REPORT
PROJECT: 118404-5.2.2

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
CLARIDGE HOMES PHASE 3 LANDS
- 4725 SPRATT ROAD
(CLARIDGE HOMES (SPRATT ROAD) INC.)
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA

Prepared for CLARIDGE HOMES (SPRATT ROAD) INC.
by IBI GROUP

FEBRUARY 2019

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1 INTRODUCTION

1.1 Purpose

The purpose of this report is to investigate and confirm the adequacy of public services for the proposed site. This report will review major municipal infrastructure including water supply, wastewater collection and disposal and management of stormwater. This report will also include a Sedimentation and Erosion Control Plan. A review of traffic components will be the subject of a separate report.

This report is being prepared as a technical document in support of the subdivision submission, and was prepared in accordance with the November 2009 “Servicing Study Guidelines for Development Applications” in the City of Ottawa. **Appendix A** contains a customized copy of those guidelines which can be used as a quick reference for the location of each of the guideline items within the study report.

1.2 Background

The Riverside South Community, formerly known as South Urban Community (SUC), is a part of the former City of Gloucester. The Council of the City of Gloucester adopted the first Official Plan for the community in September 1990. The original concept plan for the community served as the basis for both a Gloucester and a Regional OPA. A Master Drainage Plan (MDP) for the community was formulated in June 1992 based on the preliminary land use plan prepared by J. Bousfields and Associates Ltd. in December 1991.

The South Urban Community became a part of the City of Ottawa through amalgamation in 2001 and the new Official Plan of the City of Ottawa designated the areas as “General Urban Area” and “Employment Area” with some adjustments to the urban boundaries. In 2003, the City of Ottawa initiated a Community Design Plan (CDP) for the Riverside South area. The basis of the CDP is the land use plan for the community, which has evolved over the time and has changed significantly since the original plan prepared in early 1990’s.

The South Urban Community River Ridge Master Infrastructure Plan (SUC RR MIP) prepared by Ainley Graham and Associates in 1994 presented a preferred servicing strategy for potable water, sanitary and storm infrastructure in the Riverside South community. The Riverside South Infrastructure Servicing Study Update (ISSU) was issued in 2008 as an update to the SUC RR MIP, to account for modifications to the MDP and CDP since 1994.

There have been significant revisions to the CDP, MDP and City of Ottawa Design Guidelines since 2008 so in June 2017, Stantec helped the City of Ottawa complete an update to the 2008 ISSU for a portion of the Riverside Community called Rideau River Area and which includes the lands proposed to be tributary to Pond 5. The 2017 Riverside South Community Infrastructure Servicing Study Update – Rideau River Area (2017 ISSU) report recognized the approved 2016 CDP which considers changes in land use planning and development densities in accordance with Official Plan objectives. For reference a copy of the 2016 Riverside South Community Design Plan – Land use Plan is included in **Appendix A**. The infrastructure analyses also accounted for existing sewer and infrastructure and the stormwater management pond within the study area. The purpose of the 2017 ISSU report was to present a new preferred potable water, sanitary and stormwater infrastructure servicing strategy for the Rideau River Study area. A copy of Figure 1.1, Riverside South Community and Study Area Boundary, from the 2017 report, is also included in **Appendix A** for reference.

Subsequent to the completion of the revised ISSU, construction of the Riverside South Pond 5 and the River Road reconstruction has been substantially completed. Additionally, adjacent land located between River Road and Spratt Road, also contributing to Pond 5, have submitted detailed subdivision engineering designs and in some cases are under construction.

1.3 Previous Studies

Since the South Urban Community and Riverside South Community have been planned and developed for over twenty five years, there have been numerous background studies dealing with major municipal infrastructure. Many of those reports are listed in the 2017 Updated Report. For reference, pages 1.4 and 1.5 which list these previous studies from that report, are included in **Appendix A**. The following reports however, were referenced prior to completing this assessment:

1. **Riverside South Community Infrastructure Servicing Study Update (ISSU) – Rideau River Area (Stantec, 2017)** The report is the most current approved document which reviews the provision of major municipal infrastructure, including water supply, wastewater collection and treatment of storm runoff, in the Rideau River Area of the larger Riverside South Community. The report reviewed many of the recommendations from relevant earlier reports including:

    a) 2016 Land Use Plan for the Riverside South Community Design Plan

    b) Riverside South Master Servicing Study (Stantec 2008)

The report provided a macro level servicing plan for the Rideau River Area portion of the Riverside South Community. The subject property is proposed to be developed in accordance with the recommendations of the 2017 Updated report. The more specific details of the development will be part of the final engineering design of the lands.

2. **Design Brief Riverside South Phase 15-1A prepared for Urbandale Corporation (IBI Group, November 2018)** The report is the most current approved document which provides details on the proposed water supply and major and minor storm systems.
3. **Design Brief Riverside South Phase 15-1B prepared for Urbandale Corporation (IBI Group, February 2019)** The report is currently under review with the City of Ottawa and provides details on the proposed water supply and major and minor storm systems.
4. **Design Brief River's Edge Phase 1 prepared for Claridge Homes (IBI Group, February 2019)** The report is the currently under review with the City of Ottawa and provides details on the proposed water supply and major and minor storm systems.

1.4 Subject Property

The current draft plan of subdivision for the subject property is shown on **Figure 1.2** which is included in **Appendix A**. The property covers about 10.6 ha. It is located to the south of the future BRT corridor and east of Spratt Road.

The proposed development will include mid-density and 309 townhouse residential units.

1.5 Existing Infrastructure

Figure 1.3 shows the location of existing major municipal infrastructure in the vicinity of the 4725 Spratt development. Previous studies, including the 2017 ISSU report, recommended that wastewater flows from the subject site be routed to an extension of the Spratt Road sub-trunk sanitary sewer which is presently terminated in Spratt Road at node 111a located about 200 m north of the property.

The 2017 ISSU report recommended that the subject site be serviced with a 305 mm diameter watermain along Spratt Road. As with the sanitary sewer, this main will have to be extended from north of the site. A 305 mm diameter watermain along Borbridge Street to the west is also under construction.

All minor stormwater runoff from the site is proposed to be routed to future Pond 5 which is located beyond the subject site west of River Road. That pond is currently under construction. Development of the subject property will need to include construction of external storm sewers to connect to that facility or wait until the connecting storm sewers are constructed by others.

1.6 Pre-Consultation

There was a pre-consultation meeting with the City of Ottawa on August 30, 2018. The meeting notes can be found in **Appendix A**. The following are some of the topics reviewed and discussed:

- Zoning information
- Official plan
- Infrastructure
- Noise Study needed
- Traffic Study needed
- RMA needed
- Geotechnical conditions
- Assessment of Adequacy of Public Services Report needed

It should be noted that consultation with the Rideau Valley Conservation Authority and the Ontario Ministry of Environment, Conservation and Parks are to be scheduled forthwith.

1.7 Existing Topography

The property generally slopes from east to west towards Spratt Road. Contours for the site range between 92 and 95 meters with an average gradient of about 0.4%. **Figure 1.4,** which is included in **Appendix A**, shows the general topography of the subject property.

Most surface drainage from the property currently flows to the Spratt Road side ditch where it is routed north to an existing storm sewer.

Once developed, the intent will be to maintain existing drainage patterns. For reference, a copy of Drawing GCP-1, Macro Grading Plan from the 2017 report is included in **Appendix A**.

Figure 1.5, located in **Appendix A**, shows the proposed macro-grading plan for the subject lands.

1.8 Geotechnical Considerations

The following geotechnical investigation report has been prepared by Paterson Group

- Report No. PG4730-1 dated December 10th 2018 for the subject property;

Among other items, the reports comments on the following:

- Site grading
- Foundation design
- Pavement design
- Sub-surface Conditions
- Groundwater Control
- Seismic design
- Corrosion potential
- Trees
- Site Servicing

In general, the subsurface profile encountered topsoil, underlain by silty sand to clayey silt.

One of the recommendations from that study included grade raise restrictions for the Development. A copy of Figure 2.0, Site Plan from the Report is included in **Appendix A**. That figure shows a grade raise restriction of 3.0 m across the site.

1.9 Watercourses and Setbacks

There are no identified Municipal Drains in the 2017 ISSU report.

The February 2019 Environmental Impact Statement by Muncaster Environmental Planning states that no watercourses or municipal drains are shown on or adjacent to the site but that intermittent ditches are mapped for the south portion of the site, but these ditches are not continuous and are not connected to features with aquatic habitat potential.

The Stantec 2017 report in support of RSDC's Phase 13 development notes that some surface drainage from the subject lands are currently directed to the Phase 13 lands via overland flow. It is expected that development of the subject lands will eliminate said flows.

2 WATER SUPPLY

2.1 Existing Conditions

As noted in Section 1.5 there are existing watermains in the existing Riverside South Development to the west. A 305 mm watermain is to be stubbed on Borbridge Street and on Spratt Road at the Bus Rapid Transit corridor as part of the RSDC Phase 2 pending development. **Figure 1.3** in **Appendix A** shows the location of the existing watermains.

2.2 Riverside South Community Infrastructure Servicing Study Update – Rideau River Area (2017 ISSU)

The report provided trunk watermain servicing for the Rideau River Area, the location and size of the proposed watermains is shown on Drawing WAT-1 in **Appendix B**.

A hydraulic analysis was conducted for the Rideau River Area trunk watermain as part of the report. The analysis was conducted with the Barrhaven Pump Station operating at a discharge HGL of 147 m and the Ottawa South Pump Station operating at a discharge HGL of 146 m to Zone SUC which includes the Rideau River Area. Water demands were based on recent projections presented in the Riverside South Community Design Plan (CDP) 2016.

Results of the hydraulic modeling under basic day condition shows some areas where the pressure exceeds 552 kPa (80 psi). The high pressure areas are in the low lying land near the Rideau River, and is shown on Figure 5.4 from the Servicing Study Update which is included in **Appendix B**. Buildings in the high pressure area will require pressure reducing valves in accordance with Technical bulletin ISDTB-204.02. The hydraulic analysis showed that no areas fell below the minimum pressure of 276 kPa (40 psi) under peak hour conditions. A fire flow analysis was also conducted which showed that all nodes can provide more than a 13,000 l/min fire flow while maintaining a minimum system pressure of 138 kPa (20 psi).

2.3 Design Criteria

2.3.1 Water Demands

Water demands have been calculated for the site based on per unit population density and consumption rates taken from Tables 4.1 and 4.2 of the City of Ottawa Design Guidelines – Water Distribution and are summarized as follows:

- Single Family 3.4 person per unit
- Townhouse and Semi-Detached 2.7 person per unit
- Average Apartment 1.8 person per unit
- Residential Average Day Demand 350 l/cap/day
- Residential Peak Daily Demand 875 l/cap/day
- Residential Peak Hour Demand 1,925 l/cap/day
- ICI Average Day Demand 50,000 l/gross ha/day
- ICI peak Daily Demand 75,000 l/gross ha/day
- ICI Peak Hour Demand 135,000 l/gross ha/day

Residential units in the subject site consists of street townhouses. A watermain demand calculation sheet is included in **Appendix B** and the total water demands are summarized as follows:

- Average Day 3.30 l/s
- Maximum Day 8.21 l/s
- Peak Hour 18.02 l/s

2.3.2 System Pressure

The Ottawa Design Guidelines – Water Distribution (WDG001), July 2010, City of Ottawa, Clause 4.2.2 states that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in Clause 4.2.2 of the guidelines are as follows:

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	Maximum pressure at any point in the distribution system shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls will be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

2.3.3 Fire Flow Rates

In the recent Technical Bulletin 'ISDTB-2014-02, Revisions to Ottawa Design Guidelines – Water', the fire flow requirements for single detached dwellings and traditional town and row houses can be capped at 10,000 l/min provided that there is a minimum separation of 10 meters between the backs of adjacent units and that the town and row house blocks are limited to 600 square meters of building areas and seven dwelling units. The street townhouses in this development meet the requirements of ISDTB-2014-02, the fire flow rate of 10,000 l/min (166.7 l/s) is used in the fire flow analysis.

There are several locations where the rear of the townhouse block faces the side of an adjacent unit. At these locations the distance between the rear and side of the adjacent building is less than 10 meters which appears to violate item 4.1 of Technical Bulletin ISDTB-2014-02 which requires a 10 meter separation between the backs of the adjacent units. Without the 10,000 l/min cap the Fire Underwriters Survey (FUS) method of determining fire flow rates cannot be used as wood frame buildings separated by less than 3 meters is considered on fire unit. As the side yard distances between houses are usually less than 3 meters then all adjacent houses are considered one fire unit which results in a very large fire flow which is impractical to achieve. In order to keep the 10,000 l/min fire flow cap the side wall of a building which is less than 10 meters from an adjacent rear facing building is to be constructed as a fire wall. The locations of the buildings potentially requiring a fire wall construction is shown on **Figure 2.1**.

2.3.4 Boundary Conditions

The City of Ottawa has provided five boundary conditions in the Riverside South area for various projects. There are two boundary conditions which are near the site. One at Borbridge Avenue and Brian Good Avenue (Connection 3) and another at Spratt Road and Cambie Road (Connection 4). There are two sets of boundary conditions provided, one for pre-configuration and

another for post-configuration. As the post configuration values are higher the post configuration value for maximum HGL is used in the analysis for maximum pressure and the pre-configuration peak hour and max day plus fire values are used for minimum pressure and fire flow. A copy of the boundary condition is included in Appendix B and summarized as follows for the two adjacent locations.

	CONNECTION 3 BORBRIDGE & BRIAN GOOD	CONNECTION 4 SPRATT & CAMBIE
Max HGL (Basic Day)	147.8 m	147.8 m
Peak Hour	124.0 m	124.0 m
Max Day + Fire (10,000 l/min Fire Flow)	121.7 m	121.3 m

2.3.5 Hydraulic Model

A computer model for the subject site has been added to the model for the adjacent Riverside South Phase 15-1 & 2 developments including the River Road watermain and the Rivers Edge Phase 1 development. The model includes existing watermains, the boundary conditions and the 300 mm watermains on Borbridge and Spratt Road per the ISSU.

2.4 Proposed Water Plan

2.4.1 Modeling Results

The hydraulic model was run under basic day, maximum day with fire flows and under peak hour conditions. Water pipes are sized to provide sufficient pressure and to deliver the required fire flows. During the design stage all mains are tested at the minimum 150 mm diameter size, while the pressure criteria is met with the minimum sized mains the fire flow requirement is not achieved at all locations. The main sizes are increased in an iterative process until the fire flow results are sufficient.

Results of the hydraulic model are include in **Appendix B,** with the 4725 Spratt Road nodes highlighted, and summarized as follows:

Scenario	
Basic Day (Max HGL) Pressure Range	497.6 to 537.8 kPa
Peak Hour Pressure Range	282.1 to 303.8 kPa
Max Day + 10,000 l/min Fire Flow	144.1 l/s to 379.9 l/s

A comparison of the results and design criteria is summarized as follows:

Maximum Pressure	All nodes have basic day pressures under 552 kPa under pre-configuration, therefore pressure reducing control is not required for this development.
Minimum Pressure	All nodes in the model exceed the minimum value of 276 kPa (40 psi).

Fire Flow	All nodes for the street townhouses exceed the fire flow requirements under the post configuration except at node D-20 which is currently a dead end and the fire flow will increase when the street is extended and the watermain looped in the future. .

2.4.2 Watermain Layout

Figure 2.1 shows the proposed Water Plan for the proposed development.

As per the ISSU, a 300 mm diameter watermain is extended south along Spratt Road from the Cambie Road. A 300 mm diameter watermain is extended along Borbridge Avenue from the adjacent Riverside South Phase 15-2 development to the west.

3 SANITARY SEWERS

3.1 Existing Conditions

As noted earlier in Section 1.5, sanitary flows from the subject site will be routed to the ISSU proposed sub-trunk 525 mm diameter sanitary sewer in Spratt Road. **Figure 1.3,** in **Appendix A**, shows the current extent of this sewer, which is presently terminated about 200m north of the site. The sewer will need to be extended to reach the subject site.

3.2 Riverside South Community Infrastructure Servicing Study Update – Rideau River Area (2017 ISSU)

The report provided a macro level servicing plan for the portion of the Riverside South Community that will be tributary to Pond 5, which is referred to as the Rideau River Study Area. The limits of the study area are shown on Figure 1.1 from the study and a copy is included in **Appendix A**. The subject property is located within the Rideau River Drainage Area.

The 2017 ISSU Report recommended that wastewater flows from approximately ¾ of the study area is to be routed to the Spratt Road sewer. For reference, a copy of Drawing SAN-1, Sanitary Drainage Plan from the 2017 study is included in **Appendix C**. The 2017 ISSU study recommended that drainage area 2e be tributary to the Spratt Road sewer. A copy of Figure 4.2, Recommended Sanitary Servicing (2017 Update), from the 2017 ISSU Report, together with a related design sheet are both included in **Appendix C**. It should be noted that the 2017 ISSU includes the easternmost ¼ of the subject lands in drainage area 3b which is proposed Shoreline Drive collector sewer which shall be constructed at a later date by others.

3.3 Deviation Report Memorandum Riverside South, Rideau River Drainage Area Sanitary Sewer Design Parameters, IBI Group – 2017 (Deviation Report)

This report, which was accepted by the City of Ottawa in 2017, provided alternative drainage areas for the River Road, Spratt Road and Shoreline Drive collector sewers. This report proposed to expand the drainage area of the River Road collector sewer to better follow the storm sewer flow directions and reduce grade raise challenges associated with the ISSU Spratt Road collector drainage area. The shift of the River Road/Spratt Road drainage area split westward has resulted in additional lands west of Spratt Road being included in the Spratt Road collector drainage area. The deviation memo, supporting figures and sewer design sheets along with City of Ottawa approval emails can all be found in **Appendix C**. The deviation memo and supporting documents confirm that the small portion of the subject lands that was included in the ISSU drainage area 3b which were tributary to the Shoreline Drive collector sewer are now included in the expanded drainage area 2Diii as shown in the deviation report. As such, the entirety of the subject lands are tributary to the Spratt Road collector sewer.

3.4 Design Criteria

The estimated wastewater flows from the subject site are based on the revised City of Ottawa design criteria. Among other items, these include:

- Average residential flow = 280 l/c/d
- Peak residential flow factor = (Harmon Formula) x 0.80
- Average commercial flow = 28,000 l/s/ha

- Average institutional flow = 28,000 l/s/ha
- Peak ICI flow factor = 1.5 if ICI area is ≤ 20% total area
  1.0 if ICI area is > 20% total area
- Inflow and Infiltration Rate = 0.33 l/s/ha
- Minimum Full Flow Velocity = 0.60 m/s
- Maximum Full Flow Velocity = 3.0 m/s
- Minimum Pipe Size = 200 mm diameter

In accordance with the City of Ottawa Sewer Design Guidelines table 4.2, the following density rates are estimated for the subject site:

- Single units = 3.4
- Semi units = 2.7
- Townhouse and back to back units = 2.7
- Apartment units = 1.8

3.5 Recommended Sanitary Plan

The 2017 Updated Report recommended a preferred wastewater plan for the Rideau River Area of the Riverside South Community. For reference a copy of Drawing SAN-1, Sanitary Drainage Plan and the related sanitary sewer design sheet from the 2017 Report are both included in **Appendix C**. Wastewater flows from the subject property will discharge to the Spratt Road sub-trunk sewer. This sewer presently terminates north of the subject property. The extension of this sewer will need to be completed to facilitate development of the subject lands.

Drawing SAN-1 and the related spreadsheet dealt with the sub-trunk sewer sizing. The detail design of the development will include all smaller sewer sizes down to 200 mmØ. The final sanitary sewer design will be based on the revised City of Ottawa criteria previously discussed.

A preliminary sanitary plan is included in **Figure 3.1** in **Appendix C**. The plan builds on the information in the 2017 ISSU Report and includes potential sewer obverts for the larger sewers. This preliminary plan will need to be confirmed at the time of final design.

Aside from minor instances where the proposed road patterns cross the property line, no external sanitary flows are anticipated to cross the subject lands. As such, all sanitary sewers are proposed to be at normal depth and size.

4 STORMWATER MANAGEMENT

4.1 Existing Conditions

The ultimate storm runoff outlet from the property is the Riverside South Pond 5 which is currently under construction and is located west of River Road. Storm sewers within the Borbridge, Atrium and Brian Good right-of-ways are currently either under construction, proceeding through design and approval, or contemplated, all under separate application. There are currently no existing municipal services, including storm sewers, within or adjacent to the property.

There are no existing municipal drains, watercourses or recognized drainage features located on the subject lands.

Spratt Road is currently a rural cross-section adjacent to the property, which captures runoff in road side ditches. Prior to proceeding with the development of the subject lands, it is acknowledged that Spratt Road will need to be constructed and urbanized, eliminating the road side ditches.

4.2 Riverside South Community Infrastructure Servicing Study Update – Rideau River Area (2017 ISSU) Criteria

The report provided a macro level servicing plan for the Riverside South Community that will be tributary to future Pond 5. That area is referred to as the Rideau River Area and includes the subject property. The limits of the study are shown in Figure 1.1 from the study and a copy is included in **Appendix A**.

The 2017 ISSU report recommended that stormwater runoff from the study area be routed to Riverside South Pond 5, which is currently under construction. Minor storm runoff is proposed to be routed to the trunk storm sewer on Borbridge Street. For reference a copy of Drawing STM1, Storm Sewers from the 2017 study is included in **Appendix D**. The designated outlet for the subject lands is identified as the sewer between nodes N5-9 and N5-24.

4.3 Minor Storm Sewer Design Criteria

The minor system storm sewers for the subject site are proposed to be sized based on the rational method, applying standards of both the City of Ottawa and MECP. Some of the key criteria for this site include the following:

- Sewer Sizing: Rational Method
- Design Return Period: 1:2 year (local streets)
  1:5 year (collector streets)
  1:10 year (arterial roads)
- Initial Time of Concentration 10 minutes
- Manning's: 0.013
- Minimum Velocity: 0.80 m/s
- Maximum Velocity: 3.00 m/s

PIPE DIAMETER (MM)	SLOPE (%)
250	0.43
300	0.34
375	0.25
450	0.20
525	0.16
600	0.13
675	0.11
750 and larger	0.1

- Runoff Coefficients (per ISSU Update, to be confirmed at detailed design stage):

LAND USE		RUNOFF COEFFICIENT
Residential	Low Density	0.65
	Medium Density	0.70
	High Density	0.80
Commercial		0.75
Green Space		0.30
Institutional		0.75
Park		0.20
Transitway		0.82
Arterial Road		0.82
Collector Road		0.82

4.4 Recommended Minor Storm Plan

The recommended minor storm plan for the overall Rideau River Study Area, as presented in the 2017 ISSU Update, is included in **Appendix D**. Drawing STM-1, Storm Sewers, shows a preferred minor storm sewer layout for not only the subject sites but for adjacent lands in the development area.

As noted in Section 4.2 above, the subject lands are intended to outlet to the storm trunk sewer within Borbridge Street, and to ultimately outlet to Riverside South Pond 5. Additionally it is proposed to extend said storm trunk sewer along the section of Borbridge within the subject lands.

Figure 4.1 in **Appendix D**, shows a preliminary minor storm plan for the subject property. The Plan, which shows sewer flow directions, was based on the approved stormwater management modelling submitted by IBI Group in support of the downstream storm infrastructure completed in 2018, namely the River Road reconstruction, RSDC Phase 15-1A and RSDC Phase 15-1B. The current stormwater modelling identifies lands to the south and east, east of Spratt Road, as tributary to the proposed trunk sewer extension proposed within the subject lands. As such, external flows have been accounted for in the preliminary sizing of said trunk sewer. Refer to **Figure 4.1** for more details. Further stormwater analysis at the time of final design will determine exact drainage limits, sewer sizes and flow directions.

Some of the storm sewers recommended to service the Rideau River Area are subject to cost sharing as noted in the Draft 2013 Development Changes Study Report Update. For reference a copy of a relevant portion of Table F-2, Stormwater Services South, and Figure STM 4, Riverside South Storm Sewers are included in **Appendix D**. The report identified the larger storm sewers in the Riverside South Community including the River Road Area and the subject site. However, the

2013 plan is now outdated, so it is recommended that the Development Change Study Report for Riverside South be updated at the next opportunity.

4.5 Dual Drainage

Development of the subject site will include a stormwater strategy using the dual drainage system. The system features a combination of on-site detention (surface ponding) with inlet control devices (ICDs) and direct conveyance with no ponding. It accommodates both minor and major stormwater runoff. During frequent storms the effective runoff collected by catchment areas is directly released via catch basin inlets into the network of storm sewers, called the minor system. During less frequent storms, the balance of the flow (in excess of the minor flow) is accommodated by a system of rear yard swales and street segments (or other forms of underground storage or surface storage such as dry ponds). The main advantage of this arrangement is its ability to adjust the rate of total inflow into the minor system to satisfy the required level of service. The required total inflow is typically maintained by the restriction of the capacity and the density of the inlets directly connected into this system. As noted, during less frequent storms, the balance of the flow is accommodated by the major system. Typically, this accommodation is achieved by the attenuation on catchment surfaces called on-site detention and/or direct conveyance of the flow to a recipient.

Spratt Road, a collector road with a rural cross-section, is a constraint with respect to conveyance of major flow across the road's surface. Specifically, as a collector road, there should be no cross flow during events up to the 100 year event.

5 EROSION AND SEDIMENTATION CONTROL PLAN

During construction, existing conveyance systems and water courses can be exposed to sediment loading. Development of a subdivision such as this project can potentially create deleterious material which can enter the natural environment and gain access to fish and amphibian habitat. In order to prevent site generated sediments from entering the environment, an Erosion and Sedimentation Control Plan (ESCD) will be implemented prior to development. Although a generic ESCP can be developed as part of this report and subsequent Design Briefs, the final plan will be developed and implemented by the Owner's general contractor.

The erosion and sedimentation control strategy for the subject site could include erection of silt fences, straw bale barriers and rock check dams. These measures will ensure protection of both adjacent developments and the natural environment adjacent to and downstream of the site.

A copy of a potential Erosion and Sedimentation Control Plan (ESCP) is shown on **Figure 5.1**, which is included in **Appendix E**.

Other elements of an ESCP could also include installation of bulkhead barriers at the nearest existing downstream manholes to ensure deleterious material does not gain access to those sewers and potentially the Riverside South Pump Station and/or Pond 5. Also, the final ESCP will incorporate features to deal with disposal of any taken water. Some of the features or general requirements are sometimes conditions of a Permit To Take Water.

6 APPROVALS AND PERMIT REQUIREMENTS

6.1 City of Ottawa

The City of Ottawa will review all development documents including final working drawings and related reports. Upon completion, the City will approve the local watermains, under Permit No. 008-202; submit the sewer extension MECP application to the province and eventually issue a Commence Work Notification.

6.2 Province of Ontario

The Ministry of Environment, Conservation and Parks (MECP) will approve the local sewers under Section 53 of the Ontario Water Resources Act and issue an Environmental Compliance Approval. A Permit To Take Water may also need to be issued by the MECP.

6.3 Conservation Authority

At this time it is understood that there are no required permits, authorizations or approvals needed expressly for this development from the Conservation Authority; however, this will be confirmed through a subsequent pre-consultation with the RVCA.

6.4 Federal Government

There are no required permits, authorizations or approvals needed expressly for this development from the federal government.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusion

While some infrastructure which is needed to help service the subject site already exists, the development plan will include expansion and extension of those infrastructure to adequately service the site with water supply, wastewater collection and disposal and management of stormwater runoff. The extension of the existing watermains through the subject site will provide a reliable source of both drinking water and fire flows. The ultimate wastewater outlet is already in place. A new stormwater management facility, Pond 5, is currently under construction and once completed will provide the necessary treatment for runoff from the subject site. Development of the subject property will include the recommended storm sewer plan. Therefore, including both existing and proposed extension of major infrastructure there will be suitable public services put in place to service the subject site.

7.2 Recommendation

From an assessment of major municipal infrastructure perspective, it is recommended that the development application for the Claridge property at 4725 Spratt Road be accepted and that the development of the property move forward.

