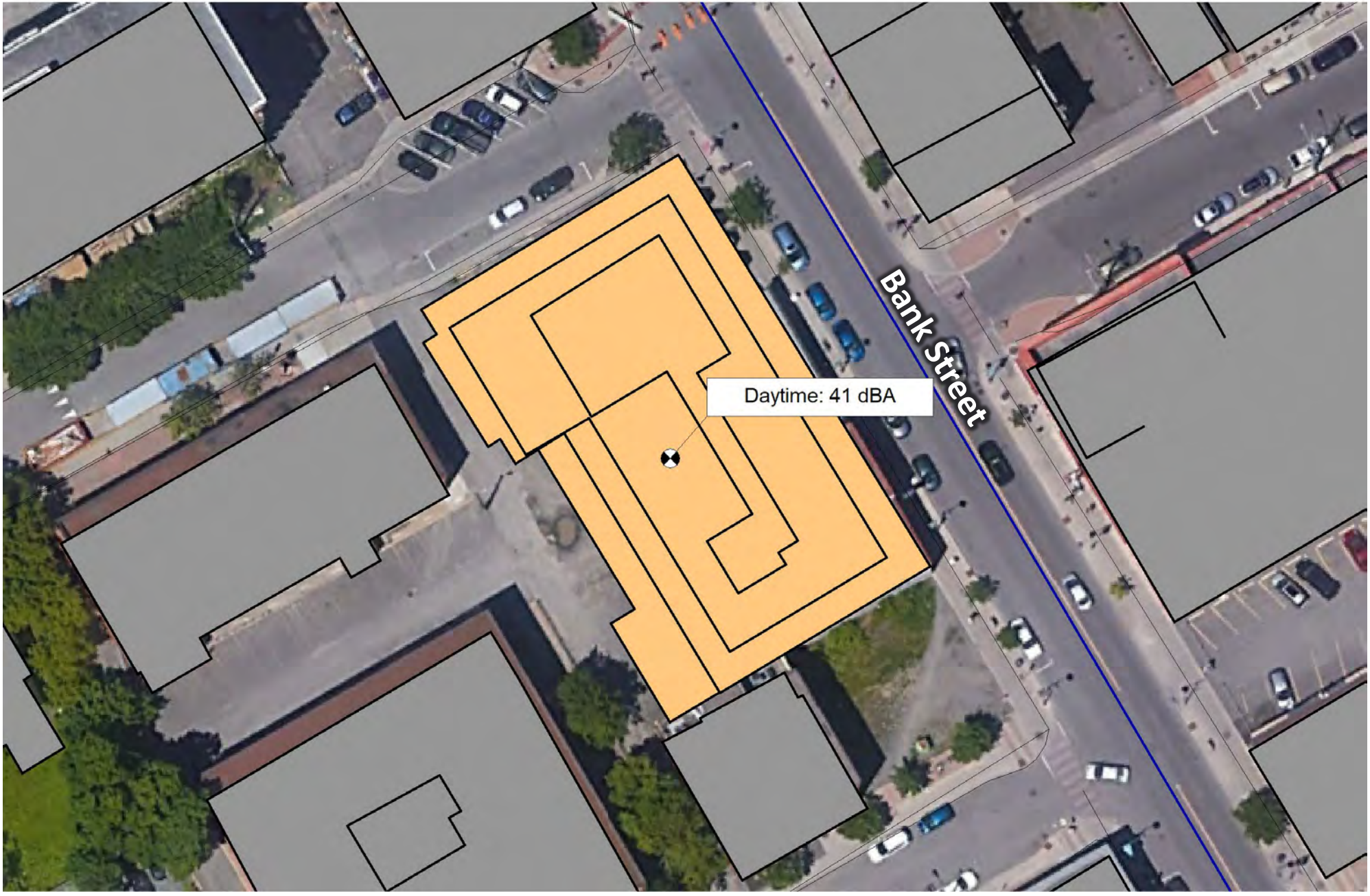

Figure No. **4**

Outdoor Living Area Sound Levels - Daytime

390 Bank Street
Ottawa, Ontario

Project North

Scale: 1:500
Date: 09/09/2019
File No.: 19-0172
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Appendix A

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PROPOSED 9-STOREY MIXED-USE DEVELOPMENT

JAMES HOUSE
390 BANK STREET, OTTAWA, ONTARIO, CANADA

CLIENT:
URBAN CAPITAL

PROJECT:	12017
ISSUED FOR:	COORDINATION
DATE :	2019-08-17

ARCHITECTURAL DRAWING LIST

ISSUED RECORD

2019.xx.xx - ISSUED FOR

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COVER SHEET

NTS

A000

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390 Bank Street, Ottawa, Ontario
Preliminary Site Stats
17 August 2019

Official Plan
Current Zoning

Site Area Gross **1,625 sq.m. 17,491 sq.ft.**

	Units					Retail GFA		Residential		Amenity*		Common		Total GFA	
	Studio	1B	2B	3B	Total	m2	sf	m2	sf	m2	sf	m2	sf	m2	sf
1					0	651	7,003	540	5,808	187	2,011			1003	10,801
2		6	11		17			1240	13,352			136	1,459	1240	13,352
3		7	11		18			1304	14,041			138	1,487	1304	14,041
4		7	11		18			1298	13,973			138	1,487	1298	13,973
5		8	10		18			1291	13,900			138	1,487	1291	13,900
6		9	9		18			1266	13,625			138	1,487	1266	13,625
7		9	9		18			1253	13,489			138	1,487	1253	13,489
8		4	6		10			939	10,107			124	1,332	939	10,107
9		5	6		11			939	10,107			124	1,332	939	10,107
Mech/ Penthouse 10								92	987			58		92	987
Totals	**0**	**55**	**73**	**0**	**128**	**650.6**	**7,003**	**10,163**	109,389	**187**	2011	**1132**	12181	10,626	114,382
	0%	43%	57%												

* excluded from GFA

FSI	6.54
Avg unit size	66.3 m2

Required Parking

Residential	0
Visitors (0.1 per unit)	13
Total	**13**

Proposed Parking

	P1	P2		
Residential	17	34	51	
Visitors	13		13	
Total			64	**64**

Required Bike Parking

Residential (0.5 per unit)	64
Retail (1 per 250m2)	3
Total	67

Proposed Bike Parking

Residential at grade	
Retail at grade	3
Residential at P1	56
Residential at P2	16
Total	72

Lockers

P1	5
P2	37
Total	42

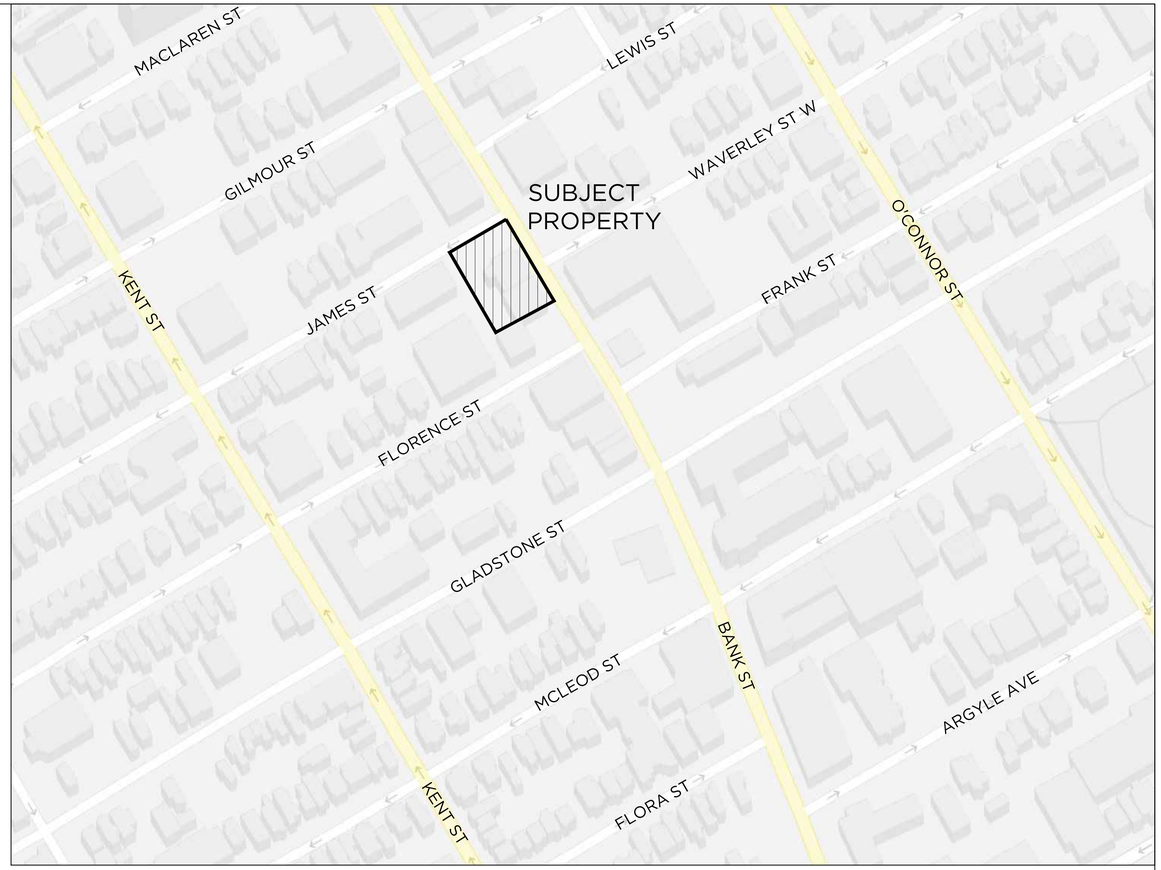
Outdoor Amenity

m2	sf	
55	590	Ground floor
157	1,690	10th floor
212	2,280	

Amenity

	Required	Provided
6m2 per unit	768 m2	
min 50% as communal areas	384 m2	399

2 SITE STATS
SCALE NTS



1 CONTEXT PLAN
SCALE NTS

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NORTH

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CONTEXT PLAN,
SITE STATS

NTS

A001

NOTE:
FOR SITE SERVICING & GRADING
REFER TO DRAWINGS PREPARED
BY DSEL

FOR LANDSCAPE & EXTERIOR
LIGHTING REFER TO DRAWINGS
PREPARED BY FOTENN

REFER TO DRAWING A201 FOR
ADDITIONAL SITE NOTATIONS

SITE PLAN INFORMATION TAKEN FROM :

1. TOPOGRAPHY SURVEY OF LOTS 18, 19 & 20, REGISTERED PLAN NO. 1558, CITY OF OTTAWA, PREPARED BY STANTEC GEOMATICS LTD. (MAY 17, 2012).

