

**PROVENCE ORLEANS SUBDIVISION – PHASE 6  
2065 PORTOBELLO BOULEVARD  
OTTAWA, ONTARIO**

**FUNCTIONAL SERVICING REPORT**

Prepared for:

**Provence Orleans Realty Investments Inc.**

Prepared by:

**NOVATECH**

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**Issued: October 31, 2019**

**Revised: June 4, 2020**

**Revised: December 2, 2020**

Ref: R-2019-000

Novatech File No. 117155

December 2, 2020

Planning, Infrastructure and Economic Development  
City of Ottawa  
110 Laurier Ave. West, 4th Floor  
Ottawa, Ontario  
K1P 1J1

**Attention: Julie Lebrun, MCIP, RPP**

Dear Mrs. Lebrun:

**Re: Provence Orleans Subdivision – Phase 6  
Functional Servicing Report  
Our File No.: 117155**

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Please find enclosed the revised report entitled, “Provence Orleans Subdivision – 2065 Portobello Boulevard – Functional Servicing Report”. It has been revised to reflect comments from City staff. The report is submitted in support of the Draft Plan submission for the subject property.

If you have any questions, please contact the undersigned.

Sincerely,

**NOVATECH**



Melanie E. Riddell, P.Eng.  
Senior Project Manager | Land Development

cc: Erin O'Connor, Provence Orleans Realty Investments Inc.

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## 1.0 INTRODUCTION

This report has been prepared in support of the Draft Plan of Subdivision, Rezoning and Official Plan Amendment applications submission for the proposed development and is consistent with the Master Servicing Study (*Gloucester and Cumberland East Urban Community Expansion Area and Bilberry Creek Industrial Park Master Servicing Update* by Stantec dated September 2013).

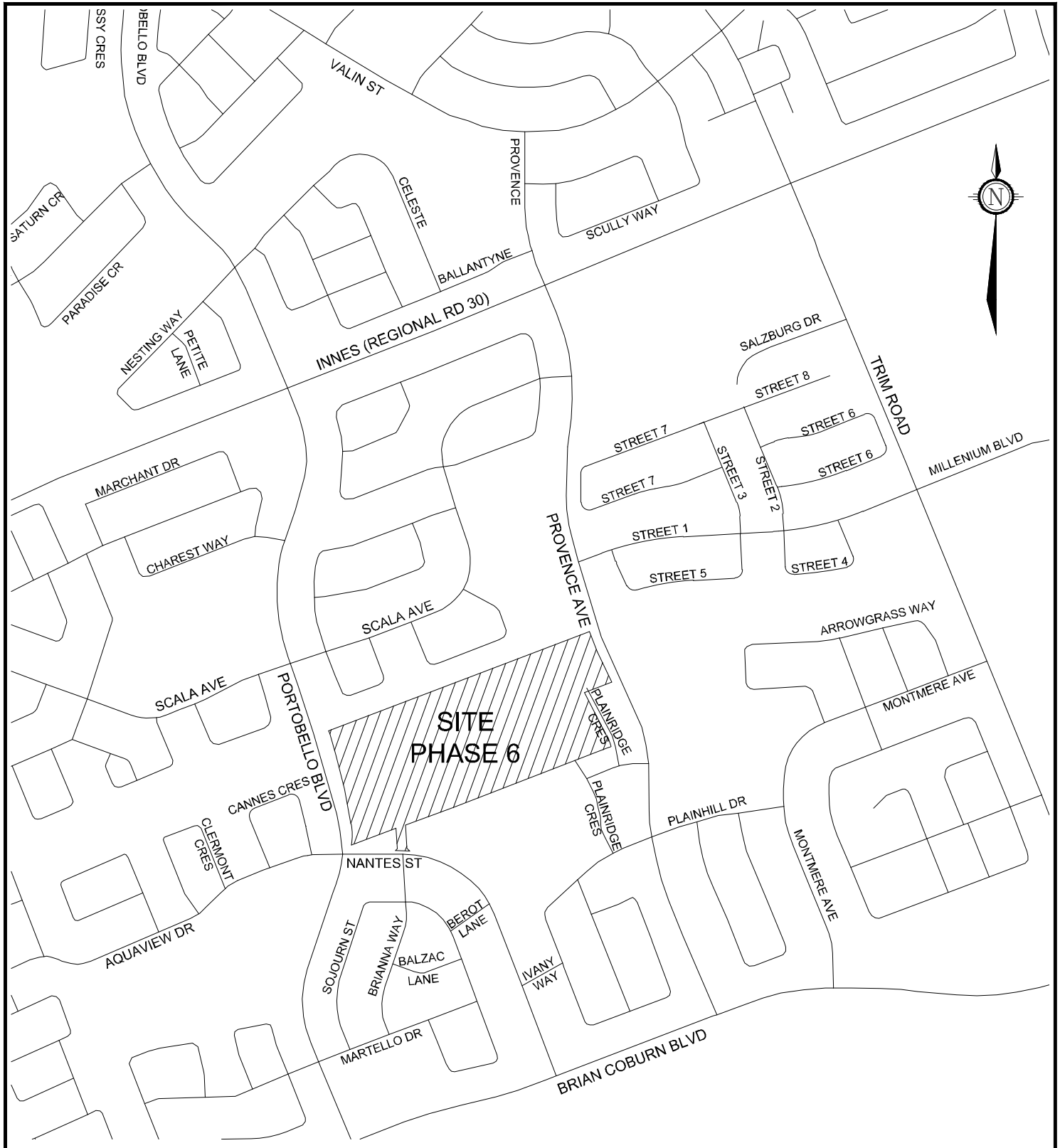
The proposed Provence Orleans Subdivision – Phase 6 development at 2065 Portobello Boulevard, owned by Provence Orleans Realty Investments Inc. managed by Regional Group, consists of a 10.7ha site located in the City of Ottawa located between Portobello Boulevard, Nantes Street and Plainridge Crescent, as shown on **Figure 1** – Key Plan.

The Provence Orleans Subdivision - Phase 6 development is proposed to consist of 108 residential units, a medium density block with multi-unit residential buildings and a woodlot park, as shown on **Figure 2** – Concept Plan / Phasing Plan. It is anticipated the medium density block will be the subject of a separate site plan control application which will occur concurrently with this application.

The parcel of land consists of farmed fields and the existing woodlot, as shown on **Figure 3** – Existing Conditions Plan.



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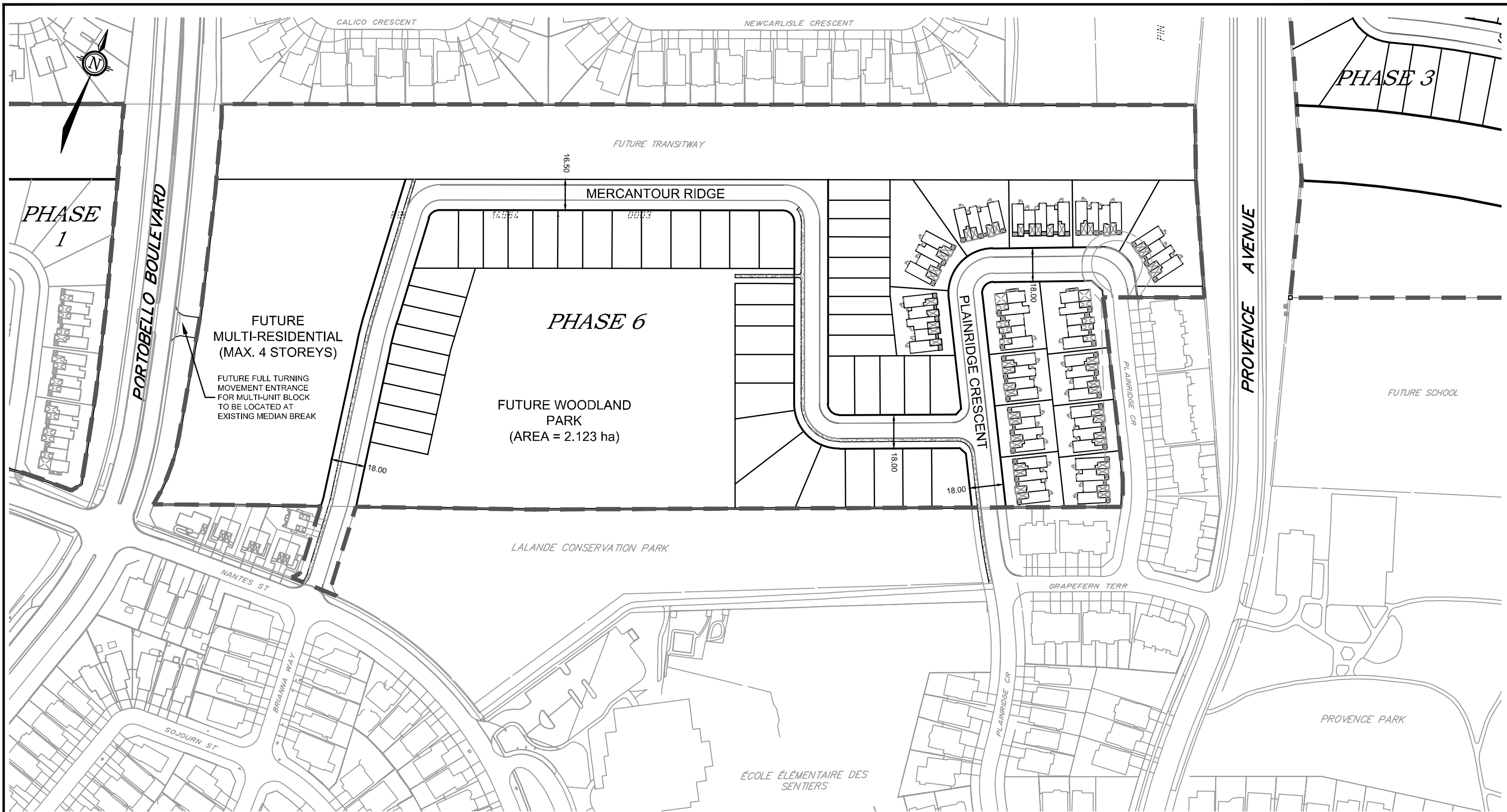
N.T.S

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 (2065 PORTOBELLO BOULEVARD)

**KEY PLAN**

DATE	JOB	FIGURE
DEC 2020	117155	FIG-1

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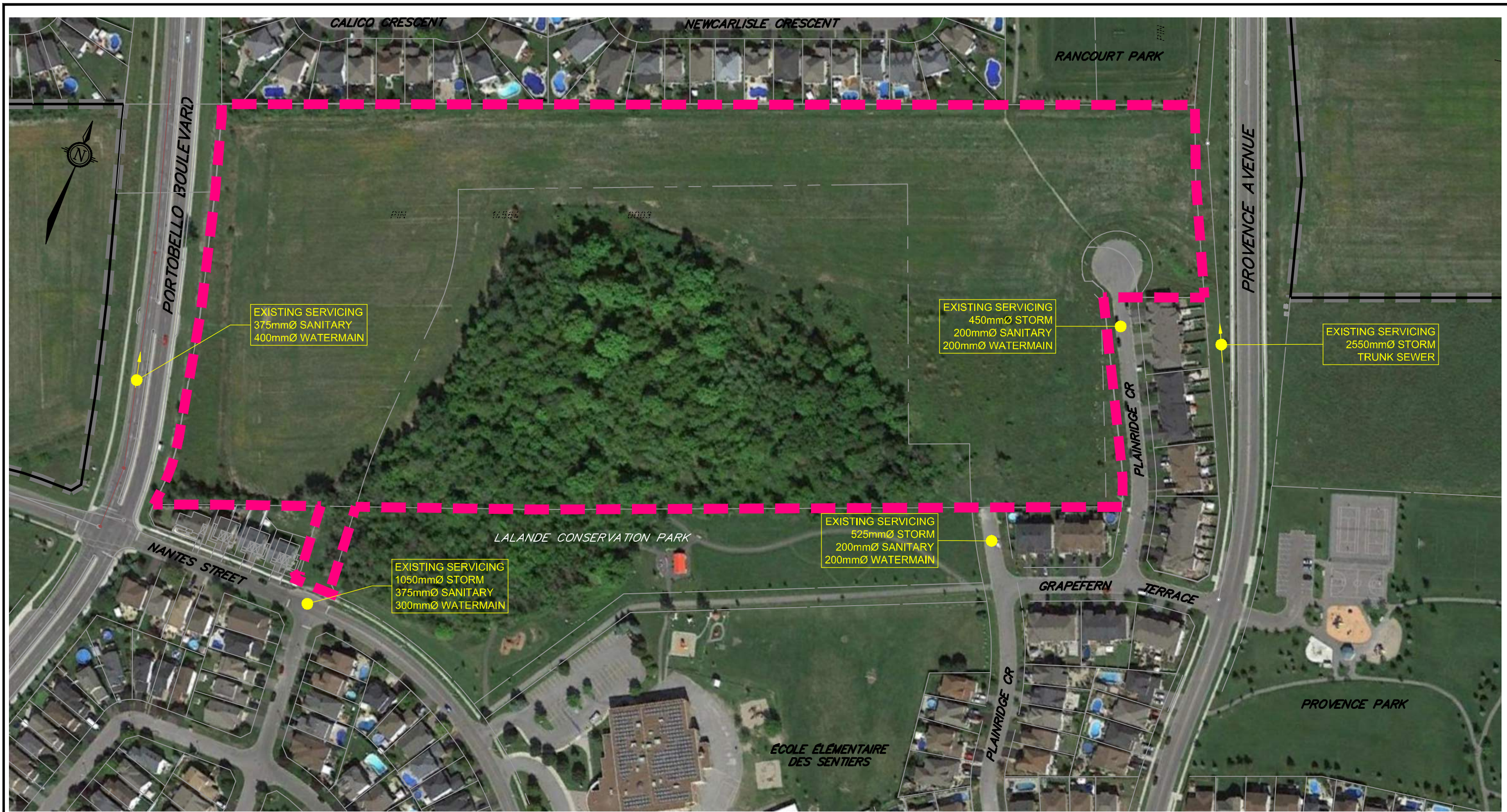
**PHASE 6 CONCEPT PLAN /  
 PHASING PLAN**

SCALE 1 : 2000

DATE DEC 2020 JOB 117155 FIGURE FIG-2



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**PHASE 6 EXISTING  
 CONDITIONS PLAN**

SCALE 1 : 2000

DATE DEC 2020 JOB 117155 FIGURE FIG-3



## 2.0 GEOTECHNICAL INVESTIGATION

Paterson Group Inc. conducted a geotechnical investigation in support of the proposed residential development on the Legault lands.

The field investigation was performed November 22 to 24, 2017; January 8, 2018; as well as February 5 to 7, 2018 and consisted of the following:

### First Stage

- Seven (7) boreholes advanced across the site to a maximum depth of 9.8m below existing ground surface.
- Groundwater monitoring devices were installed throughout the site.

### Second Stage

- Two (2) boreholes advanced at various locations to a maximum depth of 9.5m below existing ground surface.
- Groundwater monitoring devices were installed throughout the site.

### Third Stage

- Twelve (12) boreholes advanced across the site to a maximum depth of 6.4m below existing ground surface.

The principal findings of this investigation determined that the soil profile generally consists of 0.2 to 0.3m of topsoil overlying a hard to soft, brown to grey silty clay layer with trace of sand.

Groundwater measured in a range from about 3m to 5m below ground surface.

From a geotechnical perspective, the subject site is suitable for the proposed residential development. Refer to *Geotechnical Investigation – Proposed Residential Development – Provence Orleans Subdivision – 2128 Trim Road - Ottawa, prepared by Paterson Group Inc. dated July 13, 2020 (PG4278-1, Revision 1)* for the complete report.

### 3.0 WATER SUPPLY

A preliminary hydraulic analysis was performed for the Provence Orleans Subdivision, Phase 6. Per the Master Servicing Study (Stantec, 2013), the Subject Site will be serviced with 200mm PVC pipe from four (4) separate connection points to the existing watermain, refer to **Figure 4** for Conceptual Watermain Alignment and Watermain Node Locations and the Watermains plan from the Master Servicing Study in **Appendix A**. The watermain analysis confirms the proposed watermain can adequately service the overall development. Analysis of the watermain was completed using EPANET v2.0 and watermain boundary conditions provided by the City of Ottawa, included in **Appendix A**.

The required fire flow for the subdivision was calculated using the Fire Underwriter's Survey (FUS) and adjusted as per the City of Ottawa's design guidelines. The calculated FUS minimum required fire flow for Provence Orleans Subdivision singles and townhouses are 167L/s and 217L/s, respectively. However as per the City's technical bulletin ISDTB-2014-02, dated May 27, 2014, the fire flow requirement is capped at 10,000L/min (166.7L/s) for singles because the back of the units are separated by more than 10m and for towns because the units include a minimum two hour fire resistance rating, a maximum area of 600m<sup>2</sup>, and the back of the units are separated by more than 10m. The proposed townhouse blocks at the existing Plainridge and proposed Mercantour intersection do not have adequate separation and therefore are subject to the FUS calculated fire flow. The fire flow calculated for multi-unit residential block is been calculated at 200L/s. A separate report will be required to support the Site Plan Application for this block.

For reference, FUS fire flow calculations are included in **Appendix A**.

The following design criteria, per City of Ottawa Design Guidelines Water Distribution, Section 4.2, were used to determine the watermain performance on-site. Fire flow calculations are based on the Fire Underwriters Survey (FUS) and are as follows:

#### Demands:

- |                           |                          |
|---------------------------|--------------------------|
| • Average Daily Demand    | 350L/day/person          |
| • Single Home Density     | 3.4 people/unit          |
| • Townhouse Density       | 2.7 people/unit          |
| • Apartment/Condo Density | 1.8 people/unit          |
| • Maximum Daily Demand    | 2.5 Average Daily Demand |
| • Peak Hour Demand        | 2.2 Maximum Daily Demand |
| • Fire Flow               | FUS/City of Ottawa       |

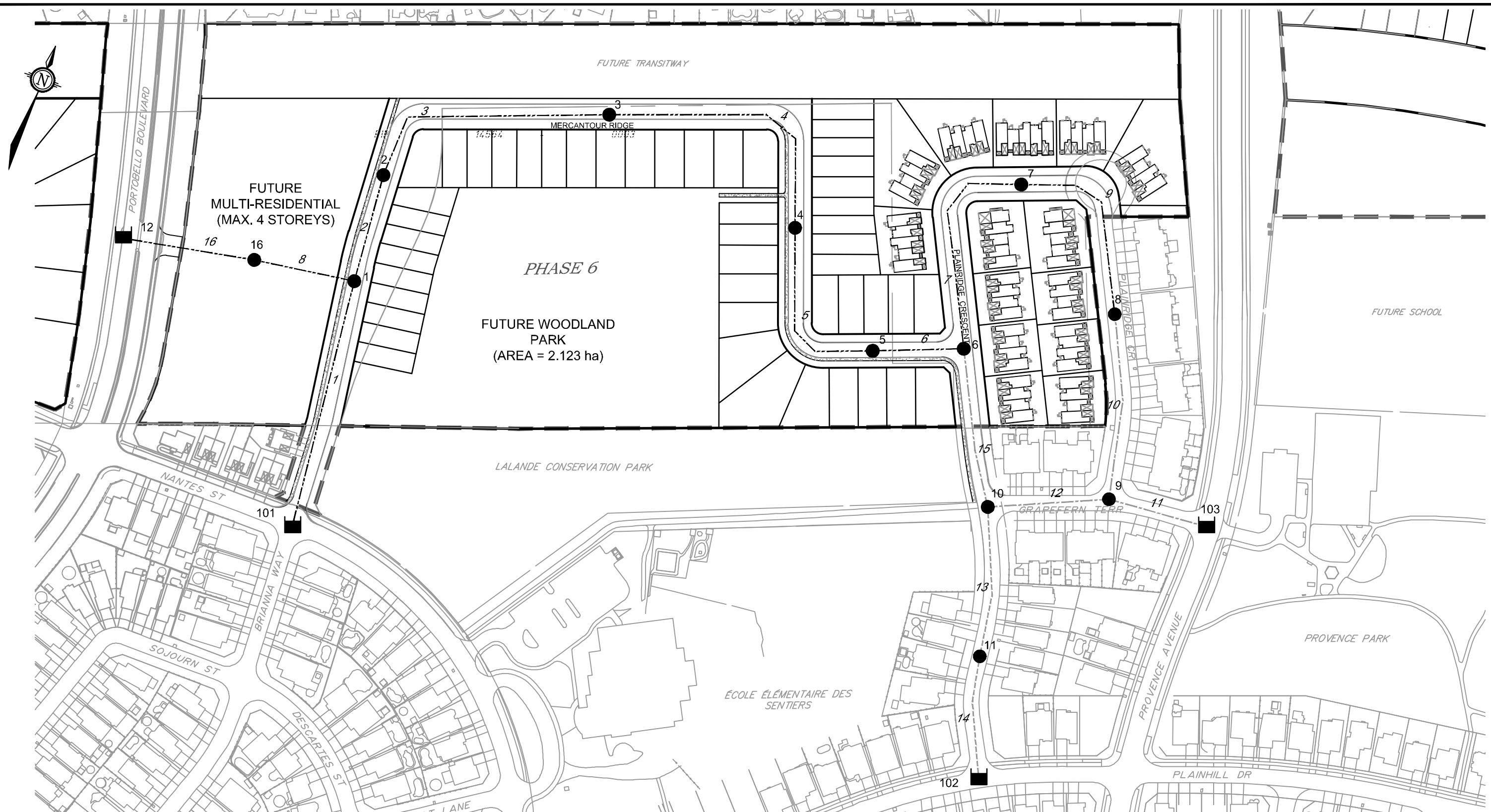
#### System Requirements:

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| • Maximum System Pressure (ROW)      | 690 Kpa (100psi)                     |
| • Maximum System Pressure (Services) | 552 Kpa (80psi)                      |
| • Minimum System Pressure            | 275 Kpa (40psi) excluding fire flows |
| • Minimum System Pressure            | 140 Kpa (20psi) including fire flows |
| • Maximum Age                        | 24 Hours (onsite)                    |

#### Friction Factors:

- |                   |     |
|-------------------|-----|
| • 150mm PVC       | 100 |
| • 200mm-250mm PVC | 110 |

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**LEGEND**

- 3 PROPOSED 200mmØ WATERMAIN PIPE
- 14 EXISTING 150mmØ WATERMAIN PIPE
- 11 EXISTING 200mmØ WATERMAIN PIPE
- WATERMAIN NODE
- RESERVOIR

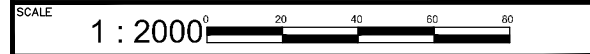


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**PHASE 6 - CONCEPTUAL  
 WATERMAIN LAYOUT /  
 WATERMAIN NODE LOCATIONS**



DATE DEC 2020	JOB 117155	FIGURE FIG-4
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**Tables 3.1** summarizes the watermain operating conditions during the high pressure, maximum daily demand and fire flow, and peak hour demands for Phase 6 of the development.

