REPORT
PROJECT: 105203-5.2.2

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
CLARIDGE HOMES PHASE 2 LANDS
- 807 RIVER ROAD
- 4720 SPRATT ROAD
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA

Prepared for CLARIDGE HOMES
by IBI GROUP

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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. The 2017 Riverside South Community Infrastructure Servicing Study Update Rideau River Area (2017 ISSU) report recognizes 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 stormwater management ponds 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.

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 – 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

1.4 Subject Property

The current draft plan of subdivision for the Claridge Phase 2 Lands is shown on **Figure 1.1** which is included in **Appendix A**. The property, which is generally located near the south west corner of the Riverside South Community, covers about 86 ha. The property is located between River Road and Spratt Road sandwiched between the RSDC property to the north and south. Cardel Homes also owns a parcel to the south of the subject site.

The proposed development will include a mixture of various residential types including singles, semis, on street towns, and a mixed use block. The development will also include two parks and two schools.

Since the subject property is relatively large, it is likely it will be a phased development. **Figure 1.2** shows one potential phasing plan. The first phase will likely be dictated by sanitary sewers. The plan assumes that Phase 1 will include maximizing the available capacity in the River Road sanitary sewer prior to extending the Spratt Road sewer. Water supply is available to support this phasing plan. The plan also assumes that Pond 5, c/w inlet structures, will be completed. The plan also assumes concurrent coordination with the RSDC Phase 15 development. A more accurate Phasing Plan will be confirmed at the time of final design.

1.5 Existing Infrastructure

Figure 1.3 shows the location of existing major municipal infrastructure in the vicinity of the Phase 2 development. Previous studies, including the 2017 ISSU report, recommended that wastewater flows from the subject site be routed to one of two sub-trunk sewers. Wastewater flows from the western portion of the property are to be routed to an extension of the River Road sub-trunk sewer which is presently terminated in River Road at node 107a located about 850 m north of the property. The balance of wastewater from the Claridge Phase 2 property is to be routed to an extension of the Spratt Road sub-trunk sanitary sewer which has been constructed to about node 111-a which is located about 1250 m north of the site assuming it will be constructed as per the recommendations of the 2017 ISSU report through the RSDC's property to the north of the subject site.

The 2017 ISSU report recommended that the subject site be serviced with a pair of 300 mm diameter watermains, one along River Road and the second in Spratt Road. As with the sanitary sewer, both those mains will have to be extended from north of the site. The development of the initial phases of the water supply network for the subject site will most likely involve coordination with the northern parcel of the RSDC property, especially for looping purposes.

All minor stormwater runoff from Phase 2 is proposed to be routed to future Pond 5 which will be located beyond the subject site west of River Road. That pond is currently under design. Development of the property will need to include construction of external storm sewers to connect to that facility.

1.6 Pre-Consultation

There was a pre-consultation meeting with the City of Ottawa on June 20, 2017. The formal meeting notes issued for that meeting are included in **Appendix A**, some of the topics reviewed included the following:

- Planning
- Transportation/Transit
- Environment
- Parks
- Engineering and Servicing
- Geotechnical
- Assessment of Adequacy of Public Services Report

A pre-consultation meeting has been set up with the Rideau Valley Conservation Authority for late August, 2017. No pre-construction meeting is proposed with the Ministry of Environment and Climate Control until prior to final design.

1.7 Existing Topography

The property generally slopes from east to west towards River Road. Contours for Phase 2 property range between 90 and 94 meters with an average gradient of about 0.35%. **Figure 1.4,** which is included in **Appendix A**, shows the general topography of the subject property.

Most surface drainage from the property flows to the River Road side ditch where it is routed under River Road through the existing culvert at the south ravine. The ravine in turn discharges into the Rideau River.

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**.

1.8 Geotechnical Considerations

The Updated 2017 Report included a geotechnical discussion for the Rideau River Area which was based on a 2007 geotechnical investigation. One of the recommendations from that study included grade raise restrictions for the Riverside South Community. Based on the 2007 investigation, the Phase 2 lands fall within Zones 2 and 3 which have recommended grade raise restrictions of 2.5 meters and 1.8 meters respectively.

However, Claridge has commissioned Golder Associates to complete an additional investigation specific for its Phase 2 lands. The draft Golder investigation report, “Geotechnical Investigation

Proposed Residential Development Riverside South Lands River Road and Spratt Road Ottawa, Ontario", July 2017 has:

- Determined the subsoil and groundwater conditions at the site by means of test pits and boreholes and;
- Provided geotechnical recommendations pertaining to design of the proposed development including construction considerations.

Among other items, the report recommendations also reviewed the following:

- Site grading;
- Foundation design;
- Pavement structure;
- Sewer and Watermain Construction;
- Groundwater Control;
- Confirmation of Grade Raise limits

With respect to grade raise limits, the report recommended grade raise of 2.4 meters for Area B and unlimited grade raises for Area A. For reference, copies of pages 8 and 9 and Figure 1 from the Golder Report are included in **Appendix A**.

1.9 Watercourses and Setbacks

There are two ravines within the subject property. However, based on the current CDP, there appears to be no indication of setback requirements within the Phase 2 limits.

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

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 north. A 305 mm watermain is stubbed on River Road at Summerhill Street and on Spratt Road at the Bus Rapid Transit corridor. There is a 406 mm watermain on Borbridge Street between Brian Good Avenue and Southridge Street. **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**.

An hydraulic analysis was conducted for the Rideau River Area trunk watermain as part of the report. The analysis was conducted assuming that the Barrhaven Pump Station was operating at a discharge HGL of 147 m and the Ottawa South Pump Station was 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 2017 ISSU 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

The watermains for the subject site are proposed to be sized based on 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

Fire flow requirements for the subject site shall be calculated by the Fire Underwater Survey and in accordance with Technical Bulletin ISDTB-2014-02. The following “C” valves will be used in the design of the watermain pipes.

PIPE DIAMETER (MM)	C-FACTOR
150	100
200 to 250	110
300 to 600	120
Over 600	130

2.4 Recommended Water Distribution Plan

A preliminary water plan is shown on **Figure 2.1** in **Appendix B**. The plan includes the trunk watermains identified in the 2017 ISSU Report. The local watermain sizing will be conducted during detailed design and will be in accordance with the design criteria in Section 2.3 and the construction phasing, as shown on **Figure 1.2**.

Water servicing for Phase 1A and 1B will require extension of existing mains on River Road up to and along Street No. 1. A second watermain feed can be provided from the existing main on Borbridge Street at Southbridge Street through the RSDC lands to the north. Phase 1C will likely require a connection from the extended River Road watermain at Street No. 9 or from watermain connections from the RSDC lands to the east if available at the time. For Phase 2 and 3 the existing mains on Spratt Road will need to be extended to the site and possibly the existing main at Borbridge Street at Brian Good be extended through the RSDC lands to the north. All watermain servicing of the trunk and local mains will require coordination with RSDC.

3 SANITARY SEWERS

3.1 Existing Conditions

As noted earlier in Section 1.5, sanitary flows from the subject site will be routed to one of two sub-trunk sanitary sewers; the 525 mm diameter pipe in River Road or the 525 mm diameter sewer in Spratt Road. **Figure 1.3,** in **Appendix A**, shows the current location of those sewers. Each sewer will need to be extended to reach the subject site. Again coordination with the RSDC will be required since both these sub-trunk sewers are proposed to be routed through the northern parcel of the RSDC Phase 15 property before reaching the Claridge Phase 2 property.

The proposed sanitary collection system for the Rideau River area includes multiple sanitary trunk sewers, ranging in size from 450 mm diameter to 525 mm diameter, and are designed to convey all flows westward to the existing West Rideau Collector. Sanitary flow from the existing Riverside South community is currently conveyed to a temporary sanitary pump station with a capacity of 140 l/s. Based on existing conditions flow monitoring and growth projections for the Riverside South Community, it is proposed that by the end of 2018 the sanitary flows be redirected from the Rideau River Pump Station to three existing 450 mm inverted siphons under the Rideau River. Flow monitoring should be continued throughout 2018 to confirm the timing of the switchover. It is noted that revisions to the City of Ottawa Sewer Design Guidelines are anticipated for the near future and may allow an opportunity for a re-evaluation of these results. Additionally, a re-evaluation of the existing system's residual capacity could be completed using operational flows during the detailed design analysis for future development areas, if determined acceptable by the city of Ottawa.

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 the study area be routed to either the River Road or 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 2a be tributary to the River Road sanitary sewer and areas 2c and 2d 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**.

However, subsequent to completion of the 2017 ISSU Report, it was recommended to move the drainage limit between the two sewers eastward. A copy of Figure S-1, Alternative Sanitary Drainage Limit by IBI Group, is included in **Appendix C** for reference. It is proposed to switch about 33 ha from Drainage Area 2c and 8 ha from Drainage Area 2d away from the Spratt Road sewer to Drainage Area 2a which is tributary to the River Road sewer. This drainage limit shift is supported by the impacted landowners including RSDC, Claridge and Cardel. A copy of the relevant July 20, 2017 e-mail string is included in **Appendix C**.

Therefore, it is proposed to increase the 2a sub-catchment area by about 41 ha and decrease the 2c and 2d areas by an equal amount. It is also recommended to use the revised City of Ottawa Guidelines. The City of Ottawa has requested that a Deviation Report for the proposed changes in design criteria be completed by IBI since the proposed changes are not yet official. The change

in drainage area between area 2a and areas 2c and 2d is considered a minor MSS change. A copy of the Draft Deviation Report is included in **Appendix C**.

3.3 Design Criteria

The estimated wastewater flows from the subject site are based on the proposed 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 2016 Riverside South CDP and the 2017 ISSU Report, the following density rates are estimated for the subject site:

- Single units = 3.2
- Semi units = 3.2
- Townhouse and back to back units = 2.4
- Apartment units = 1.9

3.4 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 Claridge's Phase 2 sub-division will discharge to either the River Road sub-trunk sewer or the Spratt Road sewer. Both those sewers presently terminate north of the subject property, so the plan will include southerly extensions of those two sewers.

Drawing SAN-1 and the related spreadsheet dealt with the sub-trunk sewer sizing only. 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.

Servicing of the Phase 2 property will involve some coordination with the RSDC since some of the property is tributary to the Spratt Road extension in Brian Good Avenue. Both sub-trunk sewer extensions in River Road and Brian Good Avenue will also need to be oversized for the upstream Cardel lands.

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 plan will need to be confirmed at the time of final design.

Some of the sanitary sewers which are recommended to service the Rideau River Area are subject to cost sharing as noted in the Draft 2013 Development Charges Study Report Update. For reference a copy of Figure SAN 5 from that report is included in **Appendix C**. The report specifically identifies the proposed 525mm dia sanitary sewer extension along Spratt Road into the subject site (nodes 112 to 113). The City may have to amend the DC Report at the next review to include an extension of this sewer south of node 113 and to include the extension of the River Road sewer. As per the 2017 ISSU Update Report, sanitary sewers in these two locations are proposed to be larger than 375mm dia and could qualify for cost sharing.

4 STORMWATER MANAGEMENT

4.1 Existing Conditions

The subject property is located between River Road and Spratt Road immediately south of the RSDC Phase 15 north parcel and north of both the RSDC Phase 15 south development and lands owned by Cardel Homes. Most of the property is wooded. There are no existing central municipal services including storm sewers, within the property. The ultimate storm runoff outlet from the property is Pond 5 which is presently under design and will be constructed west of River Road.

River Road is a main arterial road near the property which captures runoff in road side ditches. Runoff from the east road side ditch is captured in culverts in three locations and routed under River Road towards one of two existing ravines. Two of those culverts are located at the North and South ravines and the third is located between these two and outlets to a tributary to the south ravine. The 2017 ISSU Report noted these culverts and indicated that the outlet for the central culvert will be lost due to development. It is therefore recommended to redirect runoff from that culvert location and route it to the south ravine location assuming the road maintains its rural cross-section.

The remaining two culverts appear to be in conflict with the proposed minor sewer system and will need to be replaced.

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 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 Pond 5, through one of four trunk storm sewers. For reference a copy of Drawing STM1, Storm Sewers from the 2017 study is included in **Appendix D**. Two of the trunk sewers are proposed to be located within the subject property. These include the following sewers which are designated by nodes:

1. N5-35 to N5-53 (Pond 5)
2. N5-45 to N5-53 (Pond 5)

The minor storm plan for the subject site is proposed to follow the recommendation of the 2017 ISSU report. Only minor adjustments to that plan, related to the current draft plan, are proposed for the storm sewers.

Obviously some agreement and coordination are required with adjacent land owners including Richcraft Homes and the RSDC since portions of the storm trunk sewers are proposed to be routed through downstream properties before reaching the Claridge Phase 2 lands.

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 MOECC. 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
- Minimum Slope:

PIPE DIAMETER (MM)	SLOPE (%)
250	0.432
300	0.34
375	0.25
450	0.195
525	0.16
600	0.132
675	0.113
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 site but for adjacent lands in the development area. The plan recommends that the Rideau River Area can be adequately serviced from four trunk sewers. The sewer locations and drainage areas were selected to keep trunk sewer sizes to a maximum of 3000 mm dia. The four trunk sewers will be ganged into two sewers at River Road and these two sewers will empty into the new Pond 5 stormwater facility to be located west of River Road.

Figure 4.1 in **Appendix D**, shows a preliminary minor storm plan for the Claridge Phase 2 property. This plan is based on the 2017 ISSU report recommendation for trunk sewers but is also expanded throughout the balance of the draft plan. The Plan, which shows sewer flow directions, was based on the drainage limits identified in the 2017-ISSU report but with minor adjustments to better match the current draft plan and sanitary flow directions. Further stormwater analysis at the time of final design will determine exact drainage limits and sewer sizes.

Because of the location of the Claridge Phase 2 property, which is upstream of other adjacent land owners, some coordination with both Richcraft Homes and RSDC will be necessary to implement the plan.

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 called the major system. 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.

