Robinson
Land Development

46 King St. W., Brockville Site Plan Mixed Commercial / Residential Development Servicing and Stormwater Management Report

Prepared For:

IDEA Inc.

Prepared By:

Robinson Land Development

Project No. 23062
October 2023

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LIST OF APPENDICES

LEGAL NOTIFICATION

This report was prepared by Robinson Land Development for the account of **IDEA Inc.**

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. **Robinson Land Development** accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project

1.0 INTRODUCTION

Robinson Land Development has been retained by IDEA Inc. to prepare a servicing and stormwater management design for a proposed mixed residential / commercial development located at 46 King St. West in Brockville Ontario. The subject site is proposed to be developed into a nine-storey building with two underground parking storeys that occupies nearly the entire property. The building frontage is along King St West, the rear is connected to Victoria Lane, and the building sides are immediately adjacent to the existing buildings at #32 and #48 King St. West. Refer to architectural site plan provided in **Appendix A** for reference.

This report will detail the proposed means of servicing water, sanitary, and stormwater.

2.0 EXISTING CONDITIONS

The 1275 m^2 subject site is currently developed with two-storey commercial buildings serviced off King St. West (containing municipal addresses #36, #42 & #46). These buildings will be demolished as part of this development.

The following infrastructure exists adjacent to the site:

- 300 mm dia. watermain along King St. West
  - Three 50mm service laterals are provided to the property.
- 200/250 mm dia. PVC sanitary sewer along King St. West
  - The sanitary sewer splits flows east and west at the existing SANMH12 in front of the site
  - Two 125mm service laterals are provided to the property.
- 600mm PVC storm sewer along King St. West
  - Two 150mm service laterals are provided to the property.

Refer to the as-built drawing C4 by Kostuch Engineering dated July 28, 2003 provided in **Appendix A** for more details. The water, sanitary, and storm infrastructure, including service laterals, were replaced as part of that project.

3.0 DEVELOPMENT PROPOSAL

The Owner is proposing to develop the subject site into a nine-storey building with two-storey underground parking. The 1265 m^2 footprint building will occupy nearly the entire property. The main building entrance is along the King St. West frontage, with the parking entrance at the rear off Victoria Lane. Refer to the Site Plan, prepared by Allan Stone Architect, in **Appendix A** for more details.

The proposed development will reconnect to the existing sanitary and storm services, with a new upsized water service in accordance with City requirements. The proposed civil design drawings are provided in **Appendix B** including:

- Existing Conditions & Removals Plan
- Servicing Plan
- Grading Plan
- Erosion & Sediment Control Plan
- Notes & Details Plan

4.0 WATER SERVICING

The subject site will receive water supply via a new 150 mm service lateral off the existing 300mm watermain on King St. West. The watermain system has been designed according to the following standards and guidelines:

- Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection (2020)
- City of Brockville Site Plan Control Manual (2018)
- MECP Design Guidelines for Drinking-Water Systems (2008)

Accordingly, the following watermain design criteria have been utilized for the subject site:

- Residential Demand: 450 L/cap/d
- Residential Density: 2.5 cap/unit
- Residential Peaking Factor: MECP Table 3-3
- Retail Flow: 50 cap/ha
- Commercial Peaking Factor: 1.5 Max Day; 1.8 Peak Hour
- Minimum Pressure During Peak Hour 276 kPa (40 psi)
- Minimum Pressure During Maximum Day Plus Fire 140 kPa (20 psi)
- Maximum Pressure in Unoccupied Areas 689 kPa (100 psi)
- Maximum Pressure in Occupied Areas 552 kPa (80 psi)

4.1 Proposed Demand

Based on building usage the domestic water demand is 0.85, 4.01, and 6.11 L/s for the average, max. day, and peak hour condition, respectively. The fire demand for the building is estimated at 10,000 L/min (166.67 L/s). Correspondence with the City of Brockville's Chief Building Official indicates there is no concern for the municipal system to provide such demands. Refer to **Appendix C** for proposed domestic and fire demand calculations and City correspondence. Due to building height a booster pump may be required for the upper floors to maintain minimum pressure. This will be designed by the building mechanical engineer during the detailed design phase.

The site is within Pressure Zone 1, which at the water treatment discharge has an HGL of 143 m. This is equivalent to approximately 80 psi at the ground floor elevation of the proposed building, within the acceptable pressure range.

4.2 Fire Protection

The proposed building will be sprinklered, with the fire department connection proposed at the west end of the front of the building. The nearest existing municipal hydrant is located at the southwest corner of King St. West and Broad Street. Refer to **Appendix C** for hydrant distance. In order to supply the required fire demand to the building, the existing 50 mm water service lateral will need to be upgraded to a 150 mm lateral.

5.0 SANITARY SERVICING

5.1 Design Criteria

Sanitary flows from the site will discharge to the 250 mm sanitary sewer on King St. West through the existing 125 mm service lateral. The service lateral slope has been assumed at typical 2% from the sewer. The sanitary sewer design follows the following standards and guidelines:

- City of Brockville Site Plan Control Manual (2018)
- MECP Design Guidelines for Sewage Works (2008)

Accordingly, the following design parameters have been implemented for the subject site:

- Residential Demand: 450 L/cap/d
- Residential Density: 2.5 cap/unit
- Retail Flow: 50 cap/ha
- Peaking Factor: 2.5
- Infiltration Allowance: 0.28 L/s/ha

- Velocity Range: 0.60-3.0 m/s

5.2 Proposed Design

Based on building area the peak sanitary demand was calculated to be 2.21 L/s. The existing sanitary sewer lateral has a capacity of about 13 L/s and is therefore confirmed to have sufficient capacity. Refer to the sanitary sewer design sheet in **Appendix D** for more details.

To compare to the existing sanitary demand for the property the same 50 cap/ha and 450 L/cap/d criteria will be assumed. This equals 0.06 L/s for the existing two-storey 1163 m^2 building. The proposed development represents a 2.15 L/s demand increase, or 4.6% of the downstream 250 mm sanitary sewer capacity. This is a small increase in demand considering the downstream sanitary sewer capacity and therefore the existing infrastructure is considered sufficient for the proposed development.

6.0 STORM SERVICING

6.1 Design Criteria

Stormwater runoff collected on the subject site will be discharged to the existing 600 mm storm sewer on King St. West via the existing 150 mm service lateral. The service lateral slope has been assumed at typical 2% from the sewer. Since the existing site is fully occupied by a flat-roofed building the stormwater discharge from the site is considered unchanged.

The storm sewer design follows the following standards and guidelines:

- City of Brockville Site Plan Control Manual (2018)
- MECP Stormwater Management Planning and Design Manual (2003)

Accordingly, the following design parameters have been implemented for the subject site:

- Quantity Control: Post-development to pre-development
- Storm Curve: Brockville Site Plan Control Manual, App K
- Time of Concentration: 15 min
- Velocity Range: 0.60-4.5 m/s

6.2 Proposed Design

The existing 150 mm storm service lateral has an estimated capacity of 21.6 L/s. In order to accommodate this estimated capacity up to the 100-yr design storm two options are being considered, which will be decided during the detailed design phase:

- The top-most roof level (490 m^2) will be equipped with flow-restricted roof drains at total 4 L/s. At this restriction a maximum average depth of 4 cm will be stored on the top-most roof during the 100-yr design storm. In addition, a 13.6 m^3 storm cistern within the building will store excess runoff from the lower terraced roofs. Or,
- A 30.2 m^3 storm cistern within the building will store all excess runoff from all roof levels.

Should controlled roof inlets be selected the roof drain inlets and appropriate overflow scuppers will be designed by the building mechanical engineer. Refer to the storm sewer design sheet and storm storage calculations (for both options) in **Appendix E**.

Since the proposed building occupies effectively the same footprint of the property as the existing building that discharges to the 600 mm storm sewer (flat roof with hard surface) it is considered that there is no downstream storm sewer capacity concerns.

6.3 Victoria Lane Catch Basin

On the north side of the existing building, within the property line, is a catch basin that collects storm runoff from Victoria Lane and discharges eastwards towards Victoria Ave. to a maintenance hole on Victoria Lane. Since the proposed building will overlap the existing catch basin, the catch basin will be relocated to Victoria Lane with minor regrading to facilitate the new low point. The existing 150 mm lateral will also be replaced with a 150 mm lateral to the same maintenance hole, at a slope of 1.5% (greater than the existing pipe at 1.2%).

7.0 EROSION AND SEDIMENT CONTROL

Prior to construction erosion and sediment control measures must be implemented to mitigate the impact on receiving storm sewers. The following erosion and sediment control (ESC) measures have been proposed for the subject site:

- Limiting the extent of exposed soils at any given time.
- Erosion and sediment control measures shall be maintained until building structure has been completed.
- Installation of silt sacks between frame and cover on all nearby existing catch basins and open cover storm manholes until construction is completed.
- Silt fence to be installed and maintained along the property boundaries.
- During active construction periods, visual inspections shall be undertaken on a weekly basis and after major storm events (>25mm of rain in 24 hour period) on ESC and any damage repaired immediately.
- ESC shall also be assessed (and repaired as required) following significant snowmelt events.
- Visual inspections shall also be undertaken in anticipation of large storm events (or a series of rainfall and/or snowmelt days) that could potentially yield significant runoff volumes.
- Care shall be taken to prevent damage to ESC during construction operations.
- In some cases, barriers may be removed temporarily to accommodate construction operations. The affected barriers shall be reinstated immediately after construction operations are completed.
- ESC should be adjusted during construction to adapt to site features as the site becomes developed.
- ESC shall be cleaned of accumulated sedimentation as required and replaced as necessary.
- During the course of construction, if the Engineer believes that additional prevention methods are required to control erosion and sedimentation, the Contractor shall implement additional measures, as required, to the satisfaction of the Engineer.
- Construction and maintenance requirements for erosion and sediment controls are to comply with Ontario Provincial Standard Specification (OPSS) 805.

Refer to the Erosion and Sediment Control Plan provided in **Appendix B** for more details.

8.0 CONCLUSIONS

This servicing and stormwater management report has been prepared to support the Site Plan Application for the development of the property located at 46 King Street West in Brockville. The report has detailed the proposed means of servicing the site for potable water, sanitary sewer, and storm sewer in accordance with City of Brockville standards. The proposed servicing and stormwater management designs will be achieved by implementing the following key features:

- The proposed development is a nine-storey mixed commercial/residential building replacing the existing two-storey building, occupying nearly the entire property.
- Water supply will be provided by a new 150 mm diameter water service connected to the existing 300 mm diameter watermain on King St. West to supply domestic and fire demands for the sprinklered building.
- Sanitary flows will be conveyed to the existing 250 mm diameter sanitary sewer on King St. West via the existing 125 mm diameter sanitary service.
- Stormwater runoff will be conveyed to the existing 600 mm storm sewer on King St. West via the existing 150 mm diameter storm service.
- Due to maximum assumed capacity of the 150 mm diameter storm service, on-site storage will be provided for all storm events up to and including the 100-year design storm at either the top-most roof level and an internal storm cistern; or an internal storm cistern alone.
- Erosion and sediment control measures will be implemented prior to construction and maintained until vegetation has been re-established in disturbed areas.

Report Prepared By:

Stephen McCaughey, P.Eng.
Project Engineer

Report Approved By:

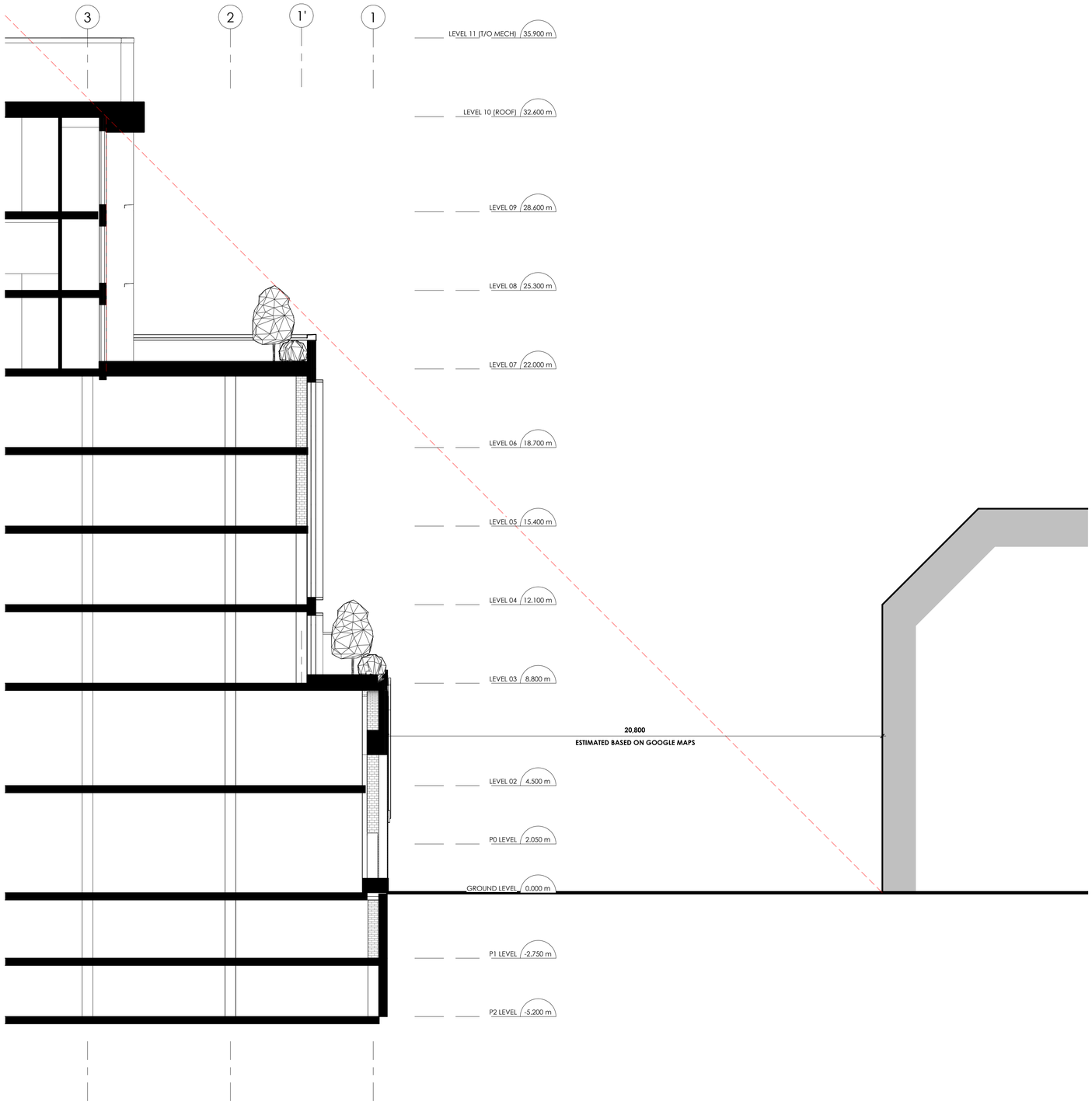
Chris C. Collins
Manager – Land Development

Appendix A

Architectural Building Plans

Architectural Site Plan

Existing As-Built (Kostuch Engineering dwg. C4)



CABER
REAL PROPERTY SOLUTIONS

IDEA
INTEGRATED DESIGN
ENGINEERING + ARCHITECTURE

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STUDIO

46 KING ST W

46 KING ST W | BROCKVILLE | ON

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ANGULAR PLANE OF ADJACENT BUILDINGS

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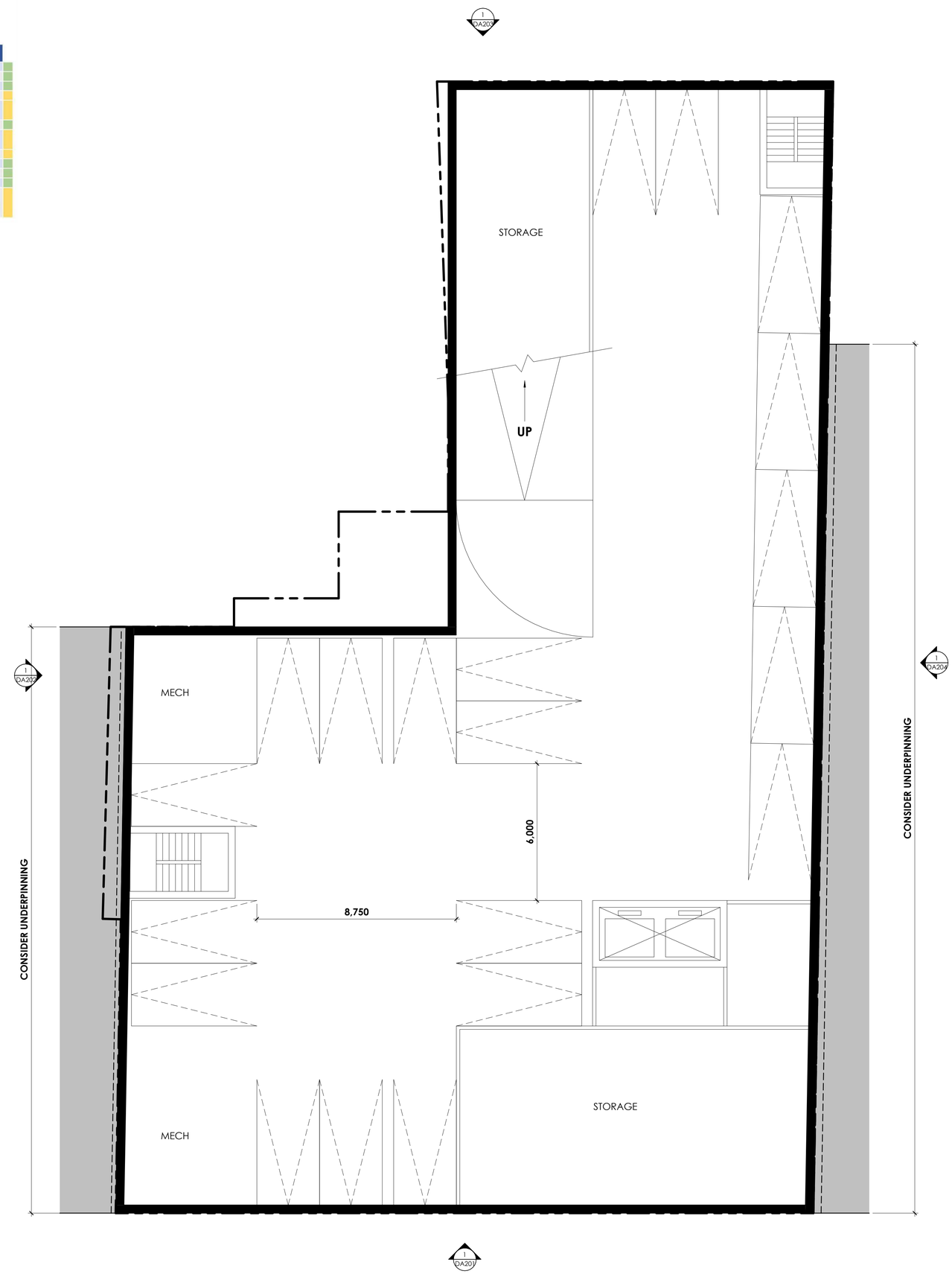
Brockville - 46 King St. West Mixed Use
Zoning By-Law / Compliance Review
2023-02-01 - Preconsultation

	Provision	Required	Proposed	
1	Type	Mixed-Use Building	Mixed-Use Building	
2	Minimum Frontage	12.0m	No Change. Approximately 32m	
3	Minimum Lot Area	500.0 m2	Approximately 1265m2	
4	Maximum Building Height	21.0m & 6 Storeys	~33.0m & 9 Storeys	
5	Angular Plane Application	Applies - 45 degrees from opposite street	Seek variance for modified setback at level 3 to 9	
6	Front/Exterior/Interior Setbacks	0.0m	0.0m	
7	Rear Yard Setback	Greater of 6.0m or 50% of the building height	No Change. Approximately 0.0m	
8	Maximum Lot Coverage	90%	No Change. Approximately 95%	
9	Minimum Landscaped Open Space	0%	0%	
10	Minimum Ground Floor Height	4.5m	4.5m	
11	Minimum Building Height	7.0m	32.6m	
12	Parking	1 Space per residential unit (77) + commercial based on type (say 30 spaces for 758m2) = ~107 Required	39 + use of adjacent public lots with long term permits	