**Table 3.1: Phase 1 Water Operating Conditions**

<b>Condition</b>	<b>Demand (L/s)</b>	<b>Minimum/Maximum Allowable Pressure (kPa/psi)</b>	<b>Operating Pressure (kPa/psi)</b>
High Pressure	3.2	552/80 (Maximum)	395/57.3
Maximum Daily Demand (c/w Fire Flow)	8.0 (217) at Node 6	140/20.0 (Minimum)	172/25.0 At Node 2
Peak Hour	17.7	276/40.0 (Minimum)	382/55.4

Based on the proposed Concept Plan and this hydraulic analysis, Phase 6 of the Provence Orleans Subdivision can be serviced with 200mm watermain and four (4) connections to the existing watermain. A detailed hydraulic analysis will be required during the detailed engineering design. Refer to **Appendix A** for complete hydraulic analysis results.

## 4.0 SANITARY SEWER SYSTEM

Per the Master Servicing Study (Stantec, 2013), the Subject Site will be serviced by 200mm gravity sewers outletting to existing sewers on Plainridge Crescent and Nantes Street and will ultimately outlet to the existing 375mm sanitary sewer on Portobello Boulevard. The proposed multi-unit residential site will be serviced directly from Portobello boulevard and will be detailed through a separate site plan control application. Refer to **Figure 5** – Conceptual Sanitary and Storm Alignment and **Figure 6** – Conceptual Post-Development Sanitary Drainage Area Plan and the Sanitary Collector Sewers and Drainage Areas Plan from the Master Servicing Study in **Appendix B** for details.

Population estimates and sanitary flows from the sites for the proposed developments are calculated using design criteria from the City of Ottawa Sewer Design Guidelines.

- Design Flow, Residential 280 L/c/day
- Residential Peaking Factor Harmon Equation
- Peak Correction Factor 2.0 minimum; 4.0 maximum
- Infiltration Allowance 0.33 L/s/ha
- Single Family Residential Dwelling 3.4 people/unit
- Multiple Family Residential Dwelling 2.7 people/unit
- Apartment Residential Dwelling 1.8 people/unit

Using the above criteria, the theoretical peak sanitary flows are summarized below in **Table 4.1**.

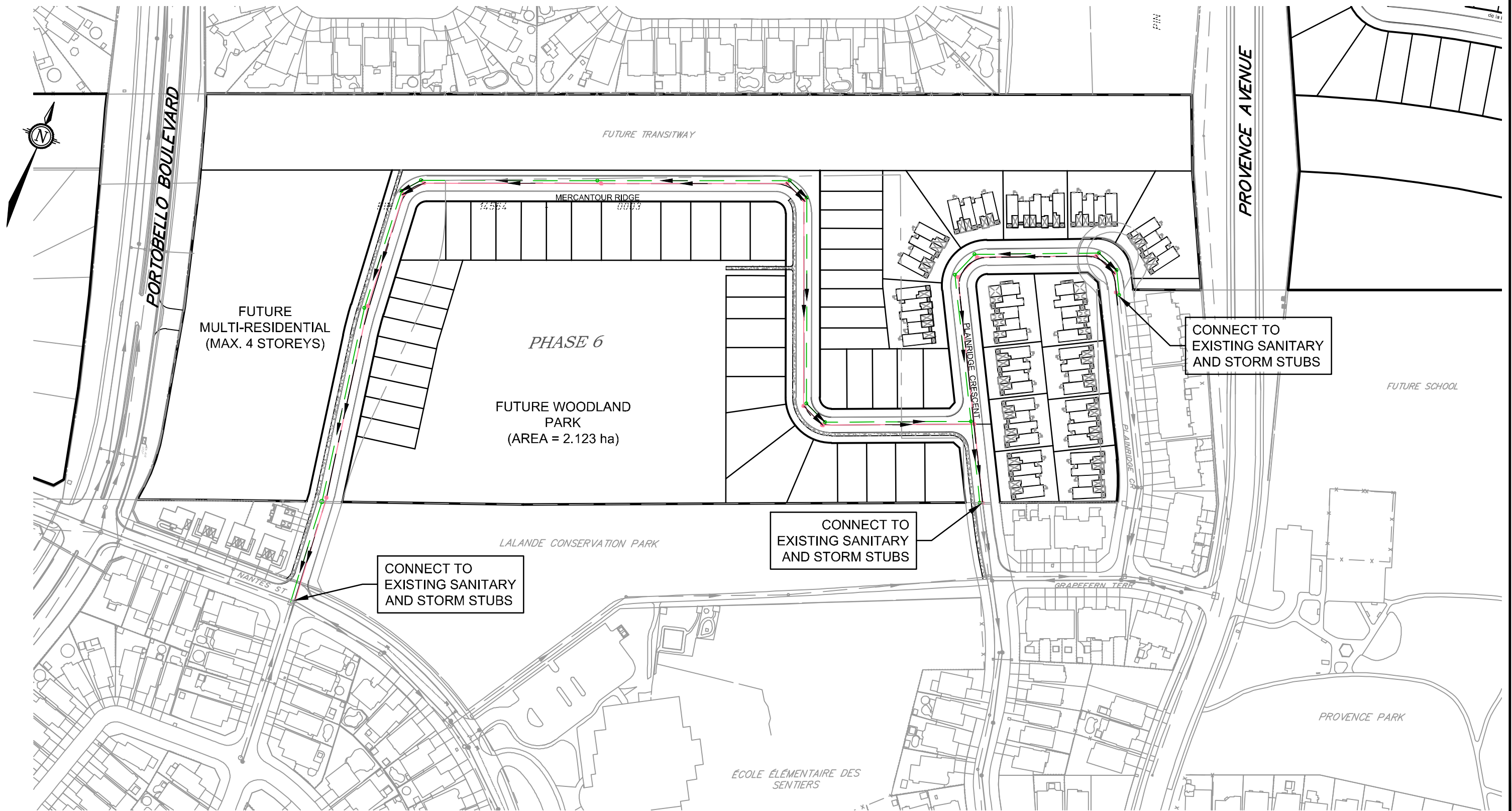
**Table 4.1: Sanitary Flow Summary**

Development Outlet	Population	Peak Residential Flow (L/s)	Peak Extraneous Flow (L/s)	Peak Design Flow (L/s)
Nantes – Outlet #1	75	1.21	0.44	1.65
Plainridge – Outlet #2	191	3.09	0.83	3.93
Plainridge – Outlet #3	14	0.22	0.10	0.32

These flows are generally in line with anticipated sanitary flows in the master servicing report from these areas to the existing sanitary systems.



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**LEGEND**

- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER

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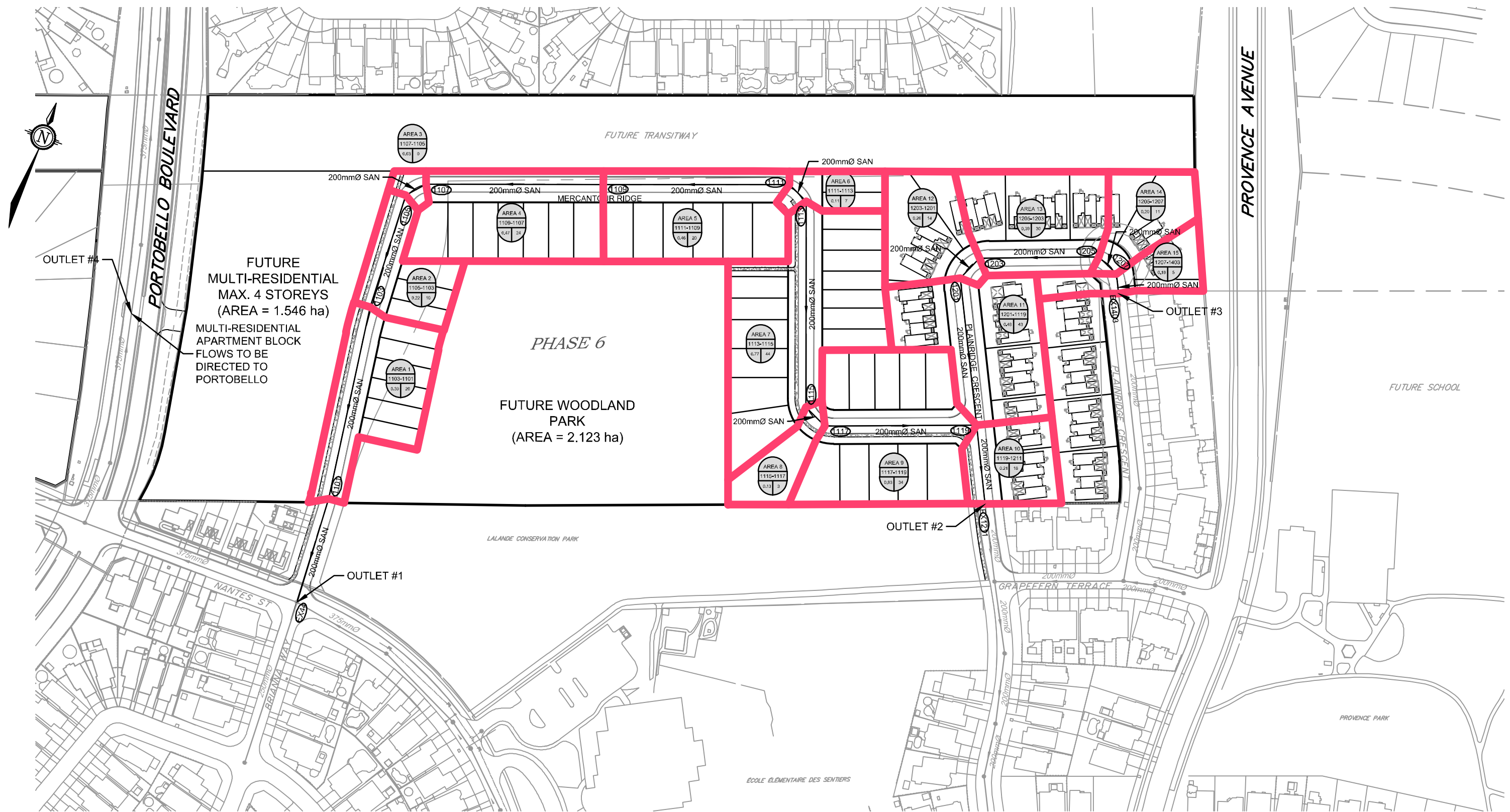
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(2065 PORTOBELLO BOULEVARD)

**PHASE 6 - CONCEPTUAL  
SANITARY AND STORM  
ALIGNMENT**

SCALE 1 : 2000

DATE DEC 2020 JOB 117155 FIGURE FIG-5

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### LEGEND

- AREA NUMBER
- MANHOLE TO MANHOLE
- POPULATION
- AREA (ha)
- PROPOSED SANITARY DRAINAGE AREA
- PROPOSED SANITARY MH & SEWER C/W FLOW DIRECTION
- EXISTING SANITARY MH & SEWER C/W FLOW DIRECTION

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### PHASE 6 - CONCEPTUAL POST DEVELOPMENT SANITARY DRAINAGE AREA PLAN

SCALE 1 : 2000

DATE DEC 2020 JOB 117155 FIGURE FIG-6

## 5.0 STORMWATER MANAGEMENT

### 5.1 Existing Conditions

Under existing conditions, the site consists of agricultural lands and a woodlot. Phase 6 is bounded by Portobello Boulevard to the west, Provence Avenue to the east, existing residential development to the north, and a conservation area to the south. Stormwater outlets for Phase 6 will be provided via Nantes Street and Plainridge Crescent. Refer to **Figure 3** – Existing Conditions.

#### Topography and Drainage

The site generally has a very gentle slope from south to north of approximately 0.8%. Within the wooded area, there are small hills with a steeper slope of approximately 2%. The site is generally lower than neighboring properties and roadways.

Stormwater runoff from the site either infiltrates or is conveyed overland towards existing catchbasins which convey runoff to the existing storm sewer systems.

There is an existing ditch located on the north and west edges of the site which conveys any surface flows to a culvert pipe on the western side of the site. This pipe is connected to the Portobello Boulevard storm sewer. The majority of the ditch is located in future transitway lands. The portions of the ditch within the subdivision limits will be abandoned (on the western edge of the property) and a temporary outlet provided to the Mercantour storm sewer until the transitway is developed.

### 5.2 Stormwater Management Criteria

The stormwater management criteria used in the design of the Provence Orleans Subdivision were developed based on the Master Servicing Study (*Gloucester and Cumberland East Urban Community Expansion Area and Bilberry Creek Industrial Park Master Servicing Update* by Stantec dated September 2013) which references the applicable portions of *Update to Master Drainage Plan East Urban Community Expansion Area* (Cumming Cockburn Ltd., September 11, 2000) and have been adapted through discussions with the City. Excerpts are included in **Appendix C**.

#### Minor System (Storm Sewers)

- Storm sewers are to be designed using the Rational Method for the 1:2 year return period;
- On an average basis, inflows to the storm sewer system are to be limited to 70 L/s/ha;
  - As this flow is less than the 2-year storm event, some ponding during the 2-year storm event will be allowed. The detailed design report should indicate depth, area, and time to dissipate;
- Inlet control devices (ICDs) will be installed in road and rearyard catchbasins to control inflows to the storm sewers;
  - Catchbasins are not to be interconnected;
- The 100-year hydraulic grade line in the storm sewer shall be at least 0.3 m below the underside of footing (USF) elevations for the proposed development;

- The HGL will be analyzed at the detailed design stage, when detailed grading and USF elevations have been determined.

#### Major System (Overland Flow)

- Minimum on-site detention storage provided by the major system is 150 m<sup>3</sup>/ha calculated with road sag storage at a dynamic flow depth of 0.35m and rearyard swale sag storage at 0.4m static depth;
- Maximum depth of flow (static + dynamic) on local and collector streets shall not exceed 0.35 m. The depth of flow may extend adjacent to the right-of-way, provided that the water level does not touch any part of the building envelope and remains below the lowest building opening during the stress test event (100-year+20%);
  - There must be at least 0.15m of vertical clearance between the spill elevation on the street and the ground elevation at the building envelope in the proximity of a flow route or ponding area;
- Storm runoff that exceeds the capacity of the minor system is to be stored within road sags and rearyard swale sags and conveyed overland along defined major system flow routes;
- As per the Master Servicing Study Update (Stantec, 2013), major system storage in rearyards will be included/accounted for in the design computations;
- The product of the 100-year flow depth (m) on street and flow velocity (m/s) shall not exceed 0.60;
- ICD flow rates and flow per hectare are to be calculated for each drainage area to ensure that the following criteria are satisfied and to ensure that the flows are generally balanced to each inlet point.

#### Water Quality & Quantity Control

- Water quality control is not required on-site. Stormwater runoff from the minor system will be directed to the existing Cardinal Creek stormwater management facility, where water quantity control will be provided;
- Lot level and conveyance Best Management Practices should be implemented to promote infiltration and treatment of storm runoff;

#### Erosion and Sediment Control

- Erosion and the amount of sedimentation should be minimized during construction and on a permanent basis;
- Erosion and sediment control measures are to be implemented during construction in accordance with the “Guidelines on Erosion and Sediment Control for Urban Construction Sites” (Government of Ontario, May 1987);
- All erosion and sediment control measures are to be installed to the satisfaction of the engineer, the municipality and the conservation authority prior to undertaking any site alterations (filling, grading, removal of vegetation, etc.) and remain present during all phases of site preparation and construction.

#### Low Impact Development

- Where feasible, low impact stormwater management design techniques should be considered for implementation in suitable areas through detailed design/site plan stage.



### 5.3 Proposed Storm Drainage System

Storm servicing for the Provence Orleans Subdivision will be provided using a dual drainage system: Runoff from frequent events will be conveyed by storm sewers (minor system), while flows from large storm events which exceed the capacity of the minor system will be conveyed overland along defined overland flow routes (major system).

Per the Master Servicing Plan (Stantec, 2013), the Subject Site will outlet to the trunk storm sewer on Provence via proposed onsite gravity sewers outletting to existing sewers on Plainridge Crescent and Nantes Street. Refer to **Figure 5** – Conceptual Sanitary and Storm Alignment and **Figure 7** – Conceptual Post-Development Storm Drainage Area Plan and the Storm Collector Sewers and Drainage Areas Plan from the Master Servicing Study in **Appendix C** for details.

The Cardinal Creek stormwater management facility is the ultimate outlet for the minor system. The major system is to be contained on-site, with emergency overland flows directed to existing City rights of ways (Provence Avenue, Plainridge Crescent, Nantes Street, and Portobello Boulevard).

#### 5.3.1 Storm Sewer Design (Minor System)

The minor system has been conceptually designed using the Rational Method to convey peak flows associated with the 2-year storm event. The conceptual storm sewer design sheets are provided in **Appendix B**. Refer to **Figure 5** – Conceptual Sanitary and Storm Alignment for details and **Figure 7** – Conceptual Post-Development Storm Drainage Area Plan. The criteria used to size the storm sewers are summarized in Table 5.1.

**Table 5.1: Storm Sewer Design Parameters**

Parameter	Design Criteria
Local Roads	2-year Return Period
Storm Sewer Design	Rational Method/Modeling
IDF Rainfall Data	Ottawa Sewer Design Guidelines (Oct. 2012)
Initial Time of Concentration ( $T_c$ )	10 minutes
Minimum Velocity	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

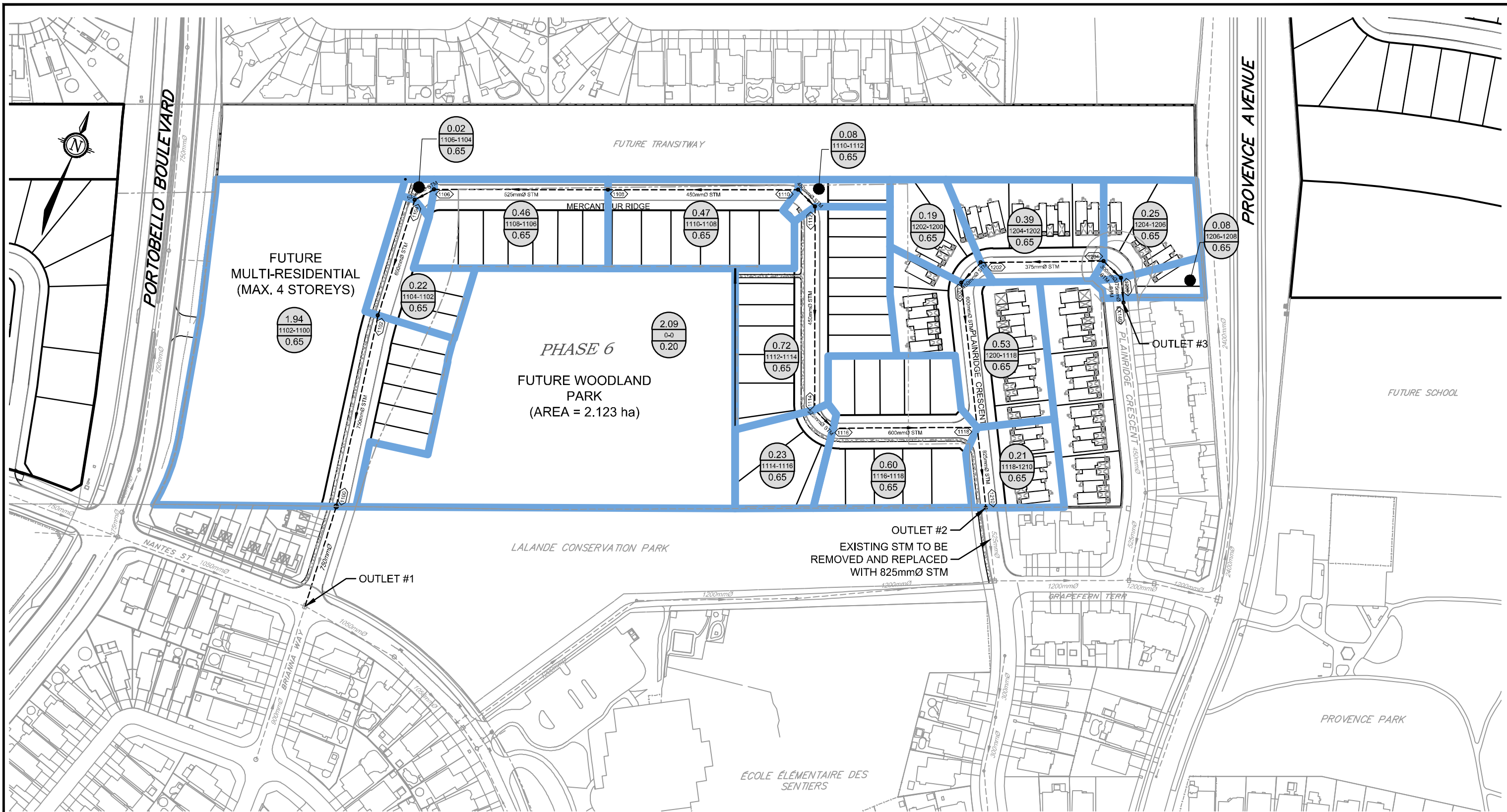
#### Inlet Control Devices

Inflows to the minor system will be controlled using inlet control devices (ICDs) designed to control inflows to the storm sewer system 70L/s/ha for all storm events up to and including the 100-year event. Each road catchbasin will have an individual connection to the storm sewer, catchbasin pairs will not be interconnected.