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

There are three existing culverts crossing River Road that currently convey runoff to the Rideau River. It is noted in the 2017 ISSU Update that a portion of the North-South Branch of the South Ravine will be lost to development. The existing culvert tributary to the North-South Branch will therefore have no outlet. River Road ditches may require regrading to convey runoff to the southern-most culvert, tributary to the main branch of the South Ravine.

Per the 2017 ISSU Update, the proposed storm and sanitary infrastructure will conflict with the two remaining culverts, which are considered the only surface outlets from the upstream Rideau River Study Area. In order for the culverts to convey runoff (from River Road and major flow from the upstream development), they will have to be modified to avoid conflicts with the proposed storm and sanitary infrastructure.

As summarized in the 2017 ISSU Update, an outcome of the Headwater Drainage Features Assessment (discussed in **Section 4.8**) completed for the 2017 ISSU Update identified that the peak flow to the North and South Ravines should not exceed that of pre-development conditions.

Based on the above constraints, the Rideau River Study Area is, for all intents and purposes, a self-contained site. The analysis presented in the 2017 ISSU Update suggests that across the Study Area, surface storage, in addition to that provided by street sags, may be required. This will be considered a last resort at the detailed design stage.

4.6 Hydraulic Evaluation

A hydraulic evaluation of the Rideau River Study Area storm sewer system was completed as part of the 2017 ISSU Update. The hydraulic grade line (HGL) for the trunk sewers is presented in Table 3-2, Minor System Minimum Freeboard in 100-yr Storm, from the 2017 ISSU Update and is enclosed along with Drawing STM-1, storm sewers, in **Appendix D** for reference.

4.7 External Drainage

Under the ultimate post-development scenario presented in the 2017 ISSU Update, lands to the east of the subject sites will be developed as part of the Rideau River Study Area. As part of development of the subject sites, trunk storm sewers will be extended upstream of Spratt Road. On an interim basis, ditch inlet catch basins will be installed upstream of Spratt Road to intercept flow from the existing rural lands and convey the flow to Pond 5. This will assure that the first phases of development do not impact the existing flow patterns.

4.8 Headwater Drainage Features Assessment

As noted in **Section 4.4** an assessment of the headwater drainage features was completed by Stantec for the North and South Ravine. The assessment is presented in “Headwaters Drainage Features Assessment” June 27, 2017 report and summarized in Section 6.1 of the 2017 ISSU Update. The findings are summarized as follows:

- The watercourses experience seasonally intermittent flow with groundwater inferred to be a significant contributing source of flow.
- The watercourses are to be either preserved and/or mitigated.
- Baseflow to the ravines will need to be maintained throughout the interim and ultimate condition of the development

Per the 2017 ISSU Update, the RVCA has indicated that a design that provides flow from foundation drains, rear yard drainage or low impact development features and conveys flows subsurface is preferred. Furthermore, total peak flow to the ravines shall not exceed that of existing conditions to assure erosion thresholds are not exceeded. Existing conditions peak flows are summarized in Table 6-1, Pre-Development Tributary Ravine Flows for Varying Storm Events, from the 2017 ISSU Update, and are enclosed in **Appendix D** for reference.

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 the subject site 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 (ESCP) 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 MOECC application to the province and eventually issue a Commence Work Notification.

6.2 Province of Ontario

The Ministry of Environment and Climate Change (MOECC) 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 MOECC.

6.3 Conservation Authority

The Rideau Valley Conservation Authority will be contacted to confirm if any permits are required from the agency and to confirm re-charge mechanisms for the two ravines west of River Road.

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 outlet wastewater sewer system is already in place. A new stormwater management facility, Pond 5, is currently under design and once constructed will provide the necessary treatment for runoff from the subject site. Therefore, including both existing and proposed 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 Phase 2 property at 807 River Road and 4720 Spratt Road be accepted and that the development of the property move forward.

APPENDIX A

- **City of Ottawa Servicing Study Guidelines Checklist**
- **2016 Riverside South Community Design Plan – Land Use Plan**
- **Figure 1-1 – Riverside South Community and Study Area Boundary – 2017 ISSU – Rideau River Area**
- **Pages 1.4 and 1.5 – 2017 ISSU – Rideau River Area**
- **Figure 1.1 – Draft Plan**
- **Figure 1.2 – Phasing Plan**
- **Figure 1.3 – Existing Municipal Infrastructure**
- **June 20, 2017 City Pre-Consultation Meeting Notes**
- **Figure 1.4 – Site Topography**
- **Drawing GCP-1 - Macro Grading Plan – 2017 ISSU – Rideau River Area**
- **Figure 2-3 – Grade Raise Restrictions – 2017 ISSU – Rideau River Area**
- **Pages 8 and 9 and Figure 1 from draft Golder July 2017 Geotechnical Report**

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.	Report Title, 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, 4.7
√	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.	Figure 1.2
√	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, 4.8
	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

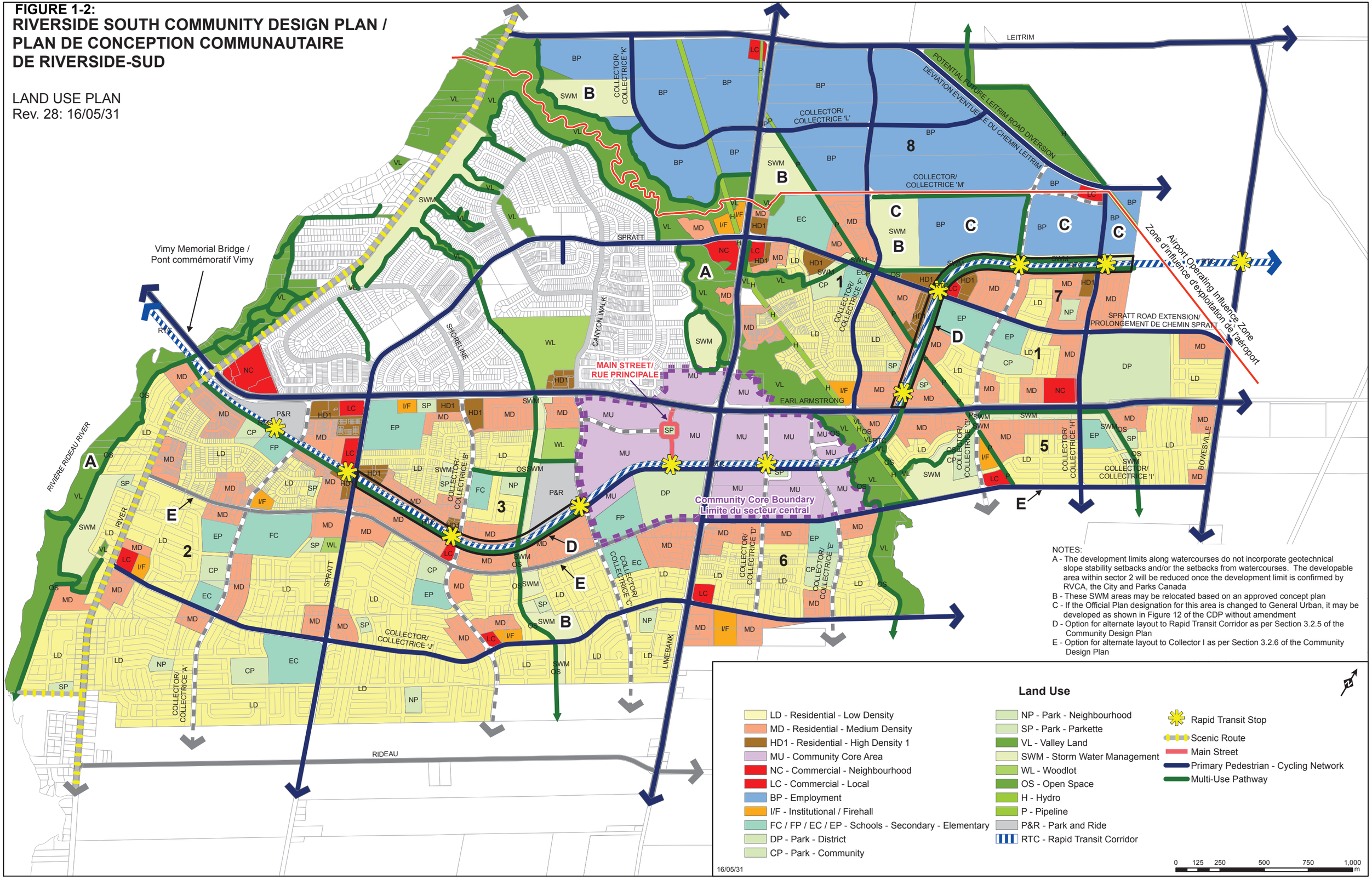
CONCLUSION CHECKLIST

	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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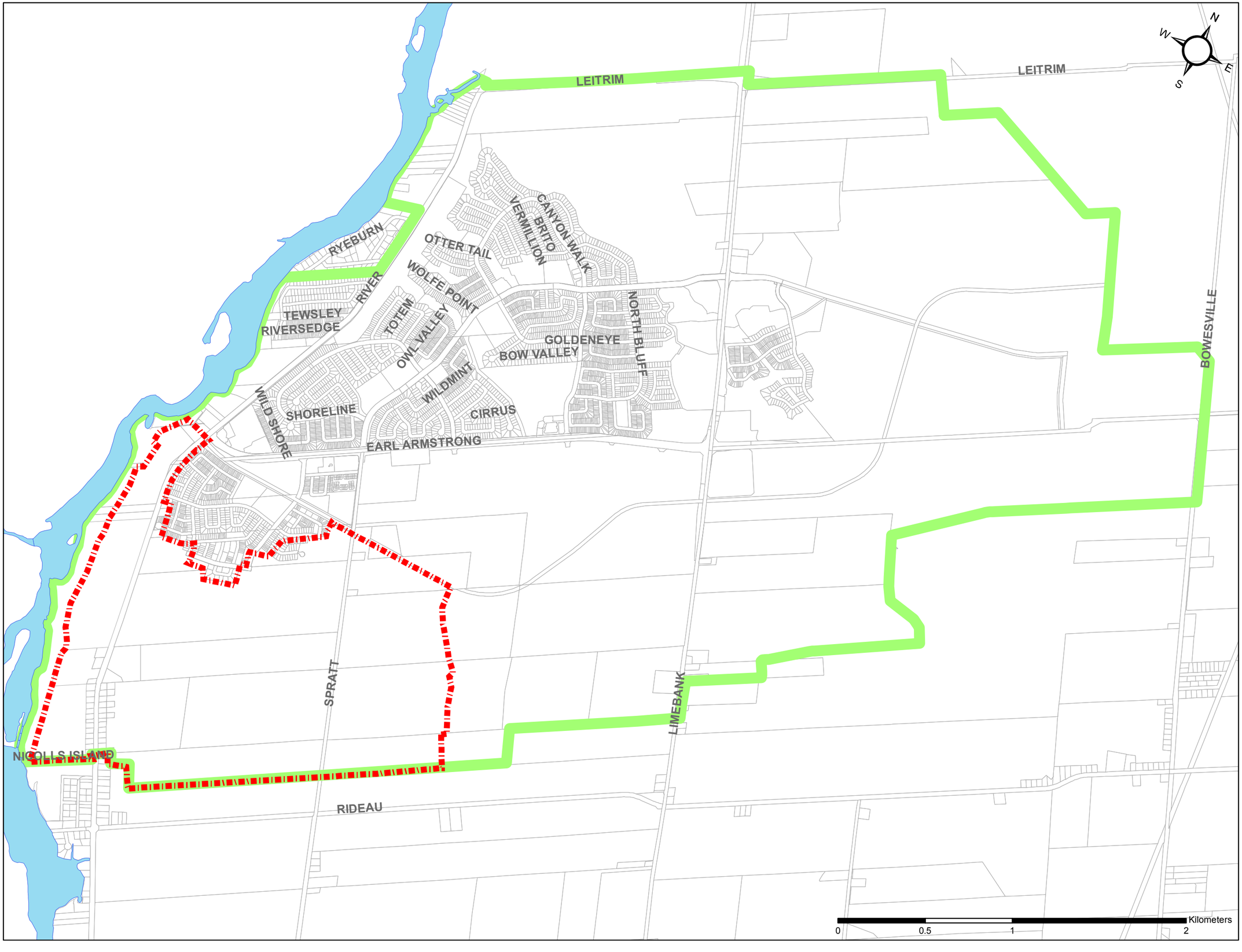


Stantec

STANTEC CONSULTING LTD.
400 1331 CLYDE AVENUE
OTTAWA, ON
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)

DRAFT PLAN OF SUBDIVISION OF
PART OF LOTS 23 And **24**
BROKEN FRONT
CONCESSION (RIDEAU FRONT)
Geographic Township of Gloucester
CITY OF OTTAWA
Prepared by Annis , O'Sullivan , Vollebekk Ltd.