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ENGINEERING + ARCHITECTURE

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46 KING ST W

46 KING ST W | BROCKVILLE | ON

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FLOOR PLAN - P1 (PARKING)

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Brockville - 46 King St. West Mixed Use
Zoning By-Law / Compliance Review
2023-02-01 - Preconsultation

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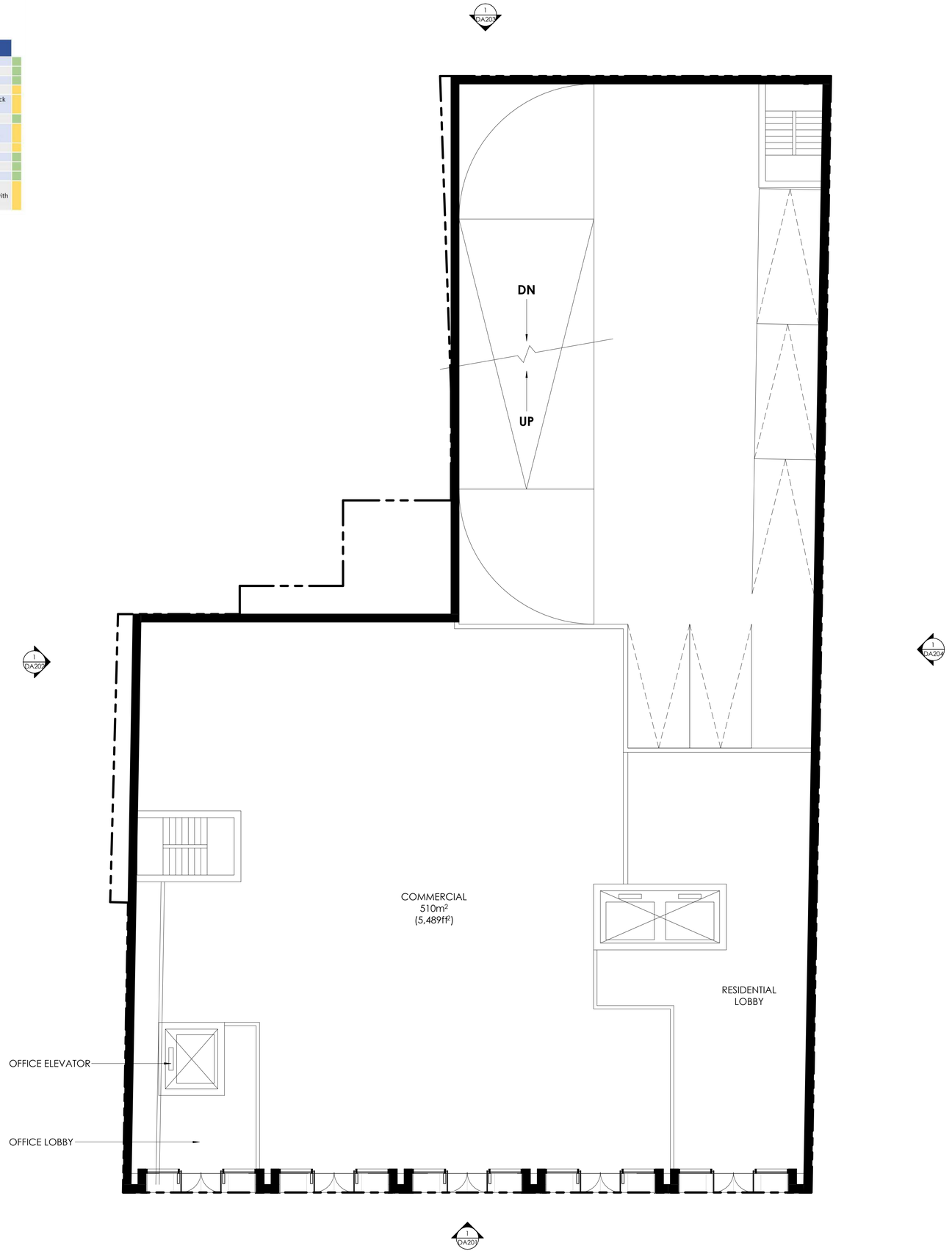

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46 KING ST W

46 KING ST W | BROCKVILLE | ON

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FLOOR PLAN - GROUND LEVEL

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Brockville - 46 King St. West Mixed Use
Zoning By-Law / Compliance Review
2023-02-01 - Preconsultation

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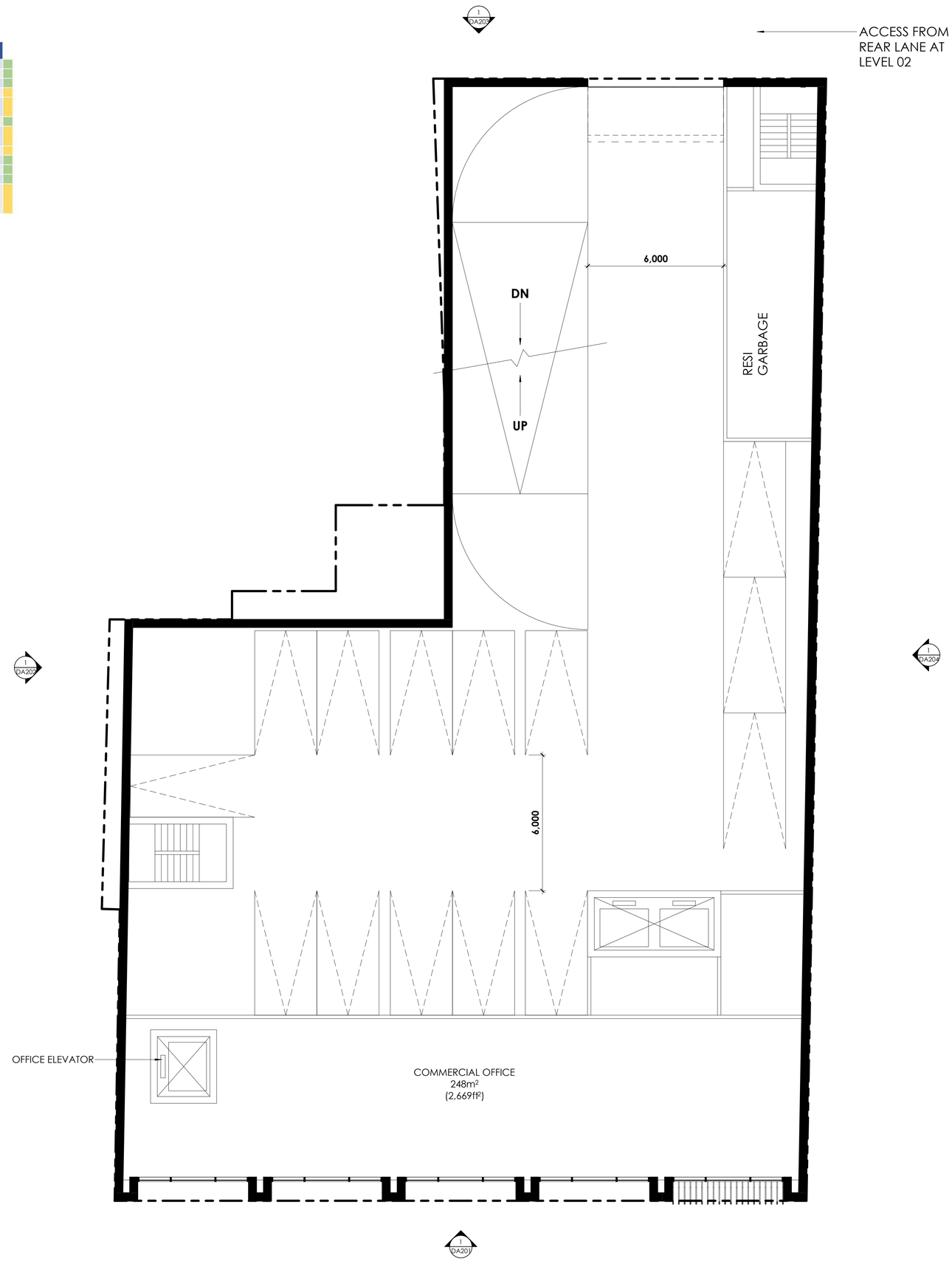

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STUDIO

46 KING ST W

46 KING ST W | BROCKVILLE | ON

DA102

FLOOR PLAN - LEVEL 02

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Brockville - 46 King St. West Mixed Use
Zoning By-Law / Compliance Review
2023-02-01 - Preconsultation

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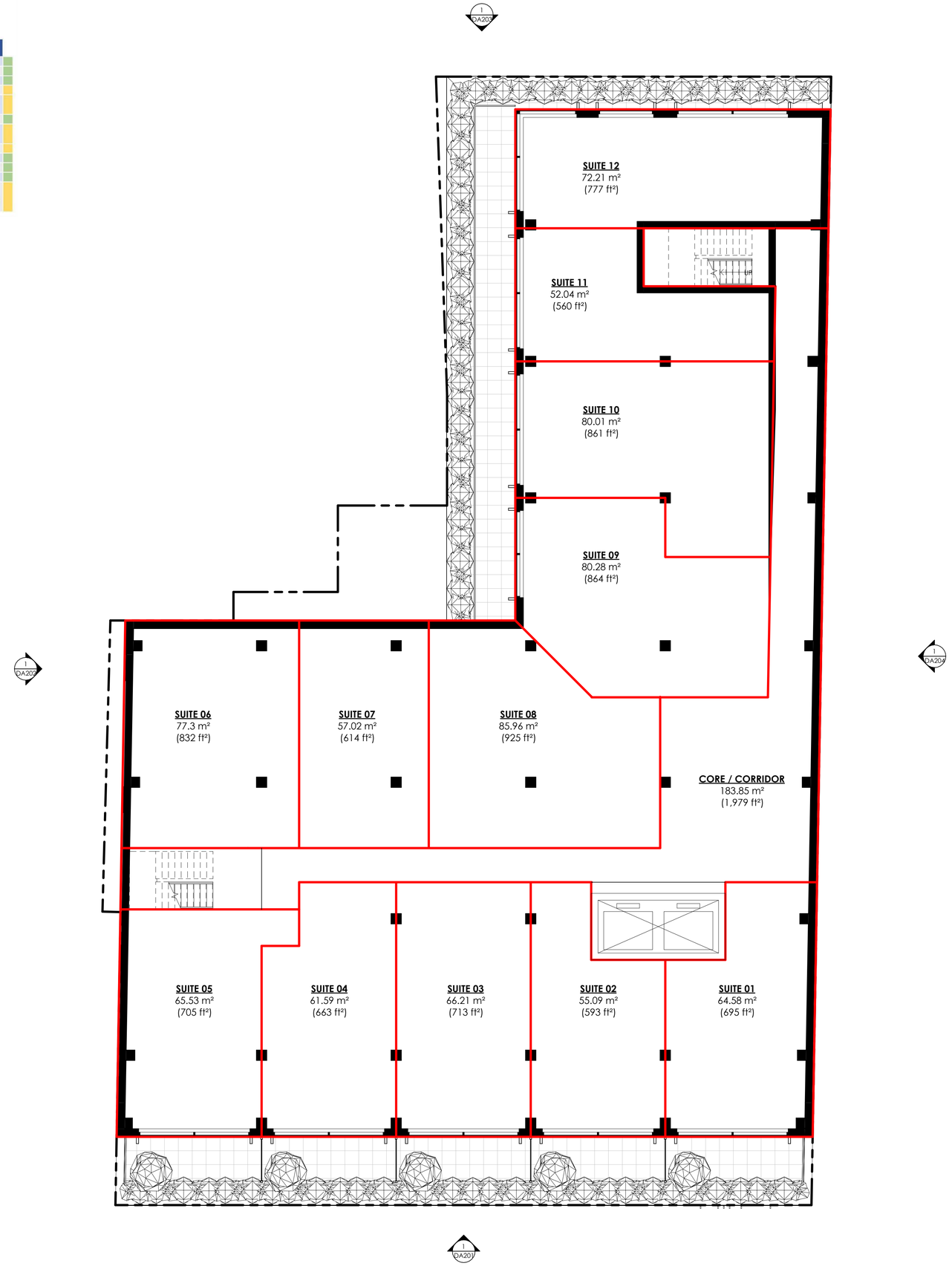

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IDEA
INTEGRATED DESIGN
ENGINEERING + ARCHITECTURE

SUITE AREAS LEVEL 03-06		
NAME	**AREA (m2)**	**AREA (ft2)**
NON-LEASABLE		
CORE / CORRIDOR	183.85 m²	1,979 ft²
	183.85 m²	**1,979 ft²**
RESIDENTIAL		
SUITE 01	64.58 m²	695 ft²
SUITE 02	55.09 m²	593 ft²
SUITE 03	66.21 m²	713 ft²
SUITE 04	61.59 m²	663 ft²
SUITE 05	65.53 m²	705 ft²
SUITE 06	77.30 m²	832 ft²
SUITE 07	57.02 m²	614 ft²
SUITE 08	85.96 m²	925 ft²
SUITE 09	80.28 m²	864 ft²
SUITE 10	80.01 m²	861 ft²
SUITE 11	52.04 m²	560 ft²
SUITE 12	72.21 m²	777 ft²
	817.82 m²	**8,803 ft²**
FLOOR TOTAL	**1,001.67 m²**	**10,782 ft²**

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STUDIO

46 KING ST W

46 KING ST W | BROCKVILLE | ON

DA103

FLOOR PLAN - LEVELS 03

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Brockville - 46 King St. West Mixed Use
Zoning By-Law / Compliance Review
2023-02-01 - Preconsultation

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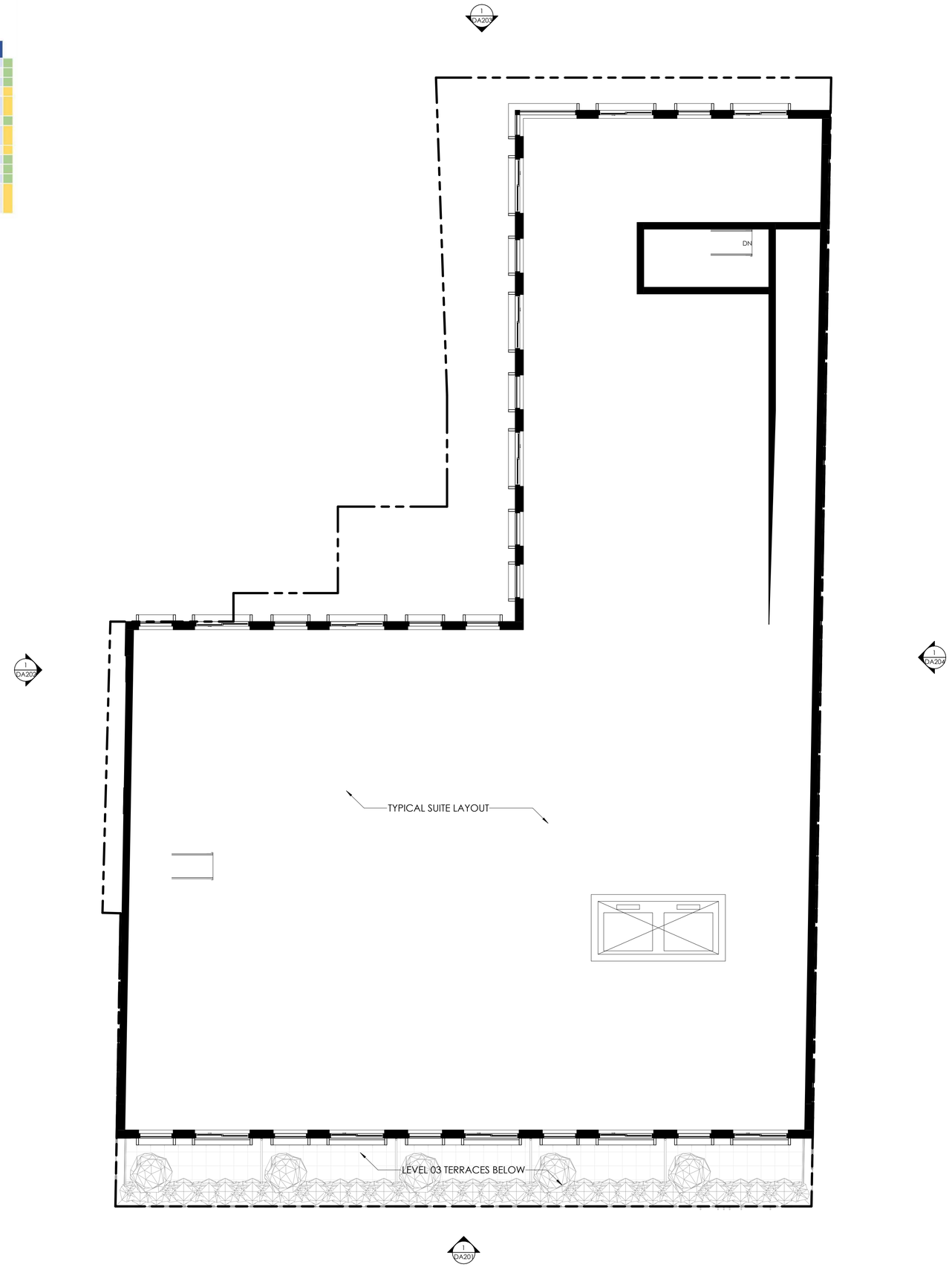

CABER
REAL PROPERTY SOLUTIONS

IDEA
INTEGRATED DESIGN
ENGINEERING + ARCHITECTURE

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STUDIO

46 KING ST W

46 KING ST W | BROCKVILLE | ON

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FLOOR PLAN - LEVELS 04 TO 06

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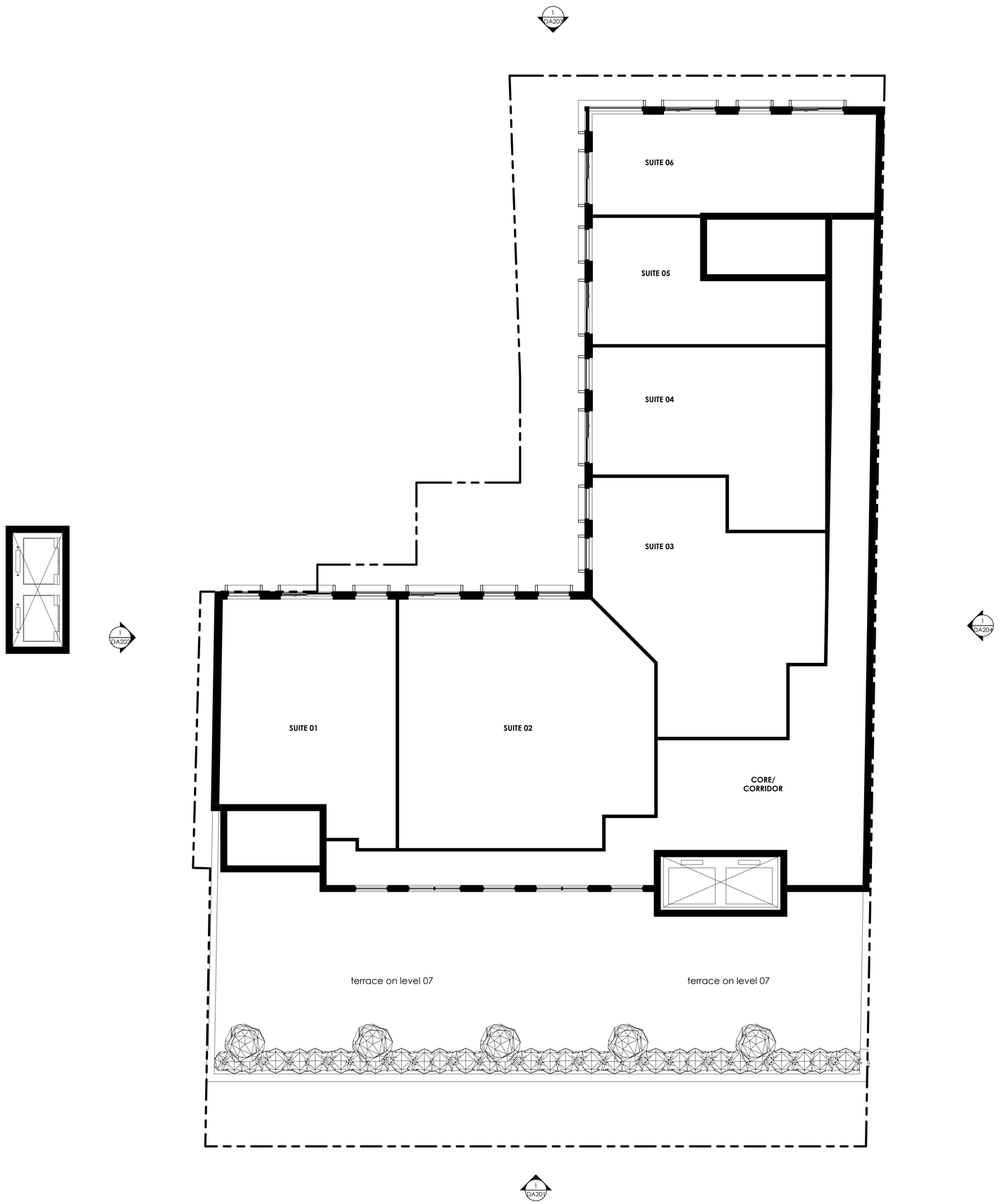

