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FUNCTIONAL SERVICING REPORT

FOR

**CAIVAN (ORLEANS VILLAGE 2)
LIMITED**

**PROPOSED RESIDENTIAL
SUBDIVISION**

ORLEANS VILLAGE PHASE 4
CITY OF OTTAWA

PROJECT NO.: 22-1296

FEBRUARY 2023

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**FUNCTIONAL SERVICING REPORT
FOR
PROPOSED RESIDENTIAL SUBDIVISION
CAIVAN (ORLEANS VILLAGE 2) LIMITED
PROJECT NO: 22-1296**

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CAIVAN (ORLEANS VILLAGE 2) LIMITED**

FEBRUARY 2023

**CITY OF OTTAWA
PROJECT NO.: 22-12**

1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained to prepare a Functional Servicing Report in support zoning by-law amendment and draft plan of subdivision for the Orleans Village (OV) Phase 4 development on behalf of Caivan (Orleans Village 2) Limited (COVL).

The subject property at 245 and 275 Lamarche Avenue is located within the City of Ottawa urban boundary in the Innes Ward and is defined in the attached General Plan (DSEL, 2018) provided in **Appendix A**. The subdivision encompasses lands south of Innes Road, east of Lamarche Avenue and north of existing OV Phases 1, 2 and 3. The subject property is known as PIN 04404-1892 and is under private ownership, and measures approximately 4.5ha. The existing Orleans Village is shown in the legal plan found in **Appendix A** prepared by J.D. Barnes Limited with the subject lands referenced as Blocks 147 and 148

The subject property is zoned as a Development Reserve (DR) Zone. Per the detailed **Design Brief** prepared in November 2018 for Caivan (Orleans Village) Limited 340 Innes Road, the existing servicing infrastructure has been designed to accommodate development of 245 and 275 Lamarche Avenue. As-built engineering drawings of Lamarche Avenue are located in **Appendix A**.

The objective of this report is to provide sufficient detail to demonstrate that the proposed development area can be supported by municipal services.

1.1 Existing Conditions

The subject lands totals 4.5 hectares. The subdivision lands are currently undeveloped and are within the jurisdiction of the Rideau Valley Conservation Authority. Light industrial uses are associated with the adjacent properties to the north and east of the subject property. The subject property shares its west and south boundary with residential lots. The existing elevation within the subject property generally ranges between 88m - 92m. The topography is gently sloping from north (higher) to south (lower).

There is minimal vegetation present within the subject property with much of the property being composed of agricultural land and parking lots with few trees present. The subsurface conditions of the subject property, the subsurface conditions consist of fill and glacial till overlaying shallow limestone bedrock (Golder, November 2016). Geotechnical studies and other studies related to the Planning Act applications for the subject lands will characterize and provide management recommendations for subsurface conditions, including soil, rock, groundwater, and any nearby wells.

1.2 Development Layout

The proposed development consists of a park block, residential blocks with a mix of townhouse, rear lane townhouse, back-to-back townhomes, 18.0m right-of-way (ROW), and 14.75m ROW (see proposed draft plan in **Appendix A**)

The predicted populations currently associated with the development concept are described in Table 1.

Table 1: Development Statistics for Orleans Village Phase 4

Land Use	Total Area (ha)	Projected Residential Units	Residential Population per Unit *	Projected Population
Townhouses	1.38	74	2.7	~200
Back to Back Townhomes	0.93	92	2.7	~248
Rear Lane Townhomes	0.26	19	2.7	~51
Parks/walkways	0.28			
Local Roads	1.66			
Total	4.52	185		~499

* NOTE: Population projections may differ from population estimates used in background Transportation Studies, Planning Rationale, and other studies.

1.3 Consultation Summary

Consultation with the City of Ottawa was initiated by COVL in February 2022, under the *Planning Act* process for development applications. The City of Ottawa submitted a set of relevant engineering comments from the pre-application consultation, which are provided in **Appendix A**. The key items areas are as follow:

- Water: Service areas with a basic demand greater than 50 m³/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid creation of vulnerable service area; and a District Metering Area Chamber (DMA) is required for services 150mm or greater in diameter.
- Wastewater: DSEL to demonstrate that adequate capacity for Phase 4 has been allocated by the existing OV per the Design Brief.
- Stormwater: site is subject to Development Charges for the Gloucester Urban Center Stormwater Management Facilities; existing STM Pond 1 must be upgraded prior to the development of this site per the OV Design Brief; and RVCA to confirm quality control requirements.

1.4 Required Permits / Approvals

Once Draft Plan of Subdivision is obtained, the City of Ottawa must approve detailed engineering design drawings and reports prior to construction of the municipal infrastructure identified in this report.

The following additional approvals and permits listed in Table 2 are expected to be required prior to construction of the municipal infrastructure detailed herein. Other permits and approvals may be required, as detailed in the other studies submitted as part of the Planning Act applications (e.g. *Tree Conservation Report, Phase 1 Environmental Site Assessment, etc.*).

Table 2: Potential Required Permits/Approvals

Agency	Permit/Approval Required	Trigger	Remarks
MECP / City of Ottawa	Environmental Compliance Approval	Construction of new sanitary & storm sewers.	MECP is expected to review the stormwater collection system and wastewater collection system by transfer of review.
MECP	Permit to Take Water	Construction of proposed land uses (e.g. basements for residential homes) and services.	Pumping of groundwater will be required during construction, given groundwater conditions and proposed land uses/ municipal infrastructure.
City of Ottawa	MOE Form 1 – Record of Watermains Authorized as a Future Alteration	Construction of watermains.	The City of Ottawa is expected to review the watermains on behalf of the MECP.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following documents were referenced in the preparation of this report:

- **Ottawa Sewer Design Guidelines,**
City of Ottawa, *SDG002*, October 2012.
(City Standards)
 - **Technical Bulletin ISDTB-2014-01, Revisions to Ottawa Design Guidelines – Sewer,**
City of Ottawa, February 5, 2014.
(ISDTB-2014-01)
 - **Technical Bulletin PIEDTB-2016-01, Revisions to Ottawa Design Guidelines – Sewer,**
City of Ottawa, September 6, 2016.
(PIEDTB-2016-01)
 - **Technical Bulletin ISTB-2018-01, Revisions to Ottawa Design Guidelines – Sewer,**
City of Ottawa, March 21, 2018.
(ISTB-2018-01)
 - **Technical Bulletin ISTB-2018-03, Revisions to Ottawa Design Guidelines – Sewer,**
City of Ottawa, June, 2018.
(ISTB-2018-04)
 - **Technical Bulletin ISTB-2019-02, Revisions to Ottawa Design Guidelines – Sewer,**
City of Ottawa, July 8, 2019.
(ISTB-2019-02)
- **Ottawa Design Guidelines – Water Distribution**
City of Ottawa, July 2010.
(Water Supply Guidelines)
 - **Technical Bulletin ISD-2010-2**
City of Ottawa, December 15, 2010.
(ISD-2010-2)
 - **Technical Bulletin ISDTB-2014-02**
City of Ottawa, May 27, 2014.
(ISDTB-2014-02)
 - **Technical Bulletin ISTB-2018-02**
City of Ottawa, March 21, 2018.
(ISTB-2018-02)

- **Technical Bulletin ISTB-2021-03**
City of Ottawa, August 18, 2021
(ISTB-2021-03)

- **Design Guidelines for Sewage Works,**
Ministry of the Environment, 2008.
(MOE Design Guidelines)

- **Stormwater Planning and Design Manual,**
Ministry of the Environment, March 2003.
(SWMP Design Manual)

- **Ontario Building Code Compendium**
Ministry of Municipal Affairs and Housing Building Development Branch,
January 1, 2010 Update.
(OBC)

- **Mississippi-Rideau Source Water Protection Plan,**
MVCA & RVCA, August 2014.

- **Erosion & Sediment Control Guidelines for Urban Construction,**
Greater Golden Horseshoe Area Conservation Authorities, December 2006.

- **Geotechnical Investigation – Commercial and Residential Development,
3490 Innes Road, Ottawa, Ontario**
Golder Associates, February 2018 **(Geotechnical Report)**

- **Design Brief for Caivan (Orleans Village) Limited,
3490 Innes Road, Ottawa, Ontario**
DSEL, November 2018 **(Design Brief)**

- **Design Brief for Pond 1 East Urban Community**
DSEL File No. 20-1191, October 2022 **(SWM Report)**

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property is located within the 2E pressure zone, as shown in the excerpt from the City of Ottawa Water Distribution Mapping in **Appendix B**. The proposed subdivision is located north of the Town’s current watermain network located in the existing Orleans Village. A 400mm diameter watermain exists within the Innes Road ROW and a 300mm diameter watermain exists on the Lamarche Avenue ROW. In addition, 200mm diameter watermain stubs with dropped at the southeast corners of blocks 147 and 148.

3.2 Water Supply Servicing Design

The City of Ottawa was contacted on March 16, 2022, to obtain boundary conditions associated with the estimated water demand as indicated in the boundary request correspondence included in **Appendix B**. The City of Ottawa provided both the anticipated minimum and maximum water pressures, as well as the estimated water pressure during fire flow demand for the demands.

Figure 6 shows the proposed configuration of watermains for the subject property. The proposed system has a looped connection to the existing 300mm diameter watermain on Lamarche Avenue that connects to the existing 400mm diameter watermain on Innes Road.

The water servicing approach for the subject lands is for potable water to be supplied through pressurized local watermains on each street conforming to the **Water Supply Guidelines**.

Table 3: Water Supply Design Criteria

Design Parameter	Value
Residential Single Detached	3.4 P/unit
Residential Townhouse	2.7 P/unit
Residential Average Daily Demand	280 L/d/P
Residential Maximum Daily Demand	3 x Average Daily *
Residential Maximum Hourly*	5.5 x Average Daily *
Minimum Watermain Size	150 mm diameter
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure must not exceed	552 kPa
During fire flow operating pressure must not drop below	140 kPa
<small>*Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons. City Guidelines used for populations greater than 500 persons. -Table updated to reflect ISTB-2018-02</small>	

Table 4, below, summarizes the estimated domestic water and fire flow demands along with the boundary conditions provided by the City.

Table 4: Water Demand Proposed Conditions

Design Parameter	Estimated Demand¹ (L/s)	Boundary Condition Connection 1 (m H₂O / kPa)	Boundary Condition Connection 2 (m H₂O / kPa)
Average Daily Demand	1.62	130.8 / 397.3	130.8 / 410.1
Maximum Daily Demand Fire Scenario #1	4.70 + 166.7 = 171.4	126.9 / 359.0	125.7 / 360.0
Maximum Daily Demand Fire Scenario #2	4.70 + 233.3 = 238.0	124.8 / 338.4	122.6 / 329.6
Maximum Hourly Daily Demand	6.97	127.1 / 361.0	127.1 / 373.8
<ul style="list-style-type: none"> • Water demand calculation per Water Supply Guidelines. See Appendix B for detailed calculations. • Ground elevation at Connection 1 = 90.3m • Ground elevation at Connection 2 = 89.0m 			

Fire demands were estimated to be limited 10,000 L/min for townhomes conforming to **ISTB-2014-02**. The contemplated rear lane town house units and back-to-back units had an estimated fire flow of 14,000L/min. Fire flow calculations are detailed in the **Appendix B**, calculated in accordance with the **Fire Underwriters Survey's Water Supply for Public Fire Protection Guideline** (1999) and **Technical Bulletins ISDTB-2014-02** and **ISTB-2018-02**.

The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow demand for the demands indicated by the correspondence in **Appendix B**. As shown in **Table 4**, the minimum and maximum pressures fall within the required range identified in **Table 3**.

Development statistics have evolved slightly since the original boundary condition requested, however fire flow demands remain consistent with previous requests.

3.3 Water Supply Conclusion

It is anticipated that the proposed concept plan OV Phase 4 can be adequately serviced by a network of local watermains that connects to existing infrastructure on Lamarche Avenue.

The City of Ottawa must confirm available water pressures during average, peak hourly, and fire flow demands.

The proposed water supply design will conform with all relevant City of Ottawa Guidelines and Policies.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

Sanitary sewers exist west of the Phase 4 area and are located along Lamarche Avenue (see sanitary drainage plan found in **Appendix C**, extracted from the approved subdivision plans). The outlet connection to existing sewers is as follows:

- Existing 375 mm / 250 mm diameter sanitary trunk running north along Lamarche Avenue at an approximate depth of 86.5 that extends just to the southern corner of Block 148.
- Wastewater outlet for Block 147 - MH104A to MH 23A; Block 148 - MH 101A to MH22A

The subject site, Blocks 147 and 148, were considered in the **Design Brief**, which previously contemplated sanitary outflows from the subject lands. Block 147 had accounted for a population allowance of 1039 people for a 2.16-hectare area; and Block 148 had accounted for a population allowance of 1222 persons and a 2.54-hectare area.

4.2 Wastewater Design

The development is proposed to connect to the existing sanitary sewer within Lamarche Avenue. The subject property will be serviced by an internal gravity sewer system that follows the local road network and any required easements. The subject lands are tributary to Lamarche Avenue and will discharge through the existing infrastructure in accordance with the approved Master Servicing Study and subsequent background studies. The existing main described above on Lamarche Avenue will need to be extended approximately 90 m north to service the proposed Rear Lane Towns.

The Phase 4 development plan was estimated to have a population of 500. The proposed Phase 4 design anticipates a peak flow of **6.96 L/s**. Refer to calculations in **Appendix C** for details. The contemplated development plan reduces the expected wastewater contributions from the subject lands by approximately 70%. The reduction in population is not expected to have a negative impact on the receiving sewers. The as-built sanitary sewer calculation sheet is included in **Appendix C**.

Sufficient depth exists for frost cover and gravity to support the subject development.

Table 5, below, summarizes the **City Standards** to be employed in the design of the proposed wastewater sewer system.

Table 5: Wastewater Design Criteria

Design Parameter	Value
Residential – Townhome/ Semi	2.7 P/unit
Residential – Apartment / Back To Back	1.8 P/unit
Average Daily Demand	280 L/d/per
Peaking Factor	Harmon’s Peaking Factor. Max 4.0, Min 2.0 Harmon’s Corrector Factor 0.8
Infiltration and Inflow Allowance	0.05 L/s/ha (Dry Weather) 0.28 L/s/ha (Wet Weather) 0.33 L/s/ha (Total)
Park Flows	0.33 L/s/ha
Parking Peaking Factor	9300 L/ha/d
Sanitary sewers are to be sized employing the Manning’s Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sewer Size	200 mm diameter
Minimum Manning’s ‘n’	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
<i>Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012, and recent residential subdivisions in City of Ottawa (including revisions per ISTB Sewer-2018-01)</i>	

4.3 Wastewater Servicing Conclusions

The site is tributary to the Lamarche Avenue sewer. The subject property will be serviced by local sanitary sewers which will outlet to the existing infrastructure on Lamarche Avenue ROW. There is residual capacity in the downstream sewers there is sufficient capacity within the existing infrastructure to accommodate the flow from the proposed development.

The proposed wastewater design conforms to all relevant **City Standards**.

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Services

Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system located on Lamarche Avenue (see **Stormwater Drainage Plan** found in **Appendix D**, extracted from the approved subdivision plans).

The existing stormwater runoff from the site area generally drains west and is collected by the existing storm sewer located on Lamarche Avenue. Stormwater is directed overland by sheet flow from north to south towards the East Urban Community Pond 1 (EUC Pond 1) North Forebay/North Main Cell as well as associated existing ditch depressions. The outlet connection to existing sewers for the Phase 4 property is as follows:

- Existing 1350 mm / 825 mm / 375 mm / 300 mm diameter stormwater outlets run north along Lamarche Avenue. Stormwater control outlet for Block 147 - MH101 to MH 13; Block 148 - MH 104 to MH15

Flows that influence the watershed in which the subject property is located are further reviewed by the conservation authority. The subject property is located within the Ottawa River watershed and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA).

The subject site, comprising of blocks 147 and 148 was contemplated to have a Rational Method Runoff coefficient of 0.80 (Block 147 2.16ha @ 0.75 and Block 148 2.54ha @ 0.85). The Design Brief assumed time of concentrations of 10mins for each block for a total expected peak flow of 815L/s.

The subject property was included in the area tributary to the East Urban Community Pond 1 (EUC Pond 1). In December 2020 DSEL submitted and received approval for a Master Servicing Study to support the community wide servicing infrastructure for the Community Design Plan area, East Urban Community Phase 3. The subject lands, while outside of the Phase 3 area, were illustrated as tributary to the EUC Pond 1. See Drawing 4 extracted from the December 2020 MSS in **Appendix D**. DSEL / JFSA prepared and submitted a **SWM Report** in support of modifications to the north main cell and north forebay of EUC Pond 1 in October 2022. The subject lands were contemplated in the sizing of the modifications and had assumed an overall imperviousness of ~86%. See Figure 2 extracted from the SWM Report in **Appendix D**.

5.2 Post-Development Stormwater Management Target

Stormwater management requirements for the subject property have been carried forward from the **Design Brief** and **SWM Report**.

The following City standards are required for stormwater management within the subject property:

- Storm sewers on local roads are to be designed to provide a minimum 2-year level of service per the City's latest Technical Bulletin PIEDTB-2016-01;
- Provide Parks with a 5-year level of service;

- For less frequent storms (i.e. larger than 1:2 year minimum or 1:5 year minimum), the minor system sewer capture will be restricted with the use of inlet control devices to prevent excessive hydraulic surcharges;
- Under full flow conditions, the allowable velocity in storm sewers is to be no less than 0.80 m/s and no greater than 6.0 m/s;
- For the 100-year storm and for all roads, the maximum depth of water (static and/or dynamic) on streets, rear yards, public space and parking areas shall not exceed 0.35 m at the gutter;
- When catchbasins are installed in rear yards, safe overland flow routes are to be provided to allow the release of excess flows from such areas. A minimum of 30 cm of vertical clearance is required between the rear yard spill elevation and the ground elevation at the adjacent building envelope;
- The product of the maximum flow depths on streets and maximum flow velocity must be less than 0.60 m²/s on all roads;
- Quality Controls are addressed in the existing downstream stormwater management facility.

5.3 Proposed Minor System

The subject property is expected to be serviced by an internal gravity storm sewer system that is to generally follow the local road network and servicing easements as required.

Table 6: Storm Sewer Design Criteria

Design Parameter	Value
Minimum Minor System Design Return Period	2-Year (Local Streets), 5-Year (Collector Streets), 10-Year (Arterial Streets) - PIEDTB-2016-01; Park 5-year
Major System Design Return Period	1:100 year
Intensity Duration Frequency Curve (IDF) 2-year storm event: A = 732.951; B = 6.199; C = 0.810 5-year storm event: A = 998.071; B = 6.053; C = 0.814	$i = \frac{A}{(t_c + B)^C}$
Minimum Time of Concentration	10 minutes
Rational Method	$Q = CiA$
Storm sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Runoff coefficient for paved and roof areas	0.9
Runoff coefficient for landscaped areas	0.2
Minimum Sewer Size	250 mm diameter
Minimum Manning's 'n' for pipe flow	0.013
Minimum Depth of Cover	2.0m from crown of sewer to grade
Minimum Full Flowing Velocity	0.8 m/s
Maximum Full Flowing Velocity	6.0 m/s (where velocities in excess of 3.0 m/s are proposed, provision shall be made

	to protect against displacement of sewers by sudden movement)
Clearance from 100-Year Hydraulic Grade Line to Building Opening (USF)	0.30 m
Max. Allowable Flow Depth on Municipal Roads	35 cm above gutter (PIEDTB-2016-01)
Extent of Major System	To be contained within the municipal right-of-way or adjacent to the right-of-way provided that the water level must not touch any part of the building envelope and must remain below the lowest building opening during the stress test event (100-year + 20%) and 15cm vertical clearance is maintained between spill elevation on the street and the ground elevation at the nearest building envelope (PIEDTB-2016-01)
Stormwater Management Model	DDSWMM (release 2.1), SWMHYMO (v. 5.02) and XPSWMM (v. 10)
Model Parameters	Fo = 76.2 mm/hr, Fc = 13.2 mm/hr, DCAY = 4.14/hr, D.Stor.Imp. = 1.57 mm, D.Stor.Per. = 4.67 mm
Imperviousness	Based on runoff coefficient (C) where Percent Imperviousness = $(C - 0.2) / 0.7 \times 100\%$.
Design Storms	Chicago 3-hour Design Storms and 24-hour SCS Type II Design Storms. Maximum intensity averaged over 10 minutes.
Historical Events	July 1st, 1979, August 4th, 1988 and August 8th, 1996
Climate Change Street Test	20% increase in the 100-year, 3-hour Chicago storm
<i>Extracted from City of Ottawa Sewer Design Guidelines, October 2012, and Technical Bulletins</i>	

See sewer design sheet included in **Appendix D**.

5.4 Hydraulic Grade Line Analysis

A detailed hydraulic grade line (HGL) modelling analysis will be completed for the proposed system at the detailed design level, based on the 100-year 3-hour Chicago, 12-hour DCD, and 24-hour SCS design storms, including historical design storms and climate change stress test as required.

5.5 Major System Design

Major system conveyance, or overland flow (OLF), will be provided to accommodate flows more than the minor system capacity. OLF is accommodated by generally storing stormwater up to the 100-year design event in road sags then routing additional surface flow along the road network and service easements towards the proposed drainage features.

The **Design Brief** and **SWM Report** assumed that the subject lands would be designed as private development blocks complete with on-site storage. Furthermore, the SWM Report assumed minor system release rates for Block 147 to be limited to the 2-year + 20% and Block 148 to the 2-year event.

The **SWM Report** estimated impervious values of 79% for Block 147 and 93% for Block 148, for a combined imperviousness of 86%. The revised draft plan has an estimated imperviousness of 66%. Refer to runoff coefficient figures included in **Figures** and summary in **Table 7**. JFSA reviewed the impacts on the downstream infrastructure of reducing the imperviousness of the site. Results of their analysis are included in **Appendix D**. JFSA concluded that Phase 4 Orleans Village will not negatively impact the operation of EUC Pond 1 or the Orleans Village storm sewer system.

Table 7: Runoff Coefficient Summary

Land Use	Total Area (ha)	C
Townhouses	1.38	0.62
Back to Back Townhomes	0.93	0.74
Rear Lane Townhomes	0.26	0.74
Parks/walkways	0.28	0.40
18.0m ROW	1.46	0.67
14.75m ROW	0.20	0.81
Total / Weighted C	4.52	0.66

5.6 Grading and Drainage Design

The following additional grading criteria and guidelines are applied to detailed design, per City of **Ottawa Guidelines**:

- Driveway slopes will have a maximum slope of 6%;
- Slope in grassed areas will be between 2% and 7%;
- Grades in excess of 7% will require terracing to a maximum of a 3:1 slope;
- Swales are to be 0.15m deep with 3:1 side slopes unless otherwise indicated on the drawings; and,
- Perforated pipe will be required for drainage swales if they are less than 1.5% in slope.

The proposed road profile will consist of a saw tooth road pattern. Roughly 500m of the proposed 18m right-of-way will be graded with a high-point to high-point at 0.2% or less. Approximately 145m³/100m of surface storage can be accommodated within a saw tooth pattern at 0.2%. Therefore, it is anticipated that 750m³ of sag storage is available within the right-of-way. See figure in **Appendix D** for additional information.

Figure 3 illustrates the conceptual grading for the contemplated development. External areas north of the development will be captured by the proposed system. External lands to the east will be conveyed around the development in a cut of swale. The grading plan is consistent with approved plans for Phase 1 and 2 of Orleans Village.

Draft 14.75m and 18m cross-sections have been appended to this report.

5.7 Stormwater Servicing Conclusions

The site is tributary to the Lamarche Avenue storm sewer. The subject property will be serviced by local storm sewers which will outlet to the existing infrastructure on Lamarche Avenue ROW.

The subject site was contemplated in the design of the receiving sewers and stormwater management facility at a higher imperviousness than the current proposal.

There is residual capacity in the downstream sewers there is sufficient capacity within the existing infrastructure to accommodate the flow from the proposed development.

The contemplated design conforms to all relevant **City Standards**.

6.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate and topography. The extent of erosion losses is exaggerated during construction where vegetation has been removed and the top layer of soil becomes agitated. Prior to topsoil stripping, earthworks or construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

Silt fencing will be installed around the perimeter of the active part of the site (and headwater features) and will be cleaned and maintained throughout construction. The silt fence will remain in place until the working areas have been stabilized and re-vegetated. Material stockpiles shall not be permitted near the existing EUC Pond 1.

Catchbasins will have catchbasin inserts installed during construction to protect from silt entering the storm sewer system.

A mud mat will be installed at the construction access to prevent mud tracking onto adjacent roads.

The following additional recommendations to the Contractor will be included in contract documents:

- Limit extent of exposed soils at any given time.
- Re-vegetate exposed areas as soon as possible.
- Minimize the area to be cleared and grubbed.
- Protect exposed slopes with plastic or synthetic mulches.
- Install silt fence to prevent sediment from entering any existing ditches.
- No refueling or cleaning of equipment near existing watercourses.
- Provide sediment traps and basins during dewatering.

The Contractor will be required to complete regular inspections and guarantee proper performance. The inspection is to include:

- Verification that water is not flowing under silt barriers.
- Clean and change inserts at catch basins.

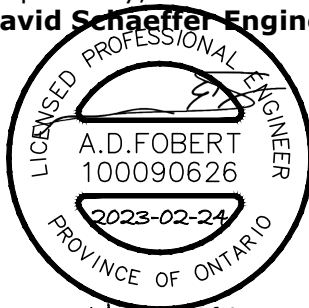
7.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by Caivan (Orleans Village 2) Limited to prepare a Functional Servicing Report in support of the application for draft plan of subdivision at 245 and 275 Lamarche Avenue. The preceding report outlines the following:

- Water – a 300mm diameter water main is available to support the subject lands. Sufficient pressure is available within the City of Ottawa’s desired pressure range.
- Wastewater – Sanitary sewers are available on Larmarche Avenue and were designed to sufficiently convey wastewater from the subject property.
- Stormwater – Block 147 and 148 were previously conceived to be private development blocks with on-site storage. The proposed change in land use and resulting reduction in imperviousness reduces site runoff and storage requirements. JFSA reviewed the impacts of the proposed changes to the receiving stormwater infrastructure and concluded that there are no .

The submitted materials demonstrate that the existing water, sanitary, and storm services can accommodate the contemplated development.

Prepared by,
David Schaeffer Engineering Ltd.



Per: Adam D. Fobert, P.Eng.

© DSEL

z:\projects\22-1296_caivan-orlean_village_ph4\b_design\b3_reports\b3-2_servicing (dsel)\04_fsr_subm4\2023-02-24_1296_ov_phase4_fsr.docx



David Schaeffer Engineering Ltd.

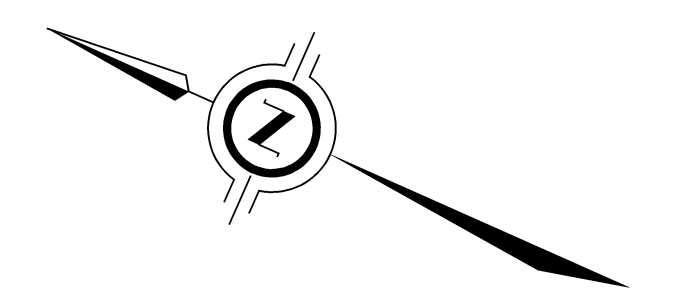
120 Iber Road, Suite 103

Stittsville, ON K2S 1E9

613-836-0856

dsel.ca

APPENDIX A



APPROVED UNDER SECTION 51 OF THE PLANNING ACT,
by the City of Ottawa, this _____ day of _____, 2018.

PLAN 4M-

I CERTIFY THAT THIS PLAN IS REGISTERED IN THE LAND REGISTRY OFFICE FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON (No. 4) AT _____ O'CLOCK ON THE _____ DAY OF _____, 2018 AND ENTERED IN THE PARCEL REGISTER FOR PROPERTY IDENTIFIER _____ AND THE REQUIRED CONSENTS ARE REGISTERED AS PLAN DOCUMENT No. _____

LAND REGISTRAR

THIS PLAN COMPREHENDS ALL OF PINS 04404-0464(LT), 04404-0998(LT), 04404-0196(LT), 04404-0198(LT) AND PART OF PIN 04404-0195(LT), PIN 04404-0998(LT) SUBJECT TO AN EASEMENT AS IN OC1702112, PIN 04404-0119(LT) SUBJECT TO AN EASEMENT AS IN OC1702109.