Lance Erion, P. Eng.
Associate

APPENDIX A

Development Servicing Study Checklist

The following table is a customized copy of the current City of Ottawa's Development Servicing Study Checklist. It is meant to be a quick reference for location of each of the items included on the list. The list contains the various item description and the study section in which the topic is contained.

GENERAL CONTENT

	ITEM DESCRIPTION	LOCATION
	Executive Summary (for larger reports only)	N/A
√	Date and revision number of the report	Front Cover
√	Location Map and plan showing municipal address, boundary, and layout of proposed development.	Figure 1.1
√	Plan showing the site and location of all existing services.	Figure 1.3
√	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.	Section 2.2, 3.2, 3.3, 4.3 Figure 1.1
√	Summary of Pre-consultation Meeting with City and other approval agencies.	Section 1.6
√	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 defendable design criteria.	Sections 1.3, 2.2, 3.2
√	Statement of objectives and servicing criteria	Section 1.1, 2.2.3, 3.3 & 4.3
√	Identification of existing and proposed infrastructure available in the immediate area.	Figure 1.3
√	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).	Sections 1.9
√	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 neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Section 1.8 Detail Design
√	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.	N/A
	Proposed phasing of the development, if applicable.	N/A
√	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.8

√	All preliminary and formal site plan submissions should have the following information: • Metric scale • North arrow (including construction North) • Key plan • Name and contact information of applicant and property owner • Property limits including bearings and dimensions • Existing and proposed structures and parking areas • Easements, road widening and rights-of-way • Adjacent street names	Noted

DEVELOPMENT SERVICING REPORT: WATER

	ITEM DESCRIPTION	LOCATION
√	Confirm consistency with Master Servicing Study, if available	Section 2.2
√	Availability of public infrastructure to service proposed development	Section 2.1
√	Identification of system constraints – external water needed	Sections 2.2
√	Identify boundary conditions	N/A
√	Confirmation of adequate domestic supply and pressure	Section 2.3 & Appendix B
√	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.	Section 2.2
√	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.	Section 2.2 Appendix B
	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defining phases of the project including the ultimate design.	Section 2.4
	Address reliability requirements such as appropriate location of shut-off valves.	Detail Design
√	Check on the necessity of a pressure zone boundary modification.	N/A
√	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.	Section 2.2
√	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.	Detail Design
√	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities and timing of implementation.	N/A
√	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 2.3
√	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Detailed Design

DEVELOPMENT SERVICING REPORT: WASTEWATER

	ITEM DESCRIPTION	LOCATION
√	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).	Section 3.3
√	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Section 3.2
√	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 condition of sewers.	Detail Design
√	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 3.2, Appendix C
√	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)	Section 3.1, 3.2, 3.4
	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix "C") format.	Section 3.3 & Detail Design
√	Description of proposed sewer network including sewers, pumping stations and forcemains.	Section 3.1, 3.4 & Figure 3.1 in Appendix C
√	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).	Section 1.9
√	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	Section 3.1
√	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
√	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
√	Special considerations such as contamination, corrosive environment etc.	Detail Design

DEVELOPMENT SERVICING REPORT: STORMWATER CHECKLIST

	ITEM DESCRIPTION	LOCATION
√	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 4.1, 4.4 Appendix D
√	Analysis of available capacity in existing public infrastructure.	Section 4.1, 4.4,
√	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Section 1.7, Figure 1.4 in Appendix A

√	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.	Section 4.5
√	Water quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 4.5
√	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 4.3, 4.4, 4.5
√	Set-back from private sewage disposal systems.	N/A
√	Watercourse and hazard lands setbacks.	Section 1.9, 4.8
√	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Section 1.6
√	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Section 4.2
√	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 4.5 Detail Design
√	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Section 1.9, 4.8
	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.	Detail Design
√	Any proposed diversion of drainage catchment areas from one outlet to another.	Section 1.7, 4.4
√	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 4.2, 4.4, Appendix D
	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.	N/A
√	Identification of potential impacts to receiving watercourses	N/A
√	Identification of municipal drains and related approval requirements.	Section 1.9
√	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 4.5 Detail Design
√ √	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Section 4.5 Detail Design
	Inclusion of hydraulic analysis including hydraulic grade line elevations.	Section 4.6
√	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 5
√	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.	N/A
√	Identification of fill constraints related to floodplain and geotechnical investigation.	Section 1.8,

APPROVAL AND PERMIT REQUIREMENTS: CHECKLIST

	ITEM DESCRIPTION	LOCATION
√	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.	Section 1.6, 1.9
	Application for Certification of Approval (CofA) under the Ontario Water resources Act.	Section 1.6 Detail Design
√	Changes to Municipal Drains	N/A
√	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	Section 6

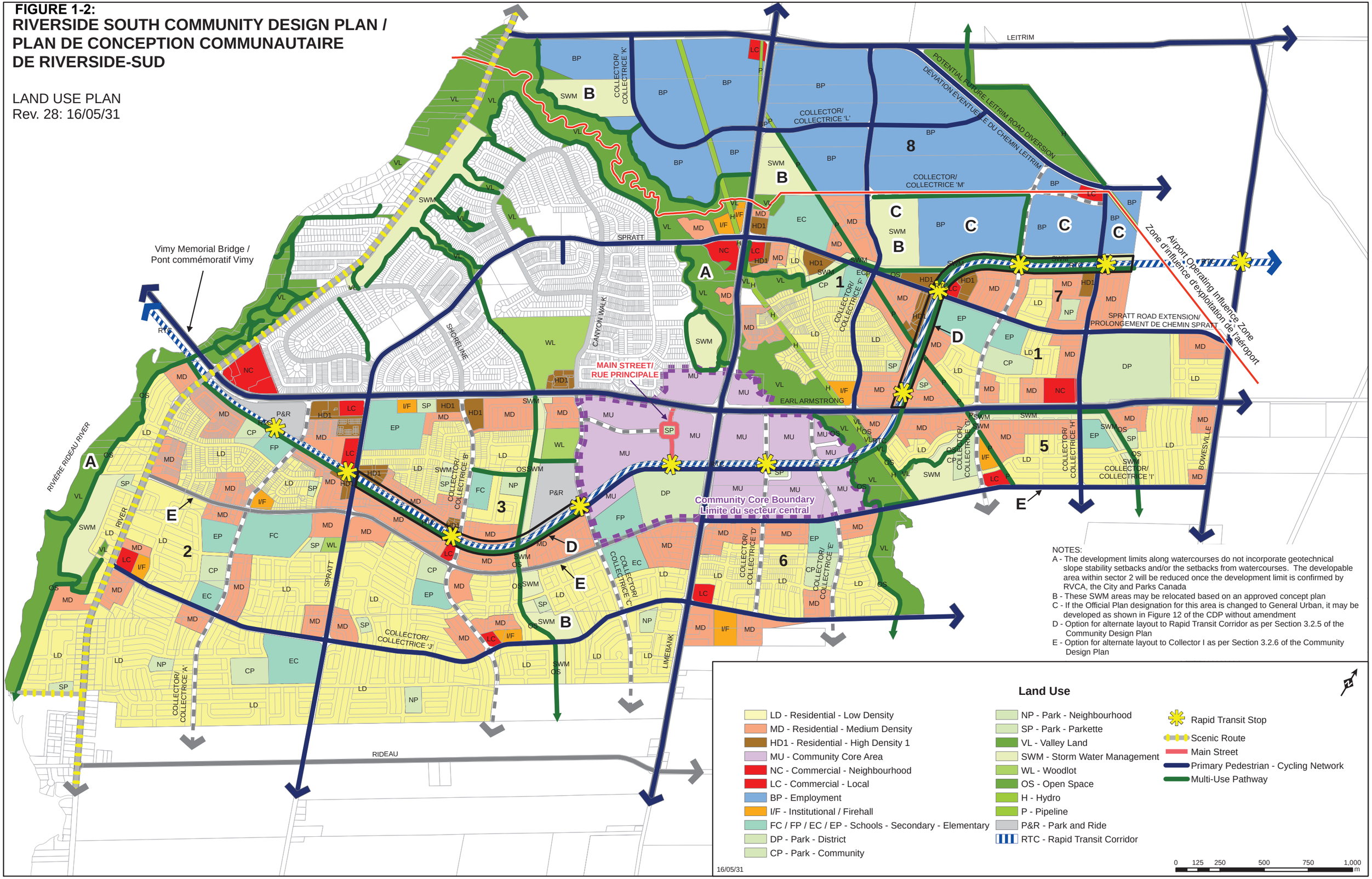
CONCLUSION CHECKLIST

	ITEM DESCRIPTION	LOCATION
√	Clearly stated conclusions and recommendations	Section 7.1 & 7.2
	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.	Detail Design
√	All draft and final reports shall be signed and stamped by professional Engineer registered in Ontario.	Completed

FIGURE 1-2:

RIVERSIDE SOUTH COMMUNITY DESIGN PLAN / PLAN DE CONCEPTION COMMUNAUTAIRE DE RIVERSIDE-SUD

LAND USE PLAN
Rev. 28: 16/05/31



NOTES:

A - The development limits along watercourses do not incorporate geotechnical slope stability setbacks and/or the setbacks from watercourses. The developable area within sector 2 will be reduced once the development limit is confirmed by RVCA, the City and Parks Canada

B - These SWM areas may be relocated based on an approved concept plan

C - If the Official Plan designation for this area is changed to General Urban, it may be developed as shown in Figure 12 of the CDP without amendment

D - Option for alternate layout to Rapid Transit Corridor as per Section 3.2.5 of the Community Design Plan

E - Option for alternate layout to Collector I as per Section 3.2.6 of the Community Design Plan

Land Use

- LD - Residential - Low Density
- MD - Residential - Medium Density
- HD1 - Residential - High Density 1
- MU - Community Core Area
- NC - Commercial - Neighbourhood
- LC - Commercial - Local
- BP - Employment
- I/F - Institutional / Firehall
- FC / FP / EC / EP - Schools - Secondary - Elementary
- DP - Park - District
- CP - Park - Community
- NP - Park - Neighbourhood
- SP - Park - Parkette
- VL - Valley Land
- SWM - Storm Water Management
- WL - Woodlot
- OS - Open Space
- H - Hydro
- P - Pipeline
- P&R - Park and Ride
- RTC - Rapid Transit Corridor

- Rapid Transit Stop
- Scenic Route
- Main Street
- Primary Pedestrian - Cycling Network
- Multi-Use Pathway

16/05/31

0 125 250 500 750 1,000 m

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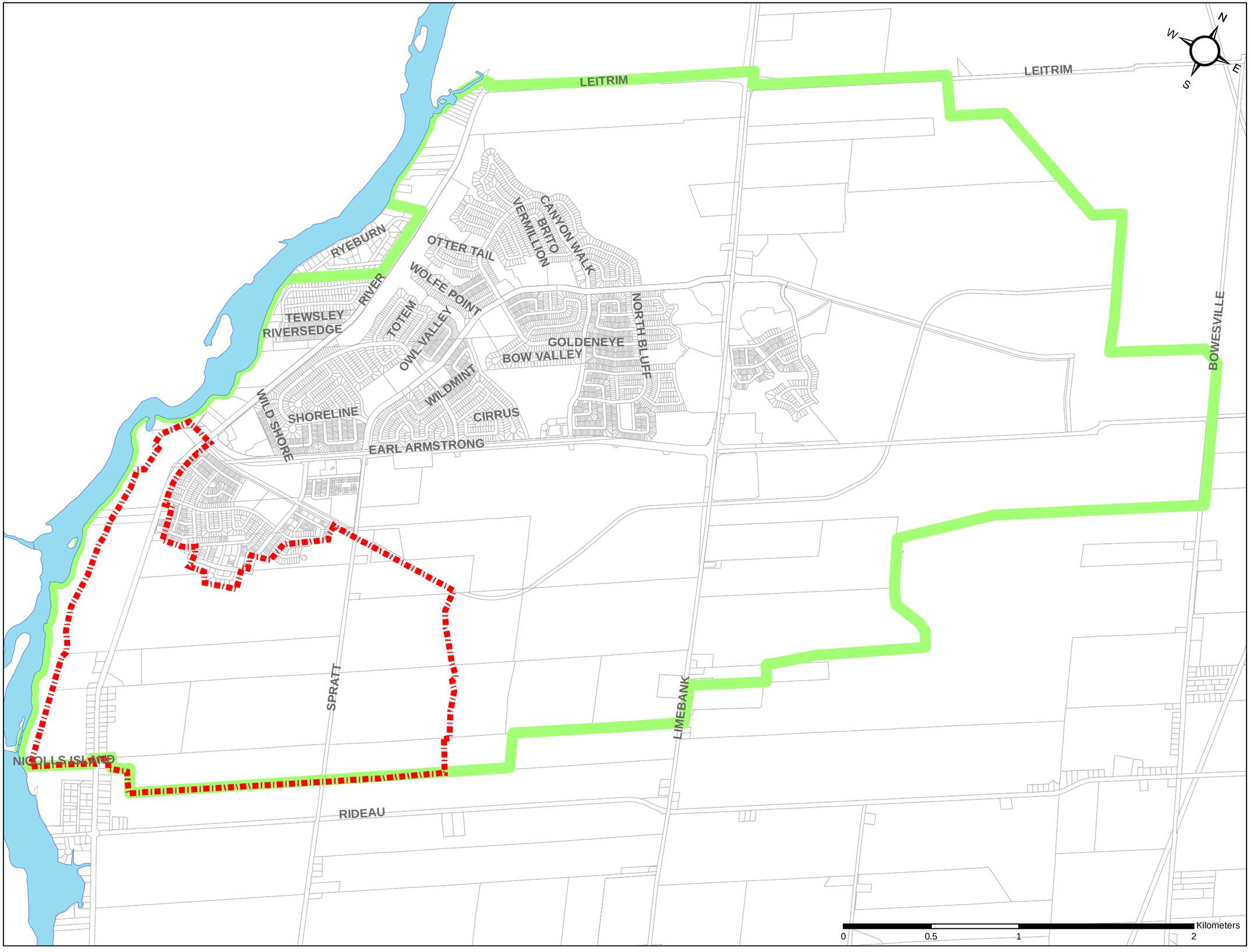

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TEL. 613.722.4420
WWW.STANTEC.COM

Legend

- Rideau River Study Area
- Riverside South Community Boundary

Client / Project:

CITY OF OTTAWA

RIVERSIDE SOUTH ISSU UPDATE

OTTAWA, ON

Title:

RIVERSIDE SOUTH COMMUNITY AND STUDY AREA BOUNDARY

Project No.:

163401101

Figure No.:

1-1

Revision 28 of the Riverside South Community Design Plan (CDP) (Bousfields, May 2016) was approved by the City of Ottawa Council in June 2016. The current Riverside South Community Infrastructure Servicing Study Update (Stantec, June 2017) is completed to reflect the CDP and Master Drainage Plan (MDP). The CDP Land Use Plan is shown in **Figure 1-2.**

1.3 PREVIOUS RELEVANT STUDIES

The following, previously completed, studies and design briefs were considered in the completed analyses.

1.3.1 Master Drainage Studies

"South Urban Community Drainage Planning Study" (UMA Engineering Ltd. and Golder Associates, May 1990)

"City of Gloucester South Urban Community Master Drainage Plan" (Gore & Storrie, July 1992)

"Riverside South Community Master Drainage Plan Update – Final Report" (Stantec Consulting Ltd., September 2008)

"Riverside South Community Master Drainage Plan Update – Rideau River Study Area – Final Report" (Stantec Consulting LTD., March 2016)

1.3.2 Master Servicing Studies

"Riverside South Master Servicing Study" (Stantec Consulting Ltd., September 2008)

"South Urban Community River Ridge Master Infrastructure Plan" (Ainley Graham and Associates, December 1994)

Pressure Zones Infrastructure Assessment" (Stantec Consulting, 2002)

"Water Master Plan" (Stantec Consulting, 2013)

1.3.3 Sanitary Studies

"South Urban Community Master Water and Sanitary Sewage Study" (Gore & Storrie, 1992)

"South Urban Community Rideau River Crossing – Facilities Phase" (Gore & Storrie, 1995)

"Wastewater Master Plan" (RMOC, July 1997)

"Wastewater IMP" (Stantec, 2013)

1.3.4 Design Briefs/Reports

"Design Report - Riverside South Development Corporation - Riverside South Community Phase 9" (J.L. Richards & Associates Limited, December 2011)

"Riverside South Elevated Water Storage Rank Class Environmental Assessment" (Stantec, 2014)

Scale	Project Title	Drawing Title	Sheet No.
1:5000	4725 SPRATT	LOCATION PLAN	FIGURE 1.1

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__.

_____
DON HERWEYER, MCIP RPP, MANAGER
DEVELOPMENT REVIEW-SOUTH
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

KEY MAP
NOT TO SCALE

DRAFT PLAN OF SUBDIVISION OF

PART OF LOT 22
CONCESSION 1 (RIDEAU FRONT)
Geographic Township of Gloucester
CITY OF OTTAWA

Prepared by Annis , O'Sullivan , Vollebekk Ltd.
November 27, 2018

Scale 1 : 1000
40 30 20 10 0 20 40 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

_____
Andre Roy
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

_____
Jim Burghout
Claridge Homes (Spratt Road) Inc.
I have the authority to bind the corporation

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

(a) see plan
(b) see plan
(c) see plan
(d) (purpose for which lots are to be used)
(e) see plan
(f) see plan
(g) see plan
(h) City of Ottawa
(i) see soils report
(j) see plan
(k) (municipal services available or to be available)
(l) see plan

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: filepean@aovltd.com

Ontario Land Surveyors

Job No. I5783-15 Claridge Pt Lt 22 Cl RF GL DPS D3 | N

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Scale	Project Title	Drawing Title	Sheet No.
NTS	4725 SPRATT	DRAFT PLAN	FIGURE 1.2

N

SUBJECT PROPERTY

TRANSIT CORRIDOR

SPRATT ROAD

STREET NO. 1

STREET NO. 2

STREET NO. 3

STREET NO. 4

STREET NO. 5

STREET NO. 6

STREET NO. 7

SUBJECT PROPERTY

LEGEND:

- PROPOSED WATERMAIN - SEPARATE APPLICATION(s)
- EXISTING WATERMAIN
- PROPOSED STORM - SEPARATE APPLICATION(s)
- EXISTING STORM
- PROPOSED SANITARY - SEPARATE APPLICATION (s)
- EXISTING SANITARY

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IBI

Scale: NTS

Project Title: 4725 SPRATT

Drawing Title: LOCATION OF EXISTING MAJOR MUNICIPAL INFRASTRUCTURE

Sheet No.: FIGURE 1.3

N

TRANSIT CORRIDOR

STREET NO. 1

STREET NO. 2

STREET NO. 3

STREET NO. 4

STREET NO. 5

STREET NO. 6

STREET NO. 7

92 94 96 98

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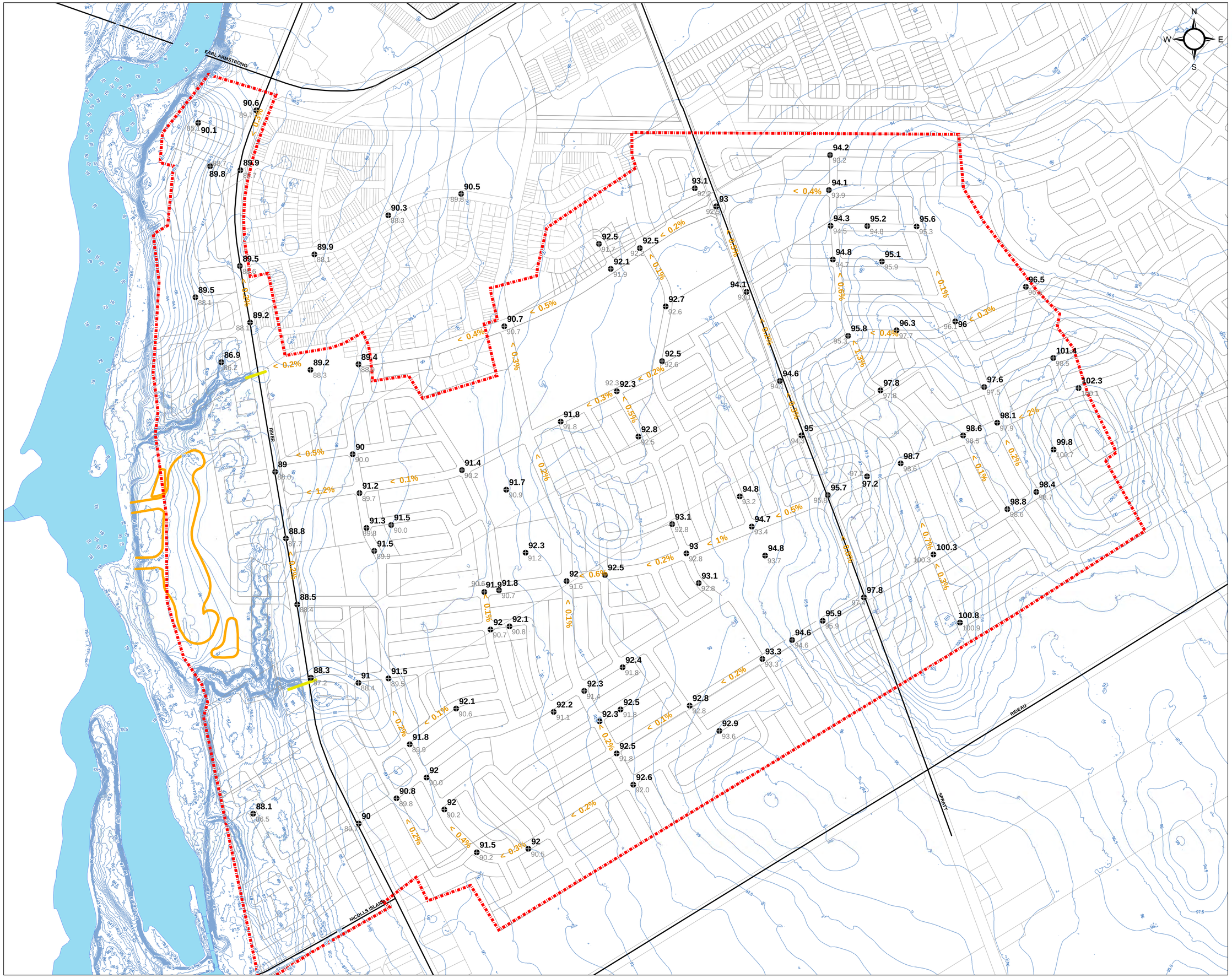
Scale	Project Title	Drawing Title	Sheet No.
NTS	4725 SPRATT	SITE TOPOGRAPGY	FIGURE 1.4



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TEL. 613.722.4420
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Legend

- Major Water
- Parcels
- Rideau River Study Area
- Pond 5
- Streets
- Proposed Elevation (m)
- Existing Elevation (m)
- Existing Contours (m)
- < Slope% — Proposed Slope
- Culverts

Client / Project:

CITY OF OTTAWA

RIVERSIDE SOUTH ISSU UPDATE

OTTAWA, ON

Title:

MACRO-GRADING PLAN

Project No.: **163401101**

Scale: 0 50 100 200 Meters

Drawing No.: **GCP-1**

Sheet: **1 of 7**

Revision: **0**

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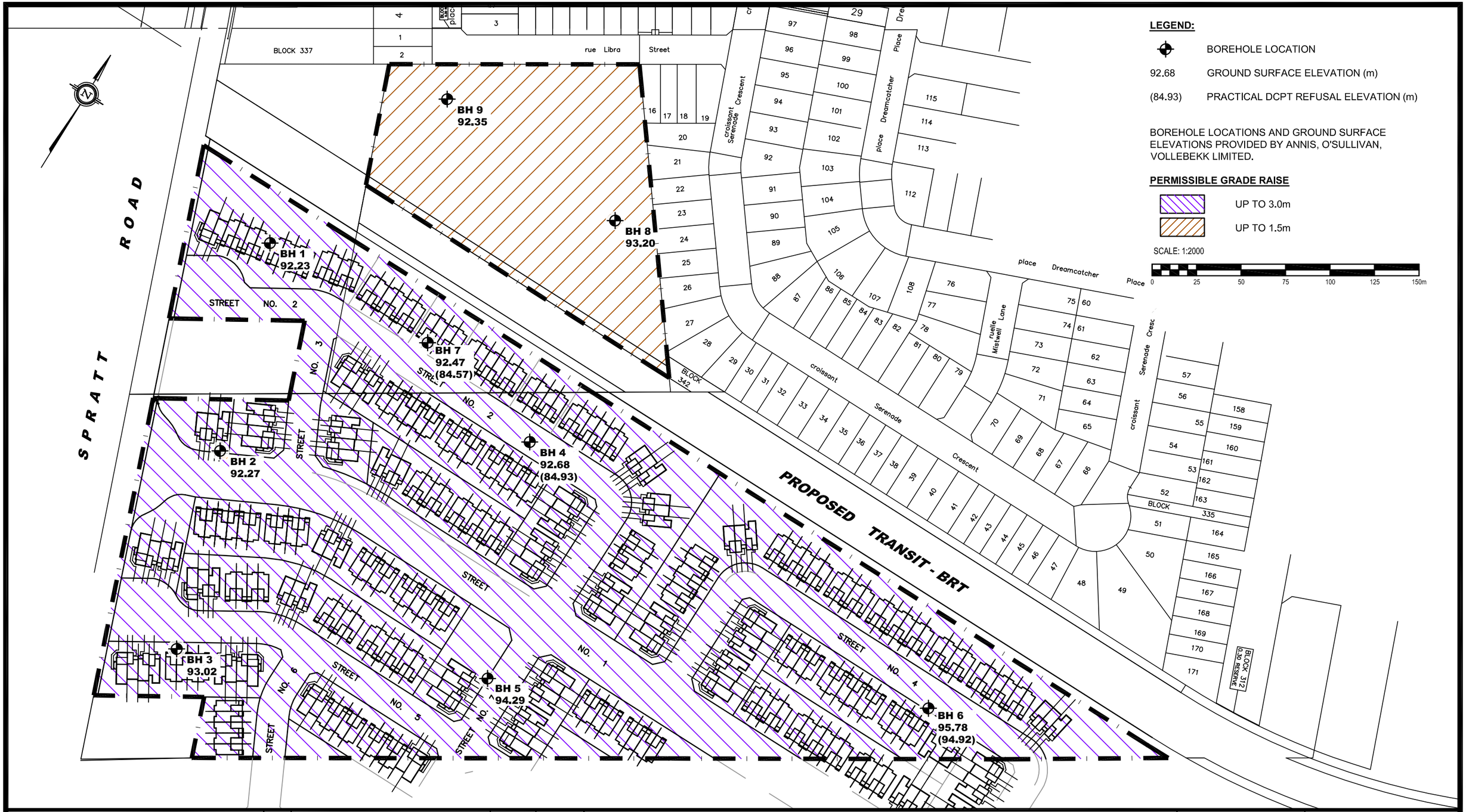
Scale	Project Title	Drawing Title	Sheet No.
NTS	4725 SPRATT	PROPOSED MACRO GRADING PLAN	FIGURE 5.1



patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
0			

CLARIDGE HOMES

GEOTECHNICAL INVESTIGATION
PROP. RESIDENTIAL DEVELOPMENT - 4623 & 4725 SPRATT ROAD
OTTAWA, ONTARIO

Title:
PERMISSIBLE GRADE RAISE PLAN

Scale: 1:2000	Date: 12/2018
Drawn by: MPG	Report No.: PG4730-1
Checked by: SD	Dwg. No.: PG4730-2
Approved by: DJG	Revision No.: 0

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4725 Spratt Road – Presonsult, Subdivision

Meeting Summary Notes

Wednesday, August 30, 9:00-9:40; Ottawa City Hall

Attendees:

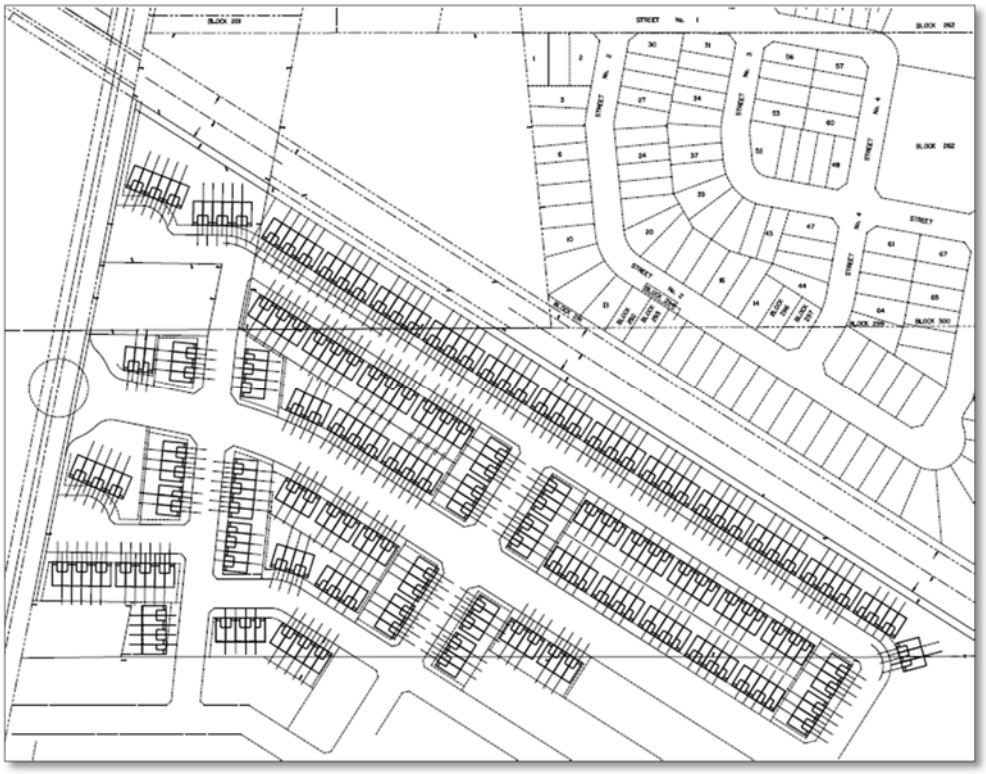
- Vincent Denomme (Claridge)
- Terry Brule (IBI)
- Justin Date (IBI)
- Natasha Baird (Project Manager, City of Ottawa)
- Frank McKinney (Project Manager, Transportation Planning, Env. Assessments)
- Wendy Tse (Planner II, City of Ottawa)
- Tracey Scaramozzino (File Lead, Planner, City of Ottawa)

Unable to Attend:

- Mark Richardson (City Forester, Planning)
- Matthew Hayley (Environmental Planner)
- Asad Yousfani (Transportation Project Manager, City of Ottawa)
- Burl Walker (Parks Planner, City of Ottawa)
- Christopher Moise (Urban Designer, Architect, City of Ottawa)
- Genya Stefanof (OC Transpo)
- Jamie Bachelor (RVCA)
- Emily Davies (Policy Planner, RSS CDP, City of Ottawa)

Issue of Discussion:

- Claridge, Draft Plan of Subdivision
- 95,576 m2 area
- 323 units, all townhouses
- One major collector through the site
- Bus Rapid Transit along the north of the site with station at the south-east corner of Spratt and the BRT Corridor



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1. **Official Plan:** Identify in Planning Rationale and ensure compliance:
   - Designated “General Urban Area”.
   - Riverside South CDP

2. **Zoning Information:**
   - Property is zoned DR – Development Reserve
   - A rezoning application will be required.

