



## Assessment of Adequacy of Public Services Report

1657 - 1673 Carling Ave, Ottawa, ON

Prepared for:

**Inside Edge Properties**

464 Bank St, Suite 200  
Ottawa, ON K2P 1Z3

Attention: Jordan Bianconi

LRL File No.: 220449

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## 1 INTRODUCTION AND SITE DESCRIPTION

LRL Engineering Ltd. was retained by Inside Edge Properties to prepare a functional serviceability report to support Zoning Bylaw Amendment of the property located at 1657 - 1673 Carling Avenue within the City of Ottawa. The applicant is submitting a Zoning By-law Amendment in order to establish site-specific building height and setback provisions to permit the establishment of a 28-storey (86m) high-rise residential apartment building with ground floor commercial uses. The building will be supported by external and below-grade vehicle and bicycle parking.

The subject site is within the Kitchissippi ward, located on the northwest side of Carling Avenue, and has an approximate area of **0.36 ha**. The property is extended and encompasses 386 Tillbury Avenue, located northwest of 1657 – 1673 Carling Avenue and has an approximate area of **0.02 ha**. The properties are currently zoned AM10. The site at 1657 - 1673 Carling Ave consists of a 2-storey commercial building occupying a majority of the south half of the site. The balance of the site consists of a paved parking lot, driveway, and small grassed areas. The site at 386 Tillbury Avenue consists of residential 2 storey building.

The collective subject site can be seen below in Figure 1.



Figure 1: Aerial View of Subject Lands

## 2 EXISTING SITE AND AVAILABLE SERVICES

The subject parcel currently consists of a 2-storey commercial building and an asphalt parking lot at 1657 – 1673 Carling Avenue and a 2-storey residential building with a paved driveway on Tillbury Avenue. There is a landscape buffer surrounding the exterior of the parcels.



Sewer and watermain mapping, along with as-built information collected from the City of Ottawa indicate the following existing infrastructure located within the adjacent rights-of-way:

**Carling Avenue:**

- 300mmØ Concrete Sanitary Sewer
- 610mmØ PVC Watermain
- 225mmØ – 375mmØ Concrete Storm Sewer

**Tillbury Avenue:**

- 225mmØ Concrete Sanitary Sewer
- 305mmØ PVC Watermain
- 450mmØ Concrete Storm Sewer

### 3 CONCEPT DEVELOPMENT

The intention of this serviceability report is to review the existing conditions of municipal services & infrastructure to determine the servicing feasibility of a high-density residential/commercial mixed development within the subject property. The contemplated development includes 28 multi-storey high-rise apartment building with surface and underground parking, with access from Carling Avenue and Tillbury Avenue.

The contemplated buildings transition down from 28 storeys at the south portion (bordered by Carling Avenue) to 9 storeys to 6 storeys and 4 storeys. The development contemplates a mixed-use floor area with retail and residential units. The following is a contemplated breakdown of the floor space:

*Table 1: Conceptual Total Floor Area*

	Building Area (m <sup>2</sup> )
Retail (4 Units)	360.78
Residential (370 Units)	23 152.50
Total	23 513.28

Refer to the Site Plan SP-01 prepared by Project1 Studio Planning & Design included in **Appendix A**.

### 4 WATER SUPPLY SERVICING

The subject property lies within the City of Ottawa 1W water distribution network pressure zone. There are currently two existing watermains within servicing range of the site; a 610 mm PVC pipe located on Carling Ave, and a 305 mm PVC pipe located on Tillbury Avenue. There are currently seven (7) existing fire hydrants within a 300m proximity of the subject property. Refer to **Appendix B** for the water pressure zone map and location of fire hydrants.

According to the City of Ottawa Water Distribution Guidelines (Technical Bulletin ISDTB-2014-02), as the subject site is anticipated to house more than 50 residential units, it is required to be



served by two water service laterals, separated by an isolation valve, for redundancy and to avoid creation of a vulnerable service area. Hence, the contemplated development is anticipated to be serviced via two services connected to either the existing 200mm watermain within Carling Avenue or the existing 305mm watermain located on Tillbury Avenue. The service laterals are to be looped inside the building in coordination with the mechanical engineer at detailed design stage. Shall pressure concerns in the network be determined during the detailed design phase, the option to connect to the high pressure 610 mm diameter watermain could be explored further with approval from the City of Ottawa's Water department.

Table 2, included below, summarizes the City of Ottawa Design Guidelines design parameters in the preparation of the water demand estimate.

*Table 2: City of Ottawa Design Guidelines - Water Design Parameters*

Design Parameter	Value
Residential Bachelor / 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Residential 3 Bedroom Apartment	3.1 P/unit
Commercial Average Daily Demand	2.8 L/m <sup>2</sup> /d
Average Daily Demand	280 L/d/per
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
Desired operating pressure range during normal operating conditions	345 kPa (50psi) to 552 kPa (80psi)
During normal operating conditions pressure must not drop below	275 kPa (40psi)
During normal operating conditions pressure shall not exceed	552 kPa
During fire flow operating conditions pressure must not drop below	140 kPa (20psi)
*Table updated to reflect technical Bulletin ISDTB-2018-02	

#### 4.1 Residential Water Demands

Anticipated population demands have been interpreted from the Site Plan SP-02 provided by Project1 Studio Inc. The contemplated development is anticipated to include **370** residential units, which translates to a population of **616** as per the City of Ottawa Water Distribution Design Guidelines. Table 3 below summarizes the proposed population count as interpreted using Table 4.1 of the *City of Ottawa Water Distribution Design Guidelines*.

*Table 3: Development Residential Population Estimate*

Unit Type	Persons Per Unit	Number of Units	Population
1 Bedroom Apartment / Studio	1.4	230	322
2 Bedroom Apartment	2.1	140	294
		<b>Total</b>	<b>616</b>

The required water supply requirements for the residential units in the proposed subdivision have been calculated using the following formula:



$$Q = (q \times P \times M)$$

Where:

$q$  = average water consumption (L/capita/day)

$P$  = design population (capita)

$M$  = Peak factor

With reference to *Table 4.2 of the City of Ottawa Water Distribution Design Guidelines*, using an average water consumption rate of 280 L/c/d, a calculated Maximum Daily Demand Factor and Maximum Hour Demand Factor of 2.5 and 2.2, respectively, anticipated demands were calculated as follows:

- Average daily domestic water demand is **2.13** L/s,
- Maximum daily demand is **5.33** L/s, and
- Maximum hourly demand is **11.73** L/s.

## 4.2 Commercial Water Demands

As previously mentioned, the concept plan indicates that a portion of the floor area will be dedicated to commercial space. As per Site Plan SP-02, this commercial space would work out to a GFA of approximately **400 m<sup>2</sup>**.

The required water supply requirements for the commercial space within the proposed subdivision have been calculated using the following formula:

Where:

$$Q = (q \times A \times M)$$

$q$  = average water consumption (L/m<sup>2</sup>/day)

$A$  = commercial area (m<sup>2</sup>)

$M$  = Peak factor

With reference to *Table 4.2 of the City of Ottawa Water Distribution Design Guidelines* and *technical bulletin ISTB-18-02*, using an average water consumption rate of 2.5 L/m<sup>2</sup>/d, a calculated Maximum Daily Demand Factor and Maximum Hour Demand Factor of 1.5 and 1.8, respectively, anticipated commercial demands were calculated as follows:

- Average daily domestic water demand is **0.012** L/s,
- Maximum daily demand is **0.017** L/s, and
- Maximum hourly demand is **0.031** L/s.



### 4.3 Total Water Demands

Based on calculated residential and commercial demands for the concept development, the total anticipated water demands are as follows.

- Average daily domestic water demand is **2.14** L/s,
- Maximum daily demand is **5.35** L/s, and
- Maximum hourly demand is **11.76** L/s.

For greater detail on Water Demand Calculations, please refer to **Appendix C**.

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand, as indicated in the boundary request correspondence included in **Appendix D**. It was requested that hydraulic analysis be performed for both Carling Avenue and Tillbury Avenue given we have not progressed into the details design required for the Site Plan Application. The boundary conditions are summarized in table 4 below (Table 4).

*Table 4: Summary of Boundary Conditions*

Boundary Conditions – Carling Avenue			
Design Parameter	Anticipated Demand (L/s)	Min Pressure (Psi/kPa)	Max Pressure (Psi/kPa)
Max Daily Demand	5.35	43.83 / 302.20	51.66 / 356.18
Max Hourly Demand	11.76	43.39 / 299.16	51.22 / 353.15
*Carling Ave, Ground Elevation assumed at 77.9m			

Boundary Conditions – Tillbury Ave			
Design Parameter	Anticipated Demand (L/s)	Min Pressure (Psi/kPa)	Max Pressure (Psi/kPa)
Max Daily Demand	5.35	43.28 / 298.41	51.68 / 356.32
Max Hourly Demand	11.76	41.97 / 289.37	50.36 / 347.22
*Carling Ave, Ground Elevation assumed at 77.9m			

As indicated in Table 4, minimum pressures in the maximum daily demand fall below the required pressure range stated in Table 1 as per City of Ottawa Design Guidelines. Means of either decreasing water demands, or increasing water service pressure mechanically, will need to be investigated and implemented to provide sufficient minimum pressure to the proposed development. Alternatively;

- Fire hydrant testing to determine actual operating pressures surrounding the subject parcel could take place during the detailed design phase to ensure that all options for connections are exhausted.



- The City of Ottawa Water Department could be consulted to investigate the circumstances of tying into the 610mm diameter high pressure water main in Carling Avenue.

Refer to **Appendix D** for Boundary Conditions.

#### 4.4 Fire Protection

The estimated fire flow for the proposed building was calculated in accordance with *ISTB-2018-02*. The following parameters were assumed by Project1 Studio:

- Type of construction – Fire resistive construction > 2 hrs
- Occupancy type – Limited combustibility; and
- Sprinkler protection – Automatic Fully Supervised Sprinkler System

Based on the following parameters, it was calculated that the required fire flow for the contemplated building floor plan and layout is **11,000 L/min (183.3 L/s)**.

Through discussion & correspondence with the City of Ottawa asset management department, it was noted that, in order to operate municipal water services at a minimum pressure of 20psi, only the following fire flows were available from municipal services;

- 145 L/s from the Carling Avenue watermain
- 117 L/s from the Tillbury Avenue watermain

Based on the provided, fire flow demands from the current concept building are too great to tie to either the Carling or Tillbury watermain. To ensure that the building can be serviced by one of the watermains during detailed design, the architect will need to investigate further means of decreasing the buildings required fire flow. Fire separation/compartimentation, such as floor assemblies, wall assemblies, etc. will need to further be investigated to reduce the fire flow to an acceptable demand. The detailed building design will be refined to minimize the area used in the fire flow calculation, ensuring that the required fire flow remains within the available capacity of 145 L/s from the Carling Avenue watermain.

Refer to **Appendix D** for Boundary Conditions.

As for aggregate flow available for fire fighting services, there are at least six (7) existing fire hydrants near the contemplated buildings that are available to provide the maximum required fire flow demands of **11,000 L/min (183.3 L/s)**.

Refer to **Appendix D** for fire hydrant locations.

Table 5 below summarizes the aggregate fire flow of the contributing hydrants near the proposed development based on Table 18.5.4.3 of *ISTB-2018-02*.





Table 5: Fire Protection Summary Table

	Max. Fire Flow Demand (L/min)	Fire Hydrants(s) within 75m	Fire Hydrant(s) within 150m	Fire Hydrant(s) within 300m	Available Combined Fire Flow (L/min)
Contemplated Development	11,000	3	2	2	(3 x 5678) + (2 x 3785) + (2 x 2839) = 30,282

The total available fire flow from contributing hydrants is equal to **30,282 L/min** which is sufficient to provide adequate fire flow for the proposed development for fire fighting purposes. A certified fire protection system specialist will need to be employed to design the building's fire suppression system and confirm the actual fire flow demand.

## 5 SANITARY SERVICE

There are two existing municipal sanitary sewers from which the contemplated development can tie into. The first municipal sanitary sewer is a 300mm concrete sanitary sewer located on Carling Avenue parallel to the southern property line of the subject site. The other sanitary sewer is a 225mm concrete sanitary sewer located on Tillbury Avenue which runs parallel to the northwest property line of 386 Tillbury Avenue.

The total anticipated post development total flow was calculated to be is **6.68 L/s** because of proposed residential population, commercial use and a small portion of infiltration. Refer to **Appendix E** for further information on the calculated sanitary flows.

As per preliminary correspondence with the City of Ottawa, the Tillbury Ave and Carling Ave sanitary sewers do have adequate capacity to accommodate the proposed development. It is still strongly recommended that the sanitary capacity determined during detailed design is to again be reviewed with the City of Ottawa to ensure the existing the City sanitary sewer has adequate capacity for the proposed sanitary flows. A conceptual servicing plan has been prepared which connects the sanitary service to the sewer located within Carling avenue.

## 6 STORMWATER MANAGEMENT

### 6.1 Existing Stormwater Infrastructure

There are three existing municipal storm sewers nearby the subject property. Two of them are located on Carling Avenue and one on Tillbury Avenue. The ones on Carling Avenue consists of a 225mm concrete storm sewer which is closer to the subject property and a 375mm storm sewer. The storm sewer located on Tillbury Avenue consists of a 450mm concrete pipe.

As-builts of the private storm network on the current site are not available; however, it is assumed that any collection and conveyance of stormwater in the underground sewers on site is directed to Carling Avenue storm sewers.



## 6.2 Design Criteria

The stormwater management criteria for this development are based on the City of Ottawa Sewer Design Guidelines including City of Ottawa Stormwater Management Design Guidelines, 2012 (City standards), as well as the Ministry of the Environment's Stormwater Planning and Design Manual, 2003 (SWMPD Manual).

The stormwater management are expected to have to meet the following stormwater design criteria;

- Meet an allowable release rate based on the pre-development Rational Method Coefficient or a maximum of 0.50, employing the City of Ottawa IDF parameters for a 5-year storm with a calculated time of concentration equal to or greater than 10 minutes;
- Attenuate all storms up to and including the City of Ottawa 100-year storm event on site, and control the 100-year storm event flow to the 2-year storm event pre-development release rate;
- Provide enhanced quality treatment (80% TSS removal) prior to release from site. Further consultation with the local conservation authority would confirm this; and
- During detailed design, the stormwater system will be designed following the principles of dual drainage, making accommodations for both major and minor flow.

## 6.3 Proposed Stormwater Management System

The contemplated development is anticipated to outlet to the existing 225mm municipal storm sewer located on Carling Avenue; mimicking the current assumed outlet location. It is anticipated that area drains on the surface parking lot along with roof drains on building rooftops will be utilised to collect and direct runoff to a control point on-site, prior to being released to the Carling Avenue storm sewer.

Currently, a private storm sewer connecting to Carling Avenue is present within the developable parcel. To meet pre-development stormwater conditions, post-development drainage will continue to be directed towards Carling Avenue. However, since part of the proposed development extends to a parcel of land on Tilbury Avenue, and the storm sewers there are at a lower elevation, any hydraulic grade line (HGL) concerns along Carling Avenue may require further investigation of a potential connection to Tilbury Avenue during the detailed design phase.

Based on stormwater objectives for the subject site, the allowable release rate for the contemplated development is  $\pm 41.74 \text{ L/s}$  for all storms up to and including the 100-year storms. To meet the stormwater objectives, the contemplated development may contain a combination of roof top flow attenuation along with surface and subsurface storage.





Table 6 below summarizes assumed post-development drainage areas based on the *Site Plan*. Calculations can be seen in **Appendix F**.

*Table 6: Post-Development Estimated Areas & Runoff Coefficients*

Watershed	C=0.2 Pervious Area (ha)	C=0.9 Building Area/Asphalt (ha)	Total Area (ha)	Weighted Runoff Coefficient
Uncontrolled Areas	0.030	0.020	0.050	0.48
Controlled Areas	0.000	0.341	0.341	0.90
<b>TOTAL</b>	<b>0.292</b>	<b>0.906</b>	<b>0.391</b>	<b>0.73</b>

Table 7, below, summarizes post-development flow rates. The following storage requirement estimate conservatively assumes that approximately 12.8% of the development area will be directed to the outlet without flow attenuation. These areas will be compensated for in areas with flow attenuation controls.

*Table 7: Summary of Post-Development Flow Rates*

Catchment Area	Drainage Area (ha)	100-year Release Rate (L/s)	100-Year Required Storage (m3)
Uncontrolled Areas	0.317	82.94	0
Controlled Areas	0.881	90.56	245.84
<b>TOTAL</b>	<b>1.198</b>	<b>173.50</b>	<b>245.84</b>

It is anticipated that approximately **109.06 m<sup>3</sup>** of storage will be required on site to attenuate flow to the established release rate of **±26.50 L/s** in the 100-year storm; storage calculations are contained within **Appendix F**. It is anticipated that the contemplated development will achieve required storage via a combination of roof top flow attenuation along with surface and subsurface storage. Actual storage volumes will need to be confirmed at the detailed design stage based on a number of factors, including grading constraints and finalized site layout.