PART OF LOT 5 CONCESSION 3 (OTTAWA FRONT) GEOGRAPHIC TOWNSHIP OF GLOUCESTER CITY OF OTTAWA AND PART OF BLOCK 58 REGISTERED PLAN 4M-948 CITY OF OTTAWA

Scale 1 : 1000
0 20 40 60 metres

J.D. BARNES LIMITED

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

OWNER'S CERTIFICATE - PLAN OF SUBDIVISION
THIS IS TO CERTIFY THAT:
1. LOTS 1 TO 330 BOTH INCLUSIVE, BLOCKS 331 TO 382 BOTH INCLUSIVE, THE STREETS NAMED, AND THE 0.30 RESERVE ARE HEREBY DEDICATED TO THE CITY OF OTTAWA IN ACCORDANCE WITH OUR INSTRUCTIONS.

2. THE STREETS ARE HEREBY DEDICATED TO _____ DATED THIS _____ DAY OF _____ 2018.

OWNERS NAME _____

1. I HAVE THE AUTHORITY TO BIND THE CORPORATION _____

NOTES

BEARINGS ARE MTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, MTM ZONE 09, NAD83 (CSRS) (2010.0).
DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9996314.

INTEGRATION DATA			
OBSERVED REFERENCE POINTS (ORP): MTM ZONE 09, NAD83 (CSRS) (2010.0). COORDINATES TO URBAN ACCURACY PER SECTION 14 (2) OF OREG 216/10.			
POINT ID	EASTING	NORTHING	
ORP (A)	380 987.01	5 034 571.28	
ORP (B)	381 109.60	5 034 643.16	
COORDINATES CANNOT IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.			

LEGEND

- DENOTES SURVEY MONUMENT FOUND
- DENOTES SURVEY MONUMENT SET
- SB DENOTES STANDARD IRON BAR
- SB DENOTES SHORT STANDARD IRON BAR
- IB DENOTES IRON BAR
- PL DENOTES PLASTIC BAR
- WT DENOTES WITNESS
- MEAS DENOTES MEASURED
- JD DENOTES J.D. BARNES LIMITED

ALL SET SSB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF OREG 525/91.

SURVEY MONUMENTS PLANTED ARE IRON BARS UNLESS OTHERWISE NOTED. DISTANCES SHOWN ON CURVED LIMITS ARE ARC MEASUREMENTS. SURVEY MONUMENTS FOUND ARE J.D. BARNES LIMITED UNLESS OTHERWISE NOTED.

SURVEYOR'S CERTIFICATE

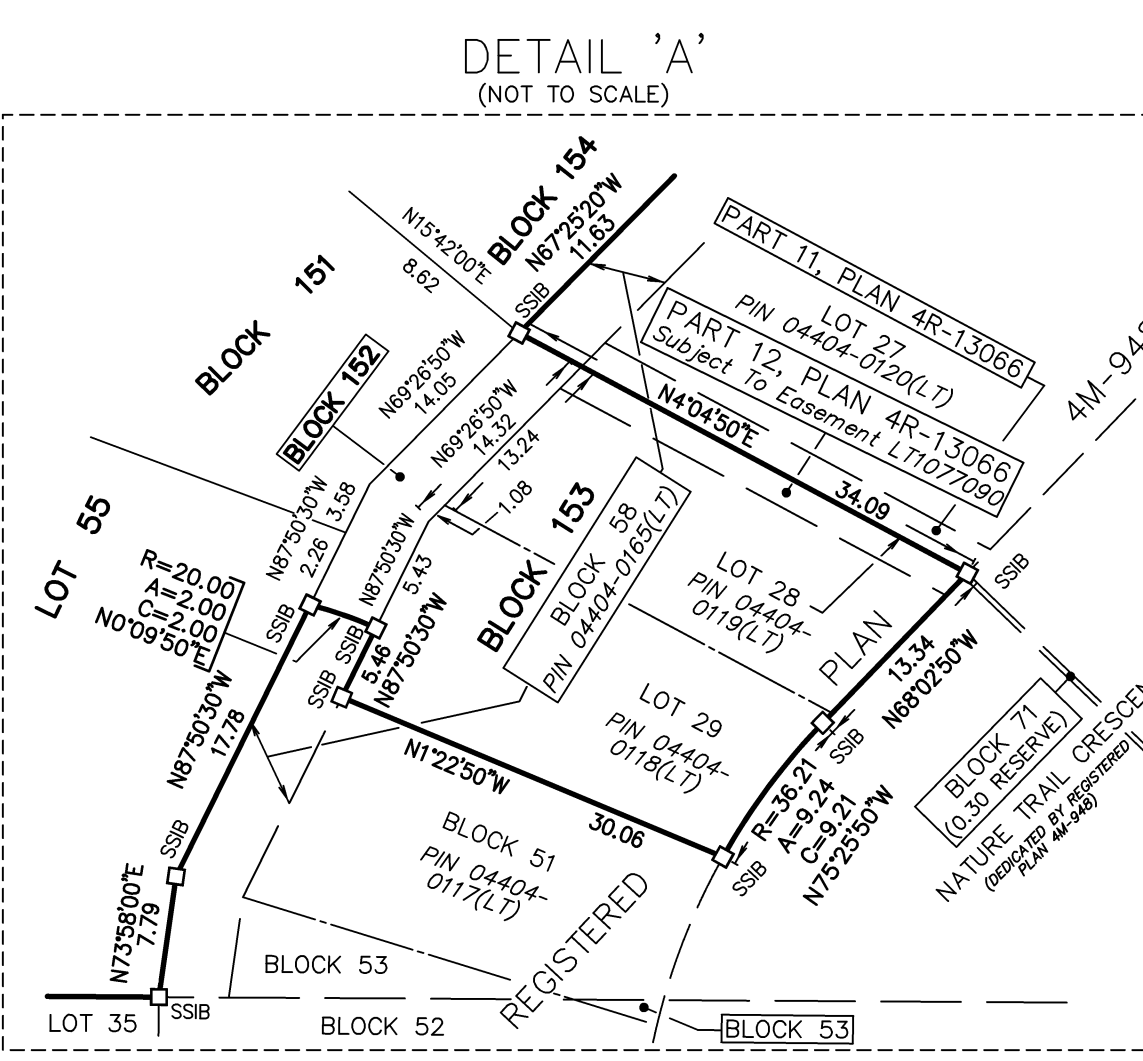
1. I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON _____

DATE _____

ONTARIO LAND SURVEYOR

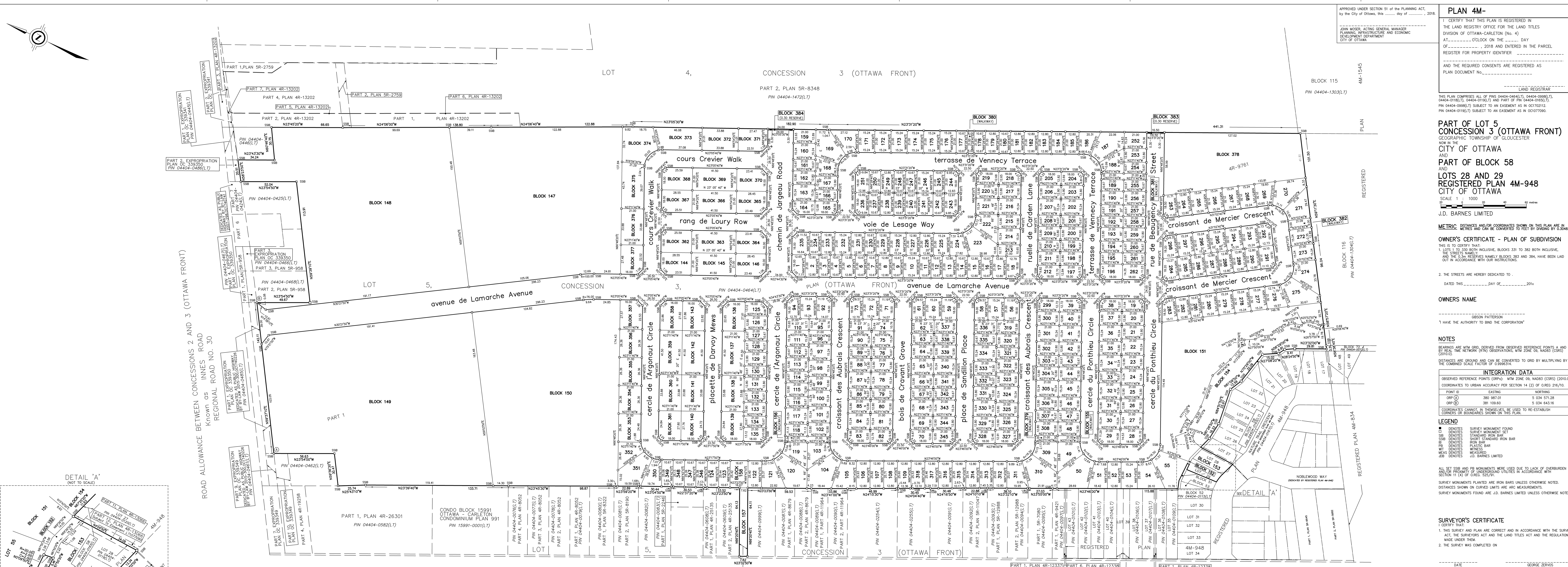


LAND INFORMATION SPECIALISTS
3400 DON RIVER DRIVE, SUITE 204, OTTAWA, ON K1H 1E1
T: (613) 731-7244 F: (613) 731-8955 www.jdbarnes.com



ROAD ALLOWANCE BETWEEN CONCESSIONS 2 AND 3 (OTTAWA FRONT) Known as INNES ROAD REGIONAL ROAD NO. 30

ROAD ALLOWANCE BETWEEN LOTS 5 AND 6 Known as PAGE ROAD PIN 04404-0409(LT)



NOTE RE: PROPOSED CONNECTION ON EXISTING PAVEMENT
 PROPOSED UNDERGROUND CONNECTIONS WITHIN EXISTING PAVEMENT TO BE CONSTRUCTED AS FOLLOWS:
 1. PROPOSED UNDERGROUND CONNECTIONS TO BE CONSTRUCTED IN VERTICAL TRENCH AND BACKFILLED WITH UNSHRINKABLE FILL
 2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF EX. UNDERGROUND SERVICES AND EX. UTILITIES PRIOR TO STARTING CONSTRUCTION
 3. ANY DISTURBED AREAS, INCLUDING CURBS, SIDEWALK AND BOULEVARD, TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER
 4. ALL REMOVED ASPHALT PAVEMENT TO BE DEPOSITED OFF SITE
 5. ALL WORKS INCLUDING REMOVAL AND RESTORATION TO THE SATISFACTION OF CITY OF OTTAWA

CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF EX. UNDERGROUND SERVICES AND EX. UTILITIES PRIOR TO STARTING CONSTRUCTION
 ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

NOTE RE: WATERMAIN / WATER SERVICE
 1. INSULATION REQUIRED FOR WATERMAIN / WATER SERVICE WHERE THE SEPARATION BETWEEN WATERMAIN / WATER SERVICE AND OTHER SERVICES AND STRUCTURES IS LESS THAN 1.2m AND THE COVER IS LESS THAN 2.4m. REFER TO CITY STD. W23 FOR DETAIL.
 2. FOR SERVICE INSTALLATION AT SEWER CROSSING, REFER TO CITY STD. W39 FOR DETAIL.

NOTE:
 THE COVER OF EX. MH, CB, CHAMBER AND OTHER ABOVEGROUND FEATURES TO BE ADJUSTED TO SUIT THE NEW FINISHED GRADE, WHERE APPLICABLE.

NOTE RE: TEST PIT/BOREHOLE EXCAVATIONS
 ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION.

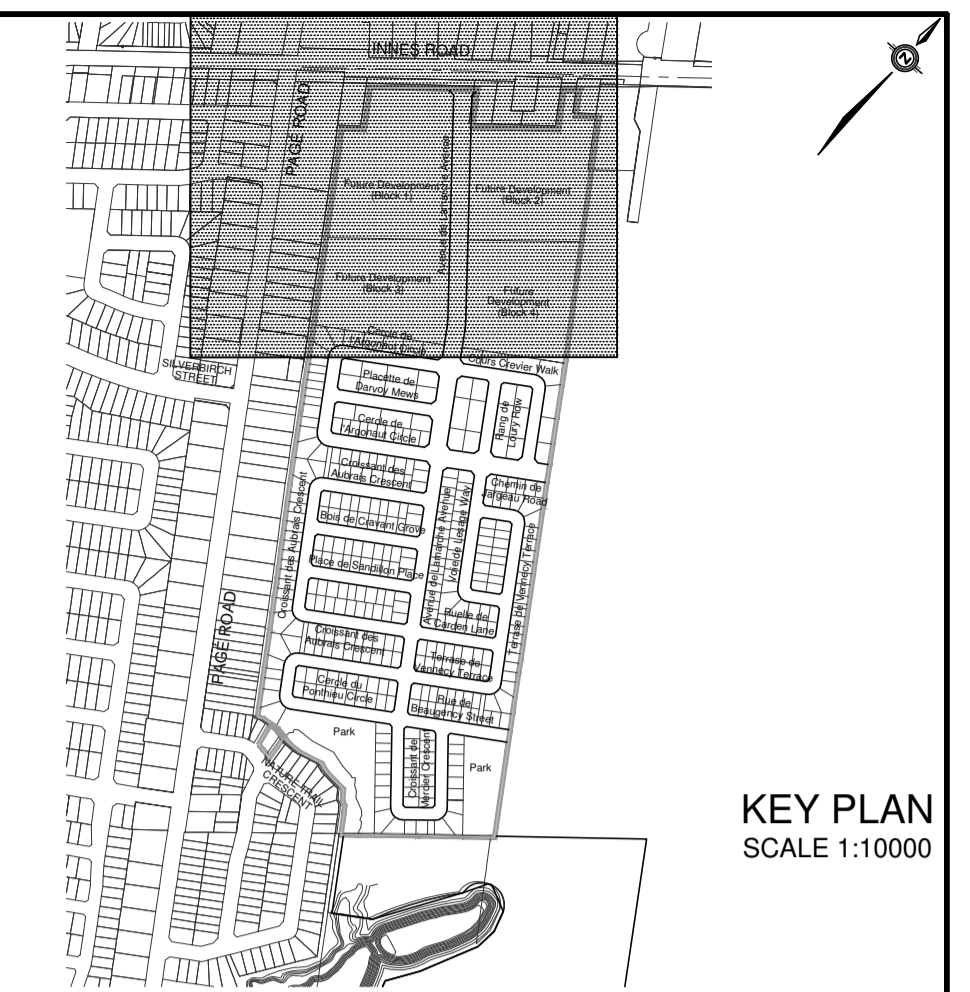
NOTE
 FOR WATERMAIN CROSSING BELOW AND ABOVE SEWERS, REFER TO CITY STD. W25 AND W25.2, RESPECTIVELY, WHERE APPLICABLE

NOTE
 FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS, SLEEVE SHALL BE USED

NOTE:
 ALL EXISTING POST & WIRE FENCE, CULVERTS, UTILITY WIRE / POLES, TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
 PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

APPROVED REFUSED
 THIS ___ DAY OF ___, 20__

JOSHUA WHITE, P.ENG
 PROJECT MANAGER - EAST BRANCH PLANNING, INFRASTRUCTURE & ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



ROAD ALLOWANCE BETWEEN CONCESSIONS 2 AND 3 (OTTAWA FRONT)
 Known as INNES ROAD
 REGIONAL ROAD NO. 30



LEGEND

CROSS	SINGLE SERVICE LOCATION (ST, SAN & WM)	
45° BEND	SINGLE SERVICE LOCATION (SAN & WM)	
LATERAL	SINGLE SERVICE LOCATION (ST, SAN & WM)	
HYDRANT, VALVE & VB	HYDRO SWITCHGEAR	
TEE	HYDRO TRANSFORMER	
VALVE & VC	STREET LIGHT STANDARD	
VALVE & VB	DITCH AND CULVERT	
22.5° BEND	CONCRETE SIDEWALK	
11.25° BEND	CURB & DEPRESSED CURB	
REDUCER	ASPHALT SIDEWALK	
CAP	CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)	
SANITARY MAINTENANCE HOLE	NOISE BARRIER (3.0m UNLESS OTHERWISE NOTED)	
CAP	DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)	
STREET CATCHBASIN & LEAD	WOOD PRIVACY BARRIER	
STREET CATCHBASIN WITH CLOSED LID & LEAD	POST AND RAIL FENCE	
STORM MAINTENANCE HOLE	PHASING LIMITS	
CURB INLET CATCH-BASIN & LEAD	PROPERTY BOUNDARY	
CATCHBASIN/ MAINTENANCE HOLE	OVERLAND FLOW DIRECTION	
INTERCONNECTED CATCH BASIN & LEADS	EXTERNAL OVERLAND FLOW DIRECTION	
CAP	EMERGENCY OVERLAND FLOW DIRECTION	
TEE CATCHBASIN	TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6)	
PERFORATED PIPE	EROSION SETBACK	
ELBOW CATCHBASIN	MEANDER BELT LIMIT	

TOPOGRAPHIC INFORMATION
 TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00, SURVEYS DATED NOVEMBER 30, 2017.
LEGAL INFORMATION
 CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00 (PHASE 1 & 2) DATED SEPTEMBER 14, 2018.

ELEVATION NOTE ELEVATION = 86.12 m
 ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM SITE BENCHMARK NCC CONTROL POINT 001196530229 HAVING A PUBLISHED ELEVATION OF 86.12m

No.	DATE	BY	DESCRIPTION
6.	18-10-30	M.Z.	REVISED M-PLAN
5.	18-07-27	M.Z.	REVISED WEST BOUNDARY STORM SYSTEM
4.	18-07-10	M.Z.	MYLARS FOR PHASE 1 COMMENCE WORK
3.	18-06-28	M.Z.	REVISED AS PER CITY AND UTILITY COMMENTS
2.	18-05-09	M.Z.	ISSUED FOR MOE APPROVAL
1.	18-01-24	M.Z.	1st SUBMISSION

Ottawa CITY OF OTTAWA



PROJECT No. 16-881

GENERAL PLAN © DSEL
 CAIVAN (ORLEANS VILLAGE) LIMITED
 ORLEANS VILLAGE

DSEL david schaeffer engineering ltd
 120 Iker Road, Unit 103
 Strathville, ON K2S 1E9
 Tel: (613) 836-8656
 Fax: (613) 836-7183
 www.DSEL.ca

DRAWN BY: M.Z.	CHECKED BY: P.P.	DRAWING NO.	SHEET NO.
DESIGNED BY: P.P.	CHECKED BY: M.Z.		6
SCALE: 1:1000	DATE: JANUARY 2018		

CITY PLAN No. 17675
 D07-16-16-0022
 CITY FILE No.

PAVEMENT DESIGN

40mm HL-3 OR SUPERPAVE 12.5
 50mm HL-8 OR SUPERPAVE 19.0
 150mm GRANULAR "A"
 600mm GRANULAR "B" TYPE II

PERMISSION REQUIRED
 FOR WORK ON ADJACENT LANDS

NOTE
 FOR WATERMAIN CROSSING BELOW AND ABOVE
 SEWERS, REFER TO CITY STD. W25 AND W25.2,
 RESPECTIVELY, WHERE APPLICABLE

ANY DISTURBED AREA DURING
 CONSTRUCTION TO BE RESTORED TO THE
 ORIGINAL CONDITION OR BETTER TO THE
 SATISFACTION OF THE AUTHORITIES
 HAVING JURISDICTION

NOTE
 FOR WATERMAIN STUBS, 2.4m
 MIN. COVER TO BE PROVIDED

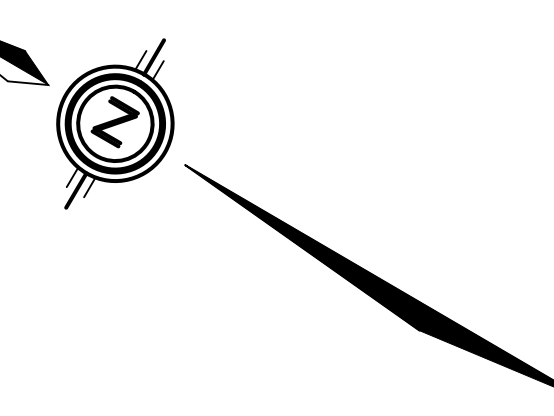
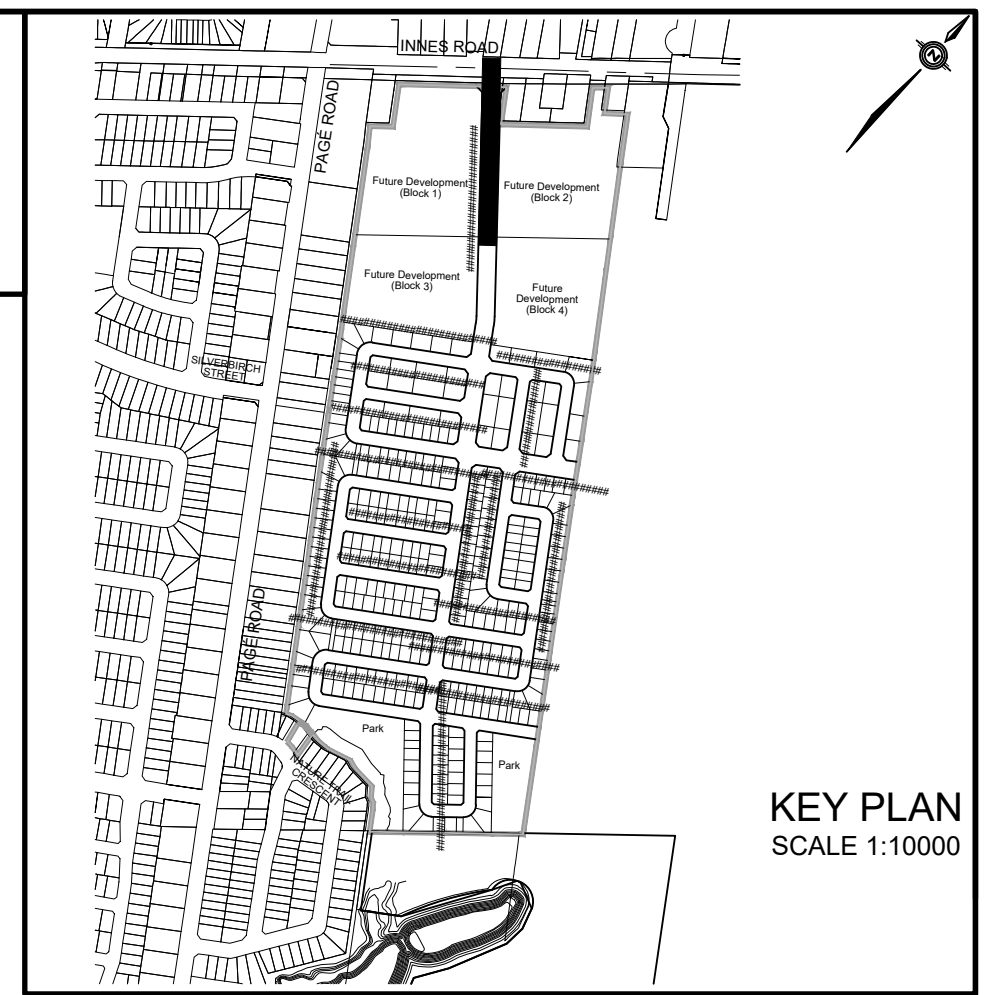
NOTE: ICD
 FOR ICD APPLICATION, REFER TO
 DRAWING 72 FOR DETAIL.

NOTE:
 THE COVER OF EX. MH, CHAMBER AND OTHER
 ABOVEGROUND FEATURES TO BE ADJUSTED TO SUIT
 THE NEW FINISHED GRADE,
 WHERE APPLICABLE.

NOTE:
 ALL EXISTING POST & WIRE FENCE,
 CULVERTS, UTILITY WIRE / POLES,
 TREES, SHRUBS ETC. WITHIN LOTS,
 BLOCKS AND ROADS TO BE
 REMOVED, UNLESS OTHERWISE NOTED

APPROVED REFUSED
 THIS ___ DAY OF _____, 20__

JOSHUA WHITE, P.ENG
 PROJECT MANAGER - EAST BRANCH
 PLANNING, INFRASTRUCTURE & ECONOMIC
 DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



LEGEND

- CROSS
- 45° BEND
- LATERAL
- HYDRANT, VALVE & VB
- TEE
- VALVE & VC
- VALVE & VB
- 22.5° BEND
- 11.25° BEND
- REDUCER
- CAP
- SANITARY MAINTENANCE HOLE
- CAP
- STREET CATCHBASIN & LEAD
- STREET CATCHBASIN WITH CLOSED LID & LEAD
- STORM MAINTENANCE HOLE
- CURB INLET CATCHBASIN & LEAD
- CATCHBASIN/ MAINTENANCE HOLE
- INTERCONNECTED CATCH BASIN & LEADS
- CAP SINGLE SERVICE LOCATION (S1, SAN & WM)
- SINGLE SERVICE LOCATION (ST, SAN & WM)
- TEE CATCHBASIN
- PERFORATED PIPE
- ELBOW CATCHBASIN
- AS-BUILT ELEVATION
- HYDRO SWITCHGEAR
- HYDRO TRANSFORMER
- STREET LIGHT STANDARD
- CONCRETE SIDEWALK
- CURB & DEPRESSIONED CURB
- ASPHALT WALKWAY
- CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
- NOISE BARRIER (3.0m UNLESS OTHERWISE NOTED)
- DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)
- WOOD PRIVACY BARRIER
- POST AND RAIL FENCE
- PROPERTY BOUNDARY
- BOREROLE (BH)
- TEST PIT (TP)
- AUGER HOLE (AH)
- MONITORING WELL LOCATION
- CONCEPTUAL WELL LOCATION
- TOP OF FOUNDATION ELEVATION
- FINISHED FLOOR ELEVATION
- UNDERSIDE OF FOOTING ELEVATION
- NUMBER OF RISERS
- UNITS REQUIRING PRESSURE REDUCING VALVES
- WALKOUT UNITS
- SLAB ON GRADE
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION
- TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. S06)
- PHASE LINE
- CLAY SEAL (REFER TO GENERAL NOTES AND GEOTECHNICAL REPORT)

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00, SURVEYS DATED NOVEMBER 30, 2017.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00 (PHASE 1 & 2) DATED SEPTEMBER 14, 2018.

ELEVATION NOTE

ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM SITE BENCHMARK NCC CONTROL POINT 001196530229 HAVING A PUBLISHED ELEVATION OF 86.12m

No.	DATE	BY	DESCRIPTION
7.	21-03-03	L.M.	AS-BUILT SERVICING INFORMATION ADDED
6.	18-10-30	M.Z.	REVISED M-PLAN
5.	18-07-27	M.Z.	REVISED WEST BOUNDARY STORM SYSTEM
4.	18-07-10	M.Z.	MYLARS FOR PHASE 1 COMMENCE WORK
3.	18-06-28	M.Z.	REVISED AS PER CITY AND UTILITY COMMENTS
2.	18-05-09	M.Z.	ISSUED FOR MOE APPROVAL
1.	18-01-24	M.Z.	1st SUBMISSION



AS-BUILT

PROJECT No. 16-881

This drawing has been updated by DSEL to represent the 'as-built' condition of the infrastructure constructed. The information contained herein has been provided by third parties. Although the information is believed to correctly reflect conditions at the time of certification, DSEL provides no warranty as to the currency, accuracy or completeness of the information shown. There may have been changes to the infrastructure represented since the completion of the subject development and others intending to reference this information are advised to obtain independent third party confirmation of its accuracy prior to its use.