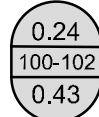



Rear yard catchbasins will be connected in series with an ICD at the outlet of the downstream structure. ICDs for rear-yard catchbasins will be sized at the detailed design stage.

ICDs will be either round orifice plates or vortex-type inlets. The required ICD sizes will be confirmed at the detailed design stage.

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**LEGEND**

-  CATCHMENT AREA (ha)  
MANHOLE - MANHOLE  
RUNOFF COEFFICIENT
-  DRAINAGE AREA BOUNDARY
-  PROPOSED STORM SEWER C/W FLOW DIRECTION
-  EXISTING STORM MH & SEWER C/W FLOW DIRECTION

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**PHASE 6 - CONCEPTUAL  
 POST DEVELOPMENT STORM  
 DRAINAGE AREA PLAN**  
 SCALE 1 : 2000  
 DATE DEC 2020 JOB 117155 FIGURE FIG-7

### 5.3.2 Overland Flow Path (Major System)

The site will be graded to provide an engineered overland flow route (major system) for large, infrequent storms, or in the event that the storm sewer system becomes obstructed. A minimum 150 m<sup>3</sup>/ha on-site detention storage will be provided within the right-of-way (ROW). Major system flows will be conveyed overland along defined major system flow routes as shown on **Figure 7** – Phase 6 Storm Drainage Area Plan and **Figure 8** – Phase 6 Preliminary Macro Grading Plan. The design of the major system will be completed at the detailed design stage. The major system will be designed to contain flows from the 100year storm event on site. The route will adhere to the macro grading plan prepared in the Master Servicing Plan (Stantec, 2013) and emergency overland flows will be directed to existing City rights of way.

### 5.3.3 Allowable Release Rates & Required Storage

Table 5.2 outlines the required storage and allowable release rate for this phase of the proposed development.

- On an average basis, inflows to the storm sewer system are to be limited to 70 L/s/ha;
- Minimum on-site detention storage provided by the major system is 150 m<sup>3</sup>/ha.

**Table 5.2: Release Rate & Storage Requirements**

Phase	Area (ha)	Required Storage (m <sup>3</sup> )	Allowable Release Rate (L/s)
Phase 6	6.41	962	448

- Area does not include the woodlot or the transitway lands.

Per the designs for Phase 1, and Phases 2 & 3, the required major system storage will be provided through maximizing ponding areas in both the right-of-ways and rear-yard swales. Storage will be based on the static + dynamic ponding depths. The allowable release rate will be achieved through inlet control devices in each roadway catchbasin and rear-yard connections to the main sewer.

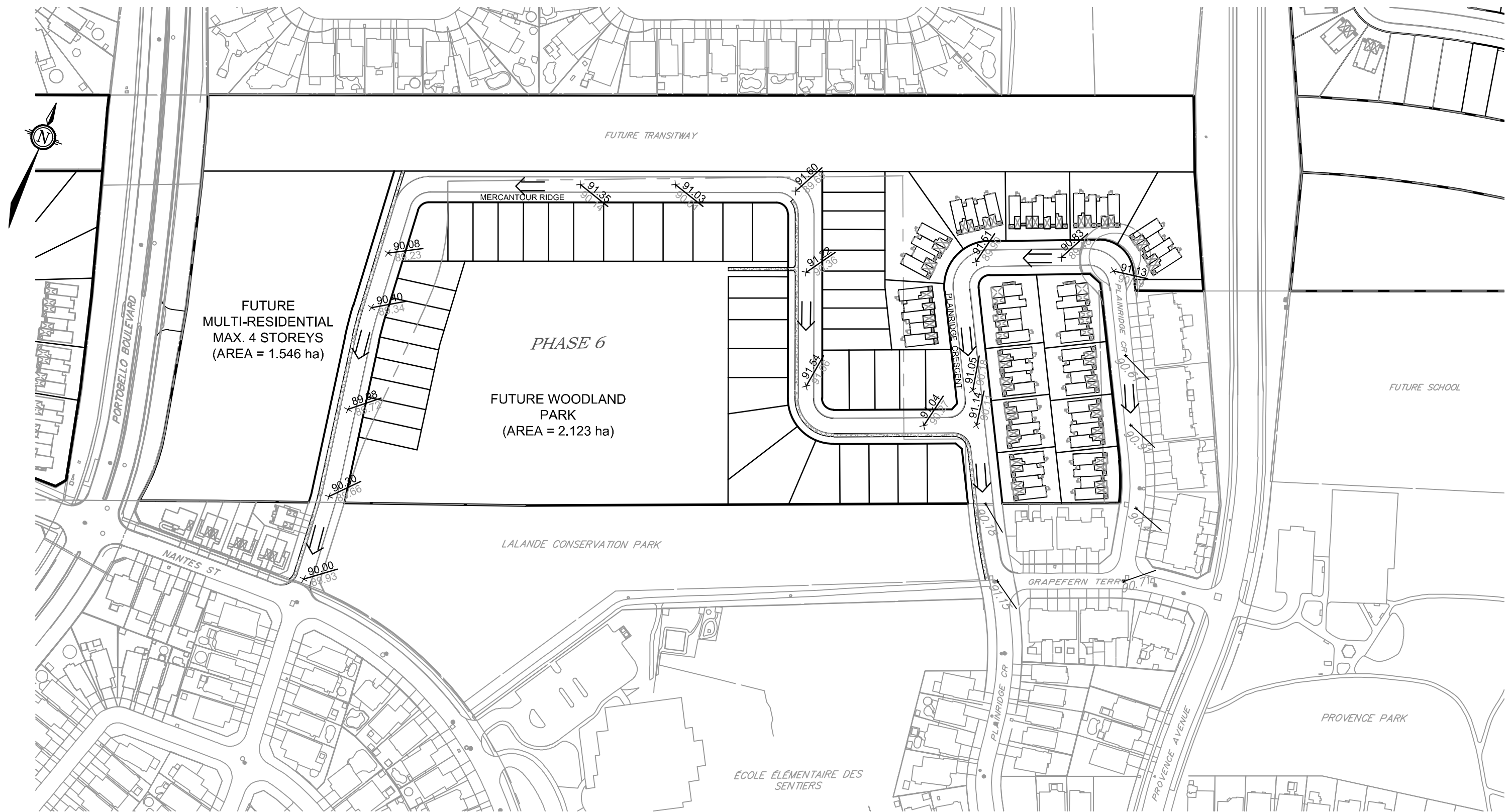
The multi-unit residential block is being designed concurrently to the Phase 6 subdivision. Some uncontrolled surface flows are anticipated from the site. These flows will be accounted for in the Phase 6 stormwater management model.

## 5.4 Hydrologic & Hydraulic Modeling

The *Ottawa Sewer Design Guidelines* state that hydrologic modeling is required for all dual drainage systems. At detailed design a PCSWMM model for Phase 6 of the development will be developed to account for both minor and major system flows from the development and ensure no adverse impacts on the downstream drainage system. The results of the analysis will be used to:

- Determine the total major and minor system runoff from the site.
- Calculate the storm sewer hydraulic grade line for the 100-year storm event; and
- Evaluate ponding volumes during the 100-year event.

M:\2017\117155\CAD\Design\Figures\Design Brief\PH-6\117155-PH6-GR-MACRO.dwg, FIG-8, Dec 04, 2020 - 12:29pm, sbernett



### LEGEND

89.24  
x  
88.59

PRELIMINARY GRADE  
EXISTING GRADE



MAJOR OVERLAND FLOW DIRECTION

# NOVATECH

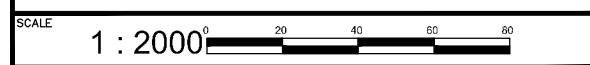
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CITY of OTTAWA  
PROVENCE ORLEANS SUBDIVISION  
(2065 PORTOBELLO BOULEVARD)

## PHASE 6 PRELIMINARY MACRO GRADING PLAN



DATE	JOB	FIGURE
DEC 2020	117155	FIG-8



## 6.0 UTILITIES

The development will be serviced by hydro, gas, phone and cable, which will be constructed as per modified right-of-way cross-sections. Refer to **Figures XS-1, XS-2, XS-3, XS-4, XS-5, XS-6 and UP-18** for various road allowances and **Figure XS - Cross Section Key Plan** for the proposed locations of each of the cross sections.

The referenced cross sections have been developed to address concerns related to tree setbacks from hard surfaces (sidewalk and curb) while respecting both the minimum setback requirements from house foundations based on the presence of sensate marine clays and the separation requirements from proposed utility trenches.

During the detailed design stage, it is anticipated that additional geotechnical analysis will be completed on the site to more accurately delineate the limits of the sensate marine clays. The proposed cross sections, specifically the maximum size of the proposed trees, will be reviewed to provided larger trees wherever possible.

Canada Post will service the site with community mailboxes.

Site lighting will be provided along roadways, sidewalks and walkways as per City standards.

## 7.0 ROADWAY GRADING

Grading throughout the proposed subdivision will be in general accordance with the macro grading plan in the master servicing report for the area and tie-in to the surrounding existing roads (Nantes Street and Plainridge Crescent). See **Figure 8 – Preliminary Macro Grading Plan** for details.

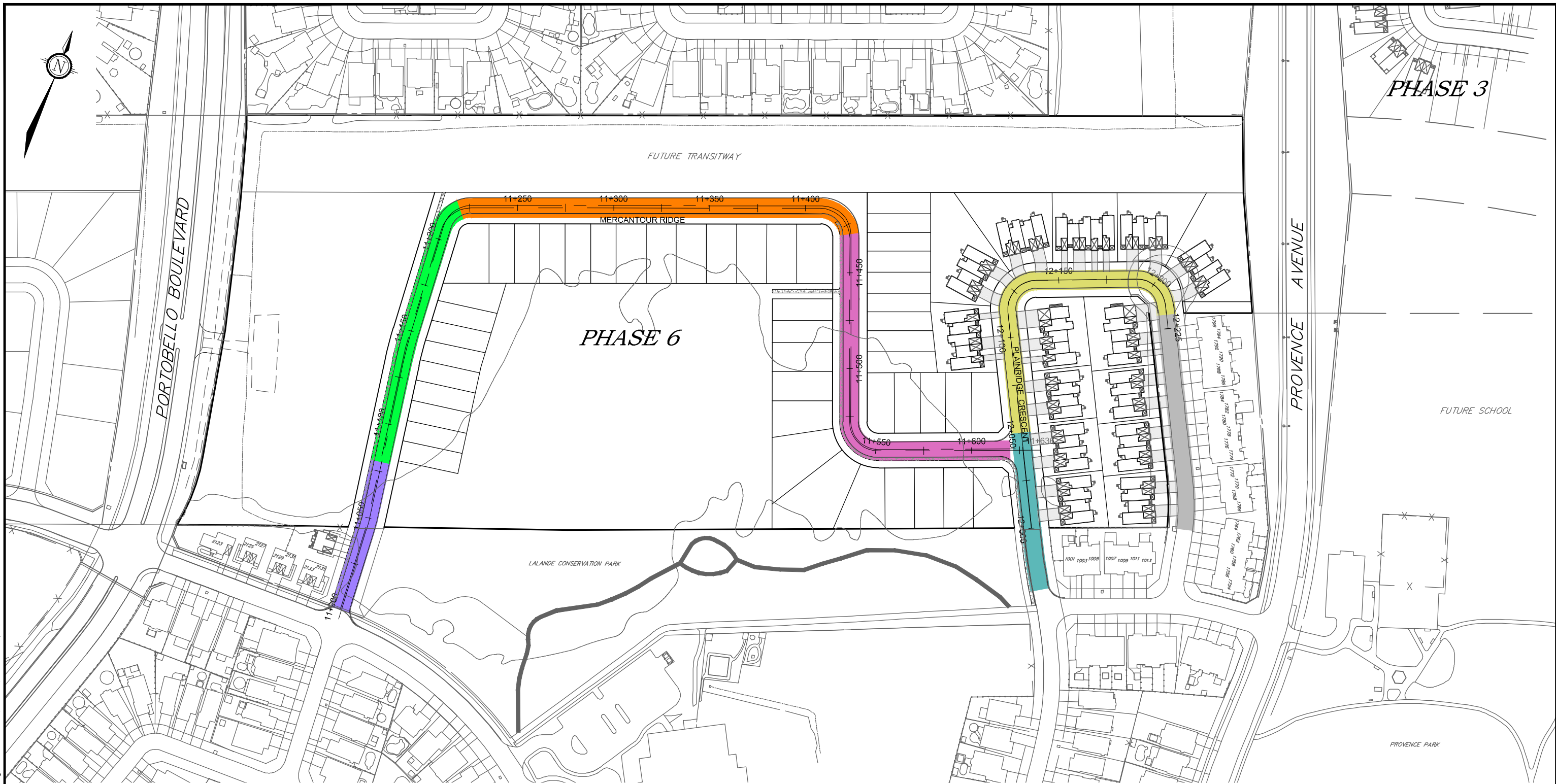
Furthermore, the grading will be as such to maximize the ponding within the ROW and an overland flow route will also be generated for all phases of the development.

## 8.0 EROSION AND SEDIMENT CONTROL








Erosion and sediment control measures will be implemented during construction in accordance with the “Guidelines on Erosion and Sediment Control for Urban Construction Sites” (Government of Ontario, May 1987).

Typical erosion and sediment control measures recommended include, but are not limited to, the use of silt fences around perimeter of site (OPSD 219.110), filter fabric or inserts under catch basin/maintenance hole lids, heavy duty silt fence barrier (OPSD 219.130), straw bale check dams (OPSD 219.180), rock check dams (219.210 or OPSD 219.211), dewatering trap (OPSD 219.240), temporary water passage system (OPSD 221.030), riprap (OPSS 511), mud mats, silt bags for dewatering operations, topsoil and sod to disturbed areas and natural grassed waterways. Dewatering and sediment control techniques will be developed for the individual situations based on the above guidelines and utilizing typical measures to ensure erosion and sediment control is controlled in an acceptable manner and there is no negative impact to adjacent lands, water bodies or water treatment/conveyance facilities.

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**REFER TO INDIVIDUAL CROSS SECTION PLANS AS LISTED BELOW**

- |   |  |   |   |
|---|--|---|---|
|  | XS-1 - 18.0m CROSS SECTION WITH SIDEWALK ON LEFT SIDE  |  | XS-5 - 18.0m CROSS SECTION WITH SIDEWALK ON LEFT SIDE |
|  | XS-2 - 18.0m CROSS SECTION WITH SIDEWALK ON LEFT SIDE  |  | XS-6 - 18.0m CROSS SECTION WITH NO SIDEWALK           |
|  | XS-3 - 16.5m CROSS SECTION WITH NO SIDEWALK            |  | EXISTING CROSS SECTION PER DRAWING UP-18              |
|  | XS-4 - 18.0m CROSS SECTION WITH SIDEWALK ON RIGHT SIDE |   |   |

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**CROSS SECTION  
KEY PLAN**

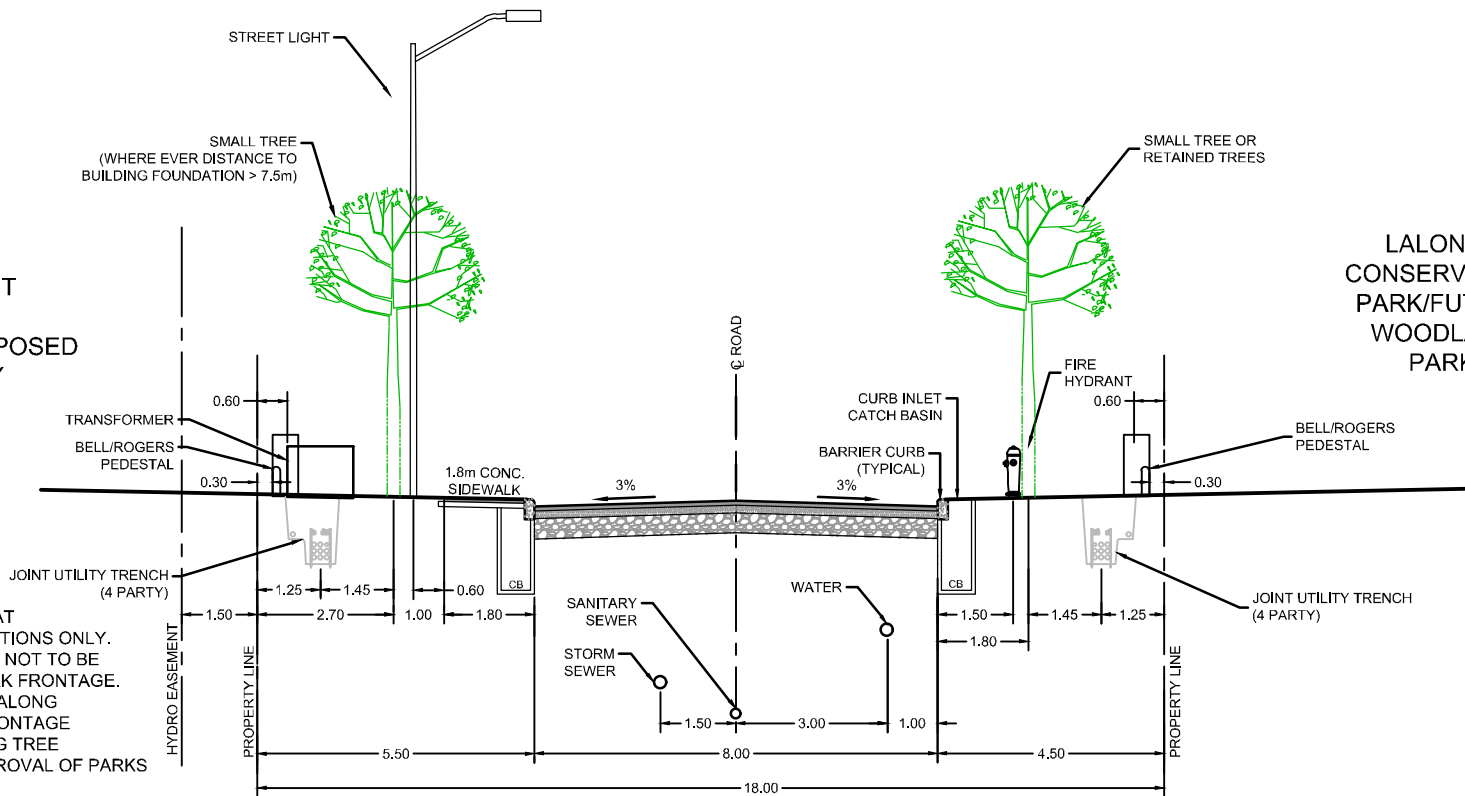
SCALE 1 : 2000 

DATE DEC 2020 JOB 117155 FIGURE FIG-XS

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FUTURE  
MULTI UNIT  
BLOCK/  
EXISTING/PROPOSED  
UNITS BY  
OTHERS

LALONDE  
CONSERVATION  
PARK/FUTURE  
WOODLAND  
PARK



**NOTES:**

1. HYDRO EASEMENTS AT TRANSFORMER LOCATIONS ONLY.
2. TRANSFORMERS ARE NOT TO BE LOCATED ALONG PARK FRONTAGE.
3. PLANTING OF TREES ALONG WOODLAND PARK FRONTAGE SUBJECT TO EXISTING TREE LOCATIONS AND APPROVAL OF PARKS AND FORESTRY.
4. TREE LOCATIONS NEAR EXISTING SIDEYARD/FUTURE PROPOSED UNITS TO BE DETERMINED AT DETAILED DESIGN.
5. EXISTING SOIL CONDITIONS TO BE CONFIRMED AT DETAILED DESIGN. WHERE SUITABLE SOILS (NON-CLAYS) ARE PRESENT, SMALL TREES WILL BE REPLACED BY MEDIUM/LARGE TREES.