72.00 = ESTABISHED GRADE

LEGEND

9.14	EXISTING ELEVATION
+ 88.20	PROPOSED ELEVATION
+ 88.20 TOS	TOP OF SLAB
+ 88.20 TOW	TOP OF WALL
+ 88.20 TOC	TOP OF CURB
	VEHICULAR EXIT/ENTRANCE
	PEDESTRIAN EXIT/ENTRANCE
	PRINCIPAL RES ENTRANCE
	SIAMESE CONNECTION

NOTE:

1. THE BUILDING IS TO BE SPRINKLERED.
2. ALL WASTE GENERATED BY THE SITE TO BE STORED ON PRIVATE PROPERTY.
3. SIDEWALKS AND BOULEVARDS WITHIN THE RIGHT OF WAY TO HAVE A MINIMUM 2% AND MAXIMUM 4% SLOPE TOWARDS THE ROADWAY.
4. REFER TO SITE SERVICING PLAN, PREPARED BY DSEL, FOR SEWER AND WATER SERVICE INFORMATION.
5. ALL EXISTING ACCESSES, CURB CUTS, TRAFFIC CONTROL SIGNS, ETC. ALONG THE DEVELOPMENT SITE FRONTAGES THAT ARE NO LONGER REQUIRED ARE TO BE REMOVED. THE BOULEVARD WITHIN THE PUBLIC RIGHT OF WAY, IN ACCORDANCE WITH CITY STANDARDS AND TO THE SATISFACTION OF THE EXECUTIVE DIRECTOR OF TECHNICAL SERVICES ARE TO BE REINSTATED.

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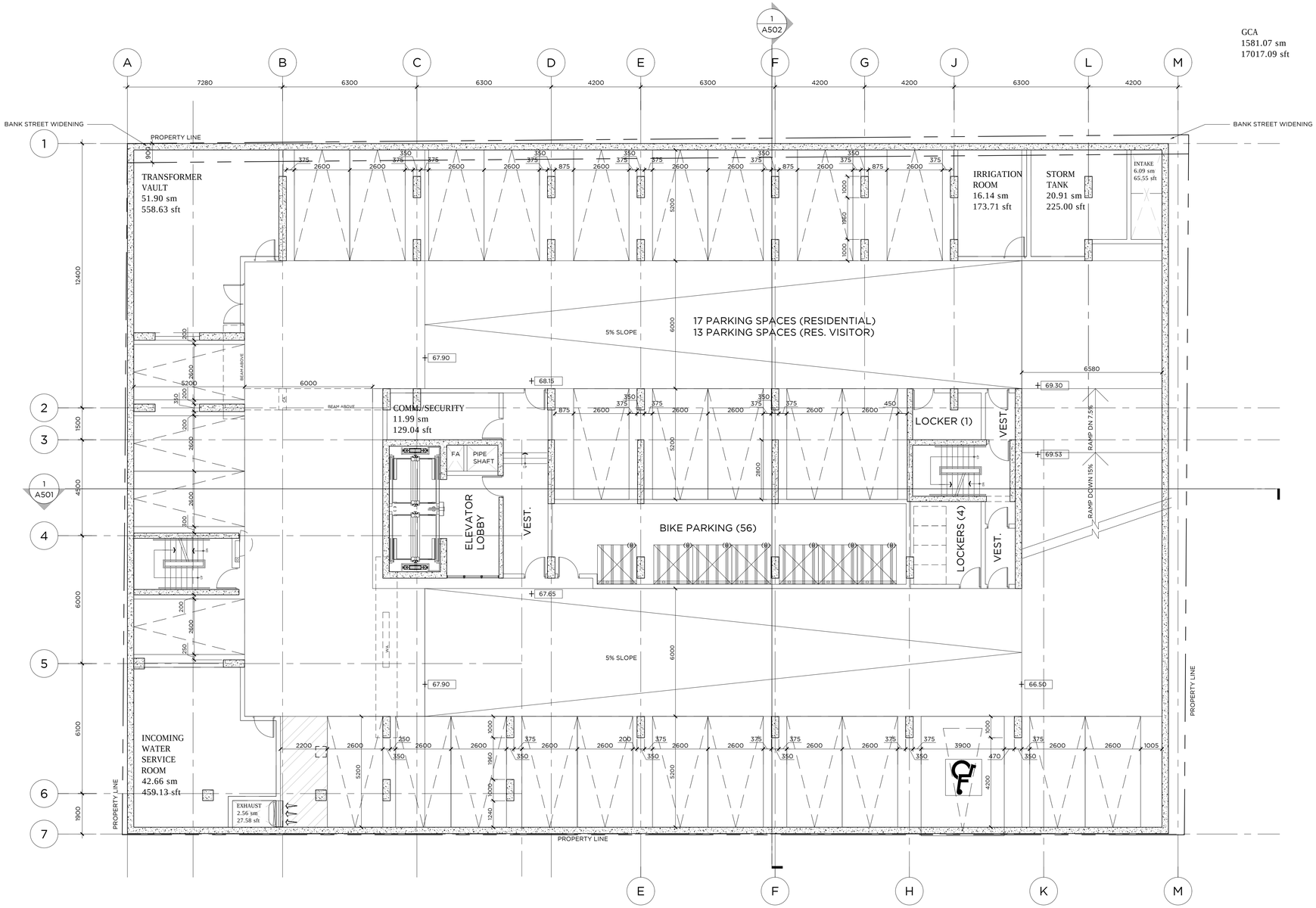
SITE PLAN

1:100

A100



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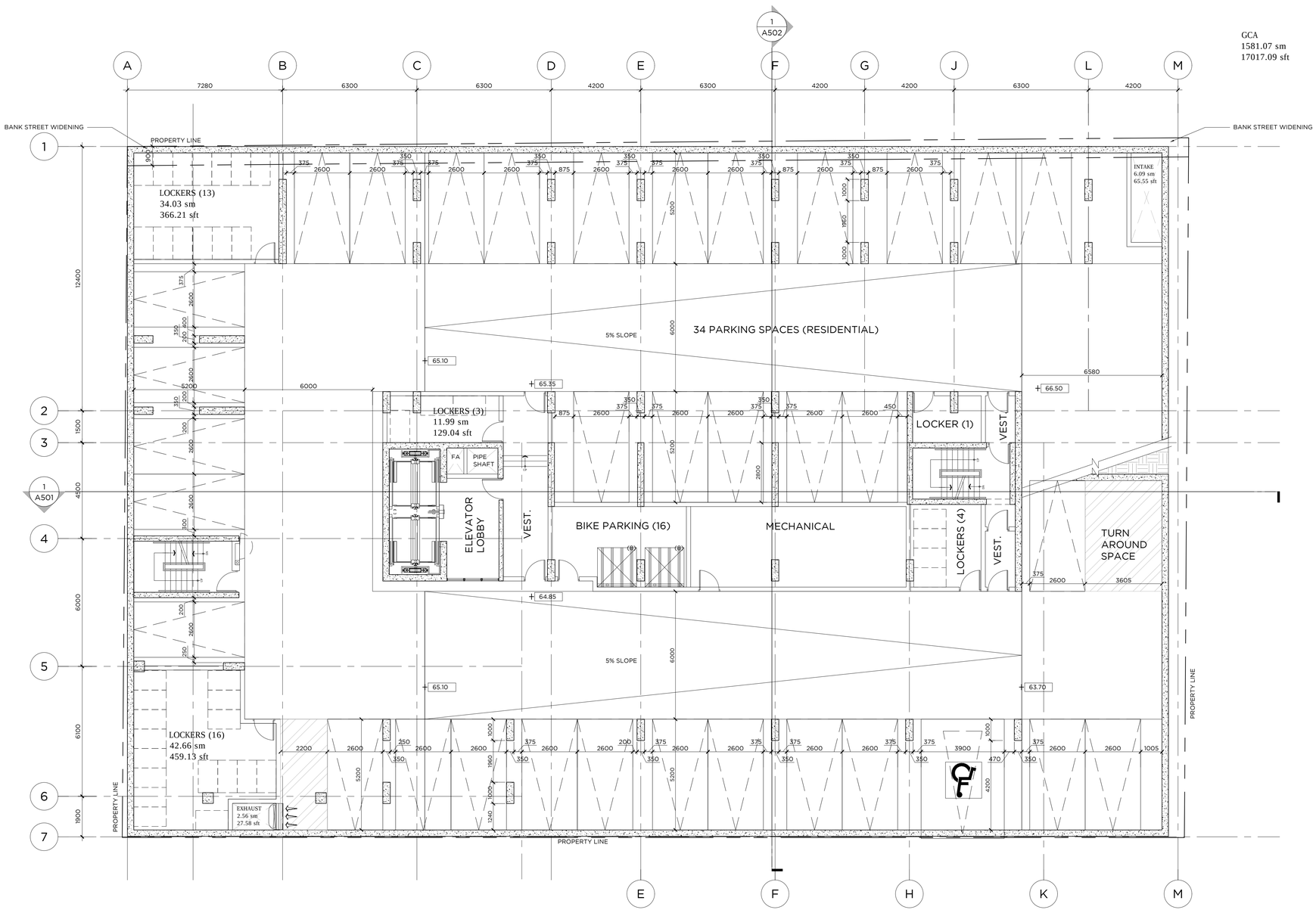
T. 416.304.0431

P1 PARKING PLAN

1:100

A101



GCA
1581.07 sm
17017.09 sft

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12017

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390 BANK STREET
OTTAWA, ON

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P2 PARKING PLAN

1:100

A102

NOTE:
FOR SITE SERVICING & GRADING
REFER TO DRAWINGS PREPARED
BY DSEL

FOR LANDSCAPE & EXTERIOR
LIGHTING REFER TO DRAWINGS
PREPARED BY FOTENN

REFER TO DRAWING A100 FOR
ADDITIONAL SITE NOTATIONS

SITE PLAN INFORMATION TAKEN FROM :

1. TOPOGRAPHY SURVEY OF LOTS 18, 19 & 20, REGISTERED PLAN NO. 1558, CITY OF OTTAWA, PREPARED BY STANTEC GEOMATICS LTD. (MAY 17, 2012).