PLAN AND PROFILE OF
Avenue de Lamarche Avenue
 (FROM STA. 0+000.000 TO STA. 0+240.000) © DSEL

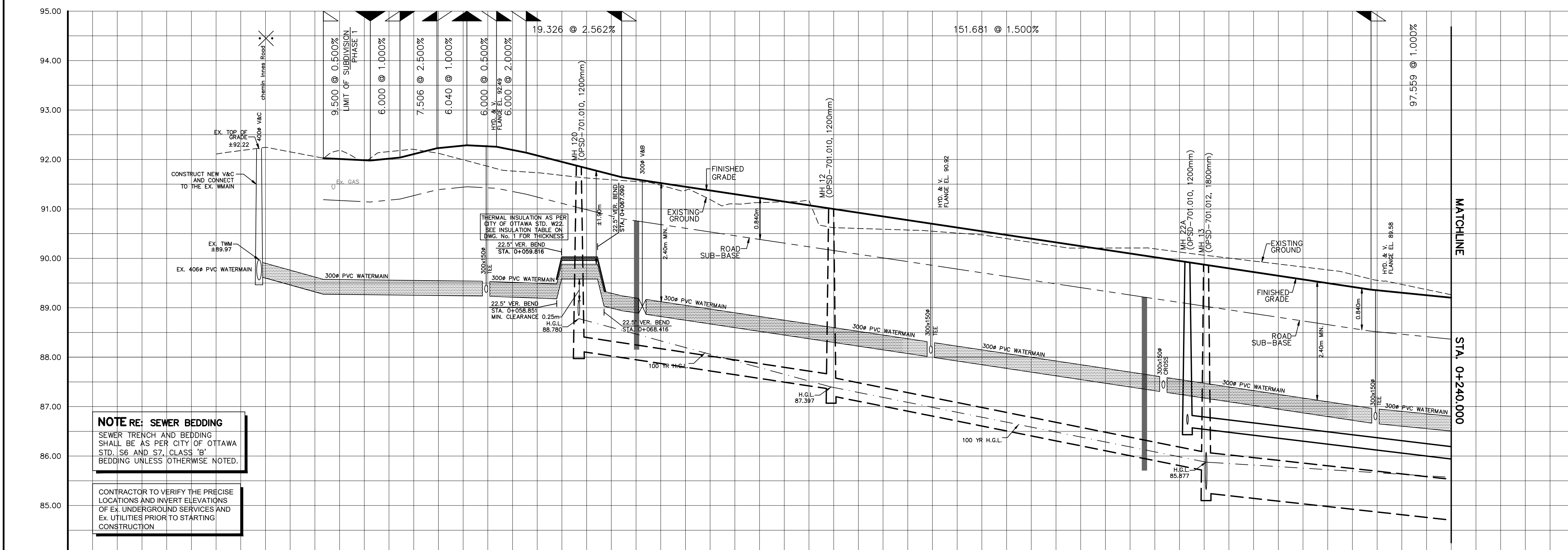
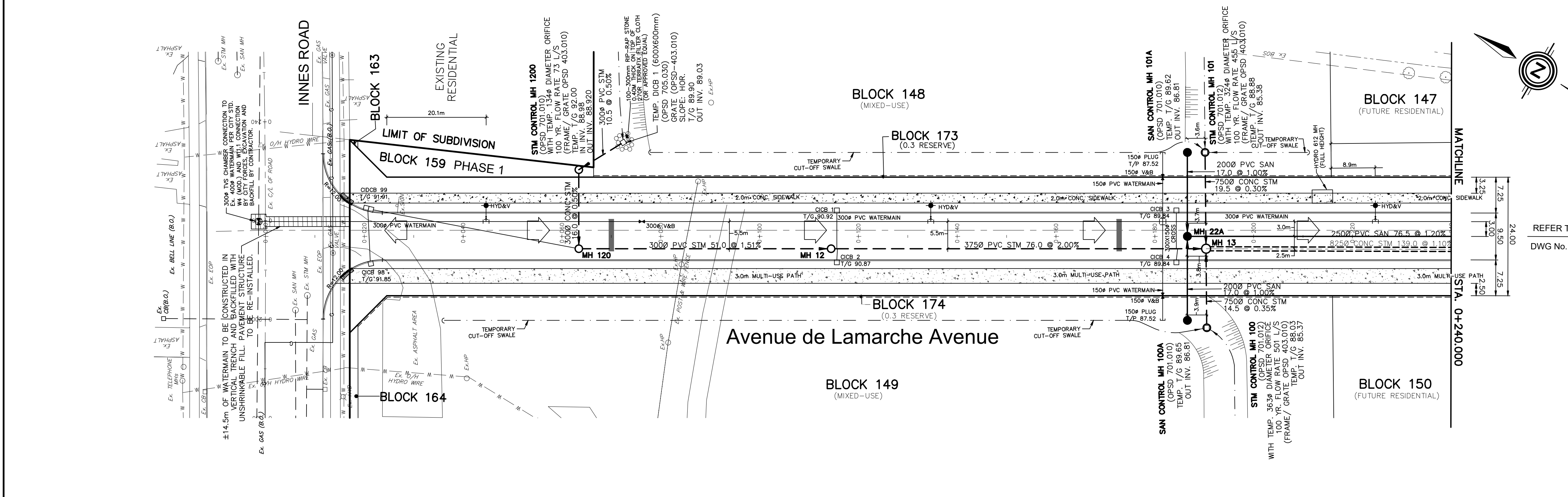
CAIVAN (ORLEANS VILLAGE) LIMITED

ORLEANS VILLAGE

DSEL
 david schaeffer engineering ltd

120 Iler Road, Unit 103
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 Tel: (613) 838-8868
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DRAWN BY: M.Z. CHECKED BY: P.P. DRAWING NO. SHEET NO.
 DESIGNED BY: P.P. CHECKED BY: M.Z.
 SCALE: H=1:500/V=1:50 DATE: JANUARY 2018 **10**



NOTE: SEWER BEDDING
 SEWER TRENCH AND BEDDING SHALL BE AS PER CITY OF OTTAWA STD. S6 AND S7, CLASS 'B' BEDDING UNLESS OTHERWISE NOTED.

CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF EX. UNDERGROUND SERVICES AND EX. UTILITIES PRIOR TO STARTING CONSTRUCTION

CENTERLINE CHAINAGE	PROPOSED GRADES	SANITARY INVERT	STORM INVERT	TOP OF WATERMAIN
0+000.000				89.970
0+010.000				89.575
0+020.000				89.57
0+030.000				89.542
0+040.000				89.542
0+050.000				89.542
0+060.000				89.542
0+070.000				89.542
0+080.000				89.542
0+090.000				89.542
0+100.000				89.542
0+110.000				89.542
0+120.000				89.542
0+130.000				89.542
0+140.000				89.542
0+150.000				89.542
0+160.000				89.542
0+170.000				89.542
0+180.000				89.542
0+190.000				89.542
0+200.000				89.542
0+210.000				89.542
0+220.000				89.542
0+230.000				89.542
0+240.000				89.542

CITY PLAN No. 17675
 D07-16-16-0022
 CITY FILE No.

PAVEMENT DESIGN

40mm HL-3 OR SUPERPAVE 12.5
 50mm HL-8 OR SUPERPAVE 19.0
 150mm GRANULAR "A"
 600mm GRANULAR "B" TYPE II

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 FOR WORK ON ADJACENT LANDS

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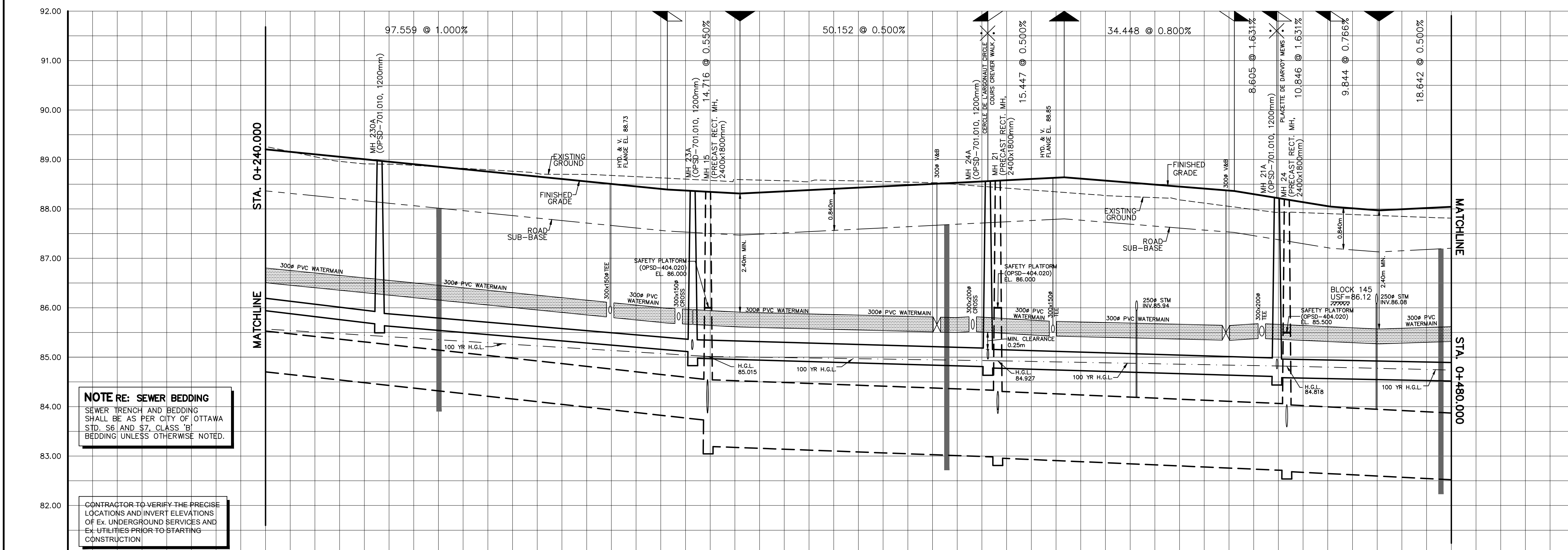
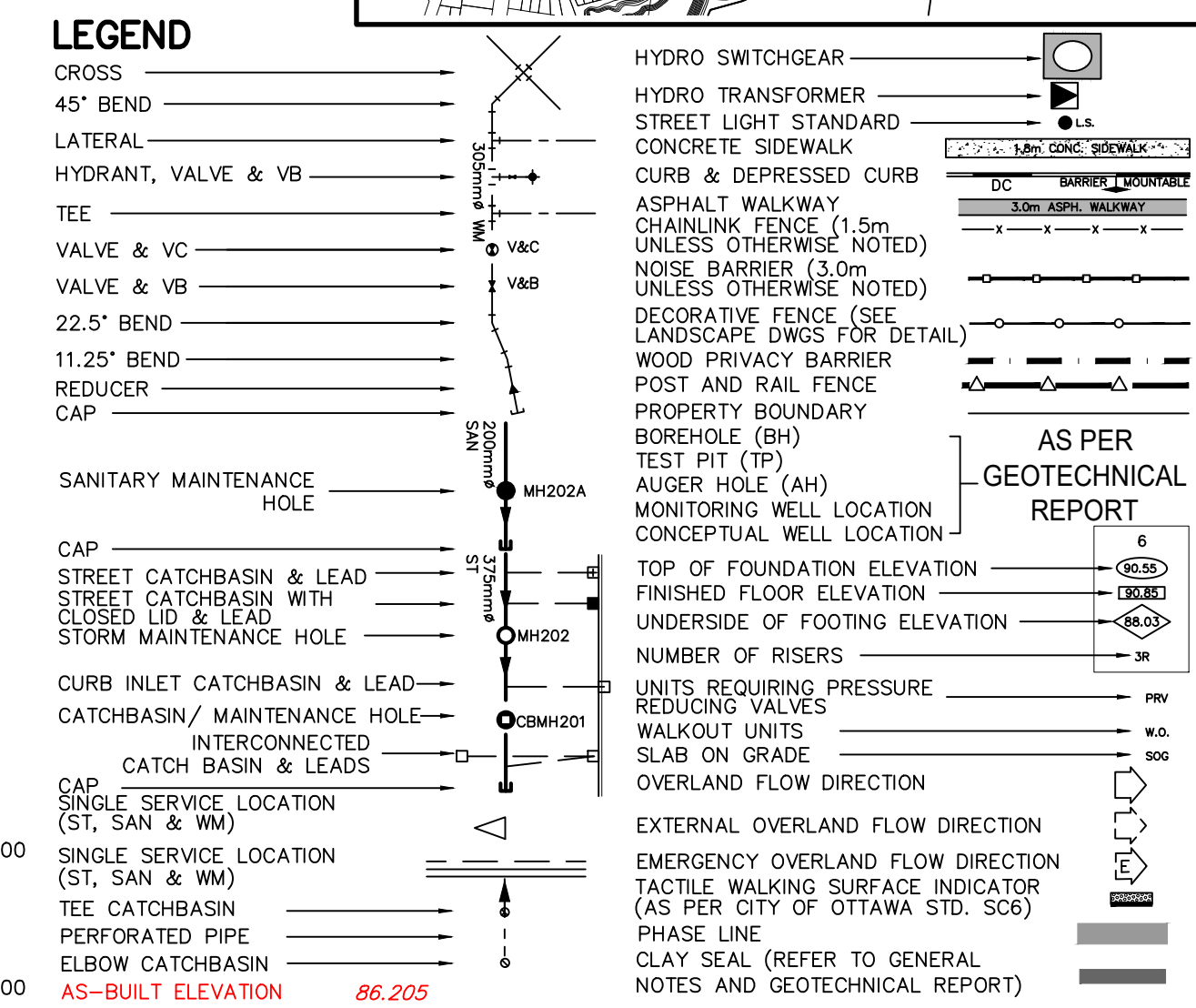
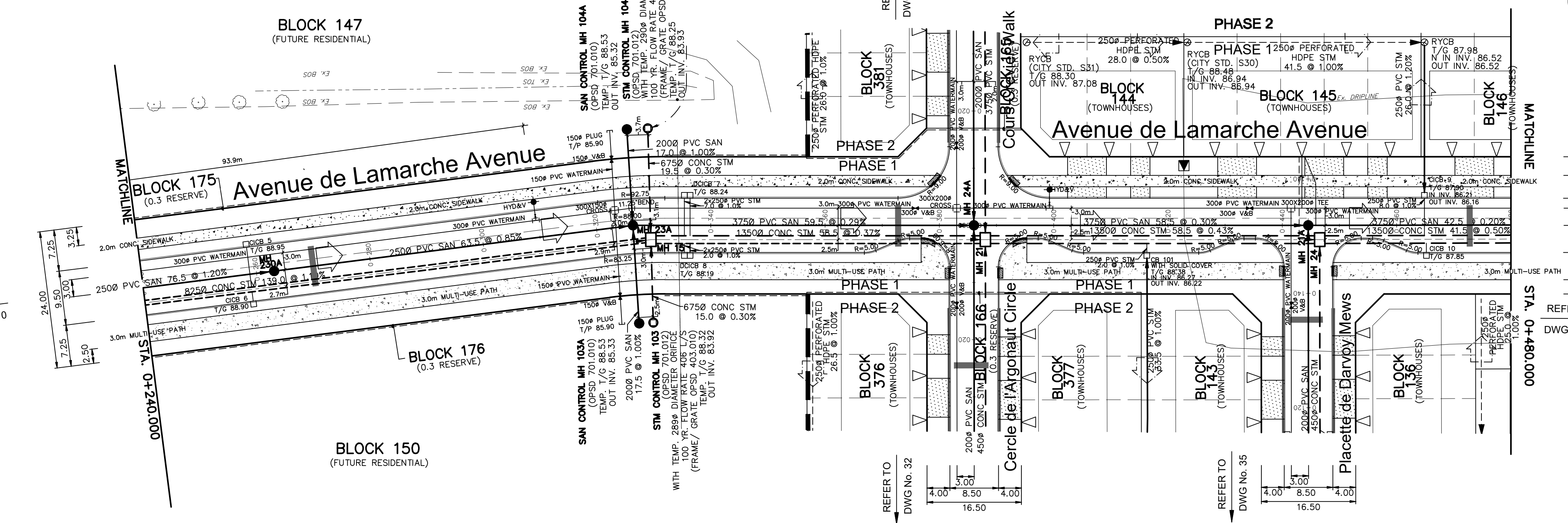
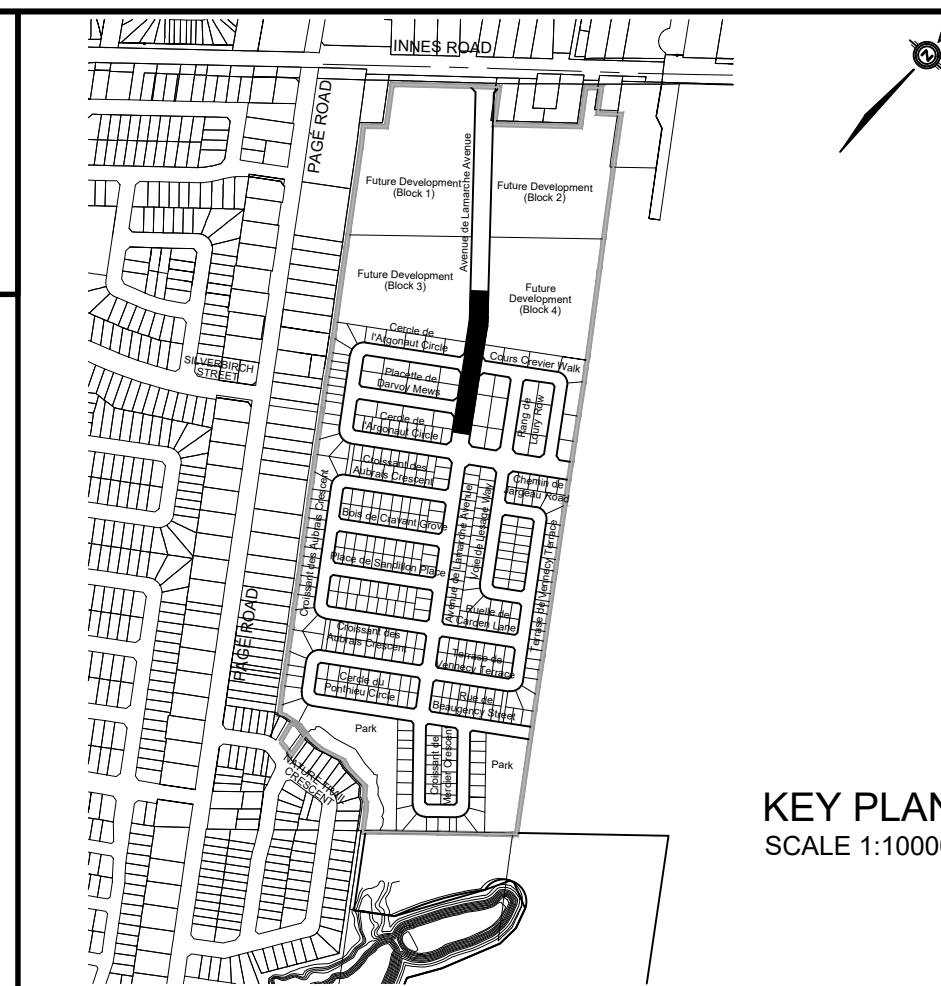
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APPROVED REFUSED
 THIS ___ DAY OF ___, 20__

JOSHUA WHITE, P.ENG
 PROJECT MANAGER - EAST BRANCH
 PLANNING, INFRASTRUCTURE & ECONOMIC
 DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



TOP OF WATERMAIN	STORM INVERT	SANITARY INVERT	PROPOSED GRADES	CENTERLINE CHAINAGE	TOP OF WATERMAIN	STORM INVERT	SANITARY INVERT	PROPOSED GRADES	CENTERLINE CHAINAGE
86.80	86.60	86.60	88.204	0+240.000	86.80	86.60	86.60	88.204	0+240.000
86.60	86.60	86.60	88.204	0+260.000	86.60	86.60	86.60	88.204	0+260.000
86.40	86.40	86.40	88.204	0+280.000	86.40	86.40	86.40	88.204	0+280.000
86.104	86.104	86.104	88.204	0+300.000	86.104	86.104	86.104	88.204	0+300.000
86.00	86.00	86.00	88.204	0+320.000	86.00	86.00	86.00	88.204	0+320.000
85.90	85.90	85.90	88.204	0+340.000	85.90	85.90	85.90	88.204	0+340.000
85.85	85.85	85.85	88.204	0+360.000	85.85	85.85	85.85	88.204	0+360.000
85.80	85.80	85.80	88.204	0+380.000	85.80	85.80	85.80	88.204	0+380.000
85.68	85.68	85.68	88.204	0+400.000	85.68	85.68	85.68	88.204	0+400.000
85.594	85.594	85.594	88.204	0+420.000	85.594	85.594	85.594	88.204	0+420.000
85.55	85.55	85.55	88.204	0+440.000	85.55	85.55	85.55	88.204	0+440.000
85.594	85.594	85.594	88.204	0+460.000	85.594	85.594	85.594	88.204	0+460.000
85.55	85.55	85.55	88.204	0+480.000	85.55	85.55	85.55	88.204	0+480.000

TOPOGRAPHIC INFORMATION
 TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00,
 SURVEYS DATED NOVEMBER 30, 2017.

LEGAL INFORMATION
 CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00
 (PHASE 1 & 2) DATED SEPTEMBER 14, 2018.

ELEVATION NOTE
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 CONTROL POINT 001196530229 HAVING A PUBLISHED ELEVATION OF 86.12m

No.	DATE	BY	DESCRIPTION
8	21-03-03	L.M.	AS-BUILT SERVICING INFORMATION ADDED
7	19-05-14	M.Z.	FENCES ADDED AS PER LANDSCAPE DESIGN, NAK DESIGN STRATEGIES
6	18-10-30	M.Z.	REVISED M-PLAN
5	18-07-27	M.Z.	REVISED WEST BOUNDARY STORM SYSTEM
4	18-07-10	M.Z.	MYLARS FOR PHASE 1 COMMENCE WORK
3	18-06-28	M.Z.	REVISED AS PER CITY AND UTILITY COMMENTS
2	18-05-09	M.Z.	ISSUED FOR MOE APPROVAL
1	18-01-24	M.Z.	1st SUBMISSION

Ottawa CITY OF OTTAWA

AS-BUILT

PROJECT No. 16-881

PLAN AND PROFILE OF
Avenue de Lamarche Avenue
 (FROM STA. 0+240.000 TO STA. 0+480.000) © DSEL

CAIVAN (ORLEANS VILLAGE) LIMITED	ORLEANS VILLAGE
----------------------------------	-----------------

DSEL
 david schaeffer engineering ltd

120 Ibor Road, Unit 103
 Stittville, ON K2S 1E9
 Tel: (613) 838-8868
 Fax: (613) 836-7183
 www.DSEL.ca

DRAWN BY: M.Z.	CHECKED BY: P.P.	DRAWING NO.	SHEET NO.
DESIGNED BY: P.P.	CHECKED BY: M.Z.		11
SCALE: H=1:500/V=1:50	DATE: JANUARY 2018		

CITY PLAN No. 17675
 D07-16-16-0022
 CITY FILE No.

Site Plan/Zoning Pre-Application Consultation Notes**Date:** Tuesday, February 8, 2022.**Site Location:** 245, 275 Lamarche Ave**Type of Development:** Residential (townhomes, stacked, singles, apartments), Office Space, Commercial, Retail, Institutional, Industrial, Other: N/A**Infrastructure**

Water

Existing public services:

- Lamarche Ave – 305mm PVC

Watermain Frontage Fees to be paid (\$190.00 per metre) Yes No**Boundary conditions:**

Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission.

- Water boundary condition requests must include the location of the service(s) and the expected loads required by the proposed developments. Please provide all the following information:
 - Location of service(s)
 - Type of development and the amount of fire flow required (as per FUS, 1999)
 - Average daily demand: ___ L/s
 - Maximum daily demand: ___ L/s
 - Maximum hourly daily demand: ___ L/s
- Fire protection (Fire demand, Hydrant Locations)

General comments

- Service areas with a basic demand greater than 50 m³/day shall be connected with a minimum of two water services, separated by an isolation valve, to avoid creation of vulnerable service area.
- A District Metering Area Chamber (DMA) is required for services 150mm or greater in diameter.

Sanitary Sewer

Existing public services:

- Lamarche Ave – 250mm PVC

Is a monitoring manhole required on private property? Yes No**General comments**

- The designer must demonstrate that the proposed development is within the sanitary capacity that was allocated as part of the Orleans Village detail design servicing report:
 - Design Brief for Caivan (Orleans Village) Ltd 340 Innes Road, prepared by DSEL, project 15-881, dated Nov 2018, rev 3

Storm Sewer

Existing public services:

- Lamarche Ave – 250mm PVC

General comments

- The site is subject to the Development Charges for the Gloucester Urban Center Stormwater Management Facilities
- The existing SWM Pond 1 must be upgraded prior to the development of this site. Please refer to the Orleans Village detail design report:
 - Design Brief for Caivan (Orleans Village) Ltd 340 Innes Road, prepared by DSEL, project 15-881, dated Nov 2018, rev 3

- Stormwater Management Report for the Orleans Village Subdivision, prepared by JFSA, project 883-10, dated Jan 2018, rev Jul 2018.

Stormwater Management

Quality Control:

- Rideau Valley Conservation Authority to confirm quality control requirements.

Quantity Control:

- Site is located within the Mud (Green's) Creek Area Subwatershed Study Area draining to the Ottawa River
- Allowable flowrate: The existing subdivision servicing report should be referenced for permitted release rates and LID features to be incorporated
- When both underground and above ground storage is utilized, the release rate from the system will significantly differ than when solely one level storage is being used (i.e. greater range of head vs smaller change of head during storm event). If both levels of storage are to be accounted for then there are two options for SWM calculations: 1) use a dynamic computer model or 2) use an assumed average flow rate of half (50%) of the controlled peak flow rate of the area(s) utilizing two levels of storage.

General Service Design Comments

- Existing sewer or watermains that are not reused must be decommissioned as per City Standards. Please show all road cuts on the plans.
- The City of Ottawa Standard Detail Drawings should be referenced where possible for all work within the Public Right-of-Way.
- The subdivision agreement conditions should be referred to when preparing the application to sure all remaining noise barriers, sidewalks, infrastructure features have been included

Other

Capital Works Projects within proximity to application? Yes No

- There is currently an intersection modification occurring at Innes Rd and Lamarche Ave

References and Resources

- As per section 53 of the Professional Engineers Act, O. Reg 941/40, R.S.O. 1990, all documents prepared by engineers must be signed and dated on the seal.
- All required plans & reports are to be provided in *.pdf format (at application submission and for any, and all, re-submissions)
- Please find relevant City of Ottawa Links to Preparing Studies and Plans below:
<https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#standards-policies-and-guidelines>
- To request City of Ottawa plan(s) or report information please contact the City of Ottawa Information Centre:
InformationCentre@ottawa.ca<mailto:InformationCentre@ottawa.ca>
(613) 580-2424 ext. 44455
- geoOttawa
<http://maps.ottawa.ca/geoOttawa/>

PLANS & STUDIES LIST

For information on preparing required studies and plans refer to:

<http://ottawa.ca/en/development-application-review-process-0/guide-preparing-studies-and-plans>

S/Z	Number of copies	ENGINEERING		S/A	Number of copies
S		1. Site Servicing Plan	2. Site Servicing Brief	S/Z	
S		3. Grade Control and Drainage Plan	4. Geotechnical Study	S/Z	
		5. Composite Utility Plan	6. Groundwater Impact Study		
		7. Servicing Options Report	8. Wellhead Protection Study		
		9. Community Transportation Study and/or Transportation Impact Study / Brief	10. Erosion and Sediment Control Plan / Brief	S	
S/Z		11. Storm water Management Brief	12. Hydro-geological and Terrain Analysis		
		13. Water main Analysis	14. Noise / Vibration Study		
		15. Roadway Modification Design Plan	16. Confederation Line Proximity Study		

S – Required for Site Plan Control

Z – Required for Zoning By-Law Amendment



David Schaeffer Engineering Ltd.