**RESIDENTIAL ROAD 18m ROW (WITH SIDEWALK BOTH SIDES) CROSS SECTION  
MERCANTOUR RIDGE (STA. 11+000 to 11+080)**

N.T.S.  
4-PARTY JOINT UTILITY TRENCH



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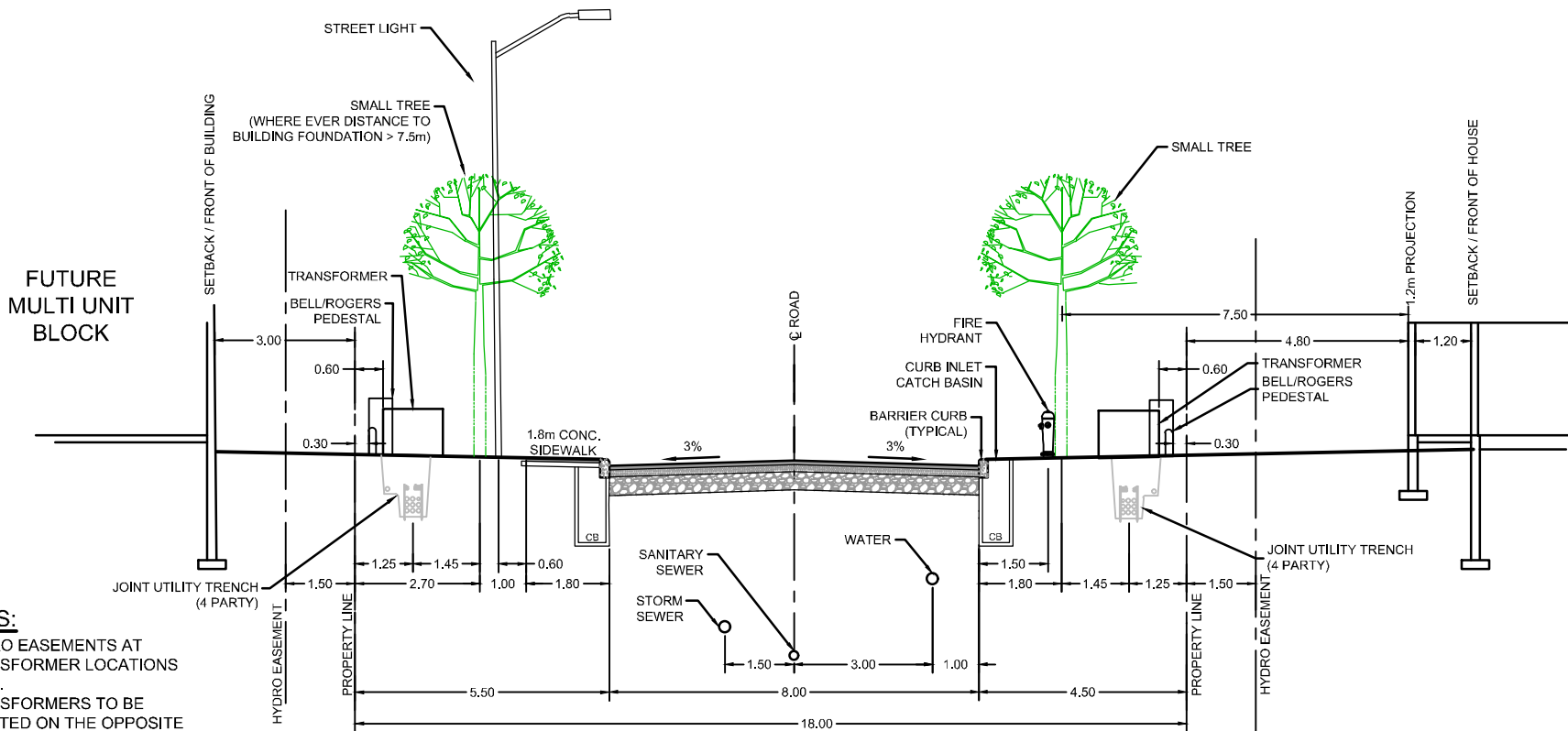
CITY of OTTAWA  
PROVENCE ORLEANS SUBDIVISION  
(2065 PORTOBELLO BOULEVARD)

**TYPICAL ROAD CROSS  
SECTION 18m ROW - WITH  
SIDEWALK**

SCALE 1 : 150

DATE DEC 2020 JOB 117155 FIGURE XS-1

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**NOTES:**

1. HYDRO EASEMENTS AT TRANSFORMER LOCATIONS ONLY.
2. TRANSFORMERS TO BE LOCATED ON THE OPPOSITE SIDE OF THE SIDEWALK WHEREVER POSSIBLE.
3. EXISTING SOIL CONDITIONS TO BE CONFIRMED AT DETAILED DESIGN. WHERE SUITABLE SOILS (NON-CLAYS) ARE PRESENT, SMALL TREES WILL BE REPLACED BY MEDIUM/LARGE TREES.

**RESIDENTIAL ROAD 18m ROW (WITH SIDEWALK) CROSS SECTION  
MERCANTOUR RIDGE (STA. 11+080 to 11+220)**

N.T.S.  
4-PARTY JOINT UTILITY TRENCH



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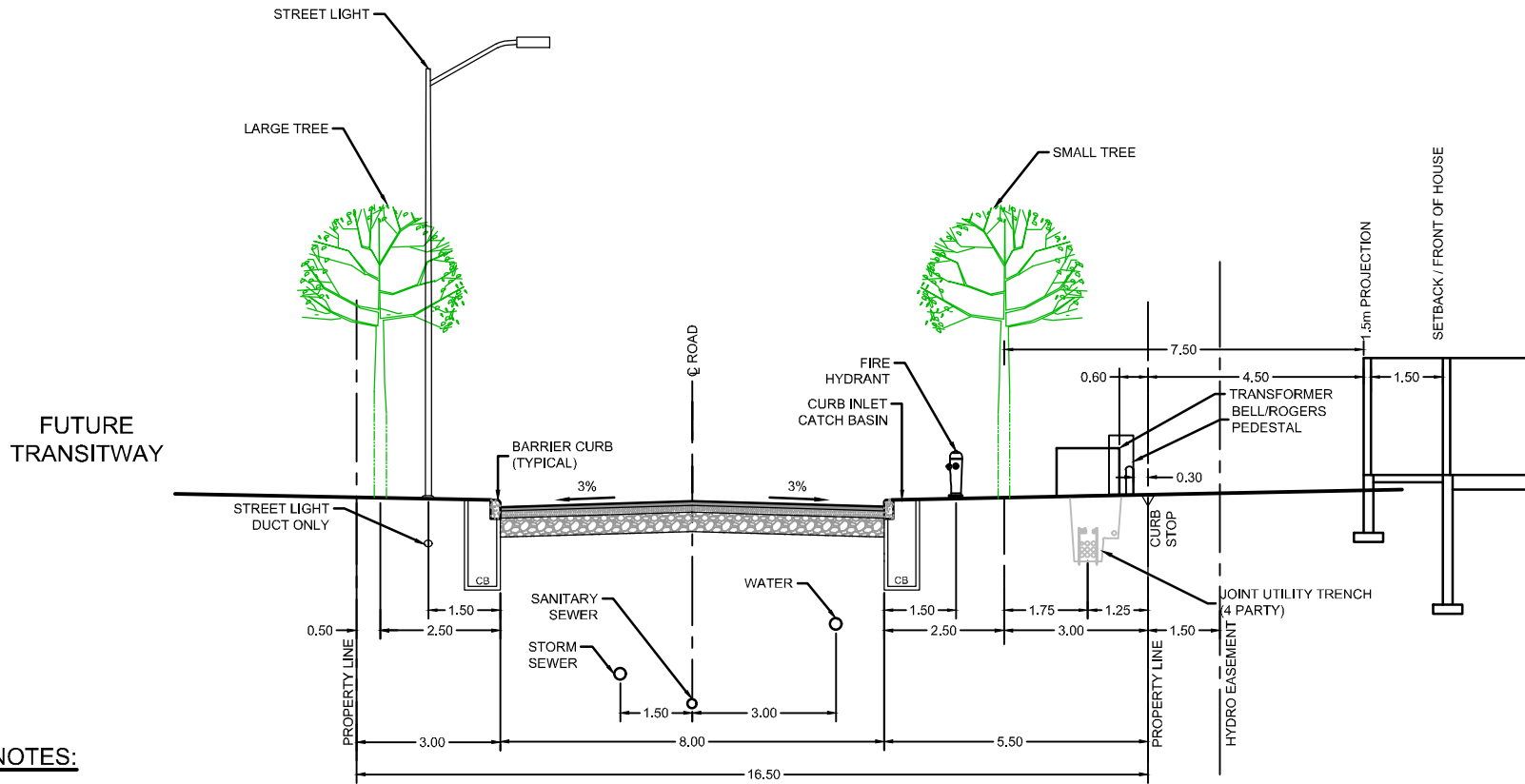
CITY of OTTAWA  
PROVENCE ORLEANS SUBDIVISION  
(2065 PORTOBELLO BOULEVARD)

**TYPICAL ROAD CROSS SECTION 18m ROW - WITH SIDEWALK**

SCALE 1 : 150

DATE DEC 2020 JOB 117155 FIGURE XS-2

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**NOTES:**

1. HYDRO EASEMENTS AT TRANSFORMER LOCATIONS ONLY.
2. EXISTING SOIL CONDITIONS TO BE CONFIRMED AT DETAILED DESIGN. WHERE SUITABLE SOILS (NON-CLAYS) ARE PRESENT, SMALL TREES WILL BE REPLACED BY MEDIUM/LARGE TREES.

**RESIDENTIAL ROAD 16.5m ROW (NO SIDEWALK) CROSS SECTION  
MERCANTOUR RIDGE (STA. 11+220 to 11+420)**

N.T.S.  
4-PARTY JOINT UTILITY TRENCH (RIGHT SIDE ONLY)

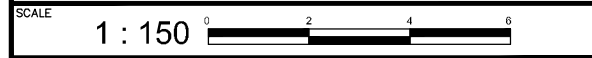


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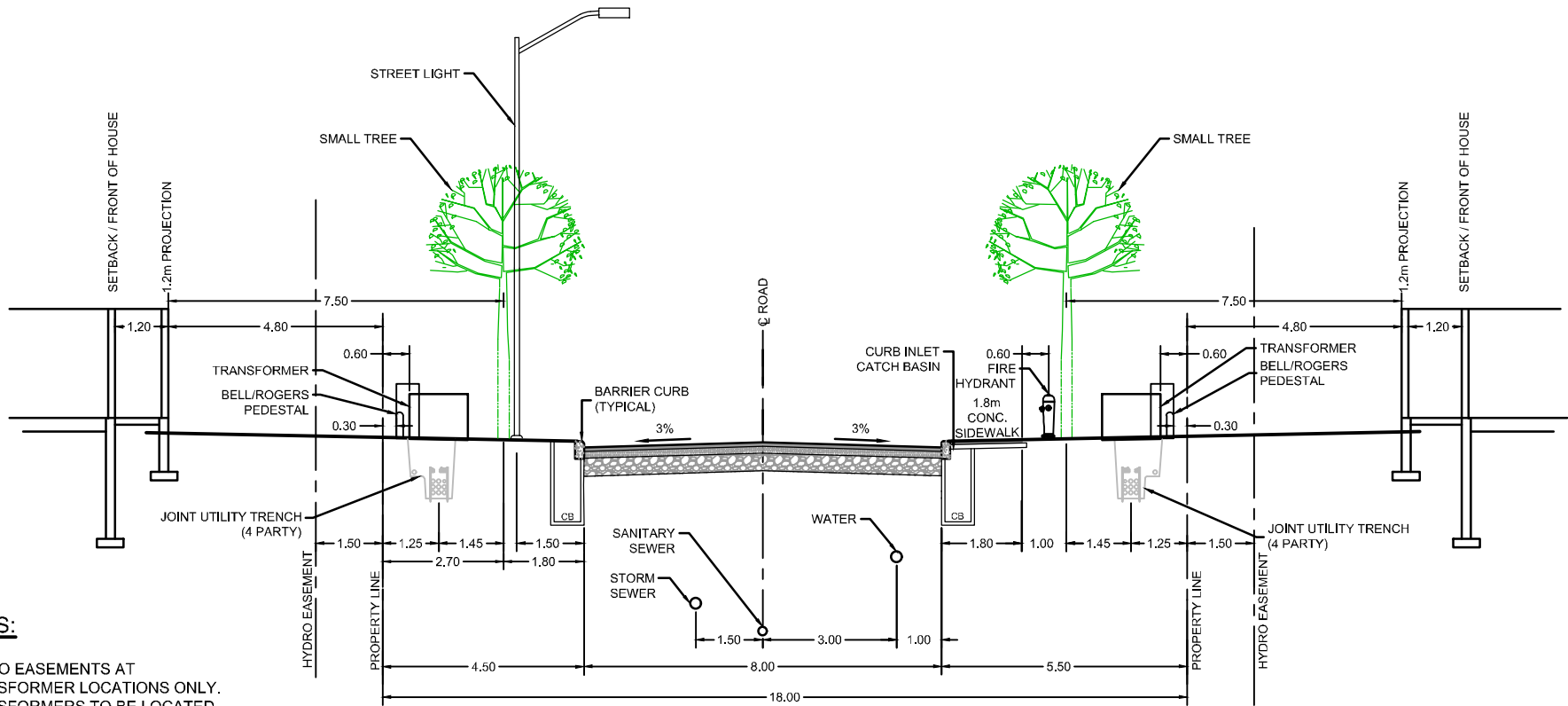
CITY of OTTAWA  
PROVENCE ORLEANS SUBDIVISION  
(2065 PORTOBELLO BOULEVARD)

**TYPICAL ROAD CROSS SECTION 16.5m ROW - NO SIDEWALK**



DATE DEC 2020	JOB 117155	FIGURE XS-3
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**NOTES:**

1. HYDRO EASEMENTS AT TRANSFORMER LOCATIONS ONLY.
2. TRANSFORMERS TO BE LOCATED ON THE OPPOSITE SIDE OF THE SIDEWALK WHEREVER POSSIBLE.
3. EXISTING SOIL CONDITIONS TO BE CONFIRMED AT DETAILED DESIGN. WHERE SUITABLE SOILS (NON-CLAYS) ARE PRESENT, SMALL TREES WILL BE REPLACED BY MEDIUM/LARGE TREES.

**RESIDENTIAL ROAD 18m ROW (WITH SIDEWALK) CROSS SECTION  
MERCANTOUR RIDGE (STA. 11+420 to 11+620)**

N.T.S.  
4-PARTY JOINT UTILITY TRENCH



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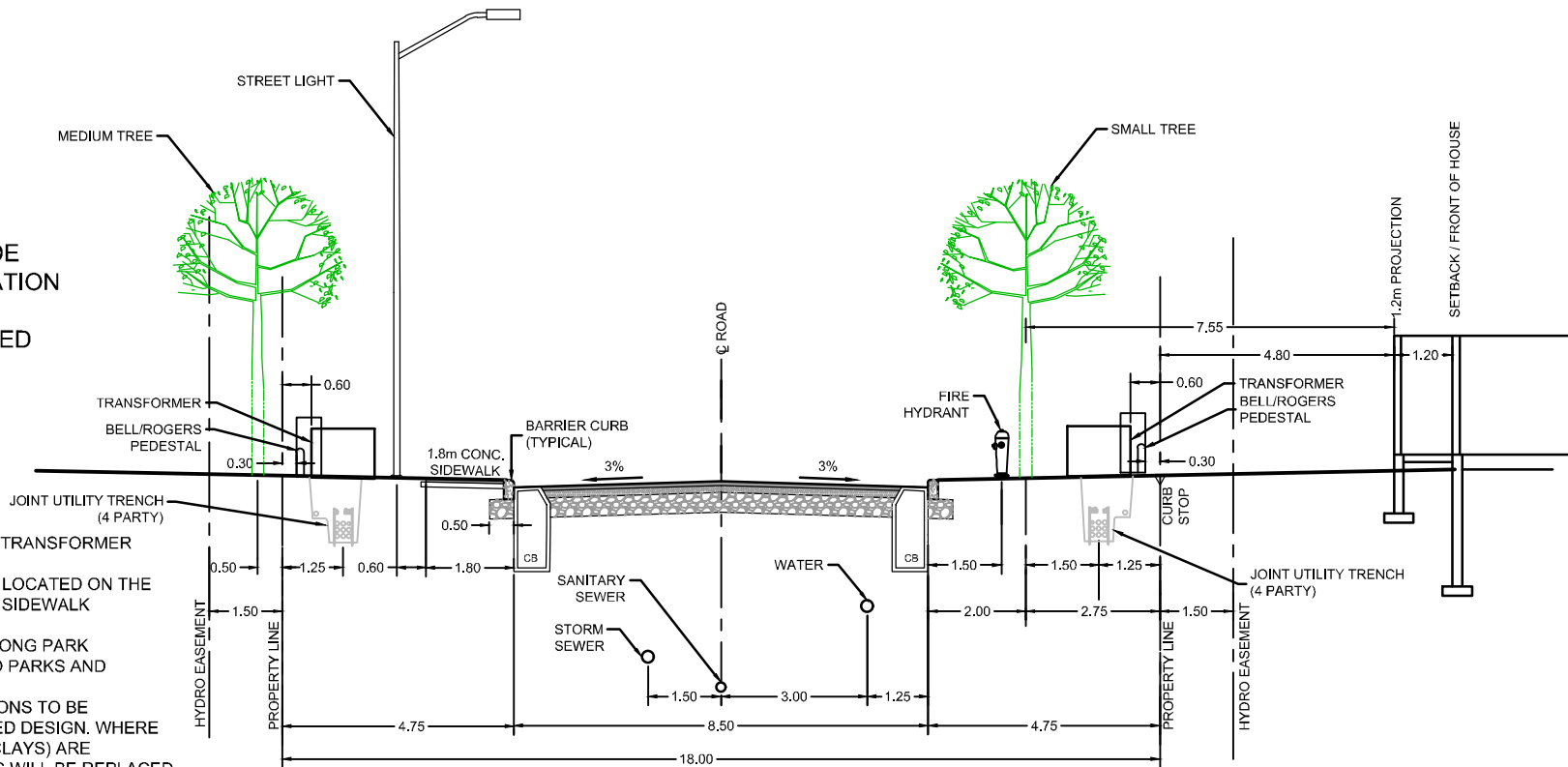
**TYPICAL ROAD CROSS SECTION 18m ROW - WITH SIDEWALK**



DATE DEC 2020	JOB 117155	FIGURE XS-4
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**LALONDE  
CONSERVATION  
PARK/  
PROPOSED  
SIDE  
YARD**



**RESIDENTIAL ROAD 18m ROW (WITH SIDEWALK) CROSS SECTION  
PLAINRIDGE CRESCENT (GRAPEFERN TERRACE to 12+050)**

N.T.S.  
4-PARTY JOINT UTILITY TRENCH

**NOTES:**

1. HYDRO EASEMENTS AT TRANSFORMER LOCATIONS ONLY.
2. TRANSFORMERS TO BE LOCATED ON THE OPPOSITE SIDE OF THE SIDEWALK WHEREVER POSSIBLE.
3. PLANTING OF TREES ALONG PARK FRONTAGE SUBJECT TO PARKS AND FORESTRY APPROVAL.
4. EXISTING SOIL CONDITIONS TO BE CONFIRMED AT DETAILED DESIGN. WHERE SUITABLE SOILS (NON-CLAYS) ARE PRESENT, SMALL TREES WILL BE REPLACED BY MEDIUM/LARGE TREES.
5. TRANSFORMERS ARE NOT TO BE LOCATED ALONG PARK FRONTAGE.
6. MOUNTABLE CURB TO BE INSTALLED IN FRONT OF TOWNS. TRANSITION LOCATIONS TO BE NOTED ON GRADING PLANS.
7. REQUIREMENT FOR JUT ON LEFT SIDE OF SECTION TO BE CONFIRMED DURING DETAIL DESIGN. WHERE NO JUT REQUIRED, TREE TO BE LOCATED IN ROW. 3.7m FROM FACE OF CURB.