72.00 = ESTABISHED GRADE

LEGEND

91.14	EXISTING ELEVATION
+ 88.20	PROPOSED ELEVATION
+ 88.20 TOS	TOP OF SLAB
+ 88.20 TOW	TOP OF WALL
+ 88.20 TOC	TOP OF CURB
	VEHICULAR EXIT/ENTRANCE
	PEDESTRIAN EXIT/ENTRANCE
	PRINCIPAL RES ENTRANCE
	SIAMESE CONNECTION

NOTE:

1. THE BUILDING IS TO BE SPRINKLERED.
2. ALL WASTE GENERATED BY THE SITE TO BE STORED ON PRIVATE PROPERTY.
3. SIDEWALKS AND BOULEVARDS WITHIN THE RIGHT OF WAY TO HAVE A MINIMUM 2% AND MAXIMUM 4% SLOPE TOWARDS THE ROADWAY.
4. REFER TO SITE SERVICING PLAN, PREPARED BY DSEL, FOR SEWER AND WATER SERVICE INFORMATION.
5. ALL EXISTING ACCESSES, CURB CUTS, TRAFFIC CONTROL SIGNS, ETC. ALONG THE DEVELOPMENT SITE FRONTAGES THAT ARE NO LONGER REQUIRED ARE TO BE REMOVED. THE BOULEVARD WITHIN THE PUBLIC RIGHT OF WAY, IN ACCORDANCE WITH CITY STANDARDS AND TO THE SATISFACTION OF THE EXECUTIVE DIRECTOR OF TECHNICAL SERVICES ARE TO BE REINSTATED.

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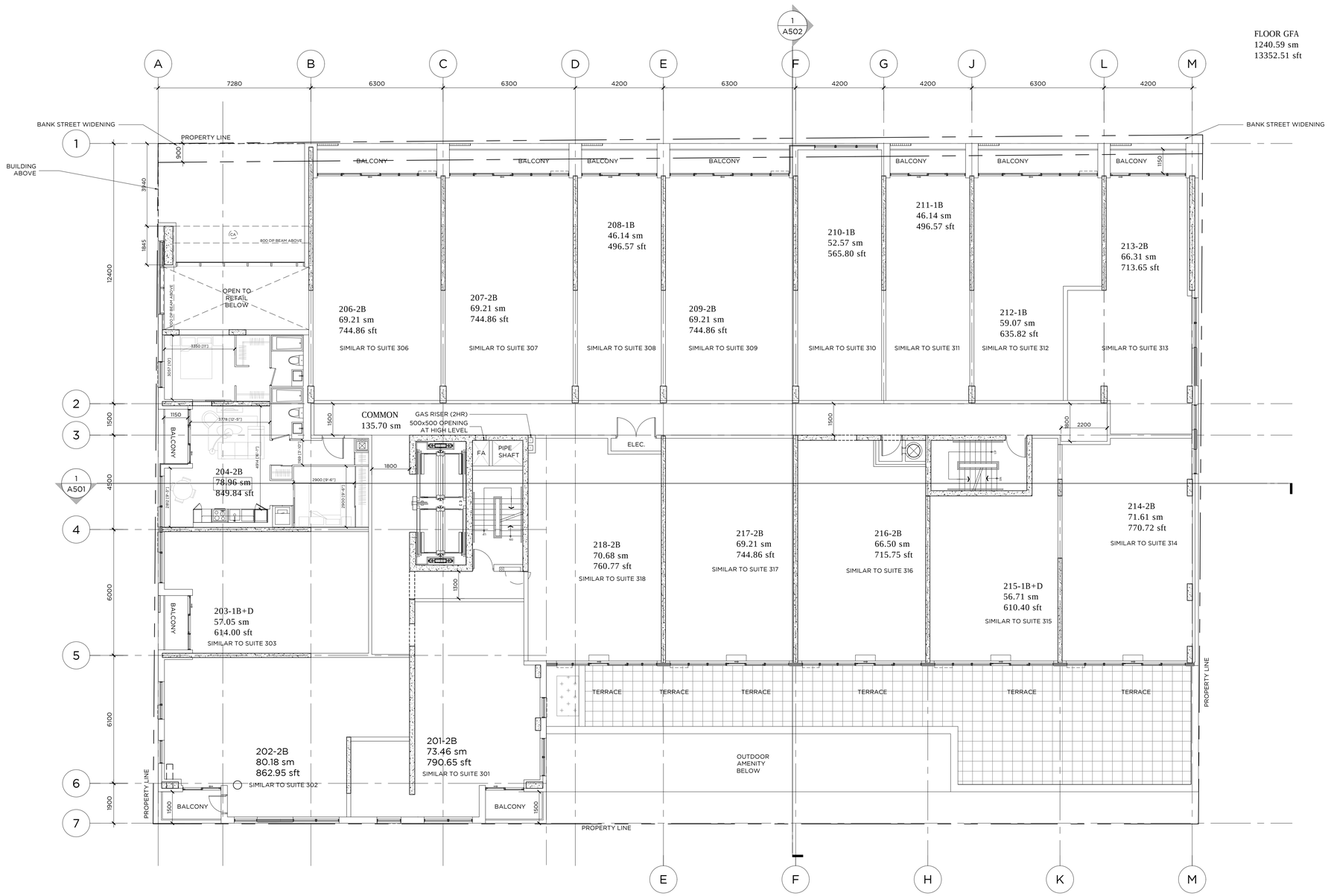
GROUND FLOOR PLAN

1:100

A201



FLOOR GFA
1240.59 sm
13352.51 sft

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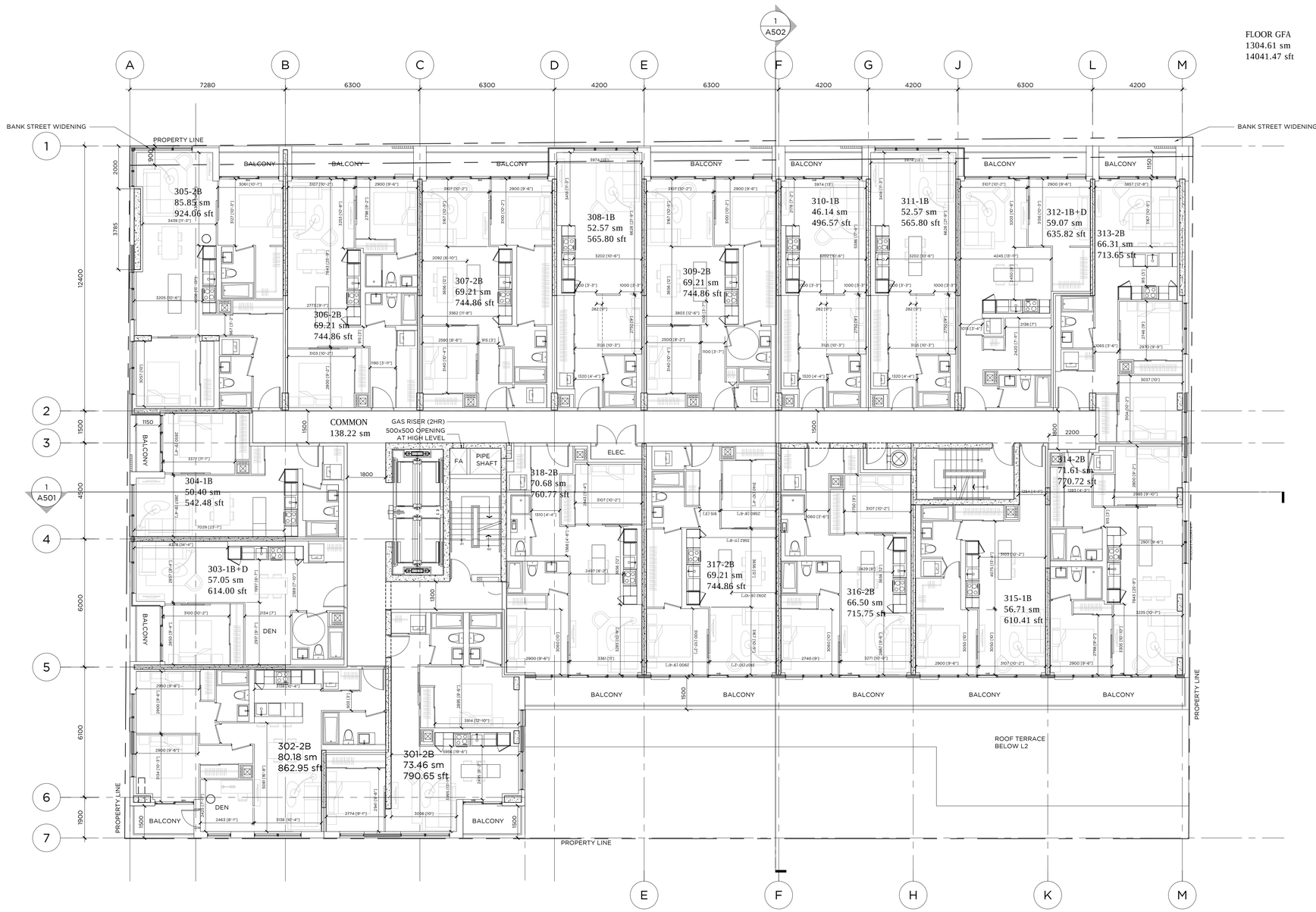
2ND FLOOR PLAN