As per preliminary correspondence with the City, based on the concept stormwater management calculations provided, the storm sewer along Tillbury Ave does not have sufficient capacity to accommodate site runoff, and there is concern the storm sewer along Carling Ave may have low level of service. The Carling storm sewer capacity would need to be reviewed with the City of Ottawa during detailed design stage to ensure the existing the City storm sewer(s) has adequate capacity for the proposed release rate, and if not, provide the necessary constraint (i.e. maximum allowable release/flow rate) to design site stormwater management accordingly.



## 6.4 Quality Control

It is anticipated that the contemplated development would utilize an Oil/Grit Separator (OGS) to achieve the required 80% TSS removal treatment as specified by Rideau Valley Conservation Authority. The OGS would be required to treat all contaminated runoff collected in the surface parking lot before runoff is discharged into municipal storm sewer.

## 7 CONCLUSION

This evaluation is limited to assessing the serviceability of the site described within this document to support an Official Plan Amendment and Zoning By-law Amendment.

Based on the Site Plan *SP-01* provided by Project 1, included to **Appendix C**, the following conclusions, in relation to the serviceability of the site, can be made:

- **Water:**
  - The contemplated development is anticipated to be serviced via a 150mm dual connections to either the existing 610mm watermain within Carling Ave or 152mm watermain within Tillbury Avenue.
  - During the site plan application detailed design stage, it is recommended for fire hydrant pressure testing to take place surrounding the subject parcel to determine actual operating pressures.
  - Domestic demands from the proposed concept subdivision are expected to be in the range of **2.14 L/s** for the Average daily demand, **5.35 L/s** for the maximum daily and **11.76 L/s** for maximum hourly.
  - The maximum required fire flow was calculated at **11,000 L/min (183.3 L/s)** using the FUS method.
  - As per the boundary conditions provided by the City of Ottawa, minimum pressures for the maximum daily demand fall below the required pressure range. Means of either decreasing the water demand, or mechanically increasing the water service pressure, will need to be investigated.
  - In order to operate municipal water services at 20psi, fire flows of only **145 L/s** and **117 L/s** were available from the Carling and Tillbury watermains, respectively. As concept required fire flow is too large to be supported by either watermain, the architect will need to investigate further means to reduce required fire flow to acceptable levels at the detailed design stage.
  - There are at least seven (7) existing fire hydrants available for fire fighting to service the proposed development. Hydrants within  $\pm 300\text{m}$  will provide a combined fire flow of **30,282 L/min** to the site.
- **Sanitary:**



- The post development total sanitary effluent was calculated to be is **6.68 L/s** considering proposed residential & commercial population and a small portion of infiltration.
- It is anticipated to service the contemplated development via a 200 mm diameter sanitary service lateral to be connected to either the existing 300mm sanitary sewer within Carling Avenue or 225mm sanitary sewer within Tillbury Avenue. As per correspondence with the City of Ottawa, both Carling and Tillbury sanitary sewers have adequate capacity to support concept design sanitary flows.
- **Stormwater:**
  - It is anticipated that an OGS will be installed to treat all contaminated runoff to an enhanced quality treatment level (80% TSS removal).
  - As per correspondence with the City of Ottawa, the Tillbury storm sewer does not have adequate capacity to support stormwater runoff from the concept site, and the Carling storm sewer could potentially have a low level of service. In order to be able to tie the site stormwater outlet to the Carling storm sewer, the City will need to be consulted to review existing site conditions and ensure the existing storm sewer has adequate capacity for the proposed release rate. If not, the City will need to establish a maximum allowable stormwater release rate for the site, to which site stormwater management quantity control will be designed to.

Shall the concept plan change in relation to the number of units, building footprint, or impervious area of the site, the conclusions above would no longer be appropriate. During the detailed design stage of this development, the storm, sanitary and water servicing details will be further defined and confirmed.

Prepared by:

**LRL Associates Ltd.**



Virginia Johnson, P. Eng.  
Civil Engineer

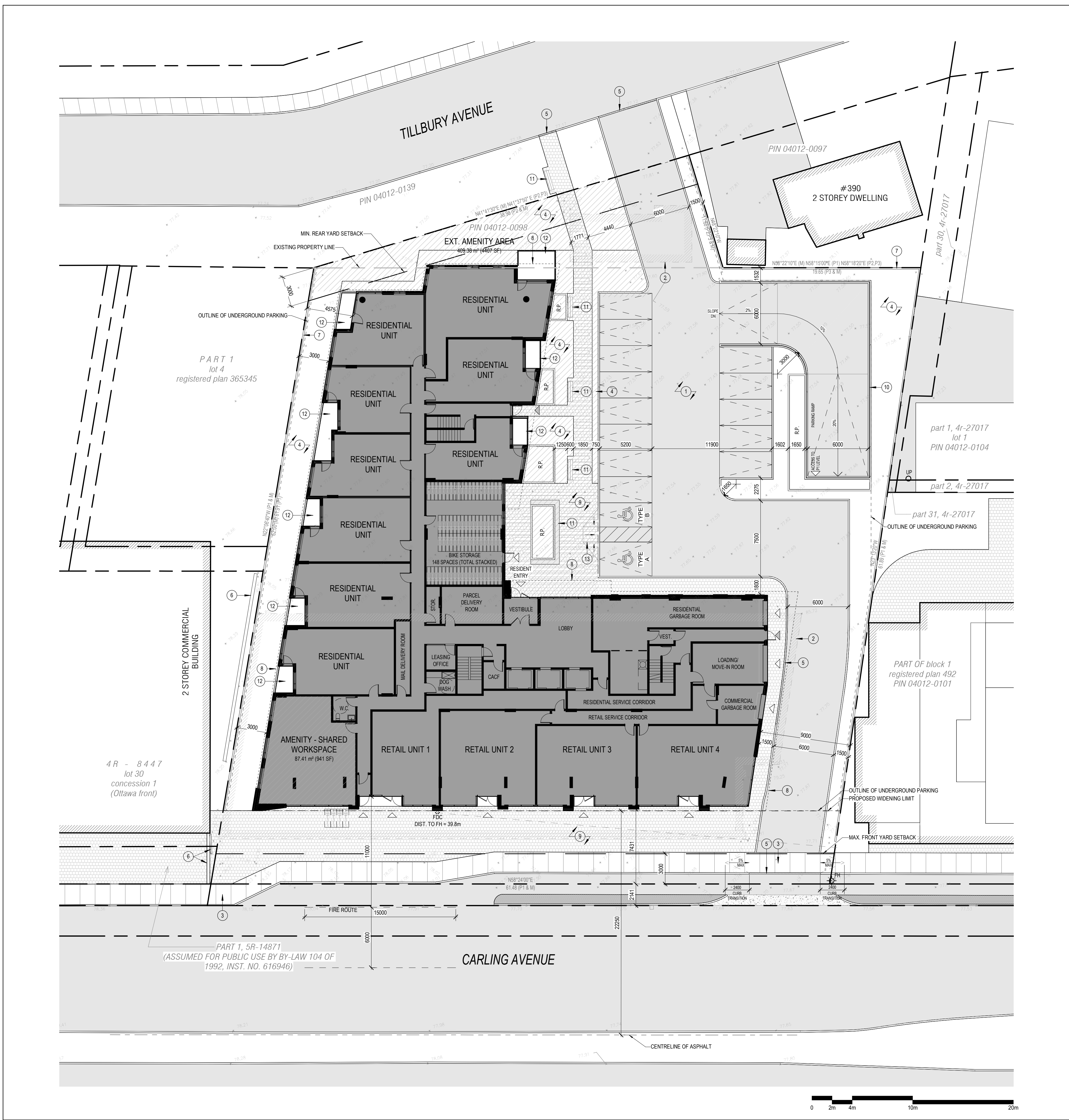


## **APPENDIX A**

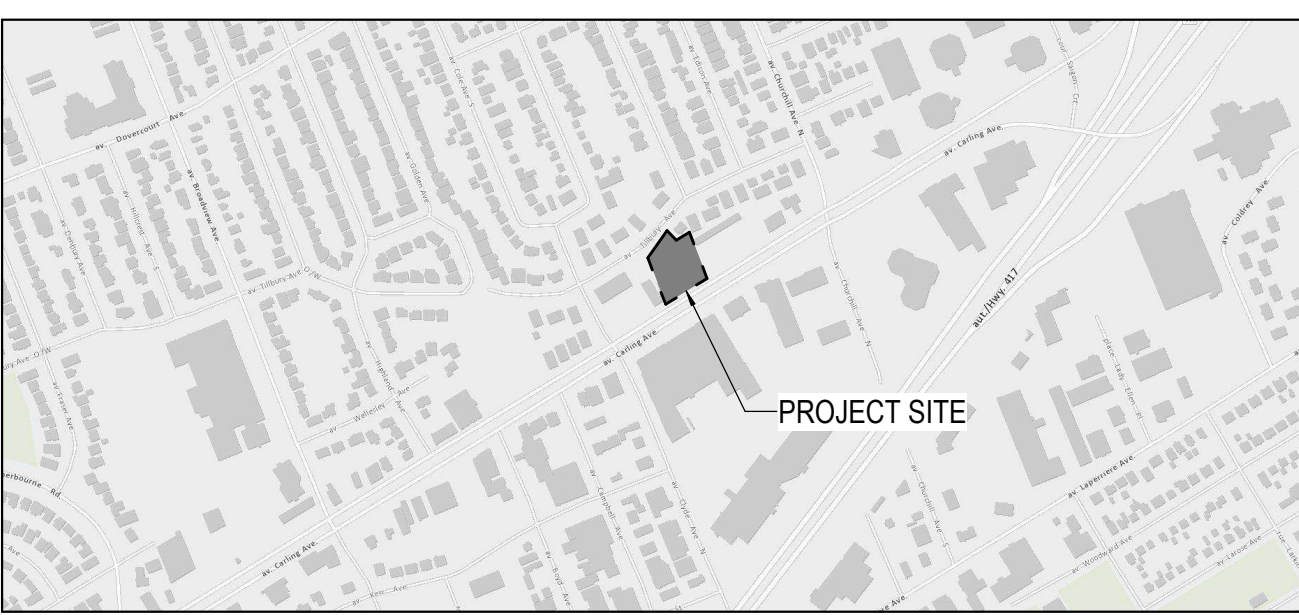
### **Concept Plan by Project1 Studio**







1 SITE PLAN  
SP-01 SCALE: 1 : 200



2 LOCATION PLAN  
SP-01 SCALE: NTS

**SITE PLAN SYMBOLS LEGEND**

	BUILDING ENTRANCE		FIRE DEPARTMENT CONNECTION
	BUILDING EXIT		FIRE HYDRANT
	BICYCLE PARKING		FIRE HYDRANT TO BE RELOCATED
	PROPERTY LINE		EXISTING UTILITY POLE TO REMAIN
	SETBACK LINE		RAISED PLANTER
	INTERLOCKING STONE PAVERS		

TOPOGRAPHIC PLAN OF SURVEY OF  
PART OF LOT 2  
REGISTERED PLAN 492  
AND  
PART OF BLOCK 4  
REGISTERED PLAN 310595  
GEOGRAPHIC TOWNSHIP OF NEPEAN  
CITY OF OTTAWA  
STANTEC GEOMATICS LTD. 2023

SURVEY INFO  
SCALE: 1 : 200

**SITE PLAN NOTES**

- ASPHALT
- EXISTING STRUCTURE TO BE DEMOLISHED
- CONCRETE SIDEWALK
- SOFT LANDSCAPING
- DEPRESSED CURB
- EXISTING RETAINING WALL
- 2m HIGH WOOD PRIVACY FENCE
- CANOPY/BUILDING ABOVE
- HARD LANDSCAPING
- RAILING AROUND PARKING RAMP PERIMETER
- BENCH
- PRIVATE TERRACE
- CURB RAMP

**OWNER**  
INSIDE EDGE PROPERTIES  
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OTTAWA, ON, K2P 1Z3

**ARCHITECT**  
PROJECT1 STUDIO  
260 ST. PATRICK ST, SUITE 300  
OTTAWA, ON, K1N 5K5

**PLANNER**  
FOTENN PLANNING + DESIGN  
396 COOPER ST SUITE, SUITE 300  
OTTAWA, ON, K2P 2H7

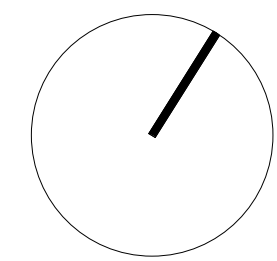
**CIVIL ENGINEER**  
LRL ENGINEERING  
5430 CANOTEK RD  
OTTAWA, ON, K1J 9G2

**SURVEYOR**  
STANTEC GEOMATICS LTD.  
1331 CLYDE AVENUE, SUITE 300  
OTTAWA, ON, K2C 0A9

- GENERAL ARCHITECTURAL NOTES:
- This drawing is the property of the Architect and may not be reproduced or used without the expressed consent of the Architect.
  - Drawings are not to be scaled. The Contractor is responsible for checking and verifying all levels and dimensions and shall report all discrepancies to the Architect and obtain clarification prior to commencing work.
  - Upon notice in writing, the Architect will provide written/graphic clarification or supplementary information regarding the intent of the Contract Documents.
  - The Architectural Drawings are to be read in conjunction with all other Contract Documents including Project Manuals and the Structural, Mechanical and Electrical Drawings.
  - Positions of exposed or finished Mechanical or Electrical devices, fittings and fixtures are indicated on the Architectural Drawings. Locations shown on the Architectural Drawings shall govern over Mechanical and Electrical Drawings. Mechanical and Electrical items not clearly located will be located as directed by the Architect.
  - These documents are not to be used for construction unless specifically noted for such purpose.

7	ISSUED FOR COORDINATION	2024-10-01
6	ISSUED FOR COORDINATION	2024-09-20
5	REISSUED FOR RE-ZONING	2024-07-05
4	ISSUED FOR COORDINATION	2024-06-27
3	ISSUED FOR RE-ZONING	2024-05-29
2	ISSUED FOR COORDINATION	2024-03-07
1	ISSUED FOR COORDINATION	2023-10-30

ISSUE RECORD



project1  
studio

Project1 Studio Incorporated  
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1657 CARLING

1657 Carling Ave  
Ottawa, ON K2A 0Y2

PROJ	SCALE	DRAWN	REVIEWED
2213	NOTED	JH/BH	RMK

SITE PLAN

SP-01

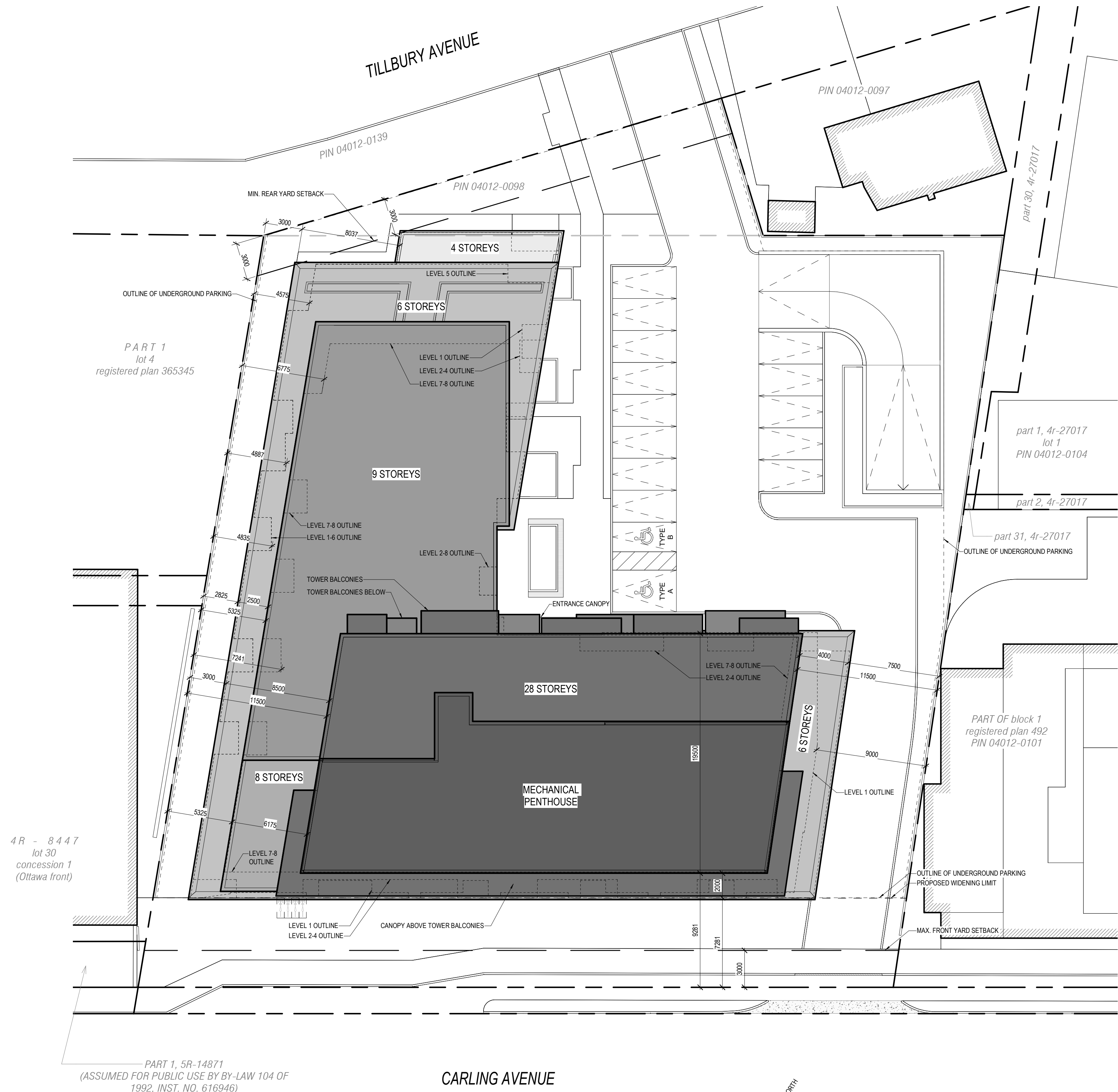


UNIT COUNT																														
NAME	LVL 01	LVL 02	LVL 03	LVL 04	LVL 05	LVL 06	LVL 07	LVL 08	LVL 09	LVL 10	LVL 11	LVL 12	LVL 13	LVL 14	LVL 15	LVL 16	LVL 17	LVL 18	LVL 19	LVL 20	LVL 21	LVL 22	LVL 23	LVL 24	LVL 25	LVL 26	LVL 27	LVL 28	TOTAL COUNT	PERCENTAGE
1-BED	3	6	6	6	6	6	8	8	7	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	133	36%
1-BED + DEN	3	7	7	7	7	7	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	72	19%
2-BED	2	5	5	5	6	6	5	5	4	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	136	37%
2-BED + DEN	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1%
STUDIO	0	5	5	5	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	7%
TOTAL	9	24	24	24	24	24	18	18	16	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	370	100%