3. **Infrastructure/Servicing (Natasha Baird):**

Please note the following information regarding the engineering design submission for the above noted site:

1. The Servicing Study Guidelines for Development Applications are available at the following address: http://ottawa.ca/en/development-application-review-process-0/servicing-study-guidelines-development-applications

2. Servicing and site works shall be in accordance with the following documents:

   ⇨ Ottawa Sewer Design Guidelines (October 2012)

- ⇨ Ottawa Design Guidelines – Water Distribution (2010)
- ⇨ Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
- ⇨ City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
- ⇨ City of Ottawa Environmental Noise Control Guidelines (January, 2016)
- ⇨ City of Ottawa Park and Pathway Development Manual (2012)
- ⇨ City of Ottawa Accessibility Design Standards (2012)
- ⇨ Ottawa Standard Tender Documents (latest version)
- ⇨ Ontario Provincial Standards for Roads & Public Works (2013)

3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).
4. The servicing (stormwater, sanitary and water), for the subject lands, is to be based on the Riverside South Community Infrastructure Servicing Study Update – Rideau River Area (June 2017) and the Riverside South Community Master Drainage Plan Update – Rideau River Study Area.
5. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:
    i. Location of service
    ii. Type of development and the amount of fire flow required (as per FUS, 1999).
    iii. Average daily demand: ___ l/s.
    iv. Maximum daily demand: ___l/s.
    v. Maximum hourly daily demand: ___ l/s.
6. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

7. Provide a geotechnical report for the proposed development.

8. Please contact Rideau Valley Conservation Authority to discuss if any requirements are necessary.

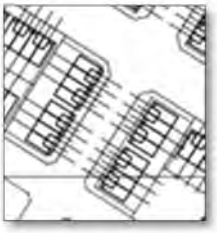
9. I will need the following studies and plans:

    - Assessment of Adequacy of Public Services Brief
    - Watermain Analysis
    - Draft Plan of Subdivision

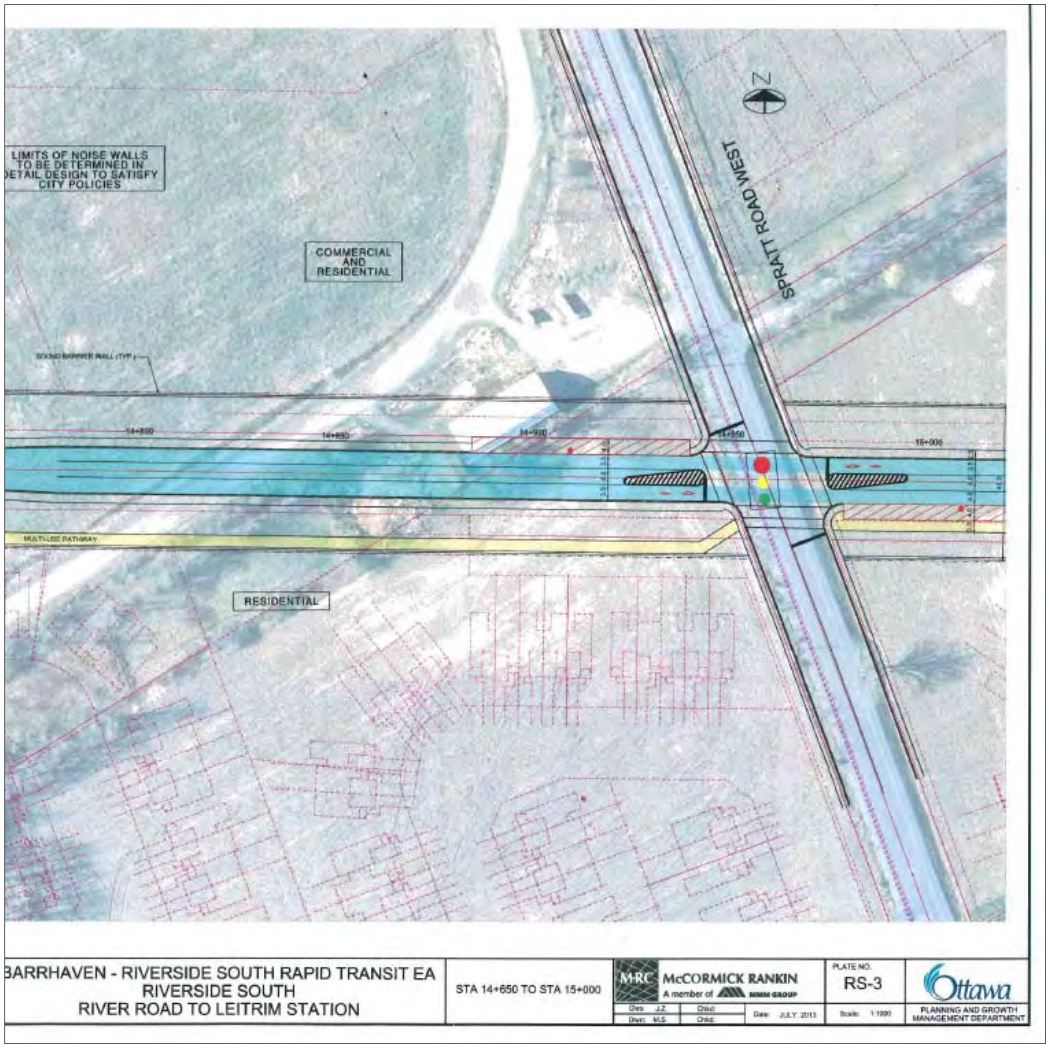
4. Initial Planning/Design Comments (Tracey Scaramozzino, Christopher Moise):

- Site is mostly medium density and a small piece of low density
- Density is to be 38u/ha for medium density. Identify the density that will be achieved through this development.
- As per P. 17 in the CDP "Areas **will have** a mix of unit types – a mix of unit types, primarily on-street and block towns interspersed with singles, semis, townhouse". Revise your plan accordingly.
- Area is within 600m of Transit and is therefore a TOD area – refer to 2.2.1 policies.
- There is 1 'neighbourhood gateway' feature shown in the CDP. Do they intend to provide one?
- Multi-use pathway runs to the north of the site. Land must be provided for this.
- Provide connectivity (a few pathways) from the subdivision to the MUP for easy access to the transit stations.
- Provide connections that will lead to future developments – such as the school to the southeast and the park/woodlot to the southwest
- Sidewalk req'd on both sides of the collector that runs through the development.
- Provide a 'Pedestrian Plan' to show the sidewalk/pathways/MUP connections within and exterior to the site.
- Try to preserve some of the hedgerows – as these are some of the most mature in the area and are specifically mentioned on the CDP section 2.2.4 – p 13.
- The long straight street at the north is not ideal – as it is not pedestrian friendly; break it up with street layout and unit type.
- FYI – ensure that the units will comply with Section 6 "Site and Built Form Guidelines" – which speaks to bldg. design and setbacks
- Ensure the units have paired driveways
- Explain how you are meeting the 'affordable housing' targets – as per S. 8.2
- Explain how the design complies with the Building Better Smarter Suburbs (BBBSS) and the RSS CDP.

- It is appreciated that the townhouse units have been turned to face the side streets.



- As per the Environmental Assessment for the Riverside South BRT – the station will be located on the south-east side of Spratt abutting Claridge lands (see image below). City Staff support a higher density in the immediate vicinity of transit stations to create a hub and will likely request that the current MD (medium density) lands at that intersection be re-designated to HD1 (high density, subzone 1) which permits low-rise, 4-storey apartment buildings.



- The red hatched lines represent the two stations – westbound station is on the west side of Spratt and the eastbound station is on the east side of Spratt.

5. **Transportation (Asad Yousfani)**
   - TIA and Noise Study are required
   - Spratt Road is to be urbanized at a 26m ROW – and is to match the cross-section of Spratt Road north of Cambie Road.
   - The round-a-bout at Spratt Road and the Future Major Collector must line up with Borbridge Avenue on the West side of Spratt Road.
   - Ensure the off-sets on local streets is at least 40 metres; and 60 metres for collectors.

6. **Transportation, Environmental Assessment (Frank McKinney):**
   - Width of BRT corridor from rear lot line to rear lot line is to be 40 metres
   - The roundabout on Spratt is an ideal location for a neighbourhood gateway sign
   - The BRT station will be located at the south-east corner of Spratt Road and the BRT Corridor
   - The BRRT Rapid Transit EA can be provided to your consultant via FTP site, once we receive their contact information.

7. **Forestry, Private (Mark Richardson):**
   - TCR is required
   - Tree Permit will be required to remove any trees
   - Contact Mark for further details and/or on-site visit

8. **Natural Environment (Matthew Hayley):**
   - TCR is required
   - Tree permit is needed to remove trees over 10 cm dbh
   - There are two existing residential properties adjacent to this development. Please pay close attention to the trees along these property lines and in

particular the boundary trees and trees on the residential property with critical root zones that extend onto the development site, boundary trees are co-owned and the neighbours permission will be required to remove or harm those trees.

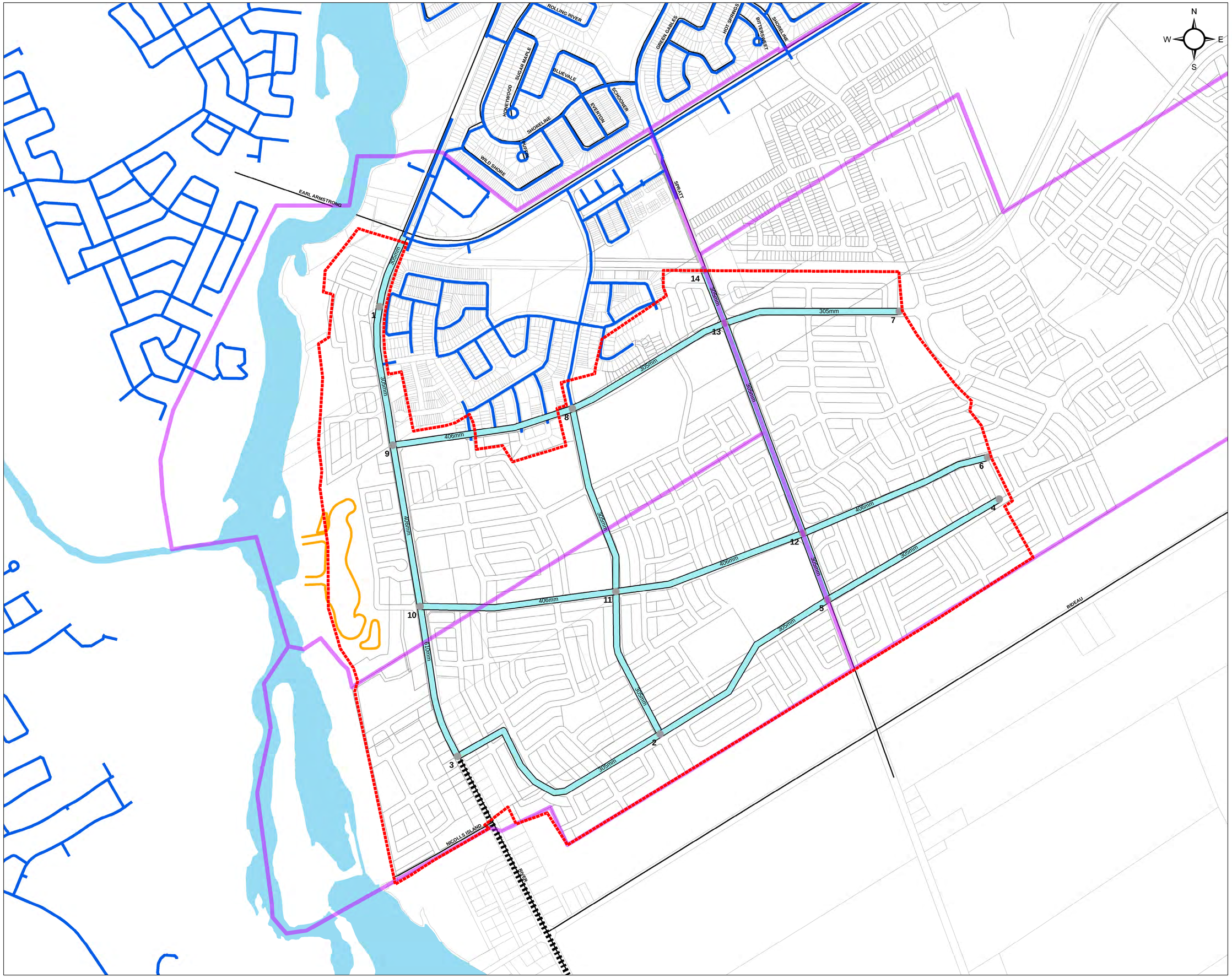
- The property may contain habitat for endangered and threatened species and as such an Environmental Impact Statement (EIS) is required. The EIS will need consultation with the local Kemptville District Office to identify species of concern. The EIS can be combined with the TCR.
- Integrated Environmental Review is to be provided as part of the Planning Rational, more guidance is available in the Official Plan Section 4.7.1.

9. Parks and Facilities (Burl Walker):

- A minimum 10 metre wide corridor is to be conveyed to the City for the MUP on the south side of the BRT. The MUP width is to be consistent with the blocks that have already been conveyed to the City to the west (Blocks 153 and 174 on 4M-1470 and Block 56 on 4M-1480).
- City records show that the Riverside South landowners' park cost sharing agreement will include the subject lands. We will be requesting a draft plan condition to address the cost sharing agreement, such as the following:

  The Owner acknowledges and agrees that the full amount of the parkland dedication requirement is to be provided through the conveyance of parkland within another subdivision or subdivisions in the Riverside South Community Design Plan area. The Owner agrees to enter into a cost sharing agreement with other landowners within the Riverside South Community Design Plan area to distribute the parkland dedication costs and the park development costs proportionately amongst the benefitting landowners in accordance with the intent of Official Plan Amendment 159, to the satisfaction of the General Manager, Recreation, Cultural and Facility Services. The Owner further acknowledges and agrees that the parkland dedication requirement shall be in the form of conveyance of parkland rather than the payment of cash-in-lieu of parkland dedication.

APPENDIX B



Stantec

STANTEC CONSULTING LTD.
400 1331 CLYDE AVENUE
OTTAWA, ON
TEL. 613.722.4420
WWW.STANTEC.COM

Legend

- Major Water
- Parcels
- Growth Polygons
- Rideau River Study Area
- Pond 5
- Streets
- Watermain Node
- Proposed Watermain
- Future Watermain to Manotick
- Existing Watermains

Client / Project:

CITY OF OTTAWA

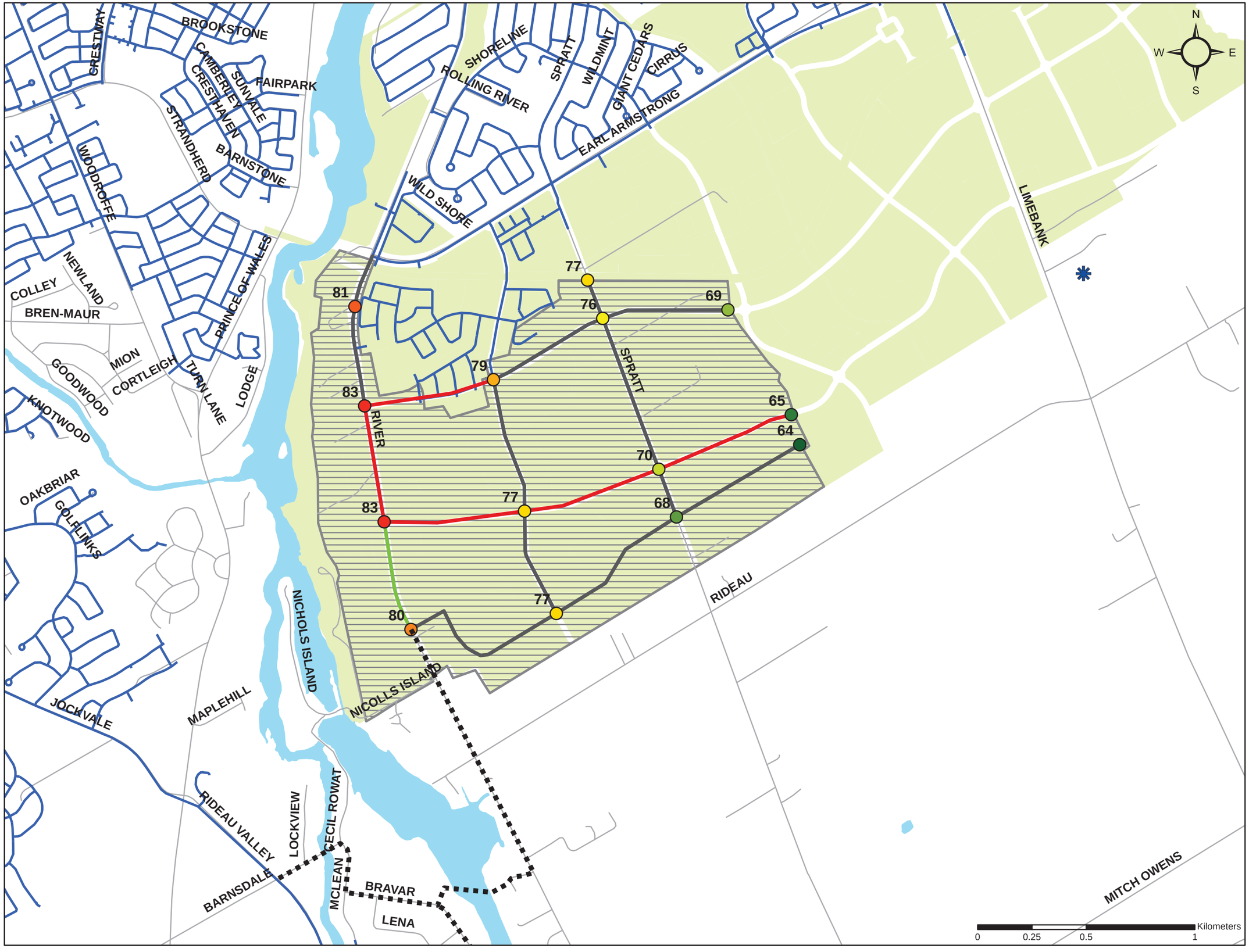
RIVERSIDE SOUTH ISSU UPDATE

OTTAWA, ON

Title:

POTABLE WATER SERVICING PLAN

Project No.:	Scale:	
163401101	0 125 250 Meters	
Drawing No.:	Sheet:	Revision:
WAT-1	**7 of 7**	**0**



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STANTEC CONSULTING LTD.
400 1331 CLYDE AVENUE
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TEL. 613.722.4420
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Legend

- Rideau River Study Area
- Riveside South Area
- Future Elevated Tank Location
- Future Pipes to Manotick
- Existing Watermains

Proposed Pipes

Dia. (mm)

- 305
- 406
- 610

Model Nodes Maximum Pressure (psi)

- 64
- 65
- 68
- 69
- 70
- 76
- 77
- 79
- 80
- 81
- 83

Client / Project:

CITY OF OTTAWA

RIVERSIDE SOUTH ISSU UPDATE

OTTAWA, ON

Title:

Maximum Pressure During BSDY

Project No.:

163401101

Figure No.:

5-4

N

SUBJECT PROPERTY

SUBJECT PROPERTY

TRANSIT CORRIDOR

SPRATT ROAD

STREET NO. 1

STREET NO. 2

STREET NO. 3

STREET NO. 4

STREET NO. 5

STREET NO. 6

STREET NO. 7

LOCAL STREET NO. 1

LOCAL STREET NO. 2

LOCAL STREET NO. 3

LOCAL STREET NO. 4

LOCAL STREET NO. 5

LOCAL STREET NO. 6

LOCAL STREET NO. 7

300Ø

LEGEND:

- PROPOSED WATERMAIN - SEPARATE APPLICATION(s)
- EXISTING WATERMAIN
- PROPOSED WATERMAIN
- POTENTIAL FIREWALL (IBI)

J:\118404_4725SprattRd\5.9 Drawings\59civil\current\Assessment Report\118404-fig-2.1-WATER.dwg Layout Name: WATER Plot Scale: 1:5.13 Plotted At: 2/27/2019 Last Saved By: Chris.Cormier Last Saved At: Feb. 27, 19

Scale	Project Title	Drawing Title	Sheet No.
NTS	4725 SPRATT	CONCEPTUAL WATER PLAN	FIGURE 2.1

BOUNDARY CONDITIONS

Boundary Conditions For: Riverside South Phase 15-2 & 760 River Road &4725 Spratt Rd & 4623 Spratt Rd

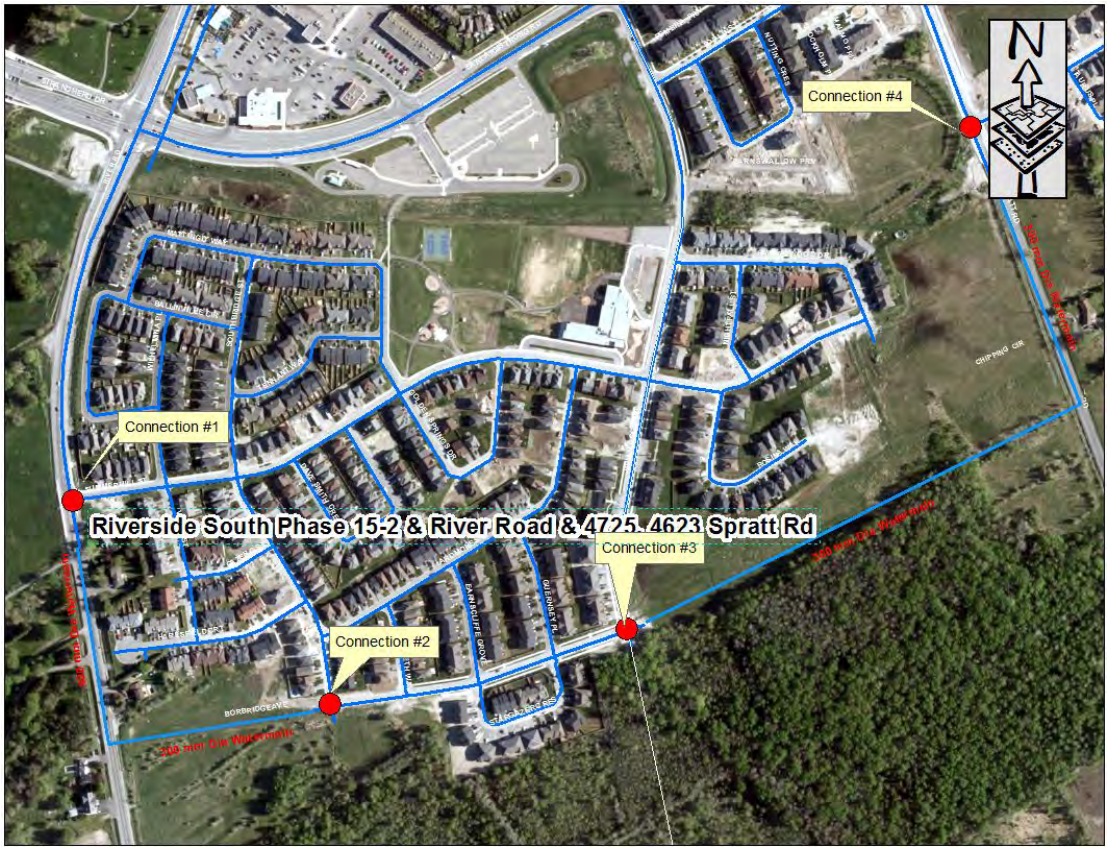
Date of Boundary Conditions: 2018-Dec-06

Provided Information:

Scenario	Demand	
	L/min	L/s
Average Daily Demand	991.8	16.53
Maximum Daily Demand	2137.2	35.62
Peak Hour	4498.8	75.0
Fire Flow #1 Demand	10,000	166.7
Fire Flow #2 Demand	12,000	200.0
Fire Flow #3 Demand	15,000	250.0

Number Of Connections: 5

Location:



BOUNDARY CONDITIONS

Location 4263 Spratt Road – Connection 5

BOUNDARY CONDITIONS

Results:

Pre_Configuration

Connection #: 1

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	132.8	61.3
Peak Hour	123.9	48.7
Max Day Plus Fire (10,000) L/min	119.9	42.9
Max Day Plus Fire (12,000) L/min	117.9	40.0
Max Day Plus Fire (15,000) L/min	117.3	38.8

[1]Elevation: **89.71 m**

Connection #: 2

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	132.8	60.8
Peak Hour	123.9	48.3
Max Day Plus Fire (10,000) L/min	121.3	44.4
Max Day Plus Fire (12,000) L/min	119.8	42.3
Max Day Plus Fire (15,000) L/min	117.3	38.8

[1]Elevation: **90.00 m**

BOUNDARY CONDITIONS

Connection #: 3

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	132.8	59.4
Peak Hour	124.0	46.9
Max Day Plus Fire (10,000) L/min	121.7	43.7
Max Day Plus Fire (12,000) L/min	120.4	41.9
Max Day Plus Fire (15,000) L/min	118.2	38.7

[1]Elevation: **99.99 m**

Connection #: 4

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	131.9	58.3
Peak Hour	124.0	45.9
Max Day Plus Fire (10,000) L/min	121.3	41.9
Max Day Plus Fire (12,000) L/min	119.8	39.8
Max Day Plus Fire (15,000) L/min	117.2	36.1

[1]Elevation: **91.79 m**

Connection #: 5

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	131.8	57.8
Peak Hour	123.7	45.0
Max Day Plus Fire (10,000) L/min	112.8	29.4
Max Day Plus Fire (12,000) L/min	107.9	22.5

[1]Elevation: **92.06 m**

BOUNDARY CONDITIONS

Post_Configuration

Connection #: 1

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.8	82.6
Peak Hour	144.6	78.0
Max Day Plus Fire (10,000) L/min	142.6	75.2
Max Day Plus Fire (12,000) L/min	141.3	73.3
Max Day Plus Fire (15,000) L/min	139.0	70.1

[1]Elevation: **89.71 m**

Connection #: 2

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.8	82.2
Peak Hour	144.6	77.6
Max Day Plus Fire (10,000) L/min	142.9	75.2
Max Day Plus Fire (12,000) L/min	141.7	73.5
Max Day Plus Fire (15,000) L/min	139.6	70.6

[1]Elevation: **90.00 m**

BOUNDARY CONDITIONS

Connection #: 3

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.8	80.7
Peak Hour	144.6	76.2
Max Day Plus Fire (10,000) L/min	143.4	74.5
Max Day Plus Fire (12,000) L/min	142.3	73.0
Max Day Plus Fire (15,000) L/min	140.6	70.5

[1]Elevation: **99.99 m**

Connection #: 4

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.8	79.7
Peak Hour	144.6	75.2
Max Day Plus Fire (10,000) L/min	143.2	73.1
Max Day Plus Fire (12,000) L/min	142.0	71.5
Max Day Plus Fire (15,000) L/min	140.0	68.7

[1]Elevation: **91.79 m**

Connection #: 5

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.8	79.3
Peak Hour	144.6	74.8
Max Day Plus Fire (10,000) L/min	137.7	65.1
Max Day Plus Fire (12,000) L/min	134.5	60.5

[1]Elevation: **92.06 m**

BOUNDARY CONDITIONS

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) Watermains extending from Connection #1 to Connection #2 and watermains extending from Connection #4 to Connection #3 as per connection location figure in this boundary condition must be as per Riverside South Community Infrastructure Servicing Study dated June 21 2017 update.