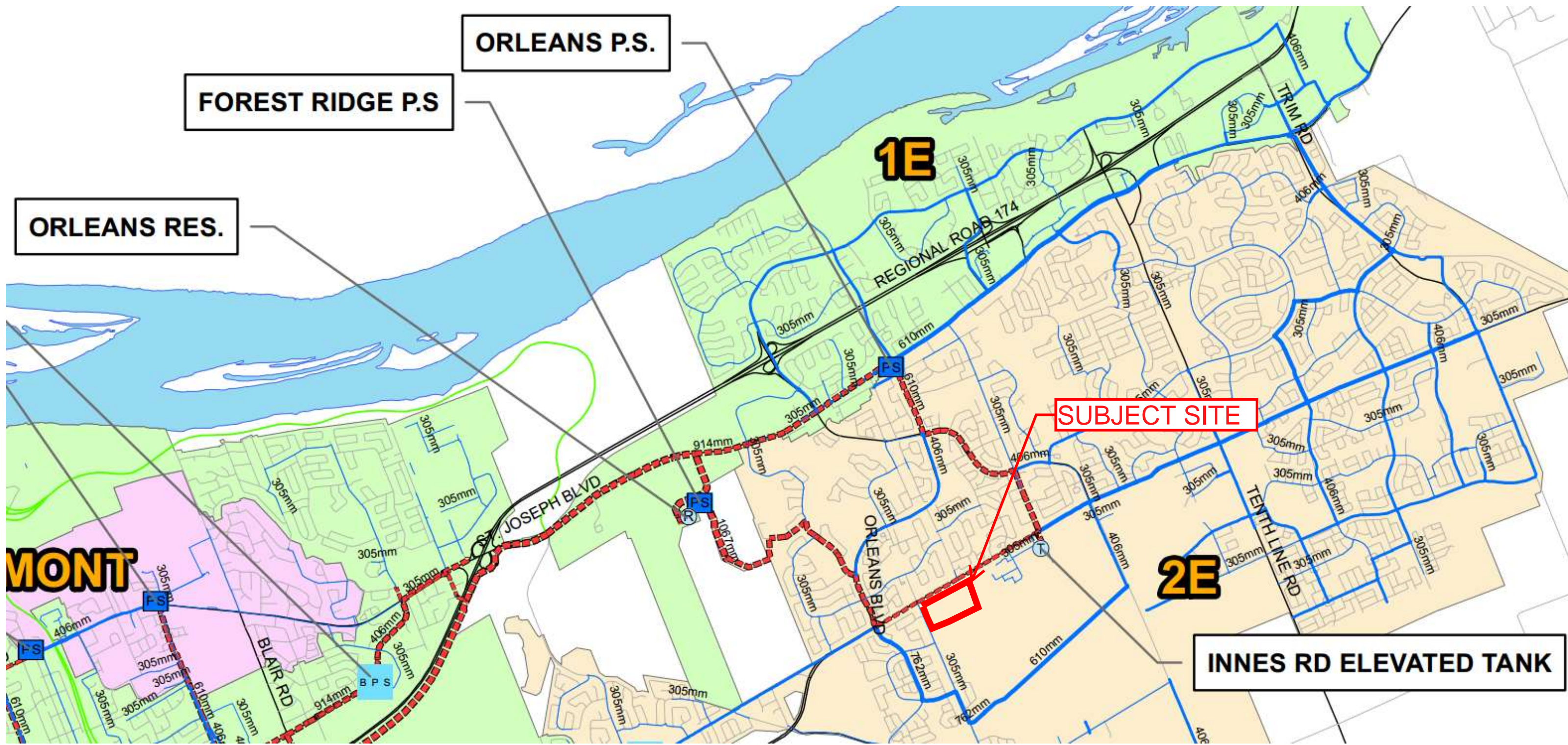
120 Iber Road, Suite 103

Stittsville, ON K2S 1E9

613-836-0856

dsel.ca

APPENDIX B



FOREST RIDGE P.S.

ORLEANS P.S.

ORLEANS RES.

SUBJECT SITE

INNES RD ELEVATED TANK

MONT

1E

2E

Adam Fobert

From: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Sent: March 15, 2022 3:42 PM
To: Adam Fobert
Cc: Emma Perry
Subject: RE: 1296 Caivan - Orleans Village Ph 4: Water Demand Request

Follow Up Flag: Follow up
Flag Status: Flagged

EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Adam,

I have forward your request for WBC, it usually takes 10 business days for request.

Best,

Rubina

Rubina Rasool, E.I.T.

Project Manager

Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique

Development Review – East Branch

City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West Ottawa, ON | 110, avenue Laurier Ouest. Ottawa (Ontario) K1P 1J1 rubina.rasool@ottawa.ca

From: Adam Fobert <AFobert@dsel.ca>
Sent: March 15, 2022 3:39 PM
To: Rasool, Rubina <Rubina.Rasool@ottawa.ca>
Cc: Emma Perry <EPerry@dsel.ca>
Subject: 1296 Caivan - Orleans Village Ph 4: Water Demand Request

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Hello Rubina,

I understand that Caivan Communities completed a pre-consultation with the City on February 8, 2022 for the properties at 245 & 275 Lamarche Avenue and that you have been assigned as the Infrastructure Approvals Project Manager.

We would like to request watermain boundary conditions for the subject lands to support the submission for zoning amendment and draft plan of subdivision.

Please see the attached location of proposed service connection points.

The subject lands are residential containing townhomes, rear lane townhomes, and back to back units. We anticipate the following required fire flow per ISTB-2018:

- 10,000L/min
- 14,000L/min

Average daily demand: 1.53L/s

Maximum daily demand: 4.45L/s

Maximum hourly daily demand: 6.59L/s

Let me know if you require any additional information.

Adam Fobert, P.Eng.

DSEL

david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

office: (613) 836-0856

direct: (613) 836-0626

cell: (613) 222-9493

email: afobert@DSEL.ca

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This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

Water Demand Design Flows per Unit Count
City of Ottawa - Water Distribution Guidelines, July 2010



Domestic Demand

Type of Housing	Per / Unit	Units	Pop	Avg. Daily		Max Day		Peak Hour		
				m ³ /d	L/min	m ³ /d	L/min	m ³ /d	L/min	
Single Family	3.4	-	0							
Semi-detached	2.7	-	0							
Townhouse	2.7	185	500							
Apartment			0							
Bachelor	1.4	-	0							
1 Bedroom	1.4	-	0							
2 Bedroom	2.1	-	0							
3 Bedroom	3.1	-	0							
Average	1.8	-	0							
Total Domestic Demand				500	140.0	97.2	406.0	281.9	602.0	418.1



Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$

L/min

Where F is the fire flow, C is the Type of construction and A is the Total floor area

Type of Construction:

Wood Frame

C 1.5 Type of Construction Coefficient per FUS Part II, Section 1
A 876.0 m² Total floor area based on FUS Part II section 1

Fire Flow 9767.1 L/min
10000.0 L/min rounded to the nearest 1,000 L/min

Adjustments

2. Reduction for Occupancy Type

Limited Combustible -15%

Fire Flow 8500.0 L/min

3. Reduction for Sprinkler Protection

Non-Sprinklered 0%

Reduction 0 L/min

4. Increase for Separation Distance

Cons. of Exposed Wall		S.D	Lw	Ha	LH	EC	
N	Wood Frame	3.1m-10m	14.3		2	29	17%
S	Wood Frame	3.1m-10m	14.3		2	29	17%
E	Wood Frame	3.1m-10m	30.65		2	62	19%
W	Wood Frame	10.1m-20m	30.65		2	62	14%
% Increase							67% value not to exceed 75%

Increase 5695.0 L/min

Lw = Length of the Exposed Wall

Ha = number of storeys of the adjacent structure. Max 5 stories

LH = Length-height factor of exposed wall. Value rounded up.

EC = Exposure Charge

Total Fire Flow

Fire Flow 14195.0 L/min
14000.0 L/min rounded to the nearest 1,000 L/min

Notes:

-Type of construction, Occupancy Type and Sprinkler Protection information provided by _____.

-Calculations based on City of Ottawa ISTB-2018

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999



Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$

L/min

Where F is the fire flow, C is the Type of construction and A is the Total floor area

Type of Construction:

Wood Frame

C 1.5 Type of Construction Coefficient per FUS Part II, Section 1
A 937.4 m² Total floor area based on FUS Part II section 1

Fire Flow 10103.6 L/min
10000.0 L/min rounded to the nearest 1,000 L/min

Adjustments

2. Reduction for Occupancy Type

Limited Combustible -15%

Fire Flow 8500.0 L/min

3. Reduction for Sprinkler Protection

Non-Sprinklered 0%

Reduction 0 L/min

4. Increase for Separation Distance

Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N Wood Frame	20.1m-30m	33.2		2	67	9%
S Wood Frame	10.1m-20m	33.2		2	67	14%
E Wood Frame	3.1m-10m	21.4		2	43	18%
W Wood Frame	3.1m-10m	21.4		2	43	18%
	% Increase					59% value not to exceed 75%

Increase 5015.0 L/min

Lw = Length of the Exposed Wall

Ha = number of storeys of the adjacent structure. Max 5 stories

LH = Length-height factor of exposed wall. Value rounded up.

EC = Exposure Charge

Total Fire Flow

Fire Flow 13515.0 L/min
14000.0 L/min rounded to the nearest 1,000 L/min

Notes:

-Type of construction, Occupancy Type and Sprinkler Protection information provided by _____.

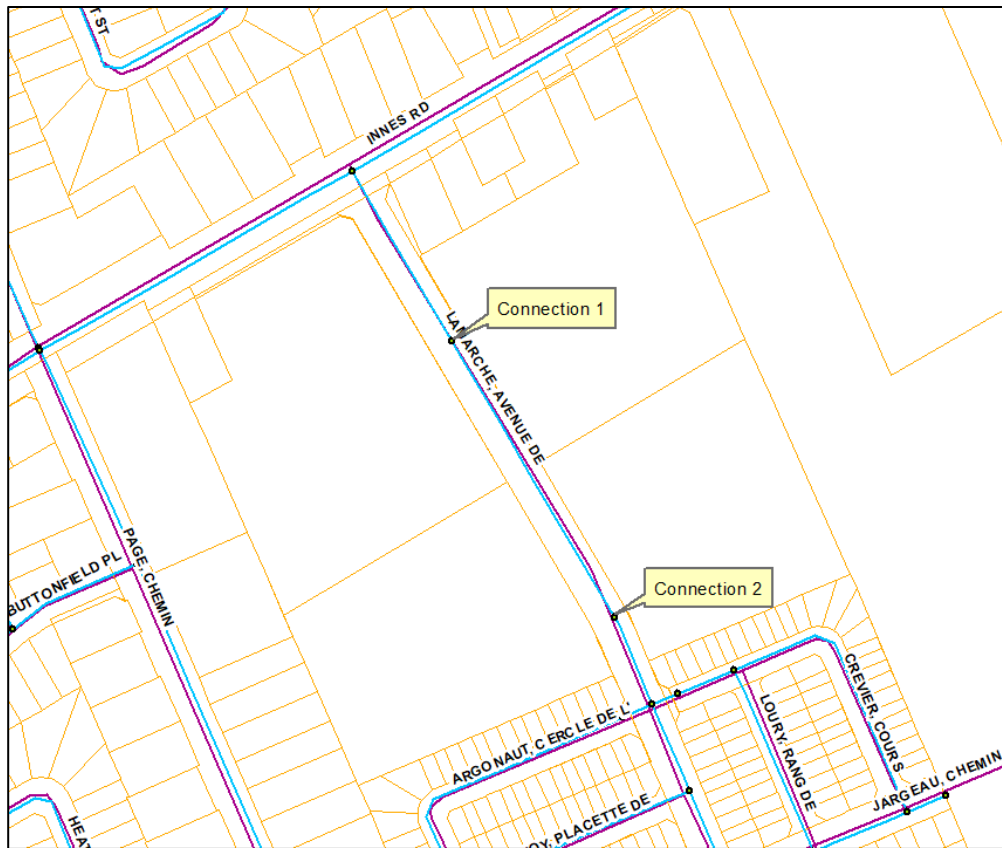
-Calculations based on City of Ottawa ISTB-2018

Boundary Conditions 1296 Caivan - Orleans Village Ph 4

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	92	1.53
Maximum Daily Demand	267	4.45
Peak Hour	395	6.59
Fire Flow Demand #1	10,000	166.67
Fire Flow Demand #2	14,000	233.33

Location



Results

Connection 1 – Lamarche Ave.

Demand Scenario	Head (m)	Pressure ¹ (psi)
Maximum HGL	130.8	57.6
Peak Hour	127.1	52.3
Max Day plus Fire 1	126.9	52.0
Max Day plus Fire 2	124.8	49.0

Ground Elevation = 90.3 m

Connection 2 – Lamarche Ave.

Demand Scenario	Head (m)	Pressure¹ (psi)
Maximum HGL	130.8	59.5
Peak Hour	127.1	54.3
Max Day plus Fire 1	125.7	52.3
Max Day plus Fire 2	122.6	47.9

Ground Elevation = 89.0 m

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. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.



David Schaeffer Engineering Ltd.

120 Iber Road, Suite 103

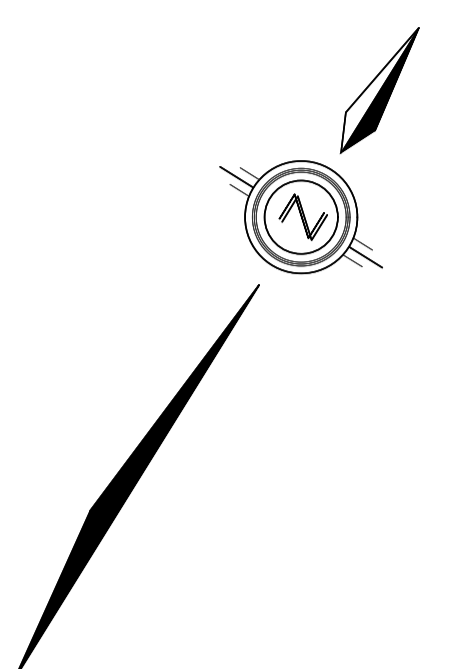
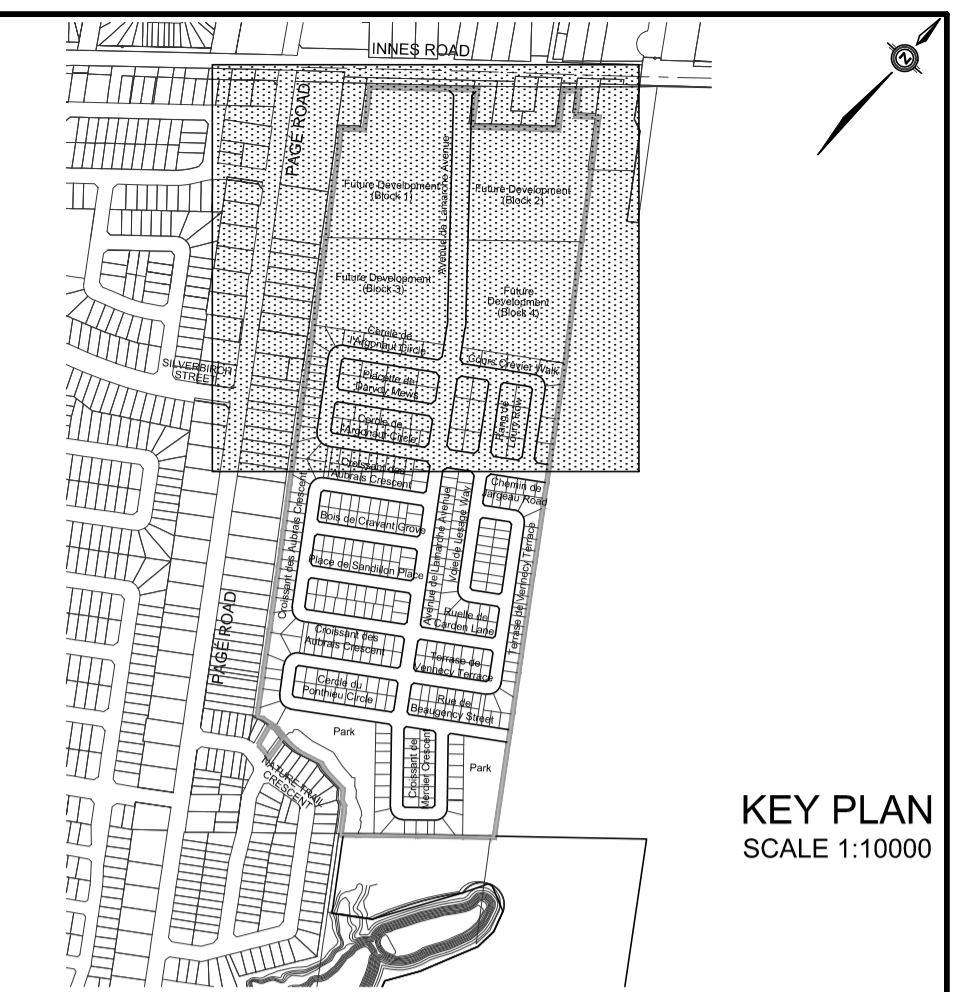
Stittsville, ON K2S 1E9

613-836-0856

dsel.ca

APPENDIX C

APPROVED REFUSED
 THIS _____ DAY OF _____, 20____
 JOSHUA WHITE, P.ENG
 PROJECT MANAGER - EAST BRANCH
 PLANNING, INFRASTRUCTURE & ECONOMIC
 DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



LEGEND

- SANITARY DRAINAGE BOUNDARY
- SANITARY SUB-DRAINAGE BOUNDARY
- SANITARY DRAINAGE BOUNDARY (OTHER PHASES)
- UPSTREAM MH TO DOWNSTREAM MH (43A-44A) AREA IN HECTARES (0.78 61) POPULATION
- UPSTREAM MH TO DOWNSTREAM MH (43A-44A) AREA IN OTHER PHASES IN HECTARES (0.78 61) POPULATION
- EXTERNAL AREA IN HECTARES (A=53.63) EXTERNAL POPULATION (107) POP=5739 DENSITY (PERSONS/HECTARE) EXTERNAL LAND USE (RESIDENTIAL)
- MAINTENANCE HOLE (MH202A)
- CAP

TOPOGRAPHIC INFORMATION
 TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00, SURVEYS DATED NOVEMBER 30, 2017.

LEGAL INFORMATION
 CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00 (PHASE 1 & 2) DATED SEPTEMBER 14, 2018.

ELEVATION NOTE ELEVATION = 86.12 m
 ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM SITE BENCHMARK NCC CONTROL POINT 001196530229 HAVING A PUBLISHED ELEVATION OF 86.12m

No.	DATE	BY	DESCRIPTION
6.	18-10-30	M.Z.	REVISED M-PLAN
5.	18-07-27	M.Z.	REVISED WEST BOUNDARY STORM SYSTEM
4.	18-07-10	M.Z.	MYLARS FOR PHASE 1 COMMENCE WORK
3.	18-06-28	M.Z.	REVISED AS PER CITY AND UTILITY COMMENTS
2.	18-05-09	M.Z.	ISSUED FOR MOE APPROVAL
1.	18-01-24	M.Z.	1st SUBMISSION



PROJECT No. 16-881

SANITARY DRAINAGE PLAN © DSEL

CAIVAN (ORLEANS VILLAGE) LIMITED ORLEANS VILLAGE

DSEL david schaeffer engineering ltd

120 Iber Road, Unit 103
 Stittsville, ON K2S 1E9
 Tel: (613) 838-8656
 Fax: (613) 838-7183
 www.DSEL.ca

DRAWN BY: M.Z./J.Y. CHECKED BY: P.P. DRAWING NO. SHEET NO.
 DESIGNED BY: P.P. CHECKED BY: M.Z.
 SCALE: 1:1000 DATE: JANUARY 2018 **65**



EAST URBAN COMMUNITY
 MIXED USE CENTRE
 REFER TO
 DAVID SCHAEFFER ENGINEERING LIMITED
 PROJECT No. 14-723

REFER TO
 DWG No. 86

CITY PLAN No. 17675
 D07-16-16-0022
 CITY FILE No.

SANITARY SEWER CALCULATION SHEET



Manning's n=0.013

LOCATION		RESIDENTIAL AREA AND POPULATION						PEAK		COMM		INSTIT		PARK		C+I+I	INFILTRATION			PIPE									
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL	ACCU.	INFILT.	TOTAL	DIST	DIA	SLOPE	SLOPE AS-BUILT	CAP (FULL)	RATIO Q act/Q cap	VEL.		
						AREA (ha)	POP.										AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)	AREA (ha)
Rang de Loury Row - 03																													
	200A	19A	0.42		44	0.42	44	3.66	0.52								0.42	0.42	0.14	0.66	76.00	200	0.90	0.88	30.77	0.02	0.98	0.38	
To Chemin de Jargeau Road, Pipe 19A - 34A																													
	200A	20A	0.18		17	0.18	17	3.71	0.20								0.18	0.18	0.06	0.26	42.00	200	0.65	0.60	25.41	0.01	0.81	0.26	
To Cours Crevier Walk, Pipe 20A - 24A																													
Cercle de l'Argonaut Circle - 12																													
	27A	26A	0.08		4	0.08	4	3.76	0.05								0.08	0.08	0.03	0.08	10.00	200	0.65	0.80	29.34	0.00	0.93	0.06	
			0.05		4	0.13	8										0.05	0.13											
		26A	0.41		44	0.54	52	3.65	0.62								0.41	0.54	0.18	0.80	71.00	200	0.65	0.63	26.03	0.03	0.83	0.37	
		25A	0.38		38	0.92	90	3.60	1.05								0.38	0.92	0.30	1.35	74.00	200	0.35	0.36	19.68	0.07	0.63	0.36	
To Avenue de Lamarche Avenue, Pipe 24A - 21A																													
	27A	29A	0.23		17	0.23	17	3.71	0.20								0.23	0.23	0.08	0.28	51.50	200	0.65	0.67	26.85	0.01	0.85	0.27	
		29A	0.26		14	0.49	31	3.68	0.37								0.26	0.49	0.16	0.53	51.50	200	0.60	0.47	22.49	0.02	0.72	0.28	
		30A	0.18		11	0.67	42	3.66	0.50								0.18	0.67	0.22	0.72	11.00	200	0.35	0.62	25.83	0.03	0.82	0.36	
		31A	0.38		34	1.05	76	3.62	0.89								0.38	1.05	0.35	1.24	65.50	200	0.35	0.35	19.40	0.06	0.62	0.34	
		32A	0.39		34	1.44	110	3.59	1.28								0.39	1.44	0.48	1.76	81.50	200	0.35	0.38	20.22	0.09	0.64	0.40	
To Avenue de Lamarche Avenue, Pipe 34A - 35A																													
Placette de Darvoy Mews - 13																													
	29A	28A	0.37		38	0.37	38	3.67	0.45								0.37	0.37	0.12	0.57	74.00	200	0.75	0.73	28.02	0.02	0.89	0.35	
		28A	0.42		44	0.79	82	3.61	0.96								0.42	0.79	0.26	1.22	78.00	200	0.35	0.33	18.84	0.06	0.60	0.33	
To Avenue de Lamarche Avenue, Pipe 21A - 33A																													
Croissant des Aubrais Crescent - 10																													
	8A	9A	0.55		41	0.55	41	3.67	0.49								0.55	0.55	0.18	0.67	75.00	200	0.65	0.67	26.85	0.02	0.85	0.33	
		9A	0.30		24	0.85	65	3.63	0.76								0.30	0.85	0.28	1.04	72.50	200	0.35	0.32	18.55	0.06	0.59	0.32	
To Avenue de Lamarche Avenue, Pipe 35A - 36A																													
	8A	7A	0.13		7	0.13	7	3.74	0.08								0.13	0.13	0.04	0.12	10.00	200	0.65	0.90	31.12	0.00	0.99	0.06	
		7A	0.23		14	0.36	21	3.70	0.25								0.23	0.36	0.12	0.37	51.50	200	0.35	0.31	18.26	0.02	0.58	0.23	
To Bois de Cravant Grove, Pipe 38A - 37A																													
	38A	40A	0.25		17	0.25	17	3.71	0.20								0.25	0.25	0.08	0.28	59.00	200	0.65	0.64	26.24	0.01	0.84	0.27	
		40A	0.22		14	0.47	31	3.68	0.37								0.22	0.47	0.16	0.53	51.50	200	0.35	0.39	20.48	0.03	0.65	0.29	
		41A	0.14		7	0.61	38	3.67	0.45								0.14	0.61	0.20	0.65	10.00	200	0.35	0.70	27.44	0.02	0.87	0.34	
		42A	0.40		34	1.01	72	3.62	0.84								0.40	1.01	0.33	1.17	69.00	200	0.35	0.32	18.55	0.06	0.59	0.32	
		43A	0.36		31	1.37	103	3.59	1.20								0.36	1.37	0.45	1.65	78.00	200	0.35	0.35	19.40	0.09	0.62	0.38	
To Avenue de Lamarche Avenue, Pipe 52A - 53A																													
Bois de Cravant Grove - 14																													
Contribution From Croissant des Aubrais Crescent, Pipe 7A - 38A																													
	38A	37A	0.39		34	0.36	21	3.64	0.65								0.36	0.36											
		37A	0.34		28	0.75	55	3.61	0.97								0.39	0.75	0.25	0.90	69.50	200	0.35	0.35	19.40	0.05	0.62	0.32	
To Avenue de Lamarche Avenue, Pipe 36A - 44A																													
						1.09	83										0.34	1.09	0.36	1.33	85.00	200	0.35	0.39	20.48	0.06	0.65	0.36	

DESIGN PARAMETERS										Designed: P.P		PROJECT: ORLEANS VILLAGE																
Park Flow =	9300	L/ha/da	0.10764	I/s/ha	Industrial Peak Factor = as per MOE Graph						Checked: M.Z		LOCATION: City of Ottawa															
Average Daily Flow =	280	I/p/day	Extraneous Flow = 0.330 L/s/ha						Dwg. Reference:		File Ref: 16-881				Date: 2018-07-27				Sheet No. 1									
Comm/Inst Flow =	28000	L/ha/da	0.5787	I/s/ha	Minimum Velocity = 0.600 m/s						Sanitary Drainage Plan, Dwgs. No.										of 4							
Industrial Flow =	35000	L/ha/da	0.40509	I/s/ha	Manning's n = (Conc) 0.013 (Pvc) 0.013																							
Max Res. Peak Factor =	4.00	Townhouse coeff= 2.7																										
Commercial/Inst./Park Peak Factor =	1.00	Single house coeff= 3.4																										
Institutional =	0.32	I/s/ha																										