RETAIL UNIT COUNT			
NUMBER	UNIT TYPE	AREA	AREA (SF)
R1	RETAIL UNIT 1	90.52 m²	974 SF
R2	RETAIL UNIT 2	92.17 m²	992 SF
R3	RETAIL UNIT 3	80.22 m²	864 SF
R4	RETAIL UNIT 4	94.40 m²	1016 SF
TOTAL		357.32 m²	3846 SF

PARKING SCH. (VEHICLE)	
TYPE	COUNT
RESIDENT	152
RETAIL/DROP-OFF AT-GRADE	15
VISITOR	36
TOTAL	203

PARKING SCH. (BICYCLE)	
LEVEL	COUNT
LEVEL P1	222
AVG. PROPOSED GRADE	4
LEVEL 01	148
TOTAL	374



Site Statistics		
Current Zoning Designation:	AM10	
Lot Width:	61.45m	
Total Lot Area:	3949.9m²	
Average Existing Grade:	77.62m	
Gross Floor Area:	27336.48m²	
Building Area	1628.99m²	
Floor Space Index:	6.92	
Proposed Development - 28 Storey High-Rise Apartment Building		
No. of units    370 Units		
Zoning Mechanism	Required	Provided
Minimum Lot Area Table 185 (a)	No Minimum	3949.9m²
Minimum Lot Width Table 185 (b)	No Minimum	61.45m
Min. Front Yard Setback Table 185 (c)(i)	No Minimum	7.3m
Max. Front Yard Setback Section 185 (10)(b)(i)	3m	7.3m
Corner Side Yard Setback Table 185 (c)(i)	No Minimum	-
Min. Rear Yard Setback Table 185 (d)(i)	3m	3m
Min. Interior Side Yard Setback Table 185 (d)(i)	No Minimum	7.5m (East) 3m (West)
Maximum Building Height Section 185 (10)(j)	<20m from a rear lot abutting a R1, R2, R3 : 11m >20m-30m from a rear lot abutting a R1, R2, R3, R4 : 20m Otherwise: 30m	28.7m 28.7m 86.0m
Total Amenity Area Table 137(3)(ii)	2220m² 6m² / unit for 370 units	4619m²
Communal Amenity Area Table 137(3)(ii)	1110m² Min. 50% of Total Amenity Area	1124m²
Parking Requirements (Residential)		
Minimum Parking Spaces 101 (Sch. 1A - Area Y)	161 Spaces 0 spaces for first 12 units - Section 101(4)(b) 0.5 spaces / unit for 358 units - Table 101(R15)(ii) - 10% Section 101(8)(c)	152 Spaces
Minimum Visitor Parking Spaces 101 (Sch. 1A - Area Y)	36 Spaces 0 spaces for first 12 units - Section 102(2) 0.1 spaces / unit for 358 units - Table 102(ii)	36 Spaces
Parking Requirements (Retail)		
Minimum Parking Spaces 101 (Sch. 1A - Area Y)	0 Spaces Section 101(4)(d)	15 Spaces
Bicycle Parking Rates		
Minimum Bicycle Parking Spaces (Residents) Table 111A (Sch. 1 - Area B)	185 Spaces 0.5 spaces / unit for 370 units(111A)(b)(i))	370 Spaces
Minimum Bicycle Parking Spaces (Retail) Table 111A (Sch. 1 - Area B)	2 Spaces 1 space / 250m² x 368m² (111A)(e))	4 Spaces

AMENITY SCHEDULE (COMMUNAL)			
LEVEL	NAME	AREA	AREA (SF)
LEVEL 01	AMENITY - SHARED WORKSPACE	87.41 m²	941 SF
LEVEL 02	EXT. AMENITY AREA	409.36 m²	4407 SF
LEVEL 09	LEVEL 9 AMENITY ROOM	77.92 m²	839 SF
LEVEL 09	LEVEL 9 TERRACE (AMENITY)	78.29 m²	843 SF
LEVEL 10	LEVEL 10 TERRACE (AMENITY)	380.85 m²	4099 SF
LEVEL 10	LEVEL 10 AMENITY ROOM	90.24 m²	971 SF
TOTAL		1124.10 m²	12100 SF

AMENITY SCHEDULE (PRIVATE)		
LEVEL	AREA	AREA (SF)
LEVEL 01	49.37 m²	531 SF
LEVEL 02	96.96 m²	1044 SF
LEVEL 03	101.32 m²	1091 SF
LEVEL 04	101.32 m²	1091 SF
LEVEL 05	132.18 m²	1423 SF
LEVEL 06	101.13 m²	1089 SF
LEVEL 07	228.95 m²	2484 SF
LEVEL 08	117.02 m²	1260 SF
LEVEL 09	130.38 m²	1403 SF
LEVEL 10	114.21 m²	1229 SF
LEVEL 11	130.21 m²	1402 SF
LEVEL 12	131.85 m²	1419 SF
LEVEL 13	125.95 m²	1356 SF
LEVEL 14	128.31 m²	1381 SF
LEVEL 15	131.85 m²	1419 SF
LEVEL 16	127.85 m²	1376 SF
LEVEL 17	128.31 m²	1381 SF
LEVEL 18	131.85 m²	1419 SF
LEVEL 19	128.31 m²	1381 SF
LEVEL 20	127.85 m²	1376 SF
LEVEL 21	130.21 m²	1402 SF
LEVEL 22	125.95 m²	1356 SF
LEVEL 23	131.85 m²	1419 SF
LEVEL 24	128.31 m²	1381 SF
LEVEL 25	127.85 m²	1376 SF
LEVEL 26	131.85 m²	1419 SF
LEVEL 27	125.95 m²	1356 SF
LEVEL 28	128.31 m²	1381 SF
TOTAL	3485.48 m²	37625 SF

RENTABLE AREA (RESIDENTIAL)			
LEVEL	AREA	AREA (SF)	TOTAL
LEVEL 01	591.76 m²	6370 SF	9
LEVEL 02	1439.11 m²	15490 SF	24
LEVEL 03	1439.11 m²	15490 SF	24
LEVEL 04	1439.11 m²	15490 SF	24
LEVEL 05	1405.80 m²	15132 SF	24
LEVEL 06	1405.80 m²	15132 SF	24
LEVEL 07	1053.94 m²	11346 SF	18
LEVEL 08	1053.94 m²	11346 SF	18
LEVEL 09	936.22 m²	10077 SF	16
LEVEL 10	557.69 m²	6003 SF	9
LEVEL 11	655.12 m²	7052 SF	10
LEVEL 12	655.12 m²	7052 SF	10
LEVEL 13	655.12 m²	7052 SF	10
LEVEL 14	655.12 m²	7052 SF	10
LEVEL 15	655.12 m²	7052 SF	10
LEVEL 16	655.12 m²	7052 SF	10
LEVEL 17	655.12 m²	7052 SF	10
LEVEL 18	655.12 m²	7052 SF	10
LEVEL 19	655.12 m²	7052 SF	10
LEVEL 20	655.12 m²	7052 SF	10
LEVEL 21	655.12 m²	7052 SF	10
LEVEL 22	655.12 m²	7052 SF	10
LEVEL 23	655.12 m²	7052 SF	10
LEVEL 24	655.12 m²	7052 SF	10
LEVEL 25	655.12 m²	7052 SF	10
LEVEL 26	655.12 m²	7052 SF	10
LEVEL 27	655.12 m²	7052 SF	10
LEVEL 28	655.12 m²	7052 SF	10
TOTAL	23114.67 m²	246894 SF	370

GROSS FLOOR AREA (OBC)		
LEVEL	AREA	AREA (SF)
LEVEL 01	1628.99 m²	17534 SF
LEVEL 02	1626.46 m²	17507 SF
LEVEL 03	1626.46 m²	17507 SF
LEVEL 04	1626.46 m²	17507 SF
LEVEL 05	1593.15 m²	17149 SF
LEVEL 06	1593.15 m²	17149 SF
LEVEL 07	1231.48 m²	13256 SF
LEVEL 08	1231.48 m²	13256 SF
LEVEL 09	1187.00 m²	12777 SF
LEVEL 10	736.41 m²	7927 SF
LEVEL 11	736.41 m²	7927 SF
LEVEL 12	736.41 m²	7927 SF
LEVEL 13	736.41 m²	7927 SF
LEVEL 14	736.41 m²	7927 SF
LEVEL 15	736.41 m²	7927 SF
LEVEL 16	736.41 m²	7927 SF
LEVEL 17	736.41 m²	7927 SF
LEVEL 18	736.41 m²	7927 SF
LEVEL 19	736.41 m²	7927 SF
LEVEL 20	736.41 m²	7927 SF
LEVEL 21	736.41 m²	7927 SF
LEVEL 22	736.41 m²	7927 SF
LEVEL 23	736.41 m²	7927 SF
LEVEL 24	736.41 m²	7927 SF
LEVEL 25	736.41 m²	7927 SF
LEVEL 26	736.41 m²	7927 SF
LEVEL 27	736.41 m²	7927 SF
LEVEL 28	736.41 m²	7927 SF
TOTAL	27336.48 m²	294247 SF

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- 3 ISSUED FOR RE-ZONING 2024-05-29
- 2 ISSUED FOR COORDINATION 2024-03-07
- 1 ISSUED FOR COORDINATION 2023-10-30

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PROJ 2213 SCALE NOTED DRAWN JH/BH REVIEWED RMK

PROJECT STATISTICS AND  
ZONING INFORMATION

SP-02



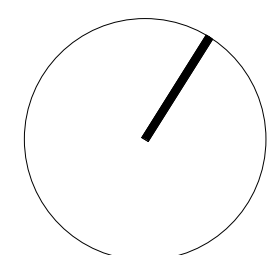



1 FLOOR PLAN - LEVEL 01  
A101 SCALE: 1 : 125

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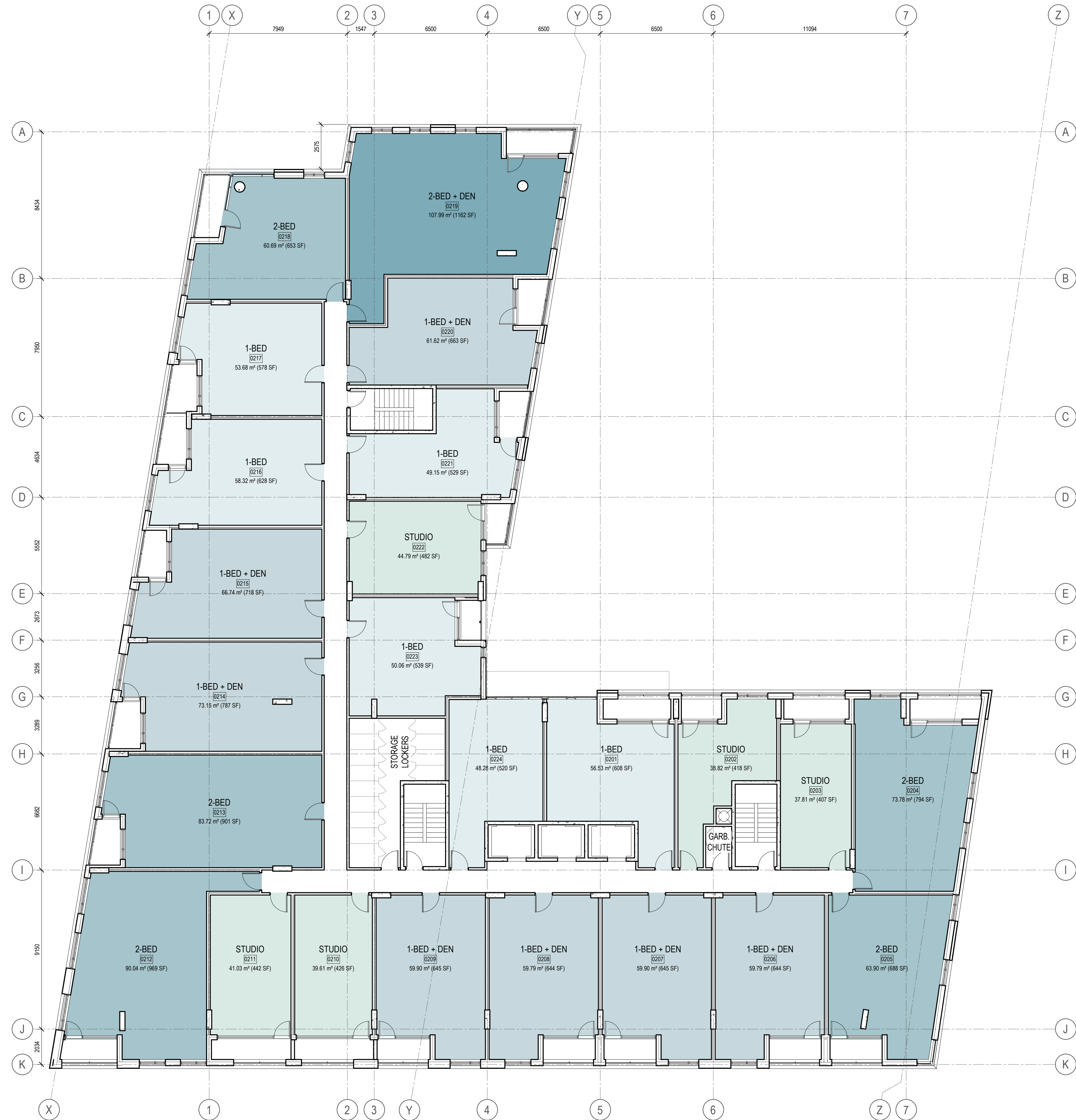
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2213	NOTED	JH/BH	RMK