3) 4623 Spratt Road proposed development will require an additional connection if the number of homes exceed 50 units.

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.

IBI GROUP
333 PRESTON STREET
OTTAWA, ON
K1S 5N4

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : 4725 Spratt
LOCATION : CITY OF OTTAWA
DEVELOPER : RIVERSIDE SOUTH DEVELOPMENT CORPORATION

FILE: 118404.5.7
DATE PRINTED: 28-Feb-19
DESIGN: LE
PAGE : 1 OF 1

NODE	RESIDENTIAL UNITS SF	RESIDENTIAL UNITS SD & TH	RESIDENTIAL UNITS APT	POP'N	NON-RESIDENTIAL INDTRL (ha.)	NON-RESIDENTIAL COMM. (ha.)	NON-RESIDENTIAL INST. (ha.)	AVERAGE DAILY DEMAND (l/s) Res.	AVERAGE DAILY DEMAND (l/s) Non-res.	AVERAGE DAILY DEMAND (l/s) Total	MAXIMUM DAILY DEMAND (l/s) Res.	MAXIMUM DAILY DEMAND (l/s) Non-res.	MAXIMUM DAILY DEMAND (l/s) Total	MAXIMUM HOURLY DEMAND (l/s) Res.	MAXIMUM HOURLY DEMAND (l/s) Non-res.	MAXIMUM HOURLY DEMAND (l/s) Total	FIRE DEMAND (l/min)
4725 Spratt Road																	
SP-01				0				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10,000
SP-02		6		16				0.07	0.00	0.07	0.16	0.00	0.16	0.36	0.00	0.36	10,000
SP-03		8		22				0.09	0.00	0.09	0.22	0.00	0.22	0.48	0.00	0.48	10,000
D-02		29		78				0.32	0.00	0.32	0.79	0.00	0.79	1.74	0.00	1.74	10,000
D-04		28		76				0.31	0.00	0.31	0.77	0.00	0.77	1.68	0.00	1.68	10,000
D-06		16		43				0.18	0.00	0.18	0.44	0.00	0.44	0.96	0.00	0.96	10,000
D-08		31		84				0.34	0.00	0.34	0.85	0.00	0.85	1.86	0.00	1.86	10,000
D-10		37		100				0.40	0.00	0.40	1.01	0.00	1.01	2.23	0.00	2.23	10,000
D-12		39		105				0.43	0.00	0.43	1.07	0.00	1.07	2.35	0.00	2.35	10,000
D-14		28		76				0.31	0.00	0.31	0.77	0.00	0.77	1.68	0.00	1.68	10,000
D-16		25		68				0.27	0.00	0.27	0.68	0.00	0.68	1.50	0.00	1.50	10,000
D-18		15		41				0.16	0.00	0.16	0.41	0.00	0.41	0.90	0.00	0.90	10,000
D-20		5		14				0.05	0.00	0.05	0.14	0.00	0.14	0.30	0.00	0.30	10,000
D-22		17		46				0.19	0.00	0.19	0.46	0.00	0.46	1.02	0.00	1.02	10,000
D-24		16		43				0.18	0.00	0.18	0.44	0.00	0.44	0.96	0.00	0.96	10,000
Total		300		810						3.30			8.21			18.02	

ASSUMPTIONS

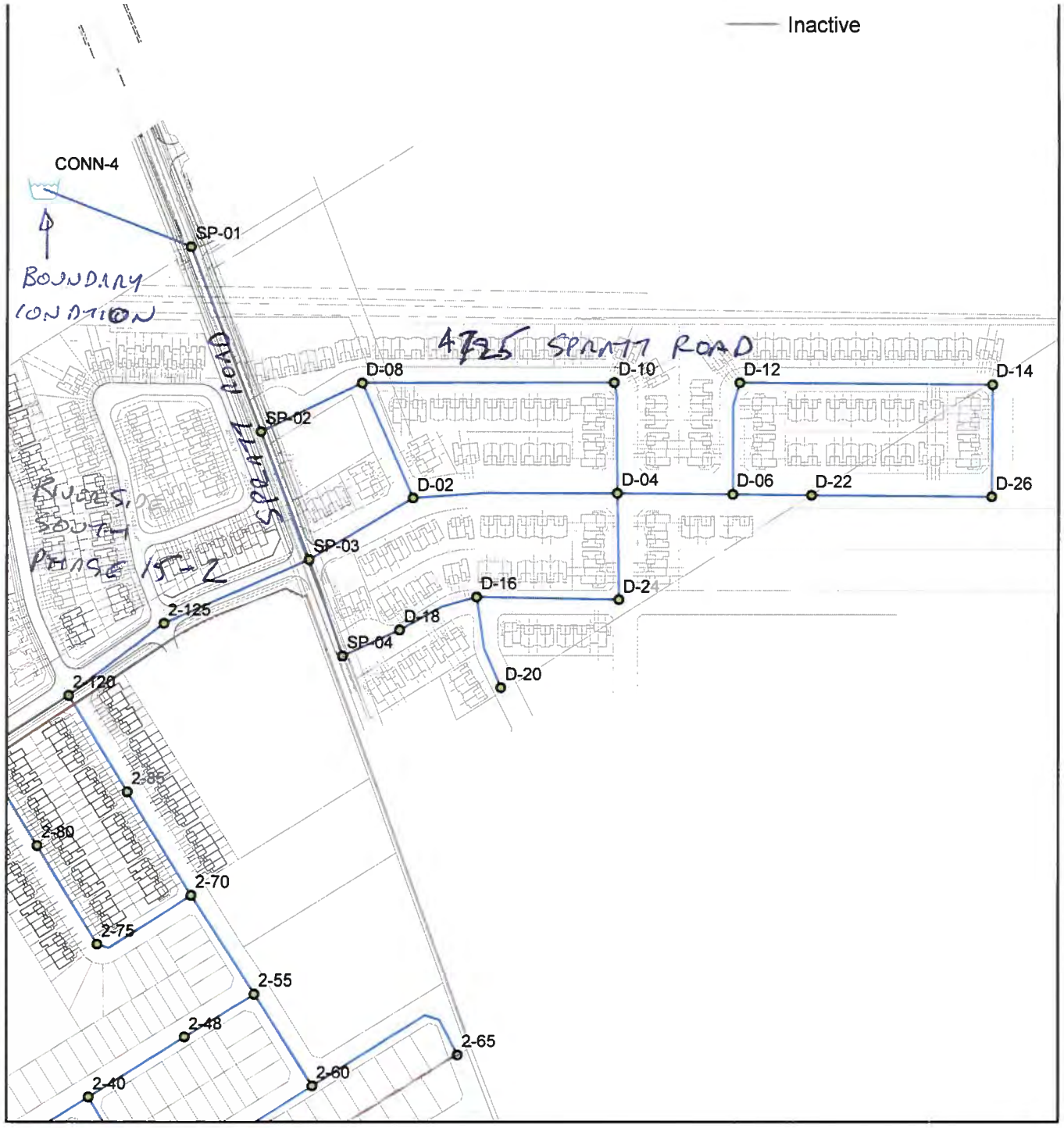
RESIDENTIAL DENSITIES
- Single Family (SF) 3.4 p / p / u
- Semi Detached (SD) & Townhouse (TH) 2.7 p / p / u
- Apartment (APT) 1.8 p / p / u
- Other 66 u / p / ha

AVG. DAILY DEMAND
- Residential 350 l / cap / day
- ICI 50,000 l / ha / day

MAX. DAILY DEMAND
- Residential 875 l / cap / day
- ICI 75,000 l / ha / day

MAX. HOURLY DEMAND
- Residential 1.925 l / cap / day
- ICI 135,000 l / ha / day

FIRE FLOW
- SF, SD, TH & ST 10,000 l / min
- Back to Back TH 12,000 l / min
- ICI 15,000 l / min


Inactive
N
CONN-4
SP-01
BOUNDARY
IONDITION
4725 SPRATT ROAD
SPRATT ROAD
RIVERSIDE
SOUTH
PHASE 1B-2
D-08
D-10
D-12
D-14
SP-02
D-02
D-04
D-06
D-22
D-26
SP-03
D-16
D-24
2-125
D-18
SP-04
D-20
2-120
2-85
2-80
2-70
2-75
2-55
2-48
2-65
2-60
2-40

Basic Day (Max HGL) - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
1	☐	1A-05	0.31	89.95	147.80	566.87	0.00
2	☐	1A-10	0.18	89.90	147.80	567.37	0.00
3	☐	1A-15	0.09	89.80	147.80	568.35	0.00
4	☐	1A-20	0.13	90.90	147.79	557.52	0.00
5	☐	1A-25	0.15	90.90	147.79	557.51	0.00
6	☐	1A-30	0.14	90.91	147.79	557.40	0.00
7	☐	1A-35	0.14	90.80	147.79	558.48	0.00
8	☐	1A-40	0.32	89.86	147.79	567.69	0.00
9	☐	1A-45	0.26	89.79	147.79	568.38	0.00
10	☐	1A-50	0.14	89.54	147.79	570.84	0.00
11	☐	1A-55	0.13	89.55	147.79	570.73	0.00
12	☐	1A-60	0.16	90.77	147.79	558.76	0.00
13	☐	1A-65	0.26	89.60	147.79	570.23	0.00
14	☐	1A-70	0.28	90.80	147.79	558.45	0.00
15	☐	1A-75	0.28	90.19	147.79	564.42	0.00
16	☐	1A-80	0.12	90.45	147.79	561.87	0.00
17	☐	1A-85	0.15	91.12	147.79	555.31	0.00
18	☐	1A-90	0.13	91.13	147.79	555.21	0.00
19	☐	1A-95	0.09	91.08	147.79	555.69	0.00
20	☐	1A-97	1.72	90.87	147.79	557.75	0.00
21	☐	1B-05	0.31	91.40	147.79	552.60	0.00
22	☐	1B-10	0.22	91.00	147.79	556.52	0.00
23	☐	1B-15	0.21	90.95	147.79	557.00	0.00
24	☐	1B-20	0.19	91.00	147.79	556.51	0.00
25	☐	1B-25	0.23	91.20	147.79	554.55	0.00
26	☐	1B-30	0.12	91.40	147.79	552.59	0.00
27	☐	1B-35	0.21	91.25	147.79	554.04	0.00
28	☐	1B-40	0.21	91.15	147.79	555.01	0.00
29	☐	1B-45	0.21	91.30	147.79	553.54	0.00
30	☐	1B-50	0.15	91.25	147.79	554.04	0.00
31	☐	1B-55	0.11	91.35	147.79	553.05	0.00
32	☐	1B-60	0.22	91.25	147.79	554.03	0.00
33	☐	2-05	0.11	92.05	147.79	546.23	0.00
34	☐	2-10	0.11	93.20	147.79	534.96	0.00
35	☐	2-100	2.29	90.80	147.80	558.51	0.00
36	☐	2-105	0.04	91.00	147.80	556.59	0.00
37	☐	2-110	3.57	91.59	147.79	550.71	0.00
38	☐	2-115	0.15	92.40	147.79	542.76	0.00
39	☐	2-120	0.11	92.50	147.79	541.77	0.00
40	☐	2-125	2.77	92.60	147.79	540.78	0.00
41	☐	2-15	0.20	92.15	147.79	545.22	0.00
42	☐	2-20	0.21	94.50	147.79	522.19	0.00
43	☐	2-25	0.21	92.35	147.79	543.24	0.00
44	☐	2-28	0.17	92.98	147.79	537.07	0.00
45	☐	2-30	0.19	93.00	147.79	536.87	0.00
46	☐	2-35	0.03	92.75	147.79	539.32	0.00
47	☐	2-38	0.18	93.32	147.79	533.73	0.00
48	☐	2-40	0.15	93.20	147.79	534.91	0.00
49	☐	2-45	0.14	93.45	147.79	532.46	0.00
50	☐	2-48	0.14	93.34	147.79	533.54	0.00

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
51	☐	2-50	0.00	93.20	147.79	534.91	0.00
52	☐	2-55	0.07	93.65	147.79	530.50	0.00
53	☐	2-58	0.12	93.67	147.79	530.30	0.00
54	☐	2-60	0.11	94.45	147.79	522.66	0.00
55	☐	2-65	0.04	94.75	147.79	519.72	0.00
56	☐	2-70	0.17	94.35	147.79	523.64	0.00
57	☐	2-75	0.24	93.30	147.79	533.93	0.00
58	☐	2-80	0.24	93.33	147.79	533.64	0.00
59	☐	2-85	0.26	93.33	147.79	533.63	0.00
60	☐	C1-02	0.24	91.20	147.79	554.51	0.00
61	☐	C1-04	0.18	91.30	147.79	553.53	0.00
62	☐	C1-06	0.18	91.40	147.79	552.55	0.00
63	☐	C1-08	0.33	91.00	147.79	556.46	0.00
64	☐	C1-10	0.09	91.45	147.78	552.03	0.00
65	☐	C1-12	0.14	91.45	147.78	552.03	0.00
66	☐	C1-14	0.12	91.45	147.78	552.03	0.00
67	☐	C1-16	0.08	91.65	147.78	550.07	0.00
68	☐	C1-18	0.11	91.65	147.78	550.06	0.00
69	☐	C1-20	0.12	91.70	147.78	549.57	0.00
70	☐	C1-22	0.19	91.90	147.78	547.61	0.00
71	☐	C1-24	0.13	91.85	147.78	548.10	0.00
72	☐	C1-26	0.14	91.90	147.78	547.61	0.00
73	☐	C1-28	0.15	91.90	147.78	547.61	0.00
74	☐	C1-30	0.11	91.70	147.78	549.57	0.00
75	☐	C1-32	0.07	91.80	147.78	548.59	0.00
76	☐	C1-34	0.28	91.55	147.78	551.05	0.00
77	☐	C1-36	0.14	91.55	147.78	551.05	0.00
78	☐	C1-38	0.17	91.45	147.78	552.03	0.00
79	☐	C1-40	0.25	91.55	147.78	551.05	0.00
80	☐	C1-42	0.30	91.30	147.79	553.52	0.00
81	☐	C1-44	0.19	91.15	147.78	554.98	0.00
82	☐	C1-46	0.19	91.35	147.78	553.01	0.00
83	☐	C1-48	0.15	91.55	147.78	551.05	0.00
84	☐	C1-50	0.10	91.60	147.78	550.56	0.00
85	☐	C1-52	0.19	91.30	147.79	553.52	0.00
86	☐	C1-54	0.19	91.15	147.79	554.98	0.00
87	☐	C1-56	0.12	91.45	147.79	552.04	0.00
88	☐	C1-60	0.30	91.00	147.79	556.46	0.00
89	☐	C1-62	0.15	91.50	147.79	551.55	0.00
90	☐	C1-64	0.12	91.65	147.78	550.07	0.00
91	☐	C1-66	0.15	91.55	147.78	551.05	0.00
92	☐	C1-68	0.08	91.75	147.78	549.09	0.00
93	☐	C1-70	0.04	91.85	147.78	548.11	0.00
94	☐	C1-72	0.10	92.00	147.78	546.63	0.00
95	☐	C1-74	0.17	91.90	147.78	547.61	0.00
96	☐	C1-76	0.14	91.70	147.78	549.57	0.00
97	☐	C1-78	0.11	91.80	147.78	548.60	0.00
98	☐	D-02	0.32	92.90	147.79	537.84	0.00
99	☐	D-04	0.31	94.35	147.78	523.61	0.00
100	☐	D-06	0.18	96.00	147.78	507.44	0.00

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
101	☐	D-08	0.34	93.00	147.79	536.86	0.00
102	☐	D-10	0.40	93.45	147.78	532.43	0.00
103	☐	D-12	0.43	93.85	147.78	528.50	0.00
104	☐	D-14	0.31	97.00	147.78	497.63	0.00
105	☐	D-16	0.27	92.90	147.78	537.83	0.00
106	☐	D-18	0.16	92.80	147.79	538.81	0.00
107	☐	D-20	0.05	92.90	147.78	537.83	0.00
108	☐	D-22	0.19	92.90	147.78	537.81	0.00
109	☐	D-24	0.18	92.90	147.78	537.82	0.00
110	☐	D-26	1.70	95.00	147.78	517.23	0.00
111	☐	RR01	0.00	89.85	147.80	567.86	0.00
112	☐	RR05	0.00	89.15	147.80	574.70	0.00
113	☐	RR10	0.23	88.91	147.80	577.05	0.00
114	☐	RR15	0.00	89.15	147.79	574.67	0.00
115	☐	RR25	0.08	88.90	147.79	577.09	0.00
116	☐	RR30	0.00	90.50	147.79	561.39	0.00
117	☐	SP-01	0.00	92.55	147.80	541.41	0.00
118	☐	SP-02	0.07	93.20	147.79	534.95	0.00
119	☐	SP-03	0.09	93.00	147.79	536.86	0.00
120	☐	SP-04	1.70	90.87	147.79	557.73	0.00

Peaqk Hour - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
1	☐	1A-05	1.68	89.95	123.87	332.42	0.00
2	☐	1A-10	0.96	89.90	123.90	333.17	0.00
3	☐	1A-15	0.48	89.80	123.93	334.47	0.00
4	☐	1A-20	0.70	90.90	123.79	322.34	0.00
5	☐	1A-25	0.80	90.90	123.77	322.13	0.00
6	☐	1A-30	0.75	90.91	123.75	321.85	0.00
7	☐	1A-35	0.76	90.80	123.75	322.92	0.00
8	☐	1A-40	1.74	89.86	123.76	332.21	0.00
9	☐	1A-45	1.44	89.79	123.77	332.94	0.00
10	☐	1A-50	0.78	89.54	123.78	335.51	0.00
11	☐	1A-55	0.72	89.55	123.77	335.32	0.00
12	☐	1A-60	0.86	90.77	123.74	323.10	0.00
13	☐	1A-65	1.41	89.60	123.74	334.57	0.00
14	☐	1A-70	1.56	90.80	123.70	322.36	0.00
15	☐	1A-75	1.56	90.19	123.69	328.24	0.00
16	☐	1A-80	0.66	90.45	123.69	325.68	0.00
17	☐	1A-85	0.84	91.12	123.69	319.11	0.00
18	☐	1A-90	0.72	91.13	123.68	318.99	0.00
19	☐	1A-95	0.48	91.08	123.66	319.24	0.00
20	☐	1A-97	7.87	90.87	123.67	321.40	0.00
21	☐	1B-05	1.69	91.40	123.77	317.21	0.00
22	☐	1B-10	1.21	91.00	123.76	321.01	0.00
23	☐	1B-15	1.14	90.95	123.75	321.39	0.00
24	☐	1B-20	1.06	91.00	123.74	320.85	0.00
25	☐	1B-25	1.29	91.20	123.75	318.95	0.00
26	☐	1B-30	0.68	91.40	123.78	317.27	0.00
27	☐	1B-35	1.14	91.25	123.71	318.11	0.00
28	☐	1B-40	1.16	91.15	123.69	318.85	0.00
29	☐	1B-45	1.14	91.30	123.69	317.37	0.00
30	☐	1B-50	0.83	91.25	123.70	317.98	0.00
31	☐	1B-55	0.61	91.35	123.69	316.88	0.00
32	☐	1B-60	1.21	91.25	123.68	317.75	0.00
33	☐	2-05	0.59	92.05	123.81	311.24	0.00
34	☐	2-10	0.60	93.20	123.81	299.97	0.00
35	☐	2-100	6.42	90.80	123.91	324.42	0.00
36	☐	2-105	0.24	91.00	123.99	323.31	0.00
37	☐	2-110	9.91	91.59	123.87	316.29	0.00
38	☐	2-115	0.83	92.40	123.83	307.95	0.00
39	☐	2-120	0.60	92.50	123.81	306.85	0.00
40	☐	2-125	15.24	92.60	123.81	305.82	0.00
41	☐	2-15	1.10	92.15	123.78	309.97	0.00
42	☐	2-20	1.14	94.50	123.78	286.93	0.00
43	☐	2-25	1.13	92.35	123.77	307.90	0.00
44	☐	2-28	0.91	92.98	123.77	301.71	0.00
45	☐	2-30	1.03	93.00	123.77	301.51	0.00
46	☐	2-35	0.18	92.75	123.77	303.96	0.00
47	☐	2-38	0.98	93.32	123.77	298.37	0.00
48	☐	2-40	0.83	93.20	123.77	299.56	0.00
49	☐	2-45	0.76	93.45	123.77	297.10	0.00
50	☐	2-48	0.76	93.34	123.77	298.20	0.00

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
51	☐	2-50	0.00	93.20	123.77	299.55	0.00
52	☐	2-55	0.38	93.65	123.77	295.19	0.00
53	☐	2-58	0.68	93.67	123.77	294.95	0.00
54	☐	2-60	0.61	94.45	123.77	287.32	0.00
55	☐	2-65	0.23	94.75	123.77	284.38	0.00
56	☐	2-70	0.93	94.35	123.79	288.49	0.00
57	☐	2-75	1.31	93.30	123.80	298.83	0.00
58	☐	2-80	1.32	93.33	123.81	298.65	0.00
59	☐	2-85	1.44	93.33	123.80	298.57	0.00
60	☐	C1-02	1.32	91.20	123.65	317.99	0.00
61	☐	C1-04	0.96	91.30	123.65	316.99	0.00
62	☐	C1-06	0.99	91.40	123.65	316.01	0.00
63	☐	C1-08	1.80	91.00	123.62	319.67	0.00
64	☐	C1-10	0.51	91.45	123.59	314.94	0.00
65	☐	C1-12	0.76	91.45	123.58	314.83	0.00
66	☐	C1-14	0.68	91.45	123.57	314.77	0.00
67	☐	C1-16	0.45	91.65	123.57	312.78	0.00
68	☐	C1-18	0.61	91.65	123.56	312.74	0.00
69	☐	C1-20	0.68	91.70	123.56	312.24	0.00
70	☐	C1-22	1.02	91.90	123.56	310.28	0.00
71	☐	C1-24	0.74	91.85	123.56	310.77	0.00
72	☐	C1-26	0.76	91.90	123.56	310.29	0.00
73	☐	C1-28	0.83	91.90	123.56	310.29	0.00
74	☐	C1-30	0.61	91.70	123.56	312.25	0.00
75	☐	C1-32	0.38	91.80	123.57	311.29	0.00
76	☐	C1-34	1.52	91.55	123.57	313.79	0.00
77	☐	C1-36	0.76	91.55	123.58	313.83	0.00
78	☐	C1-38	0.91	91.45	123.58	314.81	0.00
79	☐	C1-40	1.36	91.55	123.58	313.88	0.00
80	☐	C1-42	1.62	91.30	123.62	316.72	0.00
81	☐	C1-44	1.02	91.15	123.60	317.96	0.00
82	☐	C1-46	1.06	91.35	123.59	315.88	0.00
83	☐	C1-48	0.83	91.55	123.58	313.86	0.00
84	☐	C1-50	0.53	91.60	123.57	313.31	0.00
85	☐	C1-52	1.02	91.30	123.62	316.75	0.00
86	☐	C1-54	1.05	91.15	123.61	318.06	0.00
87	☐	C1-56	0.68	91.45	123.60	315.09	0.00
88	☐	C1-60	1.62	91.00	123.62	319.65	0.00
89	☐	C1-62	0.83	91.50	123.60	314.59	0.00
90	☐	C1-64	0.68	91.65	123.58	312.90	0.00
91	☐	C1-66	0.83	91.55	123.58	313.86	0.00
92	☐	C1-68	0.45	91.75	123.57	311.84	0.00
93	☐	C1-70	0.23	91.85	123.57	310.82	0.00
94	☐	C1-72	0.53	92.00	123.57	309.31	0.00
95	☐	C1-74	0.91	91.90	123.56	310.29	0.00
96	☐	C1-76	0.76	91.70	123.56	312.25	0.00
97	☐	C1-78	0.61	91.80	123.57	311.35	0.00
98	☐	D-02	1.74	92.90	123.81	302.87	0.00
99	☐	D-04	1.68	94.35	123.80	288.54	0.00
100	☐	D-06	0.96	94.50	123.79	287.02	0.00

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
101	☐	D-08	1.86	93.00	123.81	301.89	0.00
102	☐	D-10	2.23	93.45	123.80	297.37	0.00
103	☐	D-12	2.35	93.85	123.79	293.36	0.00
104	☐	D-14	1.68	95.00	123.79	282.09	0.00
105	☐	D-16	1.50	92.90	123.80	302.79	0.00
106	☐	D-18	0.90	92.80	123.81	303.84	0.00
107	☐	D-20	0.30	92.90	123.80	302.79	0.00
108	☐	D-22	1.02	92.90	123.79	302.69	0.00
109	☐	D-24	0.96	92.90	123.80	302.76	0.00
110	☐	D-26	1.70	95.00	123.79	282.09	0.00
111	☐	RR01	0.00	89.85	123.90	333.66	0.00
112	☐	RR05	0.00	89.15	123.86	340.17	0.00
113	☐	RR10	1.26	88.91	123.84	342.33	0.00
114	☐	RR15	0.00	89.15	123.79	339.46	0.00
115	☐	RR25	0.45	88.90	123.75	341.45	0.00
116	☐	RR30	0.00	90.50	123.69	325.24	0.00
117	☐	SP-01	0.00	92.55	124.00	308.18	0.00
118	☐	SP-02	0.36	93.20	123.88	300.62	0.00
119	☐	SP-03	0.48	93.00	123.82	301.99	0.00
120	☐	SP-04	1.70	90.87	123.81	322.83	0.00