CABER
REAL PROPERTY SOLUTIONS

IDEA
INTEGRATED DESIGN
ENGINEERING + ARCHITECTURE

SUITE AREAS LEVEL 07 TO 08

NAME	AREA (m2)	AREA (ft2)
CORE/ CORRIDOR	196.54 m²	2,116 ft²
SUITE 01	92.59 m²	997 ft²
SUITE 02	135.11 m²	1,454 ft²
SUITE 03	102.19 m²	1,100 ft²
SUITE 04	80.70 m²	869 ft²
SUITE 05	52.09 m²	561 ft²
SUITE 06	71.84 m²	773 ft²
	731.06 m²	**7,869 ft²**
FLOOR TOTAL	**731.06 m²**	**7,869 ft²**

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STUDIO

46 KING ST W

46 KING ST W | BROCKVILLE | ON

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FLOOR PLAN - LEVEL 07 TO 08

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Brockville - 46 King St. West Mixed Use
Zoning By-Law / Compliance Review
2023-02-01 - Preconsultation

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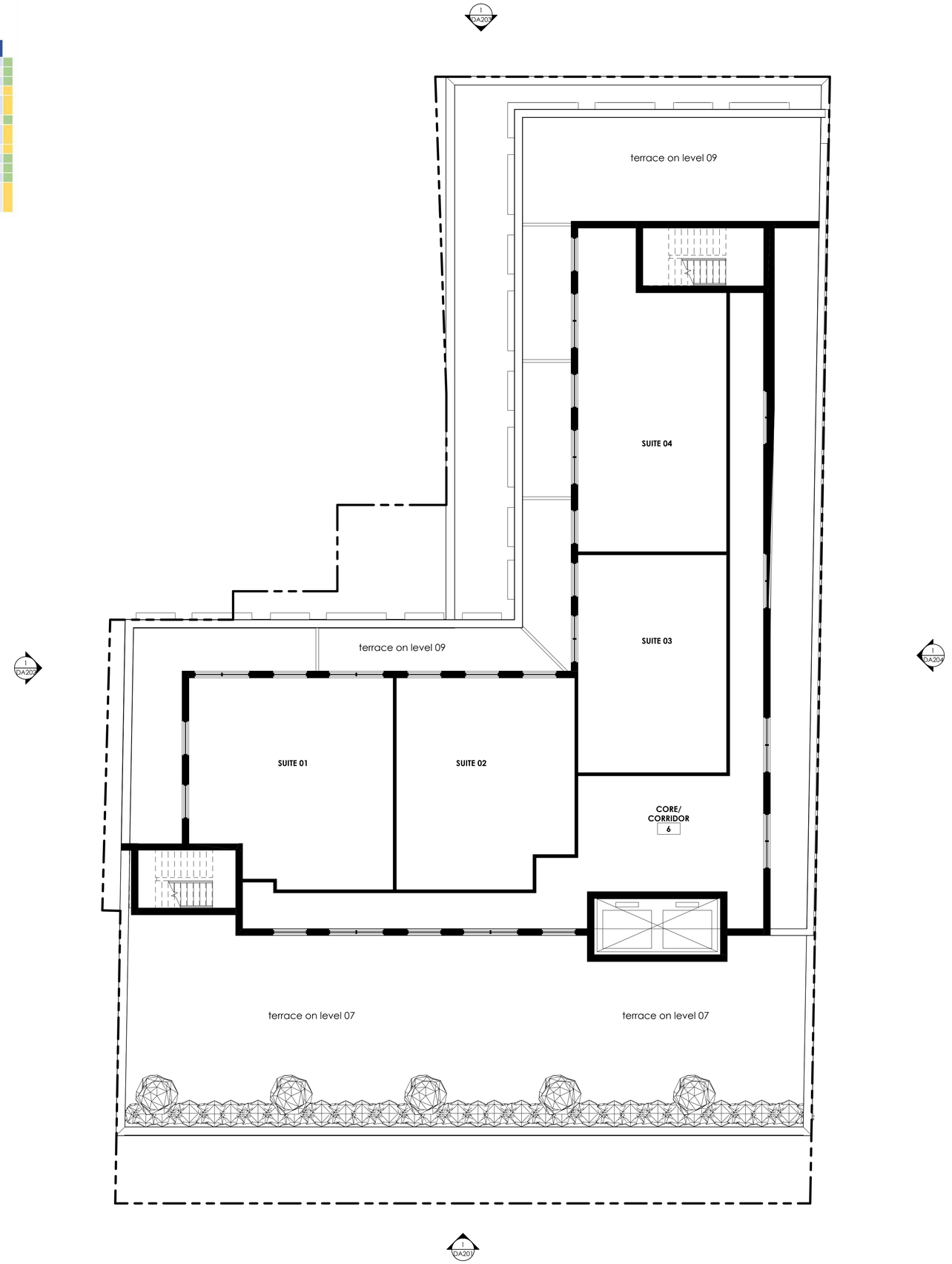

SUITE AREAS LEVEL 09		
NAME	**AREA (m2)**	**AREA (ft2)**
CORE/ CORRIDOR	167.12 m²	1,799 ft²
SUITE 01	86.05 m²	926 ft²
SUITE 02	75.43 m²	812 ft²
SUITE 03	67.22 m²	724 ft²
SUITE 04	90.98 m²	979 ft²
	486.80 m²	**5,240 ft²**
FLOOR TOTAL	**486.80 m²**	**5,240 ft²**

CABER REAL PROPERTY SOLUTIONS

IDEA INTEGRATED DESIGN ENGINEERING + ARCHITECTURE

linebox STUDIO

46 KING ST W

46 KING ST W | BROCKVILLE | ON

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FLOOR PLAN - LEVEL 09

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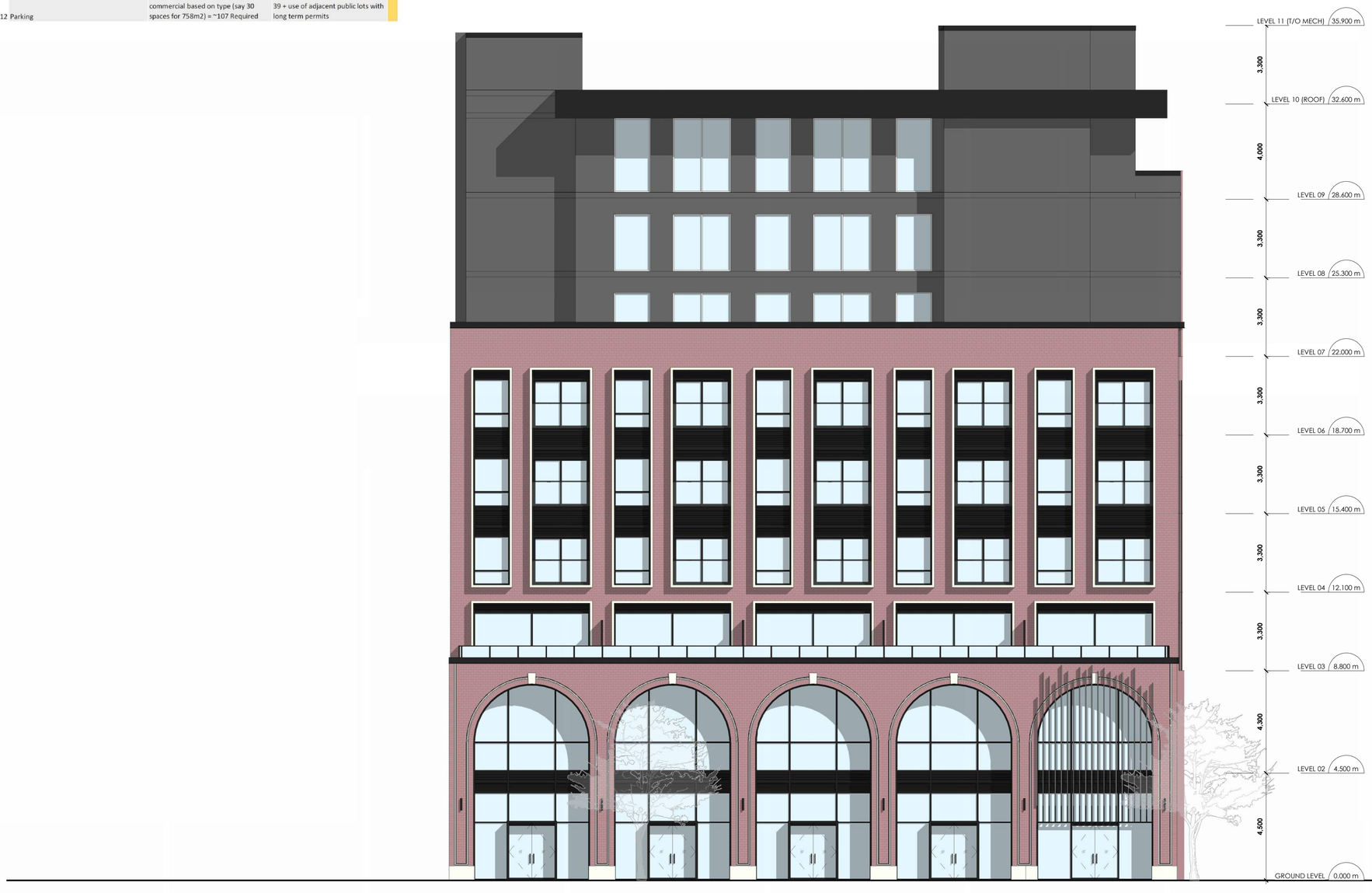
not for construction | do not scale

Brockville - 46 King St. West Mixed Use
Zoning By-Law / Compliance Review
2023-02-01 - Preconsultation

	Provision	Required	Proposed	
1	Type	Mixed-Use Building	Mixed-Use Building	
2	Minimum Frontage	12.0m	No Change. Approximately 32m	
3	Minimum Lot Area	500.0 m2	Approximately 1265m2	
4	Maximum Building Height	21.0m & 6 Storeys	~33.0m & 9 Storeys	
5	Angular Plane Application	Applies - 45 degrees from opposite street	Seek variance for modified setback at level 3 to 9	
6	Front/Exterior/Interior Setbacks	0.0m	0.0m	
7	Rear Yard Setback	Greater of 6.0m or 50% of the building height	No Change. Approximately 0.0m	
8	Maximum Lot Coverage	90%	No Change. Approximately 95%	
9	Minimum Landscaped Open Space	0%	0%	
10	Minimum Ground Floor Height	4.5m	4.5m	
11	Minimum Building Height	7.0m	32.6m	
12	Parking	1 Space per residential unit (77) + commercial based on type (say 30 spaces for 758m2) = ~107 Required	39 + use of adjacent public lots with long term permits	



CABER
REAL PROPERTY SOLUTIONS

IDEA
INTEGRATED DESIGN
ENGINEERING + ARCHITECTURE

linebox
STUDIO

46 KING ST W

46 KING ST W | BROCKVILLE | ON

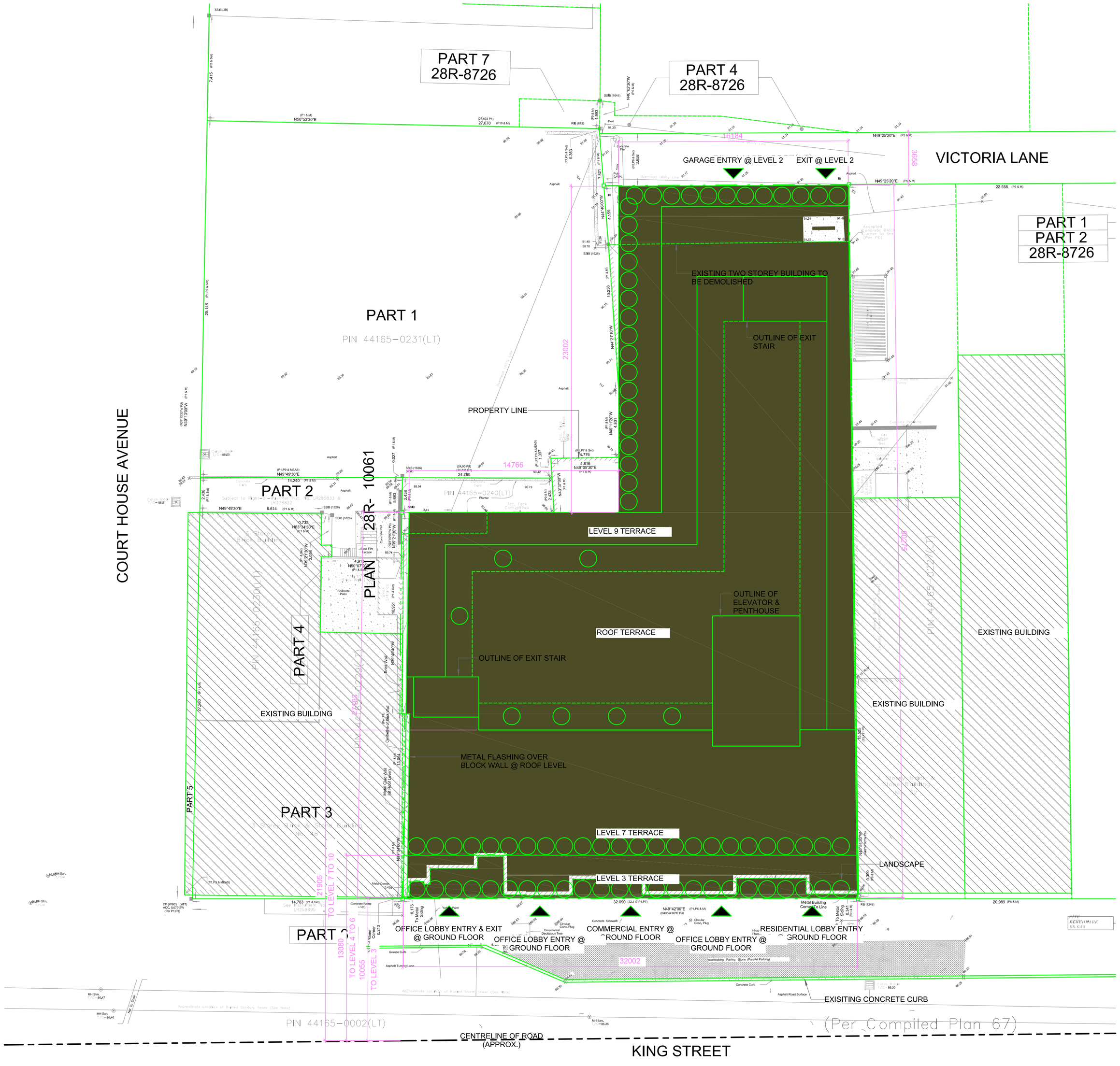
DA201

SOUTH ELEVATION (KING ST W)

scale | échelle **1 : 100**

date | date **2023-04-10 2:33:58 PM**

not for construction | do not scale



A1 / A101 SITE PLAN
1 : 150

SITE DATA:

GROSS FLOOR AREA:

3RD FLOOR	-	1002m²
4TH TO 6TH FLOOR	-	3006m²
7TH TO 8TH FLOOR	-	1462m²
9TH FLOOR	-	467m²
CONDO GROSS FLOOR AREA	-	5937m²
GROUND FLOOR COMM.	-	510m²
2ND FLOOR COMM.	-	248m²
COMM. GROSS FLOOR AREA	-	758m²
GROSS FLOOR AREA	-	6695m²
MAX. BUILDING HEIGHT	-	33.0m

AREA OF SITE:

TOTAL SITE AREA: - ±1265m²

UNIT TYPES - CONDO:
77 DWELLING UNITS TOTAL

UNIT TYPES - COMMERCIAL:
2 COMMERCIAL UNITS TOTAL

PARKING (CONDO):

BASEMENT	-	20
GROUND FLOOR	-	5
2ND FLOOR	-	14
TOTAL PARKING	-	39
(TOTAL HANDICAPPED SPACES		xx

MINUMUM RESIDENTIAL PARKING SPACES: 1 PER RESIDENTIAL UNIT.
MAXIMUM COMBINED RESIDENTIAL AND VISITOR PARKING SPACES: xxx

MINIMUM VISITOR PARKING: xxx
DWELLING UNIT: xxx

BICYCLE PARKING: xx
BICYCLE SPACES: xx

LEGAL DESCRIPTION:

PART 1 Plan of
LOTS 1 & 2 AND PART OF LOT 17
BLOCK 31, COMPILED PLAN 67
CITY OF BROCKVILLE
COUNTY OF LEEDS

ORIGINAL SURVEY PREPARED BY HOPKINS CHITTY LAND SURVEYORS INC.

595 BYRON AVE., OTTAWA, ONT. K2A 4C4
T 613.728.0008 E info@integratedesign.ca

SEAL

NOT FOR CONSTRUCTION

GENERAL NOTES
DO NOT SCALE DRAWINGS.
CONTRACTOR TO VERIFY ALL DIMENSIONS & CONDITIONS AND REPORT ANY DISCREPENCIES.