FLOOR PLAN LEVEL 01

**A101**

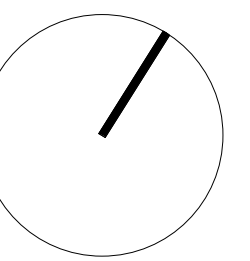


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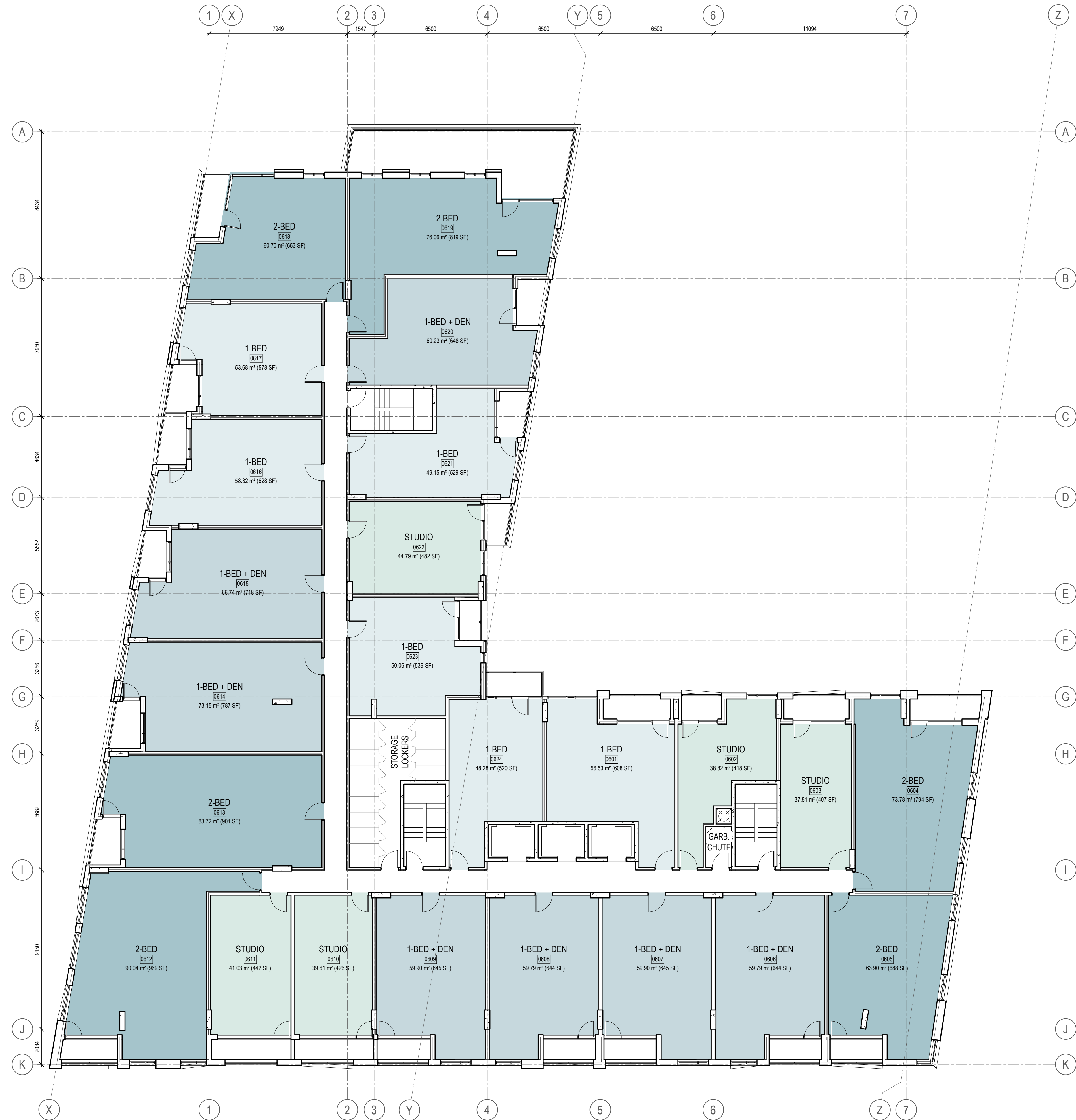
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FLOOR PLAN LEVEL 02-04



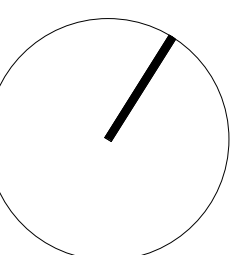



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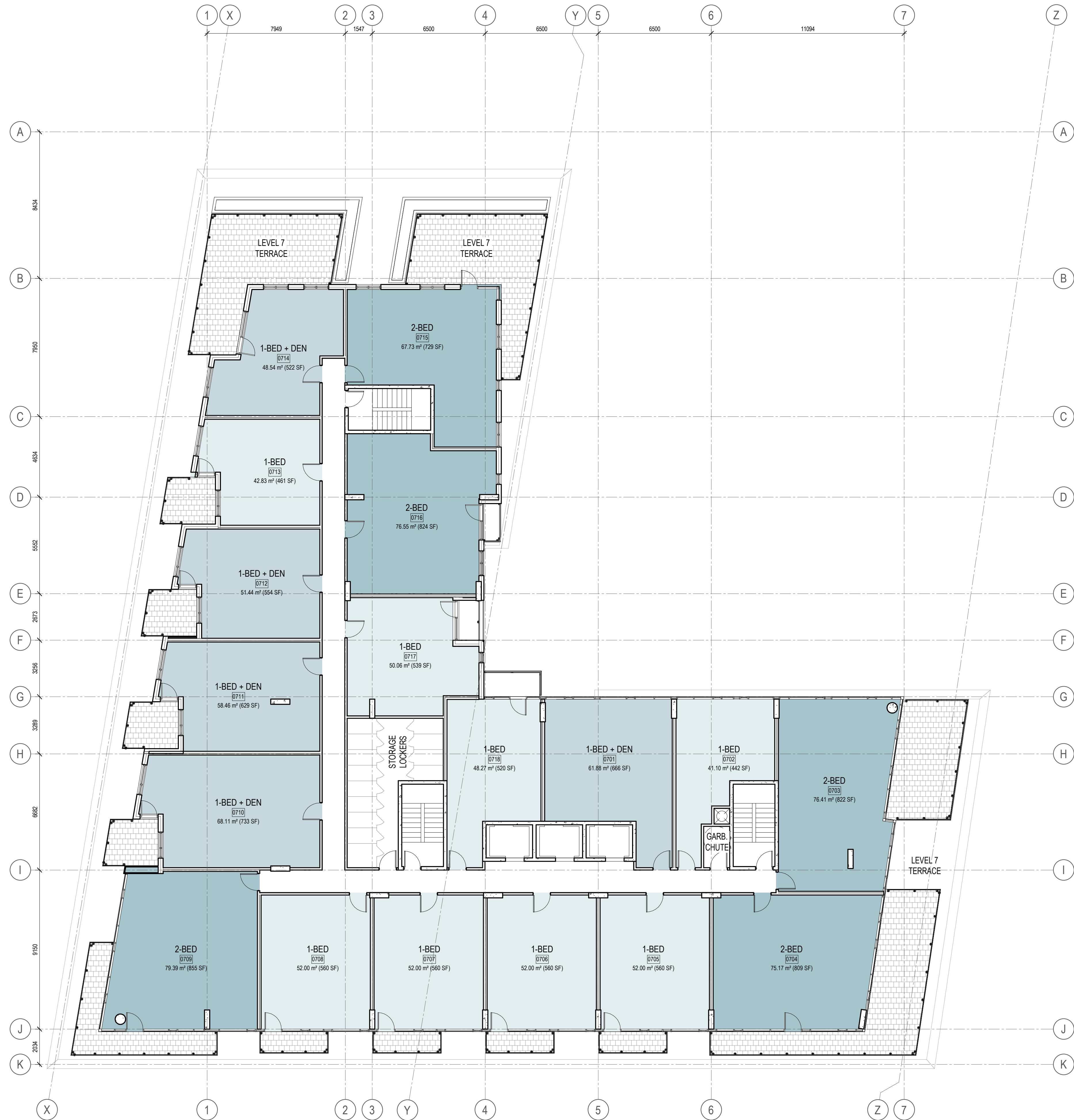
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**FLOOR PLAN LEVEL 05-06**

**A103**



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FLOOR PLAN LEVEL 07-08





1 FLOOR PLAN - LEVEL 09  
A105 SCALE: 1 : 125

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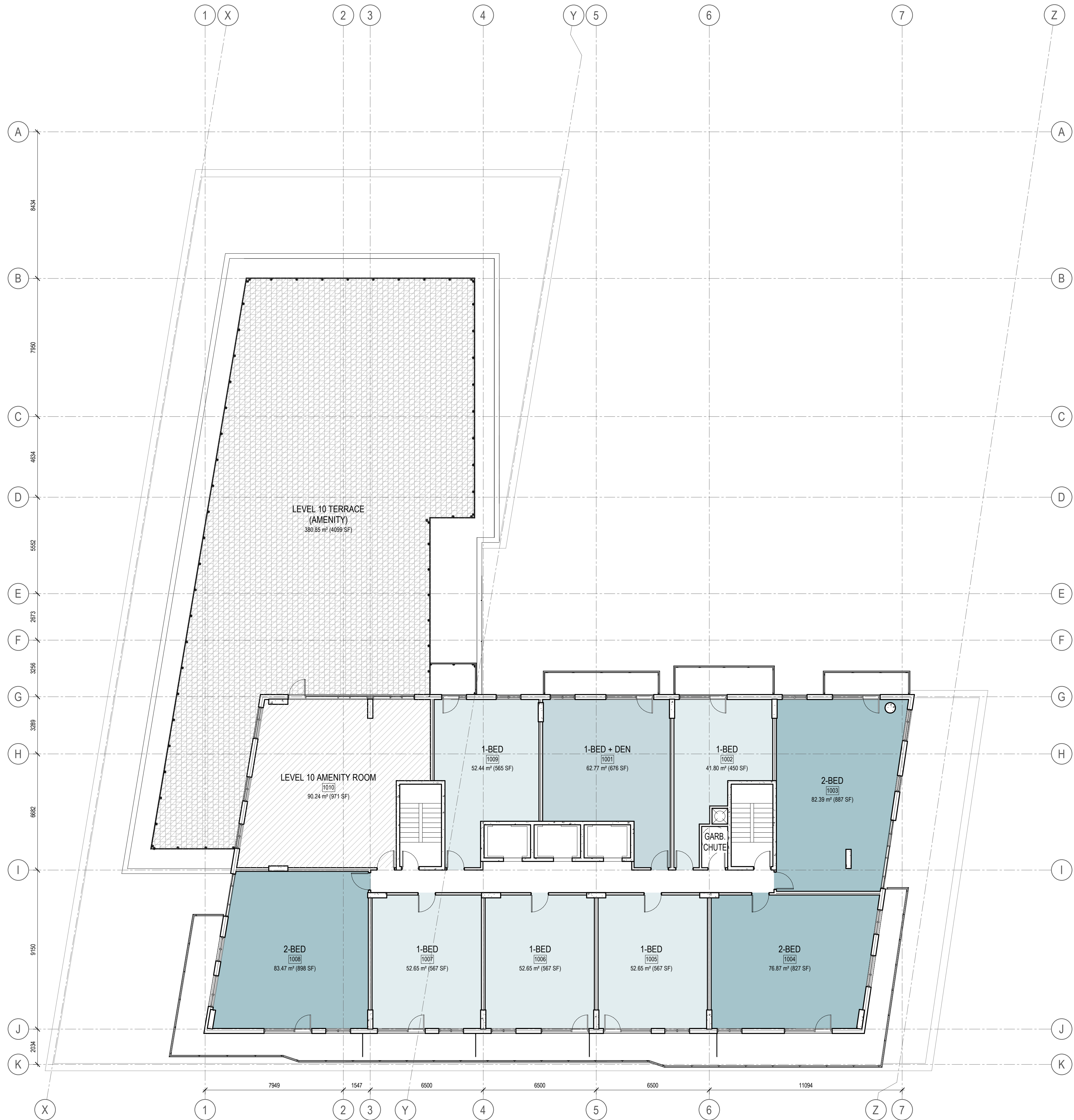
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FLOOR PLAN LEVEL 09

A105

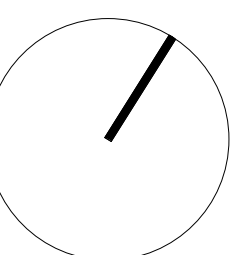



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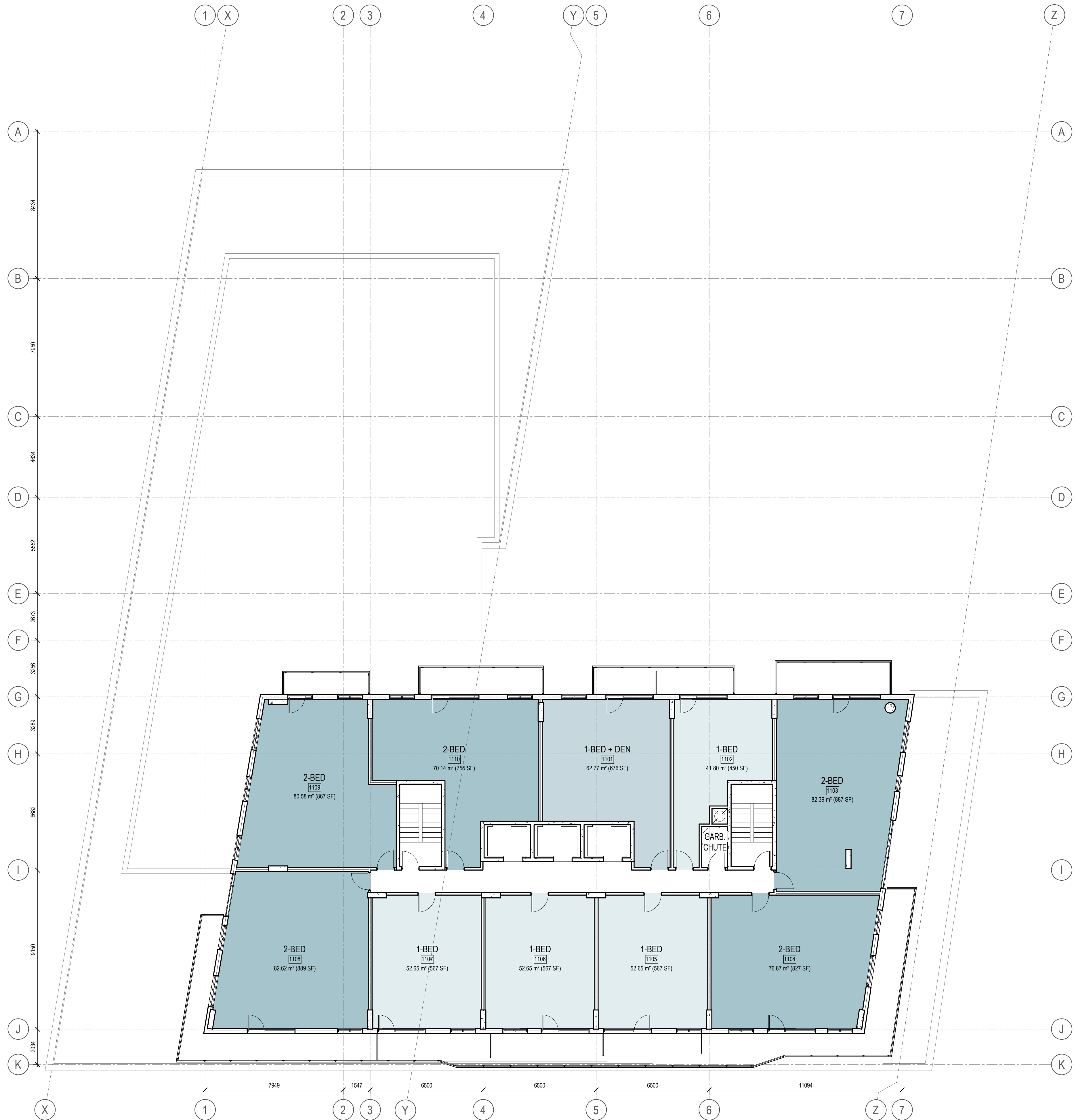
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**FLOOR PLAN LEVEL 10**

**A106**





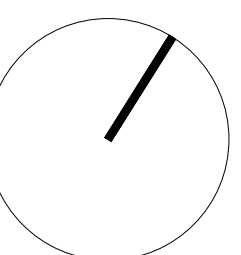

1 FLOOR PLAN - LEVEL 11-28  
A107 SCALE: 1 : 125

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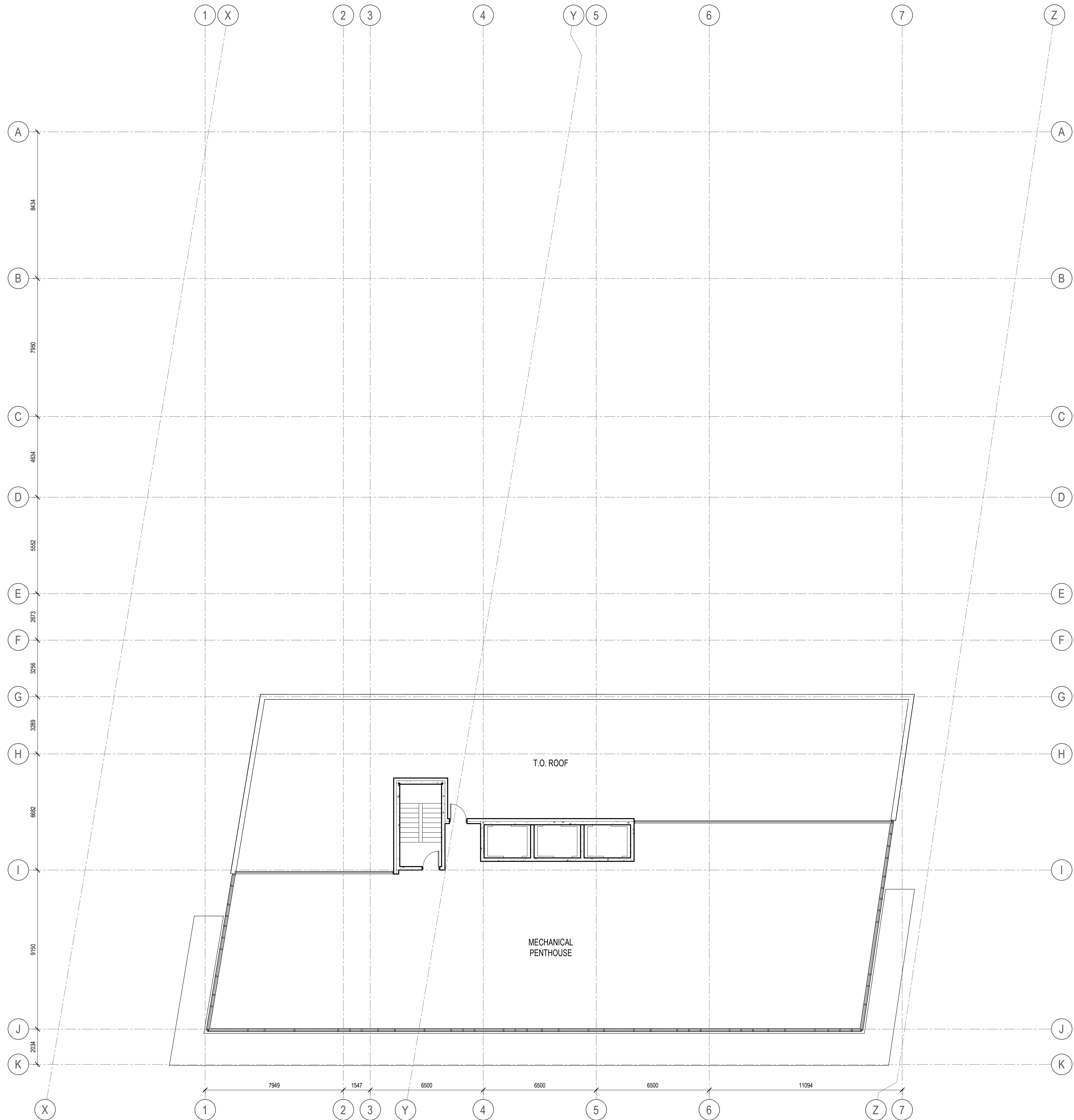
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2213	NOTED	JH/BH	RMK