Max Day + Fire (10,000 l/s) - Fireflow Design Report

		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
1	☐	1A-05	166.98	1,479.65	1A-05	139.97	104.23	1,479.69	139.96	139.96
2	☐	1A-10	166.85	14,225.00	1A-10	140.72	104.26	14,259.67	139.96	139.96
3	☐	1A-15	166.76	1,714.22	1A-15	139.97	104.08	1,714.28	139.96	139.96
4	☐	1A-20	166.80	397.38	1A-20	139.96	105.18	397.38	139.96	139.96
5	☐	1A-25	166.82	317.00	1A-25	139.96	105.18	317.00	139.96	139.96
6	☐	1A-30	166.81	397.46	1A-30	139.96	105.19	397.46	139.96	139.96
7	☐	1A-35	166.81	433.09	1A-35	139.96	105.08	433.09	139.96	139.96
8	☐	1A-40	166.99	346.97	1A-40	139.96	104.14	346.97	139.96	139.98
9	☐	1A-45	166.93	258.05	1A-45	139.96	104.07	258.05	139.96	139.96
10	☐	1A-50	166.81	457.79	1A-50	139.96	103.82	457.79	139.96	139.96
11	☐	1A-55	166.80	301.52	1A-55	139.96	103.83	301.52	139.96	139.96
12	☐	1A-60	166.83	666.11	1A-60	139.96	105.05	666.12	139.96	139.96
13	☐	1A-65	166.93	643.29	1A-65	139.96	103.88	643.29	139.96	139.96
14	☐	1A-70	166.95	327.25	1A-70	139.96	105.08	327.25	139.96	139.96
15	☐	1A-75	166.95	202.73	1A-75	139.96	104.47	202.73	139.96	139.96
16	☐	1A-80	166.79	201.15	1A-80	139.96	104.73	201.15	139.96	139.96
17	☐	1A-85	166.82	342.07	1A-85	139.96	105.40	342.07	139.96	139.96
18	☐	1A-90	166.80	389.12	1A-90	139.96	105.41	389.12	139.96	139.96
19	☐	1A-95	166.76	525.98	C1-72	131.97	105.47	510.60	139.96	148.03
20	☐	1A-97	168.39	549.79	C1-72	134.75	105.75	539.19	139.96	145.39
21	☐	1B-05	166.98	266.06	1B-05	139.96	105.68	266.06	139.96	139.97
22	☐	1B-10	166.89	260.16	1B-10	139.96	105.28	260.17	139.96	139.97
23	☐	1B-15	166.88	292.36	1B-15	139.96	105.23	292.36	139.96	139.96
24	☐	1B-20	166.86	659.31	1B-20	139.96	105.28	659.32	139.96	139.96
25	☐	1B-25	166.90	651.26	1B-25	139.96	105.48	651.27	139.96	139.96
26	☐	1B-30	166.82	558.83	1B-30	139.96	105.68	558.83	139.96	139.96
27	☐	1B-35	166.88	296.23	1B-35	139.96	105.53	296.23	139.96	139.96
28	☐	1B-40	166.88	368.36	1B-40	139.96	105.43	368.36	139.96	139.96
29	☐	1B-45	166.88	342.99	1B-45	139.96	105.58	342.99	139.96	139.96
30	☐	1B-50	166.82	344.49	1B-50	139.96	105.53	344.49	139.96	139.96
31	☐	1B-55	166.78	255.92	1B-55	139.96	105.63	255.92	139.96	139.96
32	☐	1B-60	166.89	334.87	1B-60	139.96	105.53	334.87	139.96	139.96
33	☐	2-05	166.78	576.06	2-10	128.69	106.33	551.21	139.96	151.23
34	☐	2-10	166.78	327.83	2-10	139.96	107.48	327.83	139.96	139.97
35	☐	2-100	168.96	723.61	2-100	139.96	105.08	723.61	139.96	139.96
36	☐	2-105	166.71	7,088.04	2-105	140.15	105.30	7,092.53	139.96	139.96
37	☐	2-110	170.24	600.22	2-110	139.96	105.87	600.22	139.96	139.96
38	☐	2-115	166.82	531.60	2-115	139.96	106.68	531.60	139.96	139.96
39	☐	2-120	166.78	516.60	2-120	139.96	106.78	516.60	139.96	139.96
40	☐	2-125	169.44	497.77	2-125	139.96	106.88	497.77	139.96	139.99
41	☐	2-15	166.87	248.37	2-20	116.93	106.43	226.28	139.96	162.99
42	☐	2-20	166.88	116.30	2-20	139.96	108.78	116.30	139.96	139.96

		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
43	☐	2-25	166.88	216.95	2-25	139.96	106.63	216.95	139.96	139.96
44	☐	2-28	166.84	185.04	2-28	139.96	107.26	185.04	139.96	139.96
45	☐	2-30	166.86	175.51	2-30	139.96	107.28	175.51	139.96	139.96
46	☐	2-35	166.70	146.22	2-35	139.96	107.03	146.22	139.96	139.96
47	☐	2-38	166.85	172.00	2-38	139.96	107.60	172.00	139.96	139.96
48	☐	2-40	166.82	198.62	2-40	139.96	107.48	198.62	139.96	139.96
49	☐	2-45	166.81	189.97	2-45	139.96	107.73	189.97	139.96	139.96
50	☐	2-48	166.81	187.82	2-48	139.96	107.62	187.82	139.96	139.96
51	☐	2-50	166.67	153.13	2-50	139.96	107.48	153.13	139.96	139.96
52	☐	2-55	166.74	211.25	2-65	136.94	108.72	208.42	139.96	143.18
53	☐	2-58	166.79	169.72	2-58	139.96	107.95	169.72	139.96	139.96
54	☐	2-60	166.78	167.49	2-65	137.02	108.73	165.32	139.96	142.90
55	☐	2-65	166.71	97.51	2-65	139.96	109.03	97.51	139.96	139.96
56	☐	2-70	166.84	258.55	2-70	139.96	108.63	258.55	139.96	139.96
57	☐	2-75	166.91	230.90	2-75	139.96	107.58	230.90	139.96	139.96
58	☐	2-80	166.91	249.38	2-80	139.96	107.61	249.38	139.96	139.97
59	☐	2-85	166.93	262.27	2-85	139.96	107.61	262.27	139.96	139.97
60	☐	C1-02	166.91	495.04	C1-72	135.05	105.78	485.99	139.96	145.01
61	☐	C1-04	166.85	470.19	C1-04	139.96	105.58	470.19	139.96	139.98
62	☐	C1-06	166.85	452.82	C1-06	139.96	105.68	452.82	139.96	139.98
63	☐	C1-08	167.00	258.74	C1-08	139.96	105.28	258.74	139.96	139.96
64	☐	C1-10	166.76	302.96	C1-10	139.96	105.73	302.96	139.96	139.96
65	☐	C1-12	166.81	271.42	C1-12	139.96	105.73	271.42	139.96	139.96
66	☐	C1-14	166.79	263.00	C1-14	139.96	105.73	263.00	139.96	139.96
67	☐	C1-16	166.75	253.77	C1-32	139.24	106.01	253.07	139.96	140.69
68	☐	C1-18	166.78	232.86	C1-22	138.33	106.02	231.42	139.96	141.61
69	☐	C1-20	166.79	198.69	C1-20	139.96	105.98	198.69	139.96	139.97
70	☐	C1-22	166.86	176.39	C1-22	139.96	106.18	176.39	139.96	139.96
71	☐	C1-24	166.80	179.85	C1-24	139.96	106.13	179.85	139.96	139.96
72	☐	C1-26	166.81	222.51	C1-26	139.96	106.18	222.51	139.96	139.98
73	☐	C1-28	166.82	219.32	C1-28	139.96	106.18	219.32	139.96	139.98
74	☐	C1-30	166.78	213.92	C1-30	139.96	105.98	213.92	139.96	139.97
75	☐	C1-32	166.74	204.10	C1-32	139.96	106.08	204.10	139.96	139.97
76	☐	C1-34	166.95	203.24	C1-34	139.96	105.83	203.24	139.96	139.97
77	☐	C1-36	166.81	217.21	C1-36	139.96	105.83	217.21	139.96	139.97
78	☐	C1-38	166.84	223.77	C1-38	139.96	105.73	223.77	139.96	139.98
79	☐	C1-40	166.92	209.28	C1-40	139.96	105.83	209.28	139.96	139.97
80	☐	C1-42	166.97	341.58	C1-42	139.96	105.58	341.58	139.96	139.96
81	☐	C1-44	166.86	330.29	C1-44	139.96	105.43	330.29	139.96	139.96
82	☐	C1-46	166.86	238.42	C1-46	139.96	105.63	238.42	139.96	139.96
83	☐	C1-48	166.82	247.23	C1-48	139.96	105.83	247.23	139.96	139.96
84	☐	C1-50	166.77	242.69	C1-50	139.96	105.88	242.69	139.96	139.96

		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
85	☐	C1-52	166.86	265.27	C1-52	139.96	105.58	265.27	139.96	139.96
86	☐	C1-54	166.86	268.06	C1-54	139.96	105.43	268.06	139.96	139.96
87	☐	C1-56	166.79	248.97	C1-56	139.96	105.73	248.97	139.96	139.96
88	☐	C1-60	166.97	263.30	C1-60	139.96	105.28	263.30	139.96	139.96
89	☐	C1-62	166.82	278.10	C1-62	139.96	105.78	278.11	139.96	139.96
90	☐	C1-64	166.79	252.45	C1-64	139.96	105.93	252.45	139.96	139.96
91	☐	C1-66	166.82	221.50	C1-66	139.96	105.83	221.50	139.96	139.98
92	☐	C1-68	166.75	231.32	C1-68	139.96	106.03	231.32	139.96	139.99
93	☐	C1-70	166.71	197.37	C1-70	139.96	106.13	197.37	139.96	139.97
94	☐	C1-72	166.77	207.54	C1-72	139.96	106.28	207.54	139.96	139.97
95	☐	C1-74	166.84	214.55	C1-74	139.96	106.18	214.55	139.96	139.97
96	☐	C1-76	166.81	224.14	C1-76	139.96	105.98	224.14	139.96	139.98
97	☐	C1-78	166.78	213.22	C1-78	139.96	106.08	213.22	139.96	139.97
98	☐	D-02	166.99	401.66	D-14	124.12	107.67	374.85	139.96	156.40
99	☐	D-04	166.98	311.54	D-14	133.58	108.63	302.68	139.96	146.36
100	☐	D-06	166.85	253.39	D-14	135.06	108.78	247.81	139.96	144.87
101	☐	D-08	167.01	266.46	D-08	139.96	107.28	266.46	139.96	139.96
102	☐	D-10	167.07	218.65	D-10	139.96	107.73	218.65	139.96	139.96
103	☐	D-12	167.10	217.56	D-12	139.96	108.13	217.56	139.96	139.96
104	☐	D-14	166.98	196.50	D-14	139.96	109.28	196.50	139.96	139.96
105	☐	D-16	166.94	225.03	D-20	139.96	107.18	225.03	139.96	139.96
106	☐	D-18	166.83	262.75	D-18	139.96	107.08	262.75	139.96	139.97
107	☐	D-20	166.72	144.10	D-20	139.96	107.18	144.10	139.96	139.96
108	☐	D-22	166.86	251.12	D-14	125.02	107.76	235.24	139.96	155.56
109	☐	D-24	166.85	231.05	D-24	139.96	107.18	231.05	139.96	139.96
110	☐	RR01	166.67	6,367.29	RR01	140.11	104.15	6,370.64	139.96	139.96
111	☐	RR05	166.67	844.84	RR05	139.96	103.43	844.85	139.96	139.96
112	☐	RR10	166.90	1,268.53	RR10	139.97	103.19	1,268.56	139.96	139.96
113	☐	RR15	166.67	964.30	C1-72	135.59	105.84	948.67	139.96	145.05
114	☐	RR25	166.75	810.06	C1-72	122.68	104.52	761.36	139.96	158.71
115	☐	RR30	166.67	586.28	C1-72	135.80	105.86	577.17	139.96	144.41
116	☐	SP-01	166.67	5,971.24	SP-01	140.10	106.85	5,974.27	139.96	139.95
117	☐	SP-02	166.74	567.09	SP-02	139.96	107.48	567.09	139.96	139.96
118	☐	SP-03	166.76	509.97	D-14	121.20	107.37	470.32	139.96	158.86

APPENDIX C

STANTEC CONSULTING LTD.
400 1331 CLYDE AVENUE
OTTAWA, ON
TEL. 613.722.4420
WWW.STANTEC.COM

Legend

- Major Water
- Parcels
- Streets
- Rideau River Study Area
- Pond 5

Catchments

- **Catchment Name**
  Catchment Size (ha)

Sanitary Manholes

- **Sanitary Manholes**
- Existing Sanitary Sewers
- Recommended Sanitary Sewers

Client / Project:

CITY OF OTTAWA

RIVERSIDE SOUTH ISSU UPDATE

OTTAWA, ON

Title:

SANITARY DRAINAGE PLAN

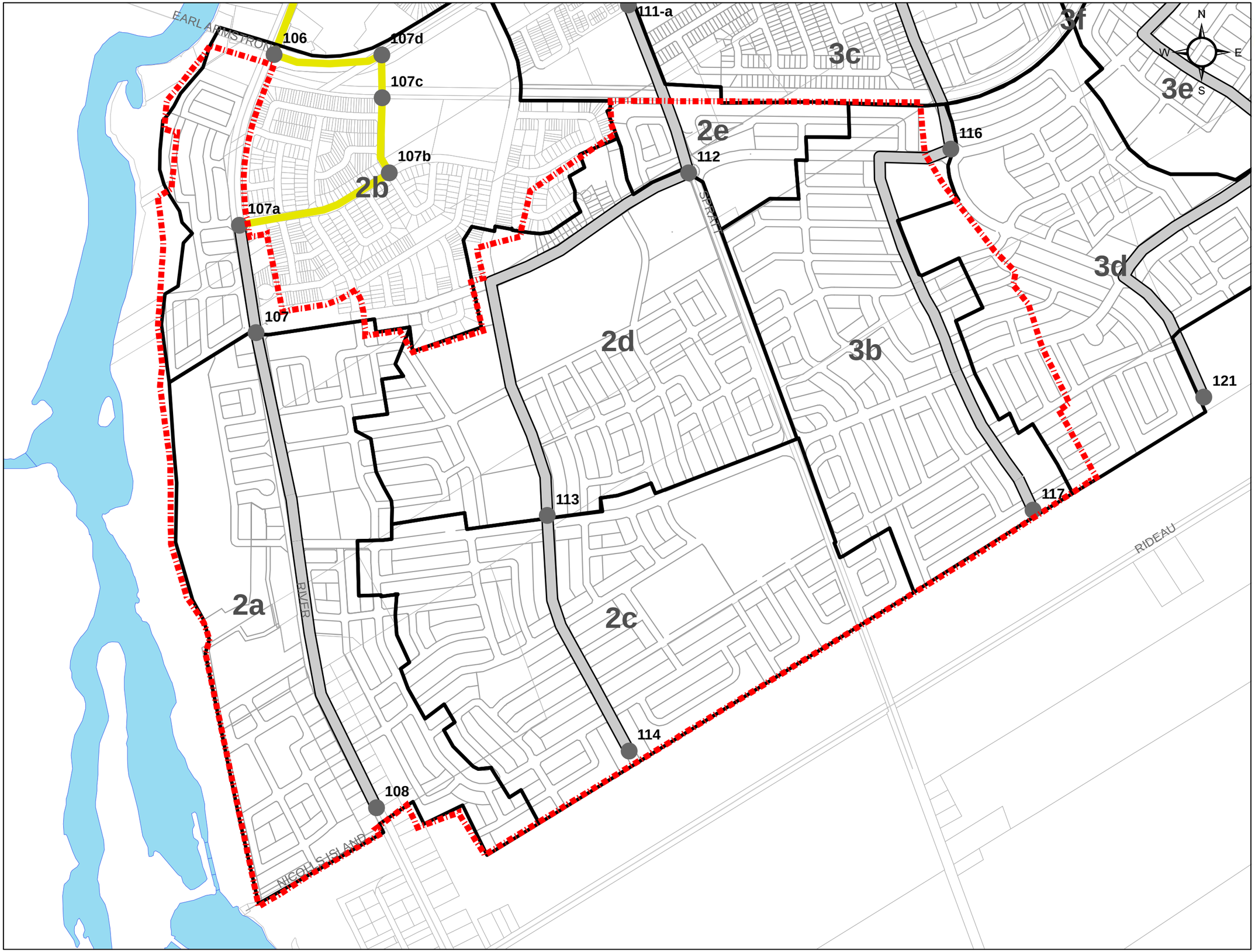
Project No.: **163401101**

Scale: 0 125 250 500 Meters

Drawing No.: **SAN-1**

Sheet: **6 of 7**

Revision: **0**



STANTEC CONSULTING LTD.
400 1331 CLYDE AVENUE
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WWW.STANTEC.COM

Legend

- Rideau River Study Area
- Recomended Sanitary Catchments
- Sanitary Manholes
- Constructed Sanitary Sewers
- Recommended Sanitary Sewers

Client / Project:

CITY OF OTTAWA

RIVERSIDE SOUTH ISSU UPDATE

OTTAWA, ON

Title:

RECOMMENDED SANITARY SERVICING (2017 UPDATE)

Project No.: **163401101**

Scale: 0 62.5 125 250 Meters

Figure No.: **4-2**

Stantec

Riverside South Community
Infrastructure Servicing Study

Revision Date: June 5, 2017
Revison : 3
Designed by: Megan Young
Checked By: Amanda Lynch

SANITARY SEWER DESIGN SHEET

CITY CRITERIA & DENSITIES
Approved area

File Number: 1634-01101

DESIGN PARAMETERS

Average Daily Flow / Person:	350	l/p/day	Commercial:	0.579	l/s/ha
Minimum Velocity:	0.60	m/s	Employment	0.579	l/s/ha
n =	0.013		Institutional:	0.579	l/s/ha
Max Peaking Factor:	4.0		Infiltration:	0.280	l/s/ha
Min. Peaking Factor:	2.0				
Peaking Factor Industrial:	Based on Appendix 4-B		Low Density:	@ 3.2	pers/unit
Peaking Factor Comm. / Inst.:	1.5		Medium Density:	@ 2.4	pers/unit
			High Density:	@ 1.9	pers/unit

Existing Sanitary Sewer flows estimated by existing land use. Existing Phase 9 area contribution based on JLR 2011 report

STREET	ID Area	From MH	To MH	RESIDENTIAL AREA (ha)	LOW Area (ha)	LOW Pop.	LOW Accum. Pop.	MED Area (ha)	MED Pop.	MED Accum. Pop.	HIGH Area (ha)	HIGH Pop.	HIGH Accum. Pop.	Units	Accum. Units	Total Accum. Pop.	Peak Factor	Peak Flow (l/s)	COMMERCIAL Area (ha)	COMMERCIAL Accum. Area (ha)	EMPLOYMENT Area (ha)	EMPLOYMENT Accum. Area (ha)	INSTITUTIONAL Area (ha)	INSTITUTIONAL Accum. Area (ha)	C+I+I Peak Flow (l/s)	ROAD Area (ha)	ROAD Accum. Area (ha)	INFILTRATION Total Area (ha)	INFILTRATION Accum. Area (ha)	Infilt. Flow (l/s)	Total Flow (l/s)	PIPE Distance (m)	Diameter (mm)	Slope (%)	Qa/Qc	Capacity (Full) (l/s)	Velocity (Full) (m/s)	Velocity (Actual) (m/s)
RIVER ROAD	**2a**	108	107	50.51	44.40	2189	2189	6.11	389	389	0.00	0	0	846	846	2578	3.5	36.5	1.19	1.19	0.00	0.00	1.01	1.01	1.9	4.48	4.48	57.18	57.18	16.0	54.4	1255	450	0.12	0.53	103.0	0.63	0.63
RIVER ROAD	**2b Future**	107	107a	12.21	10.22	502	2691	1.99	127	516	0.00	0	0	210	1056	3207	3.4	44.4	0.00	1.19	0.00	0.00	0.00	1.01	1.9	2.64	7.12	14.85	72.03	20.2	66.5	254	525	0.12	0.43	155.4	0.70	0.66
RIVER ROAD	**2b Existing (Phase 9)**	107a	107b	43.20	43.20	2351	5042	0.00	0	516	0.00	0	0	N/A	1056	5558	3.2	72.1	0.00	1.19	0.00	0.00	2.46	3.47	4.0	0.00	7.12	45.66	117.69	33.0	109.1	**405**	**525**	**0.10**	**0.76**	**144.5**	**0.65**	**0.71**
RIVER ROAD		107b	107c	0.00	0.00	0	5042	0.00	0	516	0.00	0	0	0	1056	5558	3.2	72.1	0.00	1.19	0.00	0.00	0.00	3.47	4.0	0.00	7.12	0.00	117.69	33.0	109.1	**217**	**525**	**0.12**	**0.72**	**152.3**	**0.68**	**0.74**
RIVER ROAD		107c	107d	0.00	0.00	0	5042	0.00	0	516	0.00	0	0	0	1056	5558	3.2	72.1	0.00	1.19	0.00	0.00	0.00	3.47	4.0	4.70	11.82	4.70	122.39	34.3	110.4	**107**	**525**	**0.10**	**0.77**	**143.9**	**0.64**	**0.71**
		107d	106	0.00	0.00	0	5042	0.00	0	516	0.00	0	0	0	1056	5558	3.2	72.1	0.00	1.19	0.00	0.00	0.00	3.47	4.0	0.00	11.82	0.00	122.39	34.3	110.4	**278**	**525**	**0.08**	**0.90**	**123.3**	**0.55**	**0.63**
	Ex3	106	103	17.90	10.04	413	5455	7.86	564	1080	0.00	0	0	364	1420	6535	3.1	83.0	5.35	6.54	0.00	0.00	0.00	3.47	8.7	0.00	11.82	23.25	145.64	40.8	132.5	**835**	**525**	**0.10**	**0.93**	**141.9**	**0.63**	**0.73**
	Ex2	103	102	16.42	16.42	573	6028	0.00	0	1080	0.00	0	0	179	1599	7108	3.1	89.3	0.00	6.54	0.00	0.00	0.00	3.47	8.7	5.11	16.93	21.53	167.17	46.8	144.8	**1100**	**525**	**0.10**	**1.02**	**141.9**	**0.63**	**0.74**
SPRATT SOUTH	**2c**	114	113	53.79	51.84	2554	2554	1.95	125	125	0.00	0	0	850	850	2679	3.5	37.8	0.00	0.00	0.00	0.00	7.68	7.68	6.7	5.93	5.93	67.41	67.41	18.9	63.4	695	450	0.11	0.64	98.6	0.60	0.64
SPRATT SOUTH	**2d**	113	112	39.28	28.89	1424	3978	10.40	665	790	0.00	0	0	722	1572	4768	3.3	63.0	0.00	0.00	0.00	0.00	14.95	22.63	19.7	5.45	11.38	59.69	127.09	35.6	118.3	1155	525	0.11	0.79	148.8	0.67	0.74
SPRATT SOUTH	**2e**	112	111-a	17.48	0.00	0	3978	13.28	847	1637	4.19	479	479	605	2177	6094	3.2	78.1	2.55	2.55	0.00	0.00	0.00	22.63	21.9	6.14	17.52	26.17	153.26	42.9	142.9	470	525	0.12	0.92	155.4	0.70	0.80
SPRATT SOUTH		111-a	111	0.00	0.00	0	3978	0.00	0	1637	0.00	0	479	0	2177	6094	3.2	78.1	0.00	2.55	0.00	0.00	0.00	22.63	21.9	0.00	17.52	0.00	153.26	42.9	142.9	215	525	0.11	0.96	148.8	0.67	0.77
SPRATT SOUTH	**Ex4**	111	110	14.93	13.31	90	4068	1.62	468	2105	0.00	0	479	223	2400	6652	3.1	84.3	0.91	3.46	0.00	0.00	0.00	22.63	22.7	0.00	17.52	15.84	169.10	47.3	154.3	**600**	**525**	**0.12**	**0.99**	**155.4**	**0.70**	**0.81**
SHORELINE DRIVE	**3b**	117	116	48.13	43.40	2138	2138	4.73	302	302	0.00	0	0	794	794	2440	3.5	34.8	0.66	0.66	0.00	0.00	0.05	0.05	0.6	2.77	2.77	51.60	51.60	14.4	49.8	1270	450	0.11	0.51	98.6	0.60	0.60
SHORELINE DRIVE	**3c**	116	115	47.51	27.40	1350	3488	15.47	989	1291	4.64	530	530	1113	1907	5309	3.2	69.3	0.00	0.66	0.00	0.00	11.13	11.17	10.3	10.02	12.79	68.67	120.26	33.7	113.2	990	450	0.17	0.92	122.6	0.75	0.86
SHORELINE DRIVE	**Ex5**	115	110	20.60	14.47	480	3968	6.13	302	1593	0.00	0	530	276	2183	6091	3.2	78.1	0.80	1.46	0.00	0.00	3.16	14.33	13.7	0.00	12.79	24.56	144.82	40.6	132.3	**480**	**450**	**0.20**	**0.99**	**133.0**	**0.81**	**0.94**
SPRATT SOUTH	**Ex6**	110	109	25.47	20.32	822	8858	5.15	288	3986	0.00	0	1009	377	4960	13853	2.8	157.9	0.00	4.92	0.00	0.00	2.39	39.36	38.5	0.00	30.31	27.86	341.78	95.7	292.0	**675**	**675**	**0.12**	**0.96**	**303.8**	**0.82**	**0.95**
CANYON WALK DRIVE	**3d**	121	120	46.05	35.39	1744	1744	10.66	679	679	0.00	0	0	828	828	2423	3.5	34.5	0.60	0.60	0.00	0.00	3.72	3.72	3.8	5.41	5.41	55.78	55.78	15.6	53.9	820	450	0.15	0.47	115.2	0.70	0.69
CANYON WALK DRIVE	**3e**	120	119	54.06	40.27	1984	3728	13.79	881	1560	0.00	0	0	987	1815	5288	3.2	69.0	0.00	0.60	0.00	0.00	3.91	7.63	7.2	9.21	14.62	67.19	122.97	34.4	110.6	925	525	0.18	0.58	190.3	0.85	0.89
CANYON WALK DRIVE	**3f-4a**	119	118	17.44	0.00	0	3728	3.06	194	1754	14.38	1007	1007	577	2392	6489	3.1	82.5	6.01	6.61	0.00	0.00	5.28	12.92	17.0	16.75	31.37	45.49	168.46	47.2	146.6	880	525	0.19	0.75	195.6	0.88	0.97
internal south	**6a**	123	122	49.84	31.53	1555	1555	18.31	1169	1169	0.00	0	0	973	973	2724	3.5	38.4	1.18	1.18	0.00	0.00	5.33	5.33	5.7	6.44	6.44	62.80	62.80	17.6	61.6	600	525	0.14	0.37	167.9	0.75	0.68
ARMSTRONG ROAD	**4b**	122	118	58.24	0.00	0	1555	0.00	0	1169	58.24	4070	4070	2005	2978	6794	3.1	85.8	24.34	25.53	0.00	0.00	0.00	5.33	26.8	24.91	31.35	107.49	170.29	47.7	160.3	1810	600	0.13	0.69	231.0	0.79	0.86
CANYON WALK DRIVE	**Ex1**	118	124	45.64	22.12	896	6179	23.52	1687	4610	0.00	0	5077	983	6353	15866	2.8	177.0	1.55	33.69	0.00	0.00	0.00	18.25	45.1	0.00	62.72	47.19	385.94	108.1	330.2	**860**	**750**	**0.15**	**0.73**	**449.8**	**0.99**	**1.08**
SPRATT ROAD	**5c**	130	129	25.52	20.06	989	989	5.46	348	348	0.00	0	0	454	454	1337	3.7	20.1	0.00	0.00	0.00	0.00	2.38	2.38	2.1	4.86	4.86	32.77	32.77	9.2	31.4	420	600	0.15	0.13	248.1	0.85	0.56
SPRATT ROAD	**1a**	129	128	10.26	7.00	346	1335	3.26	209	557	0.00	0	0	195	649	1892	3.6	27.6	0.00	0.00	0.00	0.00	0.00	2.38	2.1	7.76	12.63	18.02	50.79	14.2	43.9	450	675	0.15	0.13	339.6	0.92	0.61
SPRATT ROAD	**1b**	128	127	18.80	4.11	202	1537	13.56	866	1423	1.13	129	129	492	1141	3089	3.4	42.9	0.00	0.00	0.00	0.00	2.82	5.20	4.5	5.34	17.97	26.97	77.76	21.8	69.2	490	675	0.15	0.20	339.6	0.92	0.70
internal north	**5b**	135	134	17.31	10.06	496	496	7.25	463	463	0.00	0	0	348	348	959	3.8	14.8	0.00	0.00	0.00	0.00	0.03	0.03	0.0	1.32	1.32	18.66	18.66	5.2	20.1	385	375	0.15	0.28	70.8	0.62	0.53
internal north	**1d**	134	127	21.95	12.43	611	1107	9.52	607	1070	0.00	0	0	444	792	2177	3.6	31.4	2.66	2.66	0.00	0.00	0.01	0.04	2.3	4.33	5.66	28.95	47.61	13.3	47.0	550	375	0.15	0.66	70.8	0.62	0.67
	BP-1	137	127	39.70	20.70	1173	1173	17.00	1019	1019	2.00	398	398	891	891	2590	3.5	36.7	0.00	0.00	16.18	16.18	0.00	0.00	9.4	6.81	6.81	62.69	62.69	17.6	63.6	725	375	0.15	0.90	70.8	0.62	0.71
SPRATT ROAD	**1c**	127	126	14.01	0.00	0	3817	8.98	574	4086	5.03	574	1101	541	3365	9004	3.0	109.4	0.74	3.40	0.00	16.18	6.60	11.84	22.6	6.42	36.86	27.77	215.82	60.4	192.4	795	750	0.15	0.43	449.8	0.99	0.94
internal north	**5a**	133	132	11.48	4.65	230	230	6.83	437	437	0.00	0	0	254	254	667	3.9	10.6	1.02	1.02	0.00	0.00	1.15	1.15	1.9	4.02	4.02	17.68	17.68	5.0	17.4	410	375	0.15	0.25	70.8	0.62	0.50
internal north	**1e**	132	126	34.06	22.08	1088	1318	11.98	766	1203	0.00	0	0	659	913	2521	3.5	35.8	0.00	1.02	0.00	0.00	1.37	2.52	3.1	6.18	10.21	41.61	59.29	16.6	55.5	810	450	0.15	0.48	115.2	0.70	0.69
	BP-2	138	126	0.11	0.00	0	0	0.11	7	7	0.00	0	0	3	3	7	4.0	0.1	0.00	0.00	15.00	15.00	0.00	0.00	8.7	1.48	1.48	16.59	16.59	4.6	13.4	440	375	0.15	0.19	70.8	0.62	0.46
SPRATT ROAD	**1g**	126	125	14.19	1.66	83	5218	9.47	605	5901	3.05	348	1449	461	4742	12568	2.9	145.4	0.98	5.40	0.00	31.18	10.12	24.48	44.0	3.45	52.00	28.74	320.44	89.7	279.1	710	750	0.17	0.58	478.9	1.05	1.09
SPRATT ROAD	**1f**	131	125	9.29	5.05	250	250	4.24	271	271	0.00	0	0	191	191	521	4.0	8.4	0.00	0.00	0.00	0.00	0.00	0.00	0.0	3.48	3.48	12.77	12.77	3.6	11.9	420	300	0.20	0.26	45.1	0.62	0.51
	BP3	136	125	0.00	0.00	0	0	0.00	0	0	0.00	0	0	0	0	0	0.0	0.0	0.00	0.00	38.46	38.46	0.00	0.00	22.3	5.69	5.69	44.15	44.15	12.4	34.6	986	375	0.14	0.51	68.4	0.60	0.60
SPRATT ROAD	**1h**	125	124	1.69	0.00	0	5468	1.69	108	6280	0.00	0	1449	45	4978	13197	2.8	151.5	2.20	7.60	0.00	69.64	1.66	26.14	69.6	3.04	64.20	8.59	385.95	108.1	329.2	**830**	**900**	**0.15**	**0.45**	**731.4**	**1.11**	**1.07**
SPRATT ROAD	**Ex7**	124	109	17.26	11.40	768	12415	3.00	250	11140	2.86	327	6853	516	11847	30408	2.5	304.4	0.64	41.93	0.00	69.64	0.00	44.39	115.3	0.00	126.93	17.90	789.79	221.1	640.9	**515**	**1050**	**0.15**	**0.58**	**1103.3**	**1.23**	**1.28**
CANYON WALK DRIVE	**Ex8**	109	102	56.40	54.40	2150	23423	2.00	134	15260	0.00	0	7862	728	17535	46545	2.3	432.5	0.00	46.85	0.00	69.64	0.00	83.75	153.7	5.45	162.68	61.85	1193.42	334.2	920.4	**1100**	**1050**	**0.15**	**0.83**	**1103.3**	**1.23**	**1.39**
SPRATT ROAD	**BP-4**	139	102	0.00	0.00	0	0	0.00	0	0	0.00	0	0	0	0	0	0.0	0.0	0.00	0.00	127.52	127.52	0.00	0.00	169.8	19.76	19.76	147.28	147.28	41.2	211.1	2790	675	0.15	0.62	339.6	0.92	0.97
CROSSING		102	101	0			29451			16340			7862		**19134**	**53653**	2.2	486.0		53.39		197.16		87.21	384.7		199.37	0	1507.87	422.2	1292.9	**145**	**1200**	**0.11**	**0.96**	**1349.0**	**1.16**	**1.33**