N

Scale 1 : 2000
80 60 40 20 0 40 80 Metres

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

REVISION SCHEDULE			
NO.	REVISION	DATE	
1	PLAN PREPARED	MAY 4, 2017	S
2	GENERAL REVISIONS	JUNE 20, 2017	N
3	INCREASED PARK AREA	JULY 25, 2017	N

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

Job No.19436–17 Urbandale Pt Lts 22–24 ... Phase 15 DPS D1S

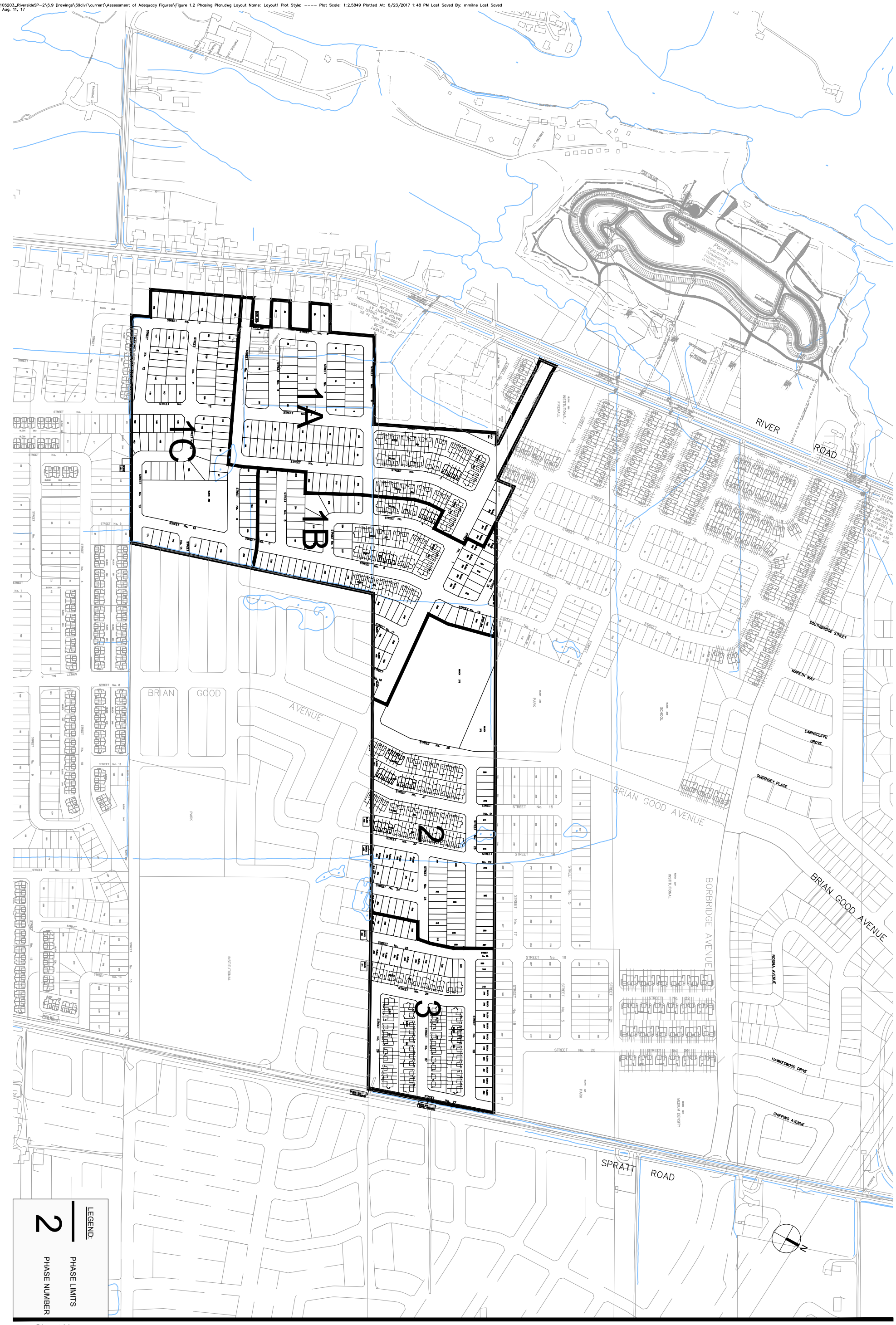
Project Title
ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
CLARIDGE HOMES PHASE 2 LANDS
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA

Scale
N.T.S.

Drawing Title
DRAFT PLAN

Sheet No.
FIGURE 1.1

J:\105203_RiversideSP-2\5.9 Drawings\59civil\current\Assessment of Adequacy Figures\Figure 1.2 Phasing Plan.dwg Layout Name: Layout1 Plot Style: ---- Plot Scale: 1:2.5849 Plotted At: 8/23/2017 1:48 PM Last Saved By: mmilne Last Saved At: Aug. 11, 17



Sheet No.

FIGURE 1.2

Drawing Title

PHASING PLAN

Project Title

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES

CLARIDGE HOMES PHASE 2 LANDS
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA

Scale

N.T.S.

IBI

Sheet No.

FIGURE 1.3

Drawing Title

LOCATION OF
EXISTING INFRASTRUCTURE

Project Title

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
CLARIDGE HOMES PHASE 2 LANDS
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA

Scale

N.T.S.

IBI

21 June 2017

RECORD OF DISCUSSIONS (ROD) -
PRECONSULTATION MEETING – Parcel located between 4650 and 4800 Spratt Road, and behind 793 to 819 River Road
City of Ottawa, City Hall Room 4102E – 20 June 2017 – 1030hrs

In attendance:	Jim Burghout	Claridge
	Bob Wingate	IBI
	Terry Brule	IBI
	Wendy Tse	Planner, City of Ottawa
	John Sevigny	Project Manager, City of Ottawa
	Burl Walker	Parks Planner, City of Ottawa
	Asad Yousfani	Transportation, City of Ottawa
	Vincent Denomme	Co-op Student, City of Ottawa
Regrets:	Matthew Hayley	Planner, City of Ottawa
	Max Walker	Transit Planner, Transit Services
	Jamie Batchelor	RVCA
Secretary:	Sarah Ezzio	Planning Student, City of Ottawa

ITEM	TOPIC	ACTION
1	Introductory Remarks Mr. Jim Burghout (JB) gave a brief introduction to the site, which are unaddressed parcel located between 4650 and 4800 Spratt Road and behind 793 to 819 River Road. The sites have since been assigned the civic addresses of 807 River Road and 4720 Spratt Road.	Info
2	Project: The current proposal is to develop a 748 unit subdivision on new streets located behind Spratt and River Roads. The subdivision will consist of 349 row house units, 347 single detached units, 52 semi-detached units, a partial school block, a partial park block and a park block. The subdivision is adjacent to the site of an Urbandale subdivision application that is expected to be submitted to the city around the same time. **Significant Discussion:** **Planning:** Wendy Tse (WT) brought up the following concerns and	

ITEM	TOPIC	ACTION
	considerations: - The Riverside South Community Design Plan designates a "Primary Pedestrian – Cycling Network" as located within the site. WT mentioned that this should be kept in mind when designing the treatment and developing Street No. 1 in the submitted concept plan. Mr. Jim Burghout (JB) mentioned that he would like clarification on what this designation entails for the cross-section of this street. - The Riverside South Community Design Plan designates River Road as a Scenic Entry Route into the community. The development should maintain and preserve the road as such. - Consideration should be made to establish a reasonable buffer between the proposed subdivision units and the existing houses along River Road. - To follow the direction of Building Better and Smarter Suburbs, townhouse unit driveways should be paired. This will provide additional opportunities for on-street parking as well as tree planting. - Additional walkways and pathway connections through blocks should be contemplated to further the directions of the Riverside South Community Design Plan. Walking/cycling to key facilities within the neighborhood and the wider community should be direct and convenient. - The location of sidewalks will be determined at draft plan stage; at minimum local roads should provide sidewalk on at least one side. **Transportation/Transit:** - Asad Yousfani (AY) detailed the road widths that will be required within the subdivision. The collector road should be at least 24 m wide and no roads should be less than 18 m. - Access to the subdivision will permanently be off of River Road, but AY mentioned that a construction entrance off of Spratt Road will be required while the River Road entrances are being developed. Regulations are that once 100 units are developed, a second entrance is required. - A Transit Servicing Strategy will be imposed as a Draft	

ITEM	TOPIC	ACTION
	Plan Condition as the development is located beyond 400 m of existing service. - As part of the Strategy, the developer should consider potential areas for temporary turn around(s). - The developer is to work with Transit Services to ensure that where bus stops are located adjacent to a home that it is located adjacent to a side lot. The developer should contact Transit Services to identify future bus stop locations. - To accommodate transit in the proposed subdivision, consideration will be required for where bus turnarounds and bus stops should be located. - AY mentioned that the school site may be a good fit for a roundabout. **Environment:** - An Environmental Impact Statement to address endangered and threatened species habitat is required. Some hedgerows may provide habitat or contain endangered species along with the outbuildings which may provide barn swallow habitat. - Opportunities to retain trees should be investigated, especially along the property lines and parks. - There have been three watercourses identified on the property. Therefore a headwater drainage features assessment using the headwater drainage features assessment protocol would be required for the watercourses on the property. The results of the headwater drainage feature assessment would determine if alterations/eliminations of watercourses would be permissible. - The watercourses are also subject to Ontario Regulation 174/06 "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation" under Section 28 of the Conservation Authorities Act. This regulation affects the property in the following manner: *Any alteration, straightening, changing, diverting or interfering in any way with any watercourse requires the prior written approval from the Conservation Authority*	

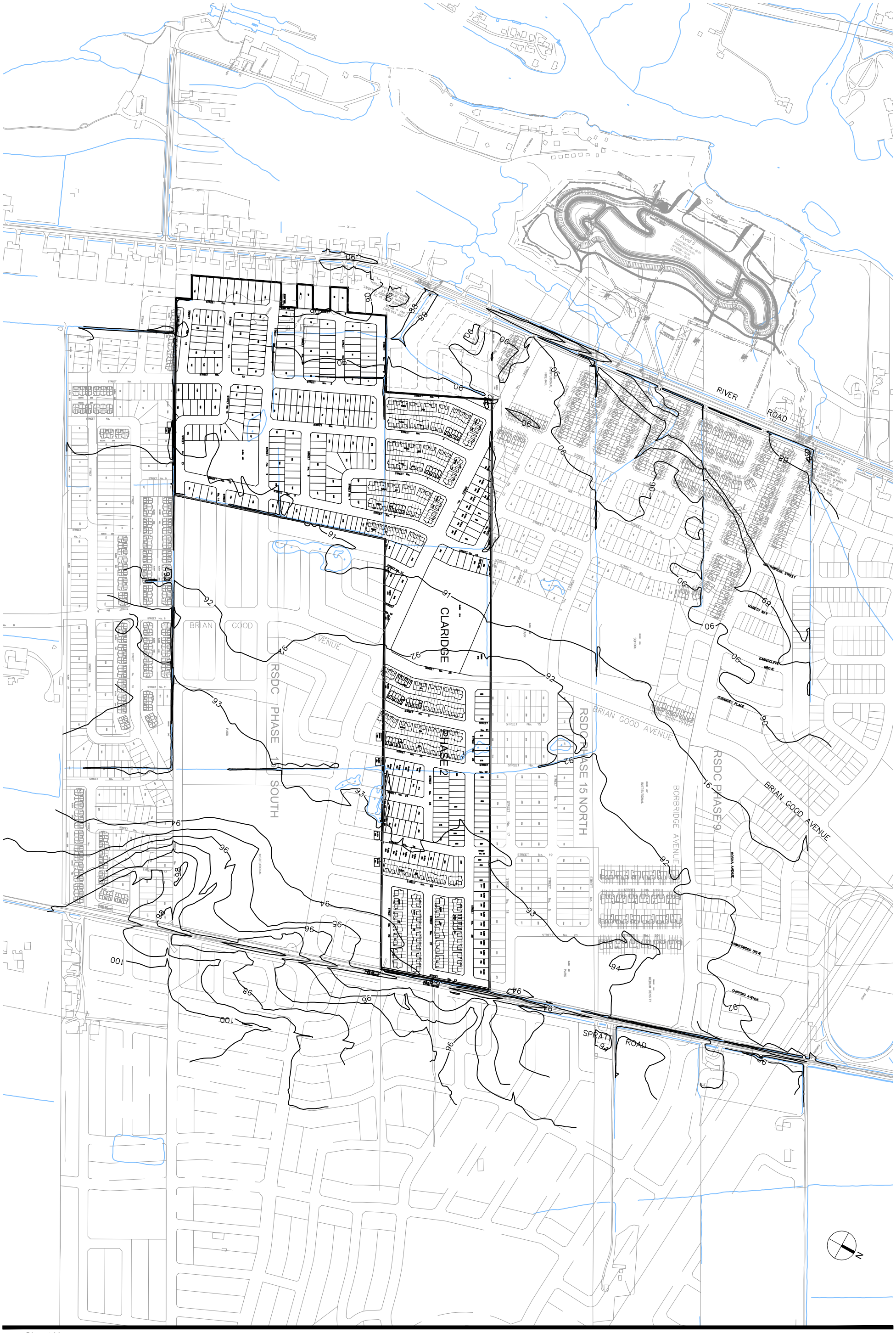
ITEM	TOPIC	ACTION
	(including watercourse crossings). - This property would fall within the area to be serviced by the future Riverside South Pond 5. Therefore the design for Stormwater management will conform to the Master Drainage Plan and the ISSU. If any interim measures are proposed, then this would require further discussion. **Parks:** - As the development of Riverside South as a whole is coordinated between several developers, efforts to provide sufficient park space will need to be harmonized through precautionary agreements between the developers. - Burl Walker (BW) mentioned that the size of the park as shown on the submitted conceptual plan should be checked against the policies of the Riverside South Area Modified Parks Plan and Fit Plans. He communicated that the size may be too small as currently proposed, but the frontage requirements appear to be met. - Post meeting, BW confirmed that the size contemplated in the CDP and MAPP is in the range of 1.0 to 1.0 3ha. **Engineering and Servicing:** - Mr. John Sevigny (JS) communicated that the development of services needs to be coordinated with surrounding developers. Capacity should be allocated so that Urbandale to the north and Cardel to the south have sufficient serviceability for their sites. - JS mentioned that the developers should get in contact with utility providers (i.e. Enbridge, Hydro Ottawa) in the early stages of development for utility planning purposes. - JB discussed the front-ended co-development of Stormwater Pond 5 that will be required to service the development. The construction of this pond is expected to be in the fall or spring. - The RVCA should be contacted to confirm if any permits are required for altering, decommissioning etc, any existing watercourses, ditches etc. in the area.	