FLOOR PLAN LEVEL 11-28

**A107**



1 ROOF/MECHANICAL PENTHOUSE PLAN  
A108 SCALE: 1 : 125

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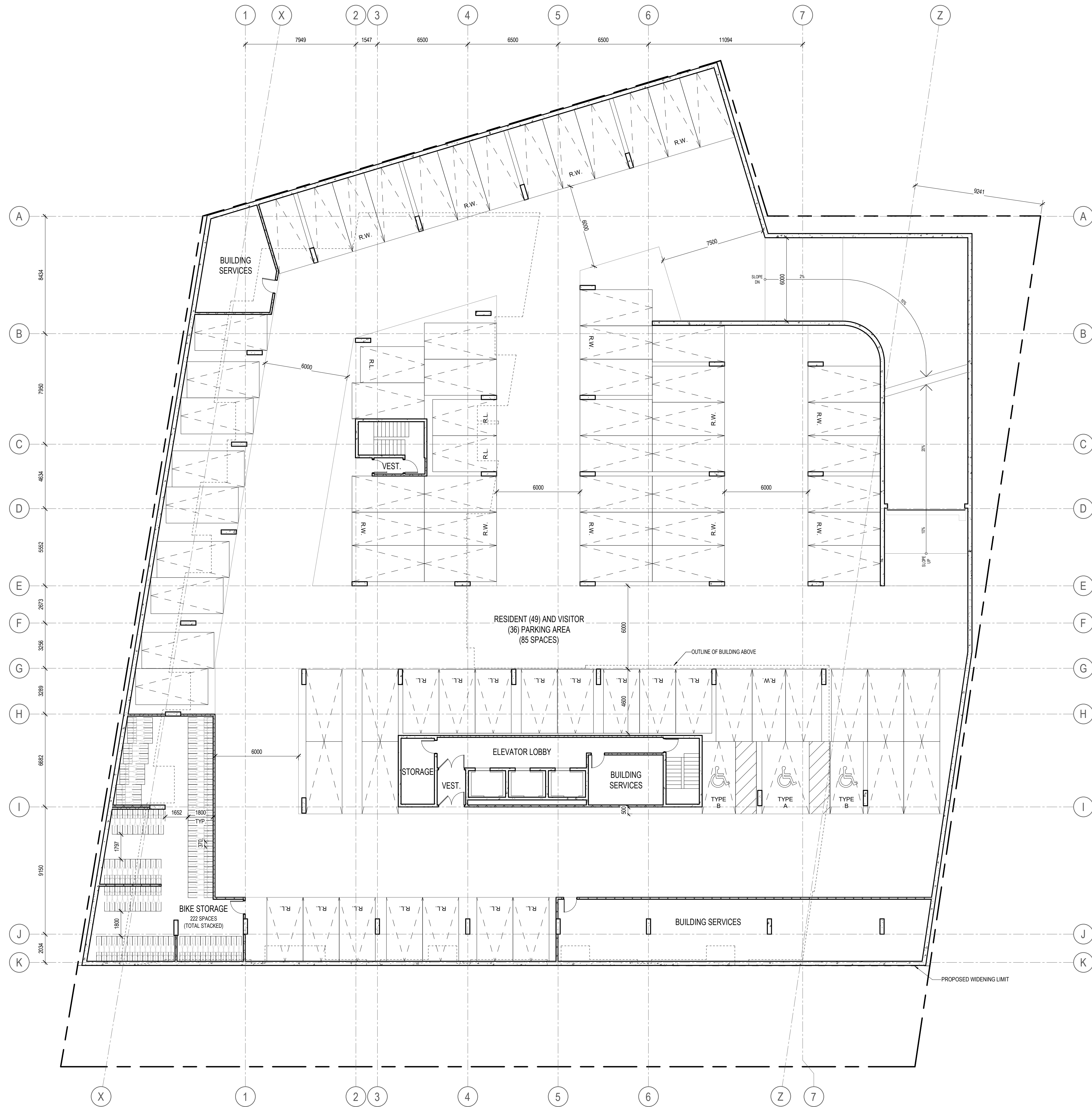
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2213	NOTED	JH/BH	RMK

ROOF/MECHANICAL  
PENTHOUSE PLAN

A108

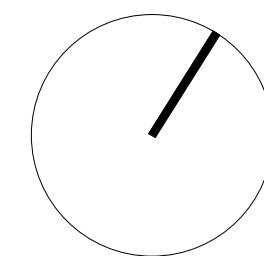


1 FLOOR PLAN - LEVEL P1  
A109 SCALE: 1 : 150

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  6. These documents are not to be used for construction unless specifically noted for such purpose.

7	ISSUED FOR COORDINATION	2024-10-01
5	REISSUED FOR RE-ZONING	2024-07-05
4	ISSUED FOR COORDINATION	2024-06-27
3	ISSUED FOR RE-ZONING	2024-05-29
2	ISSUED FOR COORDINATION	2024-03-07
1	ISSUED FOR COORDINATION	2023-10-30

ISSUE RECORD



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studio

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[613.884.3939] | mail@project1studio.ca

1657 CARLING

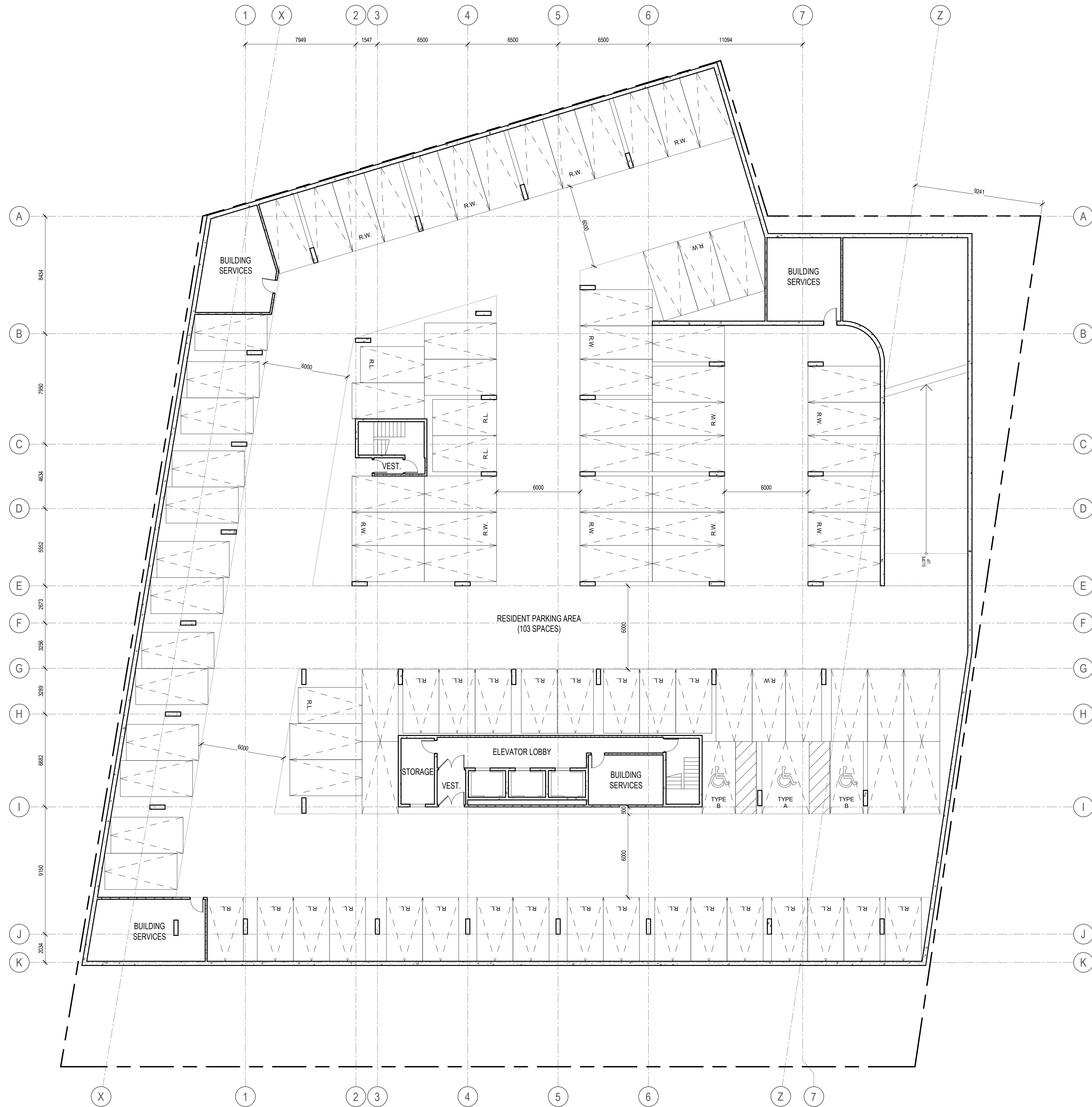
1657 Carling Ave  
Ottawa, ON K2A 0Y2

PROJ	SCALE	DRAWN	REVIEWED
2213	NOTED	JH/BH	RMK

FLOOR PLAN - PARKING  
LEVEL P1

A109



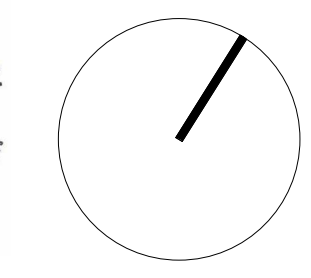


1 FLOOR PLAN - LEVEL P2  
A110 SCALE: 1 : 150

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1	ISSUED FOR COORDINATION	2023-10-30

ISSUE RECORD



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2213	NOTED	JH/BH	RMK

FLOOR PLAN - PARKING  
LEVEL P2

A110



**CLADDING LEGEND:**

AL-1

ALUMINUM COMPOSITE PANEL  
BLACK

BR-1

BRICK MASONRY  
GREY

GL-1

ALUMINUM AND GLASS RAILING

SP-1

CURTAIN WALL SPANDREL PANEL  
BLACK

AL-2

ALUMINUM COMPOSITE PANEL  
SILVER-BLUE

BR-2

BRICK MASONRY  
BLACK

GL-2

ALUMINUM AND FRITTED  
GLASS RAILING

WD-1

WOOD SIDING  
CEDAR PLANKS

**ELEVATION NOTES**

1

ADDRESS PLAQUE

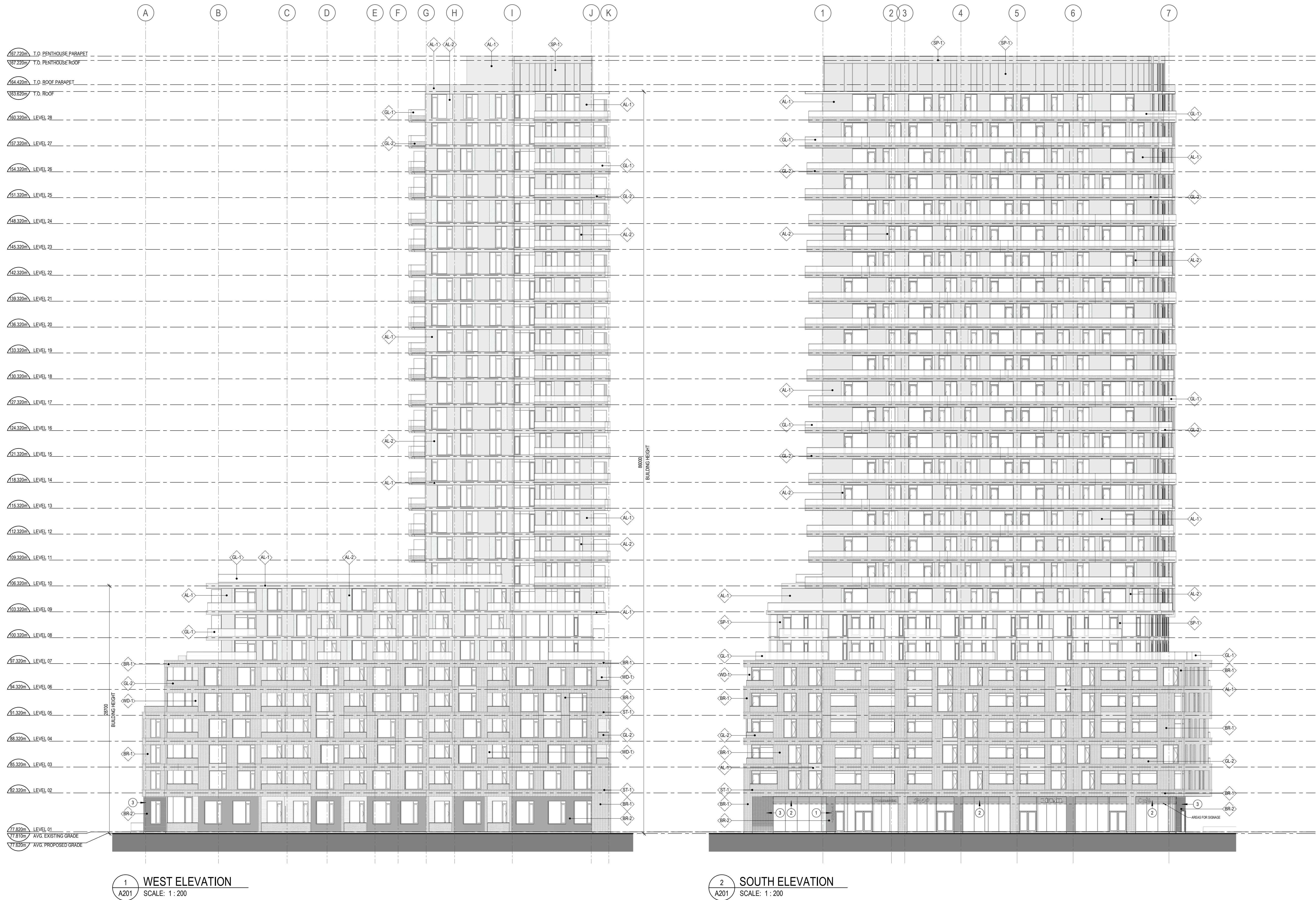
2

WOOD LOUVRES

3

PROTRUDING BRICKWORK

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1	ISSUED FOR COORDINATION	2023-10-30