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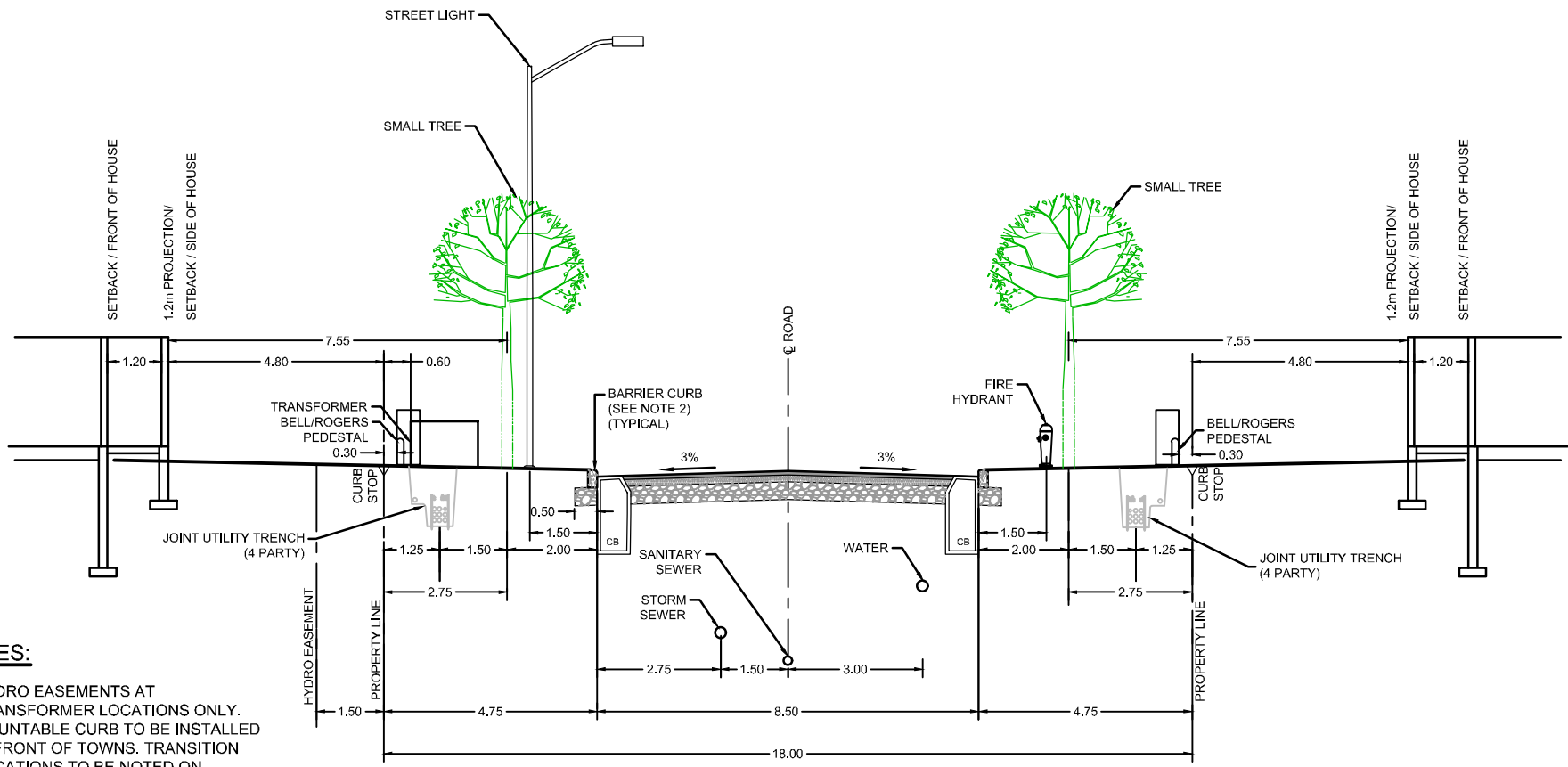
**TYPICAL ROAD CROSS  
SECTION 18m ROW - WITH  
SIDEWALK**

SCALE 1 : 150

DATE DEC 2020 JOB 117155 FIGURE XS-5



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**NOTES:**

1. HYDRO EASEMENTS AT TRANSFORMER LOCATIONS ONLY.
2. MOUNTABLE CURB TO BE INSTALLED IN FRONT OF TOWNS. TRANSITION LOCATIONS TO BE NOTED ON GRADING PLANS.
3. EXISTING SOIL CONDITIONS TO BE CONFIRMED AT DETAILED DESIGN. WHERE SUITABLE SOILS (NON-CLAYS) ARE PRESENT, SMALL TREES WILL BE REPLACED BY MEDIUM/LARGE TREES.

**RESIDENTIAL ROAD 18.0m ROW (NO SIDEWALK) CROSS SECTION**  
**PLAINRIDGE CRESCENT (STA. 12+050 to 12+225)**  
 N.T.S.  
 4-PARTY JOINT UTILITY TRENCH



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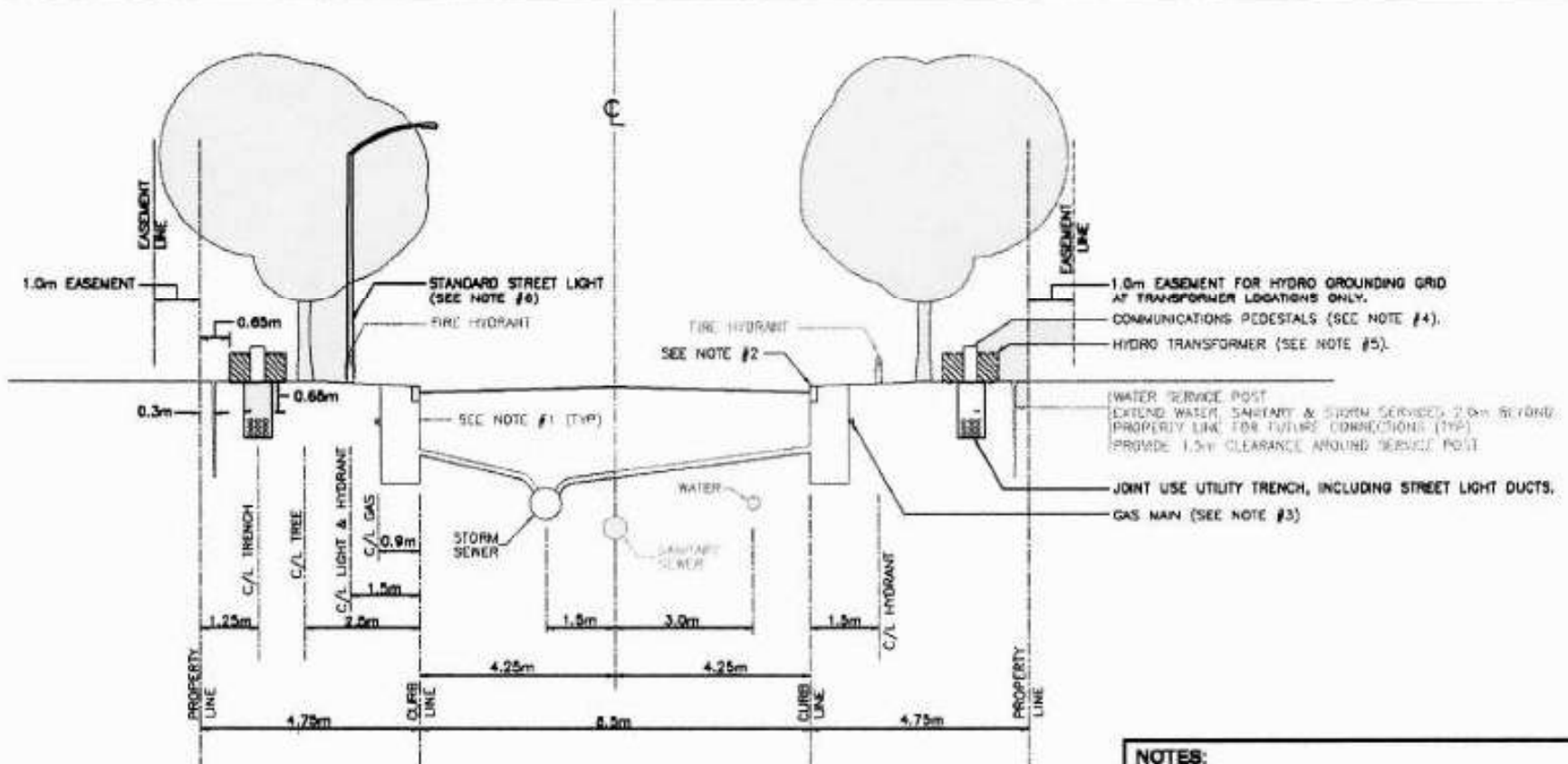
CITY of OTTAWA  
 PROVENCE ORLEANS SUBDIVISION  
 (2065 PORTOBELLO BOULEVARD)

**TYPICAL ROAD CROSS SECTION 18m ROW - NO SIDEWALK**



DATE OCT 2020	JOB 117155	FIGURE XS-6
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8.5 METRE PAVEMENT ON 18.0 METRE RIGHT-OF-WAY

NOTES:

1. IN-ROAD CATCH BASINS MAY BE USED AS AN ALTERNATIVE FOR SPECIAL CONDITIONS.
2. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE. CATCH BASIN TYPE WILL SUIT CURB DESIGN.
3. AT CATCH BASIN LOCATIONS THE GAS MAIN SHALL HAVE 0.8m CLEARANCE FROM STRUCTURE.
4. ALL PEDESTALS TO BE INSTALLED IN LINE WITH HYDRO TRANSFORMERS OR ON SIDE OF TRENCH AWAY FROM ROAD.
5. REQUIREMENT FOR PROTECTIVE BOLLARDS AT TRANSFORMERS SHALL BE DETERMINED BY HYDRO OTTAWA ON A CASE BY CASE BASIS.
6. STREET LIGHTS CAN BE LOCATED ON EITHER SIDE OF ROW.



STANDARD LOCATIONS FOR UTILITY PLANT

Scale: 1:100  
 Date: August 5, 2003  
 Dwg: UP-18 Sheet: 1 of 12

It will be the responsibility of the Contractor to submit a detailed construction schedule and appropriate staging, dewatering and erosion and sediment control plans to the Contract Administrator for review and approval prior to the commencement of work. City of Ottawa Special Provision F-1005 will become part of any development contract and which outlines the contractual requirements which includes preparation of a detailed erosion and sediment control plan.

- All erosion and sediment control measures are to be installed to the satisfaction of the engineer, the municipality and the conservation authority prior to undertaking any site alterations (filling, grading, removal of vegetation, etc.) and remain present during all phases of site preparation and construction.
- A qualified inspector should conduct daily visits during construction to ensure that the contractor is working in accordance with the design drawings and that mitigation measures are being implemented as specified.
  - A light duty silt fence barrier is to be installed in the locations shown on the Erosion and Sediment Control Plan.
  - Straw bale barriers are to be installed in drainage ditches that will remain open as part of the development.
  - Inserts are to be placed under the grates of all proposed and existing catchbasins and structures.
  - After complete build-out, all sewers are to be inspected and cleaned and all sediment and construction fencing is to be removed.
- The contractor shall ensure that proper dust control is provided with the application of water (and if required, calcium chloride) during dry periods.
- The contractor shall immediately report to the engineer or inspector any accidental discharges of sediment material into any ditch or sewer system. Appropriate response measures shall be carried out by the contractor without delay.
- The contractor acknowledges that failure to implement erosion and sediment control measures may result in penalties imposed by any applicable regulatory agency.

## 9.0 CONCLUSIONS AND RECOMMENDATIONS

The report demonstrates that the servicing strategy for the watermain servicing, the sanitary servicing as well as the stormwater management is achievable and is feasible in support of Draft Plan Application for this Phase of the Provence Orleans Subdivision. The downstream and existing systems have sufficient capacity to service the proposed development.

- The watermain flows will be supplied by connecting to existing watermains on Portobello Boulevard, Nantes Street and Plainridge Crescent.
- The sanitary flows will be collected by the on-site sanitary sewer system and directed to existing sewers on Portobello Boulevard (Multi-unit block), Nantes Street and Plainridge Crescent and ultimately to the collector sewer on Portobello Boulevard.
- The stormwater flows will be collected by the on-site storm sewer system and directed to existing sewers on Nantes Street and Plainridge Crescent and ultimately to the trunk sewer on Provence Avenue.

In closing, Novatech recommends the City of Ottawa accept the findings of this Functional Servicing Report and provide draft plan approval for Provence Orleans Subdivision, Phase 6 at 2065 Portobello Road, Ottawa, Ontario.

Respectfully issued,

### NOVATECH

Prepared By:



Trevor McKay  
Project Coordinator | Land Development  
Engineering

Prepared By:



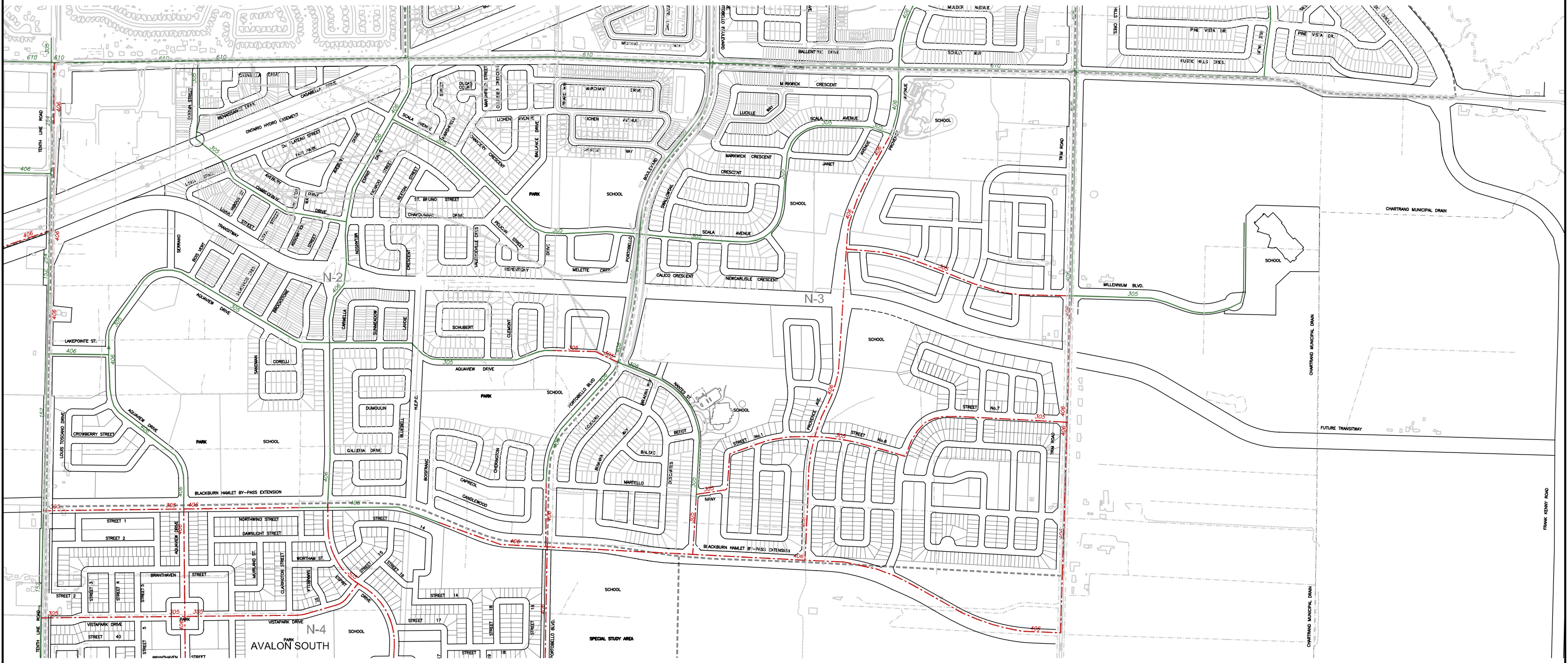
Kallie Auld, P.Eng.  
Project Coordinator | Water Resources

Reviewed/Approved by:



Melanie Riddell, P .Eng.  
Senior Project Manager | Land Development

**APPENDIX A**  
Water Calculations



- NEIGHBOURHOOD BOUNDARY
- EUC AREA BOUNDARY
- 305 EXISTING WATERMAIN
- 305 FUTURE WATERMAIN
- EXISTING ELEVATED STORAGE TANK
- FUTURE ELEVATED STORAGE TANK

**WATERMAINS**

FIRST SUBMISSION: FEB., 2004  
REVISION No.: 5 JUNE, 2006

**WM 2**

# BOUNDARY CONDITIONS



## Boundary Conditions For: Legault Lands Phase 1 - 6

Date of Boundary Conditions: 2018-May-24

### Provided Information:

Scenario (Phase 1)	Demand	
	L/min	L/s
Average Daily Demand	45	0.8
Maximum Daily Demand	112.2	1.9
Peak Hour	247.2	4.1
Fire Flow #1 Demand	10,000	166.7
Fire Flow #2 Demand	13,000	216.7

Scenario (Phase 2 & 4)	Demand	
	L/min	L/s
Average Daily Demand	178.8	3.0
Maximum Daily Demand	600	10.0
Peak Hour	984	16.4
Fire Flow #1 Demand	10,000	166.7
Fire Flow #2 Demand	13,000	216.7

Scenario (Phase 3 & 5)	Demand	
	L/min	L/s
Average Daily Demand	148.8	2.5
Maximum Daily Demand	371.4	6.2
Peak Hour	816.6	13.6
Fire Flow #1 Demand	10,000	166.7
Fire Flow #2 Demand	13,000	216.7

Scenario (Phase 6)	Demand	
	L/min	L/s
Average Daily Demand	142.2	2.4
Maximum Daily Demand	354.6	5.9
Peak Hour	780.6	13.0
Fire Flow #1 Demand	10,000	166.7
Fire Flow #2 Demand	13,000	216.7

Number of Connections: 9



# BOUNDARY CONDITIONS



## Location:



## Results:

### Connection #: 1 – Aquaview Dr. First Connection

Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	130.1	57.2
Peak Hour	123.8	48.3
Max Day Plus Fire (10,000) L/min	124.4	49.1
Max Day Plus Fire (13,000) L/min	123.8	49.9

<sup>1</sup>Elevation: 89.72 m

### Connection #: 2 – Aquaview Dr. Second Connection

## BOUNDARY CONDITIONS



Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	130.1	57.4
Peak Hour	123.8	48.5
Max Day Plus Fire (10,000) L/min	124.8	49.9
Max Day Plus Fire (13,000) L/min	123.8	48.5

<sup>1</sup>Elevation: **89.83 m**

### **Connection #: 3 – Salzburg Dr.**

Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	130.1	58.3
Peak Hour	123.7	49.4
Max Day Plus Fire (10,000) L/min	121.0	45.4
Max Day Plus Fire (13,000) L/min	119.1	42.8

<sup>1</sup>Elevation: **89.03 m**

### **Connection #: 4 – Trim Rd**

Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	130.0	57.3
Peak Hour	123.7	48.3
Max Day Plus Fire (10,000) L/min	120.4	47.8
Max Day Plus Fire (13,000) L/min	118.4	40.7

<sup>1</sup>Elevation: **89.71 m**

### **Connection #: 5 – Provence Ave – First Connection**



## BOUNDARY CONDITIONS



Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	130.0	59.6
Peak Hour	123.7	40.7
Max Day Plus Fire (10,000) L/min	121.6	47.7
Max Day Plus Fire (13,000) L/min	119.9	45.3

<sup>1</sup>Elevation: **88.08 m**

### **Connection #: 6 – Provence Ave – Second Connection**

Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	130.2	59.3
Peak Hour	123.7	50.2
Max Day Plus Fire (10,000) L/min	119.9	44.9
Max Day Plus Fire (13,000) L/min	116.7	40.4

<sup>1</sup>Elevation: **88.33 m**

### **Connection #: 7 – Provence Ave and Grapefern Terr**

Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	130.0	57.4
Peak Hour	123.7	48.2
Max Day Plus Fire (10,000) L/min	119.9	44.9
Max Day Plus Fire (13,000) L/min	117.4	39.4

<sup>1</sup>Elevation: **90.63 m**

### **Connection #: 8 – Plainridge Cres and Plainhill Dr.**

## BOUNDARY CONDITIONS



Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	130.0	58.5
Peak Hour	123.7	49.4
Max Day Plus Fire (10,000) L/min	119.6	43.7
Max Day Plus Fire (13,000) L/min	117.3	40.4

<sup>1</sup>Elevation: **91.08 m**

### **Connection #: 9 – Nantes Street**

Demand Scenario	Head (m)	Pressure <sup>1</sup> (psi)
Maximum HGL	130.0	56.7
Peak Hour	123.7	47.7
Max Day Plus Fire (10,000) L/min	120.9	43.8
Max Day Plus Fire (13,000) L/min	118.9	40.9

<sup>1</sup>Elevation: **90.105 m**

### **Notes:**

**1)** As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:

- a) If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
- b) Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

**2)** **Connection locations included in this boundary condition maybe different from initial request provided by the representing consulting firm in order to better represent current water hydraulic model.**

**3)** **203 mm watermain at Salzburg Dr. is expected to be looped by preferably connecting to 203 mm watermain stub at Millennium Blvd and Trim Rd.**

## BOUNDARY CONDITIONS



4) 203 mm watermain at Plainridge cres is expected to loop connect with the other 203 mm main extending through Grapfern Terr.

### **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.*

Provence Orleans Phase 6 Watermain Demand Calculations									
Phase	Node		Units			Pop.	Demand (L/s)		
	No.	Elev (m)	Single	Town	Apt.		High Pres.	Max Daily	Peak Hour
Phase 6	1	90.1	7		0	24	0.10	0.24	0.53
	2	90.5	4		0	14	0.06	0.14	0.31
	3	90.7	11		0	38	0.15	0.38	0.85
	4	91.3	15		0	51	0.21	0.52	1.14
	5	91.2	11		0	38	0.15	0.38	0.85
	6	91.1		11	0	30	0.12	0.30	0.67
	7	91.0		33	0	90	0.36	0.91	2.01
	8	90.6		33	0	90	0.36	0.91	2.01
	9	90.0		25	0	68	0.28	0.69	1.52
	11	90.3	9		0	31	0.13	0.31	0.69
<b>Portobello Apartments</b>	13	90.2			177	319	1.29	3.23	7.11
			<b>57</b>	<b>102</b>	<b>177</b>	<b>Subtotal</b>	<b>3.21</b>	<b>8.03</b>	<b>17.67</b>

1. Population density: 3.4 people/single, 2.7 people/town, & 1.8 people/apartment
2. High Pressure demand = 350L/s/p/d
3. Maximum Daily demand = 2.5 x High Pressure Demand
4. Peak Hour Demand = 2.2 x Maximum Daily Demand

## FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines



Engineers, Planners &amp; Landscape Architects

Novatech Project #: 117155  
 Project Name: Provence Orleans Subdivision Phase 6  
 Date: 10/31/2019  
 Input By: Mark Bowen  
 Reviewed By: Melanie Riddell, P. Eng.

