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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

APRIL 2022

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FOR  
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PROJECT NO: 22-1296**

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**APRIL 2022**

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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 north of Innes Road, west of Lamarche Avenue and south 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 4.7ha. 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 4.7 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 8.5m ROW (see proposed draft plan in **Appendix A**)

The predicted populations currently associated with the development concept are described in the following table below.

**Table 1: Development Statistics for Orleans Village Phase 4**

| Land Use       | Total Area (ha) | Projected Residential Units | Residential Population per Unit * | Projected Population |
|----------------|-----------------|-----------------------------|-----------------------------------|----------------------|
| Townhouses     |                 | 175                         | 2.7                               | ~473                 |
| Parks/walkways | 0.51            |                             |                                   |                      |
| Collector      |                 |                             |                                   |                      |
| Local Roads    |                 |                             |                                   |                      |
| <b>Total</b>   | <b>4.7</b>      | <b>175</b>                  |                                   | <b>~473</b>          |

\* 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 m<sup>3</sup>/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**

| <b>Agency</b>         | <b>Permit/Approval Required</b>                                     | <b>Trigger</b>  | <b>Remarks</b>  |
|-----------------------|---|---|---|
| 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)**
  
- **Stormwater Management Report for the Orleans Village Subdivision**  
JFSA File No. 883-10, January 2018 **(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.<br/>                     -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**

| <b>Design Parameter</b>   | <b>Estimated Demand<sup>1</sup> (L/s)</b> | <b>Boundary Condition Connection 1 (m H<sub>2</sub>O / kPa)</b> | <b>Boundary Condition Connection 2 (m H<sub>2</sub>O / kPa)</b> |
|---|---|---|---|
| Average Daily Demand  | 1.53                                      | 130.8 / 397.3   | 130.8 / 410.1   |
| Maximum Daily Demand Fire Scenario #1   | 4.45 + 166.7 = 171.1                      | 126.9 / 359.0   | 125.7 / 360.0   |
| Maximum Daily Demand Fire Scenario #2   | 4.45 + 233.3 = 278.8                      | 124.8 / 338.4   | 122.6 / 329.6   |
| Maximum Hourly Daily Demand   | 6.59                                      | 127.1 / 361.0   | 127.1 / 373.8   |
| <ul style="list-style-type: none"> <li>• Water demand calculation per <b>Water Supply Guidelines</b>. See <b>Appendix B</b> for detailed calculations.</li> <li>• Ground elevation at Connection 1 = 90.3m</li> <li>• Ground elevation at Connection 2 = 89.0m</li> </ul> |   |   |   |

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**.

### **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 473. The proposed Phase 4 design anticipates a peak flow of **6.75 L/s**. Refer to calculations in **Appendix C** for details. The contemplated development plan reduces the expected wastewater contributions from the subject lands by 80%. 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<br>Harmon’s Corrector Factor 0.8    |
| Infiltration and Inflow Allowance  | 0.05 L/s/ha (Dry Weather)<br>0.28 L/s/ha (Wet Weather)<br>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.

### 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;
- 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 m<sup>2</sup>/s on all roads;
- Blocks 147 and 148 to retain all storms up to and including the 100-year based;
- 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  |
| 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<br>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 (or 1.5m where USF freeboard to HGL is not a constraint, such as in slab-on-grade products)  |
| 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> |  |

#### 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 on-site storage requirements for blocks 147 and 148 to be 604m<sup>3</sup> and 395m<sup>3</sup>. However, that estimate was based on 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 74%. Therefore, the anticipated storage requirement is approximately 860m<sup>3</sup>. Refer to runoff coefficient figures included in **Figures**.

#### 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 145m<sup>3</sup>/100m of surface storage can be accommodated within a saw tooth pattern at 0.2%. Therefore, it is anticipated that 750m<sup>3</sup> of sag storage is available within the right-of-way.

### **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. The City of Ottawa was contacted to confirm boundary conditions for the subject lands. The results were not available at the time of publication.
- 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. The on-site storage requirements can be met within road sag storage.

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.

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***APPENDIX A***

***Pre-Consultation***

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**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 WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED

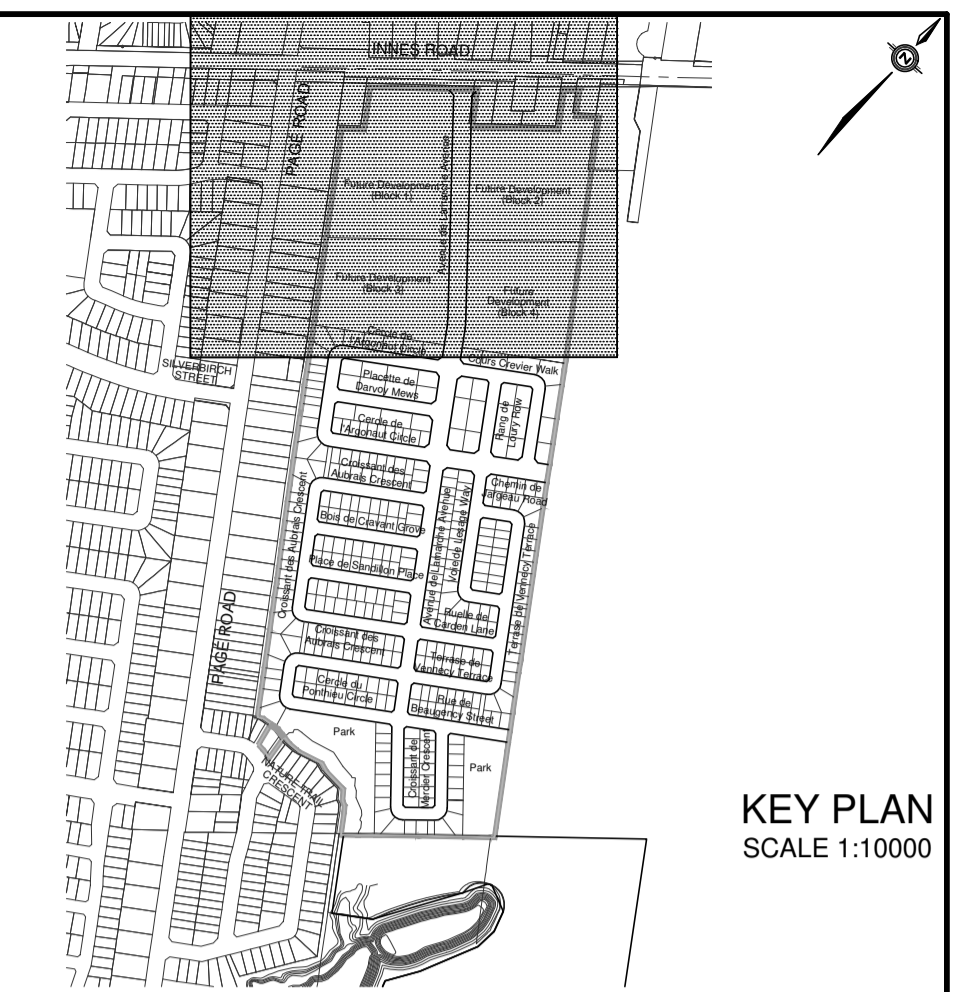
**NOTE**  
 FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS, SLEEVE SHALL BE USED

**NOTE:**  
 ALL WATERMAIN CONNECTIONS AND DECOMMISSIONING OF EXISTING WATERMAINS TO BE COMPLETED BY CITY FORCES. TRENCH BACKFILL/REINSTATEMENT TO BE COMPLETED BY THE CONTRACTOR TO THE SATISFACTION OF THE CITY OF OTTAWA.

**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
- 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 CATCH-BASIN & LEAD
- CATCHBASIN/ MAINTENANCE HOLE
- INTERCONNECTED CATCH BASIN & LEADS
- CAP
- TEE CATCHBASIN
- PERFORATED PIPE
- ELBOW CATCHBASIN
- SINGLE SERVICE LOCATION (ST, SAN & WM)
- SINGLE SERVICE LOCATION (SAN & WM)
- SINGLE SERVICE LOCATION (ST, SAN & WM)
- HYDRO SWITCHGEAR
- HYDRO TRANSFORMER
- STREET LIGHT STANDARD
- DITCH AND CULVERT
- CONCRETE SIDEWALK
- CURB & DEPRESSED CURB
- ASPHALT SIDEWALK
- 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
- PHASING LIMITS
- PROPERTY BOUNDARY
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION
- TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6)
- EROSION SETBACK
- 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**

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

**GENERAL PLAN**

CAIVAN (ORLEANS VILLAGE) LIMITED

ORLEANS VILLAGE



120 Iber Road, Unit 103  
 Strathville, ON K2S 1E9  
 Tel: (613) 636-8656  
 Fax: (613) 636-7183  
 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

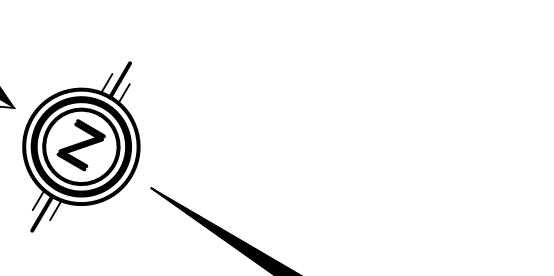
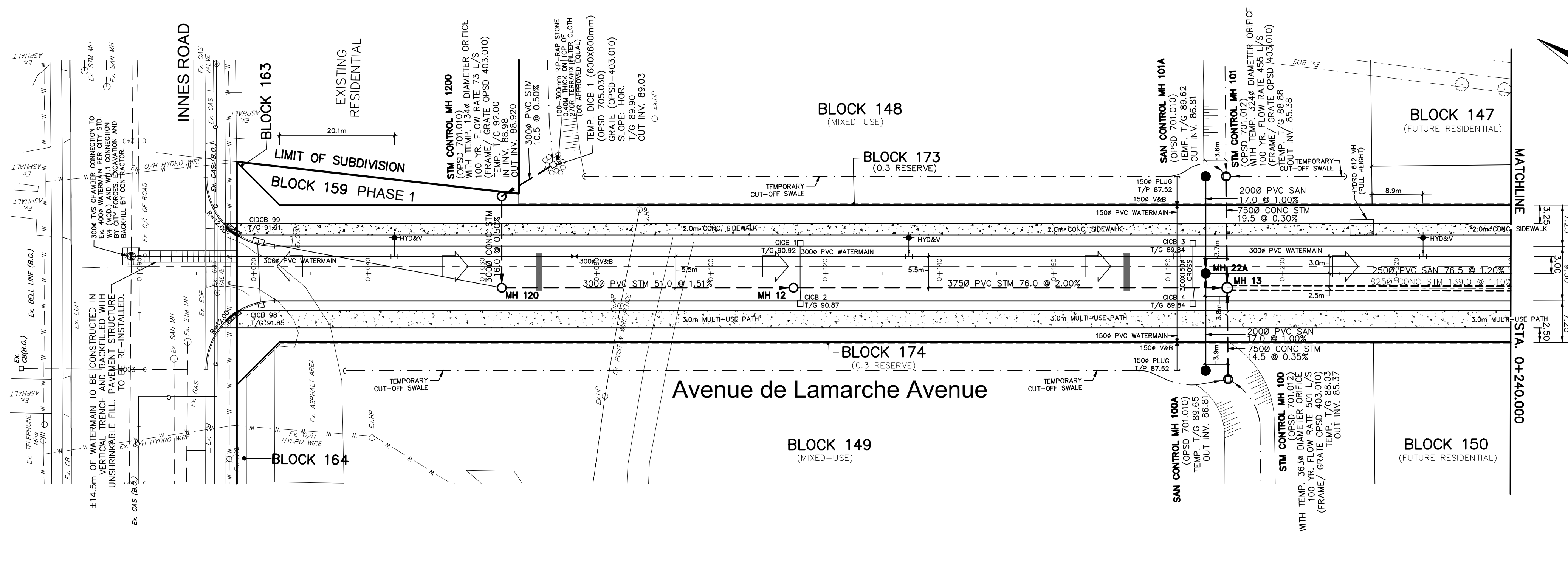
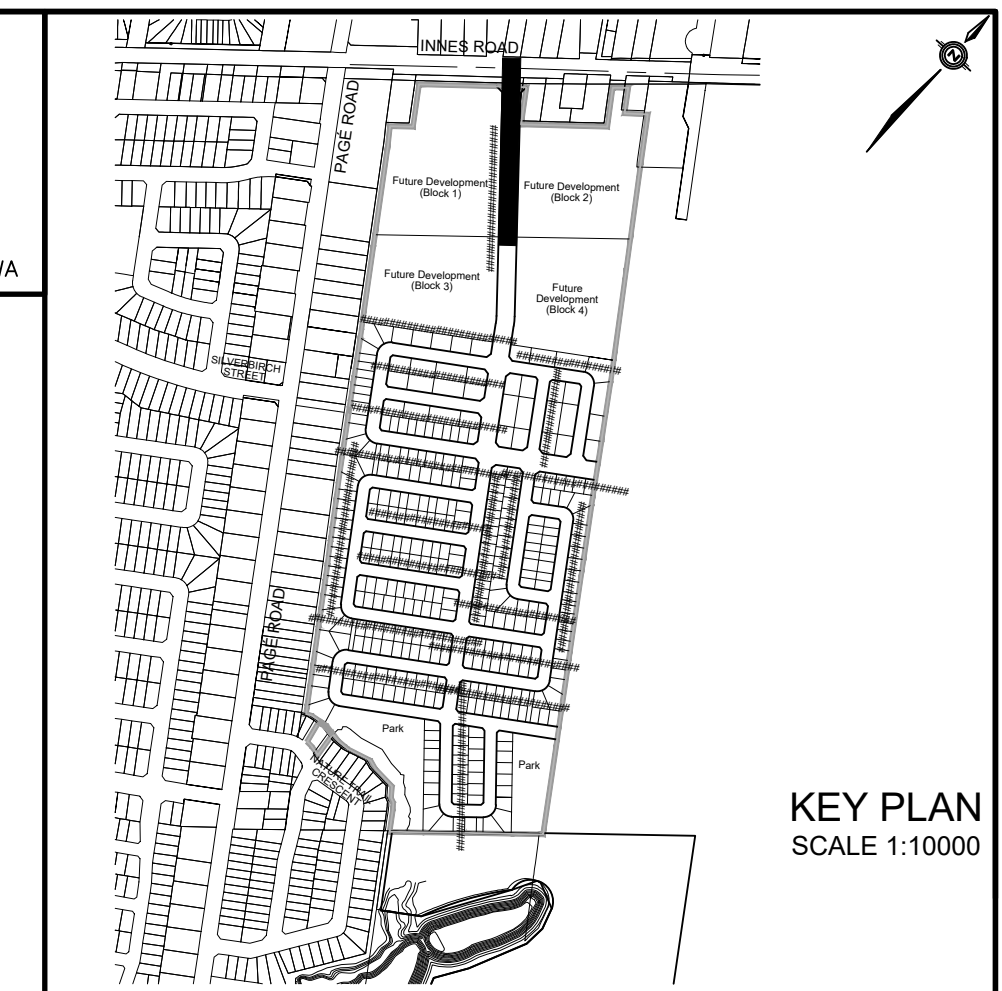
**NOTE: ICD**  
 FOR ICD APPLICATION, REFER TO  
 DRAWING 72 FOR DETAIL.