CROSSING

***Note:**
Area BP-4 also accounts for additional 39ha area outside the CDP that was accounted for in calculation of Employment Area
PIPE Capacity (Full) calculated using ACTUAL PIPE SIZE
Limiting Capacity Calculated based on 1200 mm pipe @ 0.11% between Rideau Road and River
Additional sanitary flow of 29.21 L/s from Rideau Carleton Raceway (RCR) is not included in the above calculation, as it is proposed that flow from this area be pumped into the system at off-peak times

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Memorandum

To/Attention:	John Sevigny, City of Ottawa Marcel Denomme, Urbandale (RSDC) Jim Burghout, Claridge Homes	**Date:**	July 25, 2017
From:	Robert W. Wingate	**Project No:**	38269-5.3.1
cc:			
Subject:	**DEVIATION REPORT MEMORANDUM RIVERSIDE SOUTH, RIDEAU RIVER DRAINAGE AREA SANITARY SEWER DESIGN PARAMETERS**		

INTRODUCTION:

Urbandale Corporation (RSDC), Claridge Homes and Cardel Homes are in the process of advancing the development of their lands in Riverside South located in the area known as the Rideau River Drainage Area (Figure A-1 illustrates the ownership limits).

As part of the draft plan approval process, IBI Group has been retained to prepare "Adequacy of Services Reports" to support the proposed development of the RSDC lands and the Claridge lands. In reviewing the Final Master Servicing Study (MSS) IBI Group has determined that an alternative method of calculating the design flow for the trunk sanitary sewer in River Road will be beneficial to the design of the internal sanitary sewer system for the subject area, and will ultimately benefit development of the overall development area.

PURPOSE:

The purpose of this memorandum is to present the alternative method of design for the River Road Sanitary Collector Sewer, identify the benefits of implementing the proposed deviation, and request approval to proceed with the implementation of the proposed deviation in design procedure.

JUSTIFICATION:

In advancing the detailed local sanitary sewer system layout for the development lands in the Rideau River Drainage Area west of Spratt Road, it became apparent that the drainage divide between the River Road Sanitary Collector Sewer and the Spratt Road Collector Sewer was problematic as presented in the recent update to the MSS for this area. The combination of the Spratt Road Collector Sewer being significantly higher than the River Road Collector, and the fact that the existing ground surface drops off significantly between the Spratt Road Collector and the current drainage divide is problematic as proposed in the updated MSS. It is problematic because these facts combine to produce a high risk of grade raise issues along the corridor between the Spratt Road sewer and the drainage divide. This grade raise risk is further compounded by the fact that the MSS drainage proposal results in reverse flowing sewers between the sanitary sewer and storm sewer on most streets in that area.

John Sevigny, City of Ottawa
Marcel Denomme, Urbandale (RSDC)
Jim Burghout, Claridge Homes
July 25, 2017

The simple solution to resolve all these issues is to expand the drainage limit of the deeper River Road Collector sewer easterly. Figure A-2 illustrates the proposed expansion of the River Road Collector Sewer Drainage Area. This adjustment to the drainage area reduces the potential for grade raise issues, maximizes the use of parallel sewers in the local road network, and improves the phasing potential for all three developers.

The problem with implementing the proposed expansion of the River Road Collector Sewer drainage area is that the free flow design capacity of the existing River Road Collector Sewer is exceeded using the City of Ottawa's current design guideline design parameter for sanitary sewers. To alleviate this theoretical issue we have evaluated the River Road Sanitary Collector Sewer using monitored parameters for the existing development area tributary to the River Road Collector Sewer, and the City's proposed revised sanitary sewer design parameters, as presented in Table 1, for the remainder of the development area tributary to the River Road Collector Sewer. The attached spreadsheet was created to replicate the sanitary spreadsheet in the current MSS. The City's proposed revised design parameters were then applied to the un-built area tributary to the River Road Collector Sewer using the proposed expanded drainage area (see pink highlighted section of spreadsheet). The modified spreadsheet demonstrates that the River Road Collector Sewer's capacity under free flow conditions is not exceeded at build-out under this design scenario.

CONCLUSION:

Given the significance of the benefits to expanding the River Road Sanitary Collector Sewers drainage area easterly, including reducing the risk of grade raise issues, maximizing the use of parallel sanitary and storm sewers, and enhancing construction phasing potential for all three developers involved, it is recommended that the City approve the use of the revised sanitary sewer design parameters for use in the Riverside South Rideau River Drainage Area in advance of formal approval of these revised parameters. In considering this recommendation, it should also be noted that shifting the drainage areas as proposed will provide additional residual capacity in the more easterly Spratt Road Sanitary Collector Sewer. This will help support more intensification beyond that currently proposed in the existing CDP for the eastern portion of the development area. This is consistent with the City's Building Better Smarter Suburbs (BBSS) initiative and the recent decision to extend the next phase of the LRT to Riverside South. Given these recent facts the City may want to approve the use of the proposed revised sanitary sewer design parameters for all of Riverside South at this time, to maximize the implementation of the BBSS initiative and further support the imminent extension of the LRT to Riverside South by facilitating additional intensification of development.

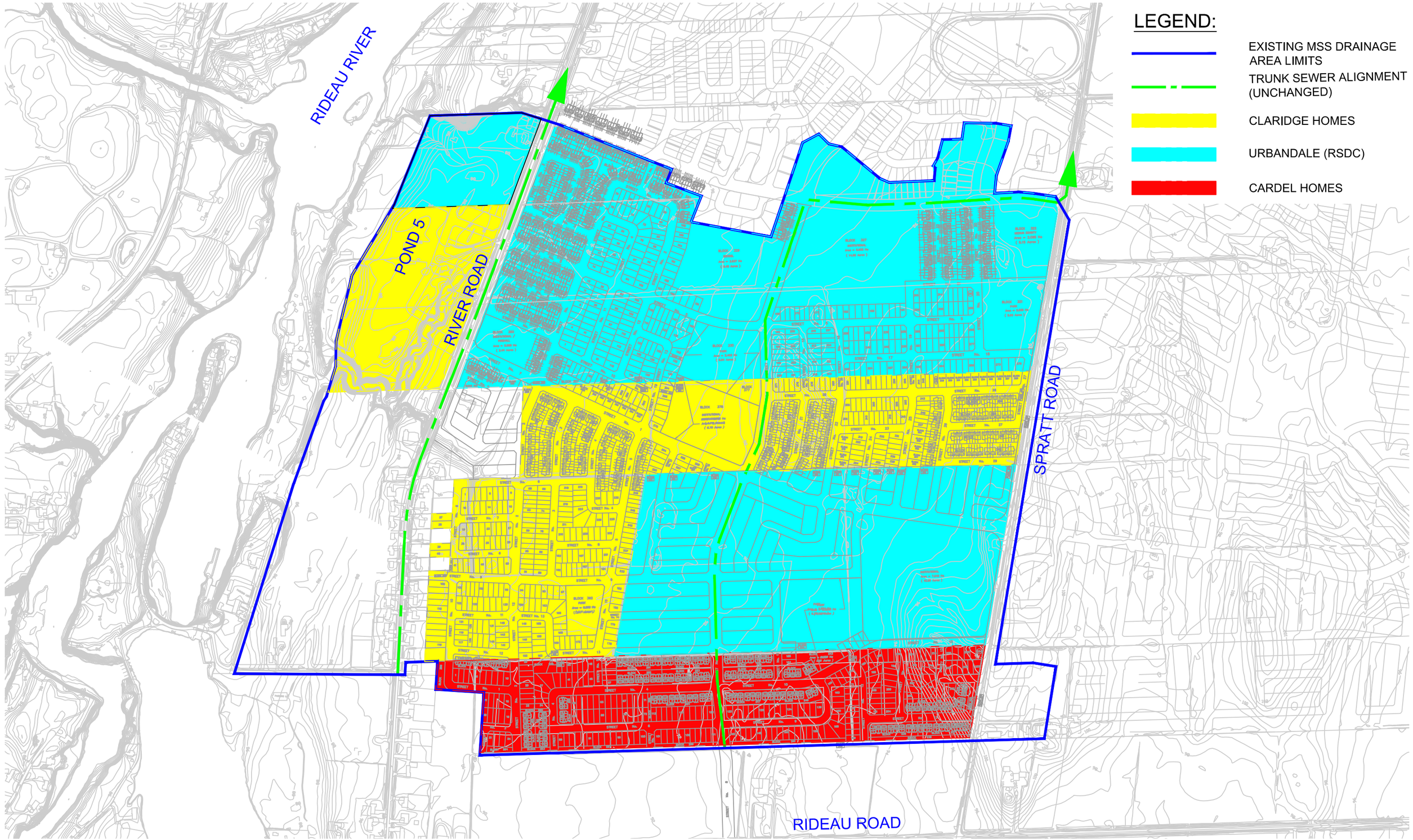
Yours truly,

IBI GROUP

Robert W. Wingate, P. Eng.
Associate

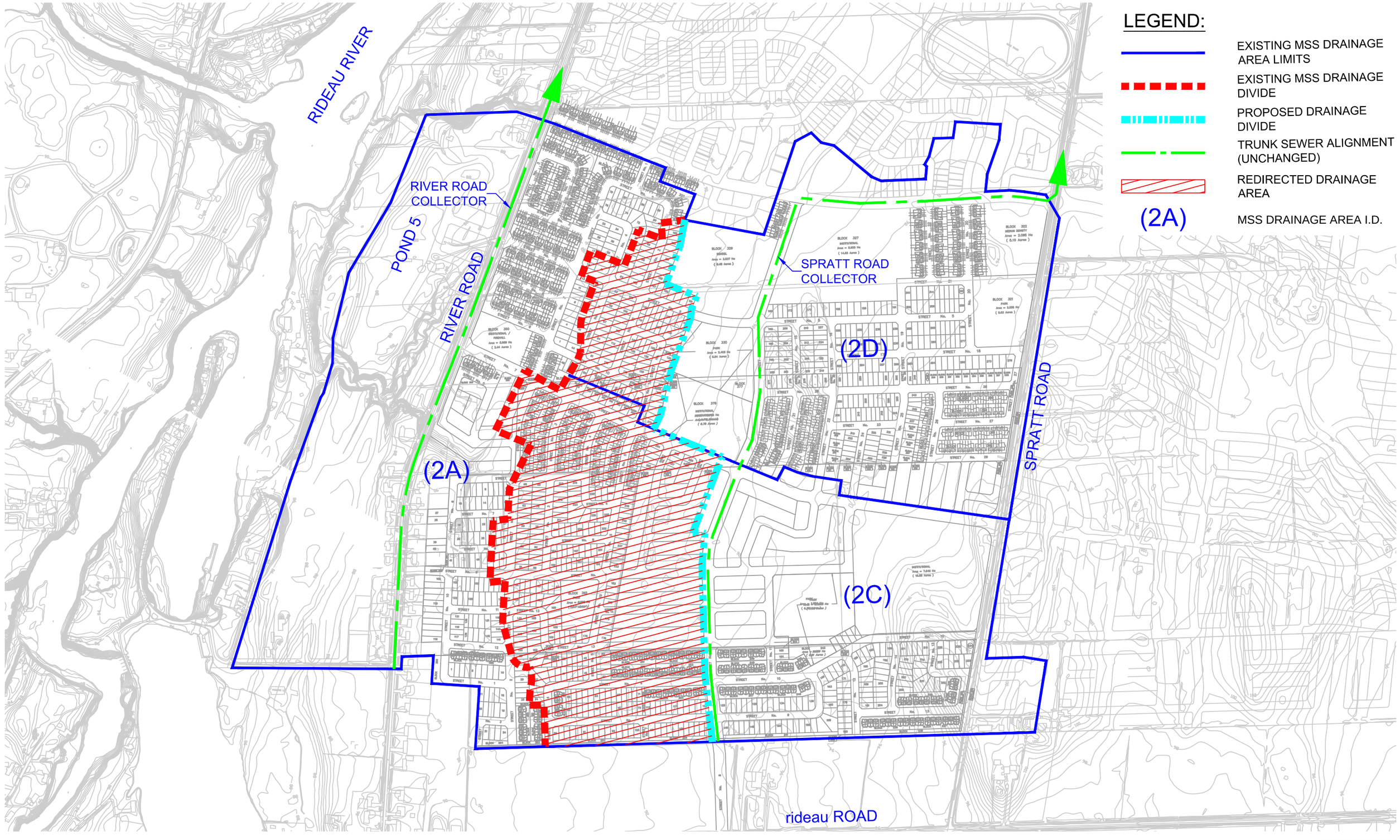
RWW/ks
Encl.

J:\38269-RiversideSthPh15\5.3 Approvals\5.3.1 Municipal\CTB_sevigny_2017-07-24.docx\2017-07-25\KS



J:\38269-RiversideSthPh15\5.9 Drawings\59civil\current\Deviation Report figures\FIGURE A-1.dwg Layout Name: FIGURE A-1 Plot Scale: 1:5.13 Plotted At: 7/25/2017 Last Saved By: chris.cormier Last Saved At:

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	RIVERSIDE SOUTH RIDEAU RIVER POND 5 DRAINAGE AREA	OWNERSHIP	FIGURE A-1



J:\38269-RiversideSthPh15\5.9 Drawings\59civil\current\Deviation Report figures\FIGURE A-2.dwg Layout Name: FIGURE S-1 Plot Scale: 1:5.13 Plotted At: 7/25/2017 Last Saved By: chris.cormier Last Saved At:

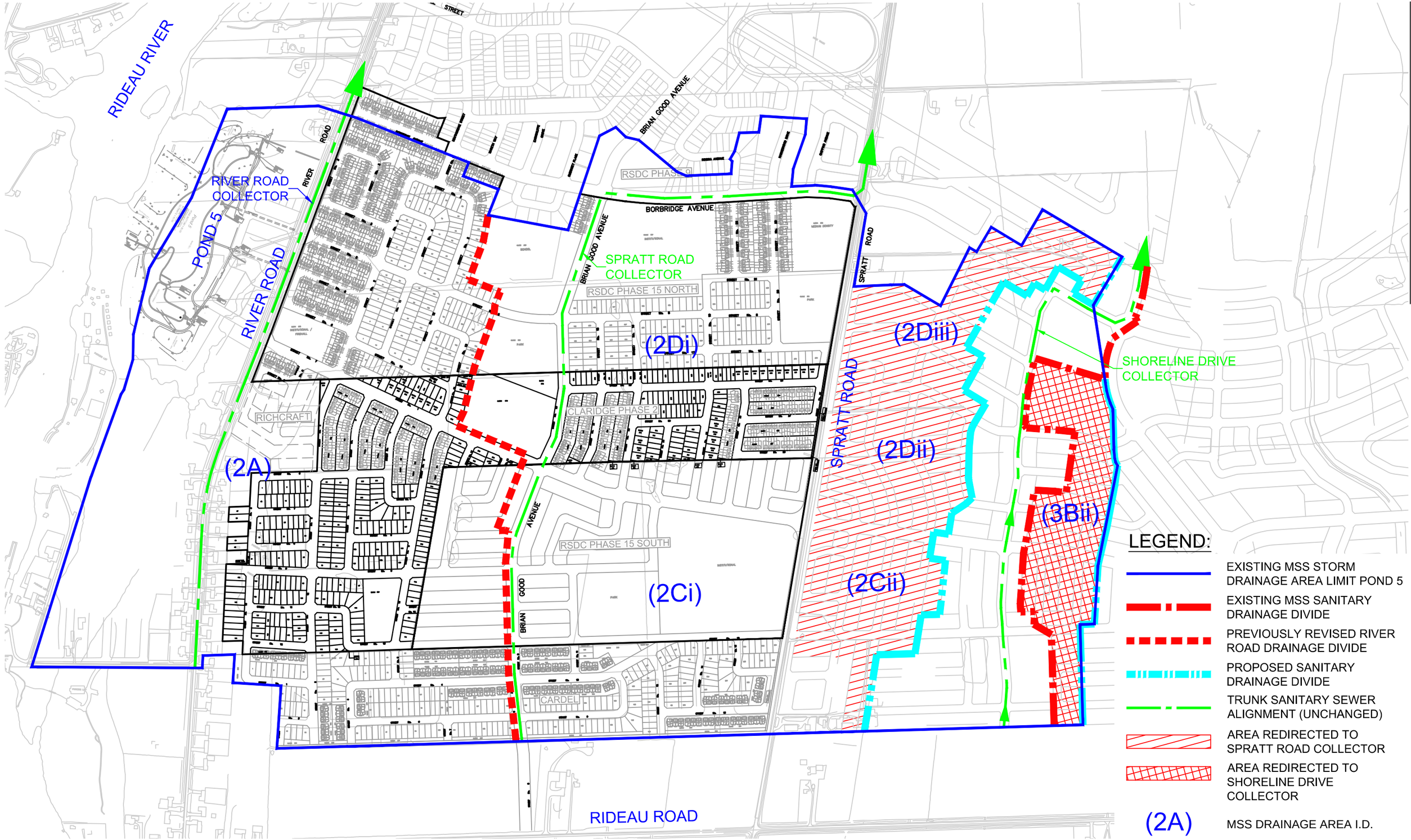
IBI

Scale: N.T.S.

Project Title: RIVERSIDE SOUTH RIDEAU RIVER POND 5 DRAINAGE AREA

Drawing Title: ALTERNATIVE SANITARY DRAINAGE LIMIT

Sheet No.: FIGURE A-2



J:\38269-RiversideSthPh15\5.9 Drawings\59civil\current\Deviation Report figures\FIGURE A-3.dwg Layout Name: FIGURE S-1 Plot Scale: 1:5.13 Plotted At: 11/22/2017 Last Saved By: Chris.Cormier Last Saved

IBI

Scale: N.T.S.

Project Title: RIVERSIDE SOUTH RIDEAU RIVER POND 5 DRAINAGE AREA

Drawing Title: ALTERNATIVE SANITARY DRAINAGE LIMIT SPRATT ROAD COLLECTOR AND SHORELINE DRIVE COLLECTOR

Sheet No.: FIGURE A-3

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REVISED RIVER ROAD AND SPRATT ROAD COLLECTOR ANALYSIS

- **EXISTING DEVELOPMENT USING MONITORED PARAMETERES FROM DESIGN GUIDELINES**
- **NEW DEVELOPMENT USING PROPOSED REVISIONS TO DESIGN GUIDELINES**
- **SPRATT ROAD DRAINAGE LIMITS REVISED**