ISSUE RECORD



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Ottawa, ON K2A 0Y2

PROJ	SCALE	DRAWN	REVIEWED
2213	NOTED	JH/BH	RMK

ELEVATIONS

**A201**



**CLADDING LEGEND:**

AL-1

ALUMINUM COMPOSITE PANEL  
BLACK

BR-1

BRICK MASONRY  
GREY

GL-1

ALUMINUM AND GLASS RAILING

SP-1

CURTAIN WALL SPANDREL PANEL  
BLACK

AL-2

ALUMINUM COMPOSITE PANEL  
SILVER-BLUE

BR-2

BRICK MASONRY  
BLACK

GL-2

ALUMINUM AND FRITTED  
GLASS RAILING

WD-1

WOOD SIDING  
CEDAR PLANKS

**ELEVATION NOTES**

1

ADDRESS PLAQUE

2

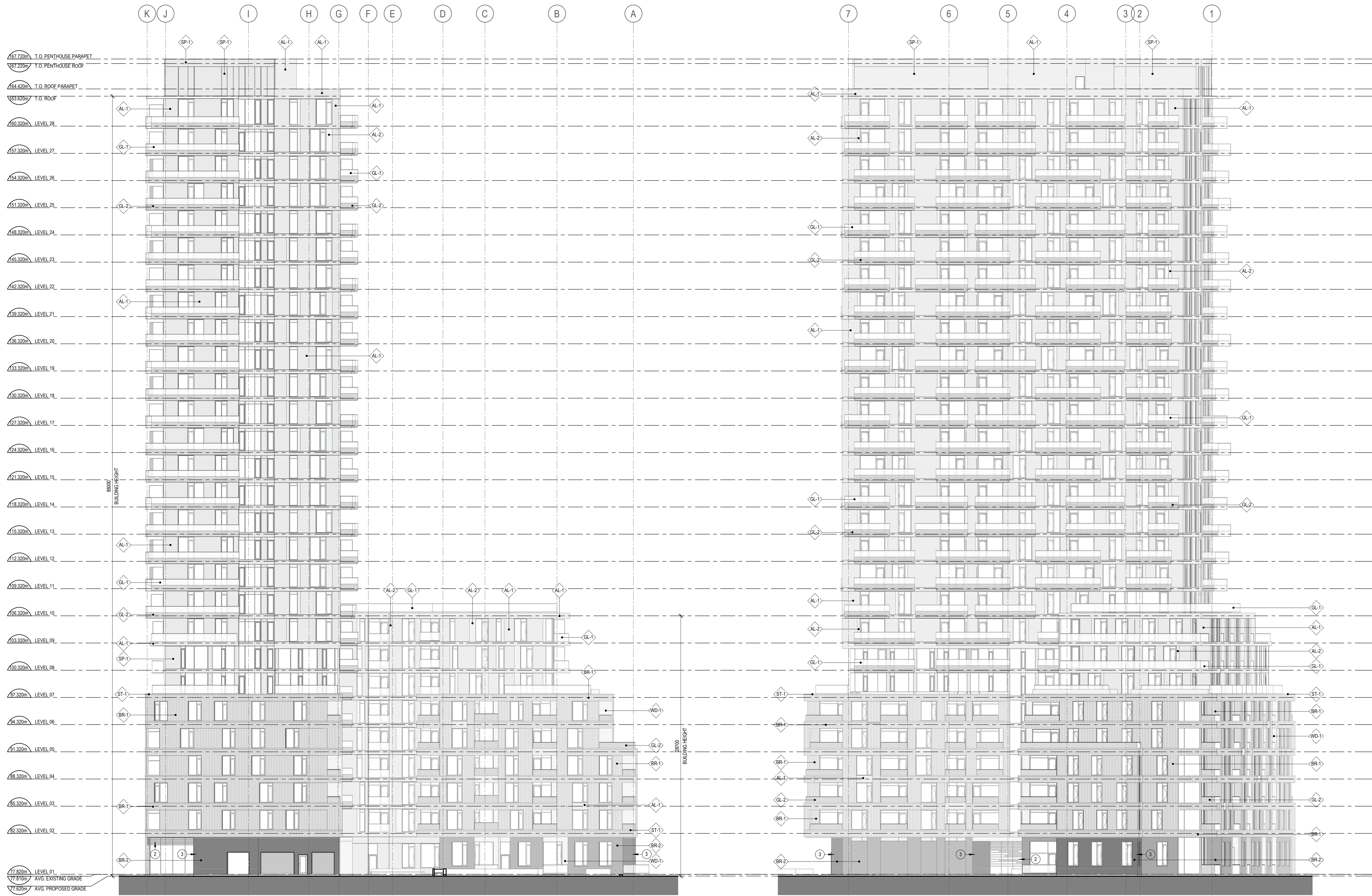
WOOD LOUVRES

3

PROTRUDING BRICKWORK

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2 EAST ELEVATION  
SCALE: 1 : 200

1 NORTH ELEVATION  
SCALE: 1 : 200

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1	ISSUED FOR COORDINATION	2023-10-30

ISSUE RECORD



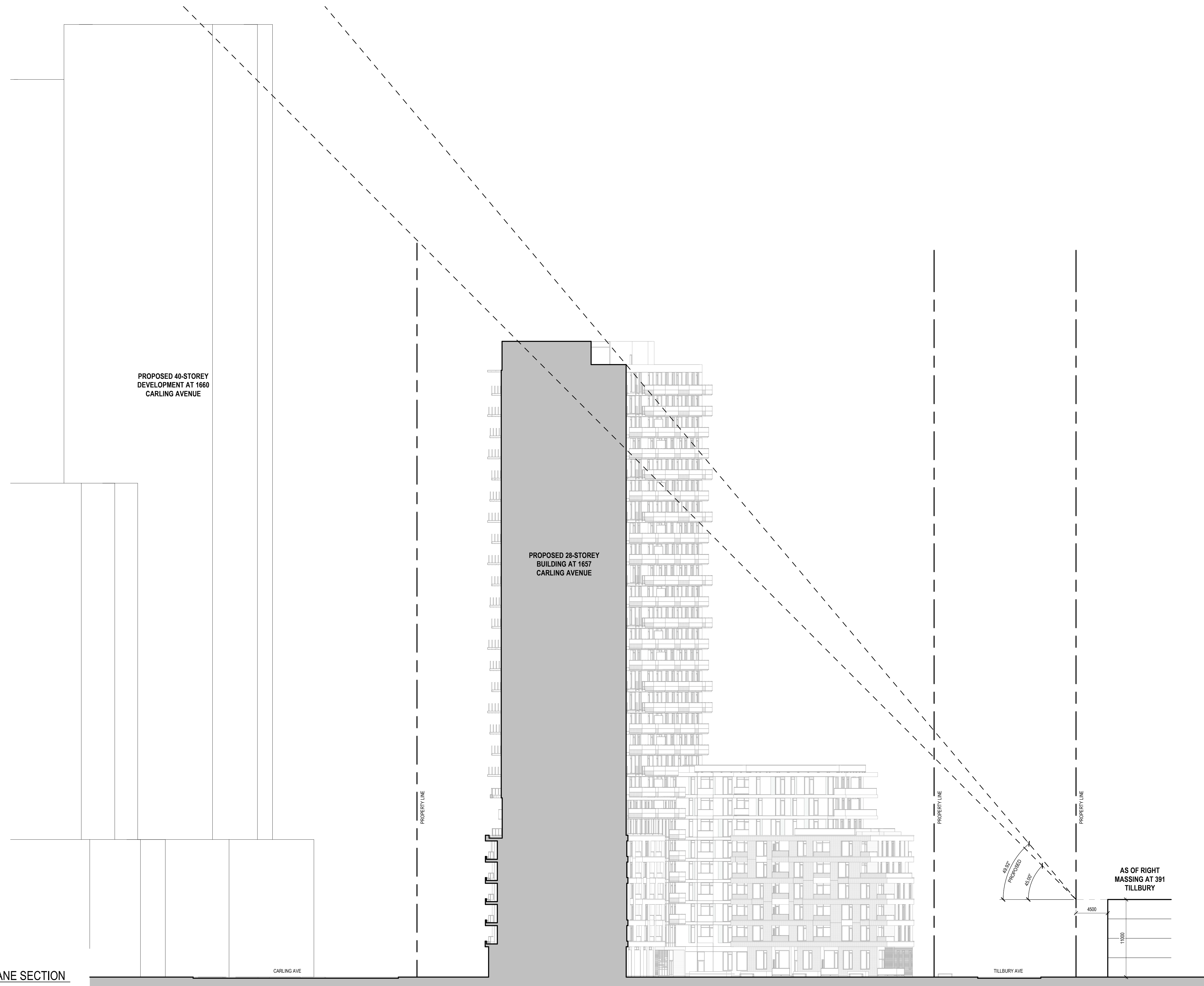
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PROJ	SCALE	DRAWN	REVIEWED
2213	NOTED	JH/BH	RMK

ELEVATIONS





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5.	Positions of openings or finished Mechanical or Electrical devices, fittings and locations are indicated on the Architectural Drawings. Locations shown on the Architectural Drawings shall govern for construction unless cross drawings Mechanical and Electrical items not clearly located by location as directed by the Architect.
6.	Comments are not to be used for construction unless specifically noted for such purpose.

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PROJ	SCALE	DRAWN	REVIEWED
2213	NOTED	JH/BH	RMK

## ANGULAR PLANE STUDY

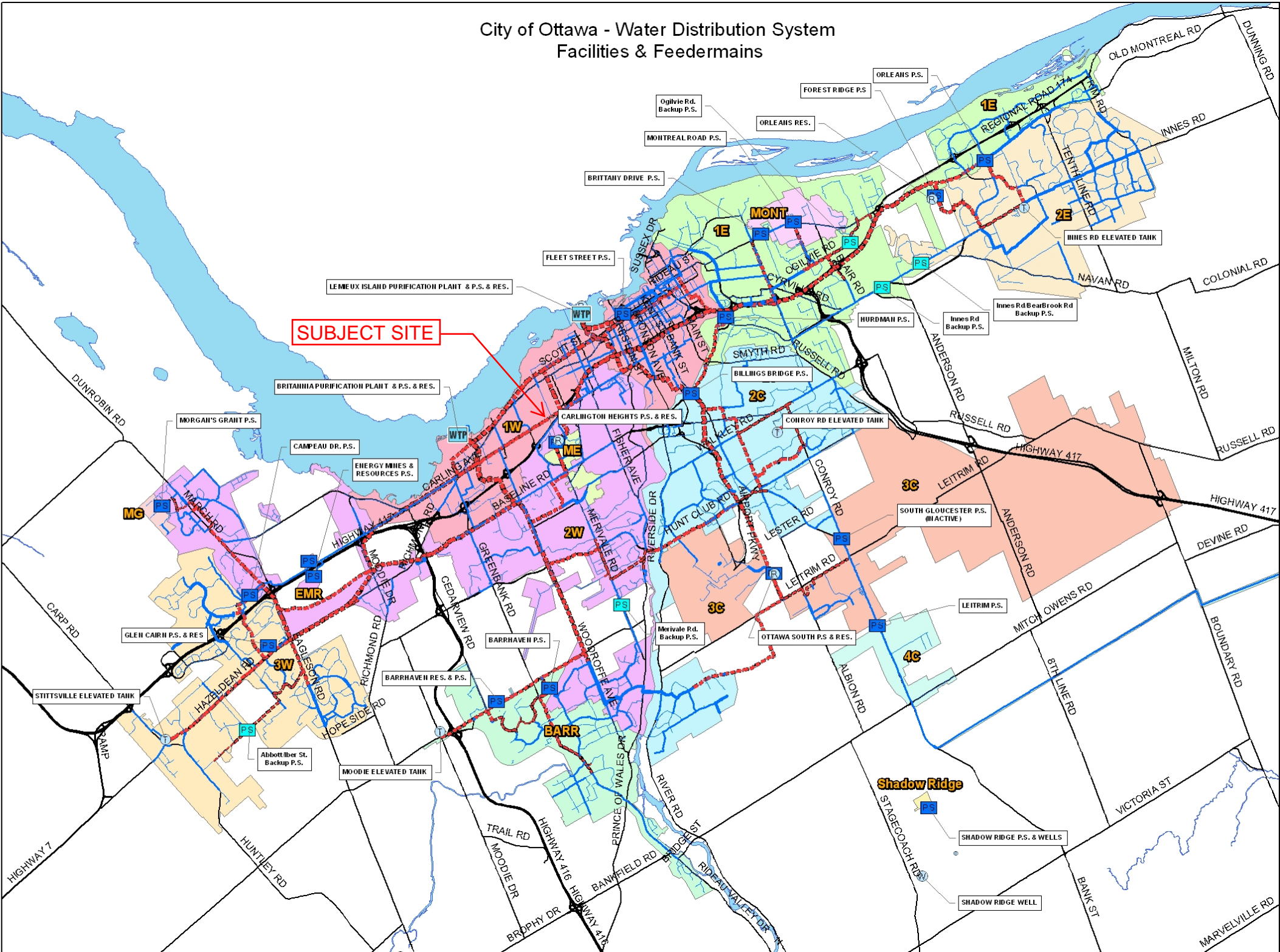
# A203

## **APPENDIX B**

### **Water Pressure Map & Fire Hydrant Locations**



City of Ottawa - Water Distribution System  
Facilities & Feeder mains



Legend

Water System Structure

- Pump Station
- Backup Pump Station
- Water Treatment Plant
- Well
- Elevated Tank
- Reservoir

WATERMAINS

- Priority, Internal Diameter
- Backbone 1524mm - 1981mm
  - Backbone 1067mm - 1372mm
  - Backbone 610mm - 914mm
  - Backbone 406mm - 508mm
  - Backbone 152mm - 305mm
  - Distribution 1676mm - 1981mm
  - Distribution 1067mm - 1372mm
  - Distribution 610mm - 914mm
  - Distribution 406mm - 508mm
  - Distribution 305mm - 381mm

PRESSURE ZONES

- 1E
- 1W
- 2C
- 2E
- 2W
- 3C
- 3W
- 4C
- BARR
- EMR
- ME
- MG
- MONT
- SHAD



Infrastructure Services & Community Sustainability  
Infrastructure Services

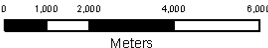
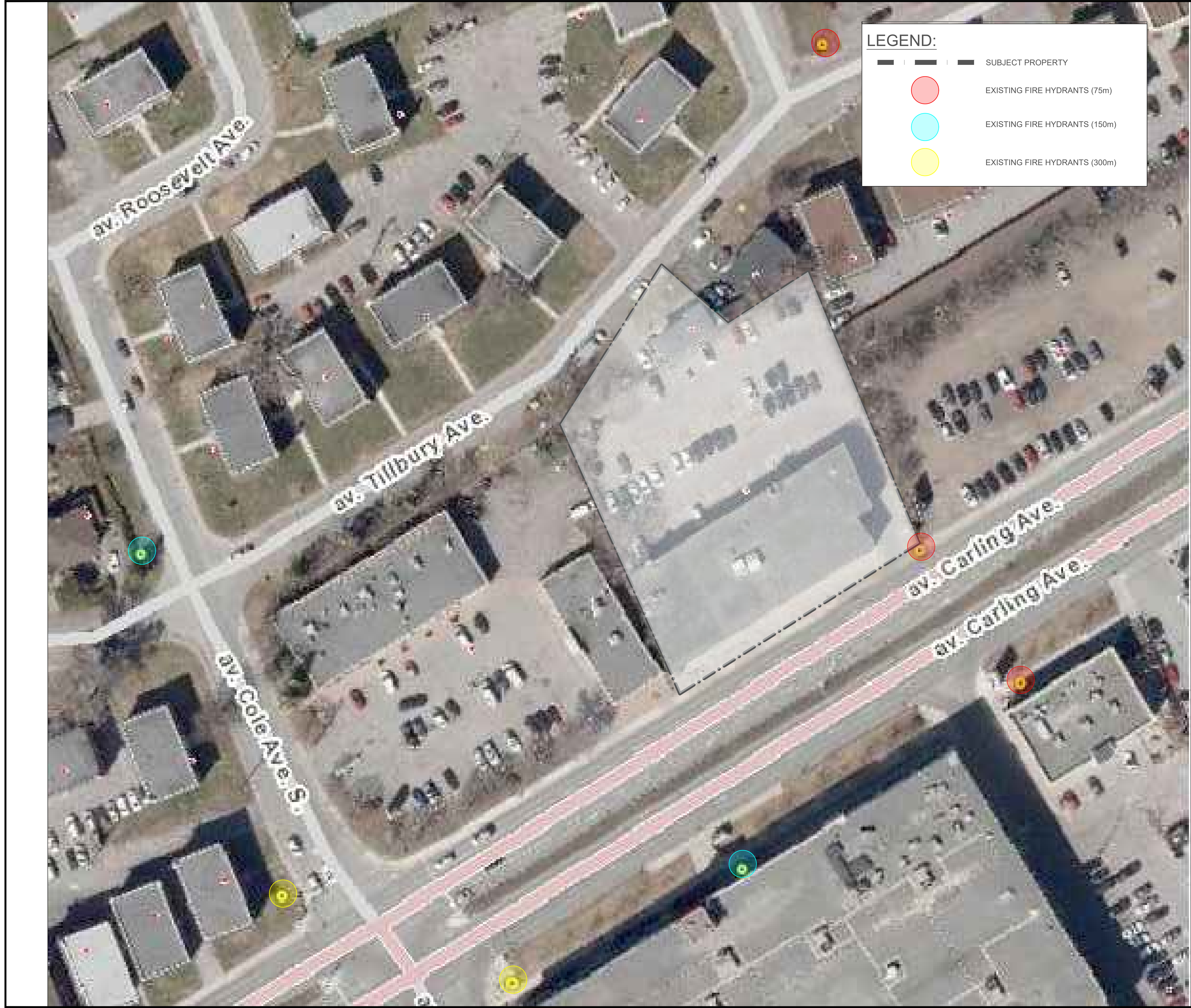


FIGURE 5.1

DRAWN BY: D. HESS DATE: 10 JAN 2013





**LEGEND:**

	SUBJECT PROPERTY
	EXISTING FIRE HYDRANTS (75m)
	EXISTING FIRE HYDRANTS (150m)
	EXISTING FIRE HYDRANTS (300m)