**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
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- 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
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- 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 (ST, SAN & WM)
- 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.

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



**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

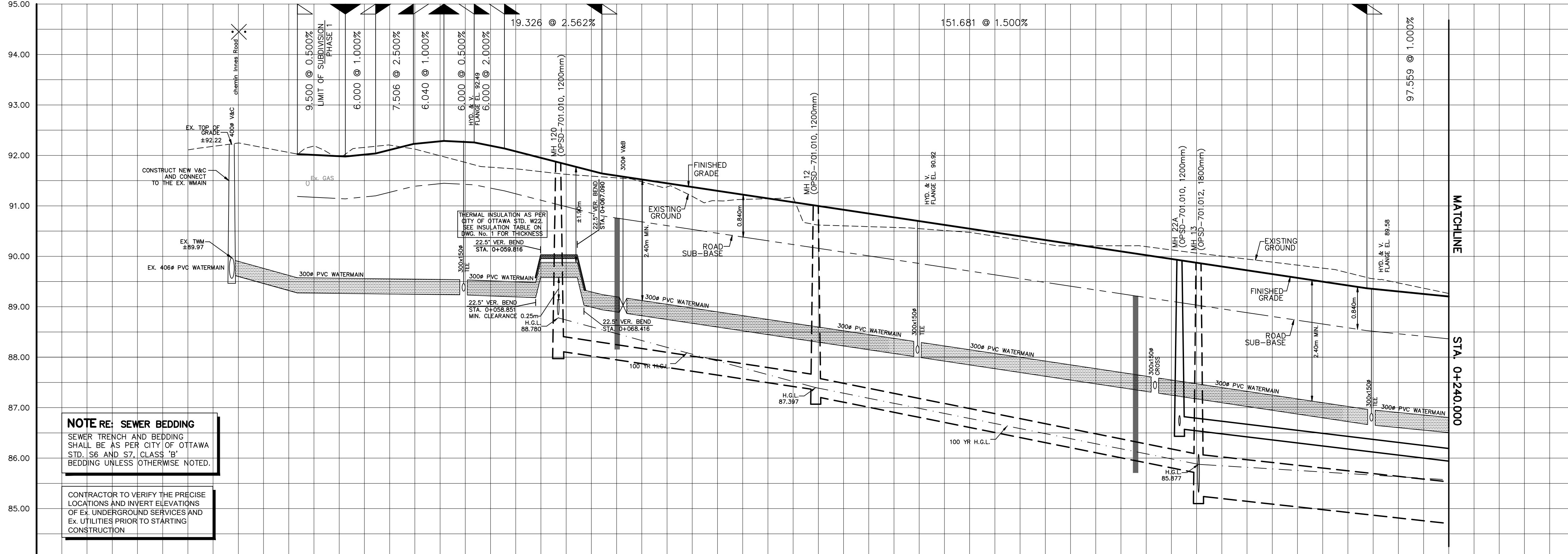
CAIVAN (ORLEANS VILLAGE) LIMITED

**ORLEANS VILLAGE**

**DSEL**  
 david schaeffer engineering ltd

120 Iler Road, Unit 103  
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 Tel: (613) 838-8868  
 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.  
 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+020.000           |                 |                 |              | 89.970           |
| 0+040.000           |                 |                 |              | 89.575           |
| 0+060.000           |                 |                 |              | 89.57            |
| 0+080.000           |                 |                 |              | 89.542           |
| 0+100.000           |                 |                 |              | 89.542           |
| 0+120.000           |                 |                 |              | 89.542           |
| 0+140.000           |                 |                 |              | 89.542           |
| 0+160.000           |                 |                 |              | 89.542           |
| 0+180.000           |                 |                 |              | 89.542           |
| 0+200.000           |                 |                 |              | 89.542           |
| 0+220.000           |                 |                 |              | 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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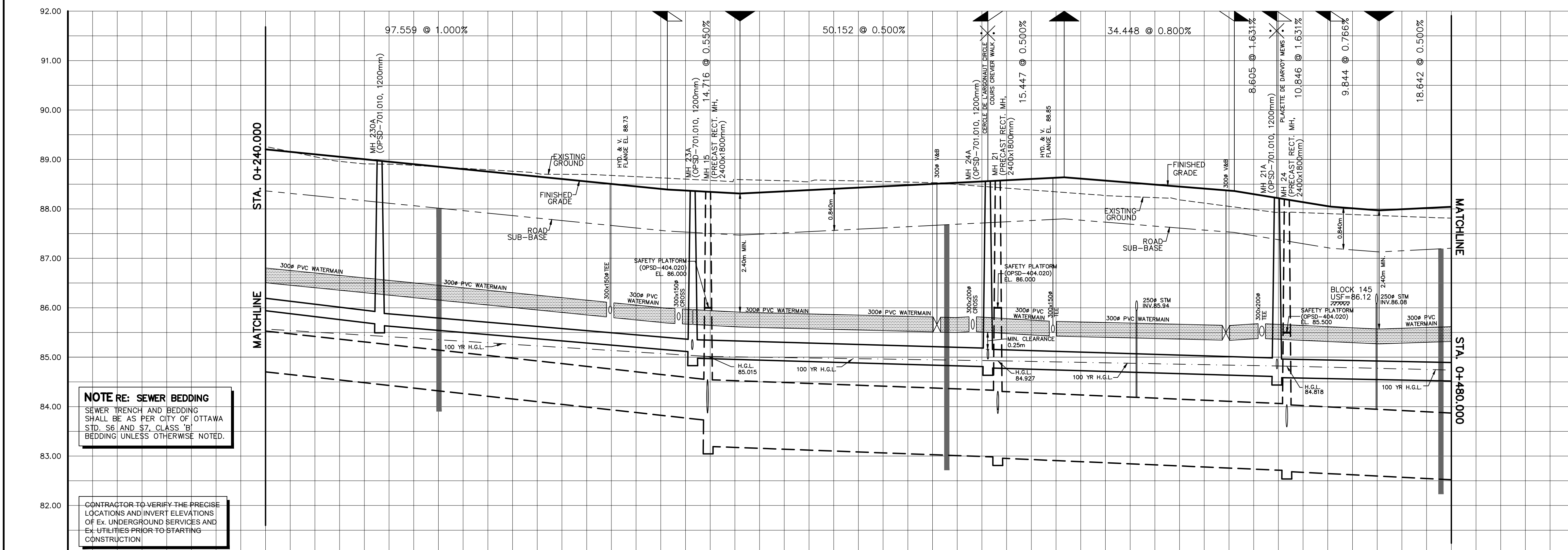
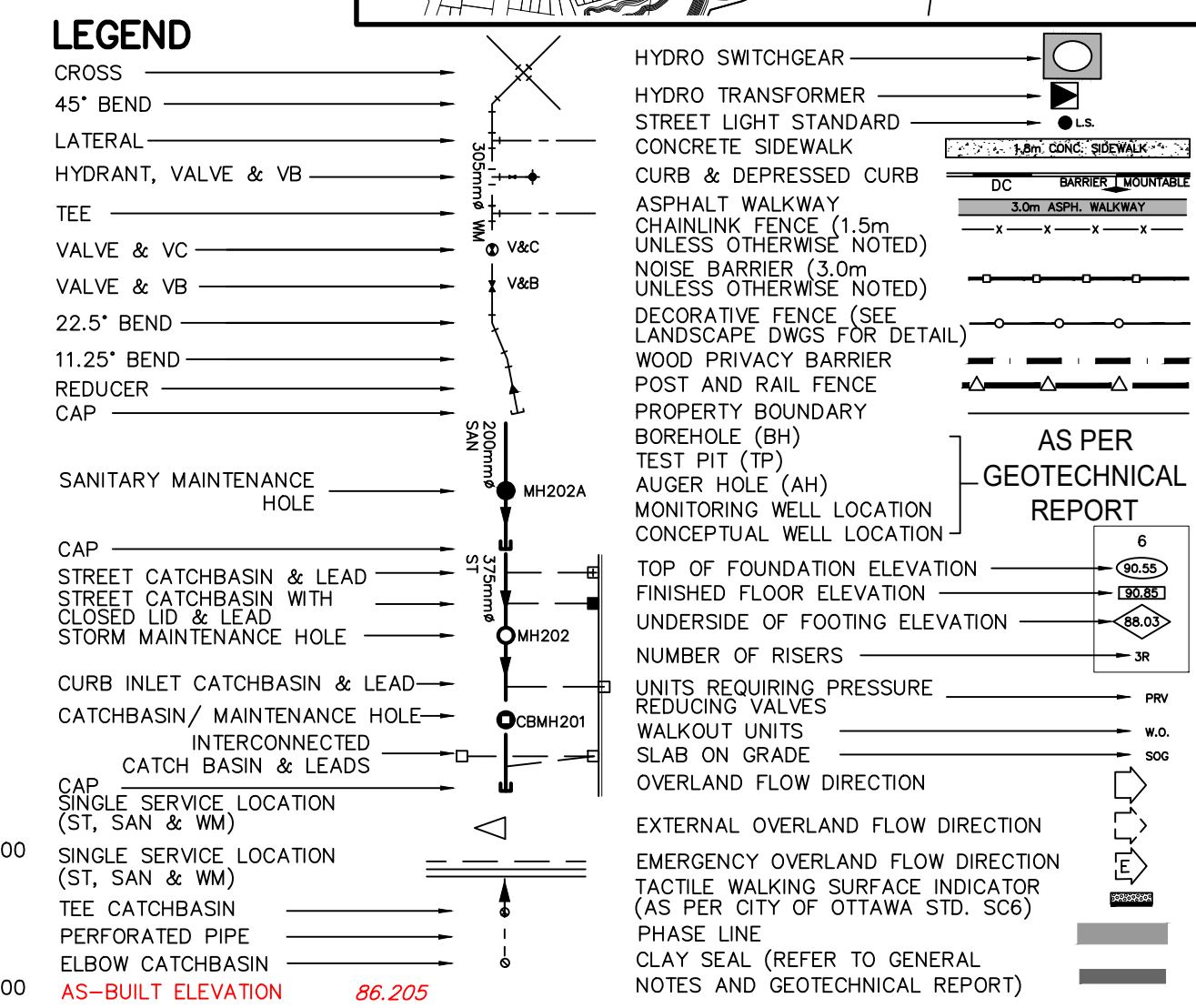
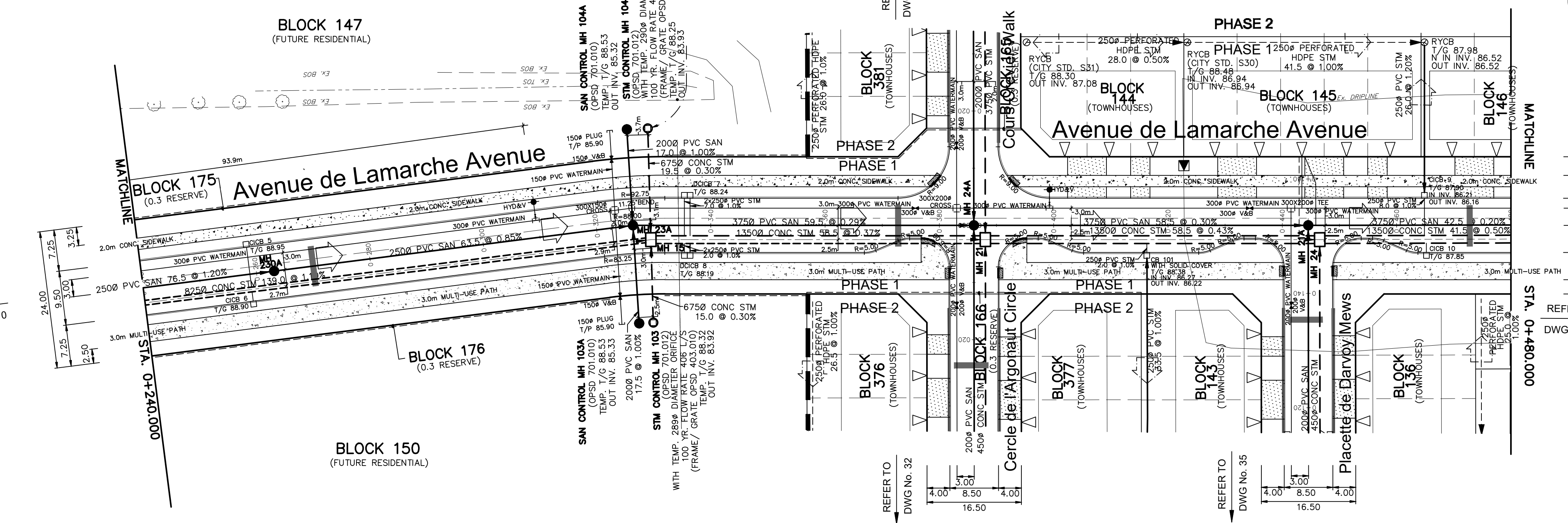
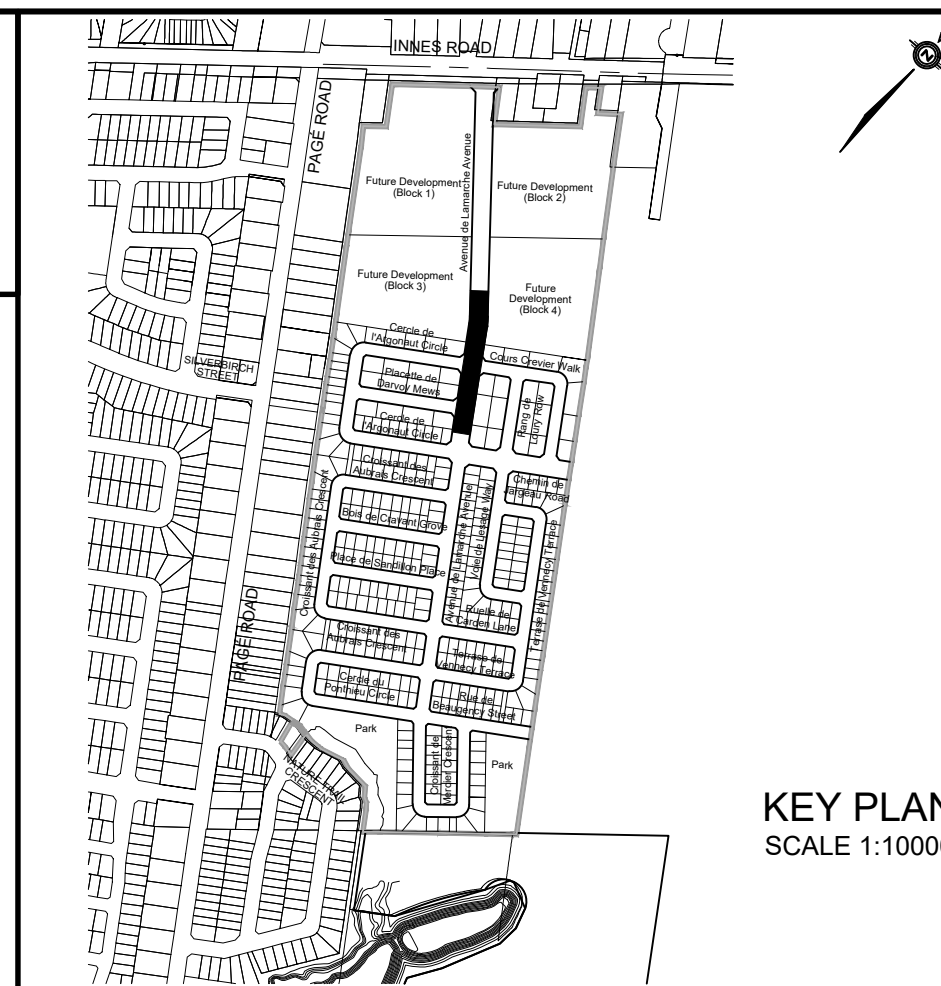
**NOTE: ICD**  
 FOR ICD APPLICATION, REFER TO  
 DRAWING 72 FOR DETAIL