SANITARY SEWER CALCULATION SHEET



Manning's n=0.013

LOCATION		RESIDENTIAL AREA AND POPULATION						COMM		INSTIT		PARK		C+I+I		INFILTRATION			PIPE									
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	SLOPE AS-BUILT (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL.	
						AREA (ha)	POP.																				(FULL) (m/s)	(ACT.) (m/s)
Place de Sandillon Place - 11																												
	40A	39A	0.38		34	0.38	34	3.68	0.41								0.38	0.38	0.13	0.54	69.50	200	0.65	0.63	26.03	0.02	0.83	0.32
	39A	44A	0.34		28	0.72	62	3.64	0.73								0.34	0.72	0.24	0.97	85.00	200	0.40	0.33	18.84	0.05	0.60	0.31
To Avenue de Lamarche Avenue, Pipe 44A - 52A																												
						0.72	62											0.72										
Cours Crevier Walk- 02																												
	18A	17A	0.07		6	0.07	6	3.75	0.07								0.07	0.07	0.02	0.09	10.00	200	0.65	0.57	24.76	0.00	0.79	0.05
	17A	16A	0.65		65	0.72	71	3.63	0.84								0.65	0.72	0.24	1.08	111.50	200	0.35	0.33	18.84	0.06	0.60	0.33
To Chemin de Jargeau Road, Pipe 16A - 19A																												
						0.72	71											0.72										
	18A	20A	0.19		17	0.19	17	3.71	0.20								0.19	0.19	0.06	0.26	51.50	200	0.80	0.80	29.34	0.01	0.93	0.30
Contribution From Rang de Loury Row, Pipe 200A - 20A																												
						0.18	17										0.18	0.37										
	20A	24A	0.20		17	0.57	51	3.65	0.60								0.20	0.57	0.19	0.79	62.50	200	0.45	0.37	19.95	0.04	0.64	0.31
To Avenue de Lamarche Avenue, Pipe 24A - 21A																												
						0.57	51											0.57										
Chemin de Jargeau Road - 04																												
	10A	16A	0.12		7	0.12	7	3.74	0.08								0.12	0.12	0.04	0.12	26.50	200	0.65		26.44	0.00	0.84	0.05
Contribution From Cours Crevier Walk, Pipe 17A - 16A																												
						0.72	71										0.72	0.84										
	16A	19A	0.23		14	1.07	92	3.60	1.07								0.23	1.07	0.35	1.42	58.50	200	0.35	0.41	21.00	0.07	0.67	0.38
Contribution From Rang de Loury Row, Pipe 200A - 19A																												
						0.42	44										0.42	1.49										
	19A	34A	0.11		1	1.60	137	3.56	1.58								0.11	1.60	0.53	2.11	59.00	200	0.35	0.32	18.55	0.11	0.59	0.38
To Avenue de Lamarche Avenue, Pipe 34A - 35A																												
						1.60	137											1.60										
Voie de Lesage Way - 05																												
	190A	15A	0.21		14	0.21	14	3.72	0.17								0.21	0.21	0.07	0.24	42.50	200	0.65	0.67	26.85	0.01	0.85	0.27
	15A	14A	0.60		55	0.81	69	3.63	0.81								0.60	0.81	0.27	1.08	106.50	200	0.35	0.36	19.68	0.05	0.63	0.33
	14A	13A	0.13		7	0.94	76	3.62	0.89								0.13	0.94	0.31	1.20	11.50	200	0.35	0.34	19.12	0.06	0.61	0.34
	13A	45A	0.16		11	1.10	87	3.61	1.02								0.16	1.10	0.36	1.38	49.00	200	0.35	0.36	19.68	0.07	0.63	0.36
To Terrasse de Vennecy Terrace, Pipe 45A - 47A																												
						1.10	87											1.10										
Terrasse de Vennecy Terrace - 06																												
	15A	11A	0.15		11	0.15	11	3.73	0.13								0.15	0.15	0.05	0.18	49.00	200	0.65	0.65	26.44	0.01	0.84	0.27
	11A	12A	0.11		7	0.26	18	3.71	0.22								0.11	0.26	0.09	0.31	11.50	200	0.35	0.35	19.40	0.02	0.62	0.24
	12A	45A	0.64		55	0.90	73	3.62	0.86								0.64	0.90	0.30	1.16	106.50	200	0.35	0.35	19.40	0.06	0.62	0.34
Contribution From Voie de Lesage Way, Pipe 13A - 45A																												
						1.10	87										1.10	2.00										
	45A	47A	0.43		31	2.43	191	3.52	2.18								0.43	2.43	0.80	2.98	111.00	250	0.30	0.33	34.16	0.09	0.70	0.43
	47A	48A	0.12		7	2.55	198	3.52	2.26								0.12	2.55	0.84	3.10	10.50	250	0.30	0.38	36.66	0.08	0.75	0.45
	48A	53A	0.59		55	3.14	253	3.49	2.86								0.59	3.14	1.04	3.90	108.50	250	0.30	0.30	32.57	0.12	0.66	0.44
To Avenue de Lamarche Avenue, Pipe 53A - 55A																												
						3.14	253											3.14										
Ruelle de Carden Lane - 07																												
	46A	52A	0.56		48	0.56	48	3.65	0.57								0.56	0.56	0.18	0.75	105.50	200	0.65	0.64	26.24	0.03	0.84	0.37
To Avenue de Lamarche Avenue, Pipe 52A - 53A																												
						0.56	48											0.56										

DESIGN PARAMETERS										Designed: P.P		PROJECT: ORLEANS VILLAGE															
Park Flow =	9300	L/ha/da	0.10764	I/s/ha	Industrial Peak Factor = as per MOE Graph					Checked: M.Z		LOCATION: City of Ottawa															
Average Daily Flow =	280	I/p/day	Extraneous Flow = 0.330 L/s/ha					Minimum Velocity = 0.600 m/s		Date: 2018-07-27																	
Comm/Inst Flow =	28000	L/ha/da	0.5787	I/s/ha	Manning's n = (Conc) 0.013 (Pvc) 0.013					Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.		File Ref: 16-881				Sheet No. 2											
Industrial Flow =	35000	L/ha/da	0.40509	I/s/ha	Townhouse coeff= 2.7											of 4											
Max Res. Peak Factor =	4.00		Single house coeff= 3.4																								
Commercial/Inst./Park Peak Factor =	1.00																										
Institutional =	0.32	I/s/ha																									

SANITARY SEWER CALCULATION SHEET



Manning's n=0.013

LOCATION		RESIDENTIAL AREA AND POPULATION					COMM		INSTIT		PARK		C+I+I		INFILTRATION			PIPE											
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	SLOPE AS-BUILT (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL.		
						AREA (ha)	POP.																				(FULL) (m/s)	(ACT.) (m/s)	
Croissant de Mercier Crescent- 09																													
	4A	5A	0.13		7	0.13	7	3.74	0.08								0.13	0.13	0.04	0.12	7.00	200	0.95	0.71	27.64	0.00	0.88	0.05	
	5A	6A	0.61		48	0.74	55	3.64	0.65								0.61	0.74	0.24	0.89	107.50	200	0.50	0.53	23.88	0.04	0.76	0.36	
To Cercle du Ponthieu Circle, Pipe 6A - 55A																													
	4A	3A	0.21		11	0.21	11	3.73	0.13								0.21	0.21	0.07	0.20	46.50	200	0.65	0.62	25.83	0.01	0.82	0.26	
	3A	2A	0.08		4	0.29	15	3.72	0.18								0.08	0.29	0.10	0.28	10.50	200	0.35	0.45	22.00	0.01	0.70	0.22	
	2A	54A	0.60		51	0.89	66	3.63	0.78								0.60	0.89	0.29	1.07	100.50	200	0.35	0.41	21.00	0.05	0.67	0.35	
	54A	55A	0.05		4	0.94	70	3.63	0.82								0.05	0.94	0.31	1.13	13.50	200	0.35	0.67	26.85	0.04	0.85	0.41	
To Cercle du Ponthieu Circle, Pipe 55A - 58A																													
			0.60		1	0.60	1			2.54	2.54						3.14	3.14											
	236.500		2.54		240	3.14	241			2.86	5.40						5.40	8.54											
	22A	230A	2.86		1376	6.00	1617	3.12	16.35		5.40					1.75	2.86	11.40	3.76	21.86	76.50	250	1.20	1.22	65.68	0.33	1.34	1.21	
	230A	23A	0.15		1	6.15	1618	3.12	16.36		5.40					1.75	0.15	11.55	3.81	21.92	63.50	250	0.85	0.85	54.83	0.40	1.12	1.05	
			0.13		1	6.28	1619				5.40						0.13	11.68											
			2.16		1039	8.44	2658				5.40						2.16	13.84											
	23A	24A	2.17		1044	10.61	3702	2.89	34.67		5.40					1.75	2.17	16.01	5.28	41.70	59.50	375	0.29	0.29	94.42	0.44	0.85	0.82	
Contribution From Cours Crevier Walk, Pipe 20A - 24A																													
Contribution From Cercle de l'Argonaut Circle, Pipe 25A - 24A																													
	24A	21A	0.23		17	12.33	3860	2.88	36.03		5.40					1.75	0.23	17.73	5.85	43.63	58.50	375	0.30	0.29	94.42	0.46	0.85	0.83	
Contribution From Placette de Darvoy Mews, Pipe 28A - 21A																													
	21A	33A	0.19		14	13.31	3956	2.87	36.79		5.40					1.75	0.19	18.71	6.17	44.71	42.50	375	0.20	0.21	80.35	0.56	0.73	0.75	
	33A	34A	0.03		1	13.34	3957	2.87	36.80		5.40					1.75	0.03	18.74	6.18	44.73	17.00	375	0.42	0.28	92.78	0.48	0.84	0.83	
Contribution From Chemin de Jargeau Road, Pipe 19A - 34A																													
Contribution From Cercle de l'Argonaut Circle, Pipe 32A - 34A																													
	34A	35A	0.29		24	16.67	4228	2.85	39.05		5.40					1.75	0.29	22.07	7.28	48.08	59.00	375	0.20	0.24	85.89	0.56	0.78	0.80	
Contribution From Croissant des Aubrais Crescent, Pipe 9A - 35A																													
	35A	36A	0.31		28	17.83	4321	2.84	39.77		5.40					1.75	0.31	23.23	7.67	49.19	58.50	375	0.20	0.23	84.09	0.58	0.76	0.79	
Contribution From Bois de Cravant Grove, Pipe 37A - 36A																													
	36A	44A	0.32		28	19.24	4432	2.83	40.65		5.40					1.75	0.32	24.64	8.13	50.53	58.50	375	0.20	0.22	82.24	0.61	0.74	0.78	
Contribution From Place de Sandillon Place, Pipe 39A - 44A																													
	44A	52A	0.29		24	20.25	4518	2.83	41.44		5.40					1.75	0.29	25.65	8.46	51.65	58.50	450	0.15	0.12	98.76	0.52	0.62	0.63	
Contribution From Croissant des Aubrais Crescent, Pipe 43A - 52A																													
Contribution From Ruelle de Carden Lane, Pipe 46A - 52A																													
	52A	53A	0.09		1	22.27	4670	2.82	42.68		5.40					1.75	0.09	27.67	9.13	53.56	58.50	450	0.15	0.19	124.27	0.43	0.78	0.75	
Contribution From Terrasse de Venneycy Terrace, Pipe 48A - 53A																													
Contribution From Cercle du Ponthieu Circle, Pipe 51A - 53A																													
	53A	55A	0.09		1	26.30	4993	2.80	45.31		5.40					1.75	0.09	31.70	10.46	57.52	61.50	450	0.15	0.16	114.04	0.50	0.72	0.72	
To Cercle du Ponthieu Circle, Pipe 55A - 58A																													

DESIGN PARAMETERS												Designed: P.P						PROJECT: ORLEANS VILLAGE											
Park Flow = 9300 L/ha/da 0.10764 l/s/ha Average Daily Flow = 280 l/p/day Comm/Inst Flow = 28000 L/ha/da 0.5787 l/s/ha Industrial Flow = 35000 L/ha/da 0.40509 l/s/ha Max Res. Peak Factor = 4.00 Commercial/Inst./Park Peak Factor = 1.00 Institutional = 0.32 l/s/ha												Industrial Peak Factor = as per MOE Graph						LOCATION: City of Ottawa											
												Checked: M.Z						Date: 2018-07-27											
												Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.						File Ref: 16-881						Sheet No. 3 of 4					

SANITARY SEWER CALCULATION SHEET



Manning's n=0.013

LOCATION		RESIDENTIAL AREA AND POPULATION						COMM		INSTIT		PARK		C+I+I		INFILTRATION			PIPE												
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	SLOPE AS-BUILT (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL.				
						AREA (ha)	POP.																				(FULL) (m/s)	(ACT.) (m/s)			
Cercle du Ponthieu Circle - 08																															
	50A	51A	0.25		21	0.25	21	3.70	0.25								0.25	0.25	0.08	0.33	41.50	200	0.70	0.67	26.85	0.01	0.85	0.27			
	51A	53A	0.55		48	0.80	69	3.63	0.81								0.55	0.80	0.26	1.07	98.50	200	0.55	0.62	25.83	0.04	0.82	0.39			
To Avenue de Lamarche Avenue, Pipe 53A - 55A																															
	490A	49A	0.14		7	0.14	7	3.74	0.08								0.14	0.14	0.05	0.13	11.00	200	0.65	0.64	26.44	0.00	0.84	0.05			
	49A	57A	0.24		14	0.38	21	3.70	0.25								0.24	0.38	0.13	0.38	50.50	200	0.35	0.34	19.12	0.02	0.61	0.24			
	57A	58A	0.09		4	0.47	25	3.69	0.30								0.09	0.47	0.16	0.46	14.00	200	0.35	0.39	20.48	0.02	0.65	0.25			
To Nature Trail Crescent, Pipe 58A - 59A																															
Rue de Beaugency Street - 08																															
	500A	501A	0.33		24	0.33	24	3.70	0.29			0.65	0.65	0.07	0.98	0.98	0.32	0.68	62.50	200	0.65	0.59	26.44	0.03	0.84	0.37					
	501A	502A	0.19		14	0.52	38	3.67	0.45				0.65	0.07	0.19	1.17	0.39	0.91	78.50	200	0.35	0.55	19.40	0.05	0.62	0.32					
	502A	55A				0.52	38	3.67	0.45				0.65	0.07	0.00	1.17	0.39	0.91	2.50	200	1.65	0.80	29.34	0.03	0.93	0.41					
Cercle du Ponthieu Circle - 08																															
	503A	504A	0.25		17	0.25	17	3.71	0.20								0.25	0.25	0.08	0.28	57.50	200.00	0.65	0.65	26.44	0.01	0.84	0.27			
	504A	505A	0.26		17	0.51	34	3.68	0.41			0.77	0.77	0.08	1.03	1.28	0.42	0.91	69.50	200.00	0.50	0.45	22.00	0.04	0.70	0.34					
	505A	58A				0.51	34	3.68	0.41				0.77	0.08	0.00	1.28	0.42	0.91	3.00	200.00	1.00	0.67	26.85	0.03	0.85	0.37					
To Nature Trail Crescent, Pipe 58A - 59A																															
	1A	6A	63.57		6462	63.57	6462	2.71	56.75	53.65	53.65						10.45	10.45	18.51	127.67	127.67	42.13	117.39	88.50	675	0.11		278.79	0.42	0.78	0.74
Contribution From Croissant de Mercier Crescent, Pipe 5A - 6A																															
	6A	55A				0.74	55										0.74	128.41													
Contribution From Avenue de Lamarche Avenue, Pipe 53A - 55A																															
	6A	55A				64.31	6517	2.71	57.23		53.65			10.45	18.51	0.00	128.41	42.38	118.12	57.00	675	0.11	0.09	278.79	0.42	0.78	0.74				
Contribution From Croissant de Mercier Crescent, Pipe 54A - 55A																															
	55A	58A				26.30	4993				5.40						31.70	160.11													
Contribution From Croissant de Mercier Crescent, Pipe 54A - 55A																															
	55A	58A				0.94	70										0.94	161.05													
To Sanitary Easement, Pipe 58A - 59A																															
	58A	58A				92.07	11618	2.51	94.50		59.05			11.10	20.33	0.00	161.05	53.15	167.98	143.00	675	0.11	0.10	265.82	0.63	0.74	0.78				
To Sanitary Easement, Pipe 58A - 59A																															
	58A	58A				92.07	11618				59.05			11.10			161.05														
Sanitary Easement - 20																															
Contribution From Cercle du Ponthieu Circle, Pipe 505A - 58A																															
						0.51	34							0.77		1.28	1.28		0.00												
Contribution From Cercle du Ponthieu Circle, Pipe 55A - 58A																															
						92.07	11618				59.05			11.10			161.05	162.33		0.00											
Contribution From Cercle du Ponthieu Circle, Pipe 57A - 58A																															
						0.47	25										0.47	162.80													
	58A	59A	0.07		1	93.12	11678	2.51	94.99		59.05			11.87	20.41	0.07	162.87	53.75	169.15	48.00	675	0.11	0.30	460.41	0.37	1.29	1.19				
			0.01		1	93.13	11679				59.05			11.87		0.01	162.88														
	59A	60A	0.05		1	93.18	11680	2.51	95.01		59.05			11.87	20.41	0.05	162.93	53.77	169.19	33.00	675	0.11	0.11	278.79	0.61	0.78	0.82				
To Nature Trail Crescent, Pipe 60A - 61A																															
						93.18	11680				59.05			11.87			162.93		0.00												
Nature Trail Crescent - 21																															
Contribution From Sanitary Easement, Pipe 59A - 60A																															
						0.06	4				59.05			11.87		0.06	162.99														
	60A	61A	1.47		82	94.71	11766	2.51	95.71		59.05			11.87	20.41	1.47	164.46	54.27	170.39	11.00	675	0.11	0.09	252.18	0.68	0.70	0.75				
	61A	62A	0.59		47	95.30	11813	2.51	96.09		59.05			11.87	20.41	0.59	165.05	54.47	170.97	73.50	675	0.11	0.08	237.75	0.72	0.66	0.72				

DESIGN PARAMETERS										Designed: P.P	PROJECT: ORLEANS VILLAGE																		
Park Flow =	9300	L/ha/da	0.10764	I/s/ha	Industrial Peak Factor = as per MOE Graph						Checked: M.Z	LOCATION: City of Ottawa																	
Average Daily Flow =	280	I/p/day	Extraneous Flow = 0.330 L/s/ha																										
Comm/Inst Flow =	28000	L/ha/da	0.5787	I/s/ha	Minimum Velocity = 0.600 m/s																								
Industrial Flow =	35000	L/ha/da	0.40509	I/s/ha	Manning's n = (Conc) 0.013 (Pvc) 0.013																								
Max Res. Peak Factor =	4.00	Townhouse coeff= 2.7																											
Commercial/Inst./Park Peak Factor =	1.00	Single house coeff= 3.4																											
Institutional =	0.32	I/s/ha							Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.	File Ref: 16-881	Date: 2018-07-27	Sheet No. 4 of 4																	

Wastewater Design Flows per Unit Count
City of Ottawa Sewer Design Guidelines, 2004

Site Area 4.500 ha

Extraneous Flow Allowances

Infiltration / Inflow 1.49 L/s

Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7	185	500
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4		0
2 Bedroom	2.1		0
3 Bedroom	3.1		0
Average	1.8		0

Total Pop 500

Average Domestic Flow 1.62 L/s

Peaking Factor 3.38

Peak Domestic Flow 5.48 L/s

Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Nursing / Rest homes	450 L/bed/d		0.00
Housekeeping Facilities	225 L/per/d		0.00
Dining room	125 L/per/d		0.00
Commercial floor space*	5 L/m ² /d		0.00
Hospitals	900 L/bed/d		0.00
School	70 L/student/d		0.00
Industrial - Light**	35,000 L/gross ha/d		0.00
Industrial - Heavy**	55,000 L/gross ha/d		0.00

Average I/C/I Flow 0.00

Peak Institutional / Commercial Flow 0.00

Peak Industrial Flow** 0.00

Peak I/C/I Flow 0.00

* assuming a 12 hour commercial operation

** peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B

Total Estimated Average Dry Weather Flow Rate	1.62 L/s
Total Estimated Peak Dry Weather Flow Rate	5.48 L/s
Total Estimated Peak Wet Weather Flow Rate	6.96 L/s

SANITARY SEWER CALCULATION SHEET



Manning's n=0.013

STREET	LOCATION		RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+H		INFILTRATION			PIPE								
	FROM M.H.	TO M.H.	AREA	UNITS	UNITS	UNITS	POP.	AREA	POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU AREA (ha)	AREA (ha)	ACCU AREA (ha)	AREA (ha)	ACCU AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (L/s)	RATIO Q act/Q cap	VEL (FULL) (m/s)	VEL (ACT) (m/s)
			(ha)		Singles	Townhouse		(ha)				(ha)	(ha)	(ha)	(ha)	(ha)	(ha)												
Unknown Road4 - 04																													
	16A	15A	0.27	12		12	32.4	0.27	32.4	3.68	0.39	0.00		0.00			0.00	0.00	0.27	0.27	0.08	0.46	81.0	200	1.10	34.40	0.01	1.09	0.38
To Unknown Road5 - 05, Pipe 8A - 9A	15A	8A	0.17	8		8	21.6	0.44	54.0	3.65	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.44	0.13	0.76	47.0	200	1.00	32.80	0.02	1.04	0.43	
								0.44	54.0			0.00	0.00	0.00	0.00	0.00	0.00		0.44										
Unknown Road5 - 05																													
	21A	9A	0.11	5		5	13.5	0.11	13.5	3.72	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.03	0.19	37.5	200	1.00	32.80	0.01	1.04	0.29	
To Unknown Road6 - 06, Pipe 9A - 22A								0.11	13.5			0.00	0.00	0.00	0.00	0.00	0.00		0.11										
Contribution From Unknown Road4 - 04, Pipe 15A - 8A								0.44	54.0			0.00	0.00	0.00	0.00	0.00	0.00		0.44										
	8A	9A	0.13	6		6	16.2	0.57	70.2	3.63	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.57	0.16	0.99	44.0	200	0.50	23.19	0.04	0.74	0.37	
To Unknown Road6 - 06, Pipe 9A - 22A								0.57	70.2			0.00	0.00	0.00	0.00	0.00	0.00		0.57										
Unknown Road6 - 06																													
Contribution From Unknown Road5 - 05, Pipe 21A - 9A								0.11	13.5			0.00	0.00	0.00	0.00	0.00	0.00		0.11	0.11									
Contribution From Unknown Road5 - 05, Pipe 8A - 9A								0.57	70.2			0.00	0.00	0.00	0.00	0.00	0.00		0.57	0.68									
	9A	22A	0.47	21		21	56.7	1.15	140.4	3.56	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.47	1.15	0.33	1.95	102.0	250	0.30	32.57	0.06	0.66	0.36	
To Unknown Road3 - 03, Pipe 22A - 14A								1.15	140.4			0.00	0.00	0.00	0.00	0.00	0.00		1.15										
Unknown Road2 - 02																													
	6A	20A	0.15	9		9	24.3	0.15	24.3	3.69	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.04	0.33	30.0	200	0.65	26.44	0.01	0.84	0.28	
To Unknown Road3 - 03, Pipe 7A - 11A	20A	7A	0.23	13		13	35.1	0.38	59.4	3.64	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.38	0.11	0.81	58.5	200	0.35	19.40	0.04	0.62	0.30	
								0.38	59.4			0.00	0.00	0.00	0.00	0.00	0.00		0.38										
Unknown Road1 - 01																													
	4A	19A	0.14	8		8	21.6	0.14	21.6	3.70	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.04	0.30	30.0	200	0.65	26.44	0.01	0.84	0.27	
To Unknown Road3 - 03, Pipe 5A - 7A	19A	5A	0.25	15		15	40.5	0.39	62.1	3.64	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.39	0.11	0.84	64.5	200	0.35	19.40	0.04	0.62	0.31	
								0.39	62.1			0.00	0.00	0.00	0.00	0.00	0.00		0.39										
Unknown Road3 - 03																													
	1A	18A	0.13	4		4	10.8	0.13	10.8	3.73	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.04	0.17	30.0	200	0.65	26.44	0.01	0.84	0.23	
	18A	2A	0.50	24		24	64.8	0.63	75.6	3.62	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.63	0.18	1.07	92.0	200	0.65	26.44	0.04	0.84	0.41	
	2A	3A	0.13	3		3	8.1	0.76	83.7	3.61	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.76	0.22	1.20	12.0	200	0.35	19.40	0.06	0.62	0.34	
	3A	5A	0.15	5		5	13.5	0.91	97.2	3.60	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.91	0.26	1.39	37.0	200	0.35	19.40	0.07	0.62	0.36	
Contribution From Unknown Road1 - 01, Pipe 19A - 5A								0.39	62.1			0.00	0.00	0.00	0.00	0.00	0.00		0.39	1.30									
	5A	7A	0.18	6		6	16.2	1.48	175.5	3.53	2.01	0.00	0.00	0.00	0.00	0.00	0.00	0.18	1.48	0.42	2.43	45.5	200	0.35	19.40	0.13	0.62	0.42	
Contribution From Unknown Road2 - 02, Pipe 20A - 7A								0.38	59.4			0.00	0.00	0.00	0.00	0.00	0.00		0.38	1.86									
	7A	11A	0.18	6		6	16.2	2.04	251.1	3.49	2.84	0.00	0.00	0.00	0.00	0.00	0.00	0.18	2.04	0.58	3.42	45.5	200	0.35	19.40	0.18	0.62	0.46	
	11A	12A	0.52	25		25	67.5	2.56	318.6	3.45	3.57	0.00	0.00	0.00	0.00	0.00	0.00	0.52	2.56	0.73	4.30	102.0	250	0.30	32.57	0.13	0.66	0.46	
	12A	13A	0.12	3		3	8.1	2.68	326.7	3.45	3.65	0.00	0.00	0.00	0.00	0.00	0.00	0.12	2.68	0.77	4.42	11.0	250	0.30	32.57	0.14	0.66	0.46	
	13A	22A	0.16	5		5	13.5	2.84	340.2	3.44	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.16	2.84	0.81	4.61	38.5	250	0.30	32.57	0.14	0.66	0.46	
Contribution From Unknown Road6 - 06, Pipe 9A - 22A								1.15	140.4			0.00	0.00	0.00	0.00	0.00	0.00		1.15	3.99									
	22A	14A	0.24	7		7	18.9	4.23	500	3.38	5.47	0.00	0.00	0.00	0.00	0.00	0.00	0.28	4.51	1.29	6.79	56.0	250	0.30	32.57	0.21	0.66	0.52	
	14A	17A						4.23	500	3.38	5.47	0.00	0.00	0.00	0.00	0.00	0.00	0.28	4.51	1.29	6.79	17.0	250	0.30	32.57	0.21	0.66	0.52	

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	I/s/ha	
Average Daily Flow =	280	I/p/day			
Comm/Inst Flow =	28000	L/ha/da	0.3241	I/s/ha	
Industrial Flow =	35000	L/ha/da	0.40509	I/s/ha	
Max Res. Peak Factor =	4.00				
Commercial/Inst./Park Peak Factor =	1.00				
Institutional =	0.32	I/s/ha			
Industrial Peak Factor =	as per MOE Graph				
Extraneous Flow =	0.286	L/s/ha			
Minimum Velocity =	0.600	m/s			
Manning's n =	(Conc)	0.013	(Pvc)	0.013	
Townhouse coeff =	2.7				
Single house coeff =	3.4				

Designed:	PROJECT:		
Checked:	LOCATION: City of Ottawa		
Dwg. Reference: Sanitary Drainage Plan, Dwg. No.	File Ref:	Date: 15 Dec 2022	Sheet No. 1 of 1



David Schaeffer Engineering Ltd.