ITEM	TOPIC	ACTION
	- Please contact the local Ministry of Environment to determine what approvals, if any, will be required for the site. The Contact information is below. **Residential** Charlie Primeau Phone: (613) 521-3450 ext. 251 email: Charlie.Primeau@ontario.ca **Future Actions:** - The development will require an application for Plan of Subdivision as well as zone amendment. - WT recommended that Councillor Michael Qaqish should be given the 'heads-up' to this potential application. - The submission requirements are the following: Draft Plan of Subdivision Landscape Plan Survey Plan (2 copies) Planning Rationale Archaeological Resource Assessment Phase 1 Environmental Site Assessment Phase 2 Environmental Site Assessment, if required by Phase 1 Environmental Impact Statement Tree Conservation Report, may be combined with Environmental Impact Statement Integrated Environmental Review, included in the Planning Rational Assessement of Adequacy of Public Services Study: • The report is to follow the City's Servicing Study guidelines which can be found at the following link: http://ottawa.ca/en/development-application-review-process-0/servicing-study-guidelines-development-applications • Prior to submitting the servicing report the consultant should contact JS and request boundary	

ITEM	TOPIC	ACTION
	conditions for the watermain design. The consultant will need to provide the type of development, fire flow required, average day demand, maximum day demand and maximum hour demand as well as a location plan showing the points of connection to the public system. • The Watermain, Storm and Sanitary Sewers are to follow the recently approved Infrastructure Servicing Study Update and the Master Drainage Plan update for the Rideau Drainage Area in Riverside South. If the consultant requires digital copies then they can email john.sevigny@ottawa.ca for the documents. Geotechnical Study: • Containing detailed information on geotechnical matters and recommendations (i.e. pavement, foundation, bedding construction etc.). The report is to follow the City's Geotechnical Reporting Guidelines which can be found at http://www.ottawa.ca/cs/groups/content/@webottawa/documents/pdf/mdaw/mtm4/~edisp/cap137602.pdf • Sensitive Marine Clay (SMC) is widely found across Ontario – geotechnical reports should include Atterberg Limits, consolidation testing, sensitivity values, and vane shear test results (at a minimum) with a discussion for proposals in areas containing SMC. • If there are any potential unstable slopes than a slope stability analysis is required and is to follow the City's slope stability reporting guidelines which can be found at http://documents.ottawa.ca/en/document/slope-stability-guidelines-development-applications Hydrogeological Assessment: • Addressing the impacts to existing well in the vicinity of the development. • This report shall include at a minimum the following items: o Basic hydrogeology for the area o Risk to existing wells during construction and from the long term development of the site (e.g. quantity/quality, recharge, water budget) o Monitoring program for existing wells.	

ITEM	TOPIC	ACTION
	Combined Community Transportation Study and Transportation Impact Study Roadway Modification Design Plan X-section of collector Preliminary Noise study - Please provide 15 hard copies of all plans, except where noted, and three copies of all reports. Please also submit the plans and reports in .pdf format.	
3	**Closing Remarks:** WT thanked everyone for their participation and input. She concluded the meeting at 1200 hrs.	

Wendy Tse
Planner, Development Review – South Services



Sheet No.

FIGURE 1.4

Drawing Title

EXISTING TOPOGRAPHY

Project Title

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
CLARIDGE HOMES PHASE 2 LANDS
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA

Scale

N.T.S.

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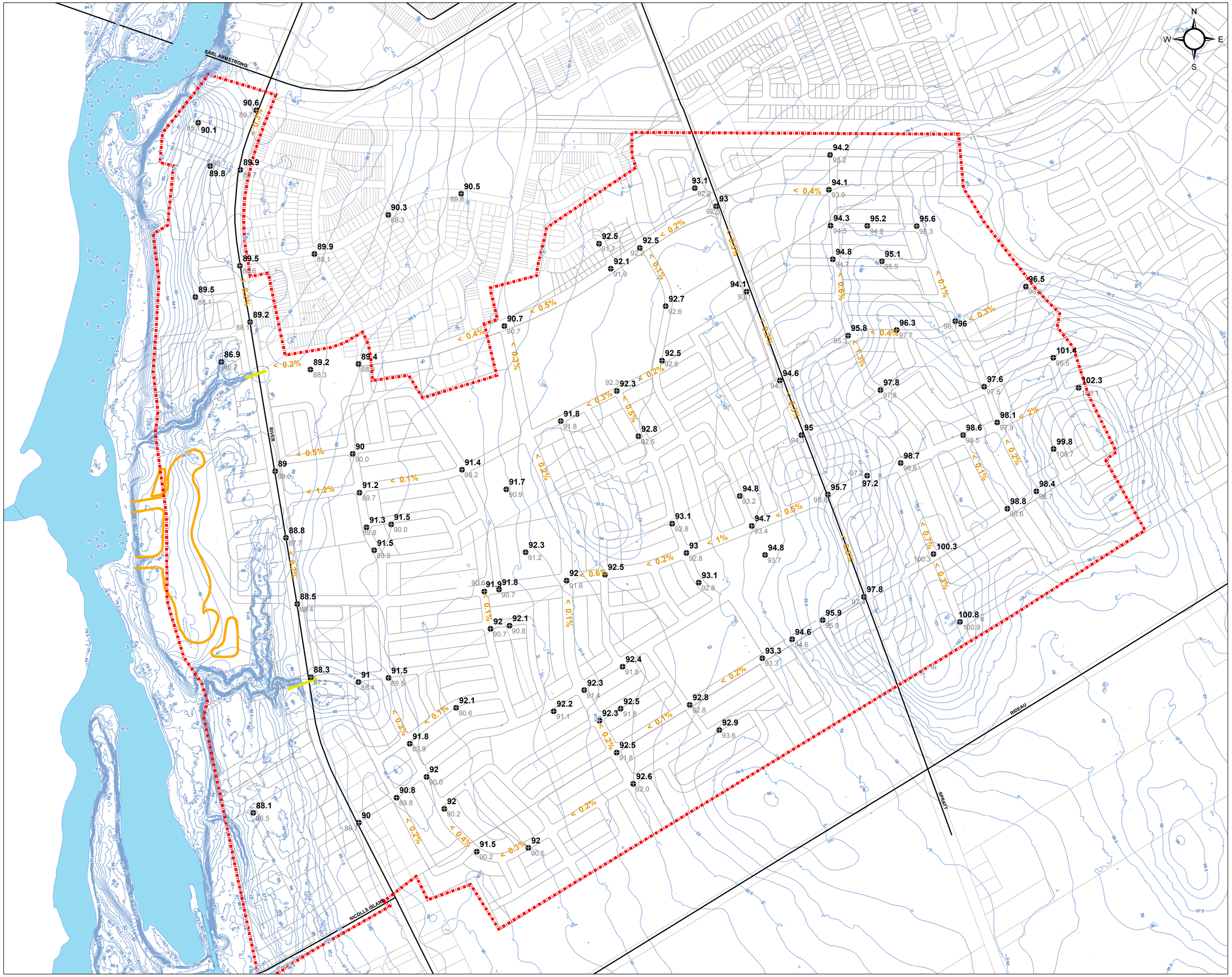

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Legend

- 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**

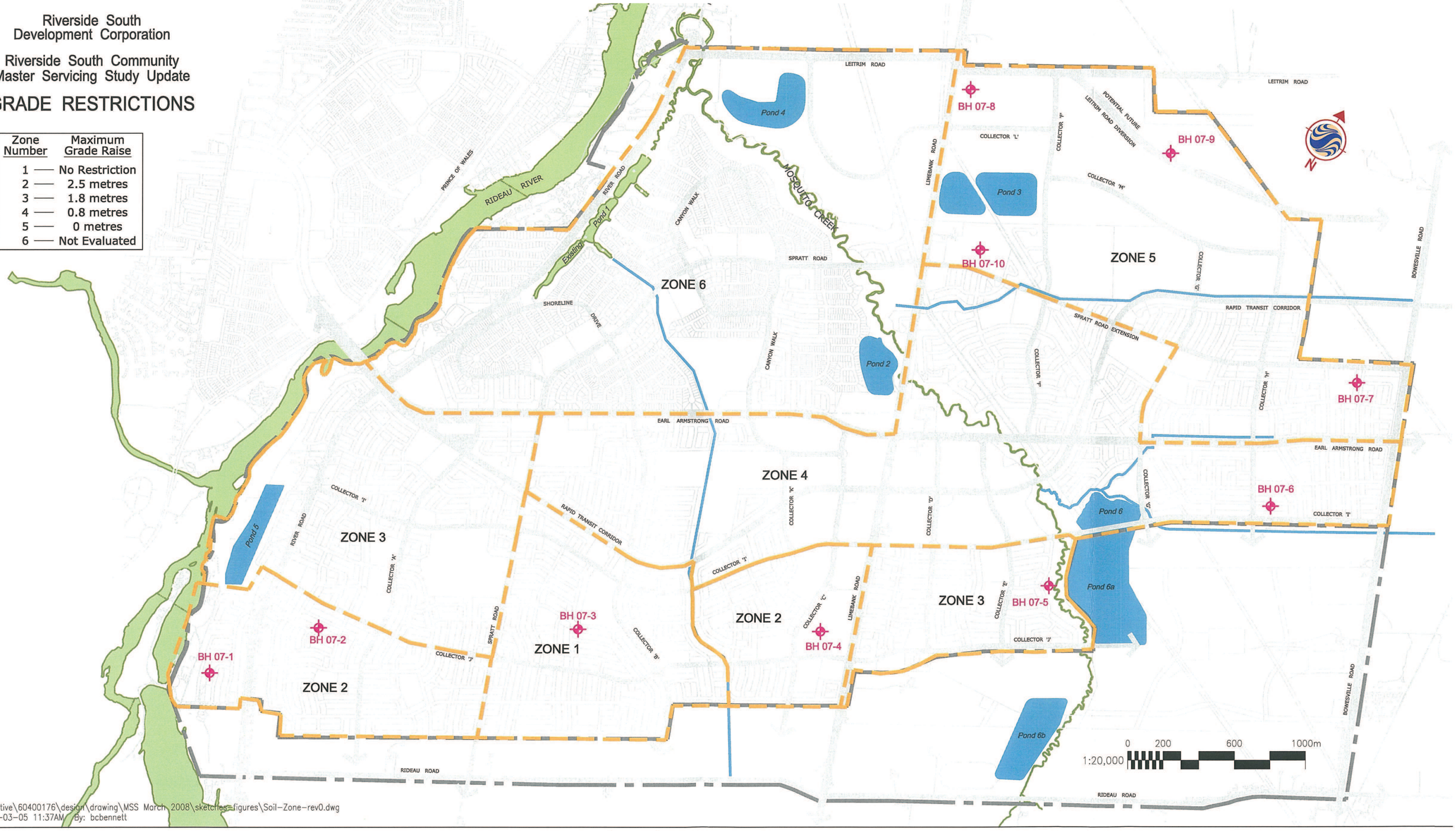
APPENDIX A - ALLOWABLE GRADE RAISES

Riverside South
Development Corporation

Riverside South Community
Master Servicing Study Update

GRADE RESTRICTIONS

Zone Number	Maximum Grade Raise
1	No Restriction
2	2.5 metres
3	1.8 metres
4	0.8 metres
5	0 metres
6	Not Evaluated



:\active\60400176\design\drawing\MSS March 2008\sketches-figures\Soil-Zone-rev0.dwg
008-03-05 11:37AM By: bcbennett

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Legend

⌖	Borehole Location	Study Zone	
BH 07-4	Borehole I.D. Number	ZONE 2	Zone I.D. Number

Grade Restriction Data is from Golder Assoc. Ltd.

Figure 2.3

5.0 DISCUSSION

5.1 General

This section of the report provides engineering guidelines on the geotechnical design aspects of this project based on our interpretation of the borehole information as well as the project requirements, and is subject to the limitations in the "Important Information and Limitations of This Report" which follows the text of this report.

5.2 Site Grading

Based on the subsurface conditions encountered and the soil strengths determined within the boreholes, the site has been divided into two "assessment areas", Area A and Area B. The boundaries of the assessment areas are shown on the Site Plan, Figure 1.

The subsurface conditions in Assessment Area A generally consist of topsoil/fill underlain low compressibility layered silt, silty clay, clayey silt, and silty sand overlying glacial till or topsoil underlain by silty sand and glacial till. The subsurface conditions in Assessment Area B generally consist of topsoil/fill underlain weathered silty clay, clayey silt, and silty sand, overlying a deposit of unweathered and potentially compressible silty clay to clay underlain by glacial till.

For Area A, there is no practical limitation on the amount of grade raise fill which can be placed in this area from a geotechnical point of view.

The "softer" unweathered silty clay in Area B has limited capacity to accept additional load from the weight of grade raise fill and from the foundations of houses without undergoing consolidation settlements. Therefore, for this area, to leave sufficient remaining capacity for the silty clay to support house foundations, with reasonable footing sizes, the thicknesses of grade raise fill will need to be limited.

The following table provides the maximum grade raises which are permitted for each of the assessment areas indicated on Figure 1. These grade raise limitations have been assessed based on leaving sufficient remaining capacity in the silty clay deposit such that strip footings up to 0.6 metres in size can be designed using an allowable bearing pressure of at least 75 kilopascals, consistent with design in accordance with Part 9 of the Ontario Building Code.

Assessment Area	Maximum Permissible Grade Raise (metres)
A*	No Limitation
B	2.4

Note: * There are no practical grade raise restrictions in Area A, however, grade raises of more than 4 metres would require additional review.

It should also be noted that the maximum permissible grade raise in Area B was calculated assuming that any fill required for site grading (above the original grade) and the backfill within the garages and porches would have a unit weight of no more than 19.5 kilonewtons per cubic metre. Silty clay, clayey silt, and silty sand (such as present on this site), as well as crushed clear stone and uniform fine sand (for the garage and porch backfill) may be

suitable for this purpose. Silty sand and gravel, gravelly silty sand, glacial till, and crushed stone typically have a higher unit weight and, if these materials are to be used, the maximum permissible grade raises would be reduced and would need to be re-evaluated. However, there are no restrictions with regards to the unit weight for site grading and garage backfill materials in Area A (i.e., silty sand and gravel, gravelly silty sand, glacial till and crushed stone would be acceptable in this area).

If the grading restrictions given above cannot be accommodated, then further recommendations from Golder Associates could be provided, if and when they are required.