Legend

Input by User

No Information or Input Required

Building Description: Singles  
 Wood frame

Step	Input		Value Used	Total Fire Flow (L/min)		
<b>Base Fire Flow</b>						
1	<b>Construction Material</b>		<b>Multiplier</b>	1.5		
	<b>Coefficient related to type of construction C</b>	Wood frame	Yes		1.5	
		Ordinary construction			1	
		Non-combustible construction	No		0.8	
		Modified Fire resistive construction (2 hrs)			0.6	
Fire resistive construction (> 3 hrs)			0.6			
2	<b>Floor Area</b>			7,000		
	<b>A</b>	Building Footprint (m <sup>2</sup> )	235			
		Number of Floors/Storeys	2			
		Area of structure considered (m <sup>2</sup> )			470	
<b>F</b>	<b>Base fire flow without reductions</b>					
<b>Reductions or Surcharges</b>						
3	<b>Occupancy hazard reduction or surcharge</b>		<b>Reduction/Surcharge</b>	5,950		
	<b>(1)</b>	Non-combustible			-25%	
		Limited combustible	Yes		-15%	
		Combustible			0%	
		Free burning			15%	
Rapid burning			25%			
4	<b>Sprinkler Reduction</b>		<b>Reduction</b>	0		
	<b>(2)</b>	Adequately Designed System (NFPA 13)	No		-30%	
		Standard Water Supply	No		-10%	
		Fully Supervised System	No		-10%	
<b>Cumulative Total</b>			<b>0%</b>			
5	<b>Exposure Surcharge (cumulative %)</b>		<b>Surcharge</b>	4,463		
	<b>(3)</b>	North Side	0 - 3 m		25%	
		East Side	10.1 - 20 m		15%	
		South Side	0 - 3 m		25%	
		West Side	10.1 - 20 m		15%	
<b>Cumulative Total</b>			<b>75%</b>			
<b>Results</b>						
6	<b>(1) + (2) + (3)</b>	<b>Total Required Fire Flow, rounded to nearest 1000L/min</b>		<b>L/min</b>	<b>10,000</b>	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	<b>L/s</b>	<b>167</b>
				or	<b>USGPM</b>	<b>2,642</b>
7	<b>Storage Volume</b>	Required Duration of Fire Flow (hours)		Hours	2	
		Required Volume of Fire Flow (m <sup>3</sup> )		m <sup>3</sup>	1200	



# FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines



Engineers, Planners &amp; Landscape Architects

**Novatech Project #:** 117155  
**Project Name:** Provence Orleans Subdivision Phase 6  
**Date:** 10/31/2019  
**Input By:** Mark Bowen  
**Reviewed By:** Melanie Riddell, P. Eng.

Legend

Input by User

No Information or Input Required

**Building Description:** Block Townhouses  
**Wood frame**

Step	Input		Value Used	Total Fire Flow (L/min)		
<b>Base Fire Flow</b>						
1	<b>Construction Material</b>		<b>Multiplier</b>	1.5		
	<b>Coefficient related to type of construction</b> <b>C</b>	Wood frame	Yes		1.5	
		Ordinary construction			1	
		Non-combustible construction	No		0.8	
		Modified Fire resistive construction (2 hrs)			0.6	
Fire resistive construction (> 3 hrs)			0.6			
2	<b>Floor Area</b>			11,000		
	<b>A</b>	Building Footprint (m <sup>2</sup> )	550			
		Number of Floors/Storeys	2			
		Area of structure considered (m <sup>2</sup> )			1,100	
<b>F</b>	<b>Base fire flow without reductions</b>		<b>F = 220 C (A)<sup>0.5</sup></b>			
<b>Reductions or Surcharges</b>						
3	<b>Occupancy hazard reduction or surcharge</b>		<b>Reduction/Surcharge</b>	9,350		
	<b>(1)</b>	Non-combustible			-25%	
		Limited combustible	Yes		-15%	
		Combustible			0%	
		Free burning			15%	
Rapid burning			25%			
4	<b>Sprinkler Reduction</b>		<b>Reduction</b>	0		
	<b>(2)</b>	Adequately Designed System (NFPA 13)	No		-30%	
		Standard Water Supply	No		-10%	
		Fully Supervised System	No		-10%	
<b>Cumulative Total</b>			<b>0%</b>			
5	<b>Exposure Surcharge (cumulative %)</b>		<b>Surcharge</b>	3,273		
	<b>(3)</b>	North Side	2Hr Fire Wall		10%	
		East Side	30.1- 45 m		5%	
		South Side	2Hr Fire Wall		10%	
		West Side	20.1 - 30 m		10%	
<b>Cumulative Total</b>			<b>35%</b>			
<b>Results</b>						
6	<b>(1) + (2) + (3)</b>	<b>Total Required Fire Flow, rounded to nearest 1000L/min</b>		<b>L/min</b>	<b>13,000</b>	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	<b>L/s</b>	<b>217</b>
				or	<b>USGPM</b>	<b>3,435</b>
7	<b>Storage Volume</b>	Required Duration of Fire Flow (hours)		Hours	2.5	
		Required Volume of Fire Flow (m <sup>3</sup> )		m <sup>3</sup>	1950	

# FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines



Engineers, Planners &amp; Landscape Architects

**Novatech Project #:** 117155  
**Project Name:** Provence Orleans Subdivision Phase 6  
**Date:** 10/31/2019  
**Input By:** Mark Bowen  
**Reviewed By:** Melanie Riddell, P. Eng.

Legend

Input by User

No Information or Input Required

**Building Description:** Multi-Use Block (assumed)  
**Ordinary construction**

Step	Input		Value Used	Total Fire Flow (L/min)		
<b>Base Fire Flow</b>						
1	<b>Construction Material</b>		<b>Multiplier</b>	1		
	<b>Coefficient related to type of construction</b> <b>C</b>	Wood frame	Yes		1.5	
		Ordinary construction			1	
		Non-combustible construction	No		0.8	
		Modified Fire resistive construction (2 hrs)			0.6	
Fire resistive construction (> 3 hrs)			0.6			
2	<b>Floor Area</b>		6,840	18,000		
	<b>A</b>	Building Footprint (m <sup>2</sup> )			1140	
		Number of Floors/Storeys			6	
		Area of structure considered (m <sup>2</sup> )				
<b>F</b>	<b>Base fire flow without reductions</b>		<b>F = 220 C (A)<sup>0.5</sup></b>			
<b>Reductions or Surcharges</b>						
3	<b>Occupancy hazard reduction or surcharge</b>		<b>Reduction/Surcharge</b>	15,300		
	<b>(1)</b>	Non-combustible			-25%	
		Limited combustible	Yes		-15%	
		Combustible			0%	
		Free burning			15%	
Rapid burning			25%			
4	<b>Sprinkler Reduction</b>		<b>Reduction</b>	-4,590		
	<b>(2)</b>	Adequately Designed System (NFPA 13)	Yes		-30%	
		Standard Water Supply	No		-10%	
		Fully Supervised System	No		-10%	
<b>Cumulative Total</b>			<b>-30%</b>			
5	<b>Exposure Surcharge (cumulative %)</b>		<b>Surcharge</b>	4,590		
	<b>(3)</b>	North Side	> 45.1m		0%	
		East Side	30.1- 45 m		5%	
		South Side	10.1 - 20 m		15%	
		West Side	20.1 - 30 m		10%	
<b>Cumulative Total</b>			<b>30%</b>			
<b>Results</b>						
6	<b>(1) + (2) + (3)</b>	<b>Total Required Fire Flow, rounded to nearest 1000L/min</b>		<b>L/min</b>	<b>15,000</b>	
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	<b>L/s</b>	<b>250</b>
				or	<b>USGPM</b>	<b>3,963</b>
7	<b>Storage Volume</b>	Required Duration of Fire Flow (hours)		Hours	3	
		Required Volume of Fire Flow (m <sup>3</sup> )		m <sup>3</sup>	2700	

Provence Orleans Subdivision Phase 6 High Pressure Condition							
Phase	Node		Demand (LPS)	Head (m)	Pressure		Age (hrs)
	No.	Elev (m)			(m)	(PSI)	
Phase 6	1	90.1	0.10	130.2	40.1	57.3	0.4
	2	90.5	0.06	130.2	39.7	56.7	0.4
	3	90.7	0.15	130.1	39.4	56.3	0.6
	4	91.3	0.21	130.1	38.8	55.4	0.9
	5	91.2	0.15	130.0	38.8	55.5	1.0
	6	91.1	0.12	130.0	38.9	55.6	1.1
	7	91.0	0.36	130.0	39.0	55.7	1.6
	8	90.6	0.36	130.0	39.4	56.3	2.2
	9	90.0	0.69	130.0	40.0	57.1	2.1
	10	90.9	0.00	130.0	39.1	55.9	1.3
	11	90.3	0.31	130.0	39.7	56.7	1.7
	16	90.2	1.29	130.2	40.0	57.1	0.1
Boundary Conditions	101	-	-	130.2	-	-	-
	102	-	-	130.0	-	-	-
	103	-	-	130.0	-	-	-
	12	-	-	130.2	-	-	-

<b>Provence Orleans Subdivision Phase 6 Peak Hour Condition</b>						
<b>Phase</b>	<b>Node</b>		<b>Demand (LPS)</b>	<b>Head (m)</b>	<b>Pressure</b>	
	<b>No.</b>	<b>Elev (m)</b>			<b>(m)</b>	<b>(PSI)</b>
<b>Phase 6</b>	1	90.1	0.10	130.2	40.1	57.3
	2	90.5	0.06	130.2	39.7	56.7
	3	90.7	0.15	130.1	39.4	56.3
	4	91.3	0.21	130.1	38.8	55.4
	5	91.2	0.15	130.0	38.8	55.5
	6	91.1	0.12	130.0	38.9	55.6
	7	91.0	0.36	130.0	39.0	55.7
	8	90.6	0.36	130.0	39.4	56.3
	9	90.0	0.69	130.0	40.0	57.1
	10	90.9	0.00	130.0	39.1	55.9
	11	90.3	0.31	130.0	39.7	56.7
	16	90.2	1.29	130.2	40.0	57.1
<b>Boundary Conditions</b>	101	-	-	130.2	-	-
	102	-	-	130.0	-	-
	103	-	-	130.0	-	-
	12	-	-	130.2	-	-

<b>Provence Orleans Subdivision Phase 6 Max Daily Condition and Fire Flow at Node 1</b>						
Phase	Node		Demand (LPS)	Head (m)	Pressure	
	No.	Elev (m)			(m)	(PSI)
Phase 6	1	90.1	167.24	119.9	29.8	42.5
	2	90.5	0.14	119.9	29.4	42.0
	3	90.7	0.38	119.9	29.2	41.7
	4	91.3	0.52	119.9	28.6	40.8
	5	91.2	0.38	119.9	28.7	40.9
	6	91.1	0.30	119.9	28.8	41.1
	7	91.0	0.91	119.9	28.9	41.2
	8	90.6	0.91	119.9	29.3	41.8
	9	90.0	0.69	119.9	29.9	42.7
	10	90.9	0.00	119.9	29.0	41.4
	11	90.3	0.31	119.7	29.4	42.0
	16	90.2	3.23	122.9	32.7	46.8
Boundary Conditions	101	-	-	126.3	-	-
	102	-	-	119.6	-	-
	103	-	-	119.9	-	-
	12	-	-	126.2	-	-



<b>Provence Orleans Subdivision Phase 6 Max Daily Condition and Fire Flow at Node 2</b>						
<b>Phase</b>	<b>Node</b>		<b>Demand (LPS)</b>	<b>Head (m)</b>	<b>Pressure</b>	
	<b>No.</b>	<b>Elev (m)</b>			<b>(m)</b>	<b>(PSI)</b>
<b>Phase 6</b>	1	90.1	0.24	122.1	32.0	45.6
	2	90.5	167.14	115.5	25.0	35.7
	3	90.7	0.38	116.5	25.8	36.8
	4	91.3	0.52	117.8	26.5	37.9
	5	91.2	0.38	118.6	27.4	39.2
	6	91.1	0.30	119.0	27.9	39.9
	7	91.0	0.91	119.2	28.2	40.3
	8	90.6	0.91	119.3	28.7	41.1
	9	90.0	0.69	119.5	29.5	42.2
	10	90.9	0.00	119.4	28.5	40.7
	11	90.3	0.31	119.5	29.2	41.7
	16	90.2	3.23	124.0	33.8	48.3
<b>Boundary Conditions</b>	101	-	-	126.3	-	-
	102	-	-	119.6	-	-
	103	-	-	119.9	-	-
	12	-	-	126.2	-	-

<b>Provence Orleans Subdivision Phase 6 Max Daily Condition and Fire Flow at Node 3</b>						
<b>Phase</b>	<b>Node</b>		<b>Demand (LPS)</b>	<b>Head (m)</b>	<b>Pressure</b>	
	<b>No.</b>	<b>Elev (m)</b>			<b>(m)</b>	<b>(PSI)</b>
<b>Phase 6</b>	1	90.1	0.24	123.4	33.3	47.6
	2	90.5	0.14	119.1	28.6	40.8
	3	90.7	167.38	110.0	19.3	27.5
	4	91.3	0.52	114.1	22.8	32.5
	5	91.2	0.38	116.4	25.2	36.0
	6	91.1	0.30	117.6	26.5	37.9
	7	91.0	0.91	118.1	27.1	38.7
	8	90.6	0.91	118.5	27.9	39.8
	9	90.0	0.69	118.9	28.9	41.3
	10	90.9	0.00	118.6	27.7	39.5
	11	90.3	0.31	119.1	28.8	41.2
	16	90.2	3.23	124.7	34.5	49.3
<b>Boundary Conditions</b>	101	-	-	126.3	-	-
	102	-	-	119.6	-	-
	103	-	-	119.9	-	-
	12	-	-	126.2	-	-

<b>Provence Orleans Subdivision Phase 6 Max Daily Condition and Fire Flow at Node 4</b>						
<b>Phase</b>	<b>Node</b>		<b>Demand (LPS)</b>	<b>Head (m)</b>	<b>Pressure</b>	
	<b>No.</b>	<b>Elev (m)</b>			<b>(m)</b>	<b>(PSI)</b>
<b>Phase 6</b>	1	90.1	0.24	124.5	34.4	49.2
	2	90.5	0.14	121.9	31.4	44.8
	3	90.7	0.38	116.3	25.6	36.6
	4	91.3	167.52	108.8	17.5	25.0
	5	91.2	0.38	113.3	22.1	31.6
	6	91.1	0.30	115.7	24.6	35.1
	7	91.0	0.91	116.5	25.5	36.5
	8	90.6	0.91	117.3	26.7	38.2
	9	90.0	0.69	118.1	28.1	40.2
	10	90.9	0.00	117.5	26.6	38.0
	11	90.3	0.31	118.6	28.3	40.4
	16	90.2	3.23	125.3	35.1	50.1
<b>Boundary Conditions</b>	101	-	-	126.3	-	-
	102	-	-	119.6	-	-
	103	-	-	119.9	-	-
	12	-	-	126.2	-	-

<b>Provence Orleans Subdivision Phase 6 Max Daily Condition and Fire Flow at Node 5</b>						
<b>Phase</b>	<b>Node</b>		<b>Demand (LPS)</b>	<b>Head (m)</b>	<b>Pressure</b>	
	<b>No.</b>	<b>Elev (m)</b>			<b>(m)</b>	<b>(PSI)</b>
<b>Phase 6</b>	1	90.1	0.24	125.0	34.9	49.9
	2	90.5	0.14	123.2	32.7	46.6
	3	90.7	0.38	119.3	28.6	40.8
	4	91.3	0.52	114.0	22.7	32.5
	5	91.2	167.38	111.2	20.0	28.5
	6	91.1	0.30	114.3	23.2	33.1
	7	91.0	0.91	115.5	24.5	34.9
	8	90.6	0.91	116.5	25.9	37.0
	9	90.0	0.69	117.6	27.6	39.4
	10	90.9	0.00	116.7	25.8	36.9
	11	90.3	0.31	118.3	28.0	39.9
	16	90.2	3.23	125.6	35.4	50.5
<b>Boundary Conditions</b>	101	-	-	126.3	-	-
	102	-	-	119.6	-	-
	103	-	-	119.9	-	-
	12	-	-	126.2	-	-

Provence Orleans Subdivision Phase 6 Max Daily Condition and Fire Flow at Node 6						
Phase	Node		Demand (LPS)	Head (m)	Pressure	
	No.	Elev (m)			(m)	(PSI)
Phase 6	1	90.1	0.24	125.0	34.9	49.8
	2	90.5	0.14	123.0	32.5	46.4
	3	90.7	0.38	118.8	28.1	40.2
	4	91.3	0.52	113.3	22.0	31.4
	5	91.2	0.38	110.2	19.0	27.1
	6	91.1	217.30	108.6	17.5	25.0
	7	91.0	0.91	111.0	20.0	28.5
	8	90.6	0.91	113.1	22.5	32.2
	9	90.0	0.69	115.2	25.2	36.1
	10	90.9	0.00	113.5	22.6	32.3
	11	90.3	0.31	116.8	26.5	37.8
	16	90.2	3.23	125.5	35.3	50.5
Boundary Conditions	101	-	-	126.3	-	-
	102	-	-	119.6	-	-
	103	-	-	119.9	-	-
	12	-	-	126.2	-	-



<b>Provence Orleans Subdivision Phase 6 Max Daily Condition and Fire Flow at Node 7</b>						
<b>Phase</b>	<b>Node</b>		<b>Demand (LPS)</b>	<b>Head (m)</b>	<b>Pressure</b>	
	<b>No.</b>	<b>Elev (m)</b>			<b>(m)</b>	<b>(PSI)</b>
<b>Phase 6</b>	1	90.1	0.24	125.5	35.4	50.5
	2	90.5	0.14	124.2	33.7	48.2
	3	90.7	0.38	121.7	31.0	44.3
	4	91.3	0.52	118.4	27.1	38.7
	5	91.2	0.38	116.5	25.3	36.2
	6	91.1	0.30	115.6	24.5	35.0
	7	91.0	167.91	108.7	17.7	25.3
	8	90.6	0.91	112.8	22.2	31.7
	9	90.0	0.69	116.8	26.8	38.2
	10	90.9	0.00	116.6	25.7	36.7
	11	90.3	0.31	118.2	27.9	39.8
	16	90.2	3.23	125.8	35.6	50.8
<b>Boundary Conditions</b>	101	-	-	126.3	-	-
	102	-	-	119.6	-	-
	103	-	-	119.9	-	-
	12	-	-	126.2	-	-

<b>Provence Orleans Subdivision Phase 6 Max Daily Condition and Fire Flow at Node 8</b>						
<b>Phase</b>	<b>Node</b>		<b>Demand (LPS)</b>	<b>Head (m)</b>	<b>Pressure</b>	
	<b>No.</b>	<b>Elev (m)</b>			<b>(m)</b>	<b>(PSI)</b>
<b>Phase 6</b>	1	90.1	0.24	125.5	35.4	50.6
	2	90.5	0.14	124.4	33.9	48.4
	3	90.7	0.38	122.1	31.4	44.9
	4	91.3	0.52	119.0	27.7	39.6
	5	91.2	0.38	117.3	26.1	37.3
	6	91.1	0.30	116.5	25.4	36.2
	7	91.0	0.91	112.8	21.8	31.1
	8	90.6	167.91	109.7	19.1	27.2
	9	90.0	0.69	116.6	26.6	38.0
	10	90.9	0.00	116.6	25.7	36.8
	11	90.3	0.31	118.2	27.9	39.9
	16	90.2	3.23	125.8	35.6	50.9
<b>Boundary Conditions</b>	101	-	-	126.3	-	-
	102	-	-	119.6	-	-
	103	-	-	119.9	-	-
	12	-	-	126.2	-	-

<b>Provence Orleans Subdivision Phase 6 Max Daily Condition and Fire Flow at Node 16</b>						
Phase	Node		Demand (LPS)	Head (m)	Pressure	
	No.	Elev (m)			(m)	(PSI)
Phase 6	1	90.1	0.24	120.6	30.5	43.6
	2	90.5	0.14	120.5	30.0	42.9
	3	90.7	0.38	120.4	29.7	42.4
	4	91.3	0.52	120.1	28.8	41.2
	5	91.2	0.38	120.0	28.8	41.1
	6	91.1	0.30	119.9	28.8	41.2
	7	91.0	0.91	119.9	28.9	41.3
	8	90.6	0.91	119.9	29.3	41.9
	9	90.0	0.69	119.9	29.9	42.7
	10	90.9	0.00	119.9	29.0	41.4
	11	90.3	0.31	119.7	29.4	42.0
	16	90.2	203.23	118.8	28.6	40.8
Boundary Conditions	101	-	-	126.3	-	-
	102	-	-	119.6	-	-
	103	-	-	119.9	-	-
	12	-	-	126.2	-	-

<b>Provence Orleans Phase 6 Pipe Data</b>				
<b>Phase</b>	<b>Pipe Data</b>			
	<b>No.</b>	<b>Length (m)</b>	<b>Size (mm)</b>	<b>Roughness</b>
<b>Phase 6</b>	1	140	200	110
	2	60	200	110
	3	125	200	110
	4	170	200	110
	5	95	200	110
	6	50	200	110
	7	125	200	110
	9	110	200	110
<b>Apartments</b>	8	65	200	110
	16	65	200	110
<b>Existing</b>	10	105	200	110
	11	55	200	110
	12	65	200	110
	13	81	150	100
	14	70	150	100
	15	85	200	110

**APPENDIX B**  
Storm and Sanitary Design

**SANITARY SEWER DESIGN SHEET**  
**Provence Orleans Subdivision - Phase 6**  
**Developer: Provence Orleans Realty Investments Inc.**