120 Iber Road, Suite 103

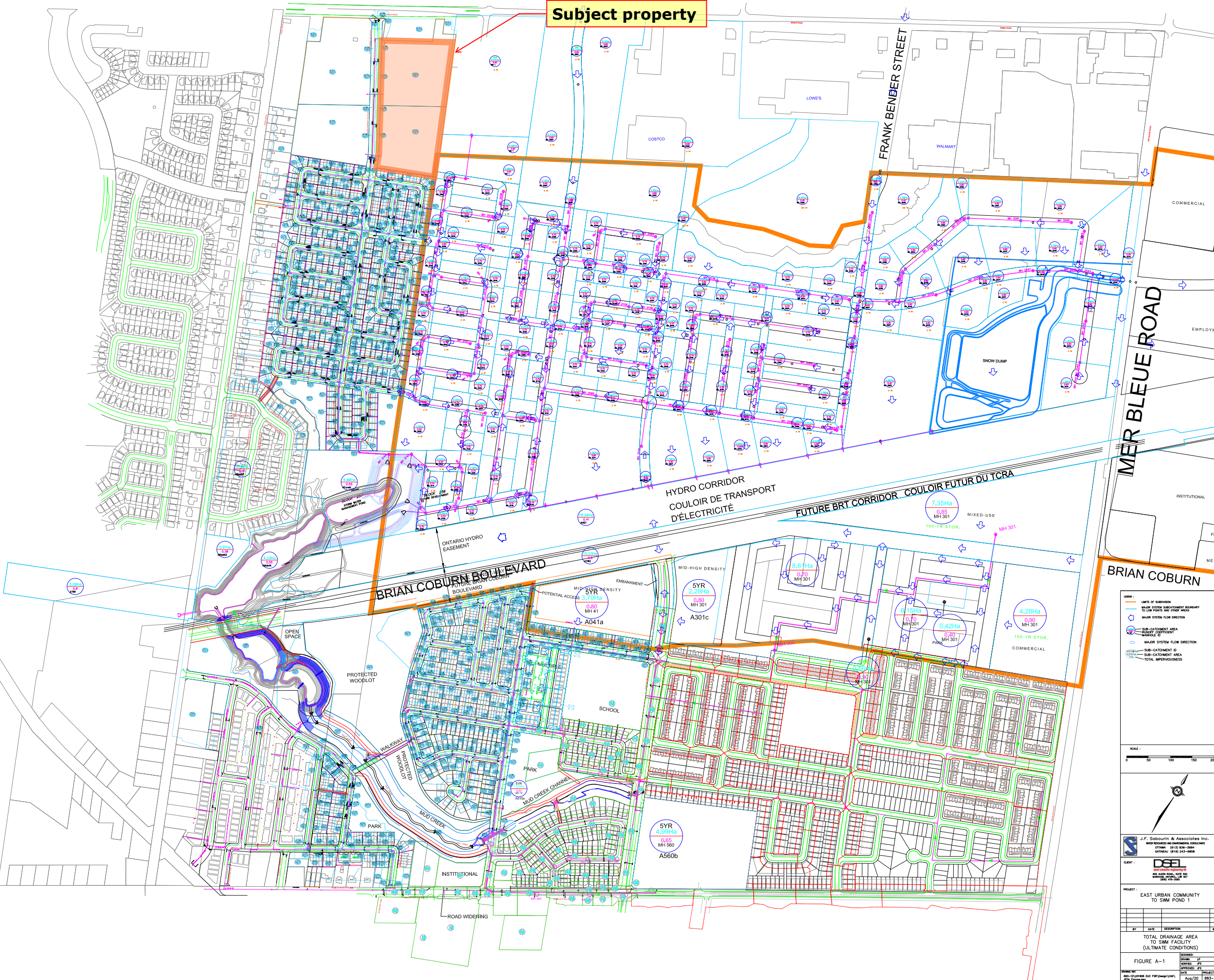
Stittsville, ON K2S 1E9

613-836-0856

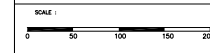
dsel.ca

APPENDIX D

Subject property



- LEGEND**
- LIMITS OF SUBDIVISION
 - MAJOR SYSTEM SUBCATCHMENT BOUNDARY TO LOW POINTS AND OTHER AREAS
 - MAJOR SYSTEM FLOW DIRECTION
 - SUB-CATCHMENT AREA - RUNOFF COEFFICIENT SAMPLE 2
 - MAJOR SYSTEM FLOW DIRECTION
 - SUB-CATCHMENT ID
 - SUB-CATCHMENT AREA
 - TOTAL IMPERVIOUSNESS



J.F. Sabourin & Associates Inc.
 1000 BOULEVARD DE LA GAZETTE, SUITE 100
 OTTAWA, ONTARIO K1P 1H1
 TEL: (613) 846-3888
 FAX: (613) 846-3889

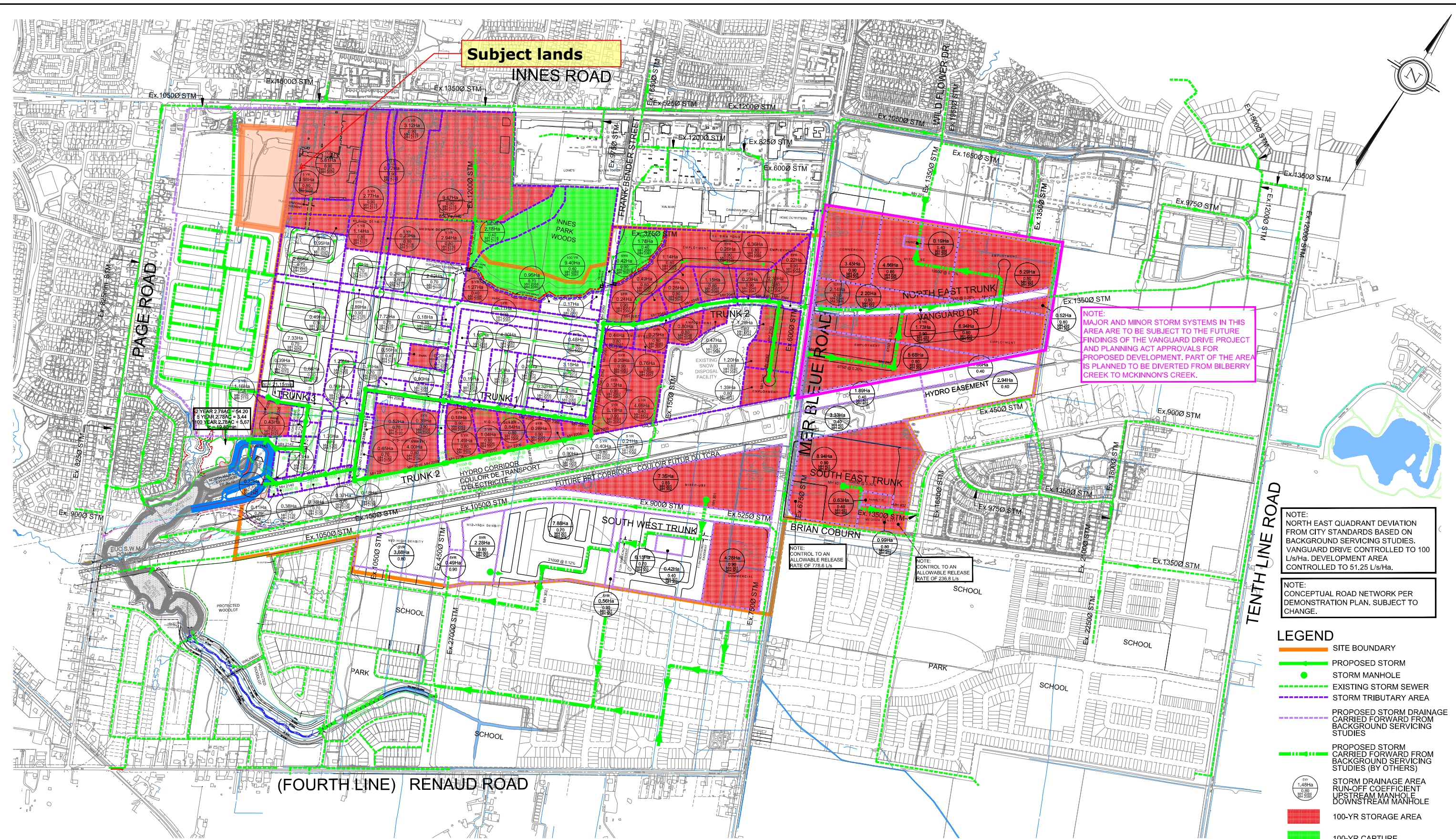
CLIENT: DSEL
 1000 BOULEVARD DE LA GAZETTE, SUITE 100
 OTTAWA, ONTARIO K1P 1H1
 TEL: (613) 846-3888
 FAX: (613) 846-3889

PROJECT: EAST URBAN COMMUNITY TO SWM POND 1

BY	DATE	DESCRIPTION	BY

TOTAL DRAINAGE AREA TO SWM FACILITY (ULTIMATE CONDITIONS)
FIGURE A-1

DESIGNED: JF	PROJECT NO: 883-10
DRAWN: JF	DATE: Aug/20
CHECKED: JF	PROJECT NO: 883-10
APPROVED: JF	DATE: Aug/20



Subject lands
INNES ROAD

NOTE:
 MAJOR AND MINOR STORM SYSTEMS IN THIS AREA ARE TO BE SUBJECT TO THE FUTURE FINDINGS OF THE VANGUARD DRIVE PROJECT AND PLANNING ACT APPROVALS FOR PROPOSED DEVELOPMENT. PART OF THE AREA IS PLANNED TO BE DIVERTED FROM BILBERRY CREEK TO MCKINNON'S CREEK.

NOTE:
 NORTH EAST QUADRANT DEVIATION FROM CITY STANDARDS BASED ON BACKGROUND SERVICING STUDIES. VANGUARD DRIVE CONTROLLED TO 100 L/s/ha. DEVELOPMENT AREA CONTROLLED TO 51.25 L/s/ha.

NOTE:
 CONCEPTUAL ROAD NETWORK PER DEMONSTRATION PLAN. SUBJECT TO CHANGE.

- LEGEND**
- SITE BOUNDARY
 - PROPOSED STORM
 - STORM MANHOLE
 - - - EXISTING STORM SEWER
 - - - STORM TRIBUTARY AREA
 - - - PROPOSED STORM DRAINAGE CARRIED FORWARD FROM BACKGROUND SERVICING STUDIES
 - - - PROPOSED STORM DRAINAGE CARRIED FORWARD FROM BACKGROUND SERVICING STUDIES (BY OTHERS)
 - STORM DRAINAGE AREA RUN-OFF COEFFICIENT UPSTREAM MANHOLE DOWNSTREAM MANHOLE
 - 100-YR STORAGE AREA
 - 100-YR CAPTURE



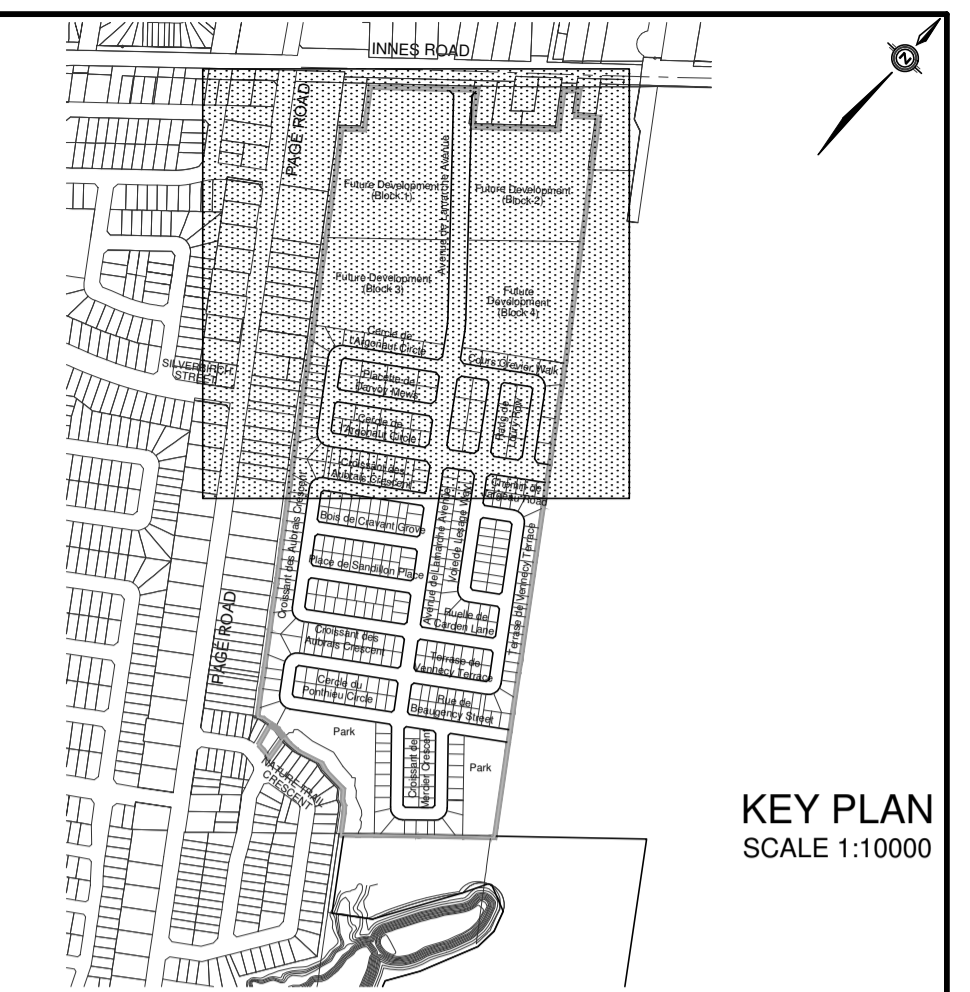
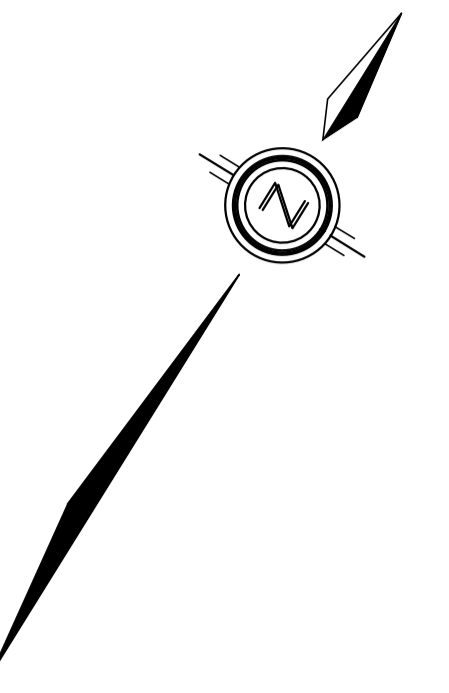
120 Iber Road, Unit 103
 Stittsville, ON K2S 1E9
 Tel. (613) 836-0856
 Fax. (613) 836-7183
 www.DSEL.ca

**EAST URBAN COMMUNITY PHASE 3 AREA COMMUNITY DESIGN PLAN
 CONCEPTUAL STORM SERVICING**

PROJECT No. :	14-733
SCALE	1:5000
DATE:	OCTOBER 2019
DRAWING No.	4



APPROVED REFUSED
 THIS DAY OF _____, 20____
 JOSHUA WHITE, P.ENG
 PROJECT MANAGER - EAST BRANCH
 PLANNING, INFRASTRUCTURE & ECONOMIC
 DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



Subject lands

LEGEND

STORM DRAINAGE BOUNDARY	-----
STORM DRAINAGE BOUNDARY (OTHER PHASES)	-----
UPSTREAM MH TO DOWNSTREAM MH	43 - 44
AREA IN HECTARES	0.37 0.51
RUNOFF COEFFICIENT	2.78AC=14.40
EXTERNAL TIME OF CONCENTRATION	TC=14.5 MIN
EXTERNAL BLENDED RUNOFF COEFFICIENT	C=0.70
STREET CATCHBASIN & LEAD	--->--->---
STREET CATCHBASIN WITH CLOSED LID & LEAD	--->--->---
MAINTENANCE HOLE	--->--->---
CURB INLET CATCHBASIN & LEAD	--->--->---
CATCHBASIN / MAINTENANCE HOLE	--->--->---
INTERCONNECTED CATCH BASIN & LEADS	--->--->---
CAP	--->--->---
OVERLAND FLOW DIRECTION	--->---
EXTERNAL OVERLAND FLOW DIRECTION	--->---
EMERGENCY OVERLAND FLOW DIRECTION	--->---

TOPOGRAPHIC INFORMATION
 TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00, SURVEYS DATED NOVEMBER 30, 2017.

LEGAL INFORMATION
 CALCULATED M-PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 16-10-116-00 (PHASE 1 & 2) DATED SEPTEMBER 14, 2018.

EAST URBAN COMMUNITY
 MIXED USE CENTRE
 REFER TO
 DAVID SCHAEFFER ENGINEERING LIMITED
 PROJECT No. 14-733

ELEVATION NOTE ELEVATION = 86.12 m
 ELEVATIONS ARE GEODETIC AND ARE DERIVED FROM SITE BENCHMARK NCC CONTROL POINT 001196530229 HAVING A PUBLISHED ELEVATION OF 86.12m

No.	DATE	BY	DESCRIPTION
6.	18-10-30	M.Z.	REVISED M-PLAN
5.	18-07-27	M.Z.	REVISED WEST BOUNDARY STORM SYSTEM
4.	18-07-10	M.Z.	MYLARS FOR PHASE 1 COMMENCE WORK
3.	18-06-28	M.Z.	REVISED AS PER CITY AND UTILITY COMMENTS
2.	18-05-09	M.Z.	ISSUED FOR MOE APPROVAL
1.	18-01-24	M.Z.	1st SUBMISSION



PROJECT No. 16-881

STORM DRAINAGE PLAN © DSEL

CAIVAN (ORLEANS VILLAGE) LIMITED	ORLEANS VILLAGE
DRAWN BY: M.Z. DESIGNED BY: P.P. SCALE: 1:1000	CHECKED BY: P.P. CHECKED BY: M.Z. DATE: JANUARY 2018
DRAWING NO.	SHEET NO.
	67

REFER TO
 DWG No. 68

CITY PLAN No. 17675
 D07-16-16-0022
 CITY FILE No.

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)



Manning 0.013
 Local Roads Return Frequency = 2 years
 Collector Roads Return Frequency = 5 years
 Arterial Roads Return Frequency = 10 years

LOCATION			AREA (Ha)																FLOW					SEWER DATA																													
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO																				
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)	(%)	(m)	(l/s)	(m/s)	FLOW (min)	Q/Q full																					
West Boundary STM System					0.00	0.00			0.00	0.00			0.00	0.00	1.74	0.55	2.66	2.66																																			
					0.00	0.00			0.00	0.00			0.00	0.00	0.02	0.70	0.04	2.70																																			
					0.00	0.00			0.00	0.00			0.00	0.00	0.14	0.50	0.19	2.89																																			
					0.00	0.00			0.00	0.00			0.00	0.00	0.05	0.50	0.07	2.96																																			
	MH C12 (100yr. Intake)	HW C13			0.00	0.00			0.00	0.00			0.00	0.00	0.44	0.50	0.61	3.58																																			
																				Tc=340/(2*60)+10min. (For 340.0m and 2.0m/s)																																	
																				12.80	67.50	91.41	0.00	156.46	500	600	600	CONC	0.90	22.0	583	2.06	0.18	0.86																			

Definitions:
 Q = 2.78 AIR, where
 Q = Peak Flow in Litres per second (L/s)
 A = Areas in hectares (ha)
 I = Rainfall Intensity (mm/h)
 R = Runoff Coefficient

Notes:
 1) Ottawa Rainfall-Intensity Curve
 2) Min. Velocity = 0.80 m/s

Designed: P.P./C.M.	PROJECT: Caivan Communities Orleans Village		
Checked: M.Z.	LOCATION: City of Ottawa		
Dwg. Reference:	File Ref:	Date: 30 Oct 2018	Sheet No. SHEET 1 OF 5

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)



Manning 0.013
Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Arterial Roads Return Frequency = 10 years

Table with columns: LOCATION, AREA (Ha) [2 YEAR, 5 YEAR, 10 YEAR, 100 YEAR], FLOW [Time of Conc., Intensity 2 Year, 5 Year, 10 Year, 100 Year, Peak Flow], SEWER DATA [DIA. (mm), TYPE, SLOPE, LENGTH, CAPACITY, VELOCITY, TIME OF, RATIO]. Rows include locations like Sandillon Place, Bois de Cravant Grove, Croissant des Aubrais Crescent, Chemin de Jargeau Road, Block 158, Placette de Darvoy Mews, and Cercle de l'Argonaut Circle.

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: P.P./C.M.
Checked: M.Z.
Dwg. Reference:
PROJECT: Caivan Communities Orleans Village
LOCATION: City of Ottawa
Date: 30 Oct 2018
Sheet No. SHEET 3 OF 5

December 15, 2022
David Schaeffer Engineering Ltd.
120 Iber Road, Unit 103
Stittsville, ON
K2S 1E9

Project Number: P883

Attention: Adam Fobert, P.Eng.

Subject: Orleans Village Phase 4 / Conceptual Design Analysis

J.F. Sabourin and Associates Inc. (JFSA) were retained by David Schaeffer Engineering Ltd. (DSEL) to evaluate the impacts of proposed revisions to the design of Phase 4 of the Orleans Village Subdivision, located within the City of Ottawa (refer to Figure 1). This memo is an update of the September 21, 2022 version.

For more details on the Orleans Village Subdivision, please refer to the July 2018 *Stormwater Management Report for the Orleans Village Subdivision* by JFSA. Refer to Figures 2 and 3 for the updated draft plan and conceptual grading plan for Phase 4 of Orleans Village, as provided by DSEL in December 2022. The areas in question are modelled as subcatchments B013DV2 and B015RE2 (refer to Figure 4) in the East Urban Community (EUC) Pond 1 model, last updated for the December 2022 *Design Brief for Pond 1 East Urban Community North Main Cell and North Forebay Modifications* by DSEL and JFSA. The December 2022 *Design Brief* model incorporates the changes made to subcatchments B013DV2 and B015RE1 in the September 21, 2022 version of this analysis:

- The imperviousness of area B013DV2 was updated from 93% to 63%;
- The imperviousness of area B015RE2 was updated from 79% to 63%;
- The minor system outlet for both drainage areas was set to MH 15 (previously split between MH 13 and MH 15); and
- On-site minor system capture and surface storage estimates were updated based on the revised imperviousness of the drainage areas.

As directed by DSEL / Caivan, the December 2022 *Design Brief* model has been further updated to increase the percent imperviousness of subcatchments B013DV2 and B015RE2 from 63% to 66%. Although this is an increase from the September 21, 2022 version of this analysis, it remains a decrease from that initially proposed in the July 2018 *Stormwater Management Report for the Orleans Village Subdivision*.

Subcatchments B013DV2 and B015RE2 were modelled with 2-year + 14% minor system capture, for a 2-year level of service plus additional capture due to increased head over the catchbasins / Inlet Control Devices (ICDs) during the 100-year storm. Excess 100-year flows are to be stored on-site. In the updated December 2022 *Design Brief* modelling, area B013DV2 is modelled with 402 L/s of minor system capture and 292 m³ of on-site storage. Similarly, area B015RE2 is modelled with 340 L/s of minor system capture and 242 m³ of on-site storage. We understand from DSEL (as of the September 21, 2022 analysis) that the available surface storage over both areas is approximately 750 m³, and as such the required surface storage volumes can be achieved.

As documented in the December 2022 *Design Brief*, with the changes to Orleans Village Phase 4 in place, all hydraulic gradeline and pond requirements are satisfied. It may therefore be concluded that the Phase 4 Orleans Village updates will not negatively impact the operations of EUC Pond 1 or the Orleans Village storm sewer system.

Yours truly,

J.F Sabourin and Associates Inc.



Laura Pipkins, P.Eng.
Project Engineer in Water Resources

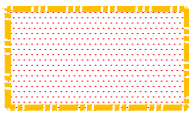
cc: J.F Sabourin, M.Eng, P.Eng
Director of Water Resources Projects

Figures

- Figure 1: Site Location
- Figure 2: Draft Plan
- Figure 3: Conceptual Grading Plan
- Figure 4: Proposed Major System



LEGEND



SITE BOUNDARY

ORLEAN VILLAGE PHASE 4

SITE LOCATION



120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca

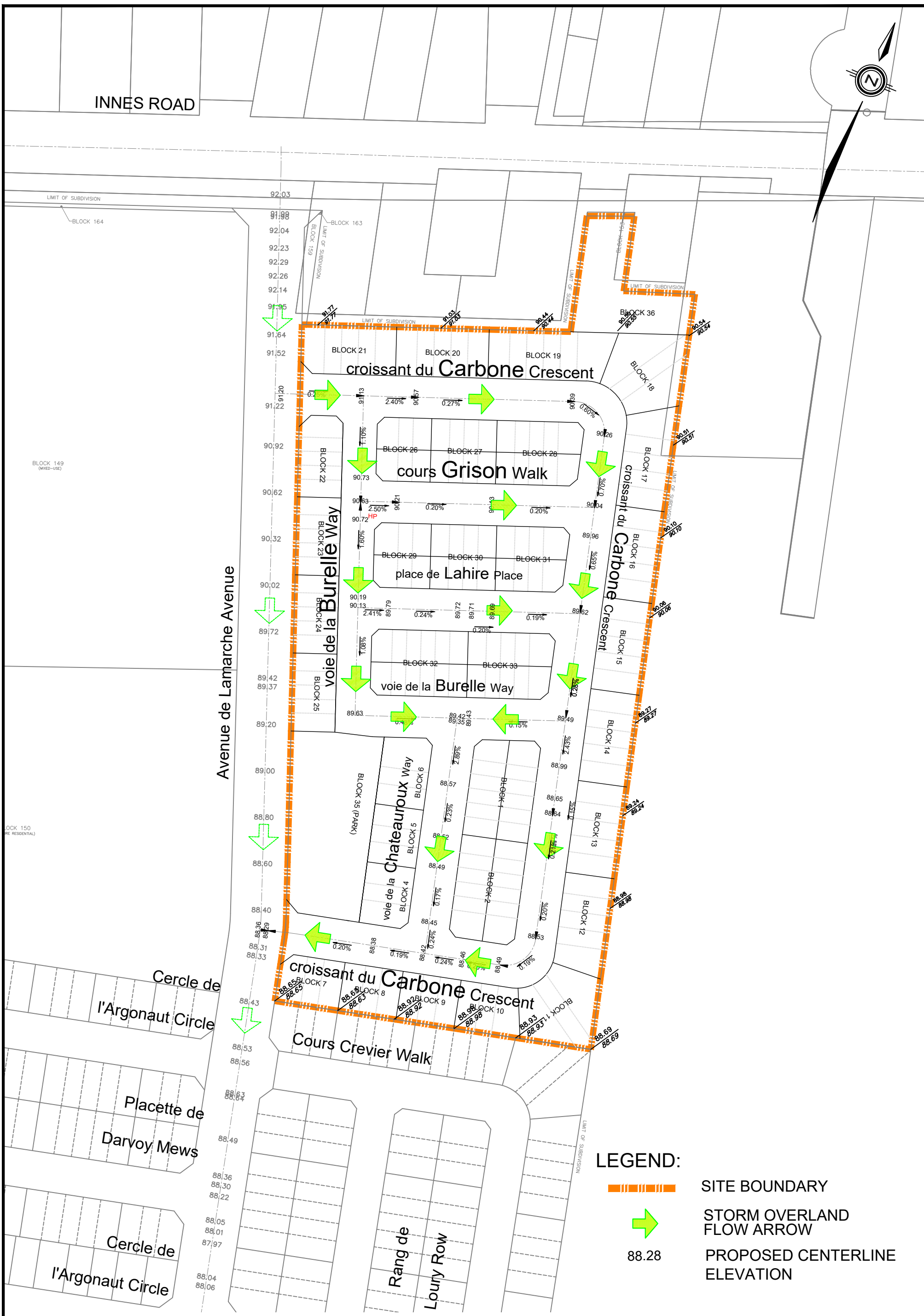
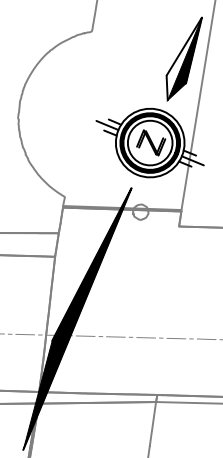
DATE:	JULY 2022
SCALE:	1:15000
PROJECT No.:	22-1296
FIGURE:	1






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DRAFT PLAN
ORLEAN VILLAGE PHASE 4

DATE: DECEMBER 2022
SCALE: 1:1500
PROJECT No.: 22-1296
FIGURE: 2



- LEGEND:**
-  SITE BOUNDARY
 -  STORM OVERLAND FLOW ARROW
 -  PROPOSED CENTERLINE ELEVATION



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CONCEPT GRADING PLAN
 ORLEAN VILLAGE PHASE 4

DATE: DECEMBER 2022
SCALE: 1:1500
PROJECT No.: 22-1296
FIGURE: 3

INNES ROAD

Avenue de Lamarche Avenue

B012EX1
0.054 ha
29%

B013EX2
0.074 ha
51%

B012EX2
0.522 ha
39%

B012NW
0.100 ha
63%

B012NE
0.082 ha
63%

B012SW
0.091 ha
63%

B012SE
0.074 ha
63%

B013DV2
2.535 ha
66%

B013NW
0.099 ha
62%

B013NE
0.080 ha
62%

B015NW
0.102 ha
63%

B015NE
0.085 ha
63%

B015RE2
2.165 ha
66%

LB015NW LB015NE

B019R4
0.025 ha
22%

B019R5
0.052 ha
23%

B015SW
0.059 ha
63%

B015SE
0.049 ha
63%

B018R1
0.060 ha
23%

B018R2
0.044 ha
23%

B018R3
0.051 ha
15%

B019S1 LB019S1
0.070 ha
70%

B019S2
0.064 ha
73%

B018SW
0.047 ha
55%

LB018SE

B018SE
0.023 ha
48%

B018N3
0.038 ha
46%

B016NE
0.135 ha
68%

B021R2
0.128 ha
23%

B024R3
0.034 ha
24%

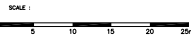
LB180N1 LB180N2

142

BLOCK 148
(MIXED-USE)