In addition, with regards to site grading, the surficial sand and silt deposits which were encountered across the site are relatively permeable and the measured groundwater levels are relatively shallow (i.e., about 0.2 metres below the ground surface). Excavations for basement construction which extend below the groundwater level could therefore encounter groundwater inflows. Limiting the required depth of excavation into these materials could be advantageous as it would reduce the groundwater management requirements (and costs).

As a general guideline regarding the site grading, the preparation for filling of the site should include stripping the topsoil and fill for predictable performance of structures and services. The topsoil is not suitable as engineered fill and should be stockpiled separately for re-use in landscaping applications only. In areas with no proposed structures, services, or roadways, the topsoil may be left in place provided some settlement of the ground surface following filling can be tolerated.

5.3 Foundations

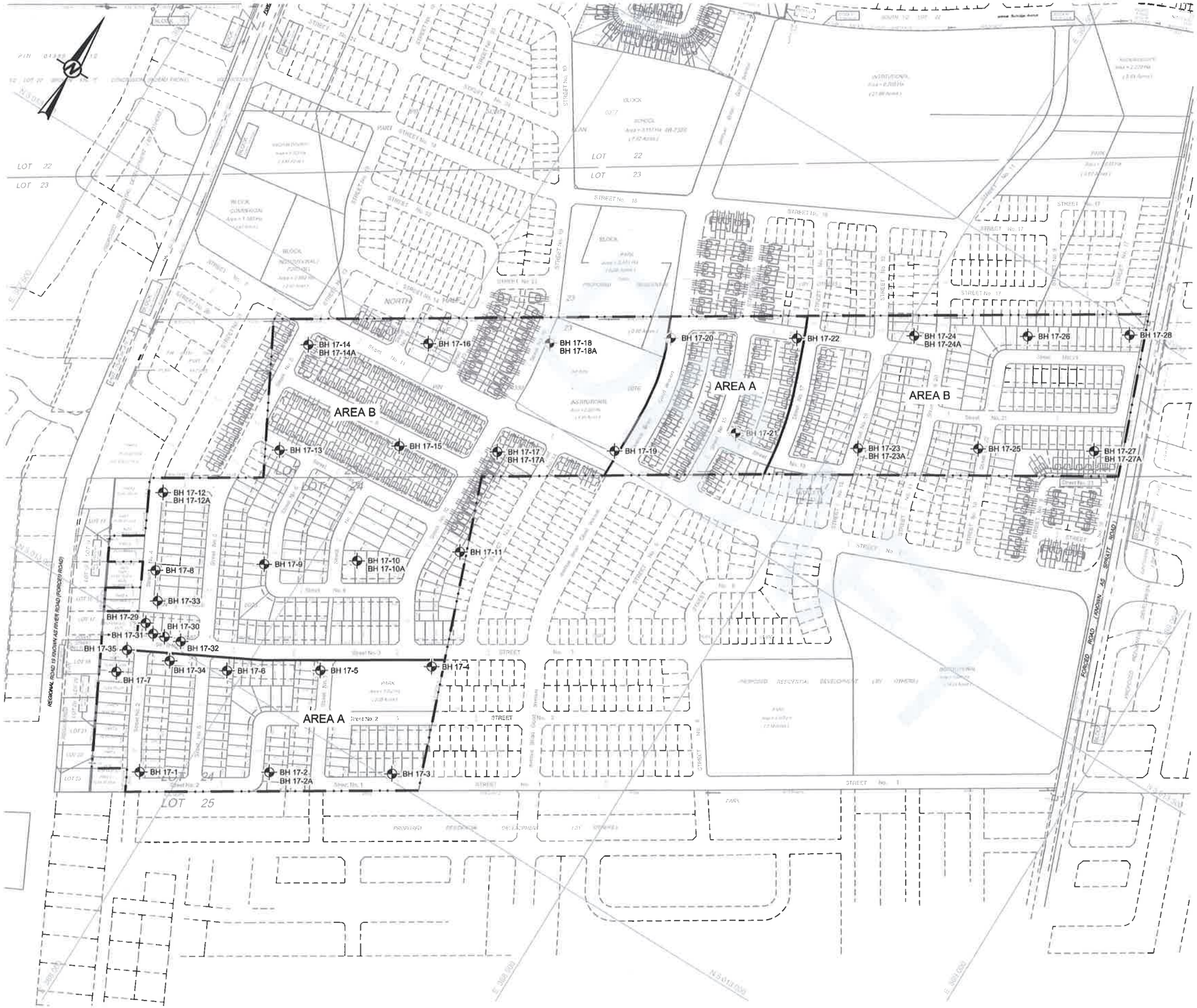
It is considered that the proposed residences may be supported on spread footings founded at conventional depth on or within the native overburden materials.

As discussed in the preceding section, the silty clay deposits have limited capacity to accept the combined load from site grading fill and foundation loads. The allowable bearing pressures for spread footing foundations in Area B are therefore based on limiting the stress increases on the firm, compressible, grey silty clay at depth to an acceptable level so that foundation settlements do not become excessive. Four important parameters in calculating the stress increase on the grey silty clay are:

- The thickness of soil below the underside of the footings and above the unweathered silty clay;
- The size (dimensions) of the footings;
- The amount of surcharge in the vicinity of the foundations due to landscape fill, underslab fill, floor loads, etc., as described in Section 5.2; and,
- The effects of groundwater lowering caused by this or other construction.

Provided that the grade raises are restricted to those indicated in Section 5.2, strip footing foundations up to 0.6 metres in width and pad footings up to 2.0 metres square can be designed using a maximum allowable bearing pressure of 75 kilopascals. As such, the house footings may be sized in accordance with Part 9 of the Ontario Building Code (OBC).

This same maximum allowable bearing pressure can be used for houses in Area A, but without restrictions on footing sizes.



KEY MAP

SCALE 1:50,000

LEGEND

- APPROXIMATE BOREHOLE LOCATION
- APPROXIMATE SITE LIMITS

NOTES

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 1658448

REFERENCE

1. BASE PLAN SUPPLIED BY ANNIS O'SULLIVAN VOLLEBEKK LTD., RECEIVED NOV. 1, 2016, FILE NO. client 15739-15 Claridge Pt Lts 23 24 BF RF GL SK S D5.dwg
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 100 200
1:5,000 METRES

CLIENT
CLARIDGE HOMES CORPORATION

PROJECT
GEOTECHNICAL INVESTIGATION
RIVERSIDE SOUTH LANDS - RIVER ROAD AND SPRATT ROAD
OTTAWA, ONTARIO

TITLE
SITE PLAN

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-03-07
DESIGNED	---
PREPARED	JM
REVIEWED	SAT
APPROVED	TMS

PROJECT NO.	PHASE	REV.	FIGURE
1658448	1000	A	1

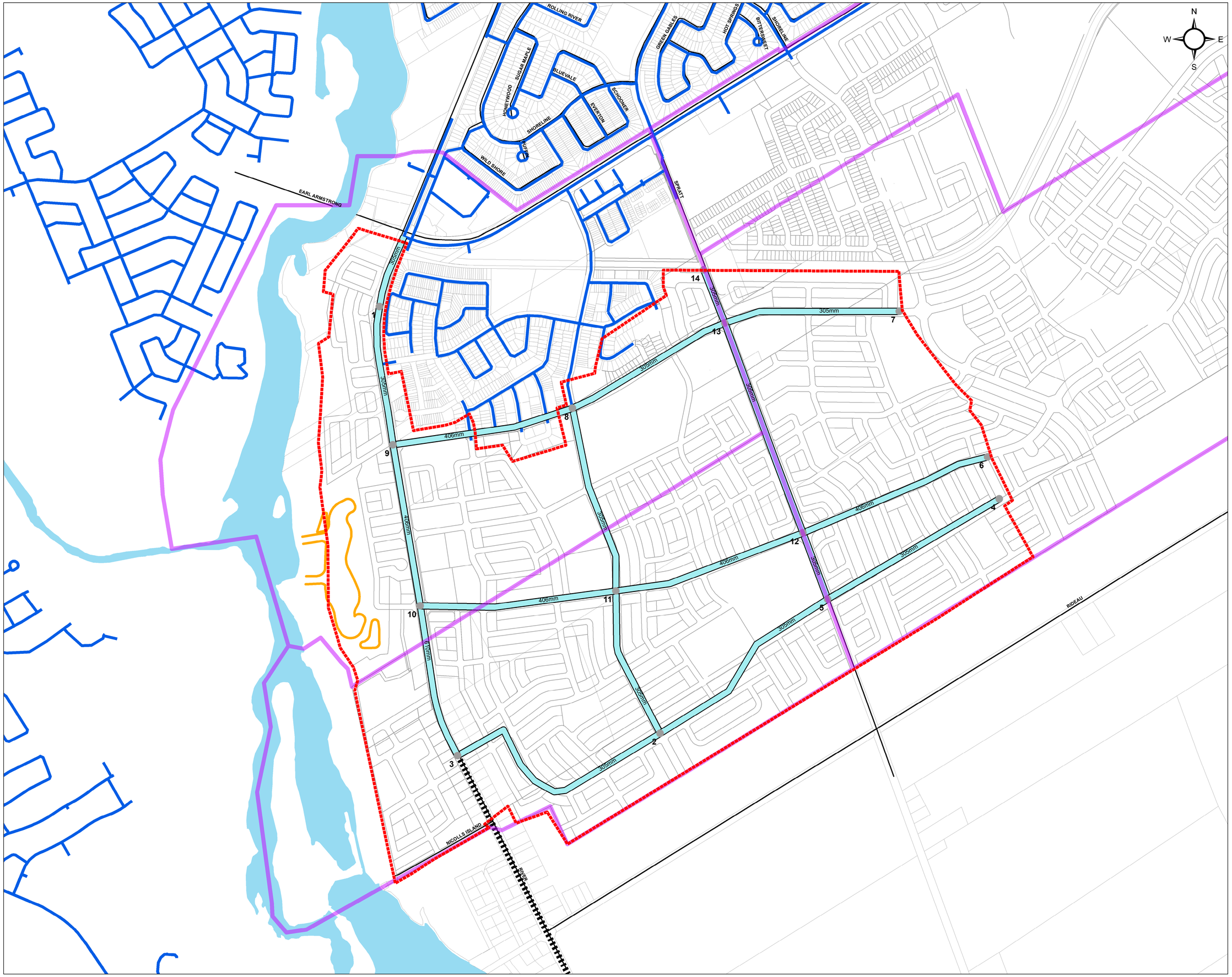
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25 mm

Path: \\golder.gds\gal\ottawa\Active\Spatial_IM\Claridge\Homes\Riverside\Archive\Spatial_IM\Claridge\Homes\Riverside\mxds\ACAD\00_PROJ\1658448_PROD\Phase1000_Docitem\ | File Name: 1658448-1000-BG-0001.dwg | Last Edited By: zsauve Date: 2017-07-21 Time:5:08:49 PM | Printed By: zsauve Date: 2017-07-28 Time:3:03:30 PM

APPENDIX B

- **Drawing WAT-1 – Potable Water Servicing Plan – 2017 ISSU Rideau River Area**
- **Figure 2.1 Preliminary Water Plan**
- **Figure 5-4 – Maximum Pressure During BSDY – 2017 ISSU Rideau River Area**



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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

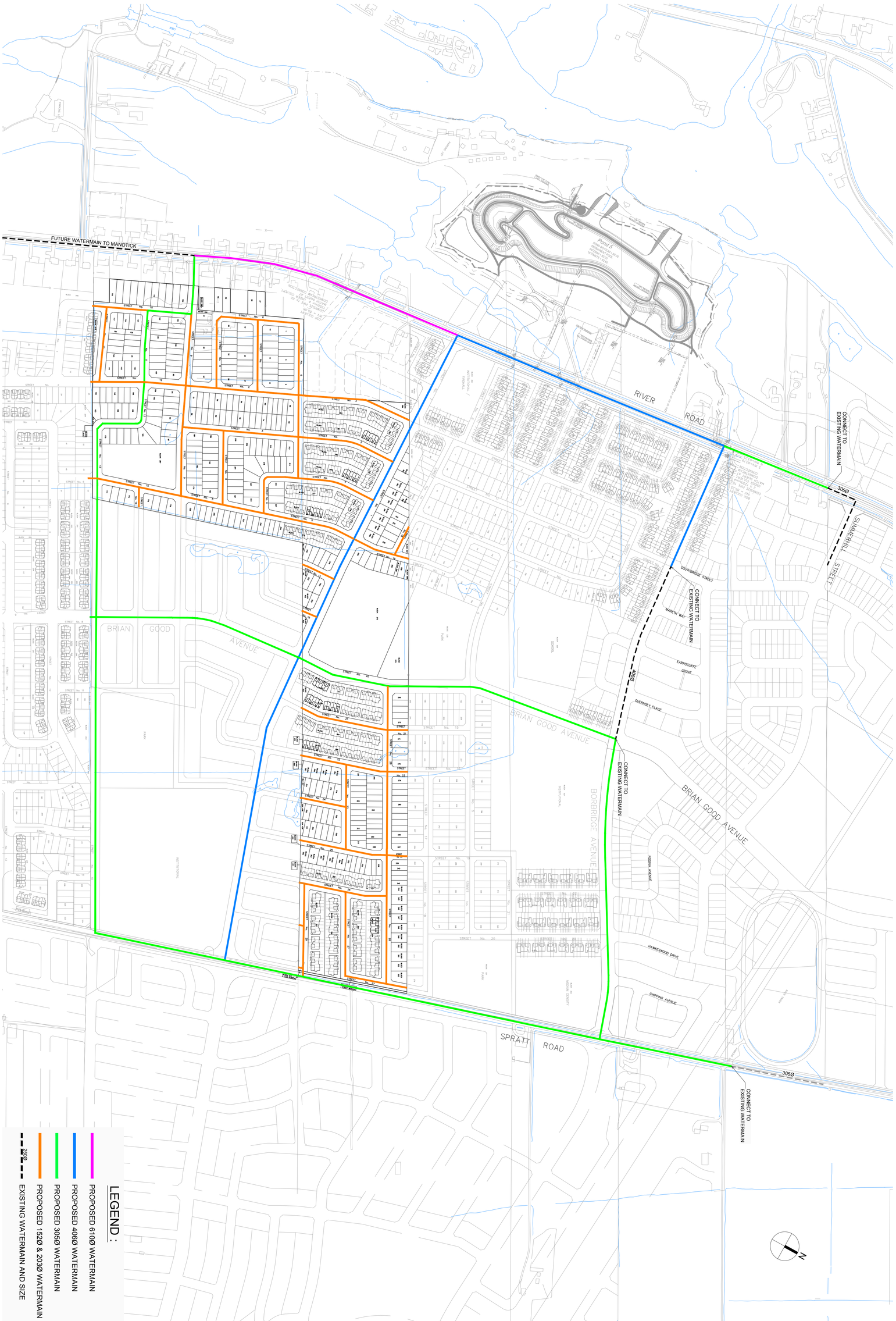
RIVERSIDE SOUTH ISSU UPDATE

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**



Sheet No.