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 THE COVER OF EX. MH,  
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**NOTE:**  
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 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



| TOP OF WATERMAIN | STORM INVERT | SANITARY INVERT | PROPOSED GRADES | CENTERLINE CHAINAGE | TOP OF WATERMAIN | STORM INVERT | SANITARY INVERT | PROPOSED GRADES | CENTERLINE CHAINAGE |
|------------------|--------------|-----------------|-----------------|---------------------|------------------|--------------|-----------------|-----------------|---------------------|
| 86.80            | 85.00        | 85.00           | 88.204          | 0+240.000           | 86.80            | 85.00        | 85.00           | 88.204          | 0+240.000           |
| 86.60            | 85.00        | 85.00           | 88.204          | 0+260.000           | 86.60            | 85.00        | 85.00           | 88.204          | 0+260.000           |
| 86.40            | 85.00        | 85.00           | 88.204          | 0+280.000           | 86.40            | 85.00        | 85.00           | 88.204          | 0+280.000           |
| 86.104           | 85.00        | 85.00           | 88.204          | 0+300.000           | 86.104           | 85.00        | 85.00           | 88.204          | 0+300.000           |
| 86.00            | 85.00        | 85.00           | 88.204          | 0+320.000           | 86.00            | 85.00        | 85.00           | 88.204          | 0+320.000           |
| 85.90            | 85.00        | 85.00           | 88.204          | 0+340.000           | 85.90            | 85.00        | 85.00           | 88.204          | 0+340.000           |
| 85.85            | 85.00        | 85.00           | 88.204          | 0+360.000           | 85.85            | 85.00        | 85.00           | 88.204          | 0+360.000           |
| 85.80            | 85.00        | 85.00           | 88.204          | 0+380.000           | 85.80            | 85.00        | 85.00           | 88.204          | 0+380.000           |
| 85.82            | 85.00        | 85.00           | 88.204          | 0+400.000           | 85.82            | 85.00        | 85.00           | 88.204          | 0+400.000           |
| 85.68            | 85.00        | 85.00           | 88.204          | 0+420.000           | 85.68            | 85.00        | 85.00           | 88.204          | 0+420.000           |
| 85.54            | 85.00        | 85.00           | 88.204          | 0+440.000           | 85.54            | 85.00        | 85.00           | 88.204          | 0+440.000           |
| 85.594           | 85.00        | 85.00           | 88.204          | 0+460.000           | 85.594           | 85.00        | 85.00           | 88.204          | 0+460.000           |
| 85.55            | 85.00        | 85.00           | 88.204          | 0+480.000           | 85.55            | 85.00        | 85.00           | 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.

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 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   |
|-----|----------|------|---|
| 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

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|                       |                    |             |           |
|-----------------------|--------------------|-------------|-----------|
| 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 m<sup>3</sup>/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)<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

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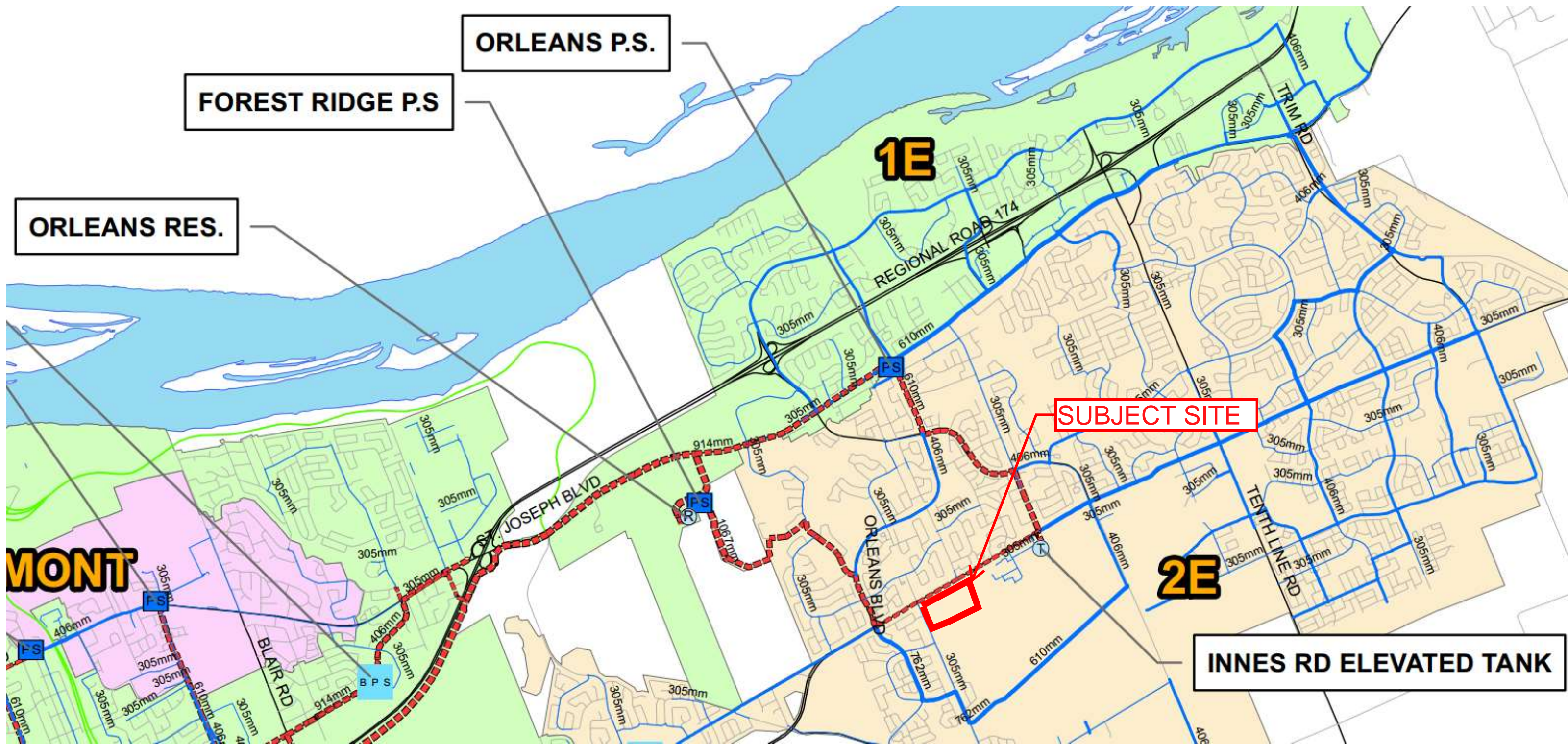
***APPENDIX B***

***Water Supply***

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FOREST RIDGE P.S.

ORLEANS P.S.

ORLEANS RES.

1E

SUBJECT SITE

MONT

2E

INNES RD ELEVATED TANK



## 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](mailto: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](mailto:afobert@DSEL.ca)

This email, including any attachments, is for the sole use of the intended recipient(s) and may contain private, confidential, and privileged information. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient or if this information has been inappropriately forwarded to you, please contact the sender by reply email and destroy all copies of the original.

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 |
|-----------------|------------|-------|-----|
| Single Family   | 3.4        | -     | 0   |
| Semi-detached   | 2.7        | -     | 0   |
| Townhouse       | 2.7        | 175   | 473 |
| 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   |

|                              | Pop | Avg. Daily        |       | Max Day           |       | Peak Hour         |       |
|------------------------------|-----|-------------------|-------|-------------------|-------|-------------------|-------|
|                              |     | m <sup>3</sup> /d | L/min | m <sup>3</sup> /d | L/min | m <sup>3</sup> /d | L/min |
| <b>Total Domestic Demand</b> | 473 | 132.4             | 92.0  | 384.1             | 266.7 | 569.5             | 395.5 |



## 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 m<sup>2</sup> 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%                     |
|                       | <b>% Increase</b> |       |    |    | <b>67%</b> | 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 m<sup>2</sup> 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%                                |
|                       | <b>% Increase</b> |      |    |    |    | <b>59%</b> 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 \_\_\_\_\_.

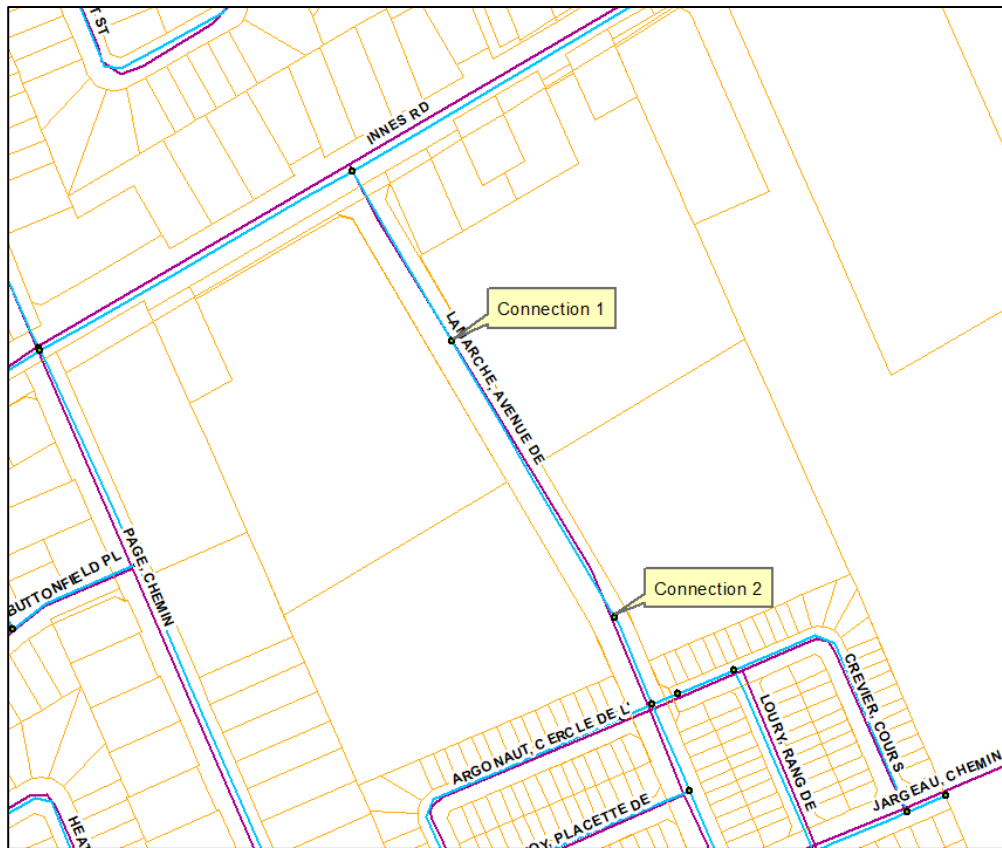
-Calculations based on City of Ottawa ISTB-2018

## 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 <sup>1</sup> (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.**

| <b>Demand Scenario</b> | <b>Head (m)</b> | <b>Pressure<sup>1</sup> (psi)</b> |
|------------------------|-----------------|-----------------------------------|
| 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.*