1:100

A202



FLOOR GFA
1304.61 sm
14041.47 sft

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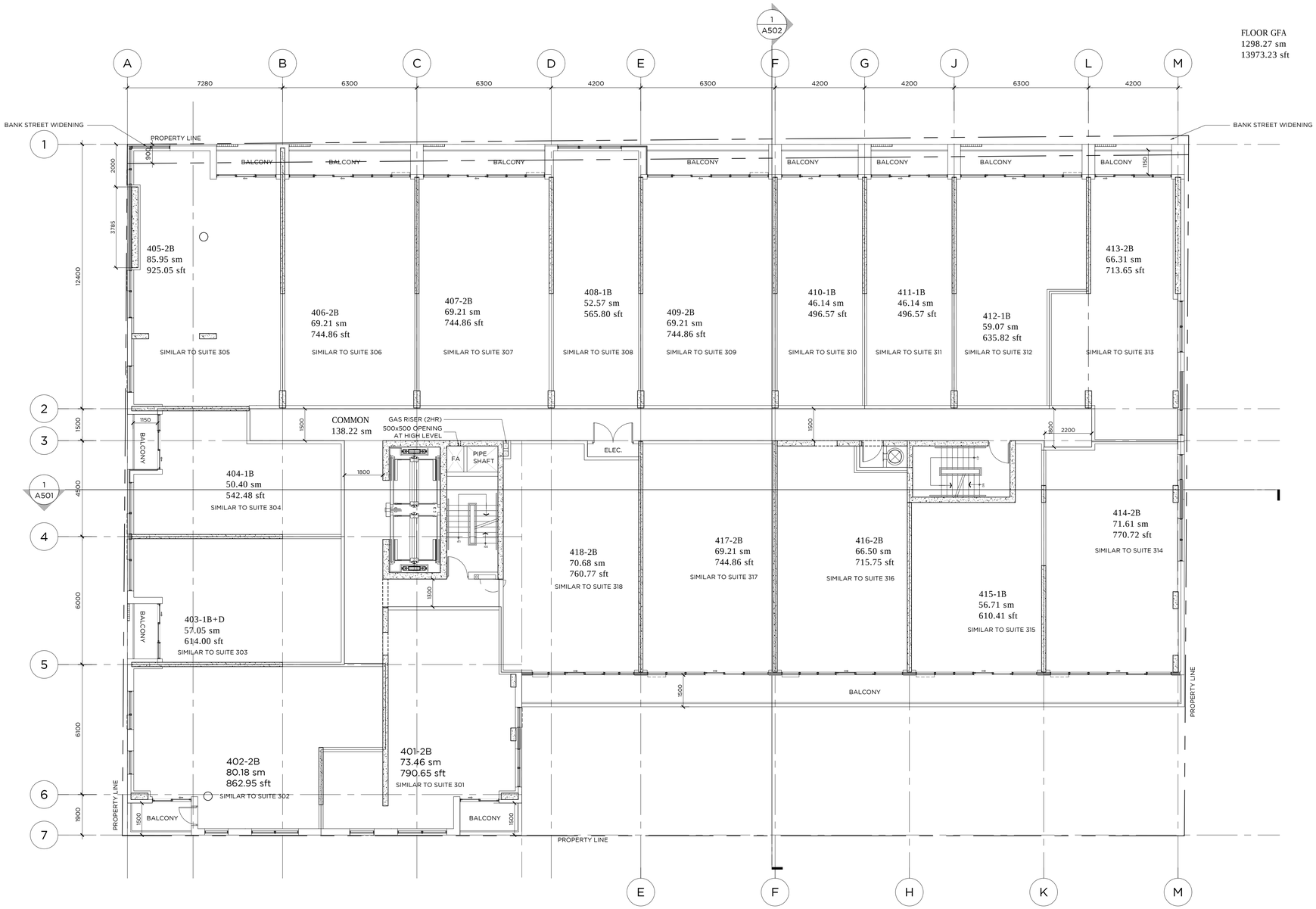
3RD FLOOR PLAN

1:100

A203



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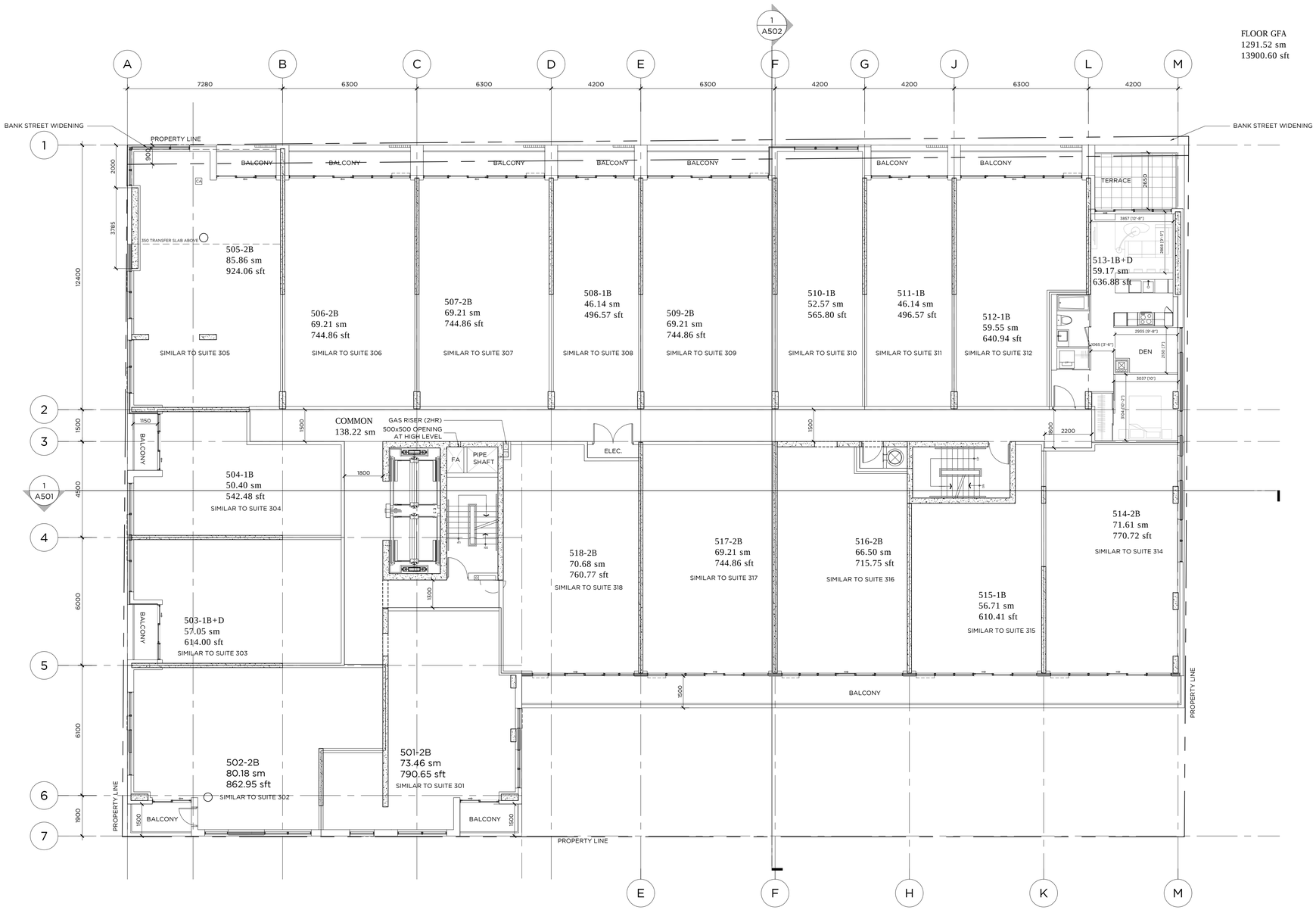
4TH FLOOR PLAN

1:100

A204



FLOOR GFA
1291.52 sm
13900.60 sft

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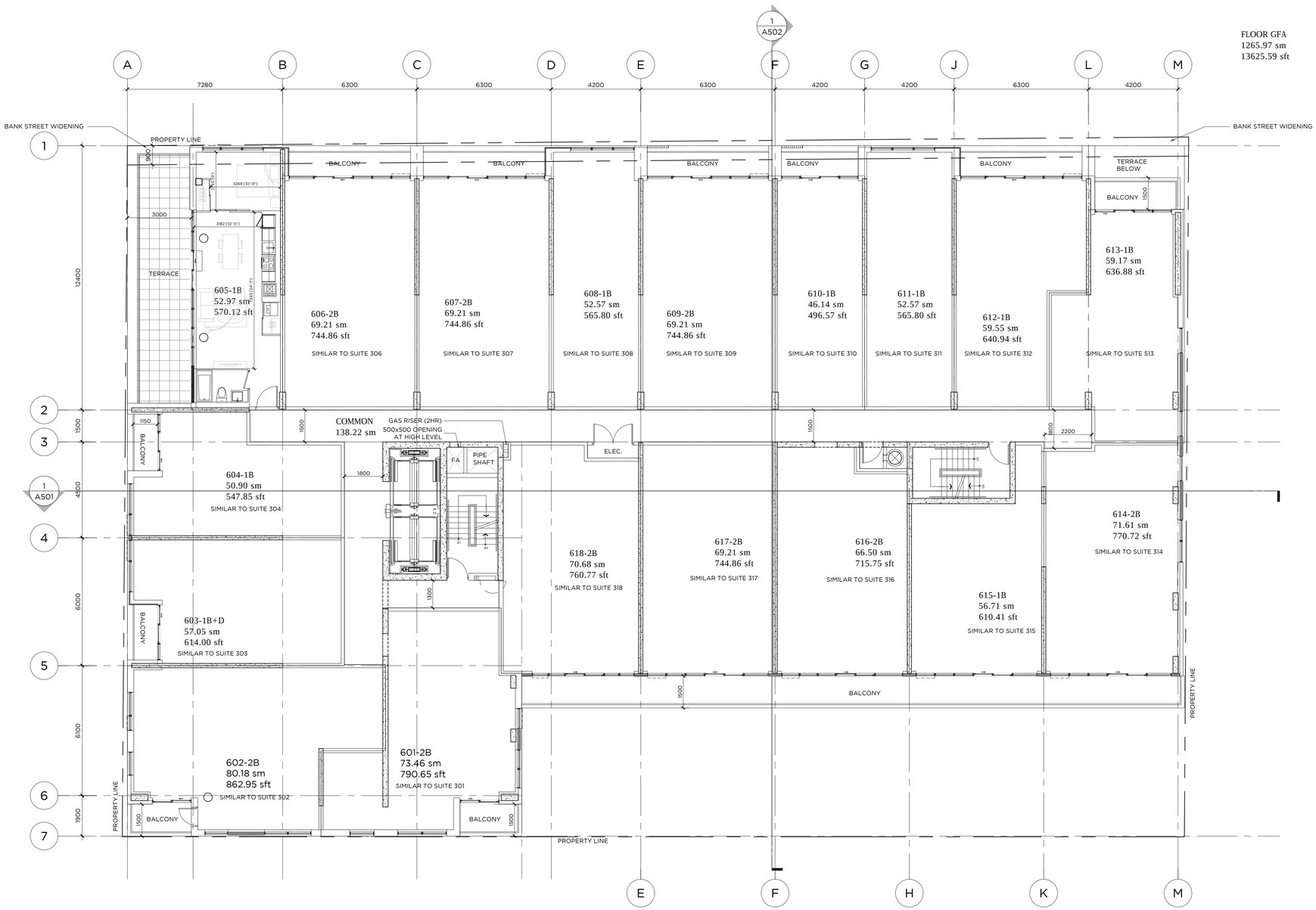
5TH FLOOR PLAN