PROJECT NORTH | TRUE NORTH

No.	DATE	DESCRIPTION

REVISIONS

PROJECT
CABER GROUP
REAL PROPERTY SOLUTIONS

46 King Street West,
Brockville, ON K6V 3P6

IDEA # 21367
CLIENT #

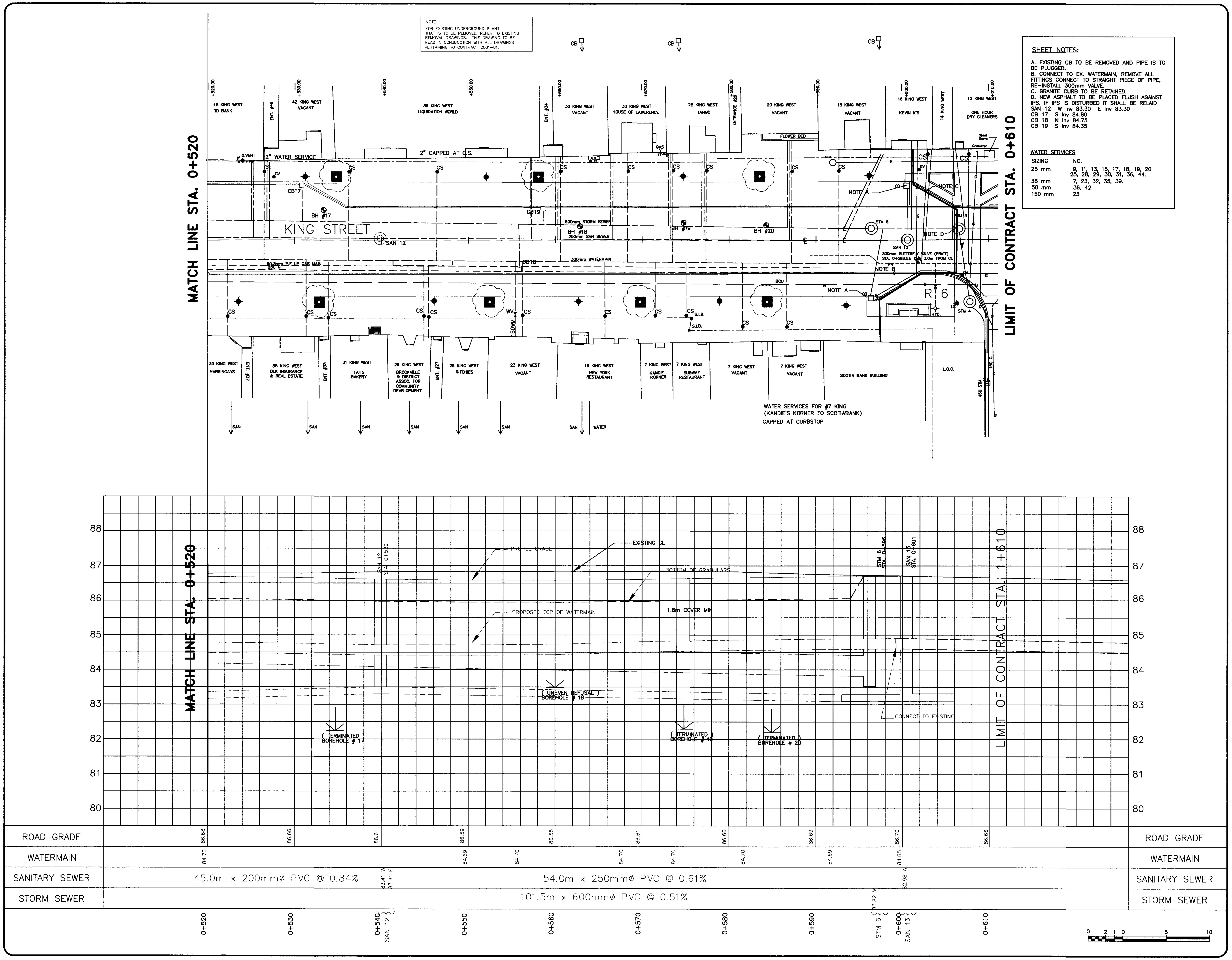
SHEET NAME
SITE PLAN

DATE 2023-09-14
SCALE AS NOTED.
CHCECKED BY CWS
DRAWN BY ND

SHEET No. A101

2023-09-18 8:39:57 AM

A1 (841x594)



SHEET NOTES:

A. EXISTING CB TO BE REMOVED AND PIPE IS TO BE PLUGGED.
B. CONNECT TO EX. WATERMAIN, REMOVE ALL FITTINGS CONNECT TO STRAIGHT PIECE OF PIPE, RE-INSTALL 300mm VALVE.
C. GRANITE CURB TO BE RETAINED.
D. NEW ASPHALT TO BE PLACED FLUSH AGAINST IPS, IF IPS IS DISTURBED IT SHALL BE RELAID

SAN 12 W Inv 83.30 E Inv 83.30
CB 17 S Inv 84.80
CB 18 N Inv 84.75
CB 19 S Inv 84.35

WATER SERVICES

SIZING	NO.
25 mm	9, 11, 13, 15, 17, 18, 19, 20, 25, 28, 29, 30, 31, 36, 44.
38 mm	7, 23, 32, 35, 39.
50 mm	36, 42
150 mm	23

GENERAL NOTES:

1. CONTRACTOR TO EXPOSE AND/OR LOCATE TIE IN POINTS OF SERVICE AND MAINS IN ADVANCE OF CONNECTIONS TO ENSURE ALL TEES, MAINS, LATERALS, CURB STOPS AND SERVICES ARE ADJUSTED TO SUIT HORIZONTAL AND VERTICAL POSITION OF THE CONNECTION.
2. PLUG OPEN ENDS OF EXISTING WATERMAIN PIPE WHEN NOT REMOVED, WITH 30MPa, 300mm THICK CONCRETE AND WRAP WITH 6 MIL. POLYETHYLENE.
3. LONG RADIUS SWEEPS TO BE USED FOR ALL SANITARY AND STORM SERVICE BENDS.
4. MAIN TORONTO TO MONTREAL BELL LINE IS LOCATED WITHIN THE CONTRACT LIMITS, INCLUDING FIBREOPTIC STRUCTURES AND CONCRETE DUCT STRUCTURES.
5. ALL EXISTING HOUSE SERVICES NOT NECESSARILY SHOWN. SERVICE LOCATIONS ARE APPROXIMATE ONLY AND ARE NOT NECESSARILY IN A COMMON TRENCH.
7. CONTRACTOR TO VERIFY THE TYPE OF PLANT, LOCATION, CONFIGURATION AND ENCASEMENT DETAILS WITH UTILITY COMPANIES PRIOR TO CONSTRUCTION.
8. ALL REMOVALS ARE NOT NECESSARILY SHOWN. WHERE PROPOSED CONSTRUCTION NECESSITATES A REMOVAL THE COST OF SUCH REMOVAL IS TO BE COVERED UNDER THE PRICE FOR INSTALLATION OF THAT PARTICULAR CONSTRUCTION COMPONENT.
9. REMOVE SIDEWALK TO FRONT FACE OF BUILDING, OR AS DIRECTED BY THE ENGINEER.
10. FILL EXISTING SEWERS LEFT IN PLACE WITH FLOWABLE CONCRETE IN LIEU OF REMOVAL.
11. ALL UTILITIES SHOWN AS ABANDONED ARE TO BE VERIFIED BY CONTRACTOR AS PART OF HIS LOCATE RESPONSIBILITY. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE PROPER CARE WHEN WORKING AROUND ABANDONED UTILITIES.
12. ALL HYDRANTS ARE TO HAVE A 1.2m CLEAR ACCESS RADIUS.
13. BUILDING SERVICES MAY BE ADDED OR SUBTRACTED AT THE DISCRETION OF THE ENGINEER

REV. No.	DATE	DESCRIPTION	BY	APPROVED
1	07/28/03	AS BUILT UPDATES	CJ	SEA

AS-BUILTS DATE: BY:

LICENSED PROFESSIONAL ENGINEER J. C. JOHNSTON PROVINCE OF ONTARIO

KOSTUCH ENGINEERING
9 Broad Street, Suite 306, Brockville, Ontario K6V 6Z4
Telephone: (613) 342-1223 - Fax: (613) 342-5526
MEMBER OF GENIVAR CONSULTING GROUP LTD.

CITY OF BROCKVILLE

PROJECT TITLE: KING STREET WEST PHASE 5

SHEET TITLE: NEW CONSTRUCTION PLAN AND PROFILE STA. 0+520 - 0+610

LOCATION:

SURVEYED BY:	CAJ, SEA, HJP	DESIGNER:	SEA
DRAWN BY:	CAJ	CHECKED BY:	SEA
CHECKED BY:	SEA	APPROVED BY:	JCJ
DATE:	2003-01-21	SCALE:	HOR. 1:200 VERT. 1:50
PROJECT No.	000149	DRAWING No.	C4 OF 4
CONTRACT No.	2003-01		

10 NEW CONSTRUCTION 4.DWG

Appendix B

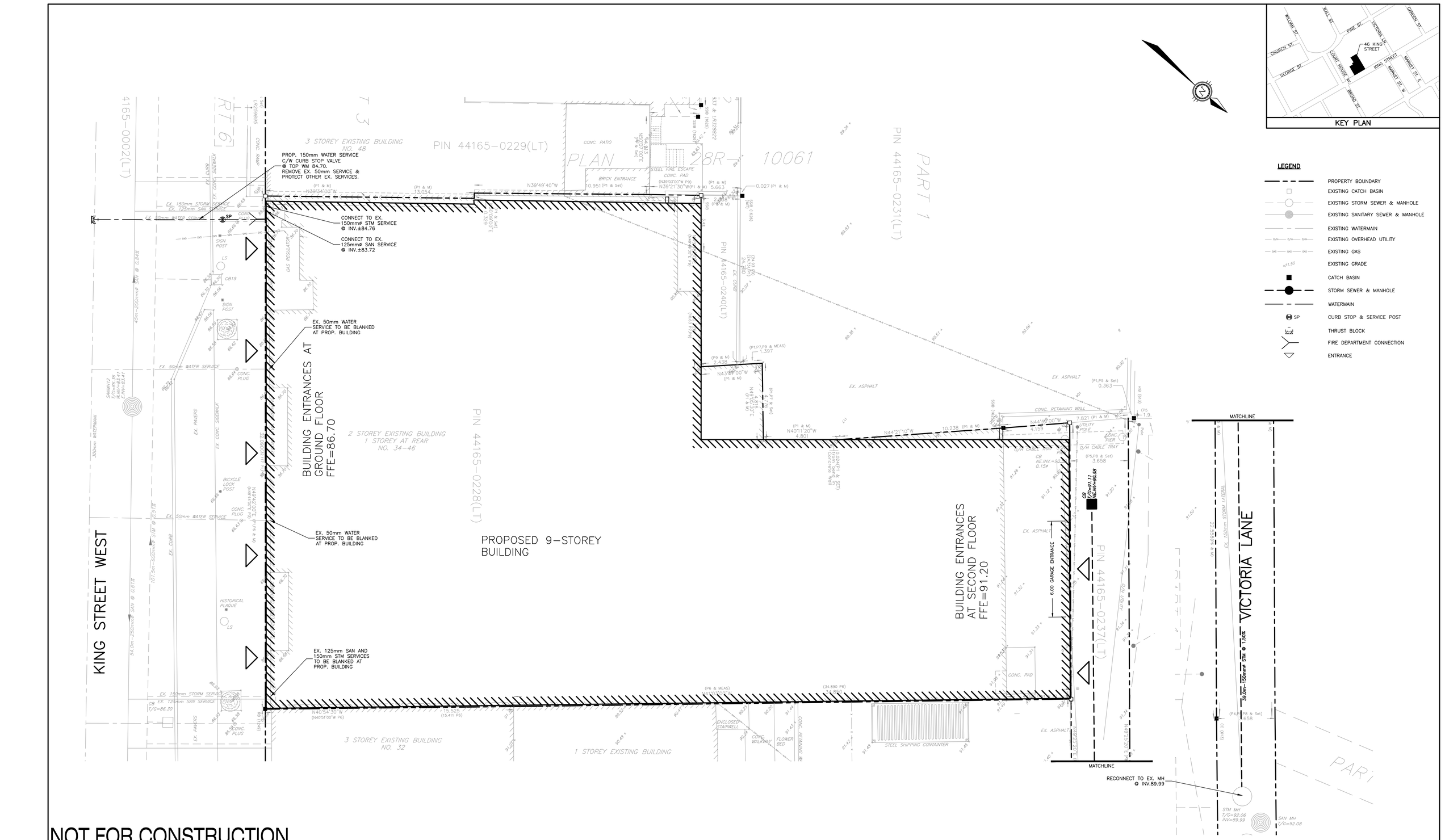
Servicing Plan
(DWG. 23062-S1)

Grading Plan
(DWG. 23062-GR1)

Erosion and Sediment Control Plan
(DWG. 23062-ESC1)

Existing Conditions and Removals Plan
(DWG. 23062-R1)

Notes and Details Plan
(DWG. 23062-N1)



NOT FOR CONSTRUCTION

NOTES

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PROPERTY BOUNDARIES ARE DERIVED FROM PLAN OF SURVEY LOTS 1 & 2 AND PART OF LOT 17, BLOCK 31, COMPILED PLAN 67, CITY OF BROCKVILLE, BY HOPKINS CHITTY LAND SURVEYORS INC. SEALED AUGUST 31, 2023. ELEVATIONS ARE REFERRED TO A SITE BENCHMARK AT THE TOP OF A CONCRETE PIN (WBC) ALONG THE SOUTHEASTERLY LIMIT OF LOT 5, BLOCK 31 WITH ELEVATION 86.645m (CGVD28)

NO.	REVISION DESCRIPTION	DATE	BY
1	ISSUED FOR SPA	06/10/23	CC

SCALE
0 1m 2m 4m
HORIZONTAL 1:100

Robinson Land Development
350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 rcii.com

DESIGN	SM
CHECKED	CC
DRAWN	LR
CHECKED	SM
APPROVED	CC

CABER DEVELOPMENTS

46 KING STREET WEST
CITY OF BROCKVILLE

SERVICING PLAN

PROJECT No.	23062
SURVEY	HCLS
DATED	OCT 2023
DWG. No:	S1


KEY PLAN
46 KING STREET
LEGEND
PROPERTY BOUNDARY
EXISTING CATCH BASIN
EXISTING STORM SEWER & MANHOLE
EXISTING SANITARY SEWER & MANHOLE
EXISTING WATERMAIN
EXISTING OVERHEAD UTILITY
EXISTING GAS
EXISTING GRADE
PROPOSED GRADE ELEVATION
PROPOSED SLOPE
CATCH BASIN
ENTRANCE
REINSTATEMENT
KING STREET WEST
VICTORIA LANE
PROPOSED 9-STOREY BUILDING
BUILDING ENTRANCES AT GROUND FLOOR FFE=86.70
BUILDING ENTRANCES AT SECOND FLOOR FFE=91.20
3 STOREY EXISTING BUILDING NO. 48
2 STOREY EXISTING BUILDING 1 STOREY AT REAR NO. 34-46
3 STOREY EXISTING BUILDING NO. 32
1 STOREY EXISTING BUILDING
PIN 44165-0229(LT)
PIN 44165-0228(LT)
PIN 44165-0240(LT)
PIN 44165-0231(LT)
PIN 44165-0237(LT)
PLAN 28R-10061
PART 1
REINSTATE ASPHALT ROADWAY, CONCRETE CURB AND SIDEWALK TO EX. GRADES AFTER WATERMAIN TRENCHING WORK. SEE DWG S1.
EXTEND CONCRETE TOE WALL
MATCH INTO EX. GRADE TYP. AROUND BUILDING U.N.O.
MATCH INTO EX. GRADE (TYP. AROUND BUILDING U.N.O.)
REINSTATE STORM TRENCHWORK (SEE DWG S1). REGRADE LANEWAY GRANULARS TO PROP. CB AND REPAVE
REINSTATE ASPHALT LANEWAY TO EX. GRADES AFTER STORM TRENCHING WORK. SEE DWG S1.
6.00 GARAGE ENTRANCE
MATCHLINE
STEEL SHIPPING CONTAINER
STM MH T/G=92.06 INV=89.99
SAN MH T/G=92.08

NOT FOR CONSTRUCTION

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NO.	REVISION DESCRIPTION	DATE	BY
1	ISSUED FOR SPA	06/10/23	CC

SCALE: HORIZONTAL 1:100

Robinson Land Development
350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 rcii.com

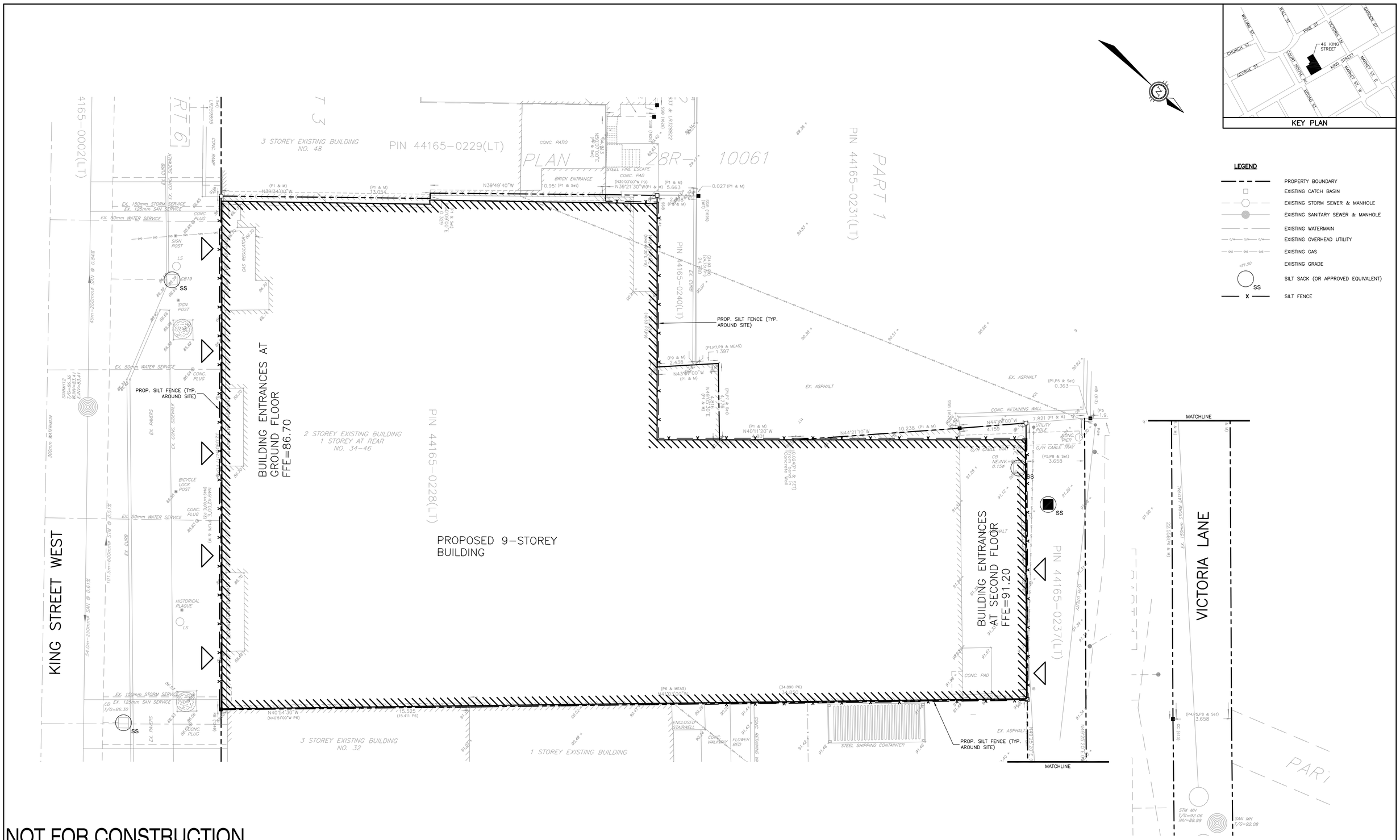
DESIGN	SM
CHECKED	CC
DRAWN	LR
CHECKED	SM
APPROVED	CC

CABER DEVELOPMENTS

46 KING STREET WEST
CITY OF BROCKVILLE

GRADING PLAN

PROJECT No.	23062
SURVEY	HCLS
DATED	OCT 2023
DWG. No:	GR1



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SCALE
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HORIZONTAL 1:100

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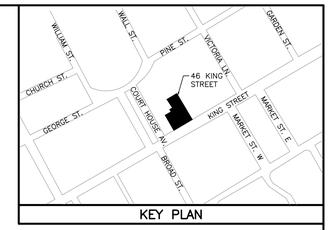
DRAWN	LR
CHECKED	SM
APPROVED	CC

CABER DEVELOPMENTS

46 KING STREET WEST
CITY OF BROCKVILLE

EROSION AND SEDIMENT CONTROL PLAN

PROJECT No.	23062
SURVEY	HCLS
DATED	OCT 2023
DWG. No:	ESC1



KEY PLAN

LEGEND

- PROPERTY BOUNDARY
- EXISTING CATCH BASIN
- EXISTING STORM SEWER & MANHOLE
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING WATERMAIN
- EXISTING OVERHEAD UTILITY
- EXISTING GAS
- EXISTING GRADE
- ASPHALT & SUBGRADE REMOVALS
- ASPHALT REMOVALS

KING STREET WEST

VICTORIA LANE

PIN 44165-0002(LT)

PIN 44165-0228(LT)

PIN 44165-0240(LT)

PIN 44165-0231(LT)

PART 1

PLAN 28R-10061

3 STOREY EXISTING BUILDING NO. 48

2 STOREY EXISTING BUILDING 1 STOREY AT REAR NO. 34-46

3 STOREY EXISTING BUILDING NO. 32

1 STOREY EXISTING BUILDING

APPROX. EXTENT OF ROAD/SIDEWALK & GRANULAR REMOVAL FOR WATER SERVICE WORK. EX. 50mm SERVICE TO BE REMOVED AND DISPOSED. PROTECT OTHER EX. SERVICES. SEE DWG S1.