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***APPENDIX C***

***Wastewater Collection***

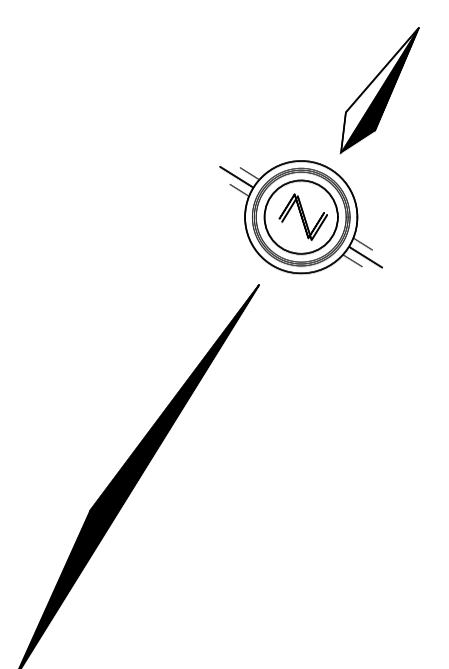
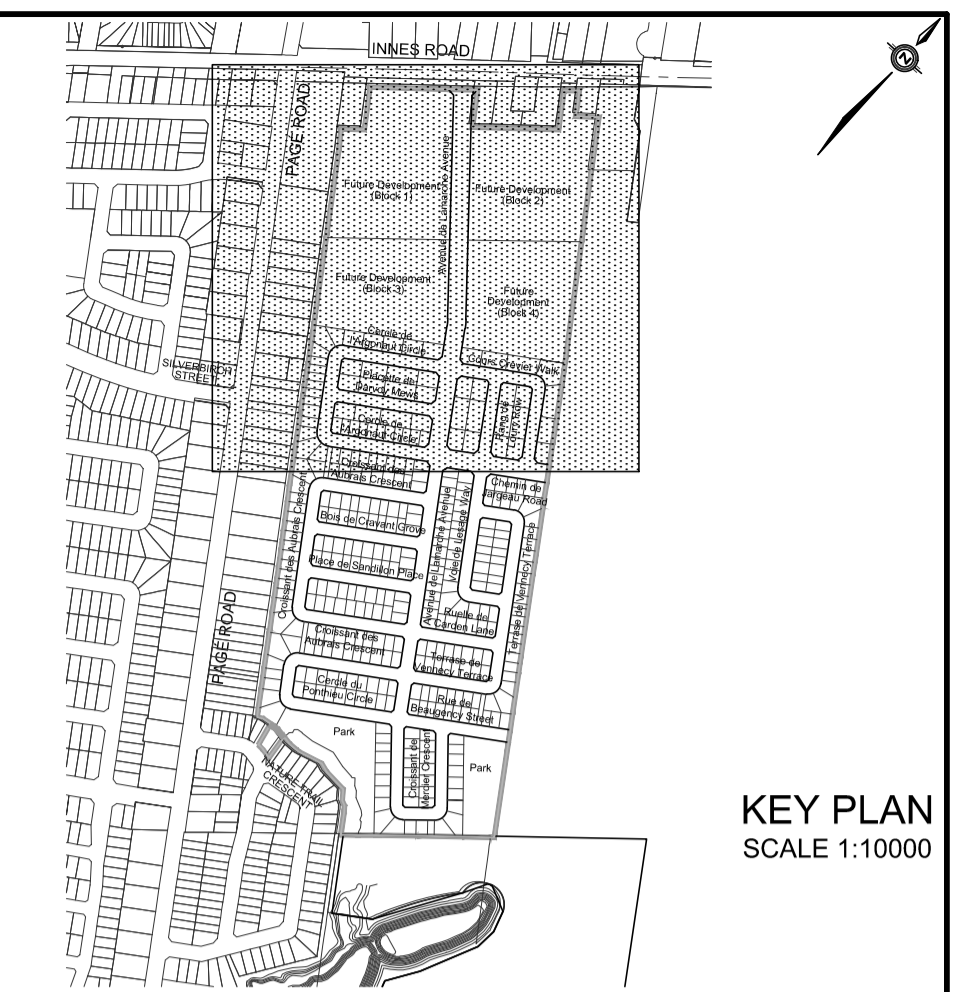
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APPROVED  REFUSED   
 THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_

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



**LEGEND**

SANITARY DRAINAGE BOUNDARY

SANITARY SUB-DRAINAGE BOUNDARY

SANITARY DRAINAGE BOUNDARY (OTHER PHASES)

UPSTREAM MH TO DOWNSTREAM MH

AREA IN HECTARES

POPULATION

UPSTREAM MH TO DOWNSTREAM MH

AREA IN OTHER PHASES IN HECTARES

POPULATION

EXTERNAL AREA IN HECTARES

EXTERNAL POPULATION

DENSITY (PERSONS/HECTARE)

EXTERNAL LAND USE

MAINTENANCE HOLE

CAP

**A=53.63**  
 POP=5739

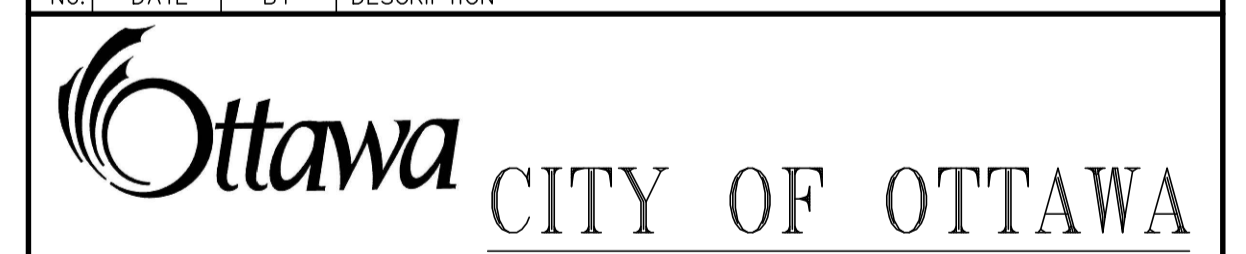
MH2022A

**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                           |



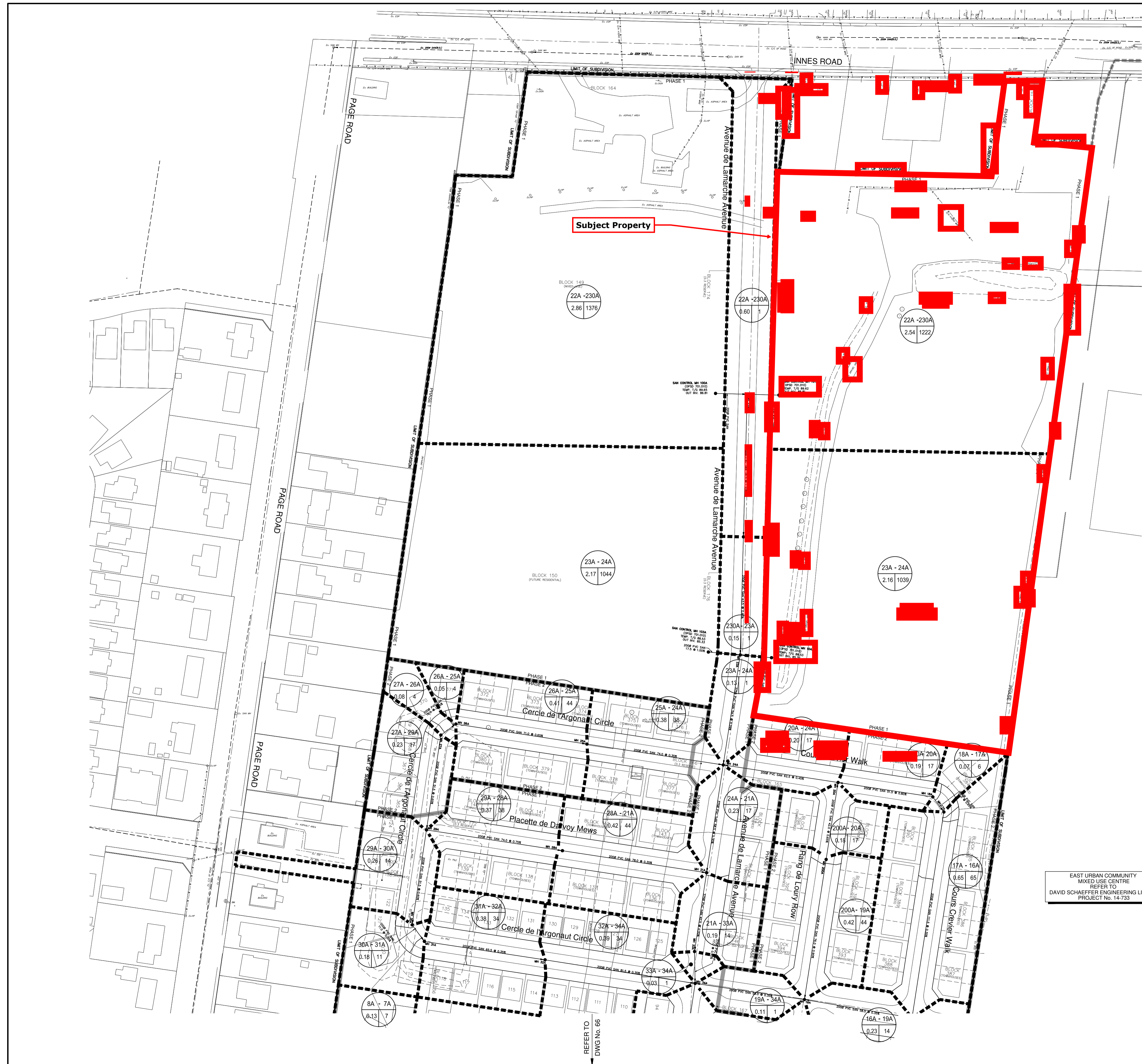
PROJECT No. 16-881

**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.   |             | <b>65</b> |
| SCALE: 1:1000       | DATE: JANUARY 2018 |             |           |



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

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 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) |  |
| <b>Rang de Loury Row - 03</b>                                   |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                  |                   |              |              |  |
|   | 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                           |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                  |                   |              |              |  |
| <b>Cercle de l'Argonaut Circle - 12</b>                         |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                  |                   |              |              |  |
|   | 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                    |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                  |                   |              |              |  |
| <b>Placette de Darvoy Mews - 13</b>                             |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                  |                   |              |              |  |
|   | 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                    |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                  |                   |              |              |  |
| <b>Croissant des Aubrais Crescent - 10</b>                      |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                  |                   |              |              |  |
|   | 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                    |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                  |                   |              |              |  |
| <b>Bois de Cravant Grove - 14</b>                               |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                  |                   |              |              |  |
| 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   |            |                 |           |                 |           |                 |           |                 |                 |                 | 1.09            |                    |                  |          |          |           |                    |                  |                   |              |              |  |

|                                     |       |                         |                                |        |   |  |  |  |                 |               |                                   |                          |                          |  |                  |  |  |  |             |  |      |  |  |  |  |  |  |  |
|-------------------------------------|-------|-------------------------|--------------------------------|--------|---|--|--|--|-----------------|---------------|-----------------------------------|--------------------------|--------------------------|--|------------------|--|--|--|-------------|--|------|--|--|--|--|--|--|--|
| 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) |
| <b>Place de Sandillon Place - 11</b>                 |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |
|  | 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            |                    |                  |          |          |           |                    |                   |                   |              |              |
| <b>Cours Crevier Walk- 02</b>                        |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |
|  | 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            |                    |                  |          |          |           |                    |                   |                   |              |              |
| <b>Chemin de Jargeau Road - 04</b>                   |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |
|  | 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            |                    |                  |          |          |           |                    |                   |                   |              |              |
| <b>Voie de Lesage Way - 05</b>                       |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |
|  | 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            |                    |                  |          |          |           |                    |                   |                   |              |              |
| <b>Terrasse de Vennecy Terrace - 06</b>              |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |
|  | 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            |                    |                  |          |          |           |                    |                   |                   |              |              |
| <b>Ruelle de Carden Lane - 07</b>                    |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |
|  | 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 |        |   |  |  |  |   |               |                  |                          |                          |  |                  |  |  |  |                  |  |  |  |  |  |  |  |  |  |
| 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. 2 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) |
| <b>Croissant de Mercier Crescent- 09</b>                         |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |
|  | 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      | <b>0.71</b>        | 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      | <b>0.53</b>        | 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      | <b>0.62</b>        | 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      | <b>0.45</b>        | 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      | <b>0.41</b>        | 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      | <b>0.67</b>        | 26.85             | 0.04              | 0.85         | 0.41         |
| To Cercle du Ponthieu Circle, Pipe 55A - 58A                     |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |
|  |           |                                 |           |       |      | 0.94       | 70   |            |                 |           |                 |           |                 |           |                 |                 |                 | 0.94            |                    |                  |          |          |           |                    |                   |                   |              |              |
| <b>Avenue de Lamarche Avenue - 01</b>                            |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |
|  |           |                                 | 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      | <b>1.22</b>        | 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      | <b>0.85</b>        | 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      | <b>0.29</b>        | 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      | <b>0.29</b>        | 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      | <b>0.21</b>        | 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      | <b>0.28</b>        | 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      | <b>0.24</b>        | 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      | <b>0.23</b>        | 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      | <b>0.22</b>        | 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      | <b>0.12</b>        | 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      | <b>0.19</b>        | 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      | <b>0.16</b>        | 114.04            | 0.50              | 0.72         | 0.72         |
| To Cercle du Ponthieu Circle, Pipe 55A - 58A                     |           |                                 |           |       |      |            |      |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |
|  |           |                                 |           |       |      | 26.30      | 4993 |            |                 |           | 5.40            |           |                 |           |                 |                 | 31.70           |                 |                    |                  |          |          |           |                    |                   |                   |              |              |

|                                     |       |         |                                |        |   |  |  |                              |  |   |  |  |                  |  |                          |  |  |  |  |             |  |  |  |  |  |  |  |  |  |
|-------------------------------------|-------|---------|--------------------------------|--------|---|--|--|------------------------------|--|---|--|--|------------------|--|--------------------------|--|--|--|--|-------------|--|--|--|--|--|--|--|--|--|
| 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. 3 |  |  |  |  |  |  |  |  |  |
| Industrial Flow =                   | 35000 | L/ha/da | 0.40509                        | I/s/ha | Townhouse coeff= 2.7                      |  |  |                              |  | Single house coeff= 3.4                           |  |  |                  |  | Date: 2018-07-27         |  |  |  |  | of 4        |  |  |  |  |  |  |  |  |  |
| Max Res. Peak Factor =              | 4.00  |         |                                |        |   |  |  |                              |  |   |  |  |                  |  |                          |  |  |  |  |             |  |  |  |  |  |  |  |  |  |
| 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) |  |
| <b>Cercle du Ponthieu Circle - 08</b>                           |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   | 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                        |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   |           |                                 |           |       |      | 0.47       | 25    |            |                 |           |                 |           |                 |           |                 |                 |                 | 0.47            |                    |                  |          |          |           |                    |                   |                   |              |              |  |
| <b>Rue de Beaugency Street - 08</b>                             |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   | 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         |              |  |
| <b>Cercle du Ponthieu Circle - 08</b>                           |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   | 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                        |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   |           |                                 |           |       |      | 0.51       | 34    |            |                 |           |                 |           |                 | 0.77      |                 |                 | 1.28            |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   | 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   |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   |           |                                 |           |       |      | 0.74       | 55    |            |                 |           |                 |           |                 |           |                 |                 | 0.74            | 128.41          |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   | 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 Avenue de Lamarche Avenue, Pipe 53A - 55A     |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   |           |                                 |           |       |      | 26.30      | 4993  |            |                 |           | 5.40            |           |                 |           |                 |                 | 31.70           | 160.11          |                    |                  |          |          |           |                    |                   |                   |              |              |  |
| Contribution From Croissant de Mercier Crescent, Pipe 54A - 55A |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   |           |                                 |           |       |      | 0.94       | 70    |            |                 |           |                 |           |                 |           |                 |                 | 0.94            | 161.05          |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   | 55A       | 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                            |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
|   |           |                                 |           |       |      | 92.07      | 11618 |            |                 |           | 59.05           |           |                 | 11.10     |                 |                 | 161.05          |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
| <b>Sanitary Easement - 20</b>                                   |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
| 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               |                  |          |          |           |                    |                   |                   |              |              |  |
| <b>Nature Trail Crescent - 21</b>                               |           |                                 |           |       |      |            |       |            |                 |           |                 |           |                 |           |                 |                 |                 |                 |                    |                  |          |          |           |                    |                   |                   |              |              |  |
| 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 4.700 ha