1:100

A205



FLOOR GFA
1265.97 sm
13625.59 sft

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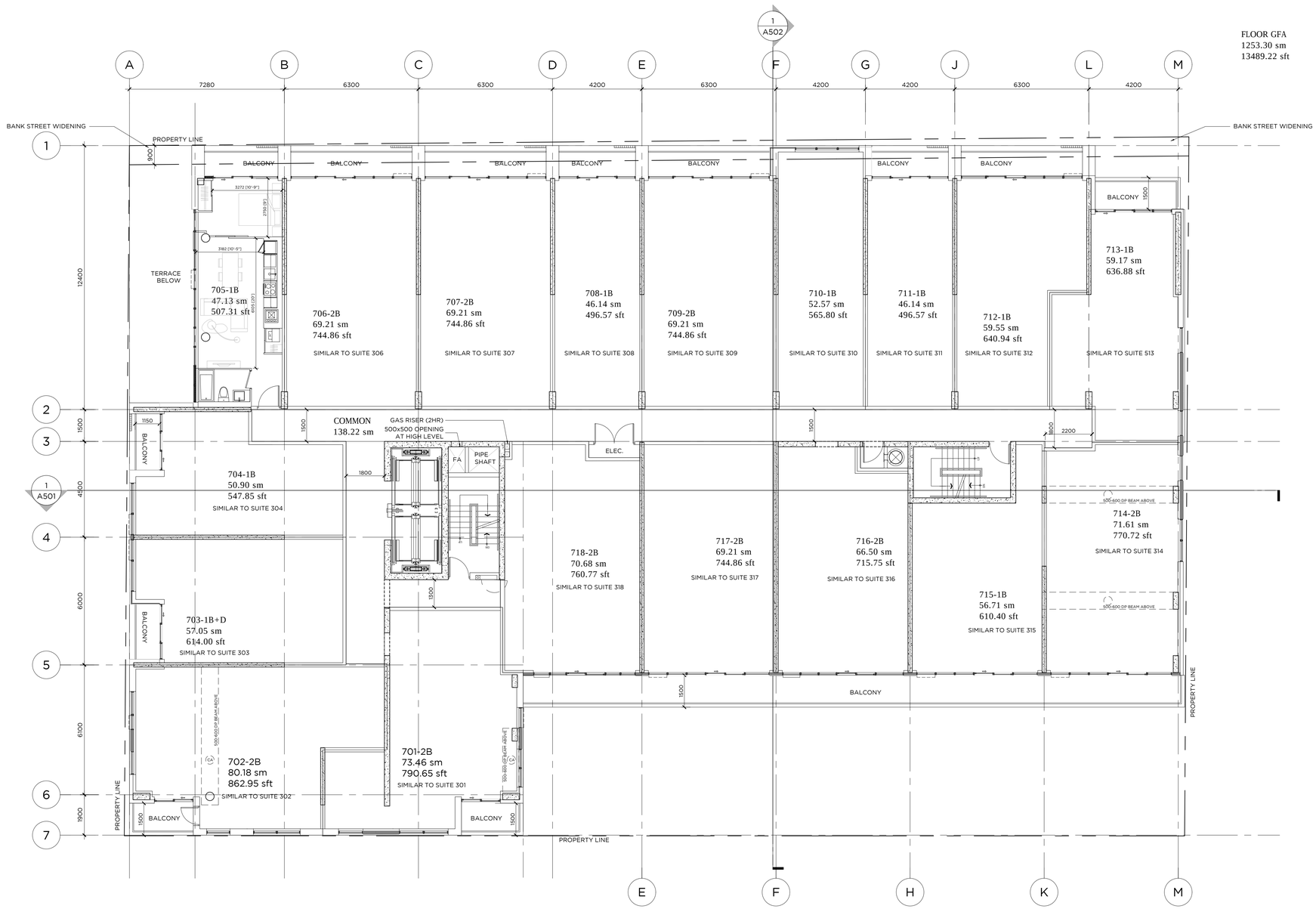
6TH FLOOR PLAN

1:100

A206



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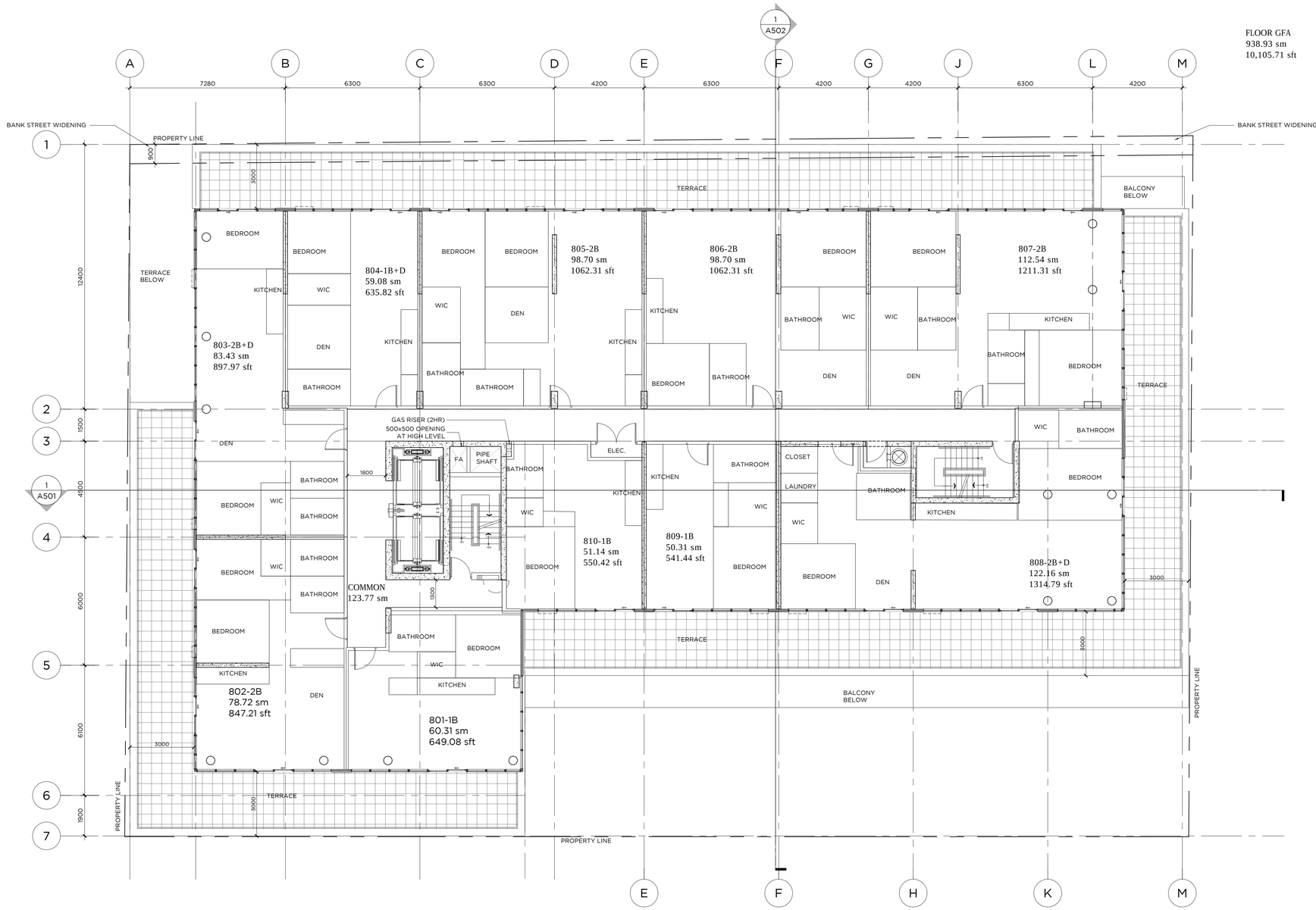
7TH FLOOR PLAN