PROJECT: 117155  
 DESIGNED BY : CAH  
 CHECKED BY : MER  
 DATE PREPARED : December 2, 2020

LOCATION			INDIVIDUAL						CUMULATIVE		PEAK FACTOR M	POPULATION FLOW Q(p) (L/s)	PEAK EXTRANEIOUS FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	PROPOSED SEWER							
STREET	FROM MH	TO MH	Area	Single Units	Townhouse Units	Apartments	Population (in 1000's)	AREA (ha.)	Population (in 1000's)	AREA (ha.)					LENGTH (m)	PIPE SIZE (mm)	PIPE ID (mm)	TYPE OF PIPE	GRADE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak/Qcap
Mercantour Ridge	1111	1109	5	6			0.0204	0.46	0.020	0.460	4.0	0.33	0.13	0.46	98.0	200	203.20	DR 35	0.65	27.6	0.85	2%
Mercantour Ridge	1109	1107	4	7			0.0238	0.47	0.044	0.930	4.0	0.72	0.26	0.98	93.4	200	203.20	DR 35	0.35	20.2	0.62	5%
Mercantour Ridge	1107	1105	3	0			0.0000	0.03	0.044	0.960	4.0	0.72	0.27	0.99	12.1	200	203.20	DR 35	0.35	20.2	0.62	5%
Mercantour Ridge	1105	1103	2	3			0.0102	0.22	0.054	1.180	4.0	0.88	0.33	1.21	61.9	200	203.20	DR 35	0.35	20.2	0.62	6%
Mercantour Ridge	1103	1101	1	6			0.0204	0.39	0.075	1.570	4.0	1.21	0.44	1.65	103.2	200	203.20	DR 35	0.35	20.2	0.62	8%
<b>Outlet #1</b>									0.075	1.57		1.21	0.44	1.65								
Mercantour Ridge	1111	1113	6	2			0.0068	0.11	0.007	0.110	4.0	0.11	0.03	0.14	12.4	200	203.20	DR 35	0.65	27.6	0.85	1%
Mercantour Ridge	1113	1115	7	13			0.0442	0.77	0.051	0.880	4.0	0.83	0.25	1.07	108.4	200	203.20	DR 35	0.35	20.2	0.62	5%
Mercantour Ridge	1115	1117	8	1			0.0034	0.13	0.054	1.010	4.0	0.88	0.28	1.16	14.1	200	203.20	DR 35	0.35	20.2	0.62	6%
Mercantour Ridge	1117	1119	9	10			0.0340	0.63	0.088	1.640	4.0	1.43	0.46	1.89	79.8	200	203.20	DR 35	0.35	20.2	0.62	9%
Plainridge Crescent	1205	1203	13		11		0.0297	0.39	0.030	0.390	4.0	0.48	0.11	0.59	62.9	200	203.20	DR 35	0.65	27.6	0.85	2%
Plainridge Crescent	1203	1201	12		5		0.0135	0.26	0.043	0.650	4.0	0.70	0.18	0.88	14.5	200	203.20	DR 35	0.35	20.2	0.62	4%
Plainridge Crescent	1201	1119	11		16		0.0432	0.48	0.086	1.130	4.0	1.40	0.32	1.72	77.9	200	203.20	DR 35	0.35	20.2	0.62	8%
Plainridge Crescent	1119	1211	10		6		0.0162	0.21	0.191	2.98	4.0	3.09	0.83	3.93	41.6	200	203.20	DR 35	0.65	27.6	0.85	14%
<b>Outlet #2</b>									0.191	2.98		3.09	0.83	3.93								
Plainridge Crescent	1205	1207	14		3		0.0081	0.20	0.008	0.200	4.0	0.13	0.06	0.19	12.9	200	203.20	DR 35	0.65	27.6	0.85	1%
Plainridge Crescent	1207	EX	15		2		0.0054	0.16	0.014	0.360	4.0	0.22	0.10	0.32	10.4	200	203.20	DR 35	0.35	20.2	0.62	2%
<b>Outlet #3</b>									0.014	0.36		0.22	0.10	0.32								

**Notes:**  
 1. Q(d) = Q(p) + Q(i)  
 2. Q(i) = 0.28 L/sec/ha  
 3. Q(p) = (PxqxM/86,400)

**Definitions:**  
 Q(d) = Design Flow (L/sec)  
 Q(p) = Population Flow (L/sec)  
 Q(i) = Extraneous Flow (L/sec)

P = Population (3.4 persons/single unit, 2.7 persons/townhouse, 2.1 persons/apartment)  
 q = Average per capita flow = 350 L/cap/day - Residential  
 M = Harmon Formula (maximum of 4.0)  
 Min pipe size 200mm @ min. slope 0.32%



**STORM SEWER DESIGN SHEET (5 YEAR DESIGN EVENT)**  
**Provence Orleans Subdivision - Phase 6**  
**Developer: Provence Orleans Realty Investments Inc.**



PROJECT #: 117155  
 DESIGNED BY : CAH  
 CHECKED BY : TJM  
 DATE PREPARED : 31-Oct-19  
 DATE REVISED : 02-Dec-20

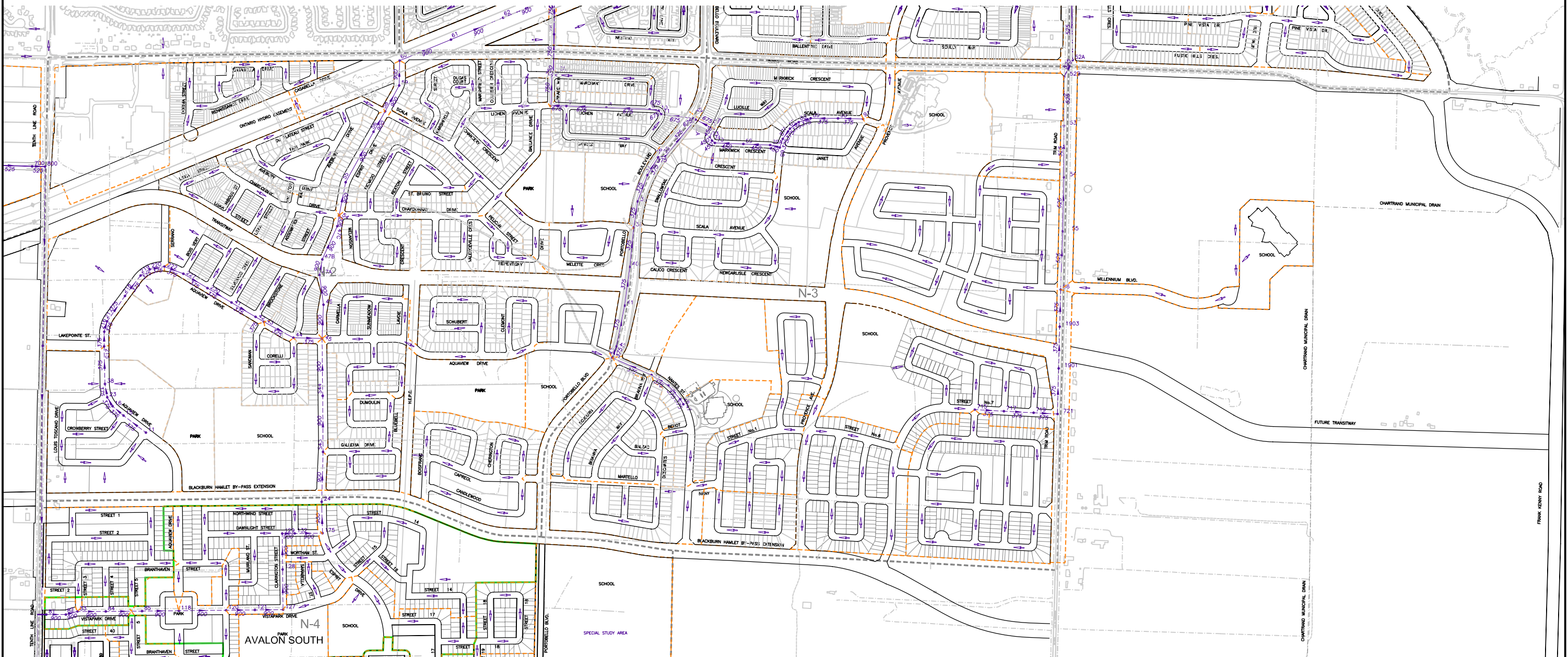
LOCATION				PROPOSED SEWER															
STREET	FROM M.H.	TO M.H.	AREA #	INDIV AREA (ha)	INDIV R	INDIV. 2.78 AR	ACCUM. 2.78 AR	TIME OF CONC. (min)	RAINFALL INTENSITY 2-Year (mm/hr)	PEAK FLOW Q (L/s)	TYPE OF PIPE	PIPE SIZE (mm)	PIPE ID (mm)	GRADE (%)	LENGTH (m)	CAPACITY (L/s)	FULL FLOW VELOCITY	TIME OF FLOW (min)	CAPACITY (%)
MERCANTOUR RIDGE	1110	1108		0.47	0.65	0.85	0.85	10.00	77	65.2	CONC	450	457	0.20	101.3	133.0	0.81	2.08	49%
MERCANTOUR RIDGE	1108	1106		0.46	0.65	0.83	1.68	12.08	70	117.0	CONC	525	533	0.20	92.9	200.6	0.90	1.72	58%
MERCANTOUR RIDGE	1106	1104		0.02	0.65	0.04	1.72	13.81	65	111.1	CONC	525	533	0.20	11.6	200.6	0.90	0.22	55%
MERCANTOUR RIDGE	1104	1102		0.22	0.65	0.40	2.11	14.02	64	135.7	CONC	600	610	0.25	64.7	320.3	1.10	0.98	42%
MERCANTOUR RIDGE	1102	1100		1.94	0.65	3.51	5.62	15.01	62	347.0	CONC	750	762	0.18	104.3	492.7	1.08	1.61	70%
MERCANTOUR RIDGE	1100	EX		0.11	0.65	0.20	5.82	16.61	58	338.6	CONC	750	762	0.18	55.7	492.7	1.08	0.86	69%
<b>OUTLET #1</b>								<b>17.47</b>		<b>338.6</b>									
MERCANTOUR RIDGE	1110	1112		0.09	0.65	0.16	0.16	10.00	77	12.5	CONC	450	457	0.30	12.7	162.9	0.99	0.21	8%
MERCANTOUR RIDGE	1112	1114		0.72	0.65	1.30	1.46	10.21	76	111.2	CONC	450	457	0.40	108.4	188.1	1.15	1.58	59%
MERCANTOUR RIDGE	1114	1116		0.19	0.65	0.34	1.81	11.79	71	127.5	CONC	525	533	0.25	13.8	224.3	1.00	0.23	57%
MERCANTOUR RIDGE	1116	1118		0.62	0.65	1.12	2.93	12.02	70	204.4	CONC	600	610	0.30	76.8	350.8	1.20	1.06	58%
								13.08											
PLAINRIDGE CRESCENT	1204	1202		0.47	0.65	0.85	0.85	10.00	77	65.2	DR 35	375	381	0.30	65.5	100.2	0.88	1.24	65%
PLAINRIDGE CRESCENT	1202	1200		0.18	0.65	0.33	1.17	11.24	72	85.0	CONC	450	457	0.25	15.0	148.7	0.91	0.28	57%
PLAINRIDGE CRESCENT	1200	1118		0.53	0.65	0.96	2.13	11.52	71	152.3	CONC	600	610	0.15	77.6	248.1	0.85	1.52	61%
								13.04											
PLAINRIDGE CRESCENT	1118	1210		0.21	0.65	0.38	5.44	13.08	67	362.8	CONC	825	838	0.15	43.1	580.0	1.05	0.68	63%
<b>OUTLET #2</b>								<b>13.77</b>		<b>362.8</b>									
PLAINRIDGE CRESCENT	1204	1206		0.19	0.65	0.34	0.34	10.00	77	26.4	DR 35	300	305	0.35	13.0	59.7	0.82	0.26	44%
PLAINRIDGE CRESCENT	1206	EX		0.09	0.65	0.16	0.51	10.26	76	38.4	DR 35	375	381	0.25	13.2	91.5	0.80	0.27	42%
<b>OUTLET #3</b>								<b>10.54</b>		<b>38.4</b>									

**Definitions:**

Q = Peak Flow in Litres per Second (L/s)  
 Q = 2.78 AIR, where  
 A = Area in hectares (ha)  
 I = Rainfall Intensity (mm/hr)  
 R = Runoff Coefficient

**Notes:**

- 1) Rainfall Intensity Curves are City of Ottawa IDF Curves I(2-year) =  $732.951 / [(T_c(\text{min})+6.199)]^{0.81}$
- 2) Minimum Tc is 10min as per the Ottawa Design Guidelines.
- 3) Roughness Coefficient 'n' in Manning's formula shall be 0.13 for Concrete & PVC pipes as per the Ottawa Guidelines.
- 4) Minimum diameter for on street sewer is 250mm.

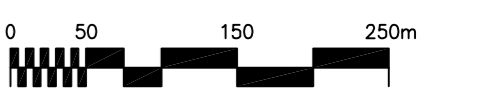
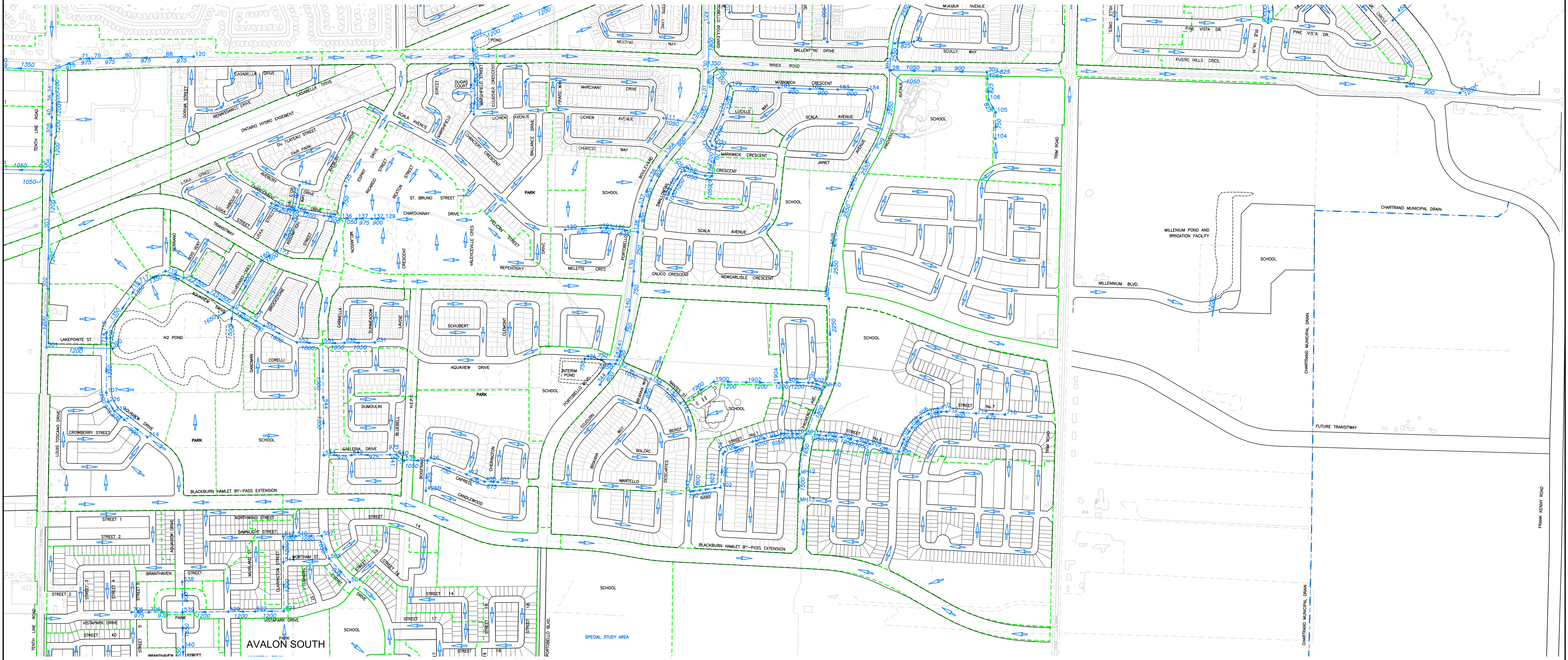
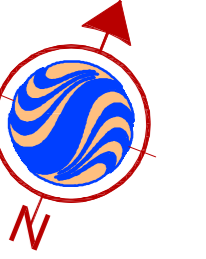


- AVALON SOUTH DRAINAGE AREA  
BOUNDARY BETWEEN GRAVITY SEWER  
TO ESPRIT DRIVE AND SANITARY SEWER  
TO TENTH LINE PUMPING STATION.
- 0 50 150 250m
- NEIGHBOURHOOD BOUNDARY
  - EUC AREA BOUNDARY
  - FUTURE SANITARY FORCEMAIN
  - EXISTING SANITARY FORCEMAIN
  - EXISTING SANITARY SEWER
  - FUTURE SANITARY SEWER
  - SANITARY DRAINAGE AREA
  - SANITARY SEWER SIZE
  - 375 MANHOLE AND NUMBER
  - 101 MANHOLE AND NUMBER
  - COLLECTOR SEWER FLOW DIRECTION
  - LOCAL SEWER FLOW DIRECTION
  - EXISTING SANITARY PUMP STATION
  - FUTURE SANITARY PUMP STATION

**SANITARY COLLECTOR SEWERS  
AND DRAINAGE AREAS**

FIRST SUBMISSION: FEB., 2004  
REVISION No.: 5 JUNE, 2006





- NEIGHBOURHOOD BOUNDARY
- EUC AREA BOUNDARY
- EXISTING STORM SEWER
- FUTURE STORM SEWER
- FUTURE MELTWER FORCEMAIN
- STORM DRAINAGE AREA
- 900 STORM SEWER SIZE
- EXISTING SWM POND
- FUTURE SWM POND
- 101 MANHOLE AND NUMBER
- COLLECTOR SEWER FLOW DIRECTION
- LOCAL SEWER FLOW DIRECTION
- FUTURE MELTWER PUMP STATION
- FUTURE DITCH REGRAIDING

**STORM COLLECTOR SEWERS AND DRAINAGE AREAS**

FIRST SUBMISSION: FEB. 2004  
REVISION No.: 5 JUNE, 2006



**APPENDIX C**  
Stormwater Management



## **APPENDIX B**

### Cumberland EUC Expansion Area Drainage Guidelines



**Stantec**

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CITY OF CUMBERLAND

UPDATE TO MASTER DRAINAGE PLAN  
EAST URBAN COMMUNITY EXPANSION AREA

PROJECT 3133-LD

AUGUST 2000

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City of Cumberland

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Cumming Cockburn Ltd  
Consulting Engineers, Planners and Environmental Scientists

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RECEIVED  
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## 5.0 LEVEL OF SERVICE

Through meetings with the City of Cumberland regarding acceptable levels of service, it was agreed the following criteria would be utilized within this study area.

### I Minor System

- I-a Storm sewers will be designed using the Rational formula for the 5 year storm using a 20 minute inlet time. Hydraulic grade line should be evaluated using the steady state Darcy-Weisbach formula.
- I-b On an average basis, inflow rates into the minor system should be limited to 70 l/s/ha. All residential inlets will be equipped with inlet restrictions limiting flows to:
  - 13.4 l/sec at a density of 5.2 minor system inlets per hectare, or
  - 19.8 l/sec at a density of 3.5 minor system inlets per hectare, or a
  - combination of both (not exceeding 70 l/s/ha).

(The term "inlet" means: "a single catchbasin" or "a group of interconnected catchbasins" connected by a single lead into the minor system).

- I-c Catchbasin densities and capacities for commercial development should be assessed on a site specific basis to limit the inflow into the minor system to a maximum of 70 l/s/ha.
- I-d Maximum permitted hydraulic grade line elevation to be 0.30 m below the underside of basement floor slab (top of footing).

### II Major System

- II-a Grading designs are to be based on split lot drainage.
- II-b The major system should be designed to accommodate on-site detention with sufficient capacity to attenuate the July 1<sup>st</sup> 1979 storm.
- II-c Modeling or detailed stormwater management calculations are required for residential subdivisions with an average runoff coefficient higher than  $c=0.6$

and for commercial developments.

- II-d The minimum on site storage is to be  $150\text{m}^3/\text{ha}$  (this storage is to be determined at 0.3 m depth on streets and 0.4 m depth in rear yards). Emergency storage in parks and other areas available for surface storage is also to be provided, unless there is a sufficient major system outlet (example: natural watercourse). A minimum of  $30\text{m}^3/\text{ha}$  of emergency storage must be provided. On site storage can be replaced with additional park storage where design constraints dictate. Where the minimum on-site detention requirement of  $150\text{m}^3/\text{ha}$  cannot be met and where the residential development exceeds 10 hectares in area, modeling will be required to support the proposed major system routing.
- II-e On-site detention storage may be provided in the following areas:
- low lying park surfaces; and/or
  - road/rear yard low points (sawtooth design).
- II-f Calculation of the actual distributed on-site storage should be supported by stage storage curves developed by the design engineer. The depth and extent of surface storage is to be illustrated on the applicable grading plan.
- II-g Maximum hydrostatic ponding depth on low lying park surfaces and the design stage storage curves should be determined and provided on a site specific basis.
- II-h The grading plan is to be co-ordinated with the required ponding and the specified house grade is to be set 0.3 m above the ponding depths stated in II.d.
- II-i The City of Cumberland reserves the right to request detailed modeling if deemed warranted.

### III Street Emergency Overflow

- III On street routing to emergency storage areas must be provided and illustrated on the grade control plan or surface storage plan. This routing must incorporate a maximum 0.3 m grade difference between any high point and the adjacent upstream low point. An overall positive slope will be required across consecutive high points for routing purposes.

It should be noted that the City of Cumberland's decision to use split lot drainage in lieu of back to front drainage, wherever possible (see Item II-a) results in a significant increase in the level of protection to all new houses, by directing all surface drainage away from the house. This new grading scenario results in the house becoming the highest point on the lot. This grading method provides additional surface storage potential in rear yards which means that houses will be less likely to flood in any given major storm event.