SANITARY SEWER DESIGN SHEET

38269 - Riverside South Community Infrastructure Servicing Study
CITY OF OTTAWA

LOCATION				RESIDENTIAL																ICI AREAS							INFILTRATION ALLOWANCE				TOTAL FLOW	PROPOSED SEWER DESIGN						
				TOTAL AREA	LOW DENSITY			MED DENSITY			HIGH DENSITY			TOTAL UNITS	POPULATION		PEAKING FACTOR			PEAK FLOW	AREA (Ha)						PEAK FLOW	ROAD AREA	AREA (Ha)		FLOW		CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH		AREA (Ha)	POP	CUM POP	AREA (Ha)	POP	CUM POP	AREA (Ha)	POP	CUM POP		IND	CUM	STANDARD PF	CORRECTED K	CORRECTED PF		COMMERCIAL IND	COMMERCIAL CUM	EMPLOYMENT IND	EMPLOYMENT CUM	INSTITUTIONAL IND	INSTITUTIONAL CUM			IND	CUM							
				(Ha)																(L/s)							(L/s)	(Ha)			(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
RIVER ROAD	2a + 2c(i) + 2c(ii) + 2d(i)	108	107	91.61	64.95	3202	3202	26.66	1721	1721	0.00	0	0	1718	4922	4922	3.25	0.80	2.60	41.49	1.19	1.19	0.00	0.00	1.01	1.01	1.07	4.48	98.28	98.28	32.43	74.99	103.03	1255	450	0.12	0.63	28.04	27.21%
RIVER ROAD	---	107	107a	0.00	0.00	0	0	0.00	0	0	0.00	0	0	0	0	0	3.20	0.60	1.92	0.00	0.00	1.19	0.00	0.00	0.00	1.01	1.07	0.00	0.00	0.00	0.00	84.50	155.42	254	525	0.12	0.70	70.92	45.63%
	2b FUTURE			12.21	10.22	502	3704	1.99	127	1848	0.00	0	0	0	629	5551		0.80	2.56	46.09								2.64	14.85	113.13	37.33							
RIVER ROAD	2b Existing (Phase 9)	107a	107b	43.20	43.20	2351	2351	0.00	0	0	0.00	0	0	N/A	2351	2351	3.06	0.60	1.83	14.97	0.00	1.19	0.00	0.00	2.46	3.47	2.27	0.00	43.20	43.20	12.10	111.45	141.88	405	525	0.10	0.63	30.43	21.45%
	---			0.00	0.00	0	3704	0.00	0	1848	0.00	0	0	0	0	5551		0.80	2.44	43.98								0.00	2.46	115.59	38.15							
RIVER ROAD	---	107b	107c	0.00	0.00	0	2351	0.00	0	0	0.00	0	0	0	0	2351	3.06	0.60	1.83	14.97	0.00	1.19	0.00	0.00	0.00	3.47	2.27	0.00	0.00	43.20	12.10	111.45	173.76	217	525	0.15	0.78	62.32	35.86%
	---			0.00	0.00	0	3704	0.00	0	1848	0.00	0	0	0	0	5551		0.80	2.44	43.98								0.00	0.00	115.59	38.15							
	---	107c	107d	0.00	0.00	0	2351	0.00	0	0	0.00	0	0	0	0	2351	3.06	0.60	1.83	14.97	0.00	1.19	0.00	0.00	0.00	3.47	2.27	0.00	0.00	43.20	12.10	113.00	141.88	107	525	0.10	0.63	28.88	20.36%
	---			0.00	0.00	0	3704	0.00	0	1848	0.00	0	0	0	0	5551		0.80	2.44	43.98								4.70	4.70	120.29	39.70							
	---	107d	106	0.00	0.00	0	2351	0.00	0	0	0.00	0	0	0	0	2351	3.06	0.60	1.83	14.97	0.00	1.19	0.00	0.00	0.00	3.47	2.27	0.00	0.00	43.20	12.10	113.00	126.90	278	525	0.08	0.57	13.90	10.95%
	---			0.00	0.00	0	3704	0.00	0	1848	0.00	0	0	0	0	5551		0.80	2.44	43.98								0.00	0.00	120.29	39.70							
	Ex3	106	103	17.90	10.04	413	2764	7.86	564	564	0.00	0	0	364	977	3328	3.01	0.60	1.80	20.84	5.35	6.54	0.00	0.00	0.00	3.47	4.87	0.00	17.90	61.10	17.11	127.54	141.88	835	525	0.10	0.63	14.34	10.11%
				0.00	0.00	0	3704	0.00	0	1848	0.00	0	0	0	0	5551		0.80	2.40	43.26								0.00	5.35	125.64	41.46							
	Ex2	103	102	16.42	16.42	573	3337	0.00	0	564	0.00	0	0	179	573	3901	2.98	0.60	1.79	24.21	0.00	6.54	0.00	0.00	0.00	3.47	4.87	5.11	21.53	82.63	23.14	136.55	141.88	1100	525	0.10	0.63	5.33	3.76%
				0.00	0.00	0	3704	0.00	0	1848	0.00	0	0	0	0	5551		0.80	2.38	42.87								0.00	0.00	125.64	41.46							
SPRATT SOUTH	**2c - 2c(i) - 2c(ii) + 2c(iii)**	**114**	**113**	**29.63**	**23.03**	**1134**	**1134**	**6.61**	**427**	**427**	**0.00**	**0**	**0**	**532**	**1561**	**1561**	**3.67**	**0.80**	**2.93**	**14.84**	**0.00**	**0.00**	**0.00**	**0.00**	**7.68**	**7.68**	**3.73**	**5.93**	**43.25**	**43.25**	**14.27**	**32.84**	**98.65**	**695**	**450**	**0.11**	**0.601**	**65.81**	**66.71%**
SPRATT SOUTH	**2d - 2d(i) + 2d(ii) + 2d(iii)**	**113**	**112**	**52.21**	**31.54**	**1555**	**2689**	**20.68**	**1331**	**1758**	**0.00**	**0**	**0**	**1041**	**2886**	**4446**	**3.29**	**0.80**	**2.63**	**37.95**	**0.00**	**0.00**	**0.00**	**0.00**	**14.95**	**22.63**	**11.00**	**5.45**	**72.62**	**115.86**	**38.23**	**87.18**	**148.80**	**1155**	**525**	**0.11**	**0.666**	**61.62**	**41.41%**
SPRATT SOUTH	2e	112	111-a	17.48	0.00	0	2689	13.28	847	2605	4.19	479	479	605	1326	5772	3.19	0.80	2.55	47.69	2.55	2.55	0.00	0.00	0.00	22.63	12.24	6.14	26.17	142.03	46.87	106.80	155.42	470	525	0.12	0.696	48.62	31.28%
SPRATT SOUTH	---	111-a	111	0.00	0.00	0	2689	0.00	0	2605	0.00	0	479	0	0	5772	3.19	0.80	2.55	47.69	0.00	2.55	0.00	0.00	0.00	22.63	12.24	0.00	0.00	142.03	46.87	106.80	148.80	215	525	0.11	0.666	42.00	28.23%
SPRATT SOUTH	Ex4	111	110	14.93	13.31	90	2779	1.62	468	3073	0.00	0	479	223	558	6330	3.15	0.80	2.52	51.67	0.91	3.46	0.00	0.00	0.00	22.63	12.68	0.00	15.84	157.87	52.10	116.45	155.42	600	525	0.12	0.696	38.97	25.07%
SHORELINE DRIVE	**3b - 2c(iii) - 2d(ii) - 2d(iii) + 3b(ii)**	**117**	**116**	**28.61**	**18.70**	**921**	**921**	**9.90**	**637**	**637**	**0.00**	**0**	**0**	**554**	**1558**	**1558**	**3.67**	**0.80**	**2.93**	**14.82**	**0.66**	**0.66**	**0.00**	**0.00**	**0.05**	**0.05**	**0.34**	**2.77**	**32.08**	**32.08**	**10.59**	**25.74**	**98.65**	**1270**	**450**	**0.11**	**0.601**	**72.90**	**73.90%**
SHORELINE DRIVE	3c	116	115	47.51	27.40	1350	2271	15.47	989	1626	4.64	530	530	1113	2869	4427	3.29	0.80	2.63	37.80	0.00	0.66	0.00	0.00	11.13	11.17	5.75	10.02	68.67	100.74	33.24	76.80	122.63	990	450	0.17	0.747	45.84	37.38%
SHORELINE DRIVE	Ex5	115	110	20.60	14.47	480	2751	6.13	302	1928	0.00	0	530	276	782	5209	3.23	0.80	2.58	43.60	0.80	1.46	0.00	0.00	3.16	14.33	7.67	0.00	24.56	125.30	41.35	92.63	133.02	480	450	0.20	0.810	40.39	30.36%
SPRATT SOUTH	Ex6	110	109	25.47	20.32	822	6352	5.15	288	5289	0.00	0	1009	377	1110	12650	2.85	0.80	2.28	93.56	0.00	4.92	0.00	0.00	2.39	39.36	21.52	0.00	27.86	311.03	102.64	217.72	303.78	675	675	0.12	0.822	86.06	28.33%
CANYON WALK DRIVE	3d - 3b(ii)	121	120	35.70	25.04	1234	1234	10.66	679	679	0.00	0	0	669	1913	1913	3.60	0.80	2.88	17.86	0.60	0.60	0.00	0.00	3.72	3.72	2.10	5.41	45.43	45.43	14.99	34.95	115.20	820	450	0.15	0.702	80.25	69.66%
CANYON WALK DRIVE	3e	120	119	54.06	40.27	1984	3218	13.79	881	1560	0.00	0	0	987	2865	4778	3.26	0.80	2.61	40.42	0.00	0.60	0.00	0.00	3.91	7.63	4.00	9.21	67.19	112.62	37.16	81.59	190.35	925	525	0.18	0.852	108.76	57.14%
CANYON WALK DRIVE	3f-4a	119	118	17.44	0.00	0	3218	3.06	194	1754	14.38	1007	1007	577	1201	5979	3.17	0.80	2.54	49.17	6.01	6.61	0.00	0.00	5.28	12.92	9.49	16.75	45.49	158.11	52.18	110.84	195.57	880	525	0.19	0.875	84.73	43.33%
INTERNAL SOUTH	6a	123	122	49.84	31.53	1555	1555	18.31	1169	1169	0.00	0	0	973	2724	2724	3.48	0.80	2.78	24.56	1.18	1.18	0.00	0.00	5.33	5.33	3.17	6.44	62.80	62.80	20.72	48.45	167.87	600	525	0.14	0.751	119.42	71.14%
ARMSTRONG ROAD	4b	122	118	58.24	0.00	0	1555	0.00	0	1169	58.24	4070	4070	2005	4070	6794	3.12	0.80	2.50	54.94	24.34	25.53	0.00	0.00	0.00	5.33	15.00	24.91	107.49	170.29	56.20	126.13	230.96	1810	600	0.13	0.791	104.82	45.39%
CANYON WALK DRIVE	Ex1	118	124	45.64	22.12	896	5669	23.52	1687	4610	0.00	0	5077	983	2583	15356	2.77	0.80	2.21	110.20	1.55	33.69	0.00	0.00	0.00	18.25	25.24	0.00	47.19	375.59	123.94	259.38	449.81	860	750	0.15	0.986	190.43	42.34%
SPRATT ROAD	5c	130	129	25.52	20.06	989	989	5.46	348	348	0.00	0	0	454	1337	1337	3.72	0.80	2.97	12.88	0.00	0.00	0.00	0.00	2.38	2.38	1.16	4.86	32.77	32.77	10.81	24.85	248.09	420	600	0.15	0.850	223.24	89.98%
SPRATT ROAD	1a	129	128	10.26	7.00	346	1335	3.26	209	557	0.00	0	0	195	555	1892	3.60	0.80	2.88	17.68	0.00	0.00	0.00	0.00	0.00	2.38	1.16	7.76	18.02	50.79	16.76	35.60	339.63	450	675	0.15	0.919	304.04	89.52%
SPRATT ROAD	1b	128	127	18.80	4.11	202	1537	13.56	866	1423	1.13	129	129	492	1197	3089	3.43	0.80	2.75	27.48	0.00	0.00	0.00	0.00	2.82	5.20	2.53	5.34	26.97	77.76	25.66	55.67	339.63	490	675	0.15	0.919	283.96	83.61%
INTERNAL NORTH	5b	135	134	17.31	10.06	496	496	7.25	463	463	0.00	0	0	348	959	959	3.81	0.80	3.05	9.48	0.00	0.00	0.00	0.00	0.03	0.03	0.02	1.32	18.66	18.66	6.16	15.65	70.84	385	375	0.15	0.621	55.19	77.91%
INTERNAL NORTH	1d	134	127	21.95	12.43	611	1107	9.52	607	1070	0.00	0	0	444	1218	2177	3.56	0.80	2.85	20.08	2.66	2.66	0.00	0.00	0.01	0.04	1.31	4.33	28.95	47.61	15.71	37.10	70.84	550	375	0.15	0.621	33.75	47.64%
	BP-1	137	127	39.70	20.70	1173	1173	17.00	1019	1019	2.00	398	398	891	2590	2590	3.50	0.80	2.80	23.47	0.00	0.00	16.18	16.18	0.00	0.00	5.24	6.81	62.69	62.69	20.69	49.40	70.84	725	375	0.15	0.621	21.44	30.26%
SPRATT ROAD	1c	127	126	14.01	0.00	0	3817	8.98	574	4086	5.03	574	1101	541	1148	9004	3.00	0.80	2.40	70.03	0.74	3.40	0.00	16.18	6.60	11.84	12.65	6.42	27.77	215.82	71.22	153.89	449.81	795	750	0.15	0.986	295.92	65.79%
INTERNAL NORTH	5a	133	132	11.48	4.65	230	230	6.83	437	437	0.00	0	0	254	667	667	3.91	0.80	3.13	6.76	1.02	1.02	0.00	0.00	1.15	1.15	1.06	4.02	17.68	17.68	5.83	13.65	70.84	410	375	0.15	0.621	57.20	80.74%
INTERNAL NORTH	1e	132	126	34.06	22.08	1088	1318	11.98	766	1203	0.00	0	0	659	1854	2521	3.51	0.80	2.80	22.91	0.00	1.02	0.00	0.00	1.37	2.52	1.72	6.18	41.61	59.29	19.57	44.20	115.20	810	450	0.15	0.702	71.00	61.63%
	BP-2	138	126	0.11	0.00	0	0	0.11	7	7	0.00	0	0	3	7	7	4.00	0.80	3.20	0.07	0.00	0.00	15.00	15.00	0.00	0.00	4.86	1.48	16.59	16.59	5.48	10.41	70.84	440	375	0.15	0.621	60.43	85.31%
SPRATT ROAD	1g	126	125	14.19	1.66	83	5218	9.47	605	5901	3.05	348	1449	461	1036	12568	2.86	0.80	2.28	93.04	0.98	5.40	0.00	31.18	10.12	24.48	24.62	3.45	28.74	320.44	105.75	223.41	478.86	710	750	0.17	1.050	255.45	53.35%
SPRATT ROAD	1f	131	125	9.29	5.05	250	250	4.24	271	271	0.00	0	0	191	521	521	3.96	0.80	3.17	5.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.48	12.77	12.77	4.21	9.57	45.12	420	300	0.20	0.618	35.54	78.79%
	BP3	136	125	0.00	0.00	0	0	0.00	0	0	0.00	0	0	0	0	0	4.00	0.80	3.20	0.00	0.00	0.00	38.46	38.46	0.00	0.00	12.46	5.69	44.15	44.15	14.57	27.03	68.44	986	375	0.14	0.600	41.41	60.51%
SPRATT ROAD	1h	125	124	1.69	0.00	0	5468	1.69	108	6280	0.00	0	1449	45	108	13197	2.83	0.80	2.27	96.97	2.20	7.60	0.00	69.64	1.66	26.14	38.96	3.04	8.59	385.95	127.36	263.30	731.45	830	900	0.15	1.114	468.15	64.00%
SPRATT ROAD	Ex7	124	109	17.26	11.40	768	11905	3.00	250	11140	2.86	327	6853	516	1345	29898	2.48	0.80	1.98	192.13	0.64	41.93	0.00	69.64	0.00	44.39	64.51	0.00	17.90	779.44	257.21	513.86	1,103.33	515	1050	0.15	1.234	589.48	53.43%
CANYON WALK DRIVE	Ex8	109	102	56.40	54.40	2150	20407	2.00	134	16563	0.00	0	7862	728	2284	44832	2.31	0.80	1.85	268.37	0.00	46.85	0.00	69.64	0.00	83.75	86.03	5.45	61.85	1152.32	380.26	734.67	1,103.33	1100	1050	0.15	1.234	368.67	33.41%
SPRATT ROAD	BP-4	139	102	0.00	0.00	0	0	0.00	0	0	0.00	0	0	0	0	0	4.00	0.80	3.20	0.00	0.00	0.00	127.52	127.52	0.00	0.00	95.03	19.76	147.28	147.28	48.60	143.63	339.63	2790	675	0.15	0.919	196.00	57.71%
CROSSING	---	102	101	0.00			3337			564			0	0	0	3901	2.23	0.60	1.34	18.14	0.00	53.39	0.00	197.16	0.00	87.21	215.26	0.00	0.00	82.63	23.14	1018.35	1,348.97	145	1200	0.11	1.155	330.62	24.51%
							24110			18411			7862		0	50383		0.80	1.79	291.49								0.00	0.00	1425.24	470.33							

Design Parameters:

Residential			ICI Areas			
SF	3.2	p/p/u				Peak Factor
TH/SD	2.4	p/p/u	COM	0.324	L/s/Ha	1.5
APT	1.9	p/p/u	EMP	0.324	L/s/Ha	1
			INST	0.324	L/s/Ha	1.5

Notes:

1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day 300 L/day
3. Infiltration allowance: 0.33 L/s/Ha 0.28 L/s/Ha
4. Residential Peaking Factor: K = 0.80 K = 0.60
   Harmon Formula = 1+(14/(4+P^0.5))
   where P = population in thousands
5. Existing Sanitary Sewer Lines

Designed: MB

Checked: MB

Dwg. Reference:

No.	Revision	Date
1a.	- Manual build of Stantec's *Riverside South Community Infrastructure Servicing Study* , dated June 5, 2017	2017-05-30
1b.	- New Sanitary parameters *(see Note 1)* and adjustments to Areas 2a, 2c, 2d	2017-06-29
1c.	- Correction Factor of K=0.6 & 0.28 L/s / 300L/day *(see Note 2)*	2017-06-29
1d.	- Increase in Area 2a split 50/50 between Low density and Medium Density *(see Note 3)*	2017-06-29
1e.	- Increase in area 2Ci & 2Di *(see Note 4)*	2017-11-23

File Reference:	Date:	Sheet No:
38269-5.7.1	2017-05-09	1 of 1

NOTE 1: Spreadsheet is Stantec's original, but using proposed revisions to design guidelines
- Res. per capita = 280 L/d
- Commercial = 28.000 L/d/ha (0.324 L/s/ha)
- Instutional = 28,000 L/d/ha (0.324 L/s/ha)
- ~~Industrial = 35,000 L/d/ha~~
- Infiltration = 0.33 L/s/ha
- Peaking Factor correction, K = 0.80
- ICI Peaking Factor = 1.5 (>20% contributing area)

NOTE 2: MH106 to MH103, MH103 to MH102 and Area 2b *(Existing (Phase 9))* flows calculated using monitored parameters from design guidelines
- Res. per capita = 300 L/d
- Infiltration = 0.28 L/s/ha
- Peaking Factor correction, K = 0.60

NOTE 3:

Additions to Area 2a (50% Low Density / 50% Medium Density)						
	Area		Low Density		Medium Density	
2d(i)	**7.63**	ha	15.40	units / ha	27.0	units / ha
2c(i)	**25.20**	ha	15.40	units / ha	27.0	units / ha
2c(ii)	**8.27**	ha	15.40	units / ha	27.0	units / ha

NOTE 4:

Additions to Area 2Ci and 2Di (50% Low Density / 50% Medium Density)						
	Area		**Low Density**		**Medium Density**	
2d(ii)	**11.49**	**ha**	**15.40**	**units / ha**	**27.0**	**units / ha**
2d(iii)	**9.07**	**ha**	**15.40**	**units / ha**	**27.0**	**units / ha**
2c(iii)	**9.31**	**ha**	**15.40**	**units / ha**	**27.0**	**units / ha**
3b(ii)	**10.35**	**ha**	**15.40**	**units / ha**	**27.0**	**units / ha**

Jim Moffatt

From: Sevigny, John <John.Sevigny@ottawa.ca>
Sent: Thursday, July 20, 2017 10:18 AM
To: Bob Wingate
Cc: Terry Brule; Jim Moffatt
Subject: RE: Riverside South , Rideau River Drainage Area

Hi Bob.
Yes, this is satisfactory.
Regards,

*****Absence alert: Please note that I will be out of the office as of July 31, 2017 and will be returning to the office on August 8, 2017*****

John Sevigny, C.E.T.
Project Manager, Infrastructure Approvals
Development Review, Suburban Services | *Examen des projets d'aménagement, Services suburbains*
Planning, Infrastructure and Economic Development Department | Services de la planification, de l'infrastructure et du développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste **14388**, fax/téléc:613-580-2576, john.sevigny@ottawa.ca

---

From: Bob Wingate [mailto:rwingate@IBIGroup.com]
Sent: Wednesday, July 19, 2017 10:18 AM
To: Sevigny, John <John.Sevigny@ottawa.ca>
Cc: Terry Brule <tbrule@IBIGroup.com>; Jim Moffatt <jmoffatt@IBIGroup.com>
Subject: Fw: Riverside South , Rideau River Drainage Area

Hi John
We assume this satisfies your requirement for acknowledgment from Cardel regarding concurrence with our proposed Revision to the sanitary drainage limit for the River Road trunk sewer.
Regards
Bob

Sent from my BlackBerry 10 smartphone on the Bell network.

From: Matt Wingate <MWingate@dsel.ca>
Sent: Tuesday, July 18, 2017 10:37 PM
To: John Sevigny
Cc: Bob Wingate; Terry Brule
Subject: Fwd: Riverside South , Rideau River Drainage Area

Hi John,
Please find Lisa Dalla Rosa's agreement below to IBI's proposed sanitary drainage plan described below.
Please feel free to call if you have any questions or need further input from our end.
Thanks

Matt Wingate, P.Eng.
DSEL
david schaeffer engineering ltd.

Begin forwarded message:

From: Lisa Dalla Rosa <lisa.dallarosa@cardelhomes.com>
Date: July 18, 2017 at 12:36:59 PM EDT
To: Matt Wingate <MWingate@dsel.ca>
Subject: RE: Riverside South , Rideau River Drainage Area

Agreed.
LDR

From: Matt Wingate [mailto:MWingate@dsel.ca]
Sent: Thursday, July 13, 2017 11:43 AM
To: Lisa Dalla Rosa <lisa.dallarosa@cardelhomes.com>
Cc: Laura Maxwell <LMaxwell@dsel.ca>; 'Bob Wingate P.Eng. (rwingate@ibigroup.com)' <rwingate@ibigroup.com>
Subject: RE: Riverside South , Rideau River Drainage Area

Hi Lisa,

IBI has requested that acceptance of their sanitary proposal come directly from Cardel. Can you respond to this email with your agreement?

Thanks

Matt

From: Matt Wingate
Sent: July 12, 2017 1:38 PM
To: 'Lisa Dalla Rosa (lisa.dallarosa@cardelhomes.com)' <lisa.dallarosa@cardelhomes.com>
Cc: Laura Maxwell <LMaxwell@dsel.ca>
Subject: FW: Riverside South , Rideau River Drainage Area

Hi Lisa,
Please see below related to the Urbandale/Claridge/Cardel coordinated sanitary servicing plan for Riverside south, as discussed two weeks ago.
Let me know if you have any questions.
We will forward the final draft of our functional servicing report to you shortly for your review.

Matt

From: Matt Wingate
Sent: July 12, 2017 1:35 PM
To: 'Bob Wingate' <rwingate@IBIGroup.com>
Cc: Steve Pichette <SPichette@dsel.ca>; Terry Brule <tbrule@IBIGroup.com>; Sevigny, John <John.Sevigny@ottawa.ca>
Subject: RE: Riverside South , Rideau River Drainage Area

Ayt Fig S1

Hi Bob;
Thanks for including us in this circulation.
I can confirm that we are in agreement with your proposal to include Cardel's developable property area west of the Brian Good collector road within the River Road trunk sanitary sewer catchment, as illustrated in your Figure S-1.

We are currently finalizing our functional servicing report to be submitted in support of Cardel's application for plan of subdivision approval, and we will present a preferred alternative wastewater servicing plan for Cardel's subdvision that will match the drainage boundaries presented in IBI's proposal.
If there are any further questions or you require additional info related to our proposed servicing plan, please do not hesitate to call.

regards

Matt Wingate, P.Eng.
Manager of Design Administration

DSEL
david schaeffer engineering ltd.

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

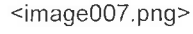
phone: (613) 836-0856 ext 522
direct: (613) 836-1522
cell: (613) 858-4975
e-mail: mwingate@DSEL.ca

From: Bob Wingate [mailto:rwingate@IBIGroup.com]
Sent: July 12, 2017 11:46 AM
To: Matt Wingate <MWingate@dsel.ca>
Cc: Steve Pichette <SPichette@dsel.ca>; Terry Brule <tbrule@IBIGroup.com>; Sevigny, John <John.Sevigny@ottawa.ca>
Subject: FW: Riverside South , Rideau River Drainage Area

Hi Matt
We have submitted our sanitary analysis for Riverside South to the City of Ottawa(John Sevigny) for their review and approval , as per our previous discussion. This morning John called to advise that he has circulated this request to expand the tributary area to the River Road trunk sanitary sewer and use the revised sanitary design parameters currently being considered by the City internally at the City . To support this submission he would appreciate it if we could get confirmation from Cardel / DSEL that you have seen this proposal and that you are in general agreement with the proposed drainage expansion through Cardel's lands as an initial servicing scenario. The e-mail below and supporting attachments included is a complete copy of the submission to reconfirm it is consistent with our discussions .
If you would provide us with the confirmation John is requesting that would be appreciated so we can ensure that this request maintains momentum at the City .

Bob Wingate

IBI GROUP
400-333 Preston Street
Ottawa ON K1S 5N4 Canada
tel +1 613 225 1311 fax +1 613 225 9868



From: Bob Wingate
Sent: Thursday, June 29, 2017 2:20 PM
To: Sevigny, John <John.Sevigny@ottawa.ca>
Cc: Terry Brule (tbrule@ibigroup.com) <tbrule@ibigroup.com>; Marcel Denomme (mdenomme@urbandale.com) <mdenomme@urbandale.com>; Jim Burghout (jim.burghout@claridgehomes.com) <jim.burghout@claridgehomes.com>; Matt Wingate <mwingate@dsel.ca>
Subject: Riverside South , Rideau River Drainage Area

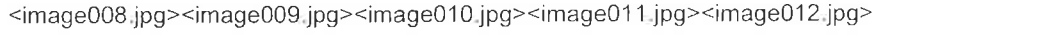
Got Plan + Spreadsheet

Hi John
Further to our previous discussions , attached is a figure which illustrates a proposed expansion of the River Road trunk sanitary sewer tributary area , easterly from the existing developed area to the north to the south limit of the urban boundary . This figure shows the drainage divide between the River Road sanitary collector sewer and the Spratt Road collector as currently proposed in the recently updated MSS , overlaid on the latest draft plans as proposed by the three major developers in the area (RSDC , Claridge , and Cardel) . also shown on this figure is a proposed expansion of the River Road collector drainage area easterly based on the use of monitored parameters from the current City design guidelines , as suggested by John Bougadis , and the use of revised design parameters currently being considered by the City for the undeveloped portion of the proposed tributary area to the River Road trunk sewer . To support the proposed expanded drainage area to the River Road trunk sewer we have recreated the sanitary spread sheet from the MSS and attached a copy of the unaltered version of this spread sheet for your use in confirming that the analysis prepared by IBI is based on exactly the same assumptions regarding land use , density , etc. as the final MSS document . The second spread sheet attached has only the design parameters for the areas tributary to the River Road trunk sewer adjusted to reflect the use of monitored parameters for the built out areas , and revised design parameters for the undeveloped areas tributary to the River Road trunk sewer . This last spread sheet demonstrates that the proposed expanded drainage area can be accommodated in the existing River Road collector sewer without surcharging the system . Given that this expanded drainage area significantly reduces the potential for grade raise issues , maximizes the use of parallel sewers in the local road network , and improves phasing potential for all three major developers involved , we request that the City confirm acceptance of this proposal as a minor adjustment to the MSS , so that all three developers can finalize their individual serviceability reports based on this revision to the drainage areas.
It should be noted that IBI represents both Claridge and RSDC for this development area and that we have met with DSEL who represents Cardel , the other major developer in the area , and all three developers are in agreement with the proposed new drainage limit , and support the implementation of this change .
If you have any questions regarding this submission please do not hesitate to contact me directly .

Regards

Bob Wingate

IBI GROUP
400-333 Preston Street
Ottawa ON K1S 5N4 Canada
tel +1 613 225 1311 fax +1 613 225 9868



N

SPRATT ROAD
SANITARY COLLECTOR
SEWER

SUBJECT PROPERTY

SUBJECT PROPERTY

STREET NO. 1
STREET NO. 2
STREET NO. 3
STREET NO. 4
STREET NO. 5
STREET NO. 6
STREET NO. 7

LEGEND:

PROPOSED SANITARY (IBI)

PROPOSED SANITARY - SEPARATE APPLICATION(s)

EXISTING SANITARY

J: \118404_4725SprattRd\5.9 Drawings\59civil\current\Assessment Report\118404-fig-3.1-SANITARY.dwg Layout Name: SANITARY Plot Scale: 1:5.13 Plotted At: 2/27/2019 Last Saved By: Chris.Cormier Last Saved At: Feb. 27, 19

Scale	Project Title	Drawing Title	Sheet No.
NTS	4725 SPRATT	CONCEPTUAL SANITARY PLAN	FIGURE 3.1

www.ottawa.ca

SUC SANITARY SEWER SYSTEM

REFER TO TABLE F-3: SANITARY SEWERS - SOUTH

LINE ID #5

CHAPMAN MILLS

WOODROFFE AVENUE

CRESTWAY

STRANDHERD DRIVE

PRESCOTT HIGHWAY

RIVER ROAD

LIMEBANK ROAD

LEITRIM ROAD

SPRATT ROAD

CANYON WALK

BOWESVILLE ROAD

EARL ARMSTRONG ROAD

SHORELINE DRIVE

RIVERSIDE SANITARY

RIDEAU ROAD

102 — 2790m–675ø — 139

125 — EX. 525ø / EX. 750ø — 710m–750ø — 126 — 795m–750ø — 127 — 490m–675ø — 128

126 — 810m–450ø — 132

118 — 836m–800ø — 206 — 120m–800ø — 207 — 120m–600ø — 208 — 92.1m–600ø — 209 — 79.7m–600ø — 210 — 550m–600ø — 122

119 — 880m–525ø — 925m–525ø — 120

115 — 990m–450ø — 116

111 — 220m–525ø — 460m–525ø — 112 — 1230m–525ø — 113

190m–525ø — 90m–525ø — 240m–525ø — 400m–525ø — 56m–525ø

NOTES:

1. TOTAL COSTS SHOWN IN TABLES INCLUDE CONSTRUCTION, LAND (WHERE APPLICABLE),10% ENGINEERING, 15% CONTINGENCY.
2. PIPE SIZES MAY BE REDUCED AT DETAILED DESIGN STAGE.
3. ROAD PATTERNS BASED ON BEST AVAILABLE.