## Extraneous Flow Allowances

Infiltration / Inflow 1.55 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       | 175   | 473 |
| 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 473

Average Domestic Flow 1.53 L/s

Peaking Factor 3.39

Peak Domestic Flow 5.20 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 <sup>2</sup> /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 | 1.53 L/s |
| Total Estimated Peak Dry Weather Flow Rate    | 5.20 L/s |
| Total Estimated Peak Wet Weather Flow Rate    | 6.75 L/s |

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***APPENDIX D***

***Stormwater Management***

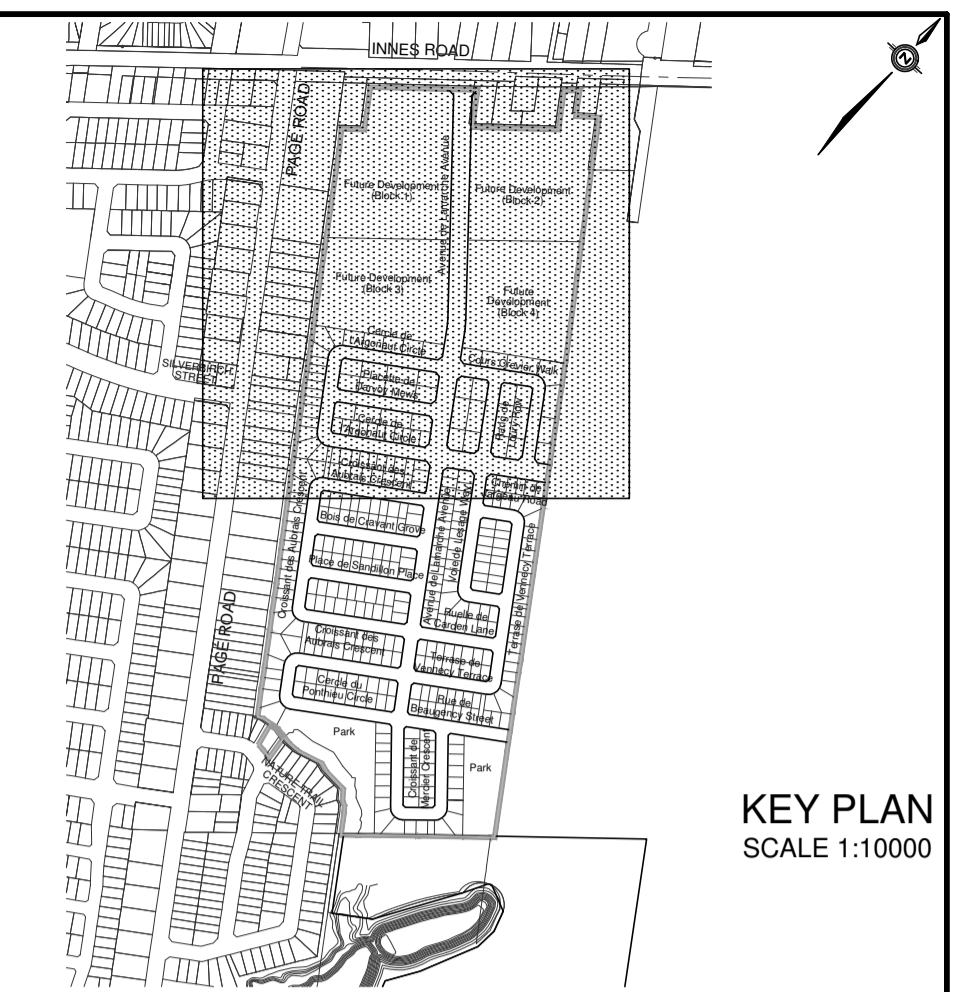
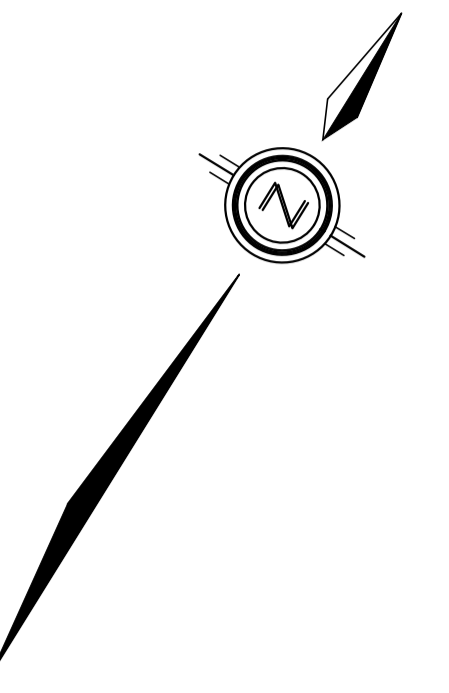
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APPROVED  REFUSED   
 THIS DAY OF \_\_\_\_\_, 20\_\_\_\_  
 JOSHUA WHITE, P.ENG  
 PROJECT MANAGER - EAST BRANCH  
 PLANNING, INFRASTRUCTURE & ECONOMIC  
 DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



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                           |

**Ottawa CITY OF OTTAWA**

PROJECT No. 16-881

**STORM DRAINAGE PLAN** © DSEL

|  |  |
|--|--|
| CAIVAN<br>(ORLEANS VILLAGE)<br>LIMITED               | ORLEANS VILLAGE                        |
|  |  |
| DRAWN BY: M.Z.<br>DESIGNED BY: P.P.<br>SCALE: 1:1000 | CHECKED BY: P.P.<br>DATE: JANUARY 2018 |
| DRAWING NO.<br>SHEET NO.                             | SHEET NO.<br><b>67</b>                 |

120 Iber Road, Unit 103  
 Stittville, ON K2S 1E9  
 Tel: (613) 836-8656  
 Fax: (613) 836-7183  
 www.DSEL.ca

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

REFER TO  
 DWG No. 68







**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 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 FLOW (min) | RATIO (Q/Q full) |      |  |
| 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 | (min)         | (mm/h)           | (mm/h)           | (mm/h)            | (mm/h)             | Q (l/s)   |                    |                     |      | (%)       | (m)        | (l/s)          | (m/s)          | FLOW (min)         | Q/Q full         |      |  |
| <b>Place de Sandillon Place - 11</b>                           |           |         | 0.13      | 0.50 | 0.18           | 0.18           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 36        | 37      | 0.26      | 0.70 | 0.51           | 0.69           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 53        | 300                | 300                 | PVC  | 0.68      | 59.0       | 80             | 1.13           | 0.87               | 0.66             |      |  |
|  |           |         | 0.17      | 0.50 | 0.24           | 0.92           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 37        | 38      | 0.26      | 0.70 | 0.51           | 1.43           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 10.87         | 73.61            | 99.80            | 0.00              | 170.96             | 105       | 375                | 375                 | PVC  | 0.75      | 80.5       | 152            | 1.37           | 0.98               | 0.69             |      |  |
| To Avenue de Lamarche Avenue, Pipe 38 - 52                     |           |         |           |      |                | 1.43           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 11.85         |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
| <b>Bois de Cravant Grove - 14</b>                              |           |         |           |      |                |                |           |   |                |                |           |   |                |                |           |      |                |                |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
| Contribution From Croissant des Aubrais Crescent, Pipe 35 - 10 |           |         |           |      |                | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 11.18         |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 10        | 11      | 0.12      | 0.50 | 0.17           | 0.17           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 11.18         | 72.54            | 98.33            | 0.00              | 168.42             | 49        | 375                | 375                 | PVC  | 0.38      | 69.0       | 108            | 0.98           | 1.18               | 0.45             |      |  |
|  |           |         | 0.19      | 0.50 | 0.26           | 0.94           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 11        | 34      | 0.29      | 0.70 | 0.56           | 1.50           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 12.36         | 68.80            | 93.19            | 0.00              | 159.53             | 103       | 375                | 375                 | PVC  | 0.76      | 80.5       | 153            | 1.38           | 0.97               | 0.68             |      |  |
| To Avenue de Lamarche Avenue, Pipe 34 - 38                     |           |         |           |      |                | 1.50           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 13.33         |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
| <b>Croissant des Aubrais Crescent - 10</b>                     |           |         |           |      |                |                |           |   |                |                |           |   |                |                |           |      |                |                |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  |           |         | 0.05      | 0.50 | 0.07           | 0.07           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  |           |         | 0.29      | 0.50 | 0.40           | 0.47           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 31        | 33      | 0.68      | 0.70 | 1.32           | 1.80           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 138       | 450                | 450                 | CONC | 0.85      | 143.0      | 263            | 1.65           | 1.44               | 0.52             |      |  |
| To Avenue de Lamarche Avenue, Pipe 33 - 34                     |           |         |           |      |                | 1.80           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 11.44         |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 31        | 35      |           |      | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 0         | 300                | 300                 | PVC  | 1.05      | 9.5        | 99             | 1.40           | 0.11               | 0.00             |      |  |
|  | 35        | 10      |           |      | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 10.11         | 76.37            | 103.60           | 0.00              | 177.53             | 0         | 300                | 300                 | PVC  | 0.35      | 52.0       | 57             | 0.81           | 1.07               | 0.00             |      |  |
| To Bois de Cravant Grove, Pipe 10 - 11                         |           |         |           |      |                | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 11.18         |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 10        | 49      | 0.19      | 0.70 | 0.37           | 0.37           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 28        | 300                | 300                 | PVC  | 0.69      | 106.5      | 80             | 1.14           | 1.56               | 0.35             |      |  |
|  | 49        | 50      |           |      | 0.00           | 0.37           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 11.56         | 71.29            | 96.61            | 0.00              | 165.44             | 26        | 300                | 300                 | PVC  | 0.35      | 9.5        | 57             | 0.81           | 0.20               | 0.46             |      |  |
|  |           |         | 0.13      | 0.50 | 0.18           | 0.55           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  |           |         | 0.17      | 0.50 | 0.24           | 0.79           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 50        | 52      | 0.62      | 0.70 | 1.21           | 1.99           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 11.76         | 70.66            | 95.74            | 0.00              | 163.94             | 141       | 450                | 450                 | CONC | 0.50      | 142.5      | 202            | 1.27           | 1.87               | 0.70             |      |  |
| To Avenue de Lamarche Avenue, Pipe 52 - 56                     |           |         |           |      |                | 1.99           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 13.63         |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
| <b>Chemin de Jargeau Road - 04</b>                             |           |         |           |      |                |                |           |   |                |                |           |   |                |                |           |      |                |                |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 39        | 40      | 0.04      | 0.54 | 0.06           | 0.06           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 5         | 300                | 300                 | PVC  | 1.60      | 27.0       | 122            | 1.73           | 0.26               | 0.04             |      |  |
| Contribution From Cours Crevier Walk, Pipe 16 - 40             |           |         |           |      |                | 1.09           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 11.79         |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  |           |         | 0.03      | 0.54 | 0.05           | 1.19           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 40        | 41      | 0.24      | 0.70 | 0.47           | 1.66           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 11.79         | 70.55            | 95.60            | 0.00              | 163.69             | 117       | 525                | 525                 | CONC | 0.30      | 54.5       | 236            | 1.09           | 0.83               | 0.50             |      |  |
| Contribution From Rang de Loury Row, Pipe 180 - 41             |           |         |           |      |                | 0.75           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 10.99         |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  |           |         | 0.01      | 0.70 | 0.02           | 2.42           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  |           |         | 0.03      | 0.54 | 0.05           | 2.47           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 41        | 30      | 0.13      | 0.70 | 0.25           | 2.72           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 12.63         | 68.00            | 92.10            | 0.00              | 157.65             | 185       | 525                | 525                 | CONC | 0.80      | 64.0       | 385            | 1.78           | 0.60               | 0.48             |      |  |
| To Avenue de Lamarche Avenue, Pipe 30 - 33                     |           |         |           |      |                | 2.72           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 13.23         |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
| <b>Block 158 - 2002</b>  |           |         |           |      |                |                |           |   |                |                |           |   |                |                |           |      |                |                |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | C100      | C4      |           |      |                |                |           |   |                |                |           |   | 0.06           | 0.25           | 0.04      | 0.04 |                |                |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  |           |         |           |      |                |                |           |   |                |                |           |   | 0.95           | 0.55           | 1.45      | 1.49 |                |                |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  |           |         |           |      |                |                |           |   |                |                |           |   | 0.19           | 0.50           | 0.26      | 1.76 |                |                |               | 10.00            | 76.81            | 104.19            | 0.00               | 178.56    | 285                | 375                 | 375  | PVC       | 3.40       | 6.0            | 323            | 2.93               | 0.03             | 0.88 |  |
|  |           |         |           |      |                |                |           |   |                |                |           |   |                |                |           |      |                |                |               | 10.03            |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  |           |         |           |      |                |                |           |   |                |                |           |   | 0.25           | 0.55           | 0.38      | 0.38 |                |                |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | C101      | C4      |           |      |                |                |           |   |                |                |           |   | 0.11           | 0.50           | 0.15      | 0.54 |                |                |               | 10.00            | 76.81            | 104.19            | 0.00               | 178.56    | 67                 | 300                 | 300  | PVC       | 2.00       | 4.5            | 137            | 1.93               | 0.04             | 0.49 |  |
|  |           |         |           |      |                |                |           |   |                |                |           |   |                |                |           |      |                |                |               | 10.04            |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | C4        | 2200    |           |      |                |                |           |   |                |                |           |   | 0.00           | 2.29           | 0.00      | 0.00 |                |                |               | 10.00            | 76.81            | 104.19            | 0.00               | 178.56    | 381                | 450                 | 450  | CONC      | 2.40       | 31.0           | 442            | 2.78               | 0.19             | 0.86 |  |
| To Cercle de l'Argonaut Circle, Pipe 2200 - 27                 |           |         |           |      |                | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      | 0.00           | 0.00           | 10.19         |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
| <b>Placette de Darvoy Mews - 13</b>                            |           |         |           |      |                |                |           |   |                |                |           |   |                |                |           |      |                |                |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |
|  | 22        | 24      | 0.50      | 0.72 | 1.00           | 1.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |      |                |                |               |                  |                  |                   |                    |           |                    |                     |      |           |            |                |                |                    |                  |      |  |