FIGURE 2.1

Drawing Title

PRELIMINARY
WATER PLAN

Project Title

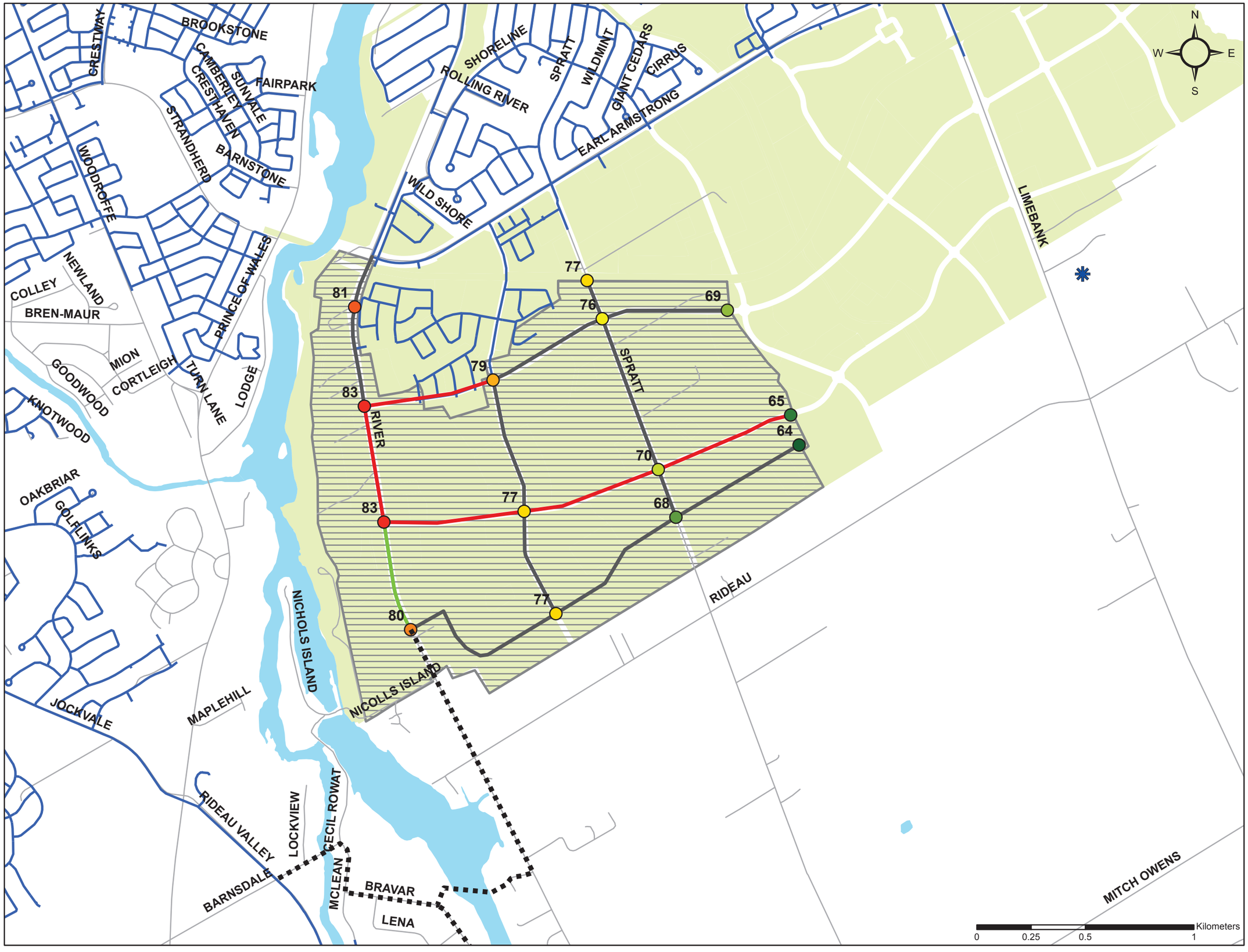
ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES

CLARIDGE HOMES PHASE 2 LANDS
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA

Scale

N.T.S.

IBI



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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

APPENDIX C

- **Drawing SAN-1 – Sanitary Drainage Plan – 2017 ISSU Rideau River Area**
- **Figure 4-2 – Recommended Sanitary Servicing – 2017 ISSU Rideau River Area**
- **Sanitary Sewer Design Sheet – 2017 ISSU Rideau River Area**
- **Figure S-1 – Alternative Sanitary Drainage Limit by IBI**
- **July 20, 2017 E-mail – Property Owners Agreement of Drainage Area Shift**
- **Draft Deviation Report (July 25, 2017 – IBI Group)**
- **Figure 3.1 – Preliminary Sanitary Plan**
- **Figure SAN-5 – 2013 Development Charges Study Report Update**

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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

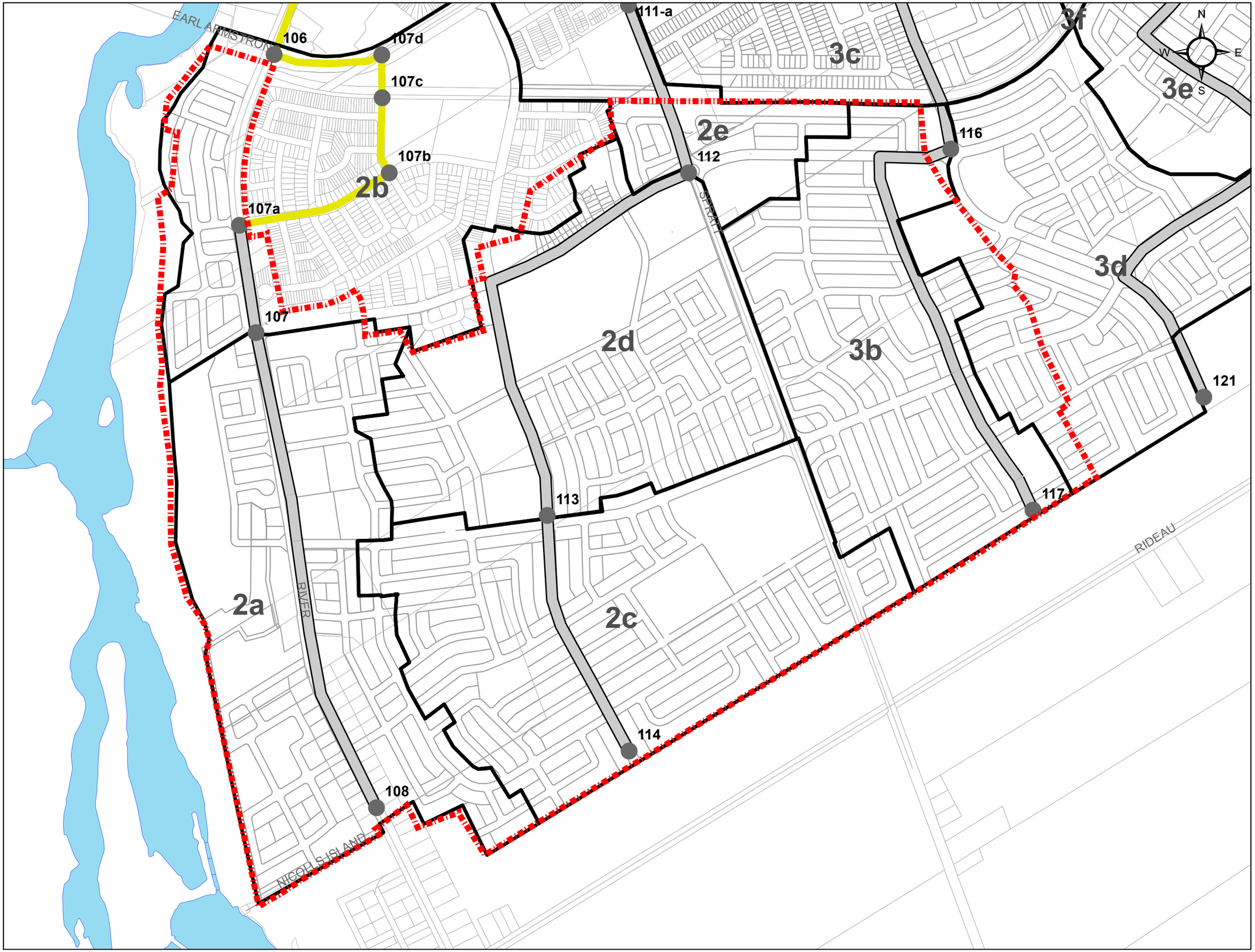
Project No.: **163401101**

Scale: 0 125 250 500 Meters

Drawing No.: **SAN-1**

Sheet: **6 of 7**

Revision: **0**



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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

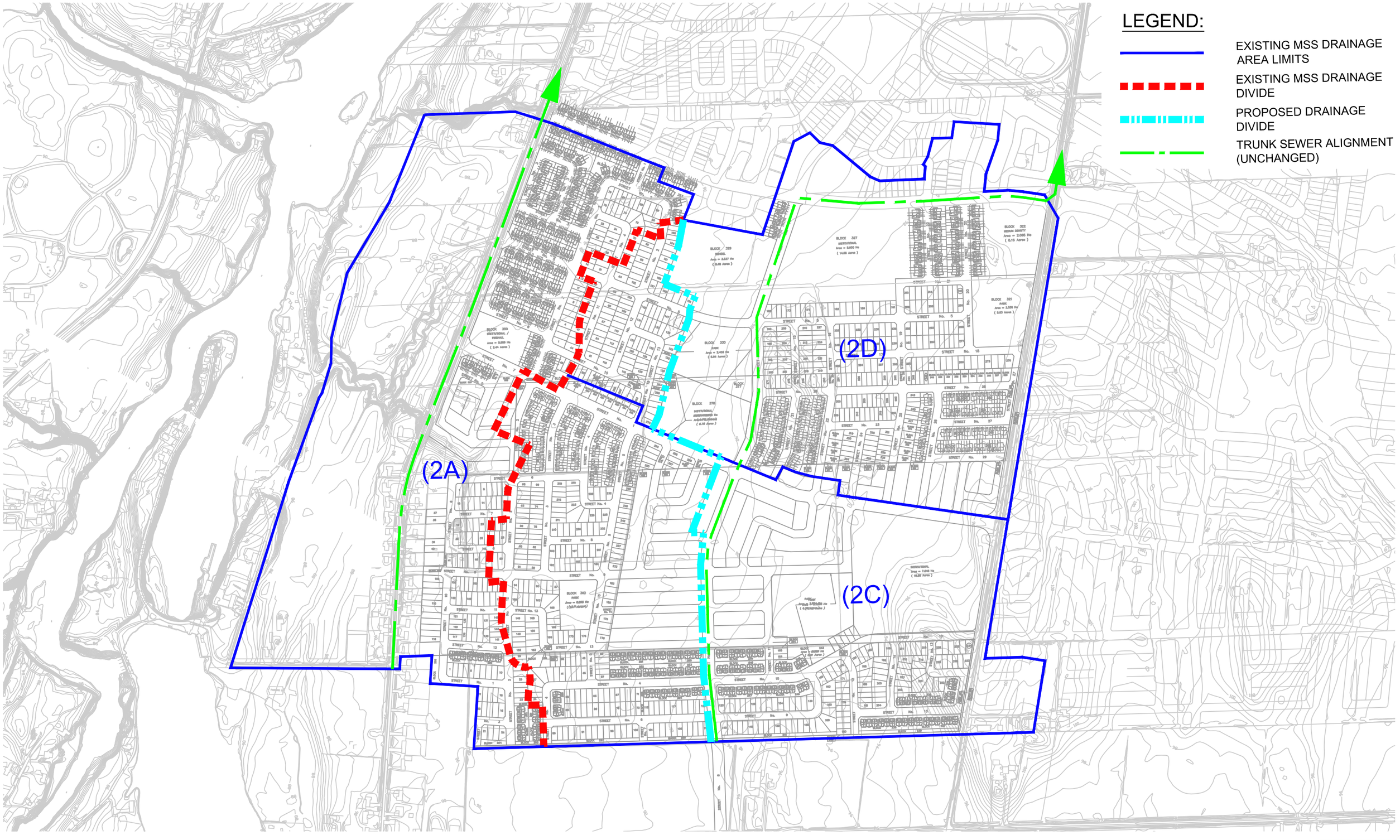
Average Daily Flow / Person:	350	l/p/day	Commercial:	0.579	l/s/ha
Minimum Velocity:	0.60	m/s	Employment	0.579	l/s/ha
n =	0.013		Institutional:	0.579	l/s/ha
Max Peaking Factor:	4.0		Infiltration:	0.280	l/s/ha
Min. Peaking Factor:	2.0				
Peaking Factor Industrial:	Based on Appendix 4-B		Low Density:	@ 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)	RESIDENTIAL LOW Area (ha)	RESIDENTIAL LOW Pop.	RESIDENTIAL LOW Accum. Pop.	RESIDENTIAL MED Area (ha)	RESIDENTIAL MED Pop.	RESIDENTIAL MED Accum. Pop.	RESIDENTIAL HIGH Area (ha)	RESIDENTIAL HIGH Pop.	RESIDENTIAL 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)	INFILTRATION Infilt. Flow (l/s)	Total Flow (l/s)	PIPE Distance (m)	PIPE Diameter (mm)	PIPE Slope (%)	PIPE Qa/Qc	PIPE Capacity (Full) (l/s)	PIPE Velocity (Full) (m/s)	PIPE 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



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

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

Ref Fig S-1

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

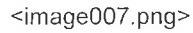
phone: (613) 836-0856 ext 522
direct: (613) 836-1522
cell: (613) 858-4975
e-mail: mwingate@DSEL.ca

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

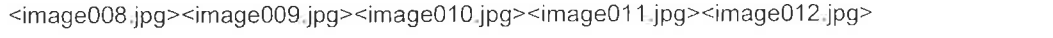
Get Plan + Spreadsheet

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



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tel 613 225 1311 fax 613 225 9868
ibigroup.com

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.