BLOCK 147
(FUTURE RESIDENTIAL)

- LEGEND:
- LIMITS OF SUBDIVISION
 - MAJOR SYSTEM SUBCATCHMENT BOUNDARY TO LOW POINTS AND OTHER AREAS
 - MAJOR SYSTEM FLOW DIRECTION
 - FIRST DIRECTION OF EXCESS MAJOR SYSTEM FLOW AT LOW POINT
 - LOW POINT
 - SUB-CATCHMENT ID
 - SUB-CATCHMENT AREA
 - TOTAL IMPERVIOUSNESS



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CLIENT: DSEL
1331 AVENUE DE LA SERRA
OTTAWA, ONTARIO K1H 8S6
TEL: (613) 243-0888

PROJECT: ORLEANS VILLAGE SUBDIVISION
PHASE 4

BY	DATE	DESCRIPTION	BY
		PROPOSED MAJOR SYSTEM	

FIGURE 4
DESIGNED: JFS
DRAWN: JFS
CHECKED: JFS
DATE: 09/22
PROJECT NO.: 083-10

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)



Local Roads Return Frequency = 2 years
 Collector Roads Return Frequency = 5 years
 Arterial Roads Return Frequency = 10 years

Manning 0.013

LOCATION		AREA (Ha)																FLOW						SEWER DATA																							
		2 YEAR			5 YEAR			10 YEAR			100 YEAR			Time of Conc.	Intensity 2 Year	Intensity 5 Year	Intensity 10 Year	Intensity 100 Year	Peak Flow	DIA. (mm) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF LOW (min)	RATIO Q/Q full																			
From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)																								
Unknown Road4 - 04																																															
16	15	0.27	0.75	0.56	0.56			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	43	375	375	PVC	1.05	75.5	179.6599	1.6267	0.7736	0.241															
	15	8	0.18	0.75	0.38	0.94			0.00	0.00			0.00	0.00			0.00	10.77	73.96	100.28	117.53	171.78	69	375	375	PVC	1.05	52.5	179.6599	1.6267	0.5379	0.386															
				0.94				0.00				0.00				0.00		11.31																													
Unknown Road5 - 05																																															
	19	9	0.11	0.76	0.23	0.23			0.00	0.00			0.00	0.00			0.00	10.00	76.81	104.19	122.14	178.56	18	300	300	PVC	0.50	33.0	68.3778	0.9673	0.5686	0.261															
				0.23				0.00				0.00				0.00		10.57																													
				0.94				0.00				0.00				0.00		11.31																													
				1.21				0.00				0.00				0.00		11.31		72.11		97.74		114.54		167.40		87		450		450		CONC		0.50		45.0		201.6005		1.2676		0.5917		0.434	
				1.21				0.00				0.00				0.00		11.90																													
Unknown Road6 - 06																																															
				0.23				0.00				0.00				0.00		10.57																													
				1.21				0.00				0.00				0.00		11.90																													
		0.21	0.76	0.44	1.89			0.00	0.00			0.00	0.00			0.00	0.00																														
	9	20	0.25	0.75	0.52	2.41			0.00	0.00			0.00	0.00			0.00	11.90	70.20	95.11	111.45	162.85	169	600	600	CONC	0.25	102.5	307.0058	1.0858	1.5733	0.551															
				2.41				0.00				0.00				0.00		13.48																													
Unknown Road2 - 02																																															
6	7	0.38	0.76	0.80	0.80			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	62	375	375	PVC	0.50	89.5	123.9771	1.1225	1.3289	0.497															
				0.80				0.00				0.00				0.00		11.33																													
Unknown Road1 - 01																																															
4	5	0.40	0.76	0.85	0.85			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	65	375	375	PVC	0.50	95.0	123.9771	1.1225	1.4105	0.524															
				0.85				0.00				0.00				0.00		11.41																													
Unknown Road3 - 03																																															
1	18	0.14	0.67	0.26	0.26			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	20	300	300	PVC	1.30	31.0	110.2558	1.5598	0.3312	0.182															
		0.49	0.67	0.91	1.17			0.00	0.00			0.00	0.00			0.00	0.00																														
	18	2	0.60	0.47	0.78	1.96			0.00	0.00			0.00	0.00			0.00	10.33	75.56	102.48	120.12	175.59	148	450	450	CONC	0.50	91.0	201.6005	1.2676	1.1965	0.734															
	2	3	0.13	0.67	0.24	2.20			0.00	0.00			0.00	0.00			0.00	11.53	71.40	96.76	113.39	165.70	157	450	450	CONC	0.50	14.5	201.6005	1.2676	0.1907	0.779															
	3	5	0.16	0.67	0.30	2.50			0.00	0.00			0.00	0.00			0.00	11.72	70.78	95.92	112.39	164.24	177	450	450	CONC	0.60	41.0	220.8423	1.3886	0.4921	0.800															
				0.85				0.00				0.00				0.00		11.41																													
	5	7	0.14	0.67	0.26	3.60			0.00	0.00			0.00	0.00			0.00	12.21	69.25	93.81	109.91	160.60	250	525	525	CONC	0.80	39.5	384.6594	1.7769	0.3705	0.649															
				0.80				0.00				0.00				0.00		11.33																													
	7	11	0.20	0.67	0.37	4.78			0.00	0.00			0.00	0.00			0.00	12.58	68.14	92.29	108.12	157.97	326	600	600	CONC	0.45	51.5	411.8915	1.4568	0.5892	0.791															
	11	12	0.51	0.67	0.95	5.73			0.00	0.00			0.00	0.00			0.00	13.17	66.45	89.98	105.40	153.98	381	825	825	CONC	0.20	100.5	641.9463	1.2009	1.3948	0.593															
	12	13	0.12	0.67	0.22	5.95			0.00	0.00			0.00	0.00			0.00	14.57	62.81	84.99	99.54	145.37	374	825	825	CONC	0.20	13.5	641.9463	1.2009	0.1874	0.582															
	13	20	0.14	0.67	0.26	6.21			0.00	0.00			0.00	0.00			0.00	14.75	62.36	84.37	98.80	144.29	387	900	900	CONC	0.15	36.5	701.1305	1.1021	0.5520	0.553															
				2.41				0.00				0.00				0.00		13.48																													
	20	14		0.67	0.47	9.09	0.28	0.40	0.31	0.31			0.00	0.00			0.00	15.30	61.06	82.59	96.71	141.22	581	900	900	CONC	0.15	59.0	701.1305	1.1021	0.8922	0.828															
	14	17		0.67	0.47	9.09			0.00	0.31			0.00	0.00			0.00	16.20	59.08	79.88	93.53	136.55	562	900	900	CONC	0.15	19.5	701.1305	1.1021	0.2949	0.801															

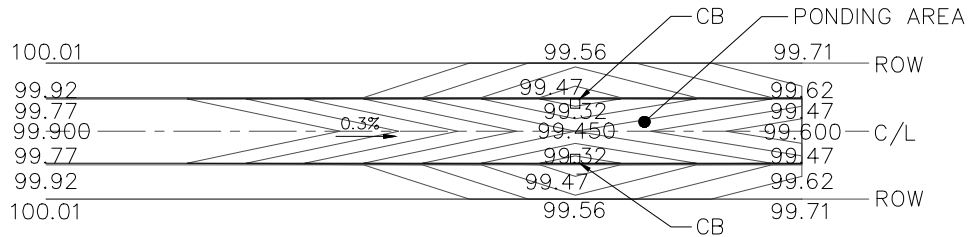
Definitions:
 Q = 2.78 AIR, where
 Q = Peak Flow in Litres per second (L/s)
 A = Areas in hectares (ha)
 I = Rainfall Intensity (mm/h)
 R = Runoff Coefficient

Notes:
 1) Ottawa Rainfall-Intensity Curve
 2) Min. Velocity = 0.80 m/s

Designed:	PROJECT:
Checked:	LOCATION:
Dwg. Reference:	File Ref:
	Date: 15 Dec 2022
	Sheet No. SHEET 1 OF 1

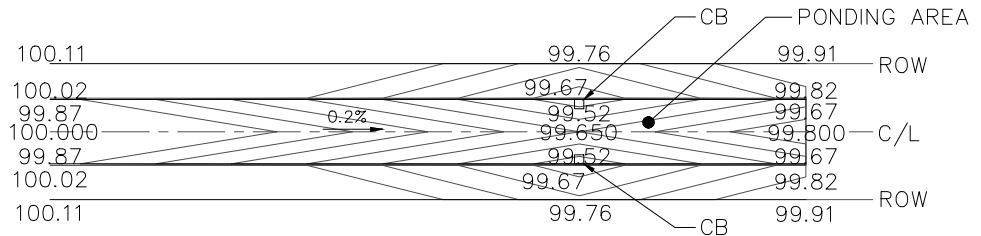
0.3% HIGH POINT TO HIGH POINT ROAD PONDING

STAGE (m)	AREA (m ²)
99.32	0.72
99.35	10.88
99.4	77.42
99.45	204.46
99.5	372.54
99.55	592.2
99.6	838.95
99.65	1060.96



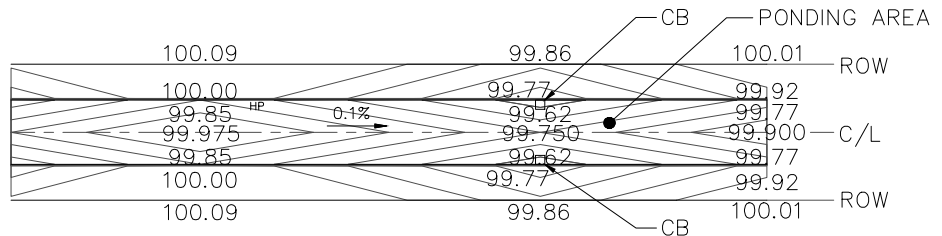
0.2% HIGH POINT TO HIGH POINT ROAD PONDING

STAGE (m)	AREA (m ²)
99.52	0.72
99.55	12.24
99.6	87.08
99.65	229.33
99.7	419.77
99.75	671.5
99.8	957.94
99.85	1219.86



0.1% HIGH POINT TO HIGH POINT ROAD PONDING

STAGE (m)	AREA (m ²)
99.62	0.36
99.65	12.12
99.7	86.14
99.75	233.37
99.8	457.52
99.85	776.36
99.9	1122.94
99.95	1427.83



DSEL
david schaeffer engineering ltd

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Stittsville, Ontario, K2S 1E9
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CITY OF OTTAWA

**ROAD SAG PONDING
DEPTH / AREA FIGURE**

SCALE: 1:1000

PROJECT No.:

DATE:

FIGURE:



David Schaeffer Engineering Ltd.

120 Iber Road, Suite 103

Stittsville, ON K2S 1E9

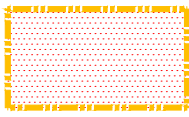
613-836-0856

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DRAWINGS / FIGURES



LEGEND



SITE BOUNDARY

ORLEAN VILLAGE PHASE 4

SITE LOCATION

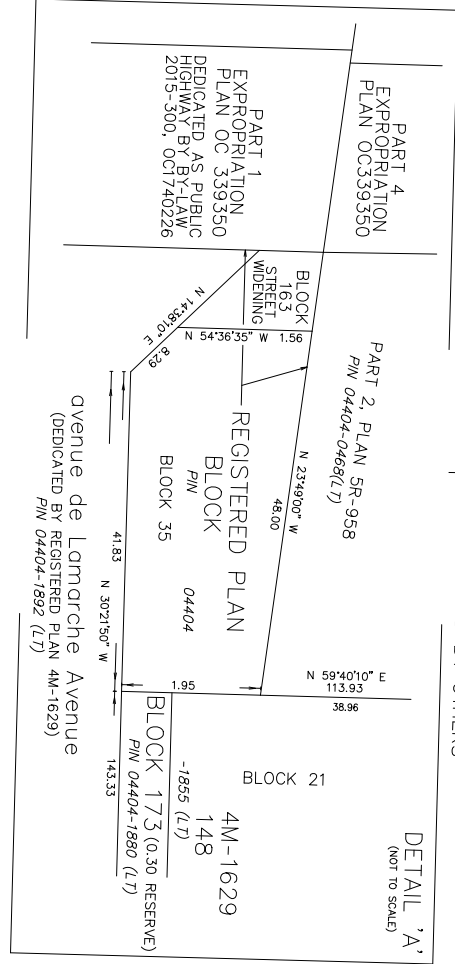
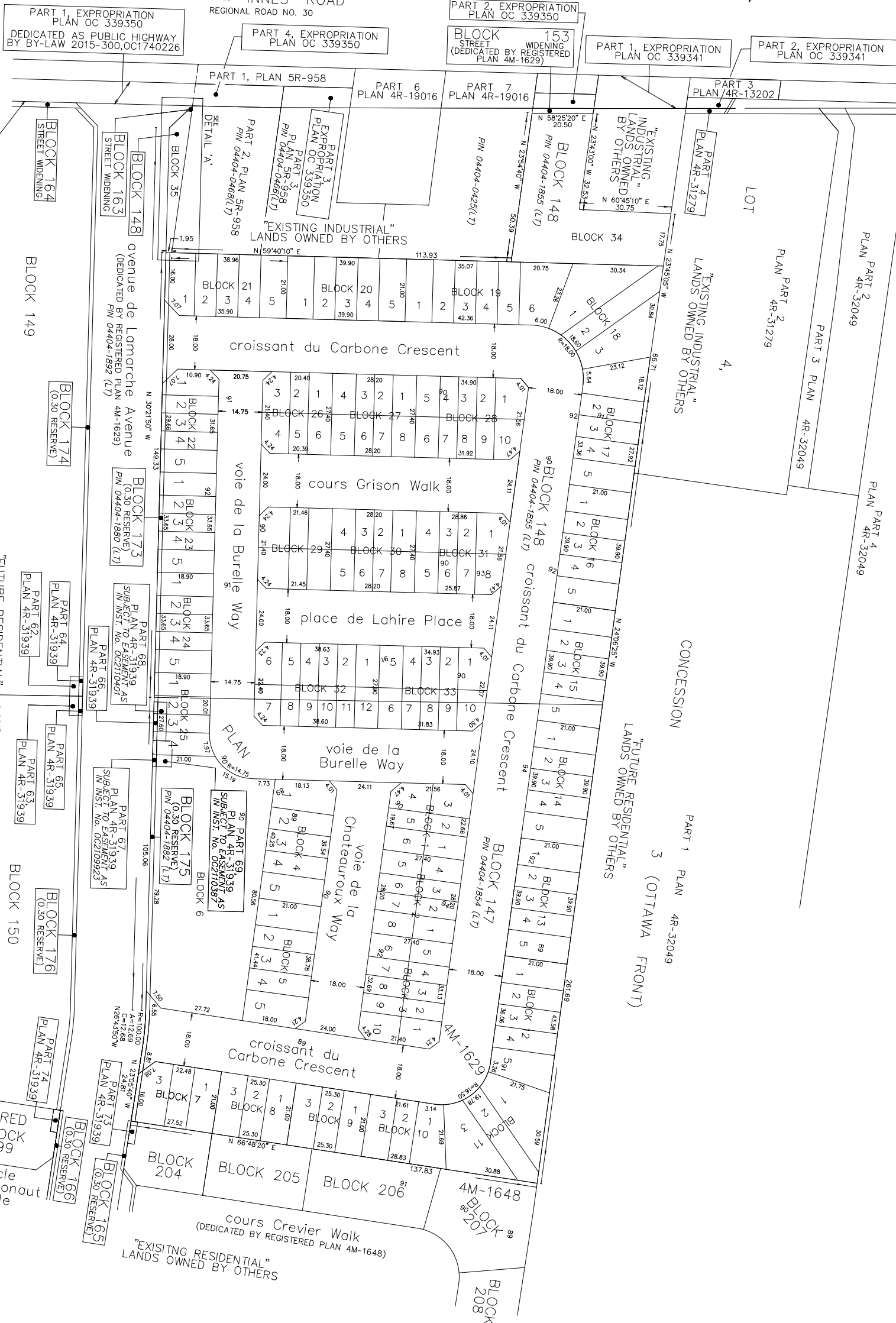


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DATE:	FEBRUARY 2023
SCALE:	1:15000
PROJECT No.:	22-1296
FIGURE:	1



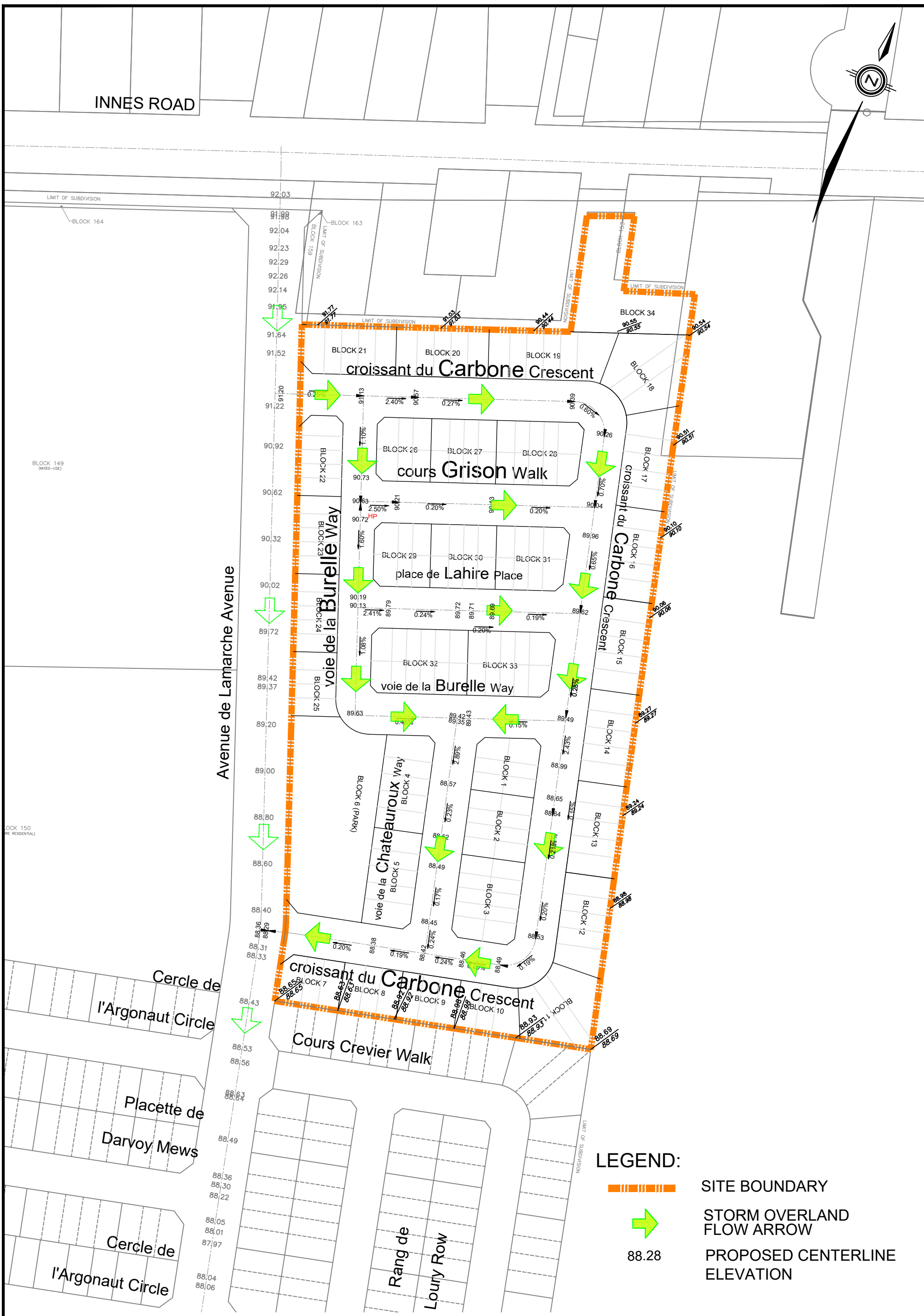
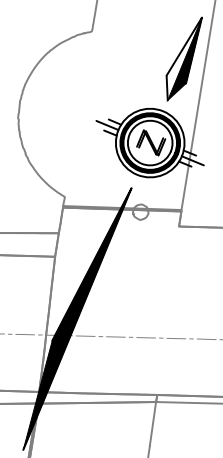
ROAD ALLOWANCE BETWEEN CONCESSIONS 2 AND 3 (OTTAWA FRONT)
Known as **INNES ROAD**
REGIONAL ROAD NO. 30






120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
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DRAFT PLAN
ORLEAN VILLAGE PHASE 4

DATE: FEBRUARY 2023
SCALE: 1:1500
PROJECT No.: 22-1296
FIGURE: 2



LEGEND:

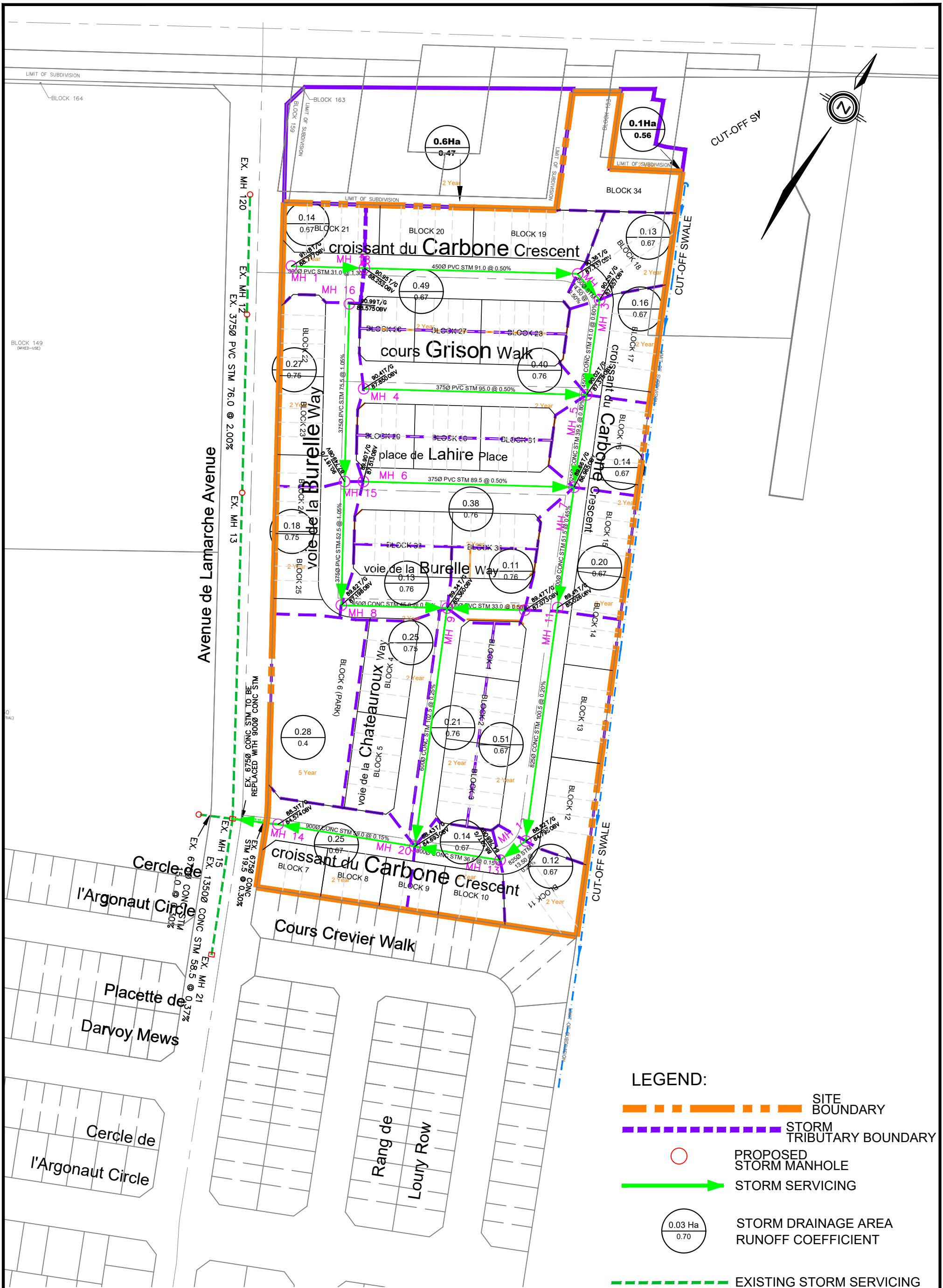
-  SITE BOUNDARY
-  STORM OVERLAND FLOW ARROW
-  PROPOSED CENTERLINE ELEVATION



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 Tel. (613) 836-0856
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**CONCEPT GRADING PLAN
 ORLEAN VILLAGE PHASE 4**

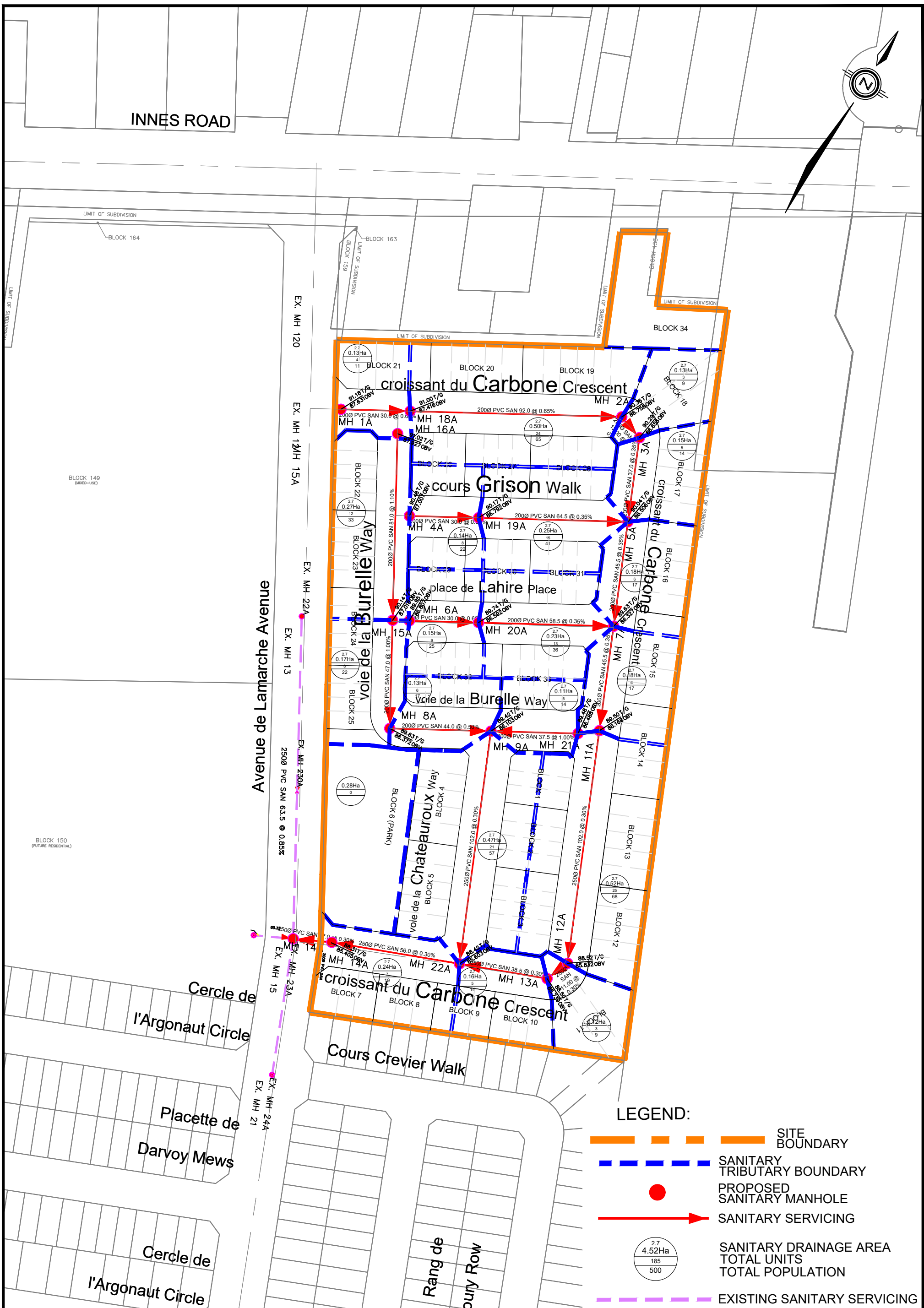
DATE: FEBRUARY 2023
SCALE: 1:1500
PROJECT No.: 22-1296
FIGURE: 3