**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

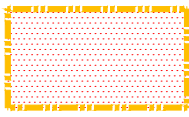
| LOCATION   |              |         | AREA (Ha) |      |                |                |           |   |                |                |           |   |                |                |           |   |                |                | FLOW          |                  |                  |                   |                    | SEWER DATA        |                  |                   |      |           |            |                |                |                    |                |       |
|--|--------------|---------|-----------|------|----------------|----------------|-----------|---|----------------|----------------|-----------|---|----------------|----------------|-----------|---|----------------|----------------|---------------|------------------|------------------|-------------------|--------------------|-------------------|------------------|-------------------|------|-----------|------------|----------------|----------------|--------------------|----------------|-------|
|  |              |         | 2 YEAR    |      |                |                | 5 YEAR    |   |                |                | 10 YEAR   |   |                |                | 100 YEAR  |   |                |                | Time of Conc. | Intensity 2 Year | Intensity 5 Year | Intensity 10 Year | Intensity 100 Year | Peak Flow Q (l/s) | DIA. (mm) actual | DIA. (mm) nominal | TYPE | SLOPE (%) | LENGTH (m) | CAPACITY (l/s) | VELOCITY (m/s) | TIME OF FLOW (min) | RATIO Q/Q full |       |
| 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 | (min)         | (mm/h)           | (mm/h)           | (mm/h)            | (mm/h)             |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | 19           | 26      |           |      | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 0                 | 300              | 300               | PVC  | 0.35      | 9.5        | 57             | 0.81           | 0.20               | 0.000          |       |
|  |              |         | 0.07      | 0.70 | 0.14           | 0.14           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | 26           | 22      | 0.12      | 0.54 | 0.18           | 0.32           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.20         | 76.06            | 103.17           | 0.00              | 176.79             | 24                | 300              | 300               | PVC  | 0.40      | 52.0       | 61             | 0.87           | 1.00               | 0.393          |       |
|  | 22           | 2200    |           |      | 0.00           | 0.32           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 11.20         | 72.49            | 98.27            | 0.00              | 168.31             | 23                | 300              | 300               | PVC  | 0.41      | 29.0       | 62             | 0.88           | 0.55               | 0.370          |       |
| Contribution From Block 158 Pipe C4 - 2200         |              |         |           |      | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 2.29          | 10.19            |                  |                   |                    | -29.00            |                  |                   |      |           |            |                |                |                    |                |       |
|  | 2200         | 27      |           |      | 0.00           | 0.32           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 2.29          | 11.75            | 70.68            | 95.78             | 0.00               | 164.01            | 399              | 675               | 675  | CONC      | 0.50       | 19.0           | 594            | 1.66               | 0.19           | 0.670 |
|  | 27           | 28      |           |      | 0.00           | 0.32           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 2.29          | 11.94            | 70.08            | 94.95             | 0.00               | 162.58            | 395              | 675               | 675  | CONC      | 1.00       | 10.5           | 841            | 2.35               | 0.07           | 0.470 |
|  |              |         | 0.05      | 0.50 | 0.07           | 0.39           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  |              |         | 0.05      | 0.54 | 0.08           | 0.46           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  |              |         | 0.10      | 0.50 | 0.14           | 0.60           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  |              |         | 0.10      | 0.54 | 0.15           | 0.75           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | 28           | 30      | 0.67      | 0.70 | 1.30           | 2.05           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 2.29          | 12.01            | 69.85            | 94.64             | 0.00               | 162.03            | 515              | 750               | 750  | CONC      | 0.50       | 142.5          | 787            | 1.78               | 1.33           | 0.654 |
| To Avenue de Lamarche Avenue, Pipe 30 - 33         |              |         |           |      |                | 2.05           |           |   |                | 0.00           |           |   |                |                |           |   |                |                | 2.29          | 13.35            |                  |                   |                    |                   | -29              |                   |      |           |            |                |                |                    |                |       |
| <b>Rang de Loury Row - 03</b>                      |              |         |           |      |                |                |           |   |                |                |           |   |                |                |           |   |                |                |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | 180          | 18      | 0.16      | 0.72 | 0.32           | 0.32           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 25                | 300              | 300               | PVC  | 1.06      | 38.0       | 100            | 1.41           | 0.45               | 0.247          |       |
| To Cours Crevier Walk, Pipe 18 - 21                |              |         |           |      |                | 0.32           |           |   |                | 0.00           |           |   |                |                | 0.00      |   |                |                | 0.00          | 10.45            |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  |              |         | 0.19      | 0.54 | 0.29           | 0.29           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | 180          | 41      | 0.23      | 0.72 | 0.46           | 0.75           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 57                | 300              | 300               | PVC  | 0.88      | 76.0       | 91             | 1.28           | 0.99               | 0.631          |       |
| To Chemin de Jargeau Road, Pipe 41 - 30            |              |         |           |      |                | 0.75           |           |   |                | 0.00           |           |   |                |                | 0.00      |   |                |                | 0.00          | 10.99            |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
| <b>Cours Crevier Walk - 02</b>                     |              |         |           |      |                |                |           |   |                |                |           |   |                |                |           |   |                |                |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | 17           | 16      |           |      | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 0                 | 300              | 300               | PVC  | 2.00      | 9.5        | 137            | 1.93           | 0.08               | 0.000          |       |
|  |              |         | 0.15      | 0.54 | 0.23           | 0.23           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | 16           | 40      | 0.43      | 0.72 | 0.86           | 1.09           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.08         | 76.49            | 103.76           | 0.00              | 177.81             | 83                | 375              | 375               | PVC  | 0.44      | 108.0      | 116            | 1.05           | 1.71               | 0.714          |       |
| To Chemin de Jargeau Road, Pipe 40 - 41            |              |         |           |      |                | 1.09           |           |   |                | 0.00           |           |   |                |                | 0.00      |   |                |                | 0.00          | 11.79            |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | 17           | 18      |           |      | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 0                 | 300              | 300               | PVC  | 1.09      | 48.0       | 101            | 1.43           | 0.56               | 0.000          |       |
| Contribution From Rang de Loury Row, Pipe 180 - 18 |              |         |           |      |                | 0.32           |           |   |                | 0.00           |           |   |                |                | 0.00      |   |                |                | 0.00          | 10.45            |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  |              |         | 0.02      | 0.72 | 0.04           | 0.36           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  |              |         | 0.15      | 0.54 | 0.23           | 0.59           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | 18           | 21      | 0.21      | 0.72 | 0.42           | 1.01           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.56         | 74.72            | 101.32           | 0.00              | 173.60             | 75                | 375              | 375               | PVC  | 0.54      | 67.0       | 129            | 1.17           | 0.96               | 0.583          |       |
| To Avenue de Lamarche Avenue, Pipe 21 - 24         |              |         |           |      |                | 1.01           |           |   |                | 0.00           |           |   |                |                | 0.00      |   |                |                | 0.00          | 11.52            |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
| <b>Avenue de Lamarche Avenue - 01</b>              |              |         |           |      |                |                |           |   |                |                |           |   |                |                |           |   |                |                |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  |              |         | 0.05      | 0.40 | 0.06           | 0.06           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | CTRL MH 1200 | 120     | 0.52      | 0.47 | 0.88           | 0.74           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 56                | 300              | 300               | PVC  | 0.50      | 16.0       | 68             | 0.97           | 0.28               | 0.826          |       |
|  |              |         | 0.04      | 0.85 | 0.09           | 0.83           |           |   |                |                |           |   |                |                |           |   |                |                |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | 120          | 12      | 0.06      | 0.85 | 0.14           | 0.97           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 75                | 300              | 300               | PVC  | 1.51      | 51.0       | 119            | 1.68           | 0.51               | 0.628          |       |
|  | 12           | 13      | 0.35      | 0.85 | 0.83           | 1.80           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.51         | 74.92            | 101.60           | 0.00              | 174.06             | 135               | 375              | 375               | PVC  | 2.00      | 76.0       | 248            | 2.25           | 0.56               | 0.543          |       |
|  |              |         | 2.86      | 0.85 | 6.76           |                |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | CTRL MH 100  | 13      | 0.11      | 0.40 | 0.12           | 6.88           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 528               | 750              | 750               | CONC | 0.35      | 14.5       | 659            | 1.49           | 0.16               | 0.802          |       |
|  |              |         | 0.07      | 0.56 | 0.11           |                |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |
|  | CTRL MH 101  | 13      | 2.54      | 0.85 | 6.00           | 6.11           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 469               | 750              | 750               | CONC | 0.30      | 19.5       | 610            | 1.38           | 0.24               | 0.770          |       |
|  | 13           | 15      | 0.18      | 0.85 | 0.43           | 15.22          |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.24         | 75.91            | 102.97           | 0.00              | 176.43             | 1155              | 825              | 825               | CONC | 1         | 139        | 1505           | 2.82           | 0.82               | 0.767          |       |
|  | CTRL MH 103  | 15      | 2.17      | 0.75 | 4.52           | 4.52           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 348               | 675              | 675               | CONC | 0.30      | 15.0       | 460            | 1.29           | 0.19               | 0.755          |       |
|  | CTRL MH 104  | 15      | 2.16      | 0.75 | 4.50           | 4.50           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.00         | 76.81            | 104.19           | 0.00              | 178.56             | 346               | 675              | 675               | CONC | 0.30      | 19.5       | 460            | 1.29           | 0.25               | 0.751          |       |
|  | 15           | 21      | 0.30      | 0.85 | 0.71           | 24.95          |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           |           |   | 0.00           | 0.00           | 10.25         | 73.85            | 102.88           | 0.00              | 176.28             | 1893              | 1350             | 1350              | CONC | 0.37      | 39         | 3247           | 2.27           | 0.43               | 0.383          |       |
| Contribution From Cours Crevier Walk, Pipe 18 - 21 |              |         |           |      |                | 1.01           |           |   |                | 0.00           |           |   |                |                |           |   |                |                |               |                  |                  |                   |                    |                   |                  |                   |      |           |            |                |                |                    |                |       |







LEGEND



SITE BOUNDARY

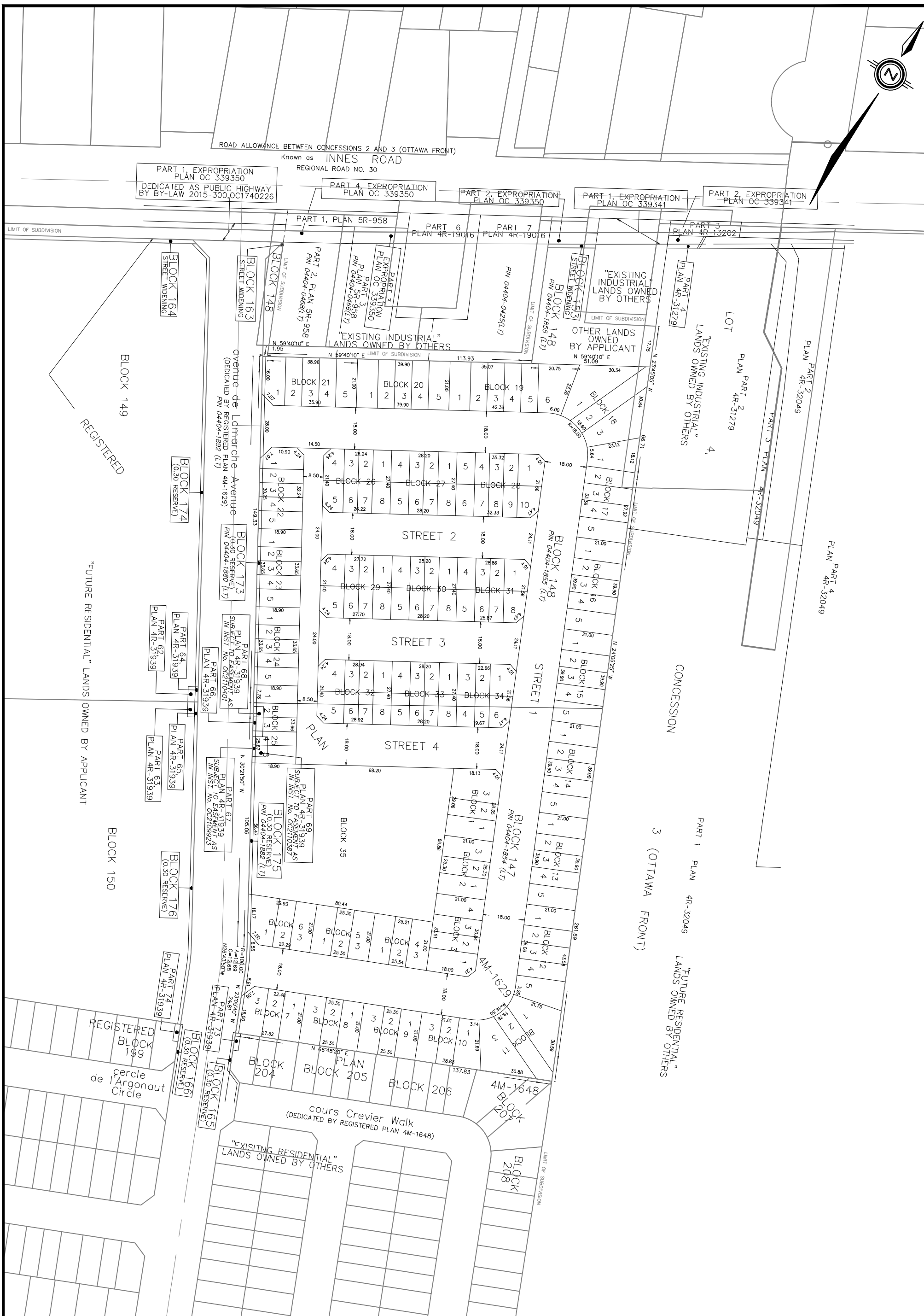
ORLEAN VILLAGE PHASE 4

SITE LOCATION



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

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



120 Iber Road, Unit 103  
 Stittsville, ON K2S 1E9  
 Tel. (613) 836-0856  
 Fax. (613) 836-7183  
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CONCEPT PLAN  
 ORLEAN VILLAGE PHASE 4