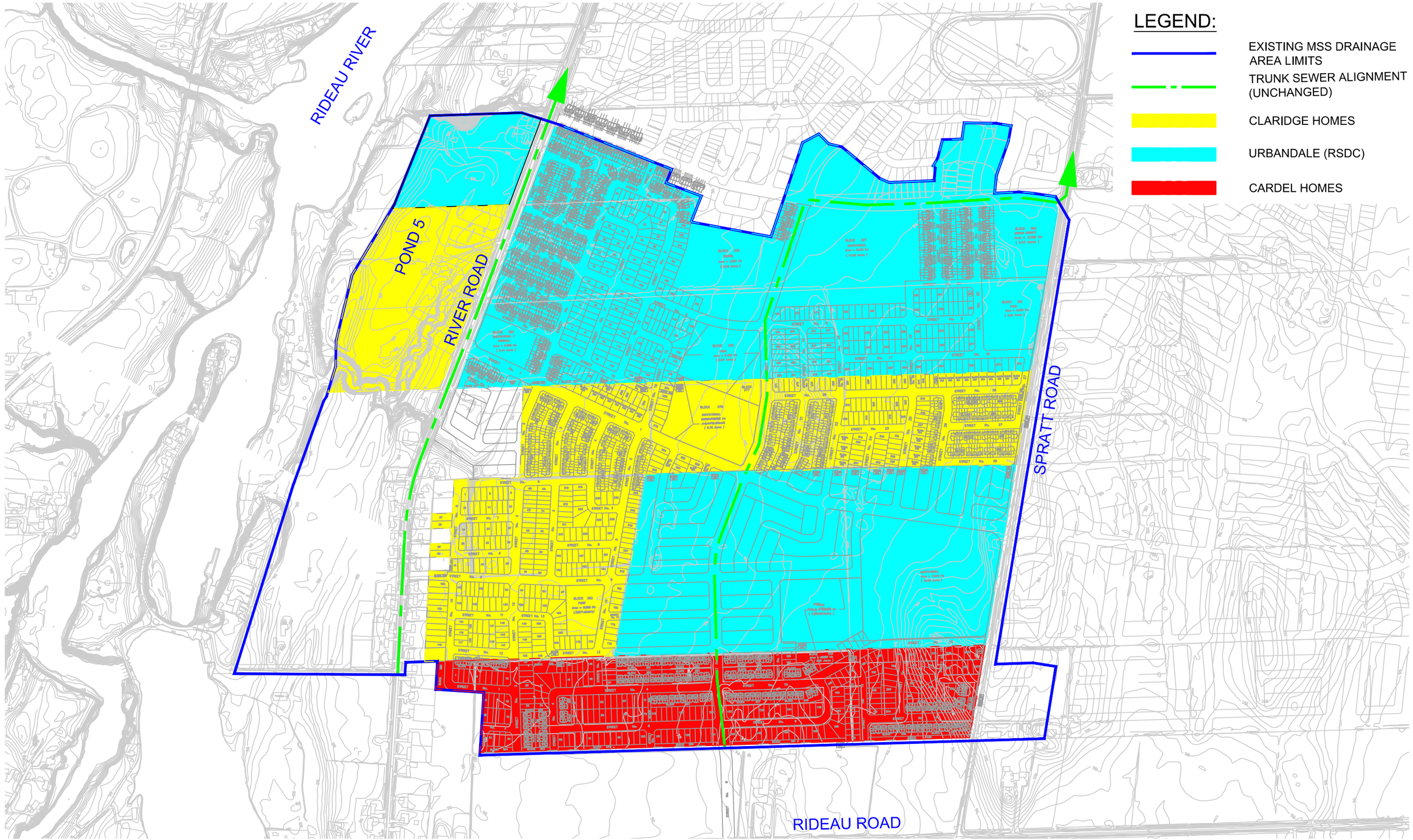
Yours truly,

IBI GROUP

Robert W. Wingate, P. Eng.
Associate

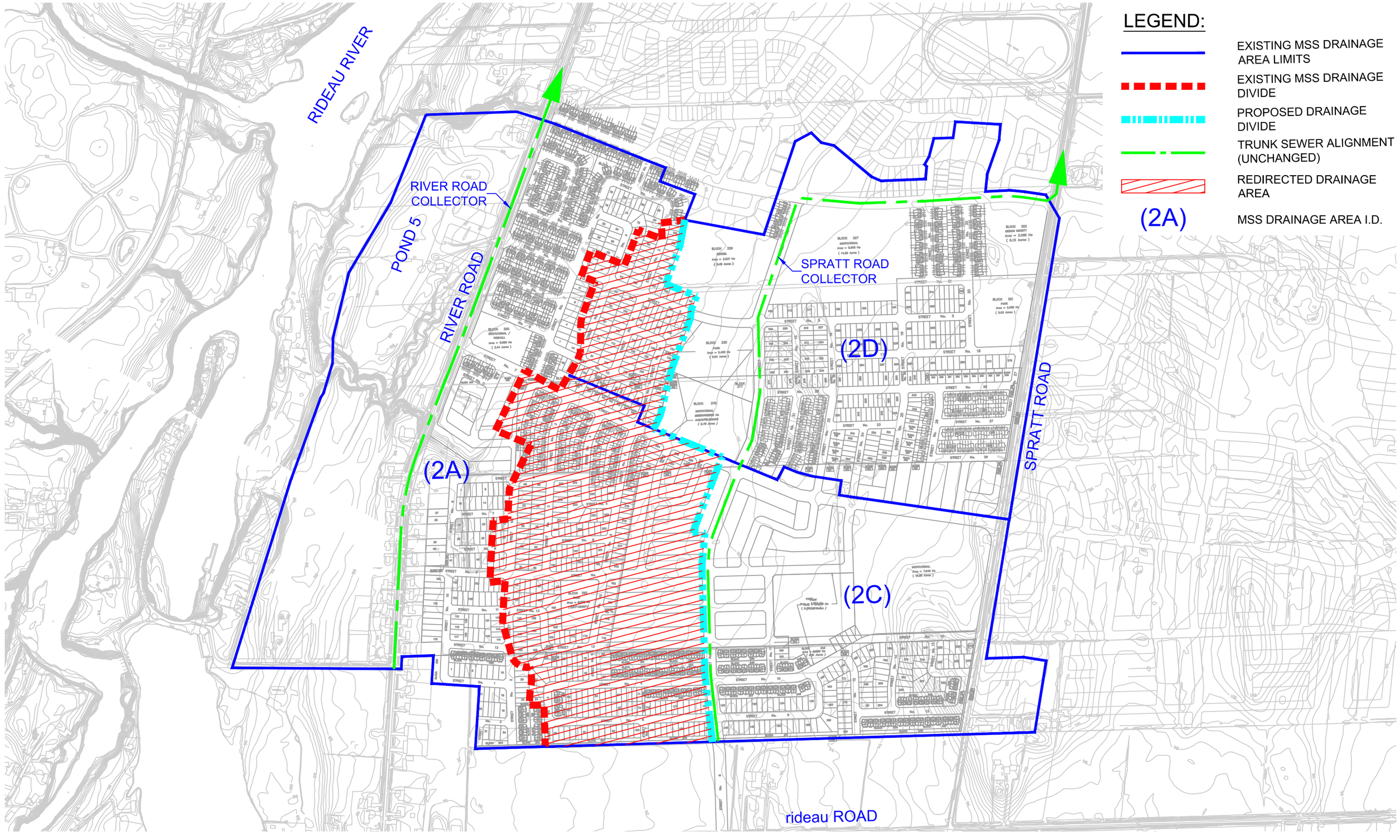
RWW/ks
Encl.

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:

Scale	Project Title	Drawing Title	Sheet No.
IBI N.T.S.	RIVERSIDE SOUTH RIDEAU RIVER POND 5 DRAINAGE AREA	ALTERNATIVE SANITARY DRAINAGE LIMIT	FIGURE A-2

Table 1

Parameters	Current			Proposed		
	Design	Annual	Rare	Design	Annual	Rare
Res. Per Capita	350	300	300	280 [1]	200 [2]	200 [2]
Commercial	50000	17000	17000	28000	17000 [4]	17000 [4]
Institutional	50000	17000	17000	28000	17000 [4]	17000 [4]
Industrial	35000	10000	10000	35000 [4]	10000 [4]	10000 [4]
I/I dry	n/a	n/a	n/a	0.05	0.02*	0.02*
I/I wet	0.28	0.28*	0.5*	0.28	0.28*	0.53*
Total I/I	0.28	0.28*	0.5*	0.33	0.3	0.55 [3]
Harmon - Correction Factor	1	0.4-0.6	0.4-0.6	0.8	0.6	0.6
ICI Peak Factor	1.5	1	1	1.5/1 [5]	1	1

* or higher with the support of monitoring data

[1] 280 L/cap/day = 90th percentile based on statistical analysis of new development

[2] 200 L/cap/day = 70th percentile for new development, 60th percentile for old development

[3] 0.53 L/ha/day = interim value to be reviewed in 2017

[4] Values to be reviewed in 2017

[5] ICI Peak Factor = 1.5 if ICI in contributing area is >20%, 1.0 if ICI in contributing area is <20%

Notes:

1) Sewers in new subdivisions shall be designed to operate under free flow conditions during peak flow periods.

2) During a catastrophic failure at a wastewater pump station, the HGL in the sanitary sewer system shall be below the underside of footing for the "Annual Event" flow condition.

3) A minimum freeboard of 0.3 m is required under a "Rare Event" flow condition. For areas serviced by a pump station, assume the station is operating at its rated capacity (rated capacity to be confirmed by ESD staff).

4) Preferably, the elevation of the sanitary overflow conduit should be above the 100 yr stormwater elevation. The overflow elevation can be lowered to the 25 year storm event on a case-by-case basis.

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REVISED RIVER ROAD COLLECTOR ANALYSIS

- EXISTING DEVELOPMENT USING MONITORED PARAMETERES FROM DESIGN GUIDELINES
- NEW DEVELOPMENT USING PROPOSED REVISIONS TO DESIGN GUIDELINES