## **APPENDIX C**

### **Water Demand & Fire Flow Calculations**





# LRL

## Water Demand Calculations

LRL File No. 220449-01  
Date July 3, 2024  
Prepared by Kyle Herold

### Residential Demand (CoO Guidelines Table 4.2)

Unit Type	Persons Per Unit	Number of Units	Population
1 Bedroom Apartment / Studio	1.4	230	322
2 Bedroom Apartment	2.1	140	294
Total			616

Population	616	Capita		
Average Water Consumption Rate	280	L/c/d		
Maximum Daily Peak Factor	2.5			
Maximum Hourly Peak Factor	2.2			
Average Domestic Water Demand	172,480	L/d	1.996	L/s
Maximum Daily Domestic Water Demand	431,200	L/d	4.991	L/s
Maximum Hourly Water Demand	948,640	L/d	10.980	L/s

### Commercial Demand (CoO Guidelines Table 4.2)

Commercial Area	400	m <sup>2</sup>		
Average Daily Demand	2500	L/(1000m <sup>2</sup> /d)		
Maximum Daily Peak Factor	1.5			
Maximum Hourly Peak Factor	1.8			
Average Commercial Water Demand	1,000	L/d	0.012	L/s
Maximum Daily Commercial Water Demand	1,500	L/d	0.017	L/s
Maximum Hourly Commercial Water Demand	2,700	L/d	0.031	L/s

### Total Water Demand

Average Total Water Demand	173,480	L/d	2.008	L/s
Maximum Daily Total Water Demand	432,700	L/d	5.008	L/s
Maximum Hourly Total Water Demand	951,340	L/d	11.011	L/s





## Fire Flow Calculations

LRL File No. 220449-01  
 Project 1657 Carling Ave  
 Date August 31, 2023  
 Method Fire Underwriters Survey (FUS)  
 Designed by Kyle Herold

Step	Task	Term	Options	Multiplier	Choose:	Value	unit	Fire Flow
<b>Structural Framing Material</b>								
1	Choose frame used for building	Coefficient C related to the type of construction	Wood Frame	1.5	Fire resistive construction >2 hrs	0.6		
			Ordinary Construction	1.0				
			Non-combustible construction	0.8				
			Fire resistive construction <2 hrs	0.7				
			Fire resistive construction >2 hrs	0.6				
<b>Floor Space Area</b>								
2	Choose type of housing	Type of housing	Single family dwelling	0	Building - no. of units per floor	0	unit(s)	
			Townhouse - no. of units	0				
			Building - no. of units per floor	0				
3	Enter area of a unit	Enter floor space area (100% floors 1-2, 50% floors 3-10)		1	8005.0		sq.m.	
4	Obtain fire flow before reductions	Required fire flow	Fire Flow = $220 \times C \times \text{Area}^{0.5}$				L/min	12,000
							L/s	200.0
<b>Reductions or surcharge due to factors affecting burning</b>								
5	Choose combustibility of contents	Occupancy hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15		
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15			L/min	10,200
			Rapid burning	0.25			L/s	170.0
6	Choose reduction for sprinklers	Sprinkler reduction	Sprinklers (NFPA13)	-0.30	True	-0.3		
			Water supply is standard for both the system and fire department hose lines	-0.10	True	-0.1	L/min	6,000
			Fully supervised system	-0.10	True	-0.1	L/s	100.0
7	Choose separation	Exposure distance between units	North side	30.1 to 45m	0.05			
			East side	20.1 to 30m	0.1			
			South side	30.1 to 45m	0.05		L/min	11,000
			West side	3.1 to 10m	0.2	0.4	L/s	183.3
<b>Net required fire flow</b>								
8	Obtain fire flow, duration, and volume	Minimum required fire flow rate (rounded to nearest 1000)					L/min	11,000
		Minimum required fire flow rate					L/s	183.3
		Required duration of fire flow					hr	2.5



## Pipe Pressure Losses Calculations

**LRL File No.** 220449

**Project** Proposed MU Development

**Location:** 1657 Carling Ave

**Date** August 31, 2023

**Designed:** K. Herold

### Piezometric Head Equation (Derived from Bernoulli's Equation)

$$h = \frac{p}{\gamma} + z$$

Where:

h = HGL (m)

p = Pressure (Pa)

$\gamma$  = Specific weight (N/m<sup>3</sup>) =

9810

z = Elevation of centreline of pipe (m) =

77.9

Water Pressure on Carling			
HGL (m)		Pressure	
		kPa	psi
Minimum =	108.8	303.13	43.97
Maximum =	114.3	357.08	51.79

### Hazen Williams Equation

$$h_f = \frac{10.67 \times Q^{1.85} \times L}{C^{1.85} \times d^{4.87}}$$

Where:

$h_f$  = Head loss over the length of pipe (m)

Q = Volumetric flow rate (m<sup>3</sup>/s)

L = Length of pipe (m)

C = Pipe roughness coefficient

d = Pipe diameter (m)

### Scenario 1: maximum daily demand

Q (L/s)	5.35
C	150
L (m.)	20

Q = Volumetric flow rate (m<sup>3</sup>/s)  
 L = Length of pipe (m)  
 C = Pipe roughness coefficient  
 d = Pipe diameter (m)

### Scenario 1: maximum daily demand

Q (L/s)	5.35	
C	150	
L (m.)	60	
I.D. (mm)	100	
V (m/s)	0.68	
h <sub>f</sub> (m)	0.28	
Head Loss (psi)	0.40	
Min. Pressure (psi)	43.28	(must not be less than 50psi)
Max. Pressure (psi)	51.68	(must not be more than 80psi)

\*consider pump to accommodate required min. pressure

### Scenario 2: maximum hourly demand

Q (L/s)	11.76	
C	150	
L (m.)	60	
I.D. (mm)	100	
V (m/s)	1.50	
h <sub>f</sub> (m)	1.20	
Head Loss (psi)	1.71	
Min. Pressure (psi)	41.97	(must not be less than 40psi)
Max. Pressure (psi)	50.36	(must not be more than 80psi)

### City of Ottawa Boundary Conditions (Multi Hydrant Analysis)

	Quantity	Max Capacity (L/min)*	Available Fire Flow** (L/min)
Fire Hydrant(s) Within 76m	3	5678	17034
Fire Hydrant(s) Within 76m to 152m	2	3785	7570
Fire Hydrant(s) Within 152m to 305m	2	2839	5678
Available Combined Fire Flow (L/min)			30282
Max Day + Fire Flow Demand (L/min)			11321

\*as per Table 18.5.4.3. of ISTB-2018-02

\*\*assumed class AA hydrants

## Kyle Herold

---

**From:** Julien Hebert <hebert@project1studio.ca>  
**Sent:** June 20, 2023 3:06 PM  
**To:** Kyle Herold  
**Cc:** Ryan Koolwine; Scott Alain; Bipin Dhillon; David Hunter; Jordan R. Bianconi; Taylor Hunter; Virginia Johnson  
**Subject:** RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)  
  
**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Kyle,

1. Type I – Fire-Resistive Construction (All floors and structural elements will be 2 hours FRR concrete construction)
2. The Major Occupancies are 'C' and 'E' (shops/stores) – based on table 3, this would be '*Limited to Combustible*'.
3. The building will be sprinklered and fully supervised.

Cheers,

**Julien Hébert**

project1studio | 613 884-3939 x6

---

**From:** Kyle Herold <kherold@lrl.ca>  
**Sent:** Tuesday, June 20, 2023 2:11 PM  
**To:** Julien Hebert <hebert@project1studio.ca>  
**Cc:** Ryan Koolwine <koolwine@project1studio.ca>; Scott Alain <alain@fotenn.com>; Bipin Dhillon <dhillon@fotenn.com>; David Hunter <dhunter@ieproperties.com>; Jordan R. Bianconi <jbianconi@ieproperties.com>; Taylor Hunter <thunter@ieproperties.com>; Virginia Johnson <vjohnson@lrl.ca>  
**Subject:** RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Good afternoon Julien,

Thank you for sending these through!

In order to complete the concept fire flow calculations as per the FUS design methodology (as per City of Ottawa requirements), we will require some further information on the building.

Can you please clarify the following?

- Type of construction? (Wood Frame, Ordinary, Non-combustible, Fire resistive construction < 2hrs, Fire resistive construction > 2hrs)
- Combustibility of contents? (Non-combustible, Limited combustible, Combustible, Free Burning, Rapid Burning)
- Sprinklered? Fully supervised system?

Please note;

Though most design standards will use the same terminology, it has been noted that the definition of certain terminology within the FUS method does vary from standard OBC-based methodologies.

I would strongly recommend reviewing the FUS while performing this exercise to ensure the correct terminology is used, based on the FUS.

Link to FUS 2020: [Downloads \(fireunderwriters.ca\)](https://www.fireunderwriters.ca/downloads) (Water Supply for Public Fire Protection)

- 1) Type of Construction (refer to pages 20-21 of the FUS Water Supply for Public Fire Protection guidelines)

- 2) Combustibility of Contents (refer to pages 24-26 of the FUS Water Supply for Public Fire Protection guidelines)
- 3) Sprinklers (refer to pages 27-29 of the FUS Water Supply for Public Fire Protection guidelines)

If you have any questions, please do not hesitate to reach out.

Thank you,

### Kyle Herold

Civil Engineering Designer

**LRL Engineering | [lrl.ca](http://lrl.ca)**

Cell: (613) 915-2988 | [kherold@lrl.ca](mailto:kherold@lrl.ca)



---

**From:** Julien Hebert <[hebert@project1studio.ca](mailto:hebert@project1studio.ca)>

**Sent:** June 20, 2023 12:50 PM

**To:** Kyle Herold <[kherold@lrl.ca](mailto:kherold@lrl.ca)>; Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>

**Cc:** Ryan Koolwine <[koolwine@project1studio.ca](mailto:koolwine@project1studio.ca)>; Scott Alain <[alain@fotenn.com](mailto:alain@fotenn.com)>; Bipin Dhillon <[dhillion@fotenn.com](mailto:dhillion@fotenn.com)>; David Hunter <[dhunter@ieproperties.com](mailto:dhunter@ieproperties.com)>; Jordan R. Bianconi <[jbianconi@ieproperties.com](mailto:jbianconi@ieproperties.com)>; Taylor Hunter <[thunter@ieproperties.com](mailto:thunter@ieproperties.com)>

**Subject:** RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Hi Kyle,

Please see the link below for updated drawings:

[https://www.dropbox.com/sh/d8g5utsoqt4y2c0/AADMO7ik\\_cm6L4zol\\_0RixJ5a?dl=0](https://www.dropbox.com/sh/d8g5utsoqt4y2c0/AADMO7ik_cm6L4zol_0RixJ5a?dl=0)

Please note that the site plan is not finalized – we have a meeting with the city this week to discuss the vehicular access from Tillbury.

The unit matrix/area calcs are up to date, but still flexible as we continue to refine the massing of the north wing of the building.

Thanks,

**Julien Hébert**

project1studio | 613 884-3939 x6

---

**From:** Kyle Herold <[kherold@lrl.ca](mailto:kherold@lrl.ca)>

**Sent:** Tuesday, June 20, 2023 12:43 PM

**To:** Julien Hebert <[hebert@project1studio.ca](mailto:hebert@project1studio.ca)>; Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>

**Cc:** Ryan Koolwine <[koolwine@project1studio.ca](mailto:koolwine@project1studio.ca)>; Scott Alain <[alain@fotenn.com](mailto:alain@fotenn.com)>; Bipin Dhillon <[dhillion@fotenn.com](mailto:dhillion@fotenn.com)>; David Hunter <[dhunter@ieproperties.com](mailto:dhunter@ieproperties.com)>; Jordan R. Bianconi <[jbianconi@ieproperties.com](mailto:jbianconi@ieproperties.com)>; Taylor Hunter <[thunter@ieproperties.com](mailto:thunter@ieproperties.com)>

**Subject:** RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Good afternoon Julien,

Just wanted to quickly follow-up on the status of the updated architectural drawings for 1657 Carling Ave.

If you have any questions, or anything to discuss, please do not hesitate to reach out.

Best regards,

**Kyle Herold**

Civil Engineering Designer

**LRL Engineering | [lrl.ca](http://lrl.ca)**

Cell: (613) 915-2988 | [kherold@lrl.ca](mailto:kherold@lrl.ca)



---

**From:** Julien Hebert <[hebert@project1studio.ca](mailto:hebert@project1studio.ca)>

**Sent:** June 13, 2023 11:13 AM

**To:** Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>

**Cc:** Kyle Herold <[kherold@lrl.ca](mailto:kherold@lrl.ca)>; Ryan Koolwine <[koolwine@project1studio.ca](mailto:koolwine@project1studio.ca)>; Scott Alain <[alain@fotenn.com](mailto:alain@fotenn.com)>; Bipin Dhillon <[dhillon@fotenn.com](mailto:dhillon@fotenn.com)>; David Hunter <[dhunter@ieproperties.com](mailto:dhunter@ieproperties.com)>; Jordan R. Bianconi <[jbianconi@ieproperties.com](mailto:jbianconi@ieproperties.com)>; Taylor Hunter <[thunter@ieproperties.com](mailto:thunter@ieproperties.com)>

**Subject:** RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Hi Virginia,

We will be sending updated drawings showing a 30-storey building by the end of the week.  
We will have a better idea of number of units and unit types for your calcs then.

Thanks!

**Julien Hébert**

project1studio | 613 884-3939 x6

---

**From:** Ryan Koolwine <[koolwine@project1studio.ca](mailto:koolwine@project1studio.ca)>

**Sent:** Tuesday, June 13, 2023 11:08 AM

**To:** Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>; Scott Alain <[alain@fotenn.com](mailto:alain@fotenn.com)>; Bipin Dhillon <[dhillon@fotenn.com](mailto:dhillon@fotenn.com)>; David Hunter <[dhunter@ieproperties.com](mailto:dhunter@ieproperties.com)>; Jordan R. Bianconi <[jbianconi@ieproperties.com](mailto:jbianconi@ieproperties.com)>; Taylor Hunter <[thunter@ieproperties.com](mailto:thunter@ieproperties.com)>; Julien Hebert <[hebert@project1studio.ca](mailto:hebert@project1studio.ca)>

**Cc:** Kyle Herold <[kherold@lrl.ca](mailto:kherold@lrl.ca)>

**Subject:** RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Hi Virginia,

Julien Hebert (cc'd on this email), will be managing the day to day from the architectural side on this project. He will follow-up with you.

Cheers,

**Ryan Koolwine**

project1studio | 613 884-3939 x1

---

**From:** Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>  
**Sent:** June 13, 2023 11:00 AM  
**To:** Scott Alain <[alain@fotenn.com](mailto:alain@fotenn.com)>; Bipin Dhillon <[dhillon@fotenn.com](mailto:dhillon@fotenn.com)>; Ryan Koolwine <[koolwine@project1studio.ca](mailto:koolwine@project1studio.ca)>; David Hunter <[dhunter@ieproperties.com](mailto:dhunter@ieproperties.com)>; Jordan R. Bianconi <[jbianconi@ieproperties.com](mailto:jbianconi@ieproperties.com)>; Taylor Hunter <[thunter@ieproperties.com](mailto:thunter@ieproperties.com)>  
**Cc:** Kyle Herold <[kherold@lrl.ca](mailto:kherold@lrl.ca)>  
**Subject:** RE: 1657 Carling Avenue - ZBLA Application Update (LRL220449)

Hello Team,

I wanted to introduce Kyle to this thread who will be pushing this forward. Ryan, has there been any further advances on the Architectural plans that we should be working off of for our demand calculations?

Can you please circulate the most updated set?

Thank you,

**Virginia Johnson, P. Eng.**  
Civil Engineering Manager/Associate  
**LRL Engineering | [lrl.ca](http://lrl.ca)**  
Cell: (613) 915-9503 | [vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)



---

**From:** Scott Alain <[alain@fotenn.com](mailto:alain@fotenn.com)>  
**Sent:** Wednesday, May 24, 2023 3:01 PM  
**To:** Astrid Nielsen <[astrid.nielsen@dendronforestry.ca](mailto:astrid.nielsen@dendronforestry.ca)>; Bipin Dhillon <[dhillon@fotenn.com](mailto:dhillon@fotenn.com)>; Ryan Koolwine <[koolwine@project1studio.ca](mailto:koolwine@project1studio.ca)>; Andrew Harte <[andrew.harte@cghtransportation.com](mailto:andrew.harte@cghtransportation.com)>; John Kingsley <[john.kingsley@cghtransportation.com](mailto:john.kingsley@cghtransportation.com)>; David Hunter <[dhunter@ieproperties.com](mailto:dhunter@ieproperties.com)>; Jordan R. Bianconi <[jbianconi@ieproperties.com](mailto:jbianconi@ieproperties.com)>; Karyn Munch <[kmunch@patersonsgroup.ca](mailto:kmunch@patersonsgroup.ca)>; Joshua Foster <[joshua.foster@gradientwind.com](mailto:joshua.foster@gradientwind.com)>; Virginia Johnson <[vjohnson@lrl.ca](mailto:vjohnson@lrl.ca)>; Taylor Hunter <[thunter@ieproperties.com](mailto:thunter@ieproperties.com)>; Kevin Myers <[kevin.myers@dendronforestry.ca](mailto:kevin.myers@dendronforestry.ca)>  
**Subject:** 1657 Carling Avenue - ZBLA Application Update

Good afternoon team,

Subject to our review of the City of Ottawa's updated development application process, we have determined that submitting our ZBLA prior to June 5 will no longer be critical to the project timeline. We are therefore setting a new

submission date of **July 14, 2023**. This will allow time for all disciplines to contribute to a complete, comprehensive submission package.