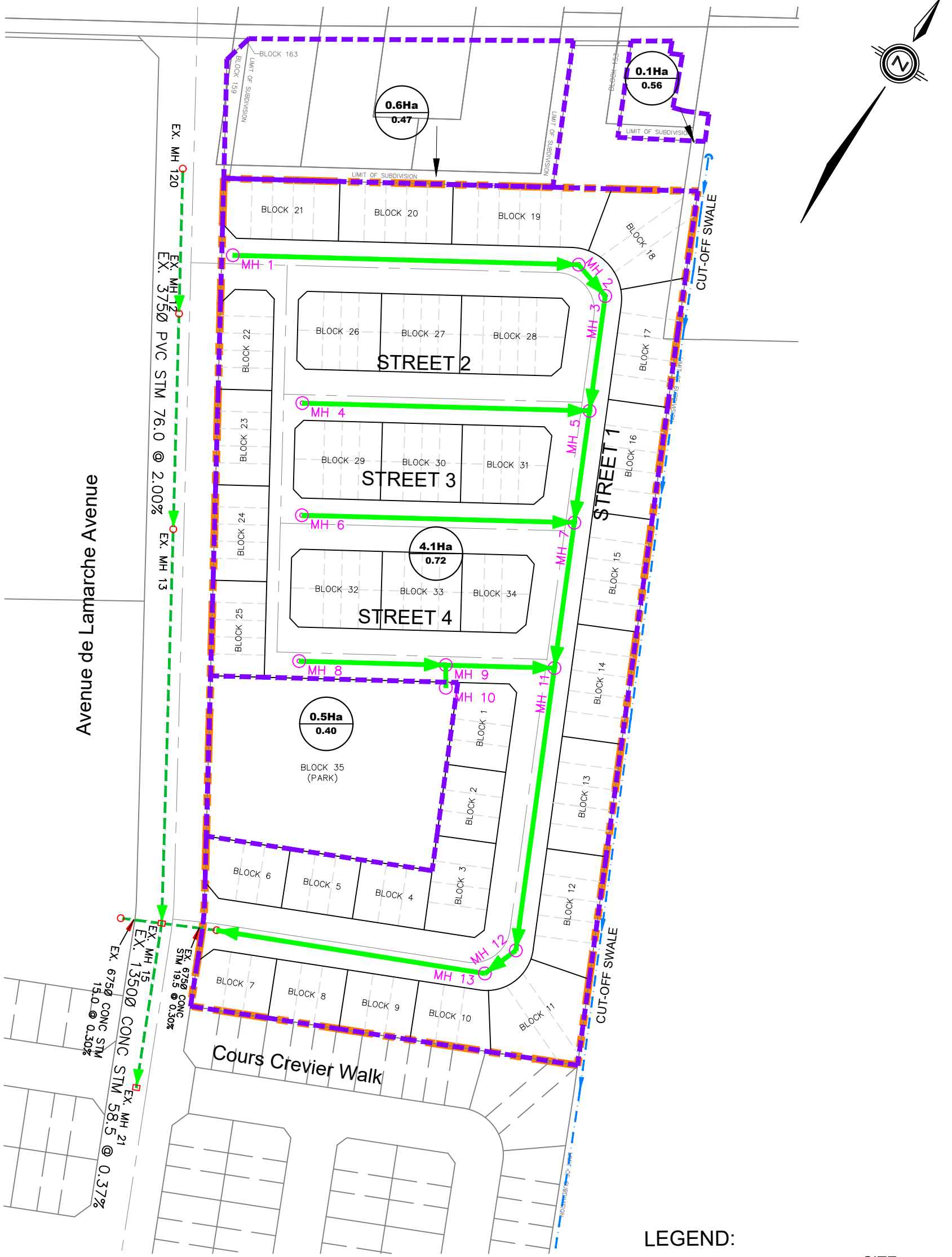
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|-------------------------|
| DATE:<br>MARCH 2022     |
| SCALE: 1:1500           |
| PROJECT No.:<br>22-1296 |
| FIGURE: 2               |







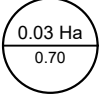

120 Iber Road, Unit 103  
 Stittsville, ON K2S 1E9  
 Tel. (613) 836-0856  
 Fax. (613) 836-7183  
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CONCEPT GRADING PLAN  
 ORLEAN VILLAGE PHASE 4

|                         |
|-------------------------|
| DATE:<br>MARCH 2022     |
| SCALE: 1:1500           |
| PROJECT No.:<br>22-1296 |
| FIGURE: 3               |



**LEGEND:**

-  SITE BOUNDARY
-  STORM TRIBUTARY BOUNDARY
-  PROPOSED STORM MANHOLE
-  STORM SERVICING
-  STORM DRAINAGE AREA  
RUNOFF COEFFICIENT
-  EXISTING STORM SERVICING

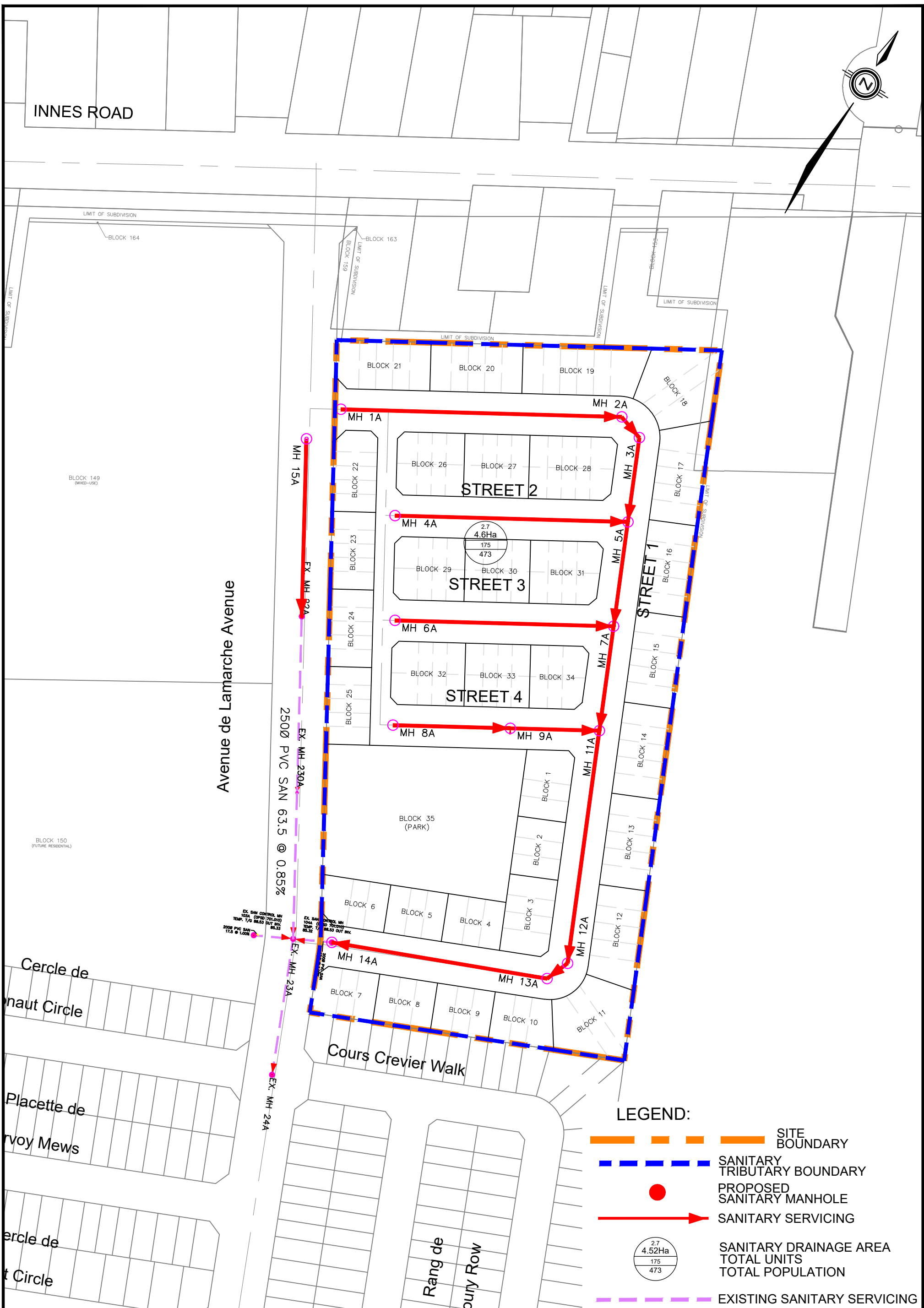


120 Iber Road, Unit 103  
Stittsville, ON K2S 1E9  
Tel. (613) 836-0856  
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**STORM SERVICING PLAN  
ORLEAN VILLAGE PHASE 4**

DATE:  
MARCH 2022  
SCALE: 1:1500  
PROJECT No.:  
22-1296  
FIGURE: 4





**LEGEND:**

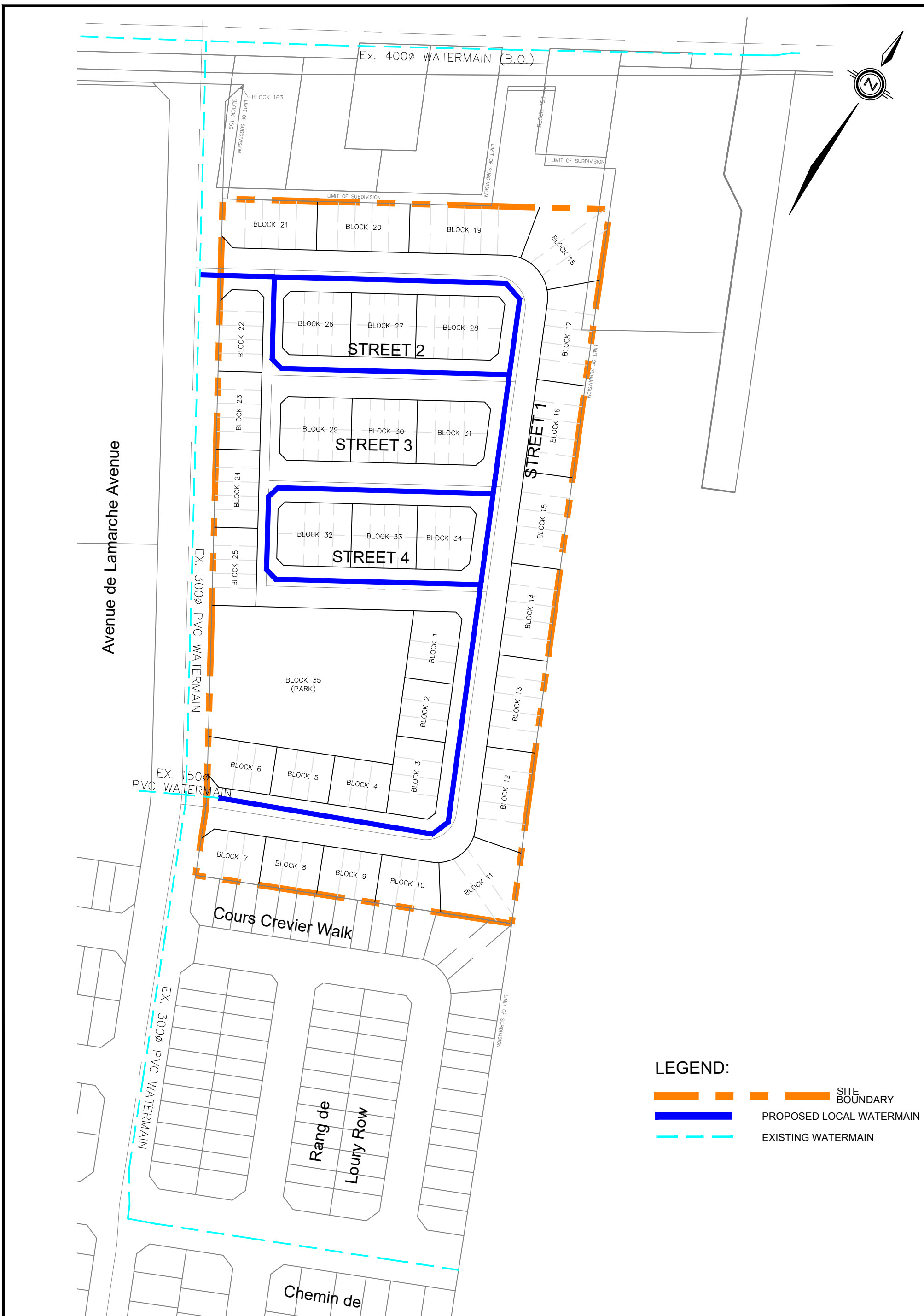
- SITE BOUNDARY
- SANITARY TRIBUTARY BOUNDARY
- PROPOSED SANITARY MANHOLE
- SANITARY SERVICING
- SANITARY DRAINAGE AREA  
TOTAL UNITS  
TOTAL POPULATION
- EXISTING SANITARY SERVICING