EX. 150mm STORM SERVICE

EX. 150mm SAN SERVICE

EX. 50mm WATER SERVICE

EX. O/H CABLE TO #48 KING ST. W. BE REROUTED DUE TO CONFLICT WITH PROP. BUILDING

SIDEWALK & GRANULAR/SOILS REMOVAL FOR PROP. BUILDING

EXISTING BUILDING TO BE DEMOLISHED AND REMOVED

EX. HISTORICAL PLAQUE TO BE PROTECTED

O/H CABLE TRAY & CONCRETE PIER TO BE REMOVED

CB TO BE REMOVED & LEAD TO BE ABANDONED

EX. O/H CABLE TO BE PROTECTED/REROUTED DUE TO POSSIBLE CONFLICT WITH PROP. BUILDING

ASPHALT & GRANULAR/SOILS REMOVAL FOR PROP. BUILDING

ASPHALT REMOVAL FOR REGRADING. SEE DWG GR1

APPROX. EXTENT OF ASPHALT/GRANULAR REMOVAL FOR STM RELOCATION. SEE DWG S1. REMOVE AND DISPOSE EX. 150mm AS REQUIRED.

MATCHLINE

NOT FOR CONSTRUCTION

NOTES

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SCALE

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CHECKED	SM
APPROVED	CC

CABER DEVELOPMENTS

46 KING STREET WEST
CITY OF BROCKVILLE

EXISTING CONDITIONS AND REMOVALS PLAN

PROJECT No.	23062
SURVEY	HCLS
DATED	OCT 2023
DWG. No:	R1

GENERAL NOTES:

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS)
2. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS AND ELEVATIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
4. DESIGN ELEVATIONS GIVEN ARE TO BE ADHERED TO WITH NO CHANGES WITHOUT PRIOR WRITTEN APPROVAL BY ROBINSON LAND DEVELOPMENT.
5. ANY AREAS BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
6. RELOCATION OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER AT THE EXPENSE OF THE CONTRACTOR.
7. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS". THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONSTRUCTOR AS DEFINED IN THE ACT.
8. ALL CONSTRUCTION SIGNAGE MUST CONFORM TO THE M.T.O. MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (LATEST AMENDMENT).
9. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
10. THE SUPPORT OF ALL UTILITIES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
11. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH, AS SPECIFIED BY OPSD, IS EXCEEDED.
12. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR.
13. THE CONTRACTOR IS RESPONSIBLE FOR AND SHALL PROVIDE FOR DEWATERING, SUPPORT AND PROTECTION OF EXCAVATIONS AND TRENCHING AS WELL AS RELEASE OF ANY PUMPED GROUNDWATER IN A CONTROLLED AND APPROVED MANNER.
14. THE CONTRACTOR SHALL BE RESPONSIBLE TO MANAGE EXCESS SOIL IN ACCORDANCE WITH ONTARIO REGULATION 406/19.
15. DO NOT CONSTRUCT USING DRAWINGS THAT ARE NOT MARKED "ISSUED FOR CONSTRUCTION".
16. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.

STORM SEWERS:

1. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2 (LATEST AMENDMENT). ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.1 (LATEST AMENDMENT). PIPE SHALL BE JOINTED WITH STD. RUBBER GASKETS AS PER CSA A257.3 (LATEST AMENDMENT).
2. ALL STORM SEWER TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH OPSD 802.030 UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
3. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
4. STORM MANHOLE FRAME AND COVERS SHALL BE AS PER OPSD 401.010. CB FRAME AND COVER PER OPSD 400.020
5. STORM SEWER MANHOLES SERVING SEWERS LESS THAN 900mm SHALL BE CONSTRUCTED WITH A 300mm SUMP. FOR STORM SEWERS 900mm AND OVER USE BENCHING IN ACCORDANCE WITH OPSD 701.021. CB SUMPS SHALL BE 600mm.
6. THE STORM SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED ABOVE. WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ADDITIONAL BEDDING, A DIFFERENT TYPE OF BEDDING OR A HIGHER PIPE STRENGTH AT HIS OWN EXPENSE AND SHALL ALSO BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
7. ALL STORM MANHOLES SHALL BE 1200mm DIAMETER AS PER OPSD 701.010 UNLESS OTHERWISE NOTED.
8. ALL CATCH BASINS SHALL BE 600mm X 600mm AS PER OPSD 705.010 UNLESS OTHERWISE NOTED.
9. SEWERS WITH LESS THAN 1.8m COVER SHALL BE INSULATED PER OPSD 1109.030

ROADWORK SPECIFICATIONS:

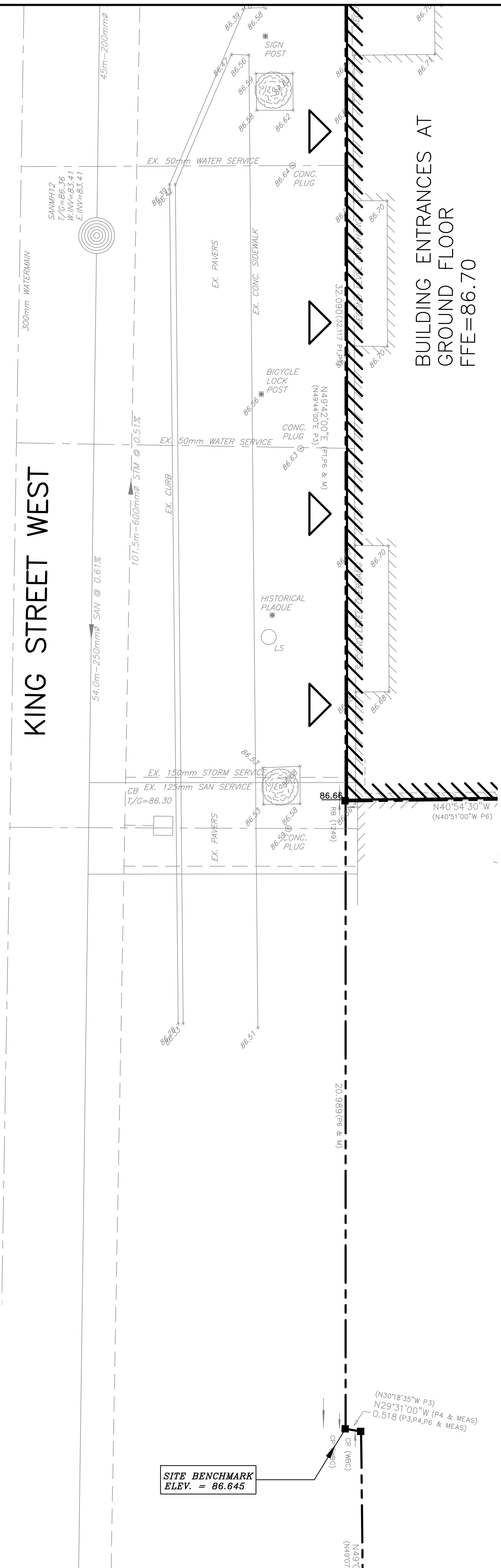
1. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS TO PROPOSED GRADES WHERE NOTED, AND EXISTING GRADES OTHERWISE.
2. TOE WALL SHALL BE IN ACCORDANCE WITH OPSD 3120.100
3. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH OPSD 509.010, OPSS 310.
4. GRANULAR "A" SHALL BE PLACED TO A MINIMUM THICKNESS OF 300mm AROUND ALL STRUCTURES WITHIN PAVEMENT AREA.
5. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS & NECESSARY REPAIRS HAVE BEEN CARRIED OUT TO THE SATISFACTION OF THE ENGINEER.
6. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 300mm LIFTS.
7. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW-CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW ASPHALT.
8. PAVEMENT DESIGN AS PER GEOTECHNICAL RECOMMENDATIONS.

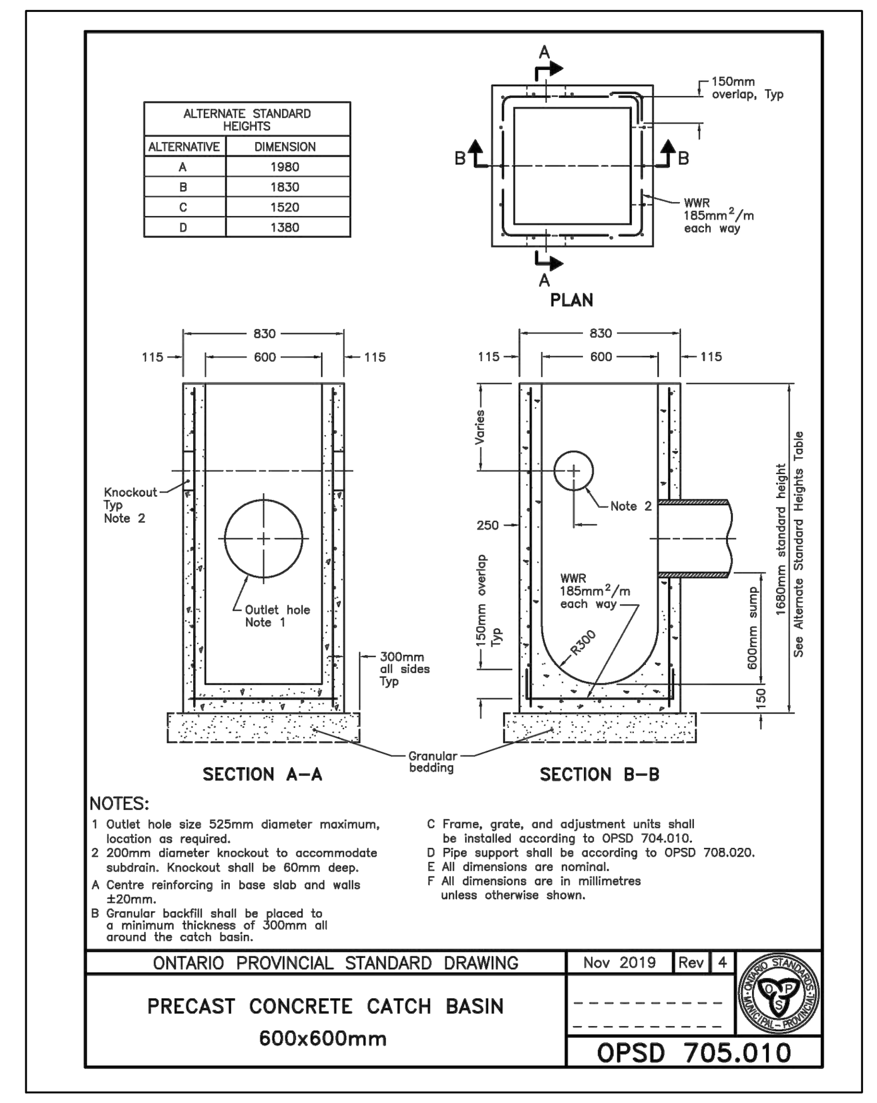
WATER SUPPLY:

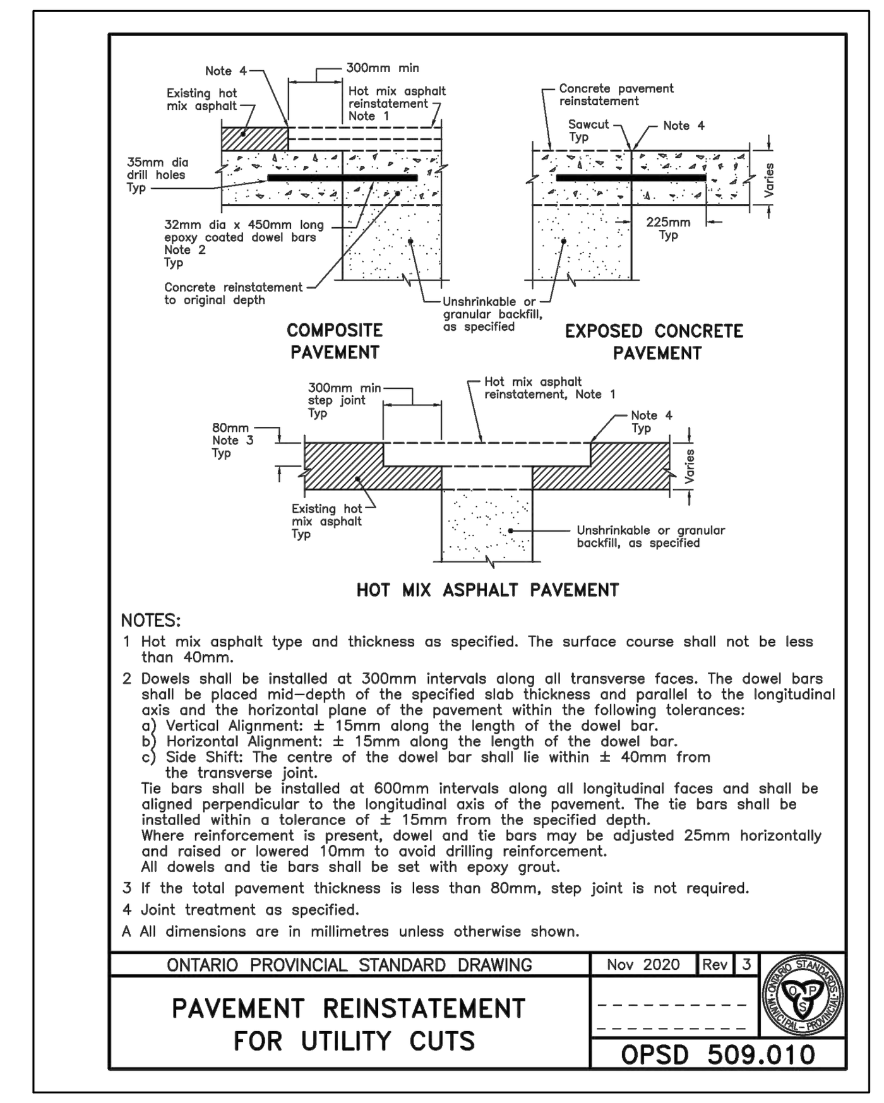
1. ALL PVC WATERMAINS SHALL BE EQUAL TO AWWA C-900 CLASS 150, SDR 18, OR APPROVED EQUAL.
2. WATERMAIN SERVICE INSTALLATION SHALL BE ACCORDING TO OPSD 1105.010, UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
3. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS AS PER OPSD 1109.011
4. THRUST BLOCKING OF WATERMAIN TO BE INSTALLED AS PER OPSD 1103.010.
5. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS AND BLOW-OFFS AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
6. WATERMAINS WITH LESS THAN 1.8m COVER SHALL BE INSULATED PER OPSD 1109.030
7. THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER / UTILITY IS 0.25m FOR WATERMAIN CROSSING OVER AND 0.50m FOR CROSSING UNDER. FOR CROSSING UNDER SEWER, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWERS IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING SO THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.CONNECTION TO EXISTING WATERMAIN TO BE PERFORMED BY CITY FORCES. CONTRACTOR TO PROVIDE LABOUR, EQUIPMENT AND MATERIAL REQUIRED FOR EXCAVATION, BEDDING AND REINSTATEMENT.
8. SWABBING, DISINFECTION, AND HYDROSTATIC TESTING TO BE CONDUCTED AS PER CITY OF BROCKVILLE STANDARDS IN THE PRESENCE OF A CITY INSPECTOR AND/OR CONSULTANT.

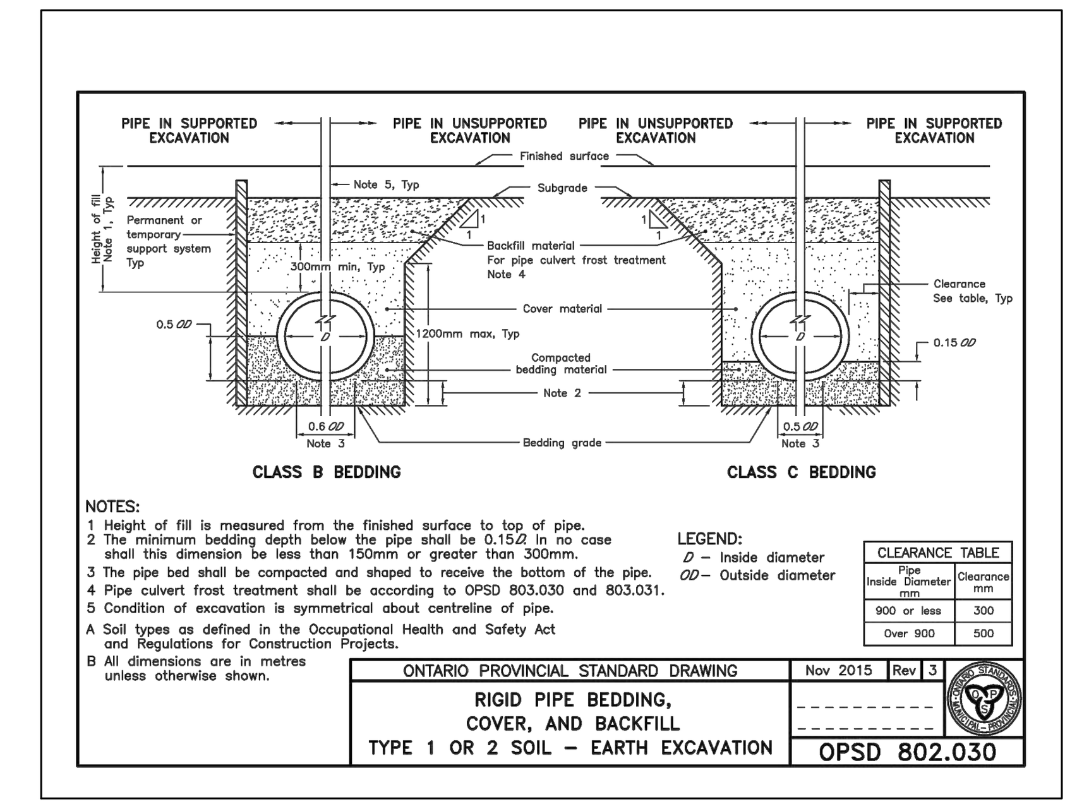
EROSION & SEDIMENT CONTROL NOTES:

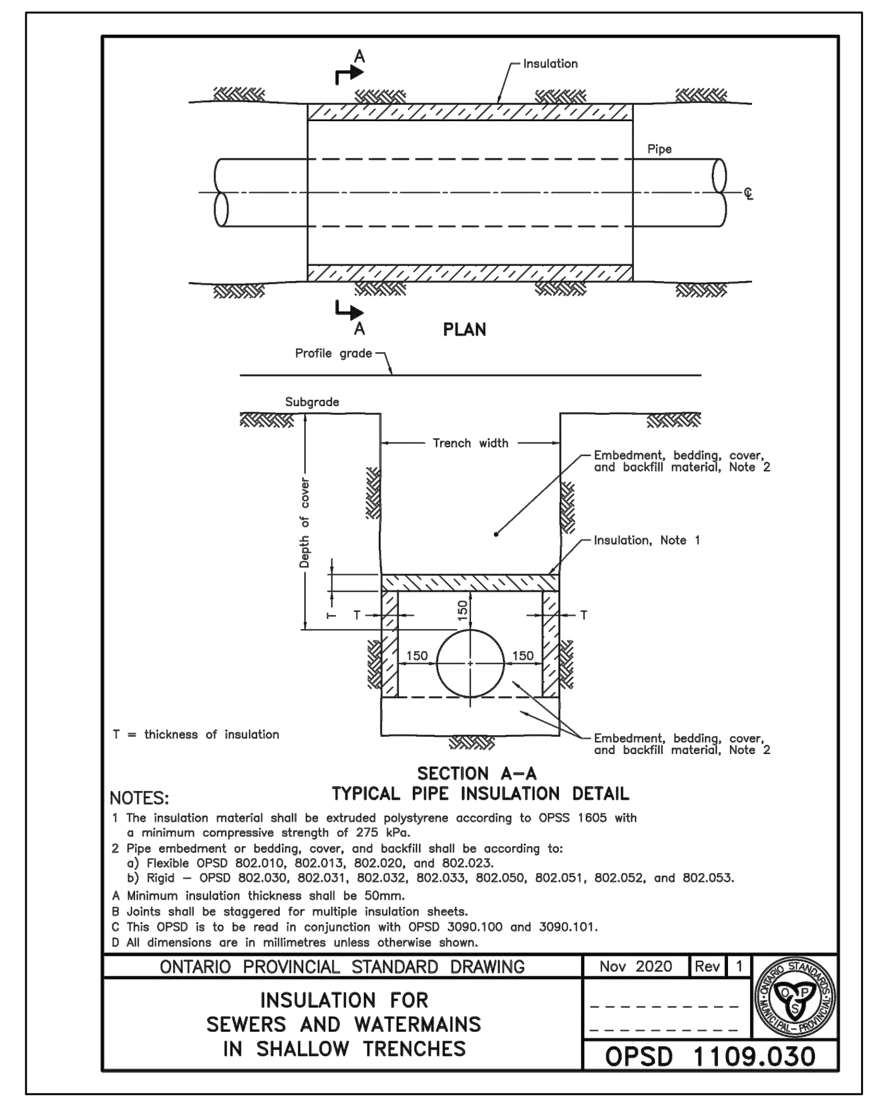
1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE ULTIMATE RECEIVING WATERCOURSE DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
2. LIMIT THE EXTENT OF EXPOSED SOILS AT ANY GIVEN TIME.
3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL VEGETATION HAS BEEN RE-ESTABLISHED IN ALL DISTURBED AREAS. RE-VEGETATE DISTURBED AREAS AS SOON AS POSSIBLE.
4. STOCKPILE SOIL AWAY (15 METRES OR GREATER) FROM WATERCOURSES, DRAINAGE FEATURES AND TOP OF STEEP SLOPES.
5. SILT SACKS ARE TO BE PLACED UNDERNEATH THE FRAME AND COVER OF ALL PROPOSED AND EXISTING CATCH BASIN AND OPEN COVER STORM MANHOLES UNTIL CONSTRUCTION IS COMPLETED.
6. A SILT FENCE BARRIER SHALL BE INSTALLED AS PER OPSD 219.110 WHERE INDICATED AND MAINTAINED AS REQUIRED.
7. INSTALL MUD MATS AT ALL CONSTRUCTION ENTRANCES.
8. DURING ACTIVE CONSTRUCTION PERIODS, VISUAL INSPECTIONS SHALL BE UNDERTAKEN ON A WEEKLY BASIS AND AFTER MAJOR STORM EVENTS (>25mm RAIN IN 24 HOUR PERIOD) ON SEDIMENT CONTROL BARRIERS AND ANY DAMAGE REPAIRED IMMEDIATELY.
9. EROSION AND SEDIMENT CONTROL BARRIERS SHALL ALSO BE ASSESSED (AND REPAIRED AS REQUIRED) FOLLOWING SIGNIFICANT SNOWMELT EVENTS.
10. VISUAL INSPECTIONS SHALL ALSO BE UNDERTAKEN IN ANTICIPATION OF LARGE STORM EVENTS (OR A SERIES OF RAINFALL AND/OR SNOWMELT DAYS) THAT COULD POTENTIALLY YIELD SIGNIFICANT RUNOFF VOLUMES.
11. CARE SHALL BE TAKEN TO PREVENT DAMAGE TO EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION OPERATIONS.
12. IN SOME CASES, BARRIERS MAY BE REMOVED TEMPORARILY TO ACCOMMODATE THE CONSTRUCTION OPERATIONS. THE AFFECTED BARRIERS SHALL BE REINSTATED IMMEDIATELY AFTER CONSTRUCTION OPERATIONS ARE COMPLETED.
13. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE ADJUSTED AS REQUIRED AS THE SITE BECOMES DEVELOPED.
14. SEDIMENT CONTROL DEVICES SHALL BE CLEANED OF ACCUMULATED SEDIMENTATION AS REQUIRED AND REPLACED AS NECESSARY.
15. DURING THE COURSE OF CONSTRUCTION, IF THE ENGINEER BELIEVES THAT ADDITIONAL PREVENTION METHODS ARE REQUIRED TO CONTROL EROSION AND SEDIMENTATION, THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL MEASURES, AS REQUIRED, TO THE SATISFACTION OF THE ENGINEER.
16. CONSTRUCTION AND MAINTENANCE REQUIREMENTS FOR EROSION AND SEDIMENT CONTROLS ARE TO COMPLY WITH OPSS 805.

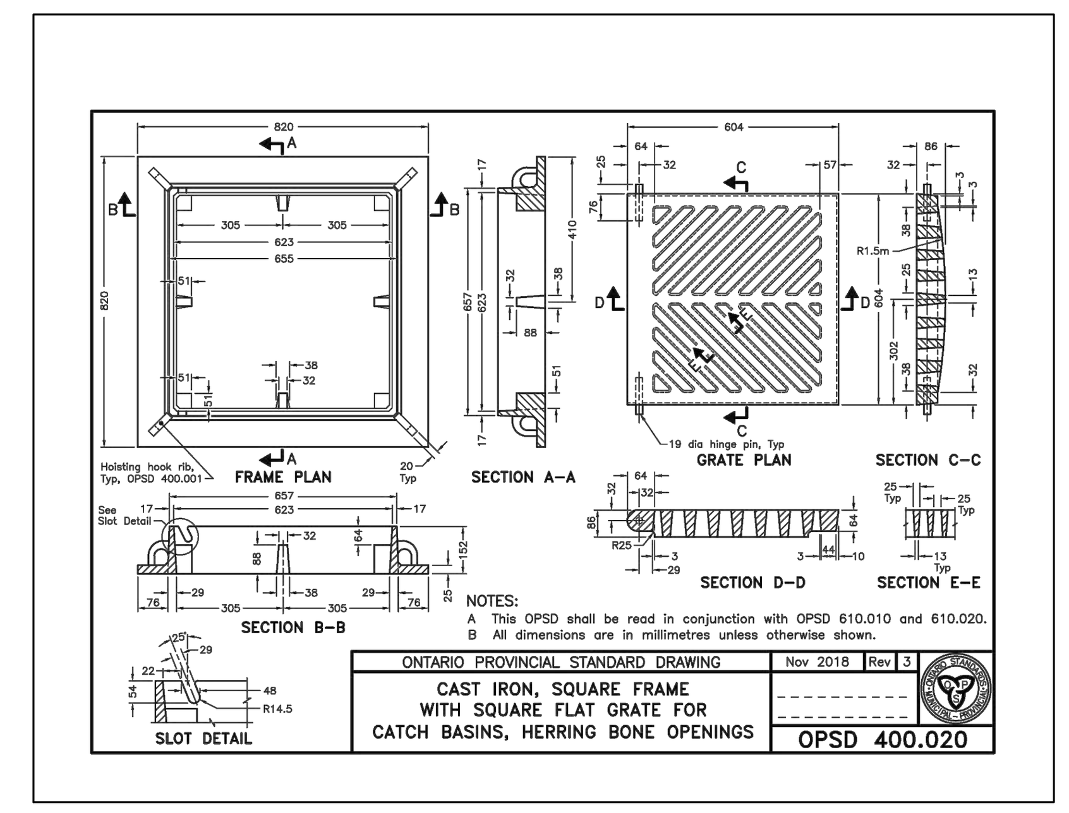


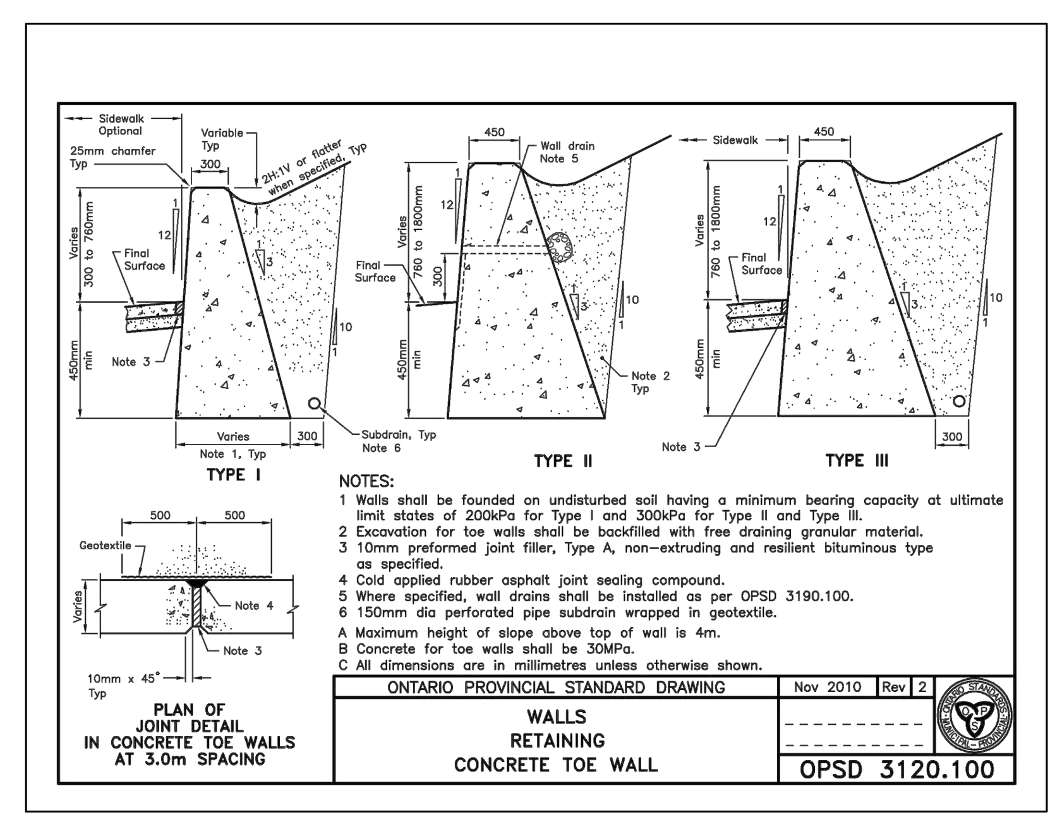


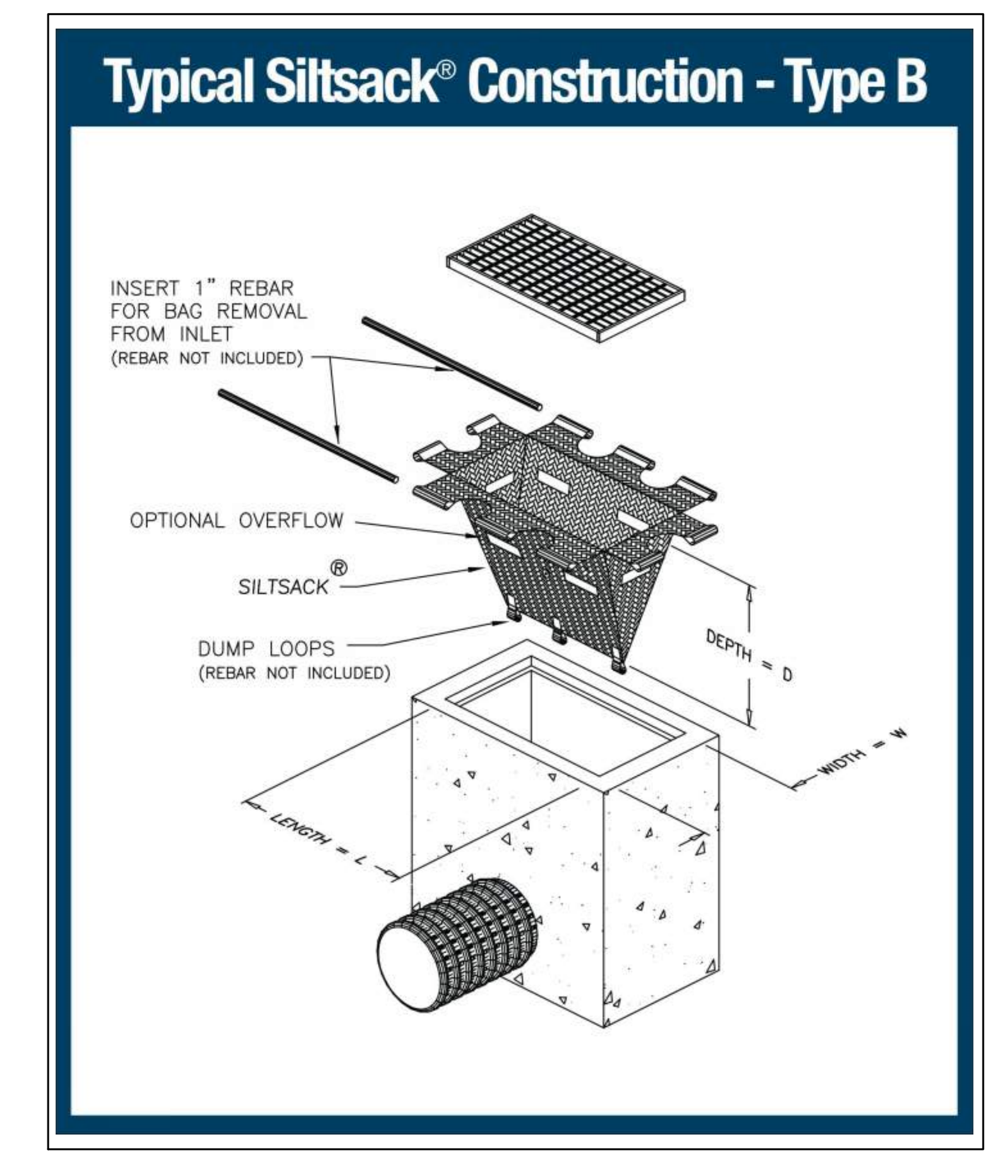


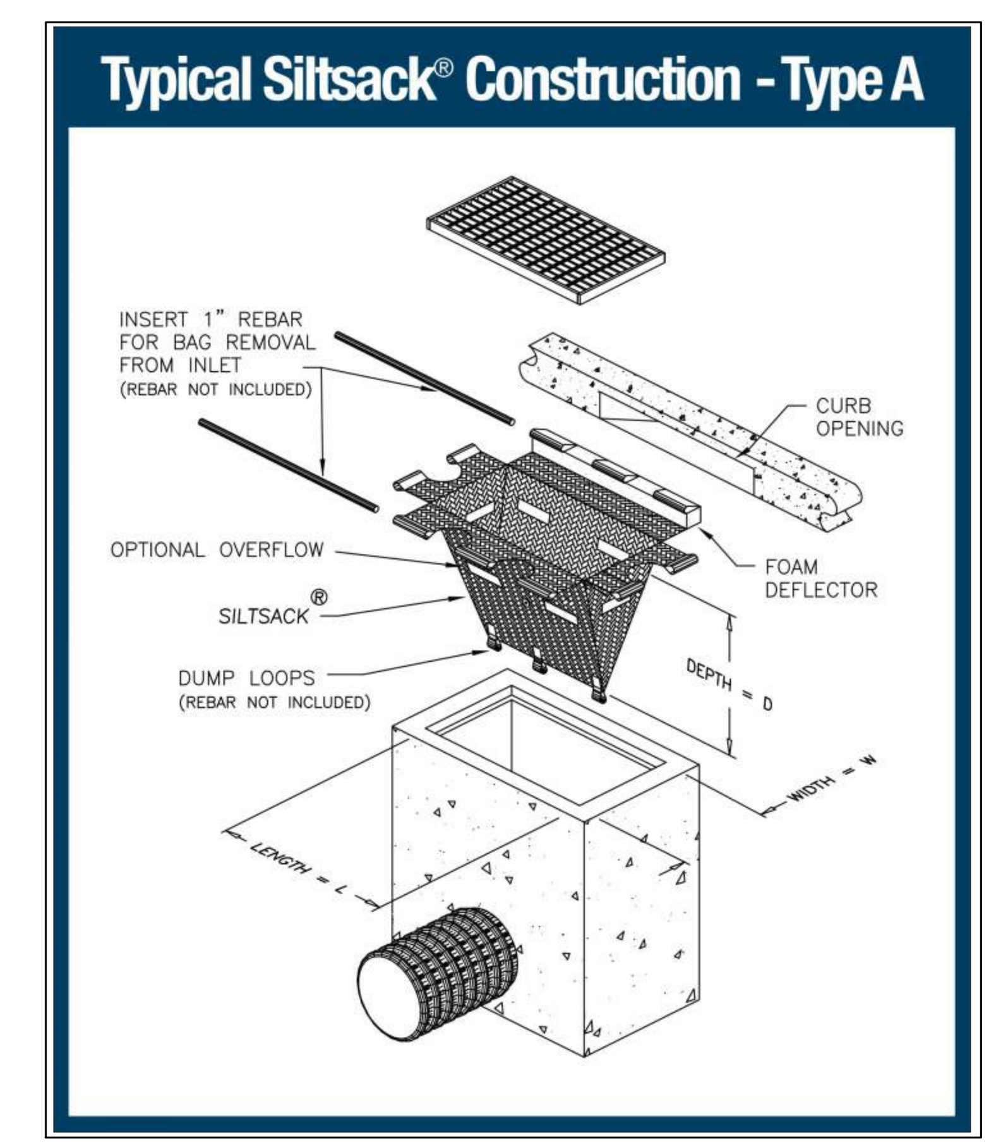


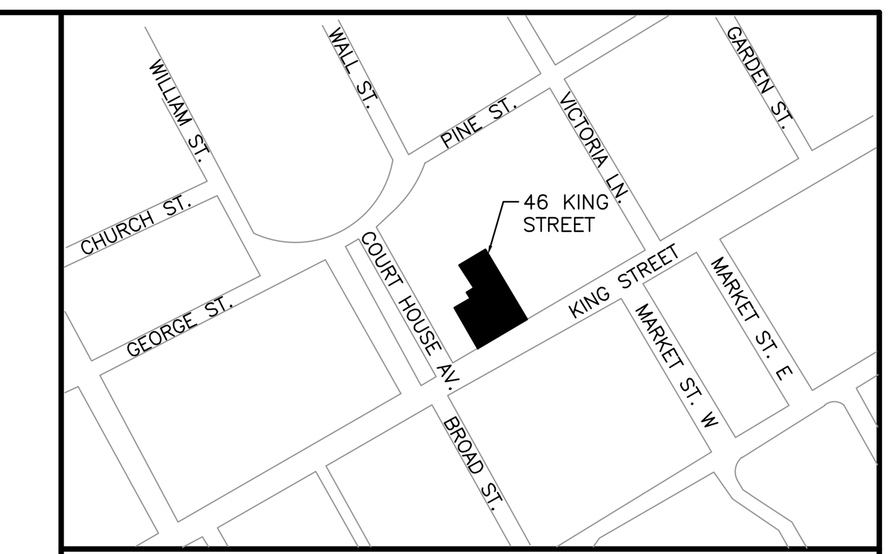












KEY PLAN

NOT FOR CONSTRUCTION

NOTES

THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

PROPERTY BOUNDARIES ARE DERIVED FROM PLAN OF SURVEY LOTS 1 & 2 AND PART OF LOT 17, BLOCK 31, COMPILED PLAN 67, CITY OF BROCKVILLE, BY HOPKINS CHITTY LAND SURVEYORS INC. SEALED AUGUST 31, 2023. ELEVATIONS ARE REFERRED TO A SITE BENCHMARK AT THE TOP OF A CONCRETE PIN (WBC) ALONG THE SOUTHEASTERLY LIMIT OF LOT 5, BLOCK 31 WITH ELEVATION 86.645m (CGVD28)