Please continue working to advance your materials as applicable. If you have any further questions or concerns, please feel free to reach out directly. We will be in touch leading up to the submission date to ensure we are meeting key milestones.

Have a good day,

**Scott Alain, RPP, MCIP (he/him)**

Senior Planner

## **FOTENN**

396 Cooper Street, Suite 300

Ottawa, ON K2P 2H7

T 613.730.5709 ext. 231

fotenn.com

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## **APPENDIX D**

### **Boundary Conditions**





**From:** Jhamb, Nishant <[nishant.jhamb@ottawa.ca](mailto:nishant.jhamb@ottawa.ca)>  
**Sent:** July 18, 2023 1:19 PM  
**To:** Kyle Herold <[kherold@lrl.ca](mailto:kherold@lrl.ca)>  
**Subject:** RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

Hi Kyle

Available fire flow from the Carling 203mm UCI main and 152mm UCI in Tillbury is limited. Please reduce fire flow demand.

The following are boundary conditions, HGL, for hydraulic analysis at 1657 Carling Avenue, (zone 1W) assumed to be connected to BOTH the 203 mm watermain on Carling Avenue and the 152 mm on Tillbury Avenue (see attached PDF for location).

Carling Connection:

Min HGL: 108.8 m

Max HGL: 114.3 m

Available fire flow at 20 psi: 145 L/s, assuming ground elevation of 77.9 m

Tillbury Connection:

Min HGL: 108.6 m

Max HGL: 114.5 m

Available fire flow at 20 psi: 117 L/s, assuming ground elevation of 77.3 m

These are for current conditions and are based on computer model simulation.

*Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.*

Thanks

Nishant Jhamb, P.Eng

Project Manager | Gestionnaire de projet

Planning, Real Estate and Economic Development Department

Development Review - Central Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 23112, [nishant.jhamb@ottawa.ca](mailto:nishant.jhamb@ottawa.ca)

---

**From:** Kyle Herold

**Sent:** June 27, 2023 4:11 PM

**To:** [Kersten.Nitsche@ottawa.ca](mailto:Kersten.Nitsche@ottawa.ca); [nishant.jhamb@ottawa.ca](mailto:nishant.jhamb@ottawa.ca)

**Subject:** LRL220449 - 1657 Carling Avenue - Boundary Condition Request

Good afternoon Kersten & Nishant,

I'm hoping either of you can help me out, or at least direct me to the right contact.

We are currently working on an adequacy of servicing report for a multi-storey residential building concept to be developed at 1657 Carling Avenue.

We require the water boundary conditions at the site to proceed with our calculations.

Please use the following data to provide the require boundary conditions:

Average Total Daily Demand = 2.144 L/s

Maximum Daily Demand = 5.348 L/s

Maximum Hourly Demand = 11.759 L/s

Required Fire Flow = 183.3 L/s

It is requested boundary conditions are provided at Carling Ave and Tillbury Avenue.

For your reference, I have included copies of the Water Supply Calculations, FUS Fire Flow Calculations and concept architectural plans along with this email.

Any questions or concerns, please do not hesitate to reach out.

Thank you,

**Kyle Herold**

Civil Engineering Designer

**LRL Engineering | [lrl.ca](http://lrl.ca)**

Cell: (613) 915-2988 | [kherold@lrl.ca](mailto:kherold@lrl.ca)



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,

## **APPENDIX E**

### **Sanitary Calculations & City Correspondance**



LRL Associates Ltd.  
Sanitary Sewer Design Sheet

<div><div><b>LRL File No.:</b> 220449 <b>Project:</b> Mixed-Use Development <b>Location:</b> 1657-1673 Carling Ave. <b>Designed:</b> <b>Checked:</b> <b>Date:</b> July 3, 2024 <b>DWG. Reference:</b></div></div>									<div><b>Sanitary Design Parameters</b><div>Commercial &amp; Institutional Flow = 28000 L/ha/day Light Industrial Flow = 35000 L/ha/day Heavy Industrial Flow = 55000 L/ha/day Maximum Residential Peak Factor = 4.0 Commercial &amp; Institutional Peak Factor = 1.5</div><div>Average Daily Flow = 280 L/p/day Industrial Peak Factor = as per Appendix 4-B Extraneous Flow = 0.33 L/s/ha</div></div>											<div><b>Pipe Design Parameters</b><div>Maximum Velocity = 3.00 m/s Minimum Velocity = 0.60 m/s Manning's n = 0.013</div></div>							
LOCATION			RESIDENTIAL						COMMERCIAL		INDUSTRIAL			INSTITUTIONAL		C+I+I	INFILTRATION			TOTAL FLOW, Q	PIPE						
STREET	FROM	TO	AREA	POP.	ACCU.		PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FACT.	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW		LENGTH	DIA.	SLOPE	MATERIAL	CAP. Q(FULL)	VEL. V(FULL)	RATIO Q /QFULL
					AREA	POP.																					
			(Ha)		(Ha)			(L/s)	(Ha)	(Ha)		(Ha)		(Ha)	(Ha)	(L/s)	(Ha)	(Ha)	(L/s)	(L/s)	(m)	(mm)	(%)		(L/s)	(m/s)	
CARLING AVE.	BLDG	Ex. SAN	1.200	616.0	1.200	616.0	3.3	6.67	0.036	0.036	0.00	0.00	0.0	0.0	0.0	0.02	1.200	1.200	0.40	7.08		150	1.00%	PVC	15.23	0.86	0.47

Notes: Existing inverts and slopes are estimated. They are to be confirmed on-site.



## Kyle Herold

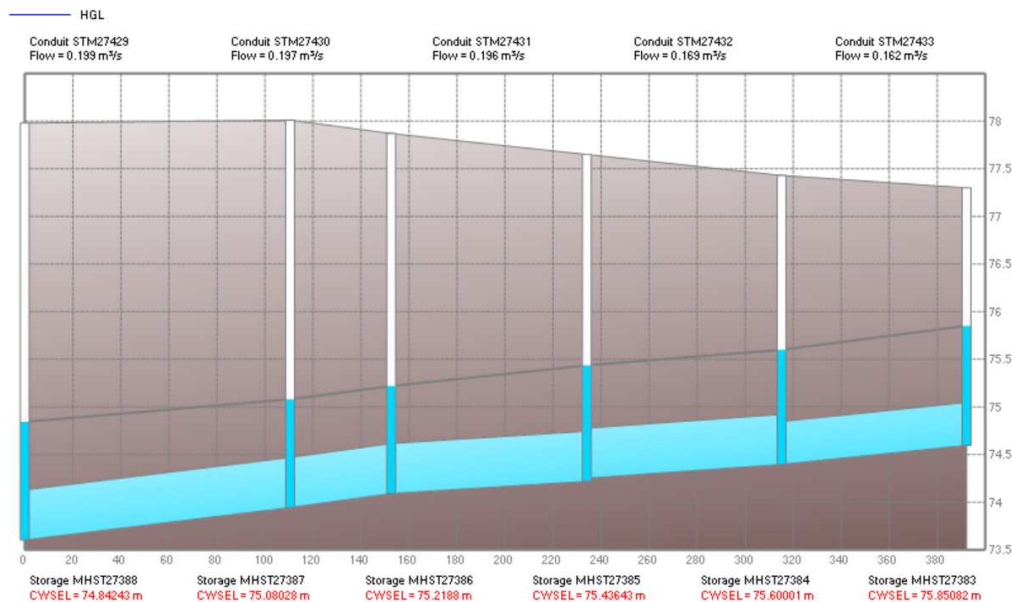
**From:** Jhamb, Nishant <nishant.jhamb@ottawa.ca>  
**Sent:** August 23, 2023 10:33 AM  
**To:** Virginia Johnson  
**Cc:** Maxime Longtin; Kyle Herold  
**Subject:** RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hello Virginia

Here is the response I got from Asset management. Can you please provide the predevelopment drainage area plan and related storm flow calculations as requested below.

I checked the sanitary in more detail and Tillbury has capacity for the proposed 6.94 L/s. As for the storm, below is the 2 year HGL along Tillbury and Cole and you can see that it does not even have 2 year capacity. The 2 year flow in Tillbury in front of their property is 219 L/s and they are asking for 42 L/s (20% increase). We therefore need to figure out where the site already drains and if it already has storm pipes. This will help me figure out what is already in the system. Can you ask them where their site currently drains?



Thanks



Nishant

**From:** Kyle Herold <kherold@lrl.ca>  
**Sent:** August 18, 2023 10:35 AM  
**To:** Jhamb, Nishant <nishant.jhamb@ottawa.ca>  
**Subject:** RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request  
**Importance:** High

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Good morning Nishant,

1657 Carling Avenue

I would like to request review of adequacy of the existing sewers in comparison to expected flow and release rates for the proposed development.

Review of adequacy will need to be performed for the storm sewers and sanitary sewers within Tillbury Ave and Carling Ave.

Expected Sanitary Total Flow = 6.94 L/s

Expected Maximum Allowable Stormwater Release Rate = 41.74 L/s\*

\*(assuming control of 100y post to 2yr pre)

If you have any questions, or require additional information, please do not hesitate to reach out.

Thank you,

**Kyle Herold**

Civil Engineering Designer

**LRL Engineering | [lrl.ca](http://lrl.ca)**

Cell: (613) 915-2988 | [kherold@lrl.ca](mailto:kherold@lrl.ca)



## **APPENDIX F**

### **Stormwater Calculations & City Correspondance**



LRL Associates Ltd.  
Storm Watershed Summary



**LRL File No.** 220449-01

**Project:** Adaquacy of Servicing

**Location:** 1657 Carling Ave, Ottawa

**Date:** August 31, 2023

**Designed:** K. Herold

**Drawing Ref.:**

**Pre-Development Catchments (within Development Area)**

Watershed	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
EWS-01 (uncontrolled)	0.024	0.000	0.367	0.391	0.86
<b>Total</b>	<b>0.024</b>	<b>0.000</b>	<b>0.367</b>	<b>0.391</b>	<b>0.86</b>

**Post-Development Catchments (within Development Area)**

Watershed	C = 0.20	C = 0.8	C = 0.90	Total Area (ha)	Combined C
WS-01 (controlled)	0.000	0.000	0.341	0.341	0.90
WS-02 (uncontrolled)	0.030	0.000	0.020	0.050	0.48
<b>Total</b>	<b>0.030</b>	<b>0.000</b>	<b>0.361</b>	<b>0.391</b>	<b>0.85</b>



LRL File No. 220449-01  
**Project:** Adequacy of Servicing  
**Location:** 1657 Carling Ave, Ottawa  
**Date:** August 31, 2023  
**Designed:** K. Herold  
**Checked:** V. Johnson  
**Drawing Ref.:**

**Stormwater Management  
Design Sheet**

**STORM - 100 YEAR**

**Runoff Equation**

$Q = 2.78CIA \text{ (L/s)}$   
 $C = \text{Runoff coefficient}$   
 $I = \text{Rainfall intensity (mm/hr)} = A / (T_d + C)^B$   
 $A = \text{Area (ha)}$   
 $T_c = \text{Time of concentration (min)}$

**Pre-Development Catchments within Development Area**

	Total Area =	0.391	ha	$\Sigma R =$	0.86
		0.391	ha	R =	0.86
	Total Uncontrolled =	0.391	ha	$\Sigma R =$	0.86

**100 Year Allowable Release Rate (Max C=0.5, 2yr Pre-dev)**

$I_2 = 732.951 / (T_d + 6.199)^{0.81}$        $A = 732.951$        $B = 0.81$        $C = 6.199$   
 $C = 0.50$       max C=0.5 as per City Guidelines  
 $I = 76.8$  mm/hr  
 $T_c = 10$  min      min 10mins as per City Guidelines  
 $A = 0.391$  ha  
**100y Allowable Release Rate = 41.74 L/s**

**Post-development Stormwater Management**

				$\Sigma R_{2\&5}$	$\Sigma R_{100}$
	Total Site Area =	0.391	ha	$\Sigma R =$	0.85
Controlled	WS-01	0.341	ha	R =	0.90
Uncontrolled	WS-02	0.050	ha	R =	0.48
	Total Controlled =	0.391	ha	$\Sigma R =$	0.85
					1.00

**100 Year Post-development Stormwater Management**

$I_{100} = 1735.688 / (T_d + 6.014)^{0.820}$        $A = 1735.688$        $B = 0.820$        $C = 6.014$

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m <sup>3</sup> )	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	169.27	85.66	26.50	14.89	41.39
15	142.89	135.46	98.06	26.50	14.89	41.39
20	119.95	113.71	104.65	26.50	14.89	41.39
25	103.85	98.44	107.92	26.50	14.89	41.39
30	91.87	87.09	109.06	26.50	14.89	41.39
35	82.58	78.28	108.74	26.50	14.89	41.39
40	75.15	71.24	107.37	26.50	14.89	41.39
45	69.05	65.46	105.19	26.50	14.89	41.39
50	63.95	60.63	102.38	26.50	14.89	41.39
60	55.89	52.99	95.35	26.50	14.89	41.39
70	49.79	47.20	86.94	26.50	14.89	41.39
80	44.99	42.65	77.52	26.50	14.89	41.39
90	41.11	38.97	67.35	26.50	14.89	41.39

**Onsite Stormwater Retention**

Total Storage Required = 109.06 m<sup>3</sup>

## Kyle Herold

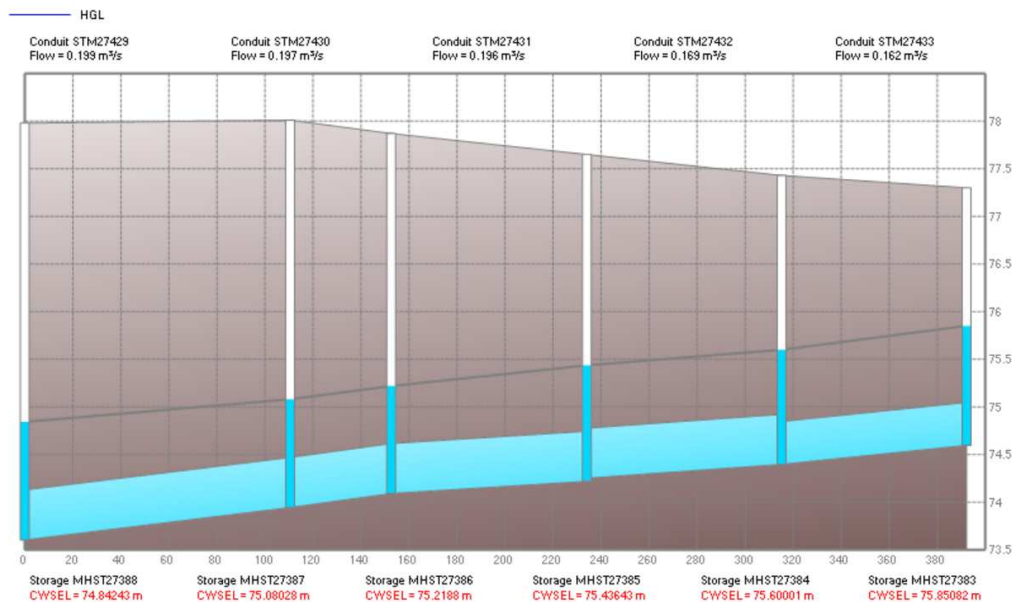
**From:** Jhamb, Nishant <nishant.jhamb@ottawa.ca>  
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**To:** Virginia Johnson  
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**Subject:** RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request

**Follow Up Flag:** Follow up  
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Hello Virginia

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Nishant

**From:** Kyle Herold <kherold@lrl.ca>  
**Sent:** August 18, 2023 10:35 AM  
**To:** Jhamb, Nishant <nishant.jhamb@ottawa.ca>  
**Subject:** RE: LRL220449 - 1657 Carling Avenue - Boundary Condition Request  
**Importance:** High

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1657 Carling Avenue

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Review of adequacy will need to be performed for the storm sewers and sanitary sewers within Tillbury Ave and Carling Ave.

Expected Sanitary Total Flow = 6.94 L/s

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\*(assuming control of 100y post to 2yr pre)

If you have any questions, or require additional information, please do not hesitate to reach out.

Thank you,

**Kyle Herold**

Civil Engineering Designer

**LRL Engineering | [lrl.ca](http://lrl.ca)**

Cell: (613) 915-2988 | [kherold@lrl.ca](mailto:kherold@lrl.ca)



## **APPENDIX G**

### **Conceptual Site Servicing Plan**