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**STORM SERVICING PLAN
 ORLEAN VILLAGE PHASE 4**

DATE: FEBRUARY 2023
SCALE: 1:1500
PROJECT No.: 22-1296
FIGURE: 4



LEGEND:

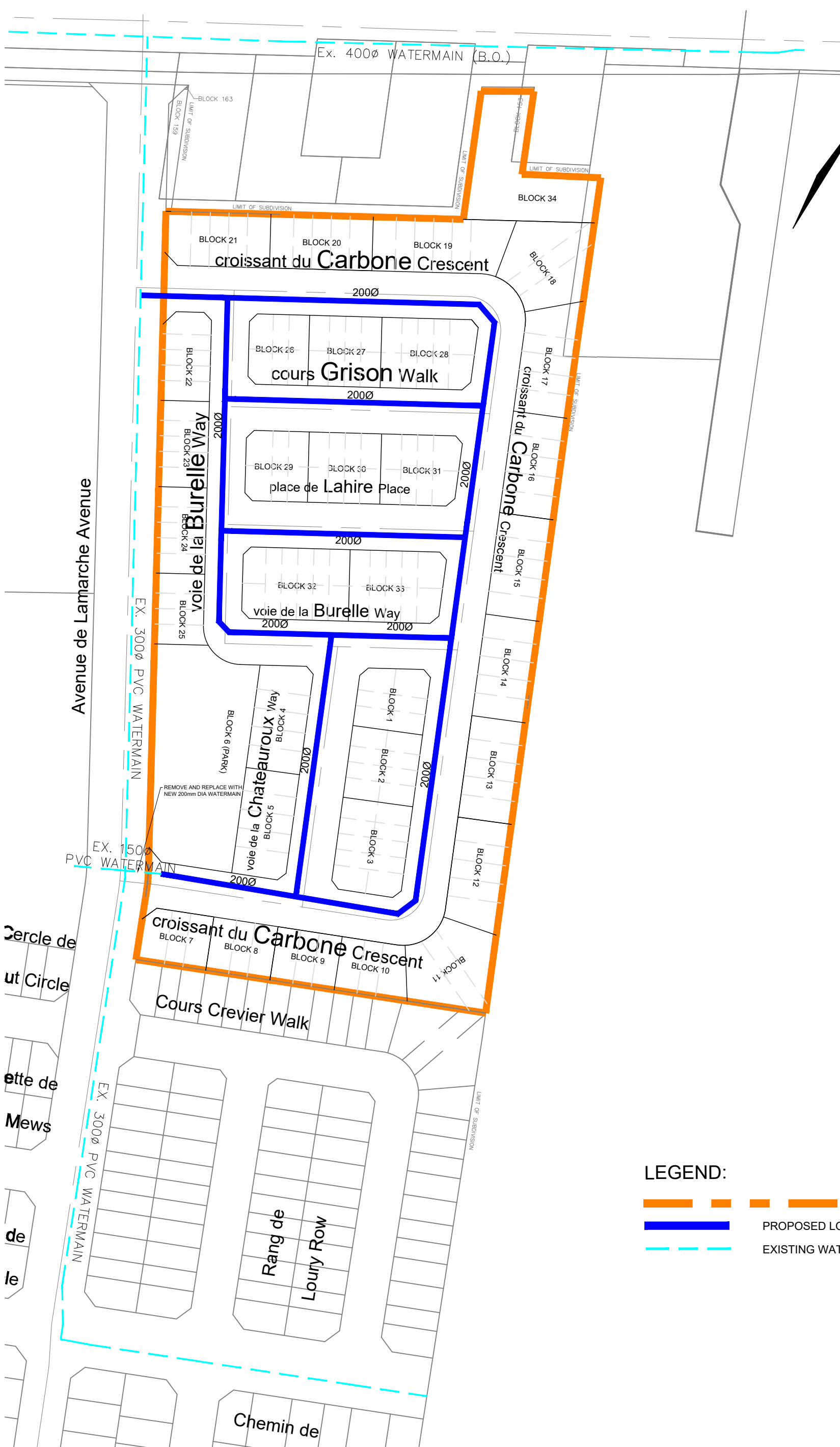
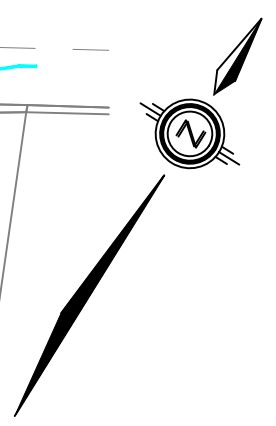
- — — — — SITE BOUNDARY
- - - - - SANITARY TRIBUTARY BOUNDARY
- PROPOSED SANITARY MANHOLE
- SANITARY SERVICING
- 2.7
4.52Ha
185
500 SANITARY DRAINAGE AREA
TOTAL UNITS
TOTAL POPULATION
- - - - - EXISTING SANITARY SERVICING



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Fax. (613) 836-7183
www.DSEL.ca

**SANITARY SERVICING PLAN
ORLEAN VILLAGE PHASE 4**

DATE: FEBRUARY 2023
SCALE: 1:1500
PROJECT No.: 22-1296
FIGURE: 5



LEGEND:

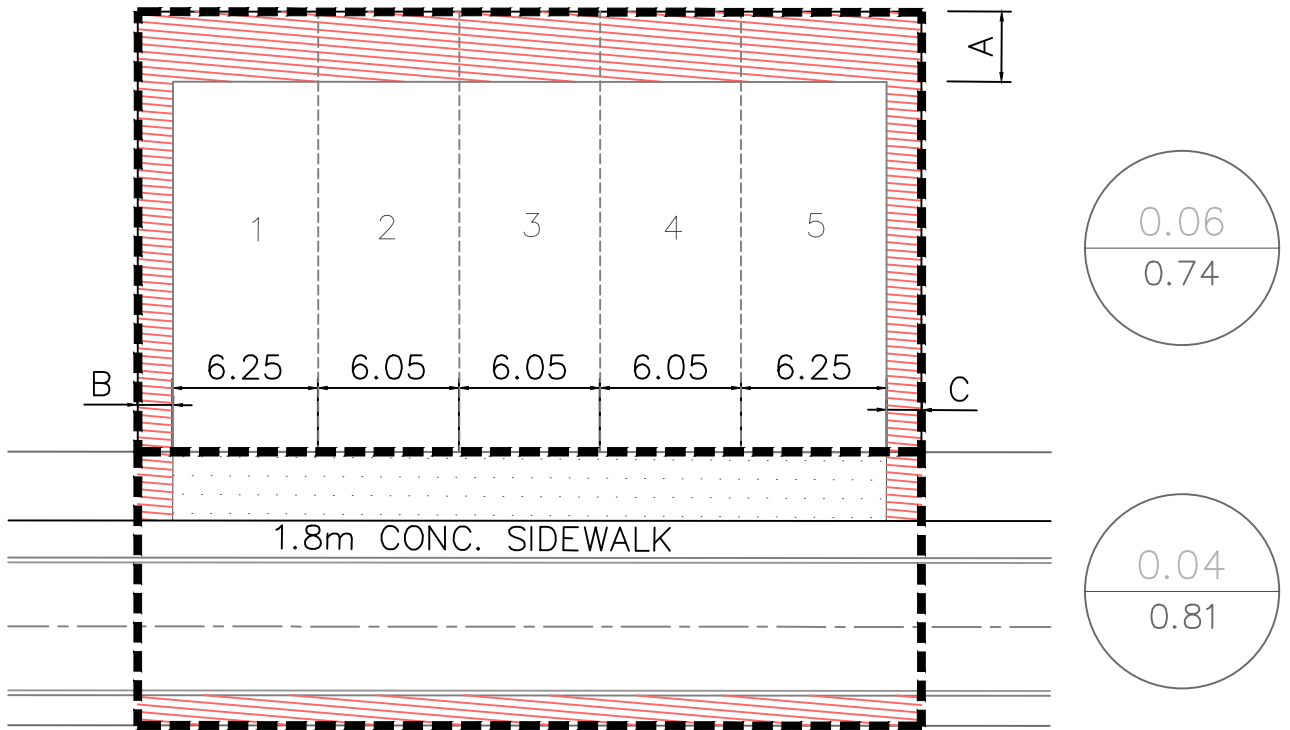
- SITE BOUNDARY
- PROPOSED LOCAL WATERMAIN
- EXISTING WATERMAIN



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 Stittsville, ON K2S 1E9
 Tel. (613) 836-0856
 Fax. (613) 836-7183
 www.DSEL.ca

**WATERMAIN SERVICING PLAN
 ORLEAN VILLAGE PHASE 4**

DATE: FEBRUARY 2023
SCALE: 1:1500
PROJECT No.: 22-1296
FIGURE: 6



DIMENSIONS:

A = 3.00 m

B = 1.50 m

C = 1.50 m

DRIVEWAY WIDTH: 100% FRONT WIDTH

ENVELOPE LENGTH: 30.64 m

LOT: 33.65x18.90 m

NOTE:

TOTAL AREA: 635.51 m²

TOTAL IMP AREA: 486.82 m²

IMP %: 77%

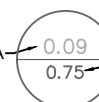
RC: 0.74

**8.5 m ROW RLTH
RC FIGURE**

LEGENDS

 PERVIOUS HATCH

 STM TRIB LINE

TOTAL AREA  RC VALUE

6.05 LOT DIMENSION



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Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
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SCALE:

NTS

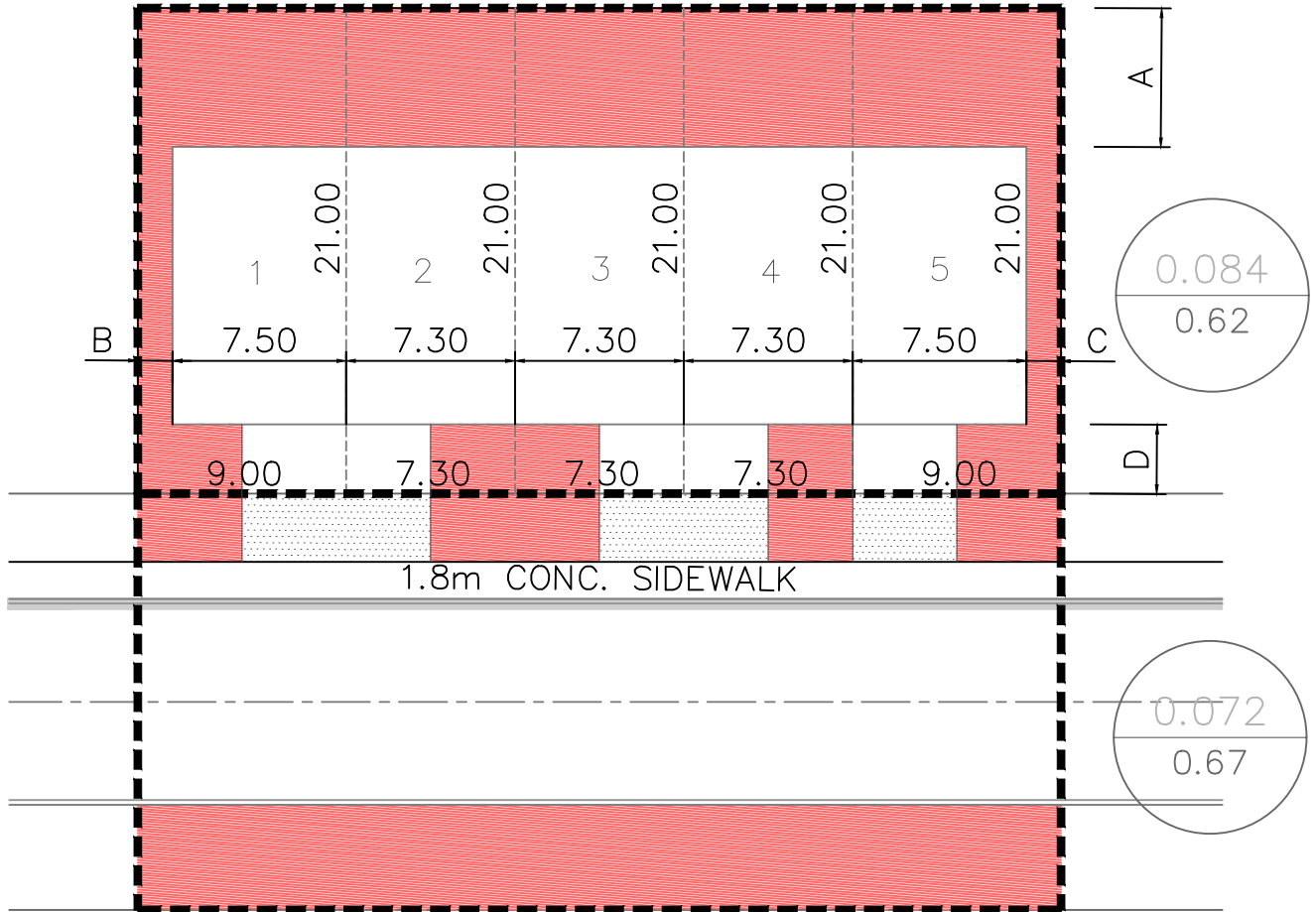
PROJECT No.:

20-1296

DATE:

DEC 2022

FIGURE: 7



DIMENSIONS:

A = 6.00 m
 B = 1.50 m
 C = 1.50 m
 D = 3.00 m
 DRIVEWAY WIDTH: 50% FRONT WIDTH
 ENVELOPE LENGTH: 12.00 m
 LOT: 39.90x21.00 m

NOTE:

TOTAL AREA: 837.90 m²
 TOTAL IMP AREA: 502.65 m²
 IMP %: 60%
 RC: 0.62

**18 m ROW TH RC
 FIGURE**

LEGENDS

PERVIOUS HATCH

STM TRIB LINE

TOTAL AREA RC VALUE

7.30 LOT DIMENSION



120 Iber Road, Unit 203
 Stittsville, Ontario, K2S 1E9
 Tel. (613) 836-0856
 Fax. (613) 836-7183
 www.DSEL.ca

SCALE:

NTS

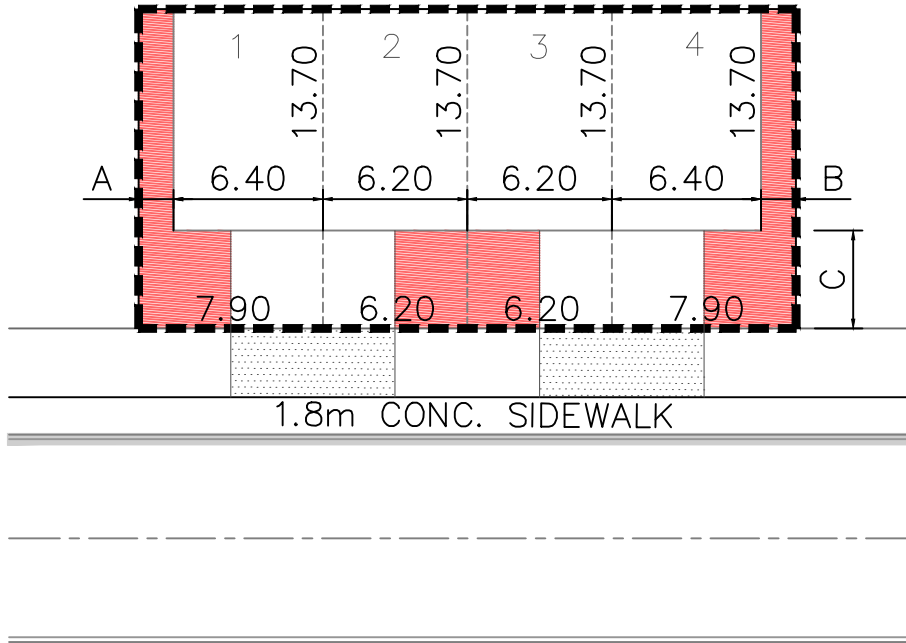
PROJECT No.:

20-1296

DATE:

DEC 2022

FIGURE: 8



DIMENSIONS:

A = 1.50 m

B = 1.50 m

C = 4.20 m

DRIVEWAY WIDTH: 50% FRONT WIDTH

ENVELOPE LENGTH: 9.50 m

LOT: 28.820x13.70 m

NOTE:

TOTAL AREA: 386.34 m²

TOTAL IMP AREA: 298.61 m²

IMP %: 77%

RC: 0.74

**18 m ROW B2B RC
FIGURE**

LEGENDS

PERVIOUS HATCH

STM TRIB LINE

TOTAL AREA: RC VALUE

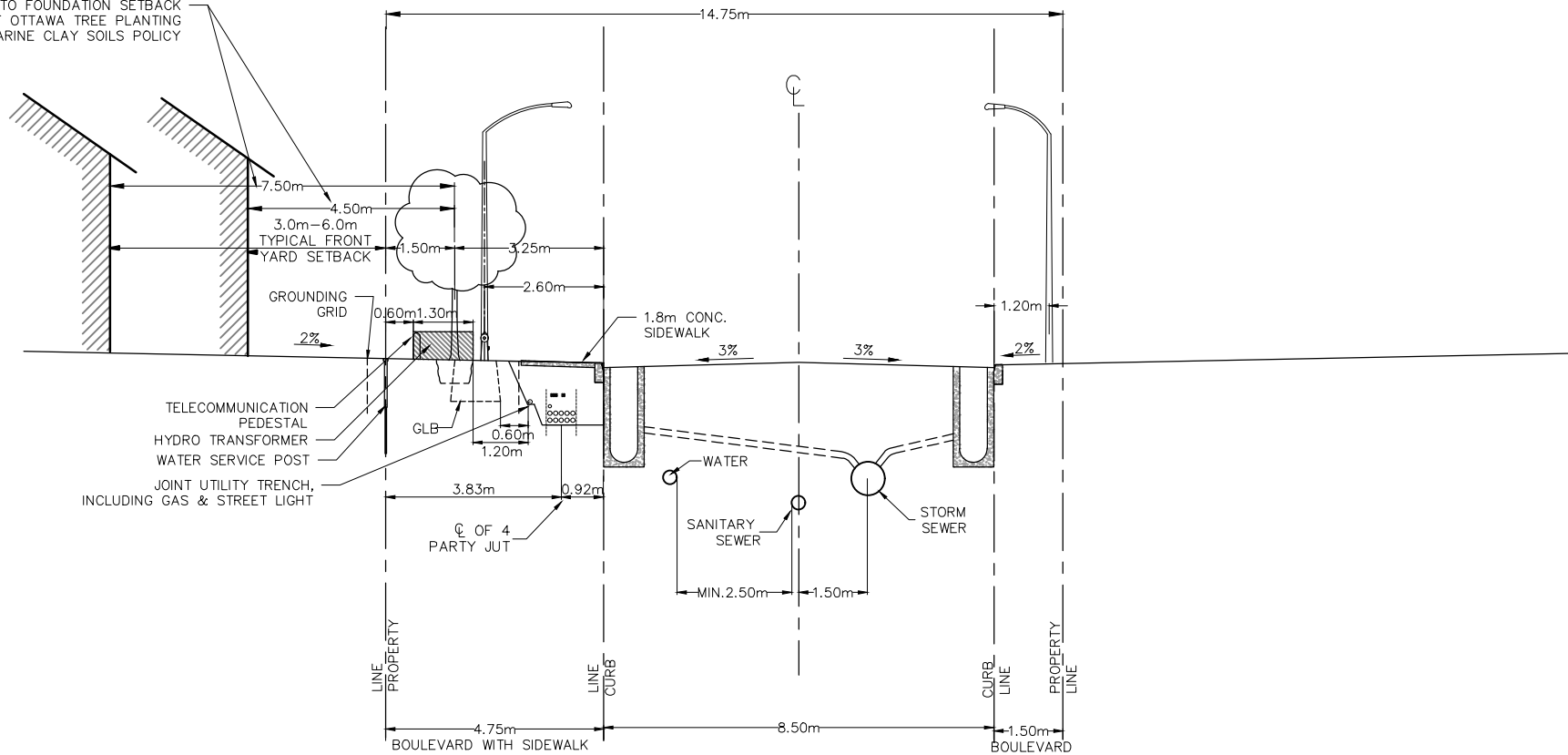
6.20 LOT DIMENSION



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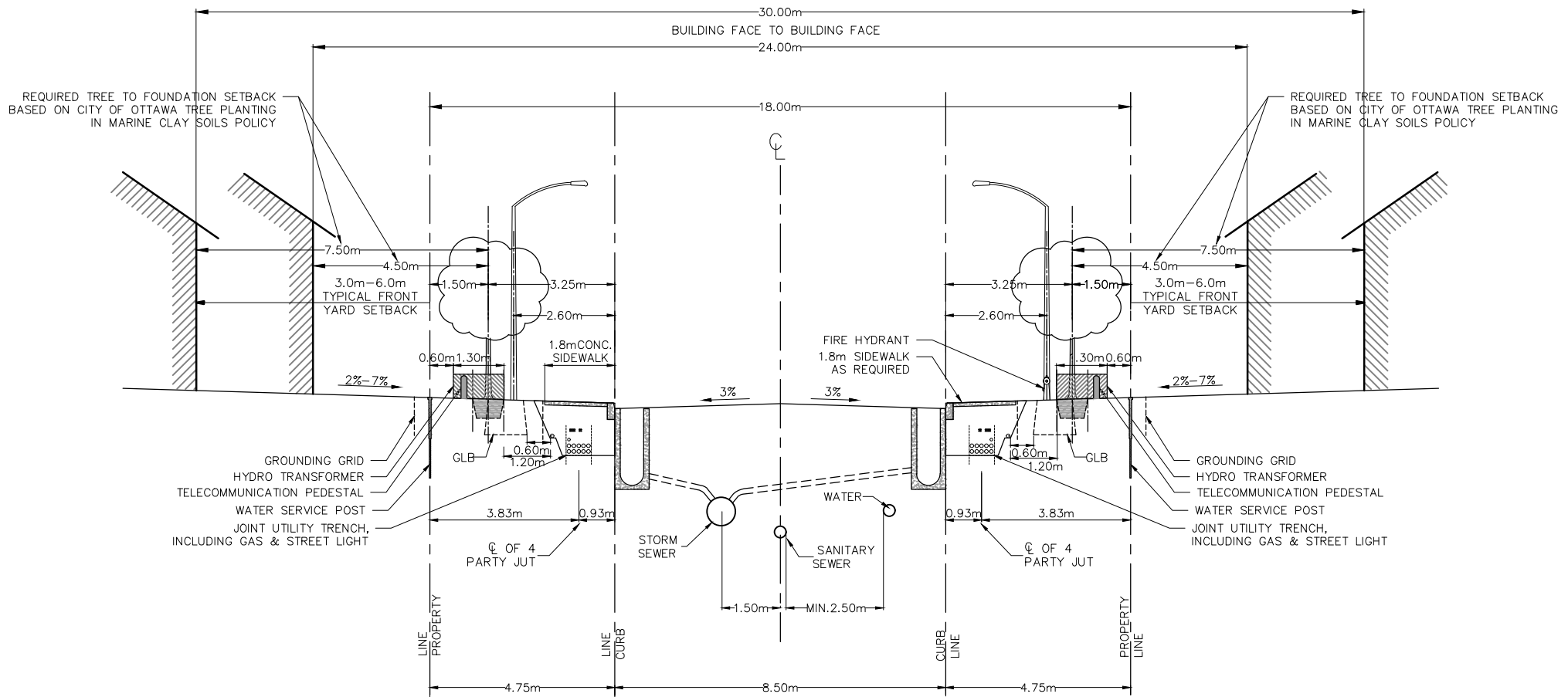
SCALE:	NTS	PROJECT No.:	20-1296
DATE:	DEC 2022	FIGURE:	9

REQUIRED TREE TO FOUNDATION SETBACK
BASED ON CITY OF OTTAWA TREE PLANTING
IN MARINE CLAY SOILS POLICY



1. REFERENCE THE GENERAL STANDARD CROSS-SECTION NOTES.
2. CONCRETE CURBS TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARD DETAILS.
3. 3m-6m TYPICAL FRONT YARD SETBACK IS TO BE CLEAR AND UNENCUMBERED OF ANY SUBSURFACE BUILDING ENCROACHMENTS.
4. HYDRANTS TO BE LOCATED ON THE WATERMAIN SIDE OF THE STREET.
5. CATCH BASINS TO BE IN-ROAD, NOT CURB INLET TYPE.
6. 14.75m RIGHT-OF-WAY NOT TO BE USED ON STREETS WITH OC TRANSPO BUS SERVICES.
7. GAS MAIN SHALL HAVE A MINIMUM OF 0.6m CLEARANCE FROM STRUCTURES (e.g. CATCH BASINS AND HYDRANTS).
8. STREET LIGHTS CAN BE LOCATED ON EITHER SIDE OF THE RIGHT-OF-WAY.
9. 4 PARTY JOINT USE UTILITY TRENCH (JUT) UNDER SIDEWALK AS PER HYDRO OTTAWA UDS0049 CONSTRUCTION DETAIL, TOTAL WIDTH AT BASE = ±1635mm. EDGE OF HYDRO DUCTS PLACED 1.0m FROM EDGE OF TREE ROOT BALL.
10. GRADE LEVEL BOX (GLB) AS DRAWN SHOWS GLB3660 WITH THE FOLLOWING DIMENSIONS: 43" WIDTH AT BASE, 36" WIDTH AT SURFACE, 36" DEPTH. EXACT LOCATION TO BE CONFIRMED.
11. THIS CROSS-SECTION CANNOT BE USED WHERE A CONCRETE ENCASED HYDROELECTRIC DUCT IS REQUIRED.

14.75m ROW (WINDOW STREET)
LAST MODIFIED ON 2022-05-11



1. REFERENCE THE GENERAL STANDARD CROSS-SECTION NOTES.
2. CONCRETE CURBS TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARD DETAILS.
3. 3m-6m TYPICAL FRONT YARD SETBACK IS TO BE CLEAR AND UNENCUMBERED OF ANY SUBSURFACE BUILDING ENCROACHMENTS.
4. HYDRANTS TO BE LOCATED ON THE WATERMAIN SIDE OF THE STREET.
5. CATCH BASINS TO BE IN-ROAD, NOT CURB INLET TYPE.
6. 18m RIGHT-OF-WAY NOT TO BE USED ON STREETS WITH OC TRANSPOR BUS SERVICES.
7. GAS MAIN SHALL HAVE A MINIMUM OF 0.6m CLEARANCE FROM STRUCTURES (e.g. CATCH BASINS AND HYDRANTS).
8. STREET LIGHTS CAN BE LOCATED ON EITHER SIDE OF THE RIGHT-OF-WAY.
9. 4 PARTY JOINT USE UTILITY TRENCH (JUT) UNDER SIDEWALK AS PER HYDRO OTTAWA UDS0049 CONSTRUCTION DETAIL, TOTAL WIDTH AT BASE = ±1635mm. EDGE OF HYDRO DUCTS PLACED 1.0m FROM EDGE OF TREE ROOT BALL.
10. GRADE LEVEL BOX (GLB) AS DRAWN SHOWS GLB3660 WITH THE FOLLOWING DIMENSIONS: 43" WIDTH AT BASE, 36" WIDTH AT SURFACE, 36" DEPTH. EXACT LOCATION TO BE CONFIRMED.
11. THIS CROSS-SECTION CANNOT BE USED WHERE A CONCRETE ENCASED HYDROELECTRIC DUCT IS REQUIRED.

18m ROW (STANDARD)
LAST MODIFIED ON 22-05-11