NO.	REVISION DESCRIPTION	DATE	BY
1	ISSUED FOR SPA	06/10/23	CC

SCALE: 0 1m 2m 4m HORIZONTAL 1:100

Robinson Land Development
350 Palladium Drive
Ottawa, ON K2V 1A8
(613) 592-6060 rcii.com

DESIGN	SM
CHECKED	CC
DRAWN	LR
CHECKED	SM
APPROVED	CC

CABER DEVELOPMENTS

46 KING STREET WEST
CITY OF BROCKVILLE

NOTES AND DETAILS PLAN

PROJECT No.	23062
SURVEY	HCLS
DATED	OCT 2023
DWG. No:	N1

Appendix C

Water Demand Calculations

Fire Demand Calculations

City Correspondence

Hydrant Separation

WATERMAIN DESIGN SHEET

46 King St. West, City of Brockville
Project No. 23062

Robinson Consultants

Junction Node Number	RESIDENTIAL POPULATION				NON-RES				AVG. DAILY					MAX. DAILY					PEAK HOURLY				
	ACTUAL COUNT				IND.	COMM.		INST.	DEMAND (L/s)					DEMAND (L/s)					DEMAND (L/s)				
	Low Density	Medium Density	High Density	Total Population	(m2)	(m2)	Pop.	(m2)	RES.	IND.	COMM.	INST.	TOTAL	RES.	IND.	COMM.	INST.	TOTAL	RES.	IND.	COMM.	INST.	TOTAL
BLDG			64	160		758	4		0.83		0.021		0.85	4.01		0.031		4.04	6.06		0.06		6.11

Residential Densities

Low Density (SFH's) =	3.4	cap/unit
Medium Density (Townhouses) =	2.7	cap/unit
High Density (Apartments) =	**2.5**	**cap/unit**

Avg. Daily Demand:			Max. Daily Demand:		Peak Hourly Demand:		
Demand =	**450**	**L/cap/day**	**4.8**	**x Avg. Day**	**7.3**	**Avg. Day**	*per MECP 2008 Table 3-3 for fewer than 500 people
Retail Density =	**50**	**cap/ha-gross**	**1.5**	**x Avg. Day**	**1.8**	**x Max. Day**	
Industrial (Light) =	35000	L/day/ha-gross	1.5	x Avg. Day	1.8	x Max. Day	
Commercial =	28000	L/day/ha-gross	1.5	x Avg. Day	1.8	x Max. Day	
Institutional =	28000	L/day/ha-gross	1.5	x Avg. Day	1.8	x Max. Day	

2023-10-04

Project Name:	46 King St. West
Project Location:	Brockville, ON
Project No:	23062
Date:	28-Sep-23
Building Type:	Mixed Commercial / Residential
Building Being Considered:	BLDG

Robinson Land Development

Calculations for Total Required Fire Flow

Step	Parameter				Value	
A	**Type of Construction**	**Options**	**C**			
		Wood Frame (Type V)	1.5			
		Ordinary Construction (Type III)	1.0	Non-Combustible Construction (Type II)	0.8	
		Non-Combustible Construction (Type II)	0.8			
		Fire Resistive Construction (Type I)	0.6			
B	Ground Floor Area				4740.0	m^2
	Total Effective Floor Area				**4,740.0**	**m^2**
C	**Fire Flow**				**12,000**	**L/min**
D	**Occupancy Class**	**Options**	**Charge**			
		Non-combustible	-0.25			
		Limited Combustible	-0.15	Limited Combustible	-0.15	
		Combustible	0.00			
		Free burning	0.15			
		Rapid Burning	0.25			
	Occupancy Adjustment				**-1800**	**L/min**
	Fire Flow				**10,200**	**L/min**
E	**Sprinkler Protection**	**Options**	**Charge**			
		Automatic Sprinkler Protection	-0.30	Automatic Sprinkler Protection	-0.30	
		None	0.00			
		Water Supply is Standard for System and Hose Lines	-0.10	Yes	-0.10	
		Full Supervision of the Sprinker System	-0.10	Yes	-0.10	
	Sprinkler Reduction				**-5,100**	**L/min**
F	**Exposures**					
	West Side					
	Subject Building and Exposed Building Fully Protected with Automatic Sprinker Systems				No	
	Exposed Building Fully Protected with Automatic Sprinker Systems				No	
	Exposed Wall Length				25	m
	Exposed Wall No. of Storeys				3	
	Length-Height Factor of Exposed Wall				75	m.storeys
	Construction Type of Exposed Wall	**Options**				
		Wood Frame				
		Ordinary with Unprotected Openings		Ordinary with Unprotected Openings		
		Ordinary without Unprotected Openings				
		Noncombustible or Fire Resistive with Unprotected Openings				
		Noncombustible or Fire Resistive without Unprotected Openings				
	Separation Distance				0.0	m
	West Side Exposure Charge				**0.18**	
	North Side					
	Subject Building and Exposed Building Fully Protected with Automatic Sprinker Systems				No	
	Exposed Building Fully Protected with Automatic Sprinker Systems				No	
	Exposed Wall Length				17	m
	Exposed Wall No. of Storeys				2	
	Length-Height Factor of Exposed Wall				34	m.storeys
	Construction Type of Exposed Wall	**Options**				
		Wood Frame				
		Ordinary with Unprotected Openings		Ordinary with Unprotected Openings		
		Ordinary without Unprotected Openings				
		Noncombustible or Fire Resistive with Unprotected Openings				
		Noncombustible or Fire Resistive without Unprotected Openings				
	Separation Distance				24.0	m
	North Side Exposure Charge				**0.01**	
	East Side					

	Subject Building and Exposed Building Fully Protected with Automatic Sprinker Systems			No	
	Exposed Building Fully Protected with Automatic Sprinker Systems			No	
	Exposed Wall Length			27	m
	Exposed Wall No. of Storeys			3	
	Length-Height Factor of Exposed Wall			81	m.storeys
	Construction Type of Exposed Wall	**Options**	Ordinary with Unprotected Openings		
		Wood Frame			
		Ordinary with Unprotected Openings			
		Ordinary without Unprotected Openings			
		Noncombustible or Fire Resistive with Unprotected Openings			
		Noncombustible or Fire Resistive without Unprotected Openings			
	Separation Distance			0	m
	East Side Exposure Charge			**0.19**	
	South Side				
	Subject Building and Exposed Building Fully Protected with Automatic Sprinker Systems			No	
	Exposed Building Fully Protected with Automatic Sprinker Systems			No	
	Exposed Wall Length			32	m
	Exposed Wall No. of Storeys			3	
	Length-Height Factor of Exposed Wall			96	m.storeys
	Construction Type of Exposed Wall	**Options**	Ordinary with Unprotected Openings		
		Wood Frame			
		Ordinary with Unprotected Openings			
		Ordinary without Unprotected Openings			
		Noncombustible or Fire Resistive with Unprotected Openings			
		Noncombustible or Fire Resistive without Unprotected Openings			
	Separation Distance			20	m
	South Side Exposure Charge			**0.09**	
	Total Exposure Charage			**0.47**	**< 0.75**
	Increase for Exposures			**4794**	**L/min**
G	**Total Required Fire Flow**			**10,000**	**L/min**

Notes:

1. Fire flow calculations have been prepared in accordance with Fire Underwriters Survey (v. 2020)

2. Where buildings are at a diagonal to each other, the shortest separtion distance is increased by 3 metres and used as the exposure distance (Ref. FUS v.2020 pg.30).

Stephen McCaughey

From: Sebastian Scott <sscott@brockville.com>
Sent: October 4, 2023 11:27 AM
To: Stephen McCaughey; Matt Tyo
Cc: Ryan Crowle; Chris Collins; Steve Allen; Ben Oliver
Subject: RE: 46 King Street W design works

"CAUTION: External Sender"
Hi Stephen,

I have checked the demands you have calculated and have no concerns at this point.

BROCKVILLE
CITY OF THE 1000 ISLANDS

Sebastian Scott, CBCO
Chief Building Official
Planning Dept. – Building & By-Law Services Division

City of Brockville
1 King St. W, Brockville, Ontario, K6V 7A5
613-342-8772 ext 4447
Email: sscott@brockville.com
Web: www.brockville.com
Permit Applications or Inspection Requests:
https://ca.cloudpermit.com

From: Stephen McCaughey <smccaughey@rcii.com>
Sent: Wednesday, October 4, 2023 8:53 AM
To: Matt Tyo <mtyo@brockville.com>; Sebastian Scott <sscott@brockville.com>
Cc: Ryan Crowle <rcrowle@integrateddesign.ca>; Chris Collins <ccollins@rcii.com>; Steve Allen <sallen@brockville.com>; Ben Oliver <boliver@integrateddesign.ca>
Subject: RE: 46 King Street W design works

Hello Matt, Sebastian,

Per my below correspondence with Steve Allen, I'm working on a site plan application for a proposed nine-storey mixed commercial/residential building at 46 King St West and I am looking to confirm watermain pressures/boundary conditions for the 300mm watermain along King St. West. The building will be sprinklered.

Attached are the water domestic demand (based on City of Brockville Site Plan Control Manual) and fire demand (based on FUS 2020) calculations. Also attached are the draft building layout plans for reference.

Avg Day Demand: 0.85 L/s
Peak Hour Demand: 6.11 L/s
Max Day + Fire Demand: 171 L/s

Thank you,

Stephen McCaughey, P.Eng. | Project Engineer – Land Development
210-350 Palladium Drive, Ottawa ON, K2V 1A8
O: 613-592-6060 x160 | smccaughey@rcii.com | www.rcii.com

From: Steve Allen <sallen@brockville.com>
Sent: Friday, September 22, 2023 10:10 AM
To: Chris Collins <ccollins@rcii.com>; Stephen McCaughey <smccaughey@rcii.com>
Cc: Ryan Crowle <rcrowle@integrateddesign.ca>; Sebastian Scott <sscott@brockville.com>; Matt Tyo <mtyo@brockville.com>
Subject: Re: 46 King Street design works

"CAUTION: External Sender"
Sorry Chris, that clears things up, the connection is to the 300 mm main on King Street for fire and domestic flows.

Any flow rate requirements will have to meet the building code and fire codes.

These rates are reviewed by fire prevention and the CBO.

Emails are above in the CC.

Matt Tyo Chief of Fire Prevention

Sebastian Scott CBO

Steve

Sent from Outlook for iOS

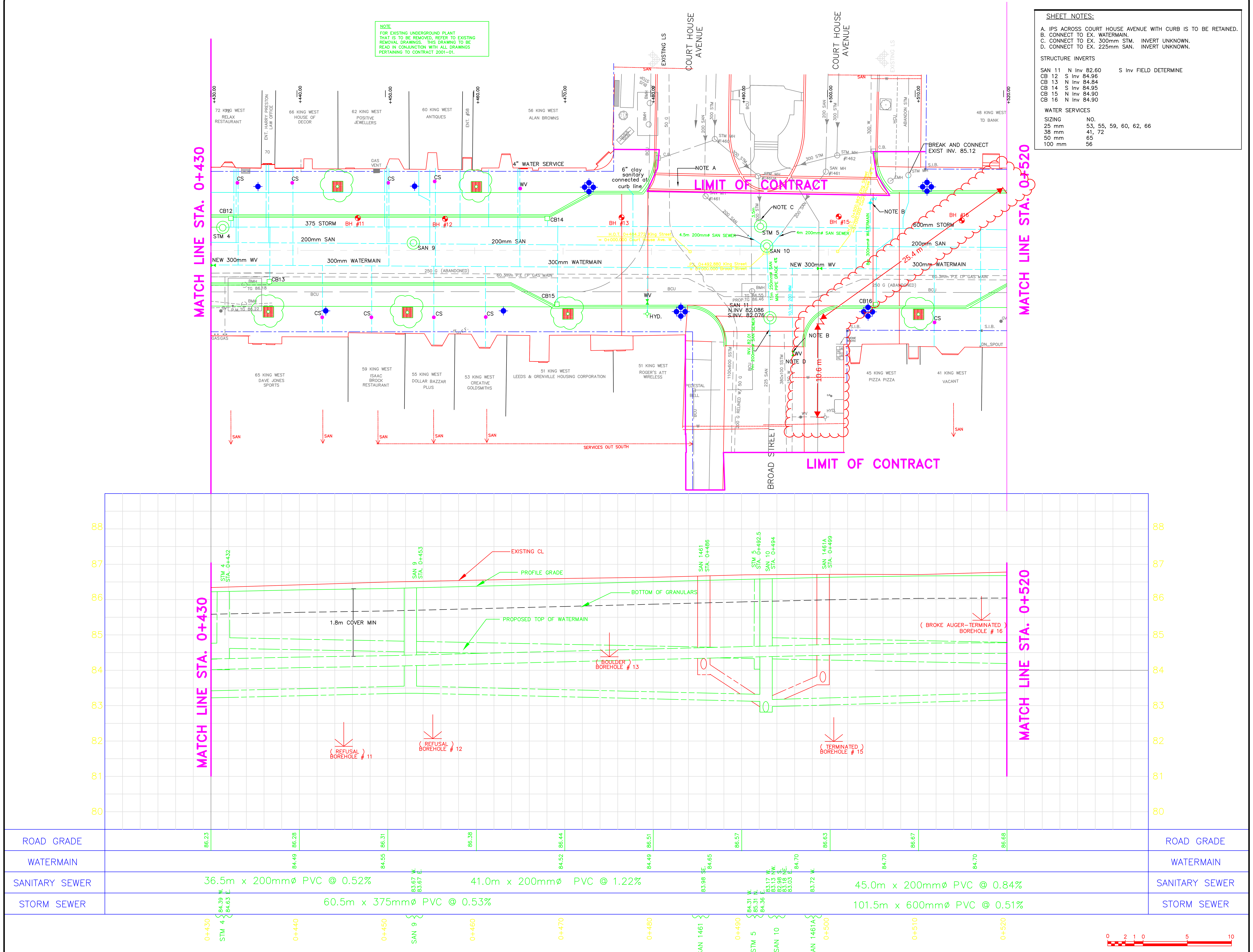
From: Chris Collins <ccollins@rcii.com>
Sent: Friday, September 22, 2023 9:47:05 AM
To: Steve Allen <sallen@brockville.com>; Stephen McCaughey <smccaughey@rcii.com>
Cc: Ryan Crowle <rcrowle@integrateddesign.ca>
Subject: RE: 46 King Street design works

Steve,

I agree that you have provided this info to EXP for the Cable Philips site, but this is the project on 46 King Street in the downtown that we are working on.

Thanks,

Chris C. Collins (he/him) **| Manager – Land Development**
210-350 Palladium Drive, Ottawa ON, K2V 1A8
O: 613-592-6060 x151 | C: 613-799-9383 | ccollins@rcii.com |
www.rcii.com



SHEET NOTES:

A. IPS ACROSS COURT HOUSE AVENUE WITH CURB IS TO BE RETAINED.
B. CONNECT TO EX. WATERMAIN.
C. CONNECT TO EX. 300mm STM. INVERT UNKNOWN.
D. CONNECT TO EX. 225mm SAN. INVERT UNKNOWN.

STRUCTURE INVERTS

SAN 11	N Inv 82.60	S Inv FIELD DETERMINE
CB 12	S Inv 84.96	
CB 13	N Inv 84.84	
CB 14	S Inv 84.95	
CB 15	N Inv 84.90	
CB 16	N Inv 84.90	

WATER SERVICES

SIZING	NO.
25 mm	53, 55, 59, 60, 62, 66
38 mm	41, 72
50 mm	65
100 mm	56

GENERAL NOTES:

1. CONTRACTOR TO EXPOSE AND/OR LOCATE TIE IN POINTS OF SERVICE AND MAINS IN ADVANCE OF CONNECTIONS TO ENSURE ALL TEES, MAINS, LATERALS, CURB STOPS AND SERVICES ARE ADJUSTED TO SUIT HORIZONTAL AND VERTICAL POSITION OF THE CONNECTION.
2. PLUG OPEN ENDS OF EXISTING WATERMAIN PIPE WHEN NOT REMOVED, WITH 30MPa, 300mm THICK CONCRETE AND WRAP WITH 6 MIL. POLYETHYLENE.
3. LONG RADIUS SWEEPS TO BE USED FOR ALL SANITARY AND STORM SERVICE BENDS.
4. MAIN TORONTO TO MONTREAL BELL LINE IS LOCATED WITHIN THE CONTRACT LIMITS, INCLUDING FIBREOPTIC STRUCTURES AND CONCRETE DUCT STRUCTURES.
5. ALL EXISTING HOUSE SERVICES NOT NECESSARILY SHOWN. SERVICE LOCATIONS ARE APPROXIMATE ONLY AND ARE NOT NECESSARILY IN A COMMON TRENCH.
6. CONTRACTOR TO VERIFY THE TYPE OF PLANT, LOCATION, CONFIGURATION AND ENCASEMENT DETAILS WITH UTILITY COMPANIES PRIOR TO CONSTRUCTION.
7. ALL REMOVALS ARE NOT NECESSARILY SHOWN. WHERE PROPOSED CONSTRUCTION NECESSITATES A REMOVAL THE COST OF SUCH REMOVAL IS TO BE COVERED UNDER THE PRICE FOR INSTALLATION OF THAT PARTICULAR CONSTRUCTION COMPONENT.
8. REMOVE SIDEWALK TO FRONT FACE OF BUILDING, OR AS DIRECTED BY THE ENGINEER.
9. FILL EXISTING SEWERS LEFT IN PLACE WITH FLOWABLE CONCRETE IN LIEU OF REMOVAL.
10. BUILDING SERVICES MAY BE ADDED OR SUBTRACTED AT THE DISCRETION OF THE ENGINEER
11. ALL UTILITIES SHOWN AS ABANDONED ARE TO BE VERIFIED BY CONTRACTOR AS PART OF HIS LOCATE RESPONSIBILITY. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE PROPER CARE WHEN WORKING AROUND ABANDONED UTILITIES.
12. ALL HYDRANTS ARE TO HAVE A 1.2m CLEAR ACCESS RADIUS.

REV. No.	DATE	DESCRIPTION	BY	APPROVED
1	07/28/03	AS BUILT UPDATE	CJ	SEA

AS-BUILTS DATE: BY:

LICENSED PROFESSIONAL ENGINEER J. C. JOHNSTON PROVINCE OF ONTARIO

KOSTUCH ENGINEERING
9 Broad Street, Suite 306, Brockville, Ontario K6V 6Z4
Telephone: (613) 342-1223 - Fax: (613) 342-5526
MEMBER OF GENIVAR CONSULTING GROUP LTD.