The decision to use the split lot drainage in lieu of back to front drainage also provided an opportunity for the interconnection of the rear yard catchbasins and for further restriction of inflow into the storm sewer system. With the new design standard, both the street and rear yard catchbasins are now restricted to the design capacity of the sewer system. The updated Master Drainage Plan also establishes the release flow rate at a maximum of 70 litres per second per hectare (see Item I-b), which is generally a slightly higher level of protection than the 5 year rational design. A combination of all of these features reduces the potential for the storm sewer system to be surcharged during major storm events and therefore reduces the potential for basement flooding, thereby further increasing the level of protection to the residents.

The surface storage requirements outlined in II-d,e,f,g,h and III recognize the on site storage potential in street sags and rear yard sags. The suggested design guidelines also provide a higher level of protection by requiring overall surface routing through streets to a positive surface outlet such as a natural water course, or routing to an area such as a park land, where additional storage space is to be provided. The routing and the additional storage space provided in open spaces, as well as the inherent storage available in the system due to the hydraulics of surface routing in flat areas provides a high level of protection against flooding of homes for events in excess of the 1:100 year design storm and the July 1, 1979 event, which is consistent with the City's desire to improve the level of protection.



- NEIGHBOURHOOD BOUNDARY
- EUC AREA BOUNDARY
- - - EXISTING SWM POND
- FUTURE SWM POND
- 88.45 APPROVED DESIGN BY OTHERS
- 88.45 DESIGN BY OTHERS NOT APPROVED
- 88.30 CONCEPTUAL DESIGN BY STANTEC (CONCEPTUAL GRADES ARE PROVIDED FOR REFERENCE PURPOSES ONLY AND ARE SUBJECT TO THE FINDINGS OF DETAILED GEOTECHNICAL AND ENGINEERING STUDIES.)
- 88.45F FUTURE DESIGN BY OTHERS
- DIRECTION OF MAJOR SYSTEM FLOW

**MACRO GRADING PLAN**

FIRST SUBMISSION: FEB., 2004  
 REVISION No.: 5 JUNE, 2006

**GRD2**

**APPENDIX D**  
Development Servicing Study Checklist



**Development Servicing Study Checklist**

<b>4.1 General Content</b>	<b>Addressed (Y/N/NA)</b>	<b>Section</b>	<b>Comments</b>
Executive Summary (for larger reports only).	NA		
Date and revision number of the report.	Y	Cover	
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y	Fig 1-2	
Plan showing the site and location of all existing services.	Y	Fig 3	
Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Y	1.0	
Summary of Pre-consultation Meetings with City and other approval agencies.	N		
Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria.	Y	1.0-7.0	
Statement of objectives and servicing criteria.	Y	3.0-5.0	
Identification of existing and proposed infrastructure available in the immediate area.	Y		Figures 4 to 7
Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	Y	5.0	
Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Y	7.0	Figure 8

**Development Servicing Study Checklist**

4.1 General Content	Addressed (Y/N/NA)	Section	Comments
Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	NA		
Proposed phasing of the development, if applicable.	NA		
Reference to geotechnical studies and recommendations concerning servicing.	Y	2.0	
All preliminary and formal site plan submissions should have the following information:			
Metric scale	Y		
North arrow (including construction North)	Y		
Key plan	Y		
Name and contact information of applicant and property owner	Y		
Property limits including bearings and dimensions	Y		
Existing and proposed structures and parking areas	Y		
Easements, road widening and rights-of-way	Y		
Adjacent street names	Y		



**Development Servicing Study Checklist**

4.2 Water	Addressed (Y/N/NA)	Section	Comments
Confirm consistency with Master Servicing Study, if available.	Y	3.0	
Availability of public infrastructure to service proposed development.	Y	3.0	
Identification of system constraints.	Y	3.0	
Identify boundary conditions.	Y	3.0	And Appendix A
Confirmation of adequate domestic supply and pressure.	Y	3.0	
Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Y	3.0	And Appendix A
Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	Y	3.0	
Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design.	NA		
Address reliability requirements such as appropriate location of shut-off valves.	Y	3.0	
Check on the necessity of a pressure zone boundary modification.	NA		
Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	Y	3.0	
Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Y	3.0	
Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	NA		
Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Y	3.0	
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Y		Figure 4 and Appendix A

**Development Servicing Study Checklist**

4.3 Wastewater	Addressed (Y/N/NA)	Section	Comments
Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Y	4.0	
Confirm consistency with Master Servicing Study and/or justifications for deviations.	Y	4.0	
Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	Y	4.0	
Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Y	4.0	
Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Y	4.0	and Appendix B
Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Y		Appendix B
Description of proposed sewer network including sewers, pumping stations, and forcemains.	Y	4.0	Figure 5
Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	NA		
Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	NA		
Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	NA		
Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	NA		
Special considerations such as contamination, corrosive environment etc.	NA		

**Development Servicing Study Checklist**

4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Description of drainage outlets and downstream constraints including legality of outlet (i.e. municipal drain, right-of-way, watercourse, or private property).	Y	5	
Analysis of the available capacity in existing public infrastructure.	Y	5	
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns and proposed drainage patterns.	Y		Figures 5 to 8
Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Y	5	
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y	5	
Description of stormwater management concept with facility locations and descriptions with references and supporting information.	Y	5	
Set-back from private sewage disposal systems.	NA		
Watercourse and hazard lands setbacks.	NA		
Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	NA		
Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Y	5	
Storage requirements (complete with calcs) and conveyance capacity for 5 yr and 100 yr events.	Y	5	Appendix C
Identification of watercourse within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Y	5	
Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Y		Appendix C
Any proposed diversion of drainage catchment areas from one outlet to another.	NA		
Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and SWM facilities.	Y	5	Appendix C

**Development Servicing Study Checklist**

If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	Y	5	Appendix C
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4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Identification of municipal drains and related approval requirements.	Y	5	
Description of how the conveyance and storage capacity will be achieved for the development.	Y	5	
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Y		Appendix C
Inclusion of hydraulic analysis including HGL elevations.	Y		Appendix C
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y	8	
Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	NA		
Identification of fill constrains related to floodplain and geotechnical investigation.	NA		

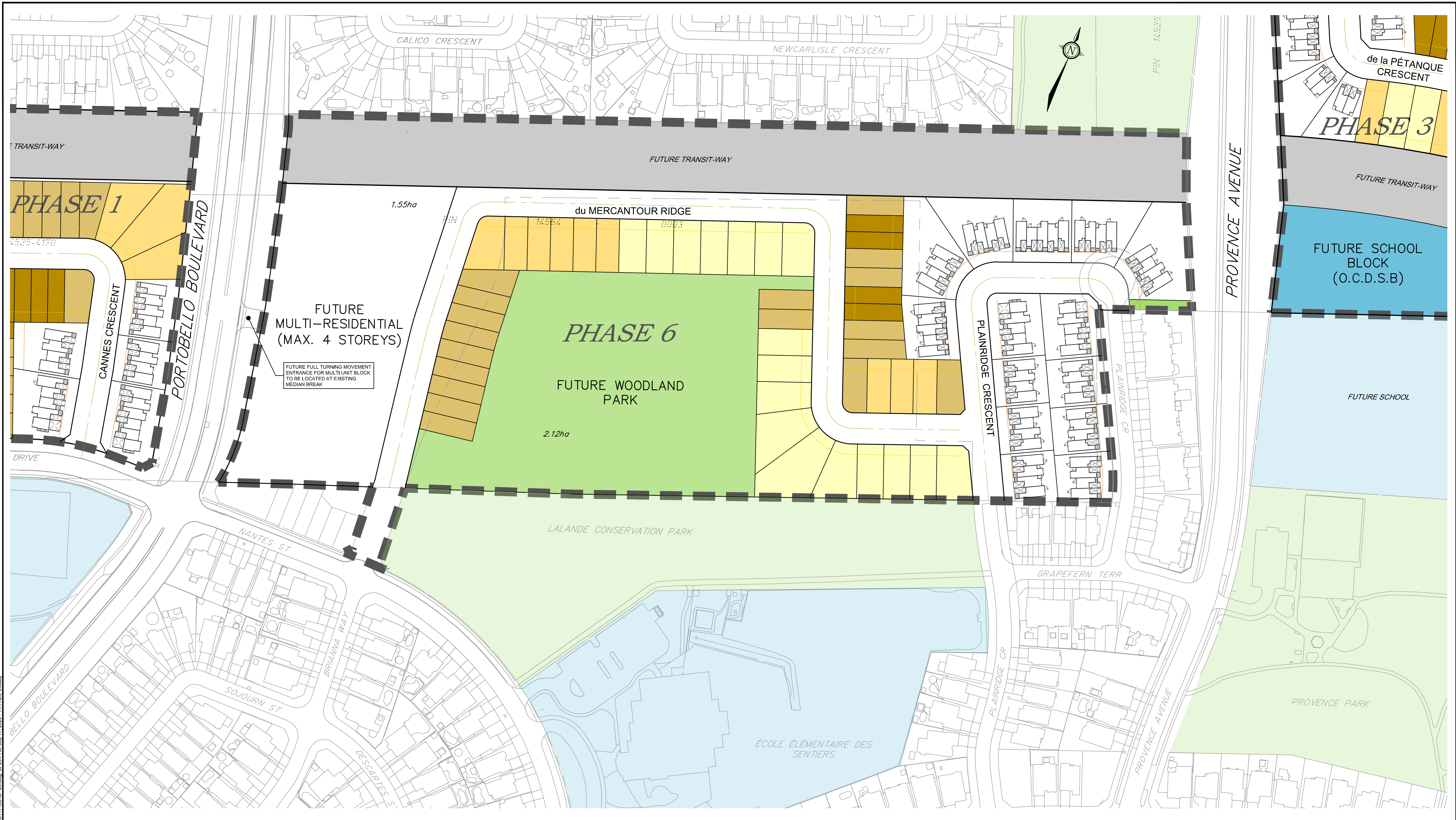
4.5 Approval and Permit Requirements	Addressed (Y/N/NA)	Section	Comments
Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	NA		
Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	NA		
Changes to Municipal Drains.	NA		
Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	NA		

**Development Servicing Study Checklist**

4.6 Conclusion	Addressed (Y/N/NA)	Section	Comments
Clearly stated conclusions and recommendations.	Y	9.0	
Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	Y		Separate Comment Response Letters
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Y	9.0	

**APPENDIX E**  
Plans





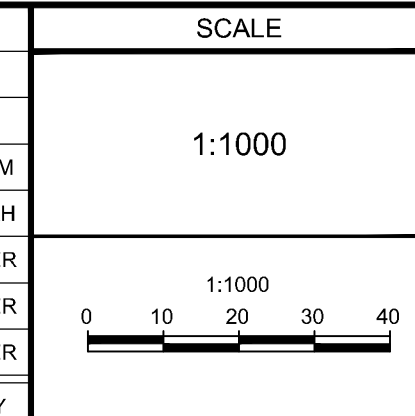
NOTE:  
 THE POSITION OF ALL POLE LINES, CONDUITS,  
 WATERMANS, SEWERS AND OTHER  
 UNDERGROUND AND OVERGROUND UTILITIES AND  
 STRUCTURES IS NOT NECESSARILY SHOWN ON  
 THE CONTRACT DRAWINGS, AND WHERE SHOWN,  
 THE ACCURACY OF THE POSITION OF SUCH  
 UTILITIES AND STRUCTURES IS NOT GUARANTEED.  
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

Unit Breakdown / Phase							
Phase #	50' Singles	42' Singles	35' Singles	31' Singles	Street Towns	Multi Unit	Total
Phase 6	17	9	18	4	60	177	285

LEGEND:

	31' SINGLES
	35' SINGLES
	42' SINGLES
	50' SINGLES
	PARK / WALKWAY BLOCK
	EXISTING PARK
	FUTURE SCHOOL BLOCK
	EXISTING SCHOOL

No.	REVISION	DATE	BY
5.	REVISED MULTI UNIT COUNT	NOV 11/20	TJM
4.	REVISED PHASE 6 TOWNHOUSE LAYOUT	AUG 14/20	CAH
3.	REVISED UNIT COUNT	NOV 08/19	MER
2.	REVISED MULTI UNIT BLOCKS	SEPT 05/19	MER
1.	ISSUED FOR DISCUSSION	APR 17/19	MER



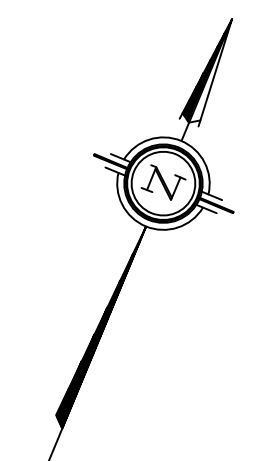
DESIGN		FOR REVIEW ONLY	
MER/WLS			
CHECKED	MER		
DRAWN	CAH		
CHECKED	MER		
APPROVED	MER		

**NOVATECH**  
 Engineers, Planners & Landscape Architects  
 Suite 200, 240 Michael Cowpland Drive  
 Ottawa, Ontario, Canada K2M 1P6  
 Telephone: (613) 254-9643  
 Facsimile: (613) 254-5867  
 Website: www.novatech-eng.com

LOCATION CITY OF OTTAWA PROVENCE ORLEANS SUBDIVISION (2128 TRIM ROAD)	
DRAWING NAME CONCEPT PLAN 25 PHASE 6	PROJECT No. 117155-00 REV #5 DRAWING No. 117155-CP25

M:\2017\117155-CP25\Drawings\Concept Plans\117155-CP-25.dwg, CP25-Ph6, Sep 17, 2020 - 11:17am, tjesky

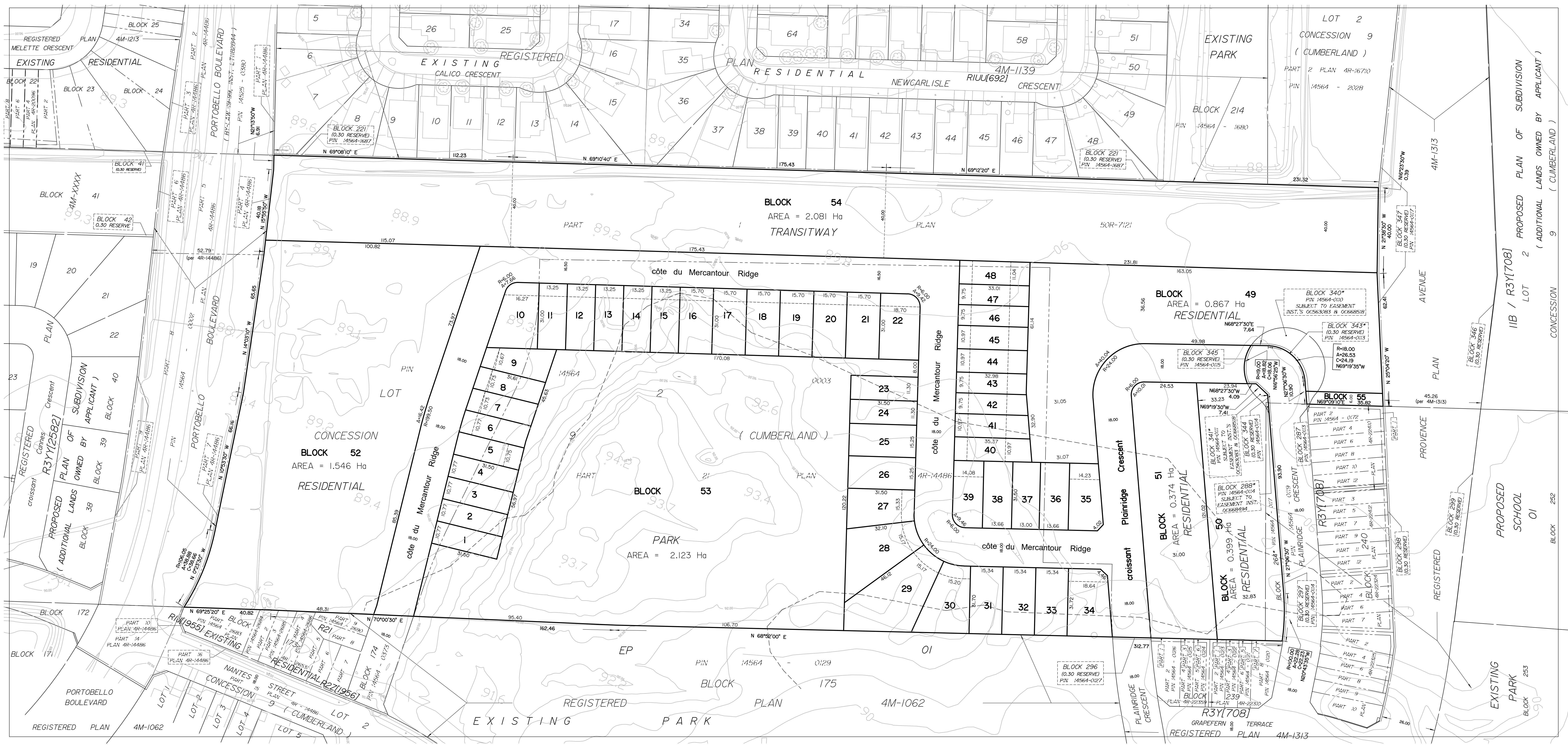
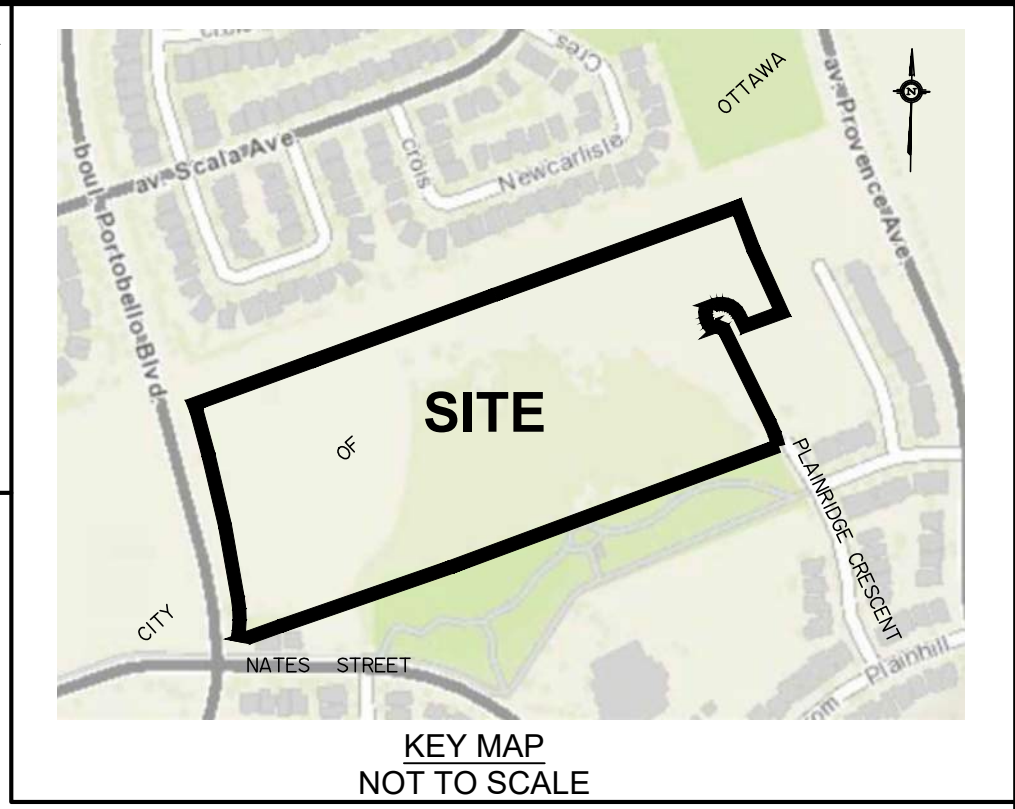




SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED \_\_\_\_\_

THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT, THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ 20\_\_\_\_.

JEFF McEWEEN, P. ENG. MANAGER  
DEVELOPMENT REVIEW-EAST  
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



**DRAFT PLAN OF SUBDIVISION OF PART OF LOT 2 CONCESSION 9**  
Geographic Township of Cumberland And  
**BLOCKS 264, 288, 340, 341 and 343 REGISTERED PLAN 4M-1313 CITY OF OTTAWA**  
Prepared by Annis, O'Sullivan, Vollebek Ltd.

Scale 1 : 750  
0 2.5 5 7.5 10 15 20 Metres

Metric  
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

**SURVEYOR'S CERTIFICATE**  
I CERTIFY THAT:  
The boundaries of the lands to be subdivided and their relationship to adjoining lands have been accurately and correctly shown.

Date \_\_\_\_\_ T. Hartwick  
ONTARIO LAND SURVEYOR

**Owner's Certificate**  
This is to certify that I am the owner / agent of the lands to be subdivided and that this plan was prepared in accordance with my instructions.

Date \_\_\_\_\_ David Kardish  
Provence Orleans Realty Investments Inc.  
I have authority to bind the corporation

**ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 OF THE PLANNING ACT**

- see plan
- see plan
- see plan
- single and multi-family residential housing and park land
- see plan
- see plan
- see plan
- City of Ottawa
- see soils report
- see plan
- sanitary, storm sewers, municipal water, bell, fire, cable and gas to be available
- Block 49 is subject to easement, Inst.'s OC6563083 and OC688518.
- Block 50 is subject to easement, Inst.'s OC6563083, OC688494 and OC688518.

**NOTES AND LEGEND**  
BLOCK 264\* Denotes Lands to be transferred to developer prior to registration.