1:100

A207



FLOOR GFA
938.93 sm
10,105.71 sft

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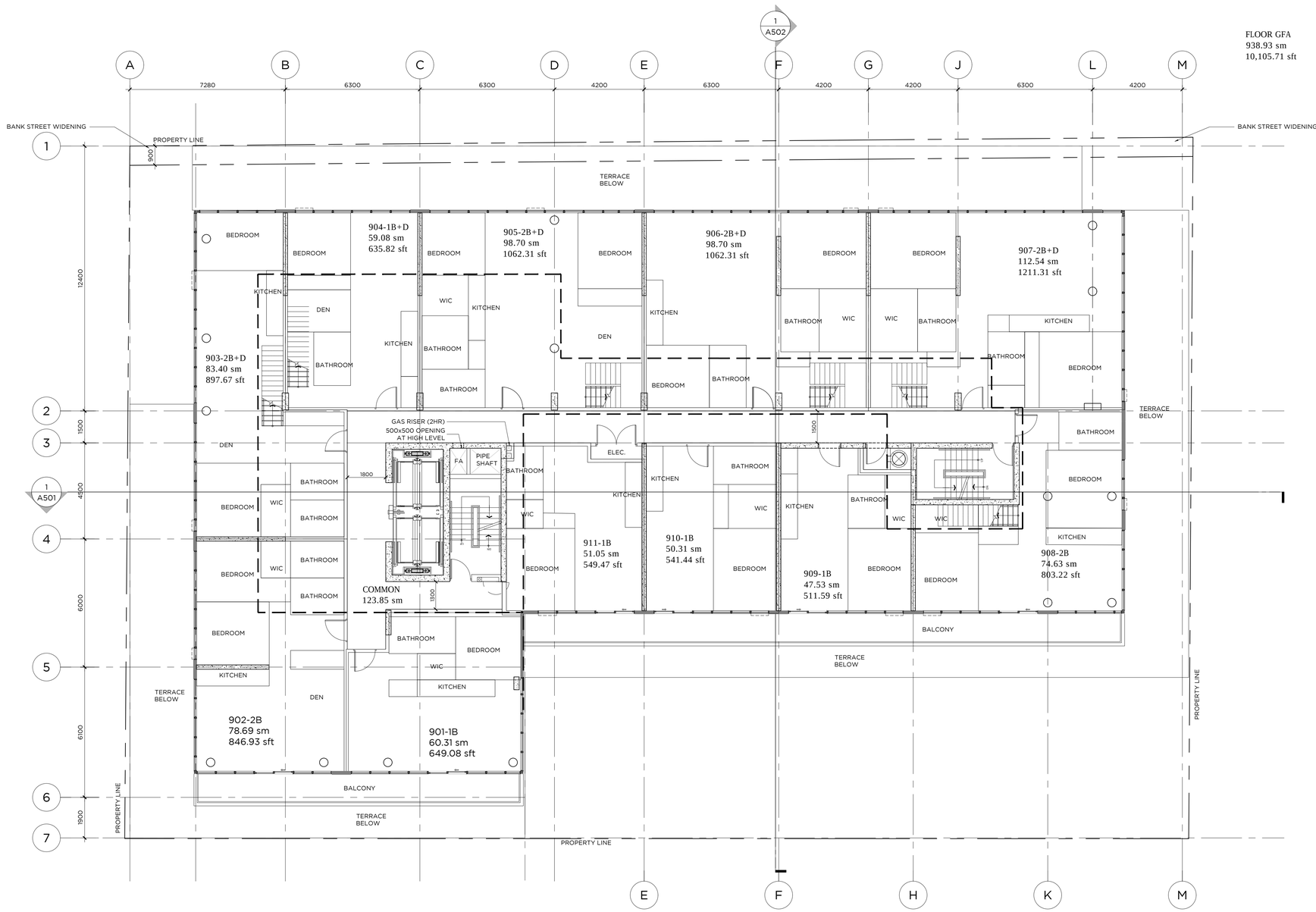
8TH FLOOR PLAN

1:100

A208



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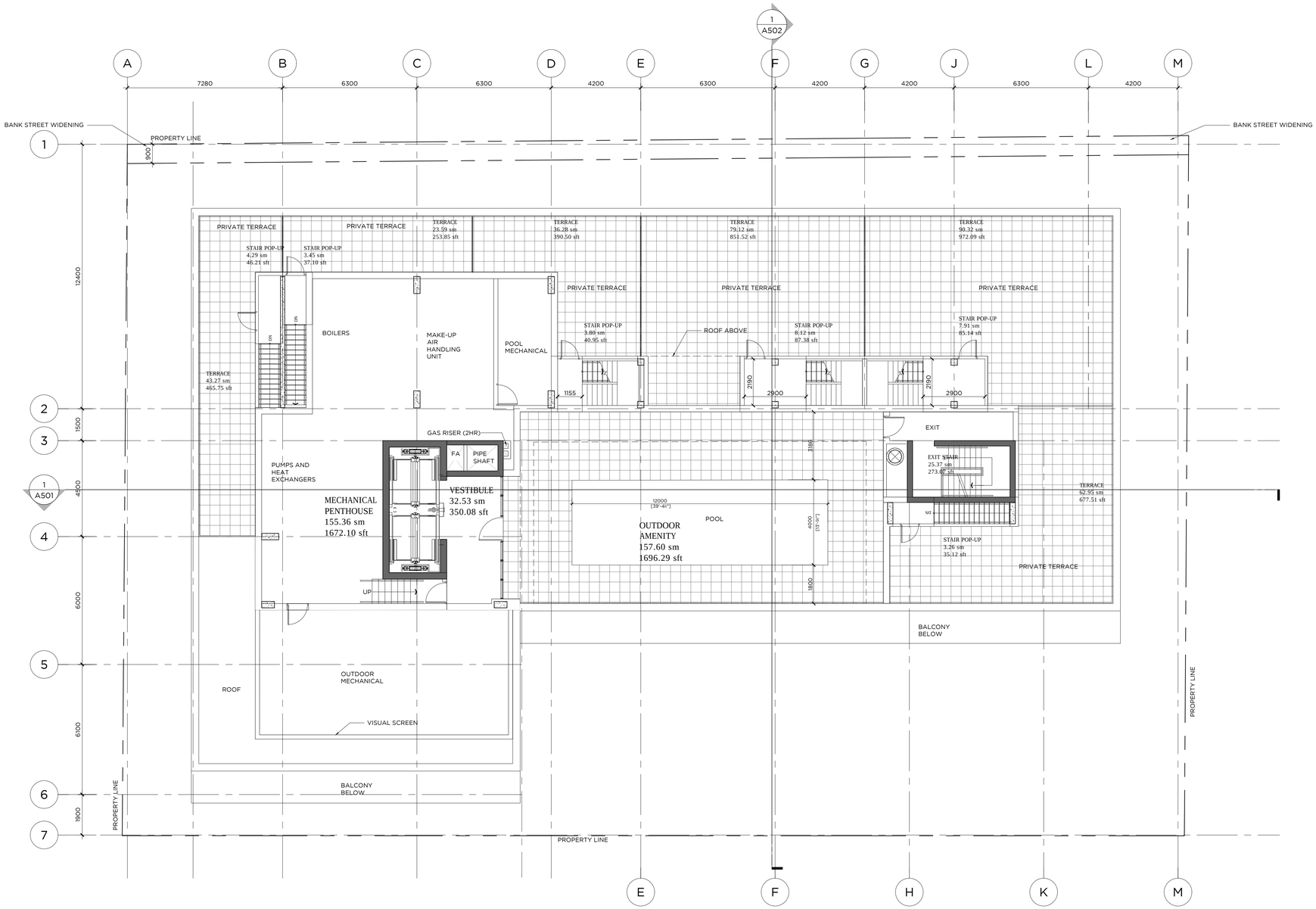
9TH FLOOR PLAN

1:100

A209



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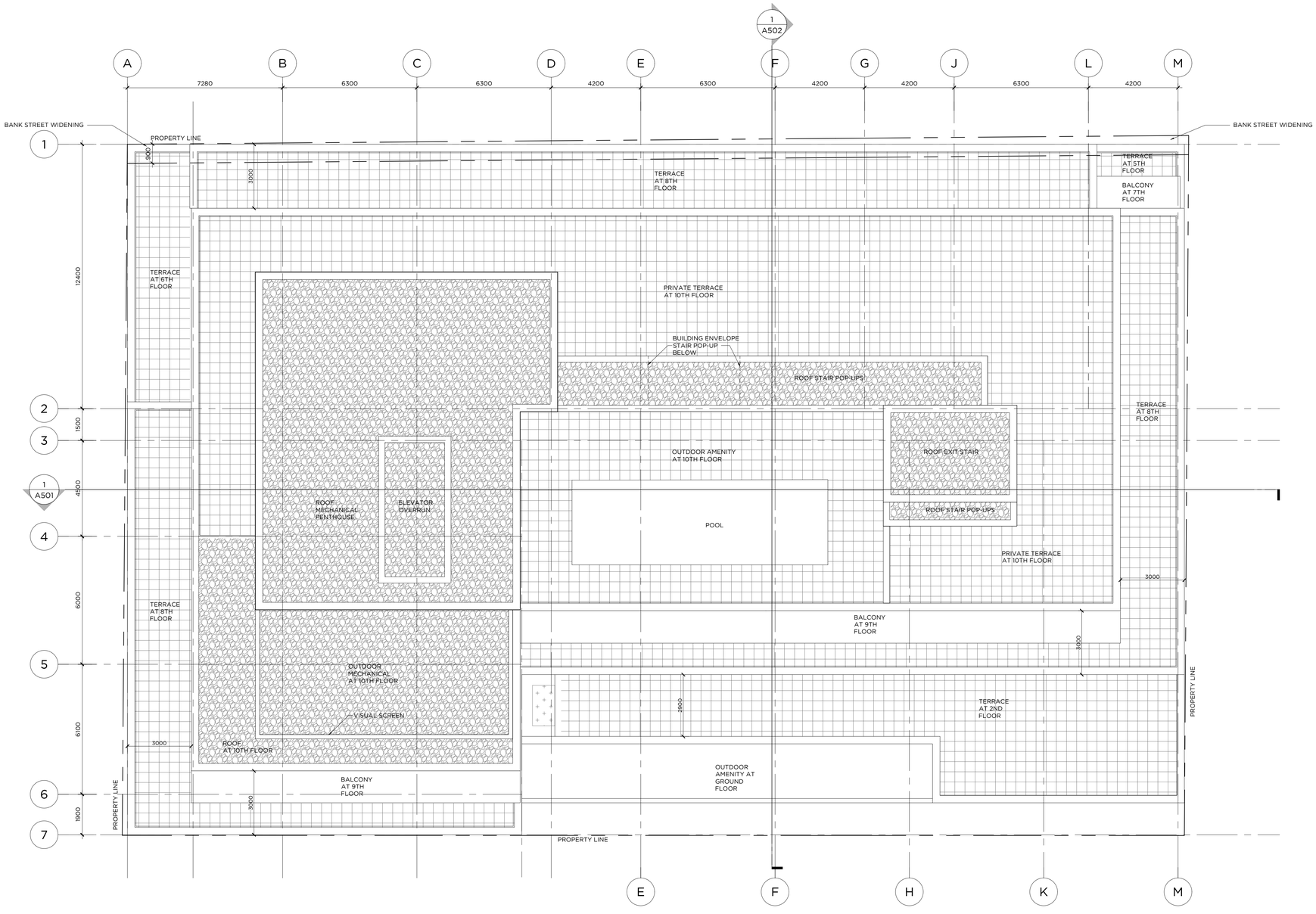
10TH FLOOR PLAN

1:100

A210



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ROOF PLAN

1:100

A211

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EAST
ELEVATION

1:100

A401

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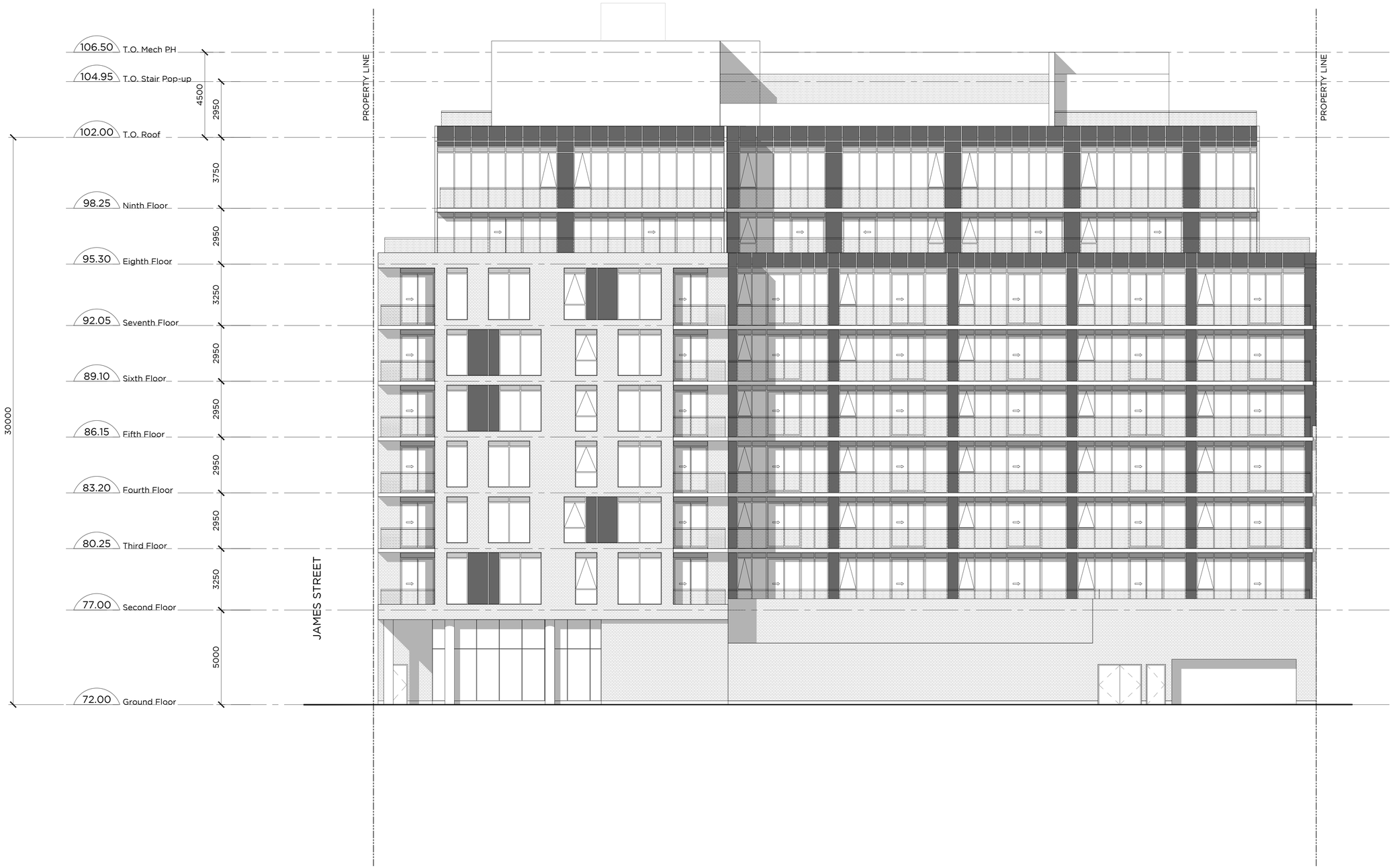
NORTH ELEVATION

1:100

A402



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WEST
ELEVATION

1:100

A403

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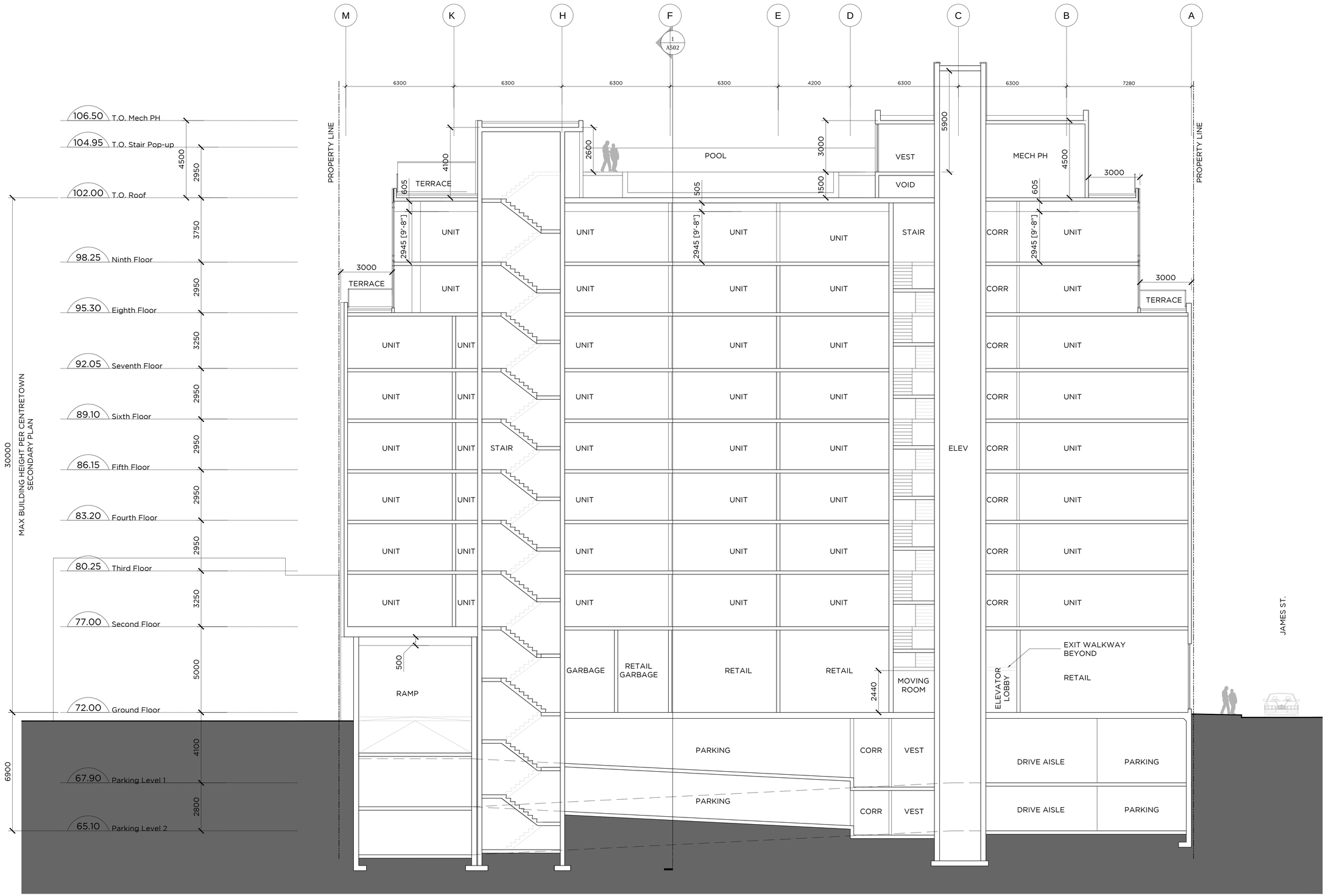
SOUTH
ELEVATION

1:100

A404



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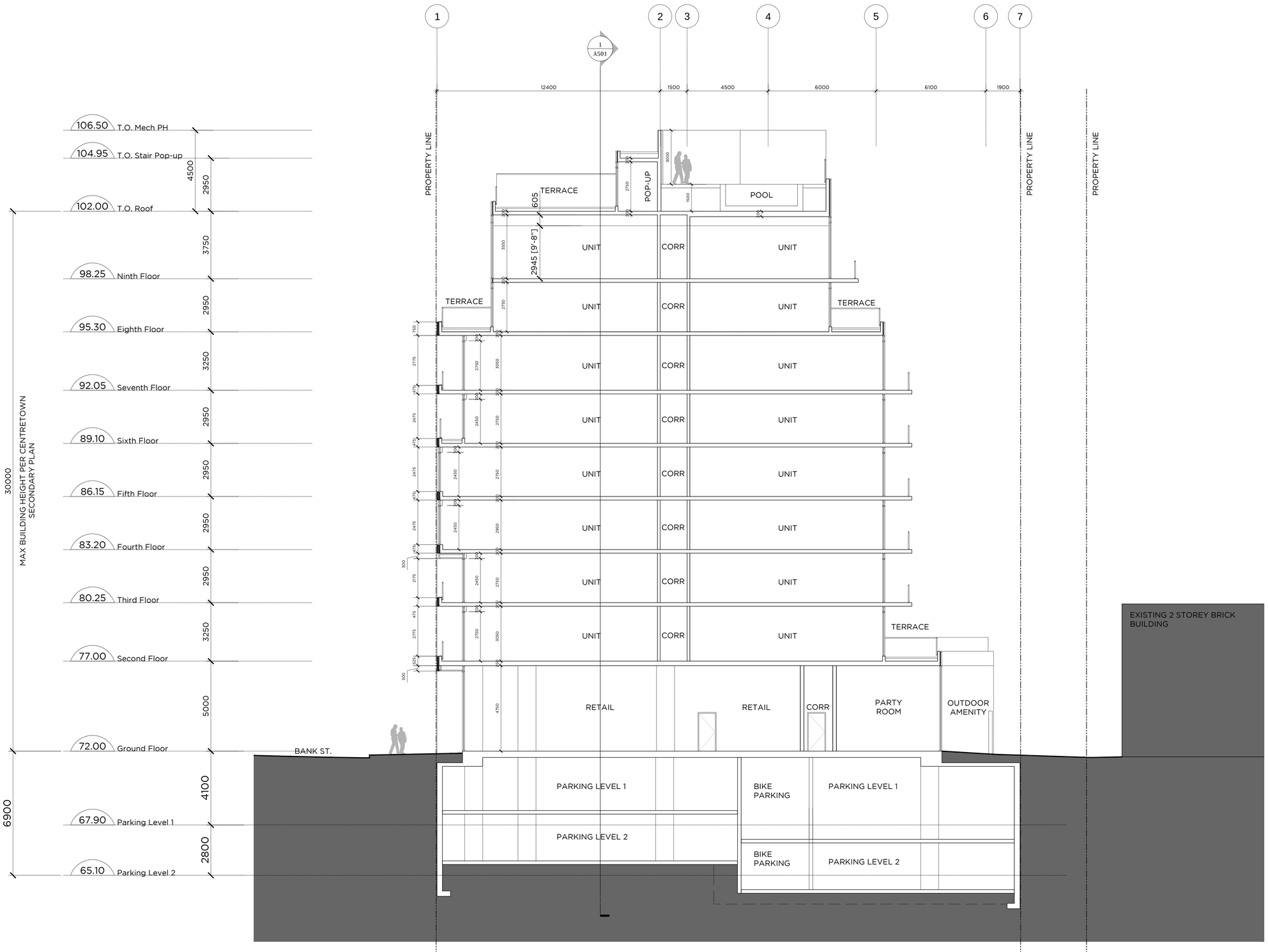
NORTH-SOUTH SECTION