CITY OF BROCKVILLE

PROJECT TITLE: KING STREET WEST PHASE 5

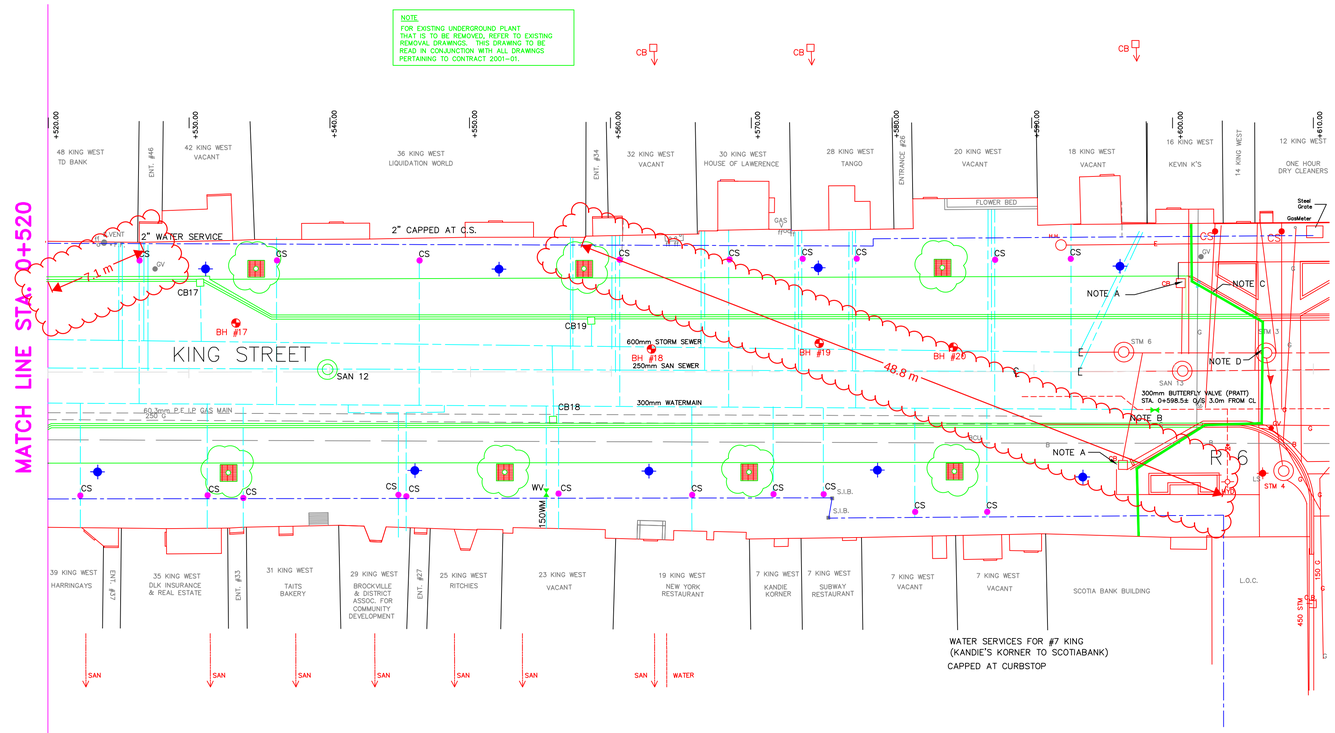
SHEET TITLE: NEW CONSTRUCTION PLAN AND PROFILE STA. 0+430 – 0+520

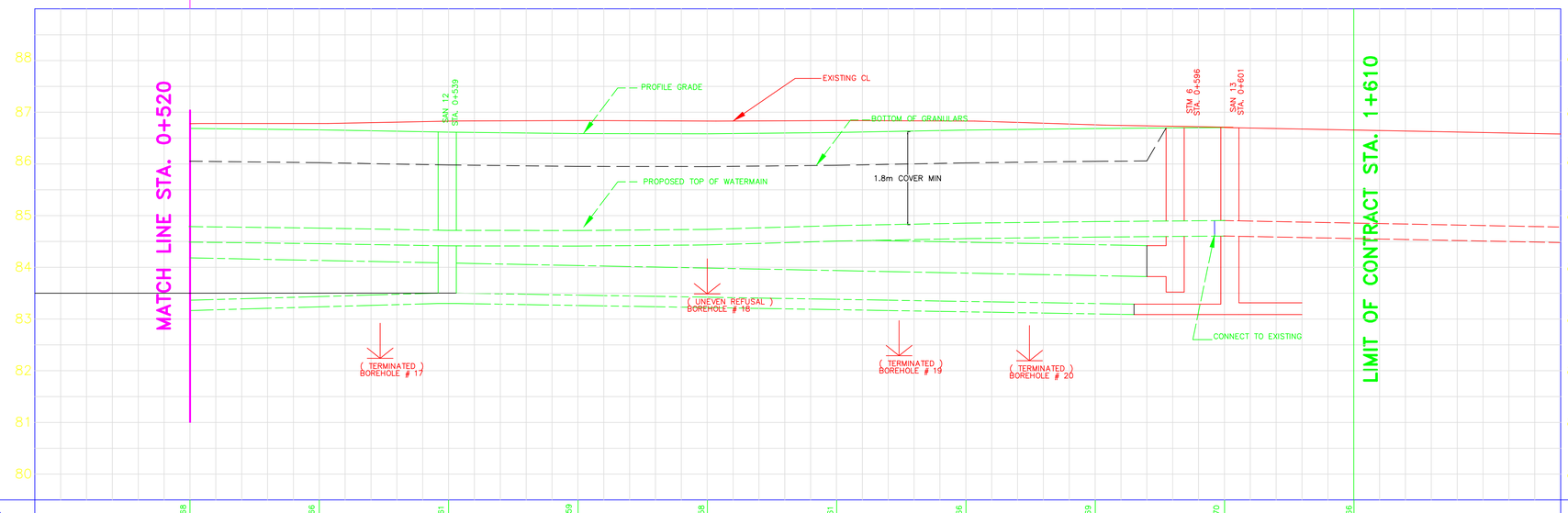
LOCATION:

SURVEYED BY:	CAJ, SEA, HJP	DESIGNER:	SEA
DRAWN BY:	CAJ	CHECKED BY:	SEA
CHECKED BY:	SEA	APPROVED BY:	JCJ
DATE:	2003-01-21	SCALE:	HOR. 1:200 VERT. 1:50
PROJECT No.	000149	DRAWING No.	C3 OF 4
CONTRACT No.	2003-01		

09 NEW CONSTRUCTION 3.DWG

NOTE
FOR EXISTING UNDERGROUND PLANT THAT IS TO BE REMOVED, REFER TO EXISTING REMOVAL DRAWINGS. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL DRAWINGS PERTAINING TO CONTRACT 2001-01.





ROAD GRADE	86.68	86.66	86.61	86.59	86.58	86.61	86.66	86.69	86.70	86.66			ROAD GRADE
WATERMAIN	84.70			84.69	84.70	84.70	84.70	84.70	84.69	84.65 W			WATERMAIN
SANITARY SEWER	45.0m x 200mmø PVC @ 0.84%		83.41 W 83.41 E		54.0m x 250mmø PVC @ 0.61%					82.98 W			SANITARY SEWER
STORM SEWER	101.5m x 600mmø PVC @ 0.51%								83.82 W				STORM SEWER
	0+520	0+530	0+540 SAN 12	0+550	0+560	0+570	0+580	0+590	STM 6	0+600 SAN 13	0+610		

0 2 1 0 5 10

SHEET NOTES:

A. EXISTING CB TO BE REMOVED AND PIPE IS TO BE PLUGGED.
B. CONNECT TO EX. WATERMAIN, REMOVE ALL FITTINGS CONNECT TO STRAIGHT PIECE OF PIPE, RE-INSTALL 300mm VALVE.
C. GRANITE CURB TO BE RETAINED.
D. NEW ASPHALT TO BE PLACED FLUSH AGAINST IPS, IF IPS IS DISTURBED IT SHALL BE RELAID
SAN 12 W Inv 83.30 E Inv 83.30
CB 17 S Inv 84.80
CB 18 N Inv 84.75
CB 19 S Inv 84.35

WATER SERVICES

SIZING	NO.
25 mm	9, 11, 13, 15, 17, 18, 19, 20 25, 28, 29, 30, 31, 36, 44.
38 mm	7, 23, 32, 35, 39.
50 mm	36, 42
150 mm	23

GENERAL NOTES:

1. CONTRACTOR TO EXPOSE AND/OR LOCATE TIE IN POINTS OF SERVICE AND MAINS IN ADVANCE OF CONNECTIONS TO ENSURE ALL TEES, MAINS, LATERALS, CURB STOPS AND SERVICES ARE ADJUSTED TO SUIT HORIZONTAL AND VERTICAL POSITION OF THE CONNECTION.
2. PLUG OPEN ENDS OF EXISTING WATERMAIN PIPE WHEN NOT REMOVED, WITH 30MPa, 300mm THICK CONCRETE AND WRAP WITH 6 MIL. POLYETHYLENE.
3. LONG RADIUS SWEEPS TO BE USED FOR ALL SANITARY AND STORM SERVICE BENDS.
4. MAIN TORONTO TO MONTREAL BELL LINE IS LOCATED WITHIN THE CONTRACT LIMITS, INCLUDING FIBREOPTIC STRUCTURES AND CONCRETE DUCT STRUCTURES.
5. ALL EXISTING HOUSE SERVICES NOT NECESSARILY SHOWN. SERVICE LOCATIONS ARE APPROXIMATE ONLY AND ARE NOT NECESSARILY IN A COMMON TRENCH.
7. CONTRACTOR TO VERIFY THE TYPE OF PLANT, LOCATION, CONFIGURATION AND ENCASEMENT DETAILS WITH UTILITY COMPANIES PRIOR TO CONSTRUCTION.
8. ALL REMOVALS ARE NOT NECESSARILY SHOWN. WHERE PROPOSED CONSTRUCTION NECESSITATES A REMOVAL THE COST OF SUCH REMOVAL IS TO BE COVERED UNDER THE PRICE FOR INSTALLATION OF THAT PARTICULAR CONSTRUCTION COMPONENT.
9. REMOVE SIDEWALK TO FRONT FACE OF BUILDING, OR AS DIRECTED BY THE ENGINEER.
10. FILL EXISTING SEWERS LEFT IN PLACE WITH FLOWABLE CONCRETE IN LIEU OF REMOVAL.
11. ALL UTILITIES SHOWN AS ABANDONED ARE TO BE VERIFIED BY CONTRACTOR AS PART OF HIS LOCATE RESPONSIBILITY. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE PROPER CARE WHEN WORKING AROUND ABANDONED UTILITIES.
12. ALL HYDRANTS ARE TO HAVE A 1.2m CLEAR ACCESS RADIUS.
13. BUILDING SERVICES MAY BE ADDED OR SUBTRACTED AT THE DISCRETION OF THE ENGINEER

REV. No.	DATE	DESCRIPTION	BY	APPROVED
1	07/28/03	AS BUILT UPDATES	CJ	SEA
AS-BUILTS DATE:			BY:	

LICENSED PROFESSIONAL ENGINEER
J. C. JOHNSTON
PROVINCE OF ONTARIO

KOSTUCH ENGINEERING
9 Broad Street, Suite 306, Brockville, Ontario K6V 6Z4
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MEMBER OF GENIVAR CONSULTING GROUP LTD.

CITY OF BROCKVILLE

PROJECT TITLE: KING STREET WEST PHASE 5

SHEET TITLE: NEW CONSTRUCTION PLAN AND PROFILE STA. 0+520 - 0+610

LOCATION:

SURVEYED BY: CAJ, SEA, HJP		DESIGNER: SEA	
DRAWN BY: CAJ		CHECKED BY: SEA	
CHECKED BY: SEA		APPROVED BY: JCJ	
DATE: 2003-01-21		SCALE: HOR. 1:200 VERT. 1:50	
PROJECT No. 000149		DRAWING No. C4 OF 4	
CONTRACT No. 2003-01			

10 NEW CONSTRUCTION 4.DWG

Appendix D

Sanitary Sewer Design Sheet

SANITARY SEWER DESIGN SHEET
for
46 KING ST. WEST, CITY OF BROCKVILLE

Robinson
Land Development

LOCATION				UNIT COUNT			RESIDENTIAL AREA AND POPULATION				RESIDENTIAL FLOW			COMM./INST. FLOW				CUM. PEAK DESIGN FLOW (L/s)	PIPE						
							INDIVIDUAL		CUMULATIVE																
STREET	FROM MH	TO MH	DRAINAGE AREA	SINGLE-FAMILY	Apartments	TOWNHOUSE	POP.	AREA (ha)	POP.	AREA (ha)	AVG FLOW (L/s)	PEAK POP. FLOW (L/s)	EXTRAN. FLOW (L/s)	GROSS AREA (m2)	POP.	AVG FLOW (L/s)	PEAK FLOW (L/s)		LENGTH (m)	DIAMETER (mm)	SLOPE (%)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	EXCESS CAPACITY (L/s)	PERCENT FULL
King St. W	BLDG	EX. SAN	0.1275		64		160		160		0.83	2.08	0.04	758	4	0.02	0.05	**2.17**	8.3	125	2.0%	13.26	1.08	11.09	16%
King St. W		SAN12	SAN13															**0.00**	54.0	250	0.61%	46.49	0.95		

DESIGN PARAMETERS

			Per Unit Populations:	
Average Daily Flow =	**450**	**L/cap/day**	Single Family	3.4 persons/unit
Comm./Inst. Flow =	28000	L/ha/day	Semi-detached	2.7 persons/unit
Retail Density =	**50**	**cap/ha**	Duplex	2.3 persons/unit
Industrial Flow =	35000	L/ha/day	Townhouse	2.7 persons/unit
Residential/Commercial Peak Factor	**2.5**		Apartments:	
Industrial Peak Factor =	7	per OSDG App. 4-B	Bachelor	1.4 persons/unit
Extraneous Flow =	**0.28**	**L/s/ha**	1 Bedroom	1.4 persons/unit
Minimum Velocity =	0.6	m/s	2 Bedroom	2.1 persons/unit
Maximum Velocity =	3.0	m/s	3 Bedroom	3.1 persons/unit
			Average Apt.	**2.5 persons/unit**

2023-10-04

Appendix E

Storm Sewer Design Sheet

Storm Storage Requirements

23062

STORM SEWER DESIGN SHEET
for
46 KING ST. WEST, BROCKVILLE

Robinson Consultants

LOCATION			2 YEAR				FLOW					PROPOSED SEWER					
DRAINAGE AREA	FROM MH	TO MH	AREA (ha)	C	INDIV. 2.78AC	ACCUM. 2.78AC	TIME OF CONC. (min)	2 YEAR RAINFALL INTENSITY (mm/hr)	2 YEAR PEAK FLOW (L/s)	CONTROLLED PEAK FLOW (L/s)	TOTAL FLOW (L/s)	PIPE DIA. (mm)	GRADE (%)	LENGTH (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	PERCENT FULL
Roof	Roof	Bldg	0.0490	1.00	0.14	0.14	15.00	56.30	7.67	4.00	4.00						
Terrace	Bldg	Ex.STM	0.0775	0.90	0.19	0.19	15.00	56.30	10.92	10.92	14.92	150	2.00	7.0	21.56	1.22	69%
			0.1265														

Design Parameters

Notes:
1. Rainfall intensity from City of Brockville Site Plan Control Manual, App. K
2. Peak flows calculated using the Rational Method.
3. Manning's roughness coefficient = 0.013
4. Time of concentration = 15 min
5. Full flow velocity: MIN 0.8 m/s; MAX 3.0 m/s

2023-09-28

23062

STORM SEWER DESIGN SHEET
for
46 KING ST. WEST, BROCKVILLE

Robinson Consultants

LOCATION			5 YEAR				FLOW					PROPOSED SEWER					
DRAINAGE AREA	FROM MH	TO MH	AREA (ha)	C	INDIV. 2.78AC	ACCUM. 2.78AC	TIME OF CONC. (min)	5 YEAR RAINFALL INTENSITY (mm/hr)	5 YEAR PEAK FLOW (L/s)	CONTROLLED PEAK FLOW (L/s)	TOTAL FLOW (L/s)	PIPE DIA. (mm)	GRADE (%)	LENGTH (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	PERCENT FULL
Roof	Roof	Bldg	0.0490	1.00	0.14	0.14	15.00	78.60	10.71	4.00	4.00						
Terrace	Bldg	Ex.STM	0.0775	0.90	0.19	0.19	15.00	78.60	15.24	15.24	19.24	150	2.00	7.0	21.56	1.22	89%
			0.1265														

Design Parameters

Notes:
1. Rainfall intensity from City of Brockville Site Plan Control Manual, App. K
2. Peak flows calculated using the Rational Method.
3. Manning's roughness coefficient = 0.013
4. Time of concentration = 15 min
5. Full flow velocity: MIN 0.8 m/s; MAX 3.0 m/s

2023-09-28

23062

STORM SEWER DESIGN SHEET
for
46 KING ST. WEST, BROCKVILLE

Robinson Consultants

LOCATION			100 YEAR				FLOW					PROPOSED SEWER						
DRAINAGE AREA	FROM MH	TO MH	AREA (ha)	C	INDIV. 2.78AC	ACCUM. 2.78AC	TIME OF CONC. (min)	100 YEAR RAINFALL INTENSITY (mm/hr)	100 YEAR PEAK FLOW (L/s)	CONTROLLED PEAK FLOW (L/s)	TOTAL FLOW (L/s)	PIPE DIA. (mm)	GRADE (%)	LENGTH (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	TOTAL CAPACITY (L/s) (twin lateral)	PERCENT FULL
Roof	Roof	Bldg	0.0490	1.00	0.14	0.14	15.00	139.70	19.03	4.00	4.00							
Terrace	Bldg	Ex.STM	0.0775	1.00	0.22	0.22	15.00	139.70	30.10	16.00	20.00	150	2.00	7.0	21.56	1.22	43.12	93%
			0.1265															

Design Parameters

Notes:
1. Rainfall intensity from City of Brockville Site Plan Control Manual, App. K
2. Peak flows calculated using the Rational Method.
3. Manning's roughness coefficient = 0.013
4. Time of concentration = 15 min
5. Full flow velocity: MIN 0.8 m/s; MAX 3.0 m/s

Flow and Storage Volume Calculations

Total Storage Required

Given:

Area (ha) = 0.1265

C = 1.00

Return Period	Time of Concentration (min)	Intensity[*1], i (mm/hr)	Flow[*2], Q (L/s)	Allowable Release Rate[*4] (L/s)	Net Runoff to be Stored (L/s)	Storage Required (m^3)
100 Year	15	139.7	49.1	20.0	29.1	26.2
	20	126.9	44.6	20.0	24.6	29.6
	25	114.2	40.1	20.0	20.1	30.2
	30	101.4	35.7	20.0	15.7	28.2
	40	86.3	30.3	20.0	10.3	24.8
	50	71.1	25.0	20.0	5.0	15.0
	60	56.0	19.7	20.0	-0.3	-1.1

Notes:

1. Rainfall intensity from City of Brockville Site Plan Control Manual, App. K
2. Flow calculated using the Rational Method (Q = 2.78CiA).
3. C (100 YR) = C + 25% (Max. 1.0)
4. Allowable Release Rate = 4 L/s to not overload twin laterals

Total Storage Required - Top Roof

Given:

Area (ha) = 0.0490

C = 1.00

Return Period	Time of Concentration (min)	Intensity[*1], i (mm/hr)	Flow[*2], Q (L/s)	Allowable Release Rate[*4] (L/s)	Net Runoff to be Stored (L/s)	Storage Required (m^3)
100 Year	15	139.7	19.0	4.0	15.0	13.5
	20	126.9	17.3	4.0	13.3	15.9
	25	114.2	15.6	4.0	11.6	17.3
	30	101.4	13.8	4.0	9.8	17.7
	35	93.8	12.8	4.0	8.8	18.4
	40	86.3	11.8	4.0	7.8	18.6
	45	78.7	10.7	4.0	6.7	18.1
	50	71.1	9.7	4.0	5.7	17.1
	55	63.6	8.7	4.0	4.7	15.4
	60	56.0	7.6	4.0	3.6	13.1

Notes:

1. Rainfall intensity from City of Brockville Site Plan Control Manual, App. K
2. Flow calculated using the Rational Method (Q = 2.78CiA).
3. C (100 YR) = C + 25% (Max. 1.0)
4. Allowable Release Rate = 4 L/s to not overload twin laterals

Total Storage Required - Terraced Roofs

Given:

Area (ha) = 0.0775

C = 1.00

Return Period	Time of Concentration (min)	Intensity[*1], i (mm/hr)	Flow[*2], Q (L/s)	Allowable Release Rate[*4] (L/s)	Net Runoff to be Stored (L/s)	Storage Required (m^3)
100 Year	15	139.7	30.1	16.0	14.1	12.7
	20	126.9	27.3	16.0	11.3	13.6
	25	114.2	24.6	16.0	8.6	12.9
	30	101.4	21.8	16.0	5.8	10.5
	35	93.8	20.2	16.0	4.2	8.9
	40	86.3	18.6	16.0	2.6	6.2
	45	78.7	17.0	16.0	1.0	2.6
	50	71.1	15.3	16.0	-0.7	-2.0
	55	63.6	13.7	16.0	-2.3	-7.6
	60	56.0	12.1	16.0	-3.9	-14.2

Notes:

1. Rainfall intensity from City of Brockville Site Plan Control Manual, App. K
2. Flow calculated using the Rational Method (Q = 2.78CiA).
3. C (100 YR) = C + 25% (Max. 1.0)
4. Allowable Release Rate = 4 L/s to not overload twin laterals