PROPOSED SANITARY SEWER
EXISTING SANITARY SEWER
50 NODE NUMBER
STREAMS
ROADS
RAILWAYS

N

CITY OF OTTAWA
DEVELOPMENT CHARGES STUDY
PLANNING AND GROWTH MANAGEMENT DEPARTMENT
DEVELOPMENT REVIEW SERVICES

Scale	Dwn No.
1:10,000 (0 100 300 500m)	SAN5
Dwn By V.H. / Date April, 2014	Revision 1

APPENDIX D

STANTEC CONSULTING LTD.
400 1331 CLYDE AVENUE
OTTAWA, ON
TEL. 613.722.4420
WWW.STANTEC.COM

Legend

- Major Water
- Parcels
- Streets
- Rideau River Study Area
- Pond 5
- Catchments
- Minor System Nodes
- Culverts
- Storm Sewers

Note:
The presented imperviousness values represent directly connected imperviousness

Client / Project:

CITY OF OTTAWA

RIVERSIDE SOUTH ISSU UPDATE

OTTAWA, ON

Title:

STORM SEWERS

Project No.: **163401101**

Scale: 0 50 100 200 Meters

Drawing No.: **STM-1**

Sheet: **3 of 7**

Revision: **0**

N

SUBJECT PROPERTY

TRANSIT CORRIDOR

STREET NO. 1

STREET NO. 2

STREET NO. 3

STREET NO. 4

STREET NO. 5

STREET NO. 6

STREET NO. 7

SPRATT ROAD

TRUNK STORM SEWER TO POND 5

EXISTING OVERLAND FLOW TO BE CAPTURED VIA TEMPORARY DITCH INLET

SUBJECT PROPERTY

LEGEND:

PROPOSED STORM (IBI)

PROPOSED STORM - SEPARATE APPLICATION(s)

EXISTING STORM

J:\118404_4725SprattRd\5.9 Drawings\Civil\current\Assessment Report\118404-fig-4.1-STORM.dwg Layout Name: STORM Plot Scale: 1:5.13 Plotted At: 2/27/2019 Last Saved By: Chris.Cormier Last Saved At: Feb. 27, 19

Scale	Project Title	Drawing Title	Sheet No.
NTS	4725 SPRATT	CONCEPTUAL STORM PLAN	FIGURE 4.1

Table F-2: Storm Water Sewers - South

Line ID	Project Name	Description	Storm Pipe Attributes					Estimated Construction Year	2013 DC Growth Related Costs					Comments
			From	To	Pipe Size (mm)	Pipe Length (m)	Green/ Brown		2013 Oversizing Cost w/o F.E.A. Unit Cost	2013 Oversizing Cost w/o F.E.A. Total Cost	F.E.A. Approved	Paid	2013 DC Project Outstanding Cost	
	South Leitrim													
	Leitrim Storm Sewers (STM5)													
	Final Servicibility report, Leitrim Development Area, 2007	Residential Storm	825	230	1800	672	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Final Servicibility report, Leitrim Development Area, 2007	Residential Storm	230	730	3000	510	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Final Servicibility report, Leitrim Development Area, 2007	Residential Storm	730	770	3000	398	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Final Servicibility report, Leitrim Development Area, 2007	Residential Storm	770	790	3600	240	Green	Pre 2013	-	-				Existing 3000 by 3600 box equivalent to 3600 dia. Under FEA
	Final Servicibility report, Leitrim Development Area, 2007	Residential Storm	790	Pond 1	3600	215	Green	Pre 2013	-	-				3000 by 3600 box equivalent to 3600 dia. (**not** in 2009 DC study table) Part of the pond cost.
1A	***Subtotal Storm Sewers on Tartan Lands***							Pre 2013			**$ 6,572,444**		**$ 6,572,444**	ACS2006-PGM-APR-0061 In March 2006 Council approved 18.185M for land pond and oversizing. The oversizing costs and applicable sewers where amended from the 2004 -303 By-Law resulting from changes to the back ground study. Overpayment balance continues on DC repayment. Includes $500,000 for land and expropriation costs (2008)
	Final Servicibility report, Leitrim Development Area, 2007	Residential Storm	401	400	1800	349	Green	Pre 2013	$ 501	$ 174,892				Existing Sewer Not Under FEA
	Final Servicibility report, Leitrim Development Area, 2007	Residential Storm	400	230	1950	440	Green	Pre 2013	$ 988	$ 434,674				Existing Sewer Not Under FEA
1B	***Subtotal Findlay Creek Drive Sewers***							Pre 2013		**$ 609,566**			**$ 609,566**	
	Final Servicibility report, Leitrim Development Area, 2007	Residential Storm	616	629	1800	348	Green	2015	$ 501	$ 174,391				
	Final Servicibility report, Leitrim Development Area, 2007	Residential Storm	629	636	1950	376	Green	2015	$ 988	$ 371,448				
	Final Servicibility report, Leitrim Development Area, 2007	Residential Storm	636	770	2100	245	Green	2015	$ 1,509	$ 369,696				
1C	***Subtotal Storm Sewers on Tartan/Reimer Lands***	Storm Sewer on Tartan/Reimer Lands						2021		**$ 915,536**			**$ 915,536**	
	Final Servicibility report, Leitrim Development Area, 2007	Storm Sewer from Analdea to Pond 1	1060	Pond 1	1950	800	Green	2010	$ 988	$ 790,316				
1D	***Subtotal Storm Sewer from Analdea to Pond 1***									**$ 790,316**			**$ 790,316**	Paid through subdivision agreement
	Final Servicibility report, Leitrim Development Area, 2007	Industrial Storm	1260	1270	1800	300	Green	2025	$ 501	$ 150,337				
	Final Servicibility report, Leitrim Development Area, 2007	Industrial Storm	1270	1285	1950	280	Green	2025	$ 988	$ 276,611				
	Final Servicibility report, Leitrim Development Area, 2007	Industrial Storm	1285	830	2100	390	Green	2025	$ 1,509	$ 588,495				
1E	***Subtotal Sewers to Pond 2***									**$ 1,015,443**			**$ 1,015,443**	
	Final Servicibility report, Leitrim Development Area, 2007	Industrial Storm	1102	1100	1800	201	Green	2015	$ 501	-				FEA (no internal order)
	Final Servicibility report, Leitrim Development Area, 2007	Industrial Storm	1100	830	2100	315	Green	2015	$ 1,509	-				FEA (no internal order)
	Final Servicibility report, Leitrim Development Area, 2007	Industrial Storm	830	Pond 2	3000	45	Green	2015	$ 5,546	-				FEA (no internal order)
1F	***Subtotal Industrial Sewers to Pond 2***									-	**$ 741,961**		**$ 741,961**	ACS2011-ICS-PGM-0220 (Nov, 2011) approved $741,961 for storm trunk o/s.
1	***Subtotal Leitrim (S-2)***									**$ 3,330,861**	**$ 7,314,405**		**$ 10,645,266**	Oversizing cost for storm sewers is a blended mix of existing with FEA and new that will require a future FEA
	Riverside South													
	Riverside South SWM Pond 1 Storm Sewers													
	Riverside South Infrastructure Servicing Study Update 2008				2100	107	Green	Pre 2013	-	-				
	Riverside South Infrastructure Servicing Study Update 2008			N	2100	100	Green	Pre 2013	-	-				
	Riverside South Infrastructure Servicing Study Update 2008				2100	100	Green	Pre 2013	-	-				
	Riverside South Infrastructure Servicing Study Update 2008				2100	185	Green	Pre 2013	-	-				
	Riverside South Infrastructure Servicing Study Update 2008				2100	32	Green	Pre 2013	-	-				
	Riverside South Infrastructure Servicing Study Update 2008				2100	83	Green	Pre 2013	-	-				

Table F-2: Storm Water Sewers - South

Line ID	Project Name	Description	Storm Pipe Attributes					Estimated Construction Year	2013 DC Growth Related Costs					Comments
			From	To	Pipe Size (mm)	Pipe Length (m)	Green/ Brown		2013 Oversizing Cost w/o F.E.A. Unit Cost	2013 Oversizing Cost w/o F.E.A. Total Cost	F.E.A. Approved	Paid	2013 DC Project Outstanding Cost	
	Riverside South Infrastructure Servicing Study Update 2008				2100	31	Green	Pre 2013	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N1-12	N1-13	1800	1200	Green	2020	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N1-13	N1-14	1950	321	Green	2020	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N1-14	N1-15	2100	646	Green	2015	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N1-15	N1-16	2400	115	Green	2015	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N1-16	Ex.	2400	220	Green	Pre 2013	-	-				
2A	***Subtotal Pond 1 Storm Sewers***									-	**$ 4,032,000**		**$ 4,032,000**	FEA not found. Reference made in Lynn Lowes table to the to 2009 DC background study. The 2008 DC oversizing cost for Stm to pond 1 is $4,032,000
	Riverside South SWM Pond 2 Storm Sewers													
	Riverside South Infrastructure Servicing Study Update 2008		N2-2	N2-3	1950	539	Green	2020	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		N2-3	N2-4	2100	149	Green	2018	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		N2-4	303	2100	275	Green	2016	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		N2-8	307	2700	216	Green	2015	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		307	306	2700	85.2	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		306	305	2700	91.3	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		305	304	2700	120	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		304	303	2700	110	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		303	302	2700	111.5	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		302	301	2700	69.7	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		301	Pond #2	2700	41	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		N2-11	303	2250	254	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Riverside South Infrastructure Servicing Study Update 2008		N2-11	N2-10	1800	304	Green	Pre 2013	-	-				Existing Sewer Under FEA
	Subtotal									-	**$ 4,924,975**	**$ -**	**$ 4,924,975**	ACS2005-PGM-APR-0159 - FEA Trunk Storm Sewer Oversizing for sewers which are tributary to Pond 2
	Riverside South Infrastructure Servicing Study Update 2008	Part of Sewers East of Limebank	N2-5	N2-7	1800	383	Green		$ 501	$ 191,931				
	Riverside South Infrastructure Servicing Study Update 2008		N2-6	N2-7	2250	645	Green		$ 2,079	$ 1,341,115				
	Riverside South Infrastructure Servicing Study Update 2008		N2-7	N2-8	2550	343	Green		$ 3,514	$ 1,205,269				
	Subtotal									**$ 2,738,314**			**$ 2,738,314**	
2B	***Subtotal Pond 2 Storm Sewers***									-			**$ 7,663,289**	
	Riverside South SWM Pond 3	**POND 3**												
	Riverside South Infrastructure Servicing Study Update 2008		N3-1	N3-2	1800	455	Green	2030	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N3-2	N3-3	2250	490	Green	2030	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N3-4	N3-3	1800	590	Green	2030	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N3-5	N3-3	2100	600	Green	2025	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N3-3	N3-7	3000	800	Green	2025	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N3-8	N3-7	1950	1005	Green	2020	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N3-7	N3-9b	3000	435	Green	2015	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N3-9b	N3-IN2	3000	100	Green	2015	-	-				
	Riverside South Infrastructure Servicing Study Update 2008		N3-6	N3-IN1	1950	160	Green	2015	-	-				
2C	***Subtotal Pond 3 Storm Sewers***									**$ 9,877,000**		**$ -**	**$ 9,877,000**	ACS2011-ICS-PGM-0199. Requires an internal order number.
	Riverside South SWM Pond 4 Storm Sewers	**POND 4**												
	Riverside South Infrastructure Servicing Study Update 2008		N4-1	N4-6	1950	530	Green	Post 2031	$ 988	$ 523,584				
	Riverside South Infrastructure Servicing Study Update 2008		N4-6	N4-7	2700	571	Green	Post 2031	$ 4,225	$ 2,412,517				
	Riverside South Infrastructure Servicing Study Update 2008		N4-7	N4-8	3000	900	Green	Post 2031	$ 5,546	$ 4,991,287				
	Riverside South Infrastructure Servicing Study Update 2008		N4-8	N4-9	3000	150	Green	Post 2031	$ 5,546	$ 831,881				
	Riverside South Infrastructure Servicing Study Update 2008		N4-10	N4-3	1800	570	Green	Post 2031	$ 501	$ 285,641				
	Riverside South Infrastructure Servicing Study Update 2008		N4-3	N4-9	2100	590	Green	Post 2031	$ 1,509	$ 890,288				

Table F-2: Storm Water Sewers - South

Line ID	Project Name	Description	Storm Pipe Attributes					Estimated Construction Year	2013 DC Growth Related Costs					Comments
			From	To	Pipe Size (mm)	Pipe Length (m)	Green/ Brown		2013 Oversizing Cost w/o F.E.A. Unit Cost	2013 Oversizing Cost w/o F.E.A. Total Cost	F.E.A. Approved	Paid	2013 DC Project Outstanding Cost	
	Riverside South Infrastructure Servicing Study Update 2008		N4-9	4-inlet	3000	45	Green	Post 2031	$ 5,546	$ 249,564				
2D	***Subtotal Pond 4 Storm Sewers***									**$ 10,184,763**				Post 2031 cost. **Not included in total 2013 outstanding cost.**
	Riverside South SWM Pond 5 Storm Sewers	**POND 5**												
	Rverside South Infrastructure Servicing Study Update 2008		N5-0	N5-0b	1800	615	Green	Post 2031	$ 501	$ 308,191				
	Riverside South Infrastructure Servicing Study Update 2008		N5-0b	N5-4	1800	345	Green	Post 2031	$ 501	$ 172,888				
	Riverside South Infrastructure Servicing Study Update 2008		N5-4	N5-5	1800	431	Green	Post 2031	$ 501	$ 215,985				
	Riverside South Infrastructure Servicing Study Update 2008		N5-5	N5-6	1800	509	Green	Post 2031	$ 501	$ 255,072				
	Riverside South Infrastructure Servicing Study Update 2008		N5-6	N5-7	1800	441	Green	Post 2031	$ 501	$ 220,996				
	Riverside South Infrastructure Servicing Study Update 2008		N5-7	N5-8	1950	651	Green	2025	$ 988	$ 643,119				
	Riverside South Infrastructure Servicing Study Update 2008		N5-8	N5-9	1950	654	Green	2025	$ 988	$ 646,083				
	Riverside South Infrastructure Servicing Study Update 2008		N5-9	N5-13	1950	181	Green	2020	$ 988	$ 178,809				
	Riverside South Infrastructure Servicing Study Update 2008		N5-12	N5-13	1800	1098	Green	2020	$ 501	$ 550,235				
	Riverside South Infrastructure Servicing Study Update 2008		N5-14f	N5-13	1800	590	Green	2017	$ 501	$ 295,663				
	Riverside South Infrastructure Servicing Study Update 2008		N5-13	Pond #5	2700	218	Green	2017	$ 4,225	$ 921,066				
	Riverside South Infrastructure Servicing Study Update 2008		N5-17	N5-18	1800	465	Green	2015	$ 501	$ 233,023				
	Riverside South Infrastructure Servicing Study Update 2008		N5-18	N5-19	1800	392	Green	2015	$ 501	$ 196,441				
	Riverside South Infrastructure Servicing Study Update 2008		N5-19	N5-22	1950	970	Green	2015	$ 988	$ 958,258				
	Riverside South Infrastructure Servicing Study Update 2008		N5-22	Pond #5	2400	250	Green	2015	$ 2,820	$ 704,996				
2E	***Subtotal Pond 5 Storm Sewers***									**$ 6,500,826**			**$ 6,500,826**	
			8	Int. Pond 6a	1950	50	Green	Post 2031	$ 988	$ 49,395				
2F	***Subtotal Pond 6A Storm Sewers***									**$ 49,395**				Post 2031 cost. **Not included in total 2013 outstanding cost.**
2	***Subtotal Gloucester SUC (S-1)***									**$ 19,473,298**	**$ 4,032,000**		**$ 28,073,115**	2005-Council approved 10.65M for Pond 2 (2008)
	South Nepean (North of Jock River)													
	Foster SWM Pond Storm Sewers (STM 3)													
			111	110	2550	425	Green	Pre 2013	$ 3,514	$ 1,493,409				
			110	109	2550	273	Green	Pre 2013	$ 3,514	$ 957,539				
			109	108B	2700	240	Green	Pre 2013	$ 4,225	$ 1,014,018				
			108B	OUTLET	3000	99	Green	Pre 2013	$ 5,546	$ 547,378				
			106	108A	2250	927	Green	Pre 2013	$ 2,079	$ 1,927,047				
3	***Subtotal Foster Pond Storm Sewers***									**$ 5,939,390**			**$ 5,939,390**	
	Kennedy Burnett Pond Storm Sewers (STM 3)	**Kennedy Burrnet Pond Storm Sewers**												
	South Nepean Urban Area Master Servicing Study Environmental Study Report	3000x1200 Box Culvert Equivalent Size ϕ	1600	1590	2100	200	Green	2015	$ 1,509	$ 301,793				
	South Nepean Urban Area Master Servicing Study Environmental Study Report	2400x1200 Box Culvert Equivalent Size ϕ	1570	1560	1950	250	Green	2016	$ 988	$ 246,974				
	South Nepean Urban Area Master Servicing Study Environmental Study Report	4200x1800 Box Culvert Equivalent Size ϕ	1560	1520 (Pond)	3000	450	Green	2017	$ 5,546	$ 2,495,643				
	South Nepean Urban Area Master Servicing Study Environmental Study Report	3600x1500 Box Culvert Equivalent Size ϕ	1510	1500	2700	70	Green	2018	$ 4,225	$ 295,755				
4	***Subtotal Kennedy Burnett Storm Sewers***									**$ 3,340,165**			**$ 3,340,165**	
5	***Subtotal for North of Jock (S-3)***									**$ 9,279,555**			**$ 9,279,555**	

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RIVERSIDE SOUTH SWM POND 4 (Post 2031)
REFER TO TABLE F-1: SWMF - SOUTH
LINE ID #6

RIVERSIDE SOUTH SWM POND 3
REFER TO TABLE F-1: SWMF - SOUTH
LINE ID #5

SWM STORMCEPTOR SITE SPECIFIC TREATMENT UNITS 2, 3, 8
REFER TO TABLE F-1: SWMF - SOUTH
LINE ID #8

RIVERSIDE SOUTH SWM POND 2
REFER TO TABLE F-1: SWMF - SOUTH
LINE ID #4

RIVERSIDE SWM POND 5
REFER TO TABLE F-1: SWMF - SOUTH
LINE ID #7

RIVERSIDE SOUTH TRIBUTARIES

TRIB.	REFER TO TABLE F-1: SWMF - SOUTH
2	LINE ID #10
3	LINE ID #11
4	LINE ID #12
7A	LINE ID #13
7B	LINE ID #14
8	LINE ID #15
10	LINE ID #16
Reach2	LINE ID #17

RIVERSIDE SOUTH STORM SEWERS
REFER TO TABLE F-2: STORM WATER SEWERS - SOUTH
LINE ID #2

RIVERSIDE SWM POND 6A (Post 2031)
REFER TO TABLE F-1: SWMF - SOUTH
LINE ID #9

NOTES:
1. TOTAL COSTS SHOWN IN TABLES INCLUDE CONSTRUCTION, LAND (WHERE APPLICABLE),10% ENGINEERING, 15% CONTINGENCY.
2. PIPE SIZES MAY BE REDUCED AT DETAILED DESIGN STAGE.
3. ROAD PATTERNS BASED ON BEST AVAILABLE.

DEVELOPMENT CHARGE AREA
PROPOSED STORMWATER POND
EXISTING STORMWATER POND
PROPOSED STORM SEWERS
EXISTING STORM SEWERS
NODE NUMBER
PROPOSED TRIBUTARY
EXISTING TRIBUTARY
PROPOSESD STORMCEPTOR (AREA EXCLUDED)
EXISTING STORMCEPTOR (AREA EXCLUDED)
STREAMS
ROADS
RAILWAYS

CITY OF OTTAWA
DEVELOPMENT CHARGES STUDY
PLANNING AND GROWTH MANAGEMENT DEPARTMENT
DEVELOPMENT REVIEW SERVICES

Scale 1:10,000 (0, 100, 300, 500m) | Dwn No. STM4
Dwn By V.H. | Date April, 2014 | Revision 1

Ride SWM Report (JFSA, January 2009) since this area drains to the existing storm sewers tributary to Pond 1. To accommodate runoff up to the 100-yr+20% storm event, additional capacity has been allocated to the Rideau Road storm sewer tributary to Pond 5. A fixed flow rate of 530 L/s has been added to the storm sewer stress test analysis, which is approximately equivalent to the difference between the 100-yr and 100-yr+20% peak runoff from the ultimate buildout of the Park and Ride. This still will not provide a surface outlet for this area however it will provide capacity for a secondary emergency outlet up to the 100-yr+20% event. Details for retrofitting the site with a swale or other drainage measures to convey overflows to the River Road storm sewer are beyond the scope of this study and would need to be evaluated separately.

3.4.2 Minor System

The City of Ottawa Sewer Design Guidelines require that the HGL remain at least 0.3m below the underside of footing (USF) during the 100-year event. For the purposes of this analysis it is assumed that the USF is typically 1.80m below the centerline of road elevation. As such a minimum clearance of 2.10m was used to evaluate the HGL in the 100-year event. Technical Bulletin PIEDTB-2016-01 specifies that the hydraulic grade line must remain below the underside of footing under the stress test event represented by the Chicago 3 hour 100-yr storm with a 20% increase in intensity. The stress test scenario was run for the Rideau River study area to confirm this criterion can be met. No minor system nodes were identified to have clearances less than 2.1m in the 100-year event or 1.8m in the stress test event. **Table 3-2** below gives the maximum HGL and minimum freeboard observed in the 100-yr storm. Results for the stress test event are included in **Appendix E.**

Table 3-2: Minor System Minimum Freeboard in 100-yr Storm

Name	Centreline of Road Elevation (m)	Maximum HGL (m)	Minimum Freeboard (m)	Name	Centreline of Road Elevation (m)	Maximum HGL (m)	Minimum Freeboard (m)
N5-1	98.60	95.25	3.35	N5-34	92.50	88.24	4.26
N5-10	95.30	91.20	4.10	N5-35	91.90	87.46	4.44
N5-11	95.25	91.11	4.14	N5-36	92.40	88.48	3.92
N5-12	94.30	91.00	3.30	N5-37	91.75	87.14	4.61
N5-13	92.73	90.44	2.29	N5-39	89.50	86.47	3.03
N5-14	92.50	89.96	2.54	N5-4	96.20	92.40	3.80
N5-15	92.70	89.73	2.97	N5-40	89.25	86.67	2.58
N5-16	92.50	89.20	3.30	N5-41	97.40	89.60	7.80
N5-17	92.20	88.62	3.58	N5-42	92.80	89.40	3.40
N5-18	91.50	87.95	3.55	N5-43	92.50	89.01	3.49
N5-19	92.15	88.20	3.95	N5-44	92.60	88.83	3.77
N5-2	98.40	94.90	3.50	N5-45	91.50	88.01	3.49
N5-20	90.90	88.03	2.87	N5-46	91.50	87.19	4.31

Name	Centreline of Road Elevation (m)	Maximum HGL (m)	Minimum Freeboard (m)	Name	Centreline of Road Elevation (m)	Maximum HGL (m)	Minimum Freeboard (m)
N5-21	91.20	85.79	5.41	N5-47	91.00	86.99	4.01
N5-22	89.50	85.41	4.09	N5-49	89.00	86.87	2.13
N5-23	89.50	85.33	4.17	N5-5	96.50	92.63	3.87
N5-24	88.10	84.33	3.77	N5-50	90.00	87.08	2.92
N5-25	90.25	87.44	2.81	N5-53	88.00	84.35	3.65
N5-26	90.00	87.18	2.82	N5-54	92.10	87.51	4.59
N5-28	89.00	84.92	4.08	N5-55	92.50	89.21	3.29
N5-29	89.25	85.42	3.83	N5-6	94.50	91.54	2.96
N5-3	98.40	93.14	5.26	N5-7	95.00	91.73	3.27
N5-31	97.80	92.88	4.92	N5-8	94.10	91.04	3.06
N5-32	95.70	89.44	6.26	N5-9	93.00	90.62	2.38
N5-33	93.00	88.52	4.48				

3.4.3 Culvert Sizing

River Road currently has a rural cross-section relying on roadside ditches to provide drainage. In the existing drainage condition, runoff from the Rideau River study area is conveyed across River Road through two (2) significant culvert crossings: one just north of the Pond 5 block (North Ravine) and one just south of the pond 5 block (South Ravine) as shown on the macro-grading plan (**Drawing GCP-1** in **Appendix B**). A third culvert crossing exists between the other two crossings and outlets to a branch of the south ravine.

The existing north and south culverts conflict with the proposed storm and sanitary infrastructure and therefore a major system flow analysis was completed to review sizing requirements for the culverts since they are no longer proposed to convey 100-year event runoff from the development areas east of River Road. The culverts do provide the only surface outlet for the future development areas during a stress test event. As such, proposed culverts would be required to have sufficient capacity to convey this flow. In the stress test event, results indicated the maximum flow through the north culvert was 103 L/s and 370 L/s through the south culvert.

As River Road is considered an arterial roadway a minimum culvert diameter of 600mm is required per the MTO Drainage Manual. It is noted that culverts are sized to have sufficient capacity to convey runoff from River Road if the rural cross-section is maintained and drainage is not captured to the minor system. It is proposed that the existing culverts be replaced with smaller culverts that do not conflict with proposed storm and sanitary infrastructure.

Table 3-3 below summarizes the recommended culvert properties and required flows. Detailed culvert sizing analysis is included in **Appendix F**.

6.0 INFRASTRUCTURE PHASING

The total study area encompasses 300ha of development lands. It is recognized that this development will take several decades to reach full build-out and as such phasing of infrastructure planning and construction was considered to the extent possible in developing the servicing plans. This study has assumed that the interim condition will consist of all development west of Spratt Road except for the Cardel Lands located north of the urban boundary between River Road and Spratt Road. Areas east of Spratt Road to the limit of the study area and the Cardel Lands are assumed to be developed as part of the ultimate scenario. Phasing boundaries are illustrated in **Figure 6-1**. Phasing considerations related to natural features and proposed infrastructure are summarized in this section.

6.1 HEADWATER DRAINAGE FEATURES

A headwater drainage features assessment (HDFA) was completed by Stantec and identified recommendations for each reach of the ravines adjacent to Pond 5. Based on the recommendations of the HDFA, base flow to these ravines will need to be maintained throughout both in the interim and ultimate condition of development.

The construction of Phase 15 will cut off much of the source of base flow for downstream ravines North and South of the Pond 5 block, specifically reaches 1A, 2A and 2B as shown in **Figure 6-1** below. Subdivision designs for areas within the existing tributary areas to the ravines will need to provide measures to ensure baseflows are maintained per the HDFA recommendations.

Observations noted in the HDFA indicate that the watercourses to be preserved and or mitigated, experience seasonally intermittent flow with groundwater inferred to be a significant contributing source of flow. As such, the RVCA has indicated that the use of pond flows or OGS discharge will not provide sufficient replication of the existing flow regime since the temperature of the water from these sources would be too warm. A solution that utilizes foundation drains, or rear-yard drainage or LIDs and conveys flows subsurface for cooling is preferred.

The combined base flow and storm runoff from this system would need to remain below the existing conditions peak flow for each storm event to ensure the erosion thresholds are not exceeded. The approximate pre-development flow rates for each of these reaches is summarized in **Table 6-1** below:

Table 6-1: Pre-Development Tributary Ravine Flows for Varying Storm Events

Reach	Flow (L/s)			
	2-yr 12hr SCS	5-yr 12hr SCS	10-yr 12hr SCS	100-yr 12hr SCS
North Ravine				
1A	310	580	840	1690
South Ravine				
2A	640	1210	1730	3500
2B	240	450	640	1290

APPENDIX E

N

TRANSIT CORRIDOR

STREET NO. 2

STREET NO. 3

STREET NO. 4

STREET NO. 1

STREET NO. 5

STREET NO. 6

STREET NO. 7

LEGEND:

LIGHT DUTY SILT FENCE

TEMPORARY MUD MAT

STRAW BALE CHECK DAM

J:\118404_4725SprattRd\5.9 Drawings \5civil\current\Assessment Report\118404-fig-6.1-EROSION & SEDIMENTATION PLAN.dwg Layout Name: ERO & SED Plot Scale: 1:5.13 Plotted At: 2/27/2019 Last Saved By: Chris.Cormier Last Saved At: Feb. 27, 19

Scale	Project Title	Drawing Title	Sheet No.
NTS	4725 SPRATT	EROSION & SEDIMENTATION CONTROL PLAN	FIGURE 6.1