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 (Ha)	LOW DENSITY			MED DENSITY			HIGH DENSITY			TOTAL UNITS	POPULATION		PEAKING FACTOR			PEAK FLOW (L/s)	AREA (Ha)						PEAK FLOW (L/s)	ROAD AREA (Ha)	AREA (Ha)		FLOW (L/s)		CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	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	CORRECTED			COMMERCIAL		EMPLOYMENT		INSTITUTIONAL				IND	CUM								L/s	(%)
																	PF	K	PF		IND	CUM	IND	CUM	IND	CUM												
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%
	---	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)	114	113	20.32	18.37	905	905	1.95	125	125	0.00	0	0	335	1030	1030	3.79	0.80	3.03	10.12	0.00	0.00	0.00	0.00	7.68	7.68	3.73	5.93	33.94	33.94	11.20	25.05	98.65	695	450	0.11	0.601	73.59	74.60%
SPRATT SOUTH	2d - 2d(i)	113	112	31.65	21.26	1048	1953	10.40	665	790	0.00	0	0	604	1713	2743	3.48	0.80	2.78	24.71	0.00	0.00	0.00	0.00	14.95	22.63	11.00	5.45	52.06	85.99	28.38	64.09	148.80	1155	525	0.11	0.666	84.71	56.93%
SPRATT SOUTH	2e	112	111-a	17.48	0.00	0	1953	13.28	847	1637	4.19	479	479	605	1326	4069	3.33	0.80	2.66	35.09	2.55	2.55	0.00	0.00	0.00	22.63	12.24	6.14	26.17	112.16	37.01	84.34	155.42	470	525	0.12	0.696	71.08	45.73%
SPRATT SOUTH	---	111-a	111	0.00	0.00	0	1953	0.00	0	1637	0.00	0	479	0	0	4069	3.33	0.80	2.66	35.09	0.00	2.55	0.00	0.00	0.00	22.63	12.24	0.00	0.00	112.16	37.01	84.34	148.80	215	525	0.11	0.666	64.46	43.32%
SPRATT SOUTH	Ex4	111	110	14.93	13.31	90	2043	1.62	468	2105	0.00	0	479	223	558	4627	3.28	0.80	2.62	39.30	0.91	3.46	0.00	0.00	0.00	22.63	12.68	0.00	15.84	128.00	42.24	94.22	155.42	600	525	0.12	0.696	61.20	39.38%
SHORELINE DRIVE	3b	117	116	48.13	43.40	2138	2138	4.73	302	302	0.00	0	0	794	2440	2440	3.52	0.80	2.81	22.25	0.66	0.66	0.00	0.00	0.05	0.05	0.34	2.77	51.60	51.60	17.03	39.62	98.65	1270	450	0.11	0.601	59.03	59.84%
SHORELINE DRIVE	3c	116	115	47.51	27.40	1350	3488	15.47	989	1291	4.64	530	530	1113	2869	5309	3.22	0.80	2.58	44.33	0.00	0.66	0.00	0.00	11.13	11.17	5.75	10.02	68.67	120.26	39.69	89.77	122.63	990	450	0.17	0.747	32.87	26.80%
SHORELINE DRIVE	Ex5	115	110	20.60	14.47	480	3968	6.13	302	1593	0.00	0	530	276	782	6091	3.16	0.80	2.53	49.97	0.80	1.46	0.00	0.00	3.16	14.33	7.67	0.00	24.56	144.82	47.79	105.44	133.02	480	450	0.20	0.810	27.58	20.73%
SPRATT SOUTH	Ex6	110	109	25.47	20.32	822	6833	5.15	288	3986	0.00	0	1009	377	1110	11828	2.88	0.80	2.31	88.37	0.00	4.92	0.00	0.00	2.39	39.36	21.52	0.00	27.86	300.68	99.22	209.12	303.78	675	675	0.12	0.822	94.66	31.16%
CANYON WALK DRIVE	3d	121	120	46.05	35.39	1744	1744	10.66	679	679	0.00	0	0	828	2423	2423	3.52	0.80	2.82	22.11	0.60	0.60	0.00	0.00	3.72	3.72	2.10	5.41	55.78	55.78	18.41	42.62	115.20	820	450	0.15	0.702	72.58	63.01%
CANYON WALK DRIVE	3e	120	119	54.06	40.27	1984	3728	13.79	881	1560	0.00	0	0	987	2865	5288	3.22	0.80	2.58	44.18	0.00	0.60	0.00	0.00	3.91	7.63	4.00	9.21	67.19	122.97	40.58	88.76	190.35	925	525	0.18	0.852	101.59	53.37%
CANYON WALK DRIVE	3f-4a	119	118	17.44	0.00	0	3728	3.06	194	1754	14.38	1007	1007	577	1201	6489	3.14	0.80	2.51	52.80	6.01	6.61	0.00	0.00	5.28	12.92	9.49	16.75	45.49	168.46	55.59	117.88	195.57	880	525	0.19	0.875	77.69	39.73%
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	6179	23.52	1687	4610	0.00	0	5077	983	2583	15866	2.75	0.80	2.20	113.27	1.55	33.69	0.00	0.00	0.00	18.25	25.24	0.00	47.19	385.94	127.36	265.87	449.81	860	750	0.15	0.986	183.94	40.89%
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	12415	3.00	250	11140	2.86	327	6853	516	1345	30408	2.47	0.80	1.98	194.84	0.64	41.93	0.00	69.64	0.00	44.39	64.51	0.00	17.90	789.79	260.63	519.98	1,103.33	515	1050	0.15	1.234	583.35	52.87%
CANYON WALK DRIVE	Ex8	109	102	56.40	54.40	2150	21398	2.00	134	15260	0.00	0	7862	728	2284	44520	2.31	0.80	1.85	266.83	0.00	46.85	0.00	69.64	0.00	83.75	86.03	5.45	61.85	1152.32	380.26	733.13	1,103.33	1100	1050	0.15	1.234	370.20	33.55%
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	18.15	0.00	53.39	0.00	197.16	0.00	87.21	215.26	0.00	0.00	82.63	23.14	1016.86	1,348.97	145	1200	0.11	1.155	332.11	24.62%
							25101			17108			7862		0	50071		0.80	1.79	289.98									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	2017-06-29
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

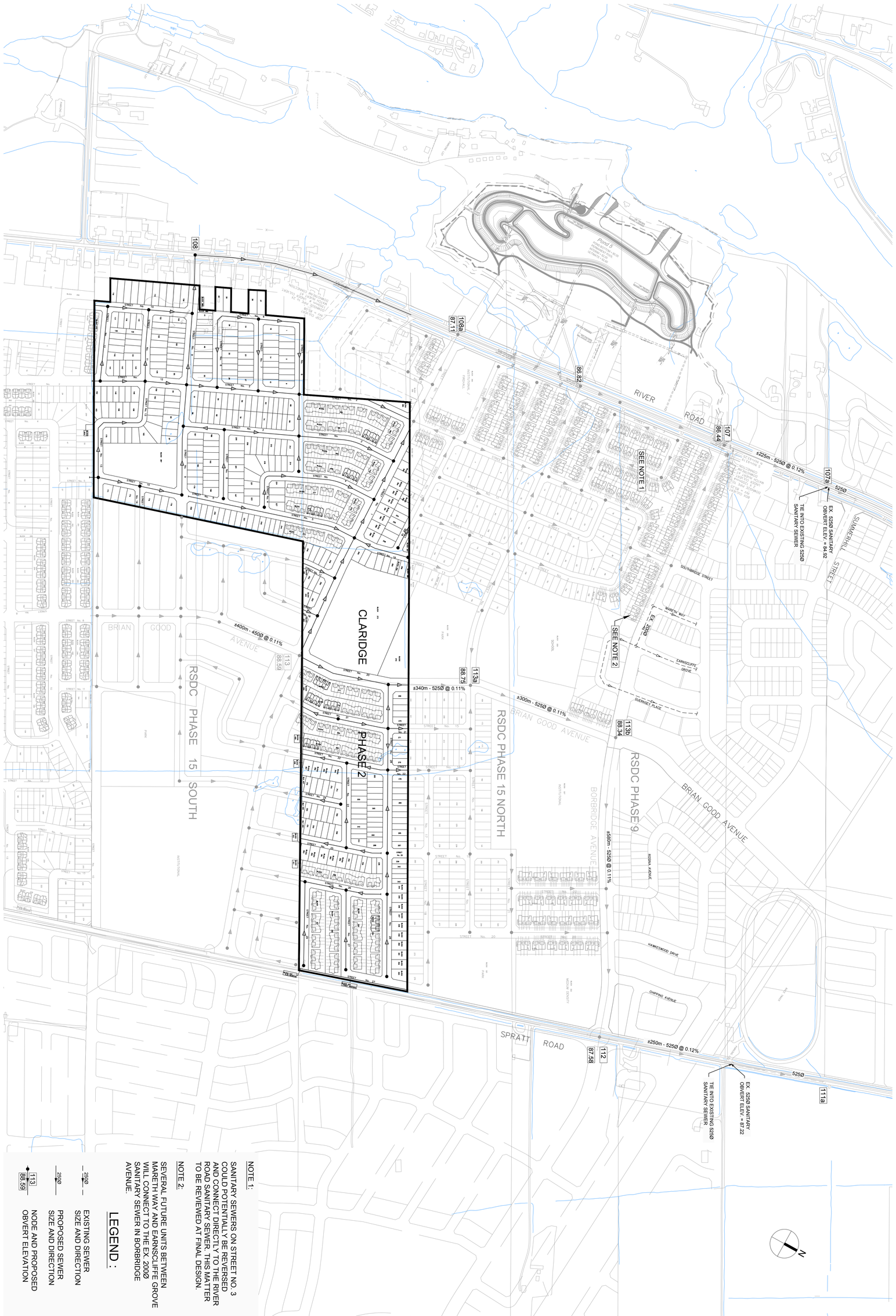
File Reference: 38269-5.7.1 | **Date:** 2017-05-09 | **Sheet No:** 1 of 1

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 1:

SANITARY SEWERS ON STREET NO. 3 COULD POTENTIALLY BE REVERSED AND CONNECT DIRECTLY TO THE RIVER ROAD SANITARY SEWER. THIS MATTER TO BE REVIEWED AT FINAL DESIGN.

NOTE 2:

SEVERAL FUTURE UNITS BETWEEN MARETH WAY AND EARNSCLIFFE GROVE WILL CONNECT TO THE EX. 200Ø SANITARY SEWER IN BORBRIDGE AVENUE.

LEGEND :

- 250Ø — EXISTING SEWER SIZE AND DIRECTION
- 250Ø — PROPOSED SEWER SIZE AND DIRECTION
- 113 / 88.59 — NODE AND PROPOSED OBVERT ELEVATION

Sheet No.

FIGURE 3.1

Drawing Title

PRELIMINARY SANITARY PLAN

Project Title

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
CLARIDGE HOMES PHASE 2 LANDS
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA

Scale

N.T.S.

IBI

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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
LEITRIM ROAD
LIMEBANK ROAD
SPRATT ROAD
CANYON WALK
BOWESVILLE ROAD
EARL ARMSTRONG ROAD
SHORELINE DRIVE
RIVERSIDE SANITARY
RIDEAU ROAD

102
2790m–675ø
139
EX. 525ø
EX. 750ø
125
710m–750ø
126
795m–750ø
127
490m–675ø
128
810m–450ø
132
190m–525ø
90m–525ø
240m–525ø
56m–525ø
400m–525ø
111
220m–525ø
460m–525ø
112
1230m–525ø
113
115
990m–450ø
116
118
836m–800ø
206
120m–800ø
207
120m–600ø
208
92.1m–600ø
209
79.7m–600ø
210
550m–600ø
122
880m–525ø
119
925m–525ø
120

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

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

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

APPENDIX D

- **Drawing STM-1, Storm Sewers from 2017 ISSU Update – Rideau River Area**
- **Figure 4.1 – Preliminary Minor Storm Plan**
- **Table F-2, Storm Water Sewers South – 2013 Development Charges Study Report Update**
- **Figure STM-4, 2013 Development Charges Study Report Update**
- **Table 3-2 – Minor System Minimum Freeboard in 100-yr Storm – 2017 ISSU Update – Rideau River area**
- **Table 6-1 – Pre-Development Tributary Ravine Flows for Varying Storm Events – 2017 ISSU Update – Rideau River area**

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

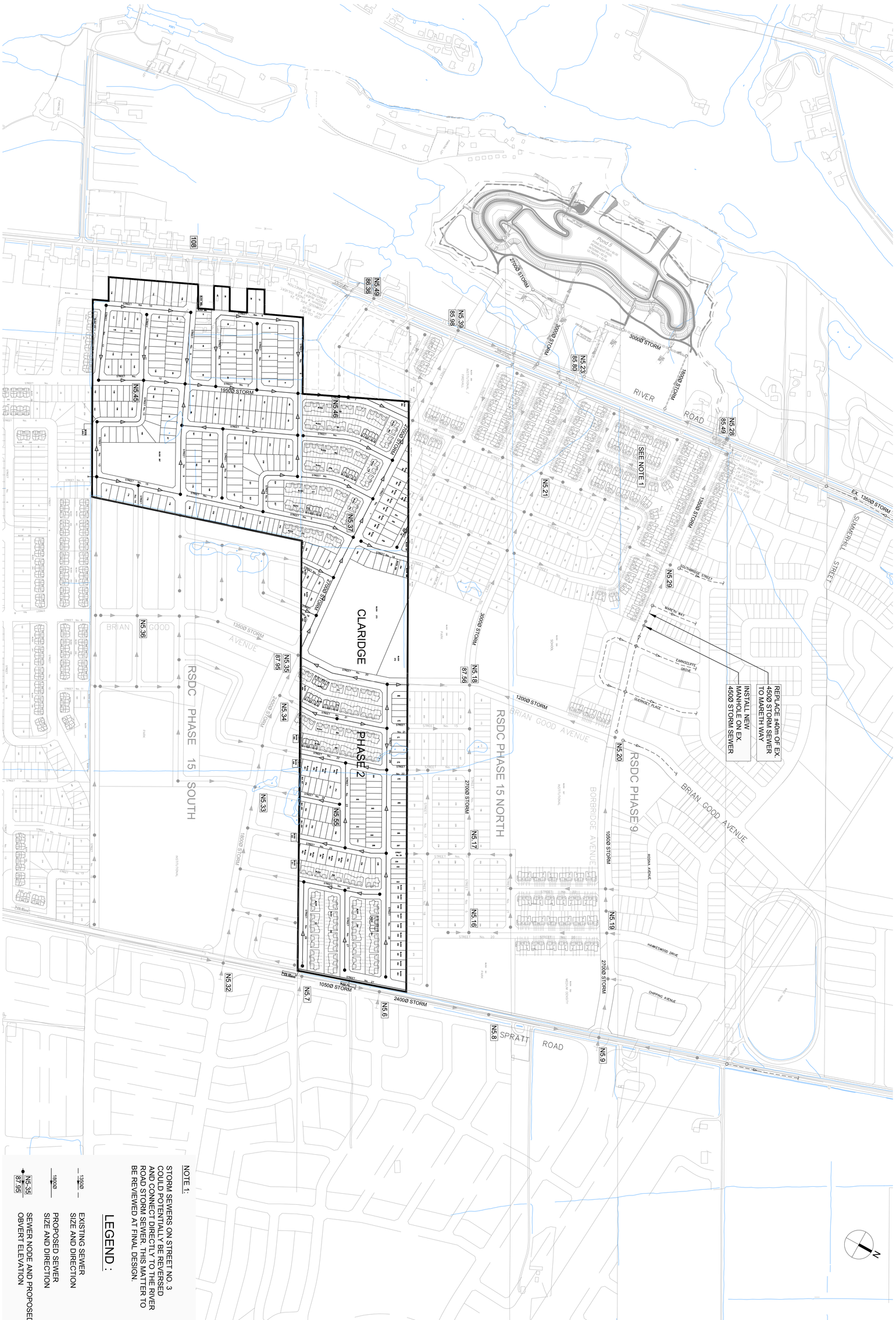
Project No.: **163401101**

Scale: 0 50 100 200 Meters

Drawing No.: **STM-1**

Sheet: **3 of 7**

Revision: **0**



Sheet No.

FIGURE 4.1

Drawing Title

PRELIMINARY
MINOR STORM PLAN

Project Title

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
CLARIDGE HOME PHASE 2 LANDS
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA

Scale

N.T.S.

IBI

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**	

CONSTRUCTED

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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

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

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

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
100 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

- **Figure 5-1 – Erosion and Sedimentation Control Plan**

Sheet No.

FIGURE 5.1

Drawing Title

PRELIMINARY EROSION AND SEDIMENT CONTROL PLAN

Project Title

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
CLARIDGE HOMES PHASE 2 LANDS
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA

Scale

N.T.S.

IBI