1:100

A501



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EAST-WEST SECTION

1:100

A502

Appendix B

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O R N A M E N T - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

Road Segment ID	Roadway Name	Link Description	Speed (kph)	Period (h)	Total Traffic Volumes	Auto %	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	Cadna/A Ground Absorption G	PWL (dBA)	Source Height, s (m)
Bank_avg	Bank Street	Daytime Impacts	50	16	13800	88.0%	7.0%	5.0%	12144	966	690	0	0.00	**83.5**	**1.5**
Bank_avg	Bank Street	Nighttime Impacts	50	8	1200	88.0%	7.0%	5.0%	1056	84	60	0	0.00	**76.0**	**1.5**

BPN 56 Calculation Procedure - Required Glazing STC Rating (Fixed Veneer)

390 Bank Street Development

Receptor ID	Source Description	Sound Levels		Room / Façade Inputs					Source Inputs		Veneer - Component 1		Glazing - Component 2	
		Façade Sound Level: (dBA)	Required Indoor Sound Level: (dBA)	Glazing as % of Wall Area	Exposed Wall Height (m)	Exposed Wall Length (m)	Room Depth (m)	Room Absorption:	Incident Sound Angle: (deg)	Spectrum type:	Assumed Veneer STC (STC)	Component Category:	Component Category:	Require Glazing STC (STC)
DAYTIME														
	North Façade	66	45	50%	2.8	8.6	3.4	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**24**
NE_LR	East Façade	70	45	80%	2.8	3.4	8.6	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**27**
N_LR	North Façade	66	45	80%	2.8	2.9	7.1	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**24**
E_LR	East Façade	70	45	80%	2.8	6.0	6.3	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**29**
S_LR	South Façade	66	45	80%	2.8	7.8	3.2	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**27**
	South Façade	66	45	0%	2.8	4.0	5.5	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**0**
SE_LR	East Façade	69	45	80%	2.8	5.5	4.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**29**
W_LR	West Façade	46	45	80%	2.8	3.1	3.6	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**1**
	North Façade	66	45	0%	2.8	3.1	3.4	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**0**
NE_BR	East Façade	70	45	80%	2.8	3.4	3.1	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**32**
N_BR	North Façade	66	45	80%	2.8	3.1	2.9	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**28**
E_BR	East Façade	70	45	80%	2.8	3.0	3.1	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**32**
S_BR	South Façade	65	45	75%	2.8	3.2	2.9	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**27**
W_BR	West Façade	46	45	80%	2.8	2.9	2.9	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**8**
NIGHT-TIME														
	North Façade	58	45	50%	2.8	8.6	3.4	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**17**
NE_LR	East Façade	62	45	80%	2.8	3.4	8.6	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**19**
N_LR	North Façade	58	45	80%	2.8	7.3	4.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**18**
E_LR	East Façade	62	45	80%	2.8	6.0	6.3	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**21**
S_LR	South Façade	58	45	80%	2.8	7.8	3.2	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**19**
	South Façade	58	45	0%	2.8	4.0	5.5	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**0**
SE_LR	East Façade	62	45	80%	2.8	2.9	2.9	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**24**
W_LR	West Façade	46	45	80%	2.8	5.5	4.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**6**
	North Façade	58	40	0%	2.8	3.1	3.4	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**0**
NE_BR	East Façade	62	40	80%	2.8	3.4	3.1	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**29**
N_BR	North Façade	58	40	80%	2.8	3.1	2.9	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**25**
E_BR	East Façade	62	40	80%	2.8	3.0	3.1	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**29**
S_BR	South Façade	58	40	75%	2.8	3.2	2.9	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**25**
W_BR	South Façade	46	40	80%	2.8	2.9	2.9	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	54	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**13**

Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions

Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % [1]
NA [2]	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6 UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
23-34	4-Lane Major Collector (4-UMCU)	24,000	40-60	92/8	7	5
30-35.5	2-Lane Rural Arterial (2-RAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Urban Arterial (2-UAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Major Collector (2-UMCU)	12,000	40-60	92/8	7	5
30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

[1] The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

[2] The number of lanes is determined by the future mature state of the roadway.

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Appendix C

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Warning Clauses

The following Warning Clauses should be registered on Title and/or included in in all agreements of purchase and sale and/or leases and/or disclosure statements and declarations for the development:

Type D Warning Clause – North, East, and South Façades

> "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior 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."

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Appendix D

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STAMSON 5.0 NORMAL REPORT Date: 09-09-2019 15:54:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 390Bank.te Time Period: 16 hours
Description: 2nd Floor Receptor South Facade

Road data, segment # 1: Bank Street

Car traffic volume : 12144 veh/TimePeriod
Medium truck volume : 966 veh/TimePeriod
Heavy truck volume : 690 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Bank Street

Angle1 Angle2 : 0.00 deg 85.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 5.10 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Bank Street

Source height = 1.50 m

ROAD (0.00 + 65.22 + 0.00) = 65.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	85	0.00	68.48	0.00	0.00	-3.26	0.00	0.00	0.00	65.22

Segment Leq : 65.22 dBA

Total Leq All Segments: 65.22 dBA

TOTAL Leq FROM ALL SOURCES: 65.22

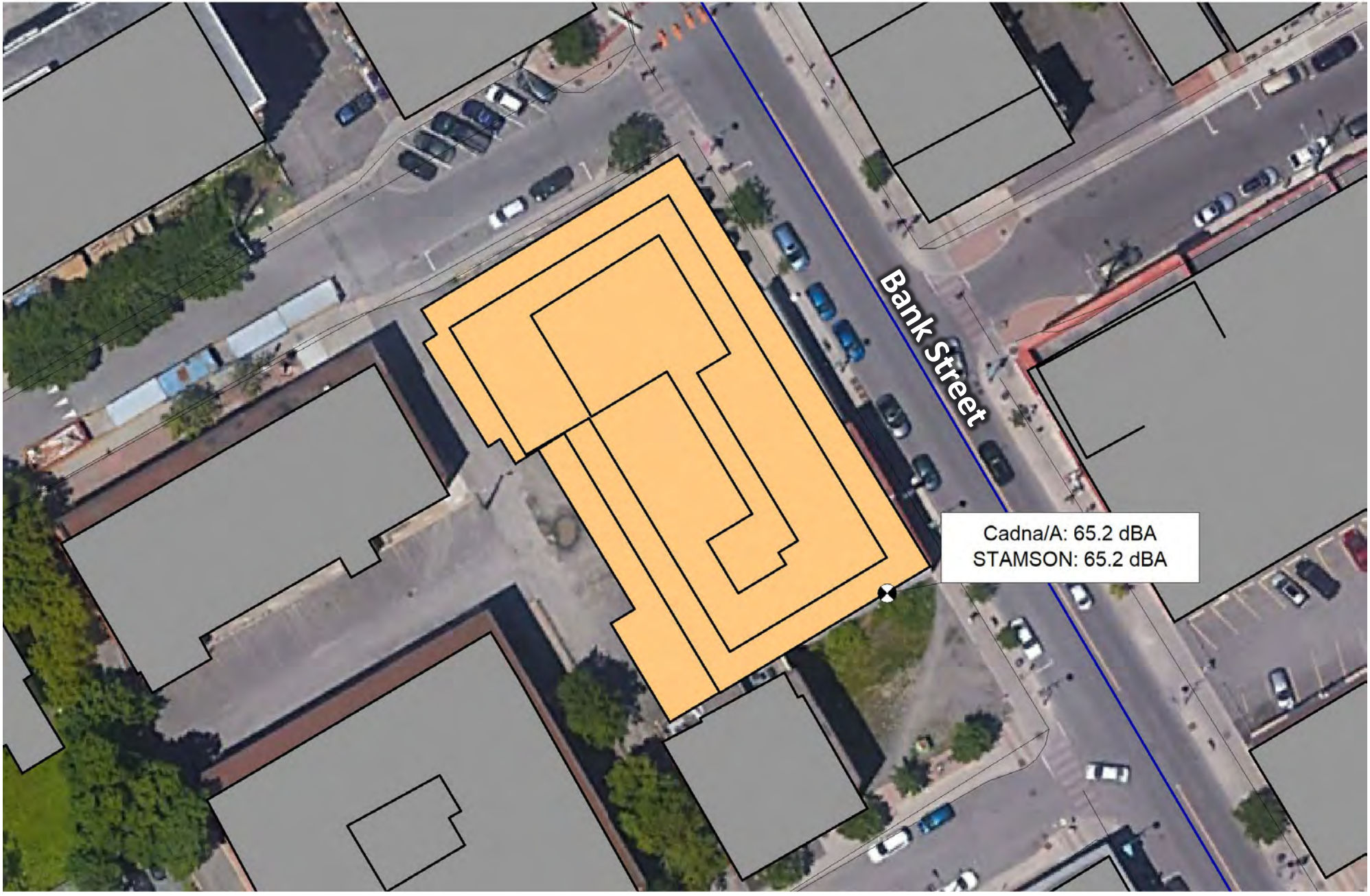

Figure No. **D1**

STAMSON Validation

390 Bank Street
Ottawa, Ontario

Project North

Scale: 1:500
Date: 09/09/2019
File No.: 19-0172
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

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