120 Iber Road, Unit 103  
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**SANITARY SERVICING PLAN  
ORLEAN VILLAGE PHASE 4**

|                         |
|-------------------------|
| DATE:<br>MARCH 2022     |
| SCALE: 1:1500           |
| PROJECT No.:<br>22-1296 |
| FIGURE: 5               |



**LEGEND:**

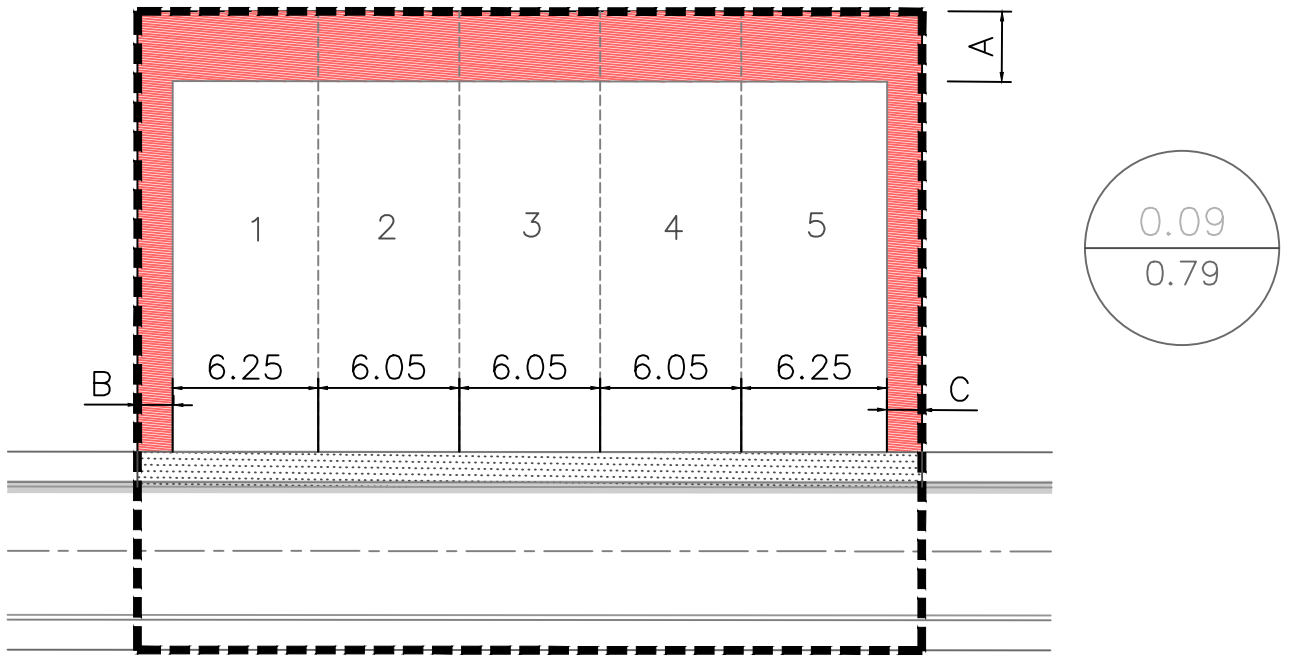
- SITE BOUNDARY
- PROPOSED LOCAL WATERMAIN
- EXISTING WATERMAIN



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 Tel. (613) 836-0856  
 Fax. (613) 836-7183  
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**WATERMAIN SERVICING PLAN  
 ORLEAN VILLAGE PHASE 4**

|                         |
|-------------------------|
| DATE:<br>MARCH 2022     |
| SCALE: 1:1500           |
| PROJECT No.:<br>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: 921.92 m<sup>2</sup>

TOTAL IMP AREA: 773.26 m<sup>2</sup>

IMP %: 84%

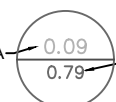
RC: 0.79

**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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SCALE:

NTS

PROJECT No.:

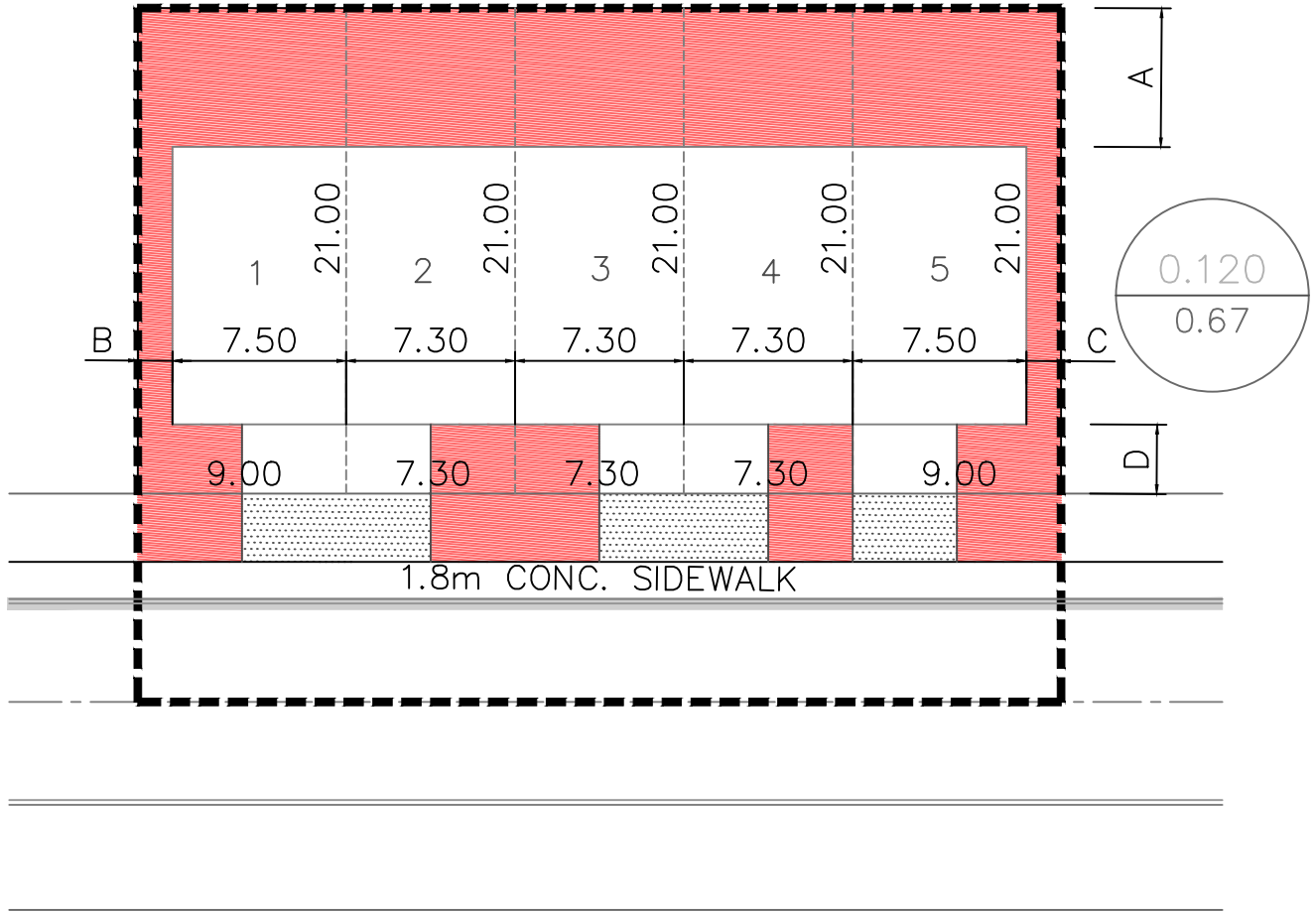
20-1296

DATE:

MAR 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: 1197.00 m<sup>2</sup>  
 TOTAL IMP AREA: 802.90 m<sup>2</sup>  
 IMP %: 67%  
 RC: 0.67

**18 m ROW TH RC  
 FIGURE**

**LEGENDS**

PERVIOUS HATCH

STM TRIB LINE

TOTAL AREA 0.035  
 0.65 RC VALUE

7.30 LOT DIMENSION



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SCALE:

NTS

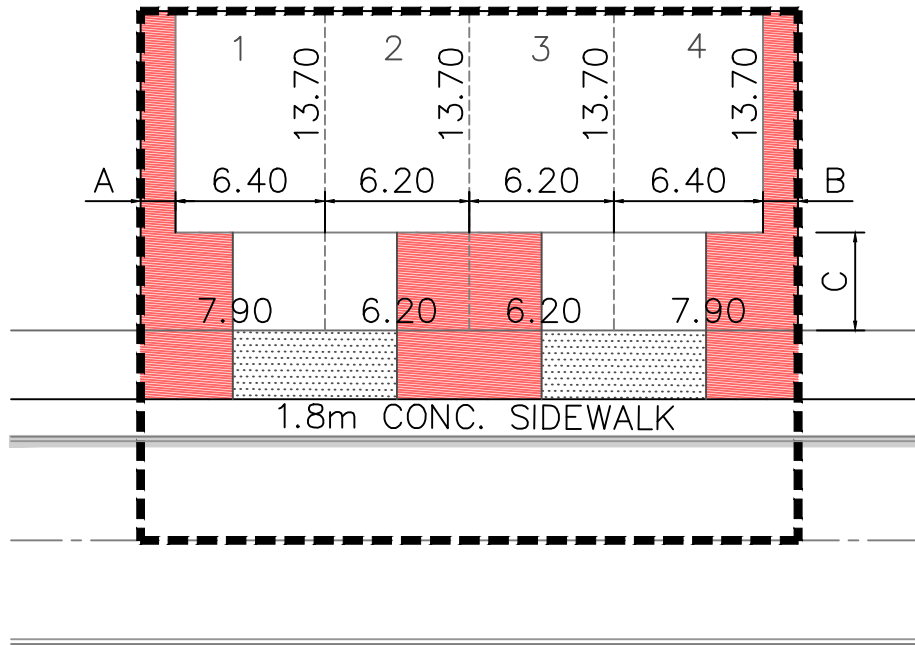
PROJECT No.:

20-1296

DATE:

MAR 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: 640.14 m<sup>2</sup>

TOTAL IMP AREA: 510.83 m<sup>2</sup>

IMP %: 80%

RC: 0.76

# 18 m ROW B2B RC FIGURE

**LEGENDS**

PERVIOUS HATCH

STM TRIB LINE

TOTAL AREA:  $\frac{0.035}{0.65}$  RC VALUE

6.20 LOT DIMENSION



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SCALE:

NTS

PROJECT No.:

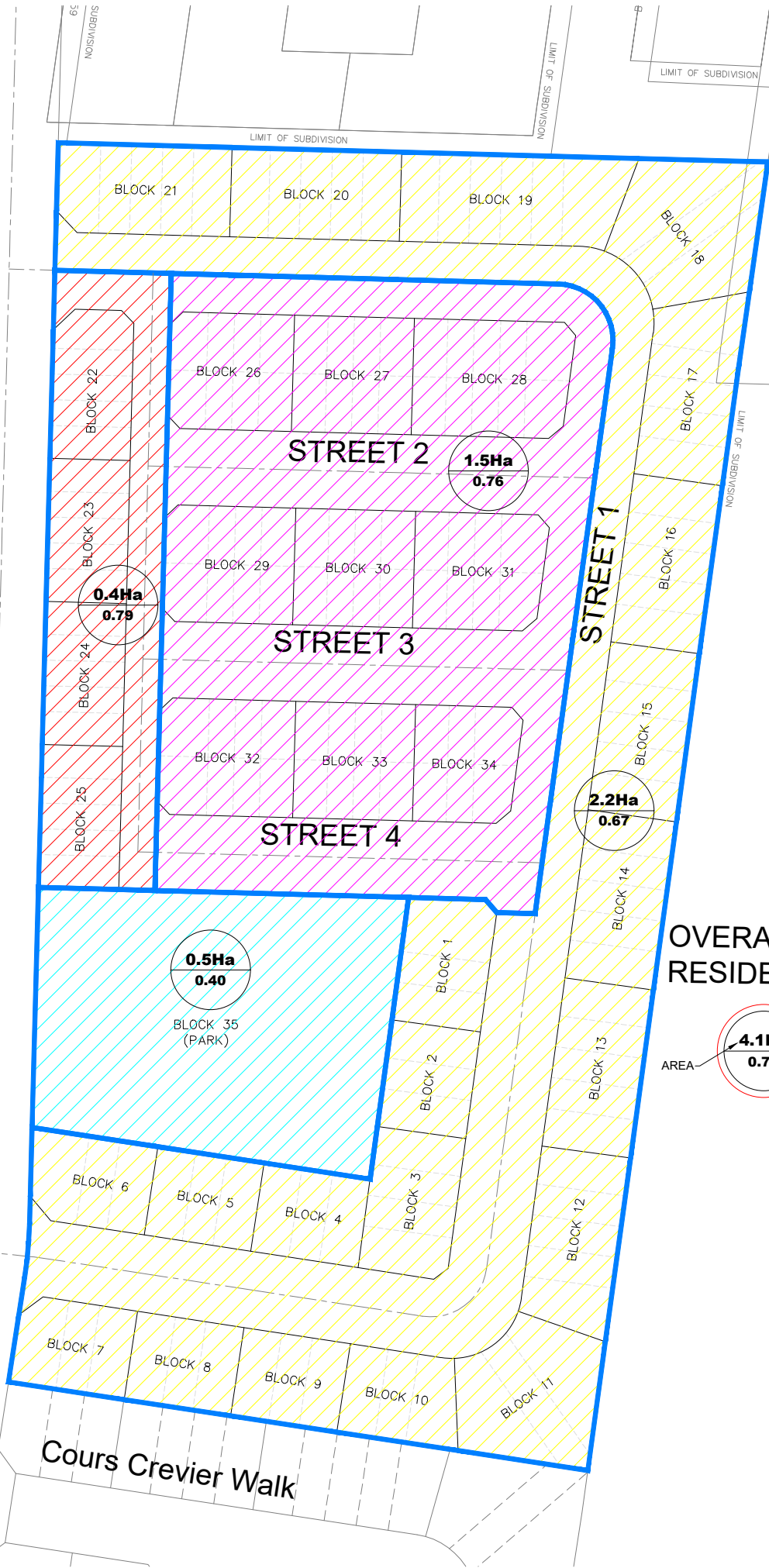
20-1296

DATE:

MAR 2022

FIGURE: 9

Avenue de Lamarche Avenue



OVERALL RESIDENTIAL:

