



REPORT
PROJECT: 120031-5.2.2

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
RIVERSIDE SOUTH PHASE 12 LANDS
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA



Prepared for URBANDALE CORPORATION
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 for the subject site, and was prepared in accordance with the November 2009 “Servicing Study Guidelines for Development Applications” in the City of Ottawa. **Appendix A** contains a customized copy of those guidelines which can be used as a quick reference for the location of each of the guideline items within the study report.

1.2 Background

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

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

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

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

Subsequent to the completion of the revised ISSU, construction of the Riverside South Pond 5 and the River Road reconstruction has been substantially completed.

1.3 Previous Studies

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

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

- a) 2016 Land Use Plan for the Riverside South Community Design Plan
- b) Riverside South Master Servicing Study (Stantec 2008)

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

2. **Design Brief River Road Reconstruction prepared for Riverside South Development Corporation (IBI Group, 2018)** The report is the current approved document which provides details on the now existing water supply, major and minor storm systems and sanitary sewers located in River Road adjacent to and south of the subject lands.
3. **Design Brief Summerhill Village Phase 2 prepared for Claridge Homes (IBI Group, November 2011)** The report provides details on the proposed water supply, major and minor storm systems and sanitary sewers also located in River Road adjacent to the site and within the existing residential subdivision across River Road from the proposed lands.
4. **Design Report for Phase 9 - Riverside South Development Corporation (JL Richards, 2012)** The report provides details on the water supply, major and minor storm systems and sanitary sewers adjacent to the proposed site within the existing residential subdivision across River Road from the proposed lands.

1.4 Subject Property

The current draft plan of subdivision for the subject property is shown on **Figure 1.2** which is included in **Appendix A**. The proposed subdivision is split into two sections, the north portion is approximately 9.6 Ha in size while the south portion is 2.4 Ha.

The proposed development will include a mix of single family and townhouse residential units. Additionally the north portion contains a block of lands to be further developed through the City's Site Plan Application process at a later date into a mid-density residential area.

1.5 Existing Infrastructure

Figure 1.3 shows the location of existing major municipal infrastructure in the vicinity of the Riverside South Phase 12 development. The 2017 ISSU report recommended that the subject

site be serviced with a 305 and 406 mm diameter watermains along River Road which have been constructed and are in service.

Previous studies recommend that wastewater flows from the subject site be routed to two outlets, the majority of the subject lands, all of the south site and the south half of the north site, are to connect to the existing sanitary sewers in River Road and flow eastwards through the River Road sub-trunk sewer located within the Summerhill Street ROW. A smaller portion of the site, the north half of the north section is designed to flow into a sanitary outlet constructed during the Phase 9 Lands development in Ballinville Circle.

All minor stormwater runoff from the site is proposed to be routed to future Pond 5 which is located south of the subject site west of River Road. All trunk sewers required to convey stormwater from the subject lands to the pond have been constructed and are complete, and the pond is currently substantially complete.

1.6 Pre-Consultation

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

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

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

1.7 Existing Topography

The property generally slopes from east to west towards the Rideau River. Contours for the site range between 90 and 85 meters. **Figure 1.4**, which is included in **Appendix A**, shows the general topography of the subject property.

Most surface drainage from the property currently flow directly to 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**.

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

1.8 Geotechnical Considerations

The subject lands are covered under two geotechnical reports, the following geotechnical investigation report has been prepared by Paterson Group in support of the north section lands.

- Report No. PG3320-2-Rev1 dated November 20, 2020.

The following geotechnical investigation report has been prepared by Golder in support of the south section lands.

- Report No. 1406631-3-Rev2 dated August 2018

Among other items, the reports comments on the following:

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

In general, the subsurface profile of the north lands include topsoil, underlain by stiff silty clay. While the south lands consist of topsoil underlain by clayey silt and silt.

One of the recommendations from the Paterson Group study included grade raise restrictions for the north side development. A general grade raise restriction for the north site of 2.5m has been provided and a 4 m grade raise over a small natural ditch, the location of this is shown on the Permissible Grade Raise Plan Drawing PG3320-4 in **Appendix A**.

Regarding the south side, Golder has established a 2.1m grade raise restriction for these lands.

1.9 Watercourses and Setbacks

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

The September 2016 Environmental Impact Statement by Dillon Consulting states that the site is not located near any provincially significant wetlands, significant woodlands, areas of natural and scientific interest, significant wildlife habitat, or any other designated natural heritage system constraints. The Dillon study does identify 2 headwater drainage features within the subject lands; however, their study determined that these features had limited functions and they deemed that “no management required”.

For the north side development Paterson has conducted a slope stability analysis for the east border that slopes down to the Rideau River. A Limit of Hazard Lands line has been determined and is shown on Drawing PG3320-2 Test Hole Location Plan in **Appendix A**, the line doesn't impact proposed housing.

2 WATER SUPPLY

2.1 Existing Conditions

As noted in Section 1.5 there is an existing 300 mm watermain on River Road along the north block. The 300 mm watermain was recently extended south on River Road, at Borbridge Avenue the River Road watermain increases to 400 mm in diameter, adjacent to the south block. . **Figure 1.3** in **Appendix A** shows the location of the existing watermains.

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

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

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

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

2.3 Design Criteria

2.3.1 Water Demands

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

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

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

- Average Day 2.28 l/s
- Maximum Day 5.73 l/s
- Peak Hour 12.54 l/s

2.3.2 System Pressure

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

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

2.3.3 Fire Flow Rates

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

There are several locations where the rear of the single family home faces the side of an adjacent unit. At these locations the distance between the rear and side of the adjacent building may be less than 10 meters depending on the size of the houses which appears to violate item 4.1 of Technical Bulletin ISDTB-2014-02 which requires a 10 meter separation between the backs of the adjacent units. Without the 10,000 l/min cap the Fire Underwriters Survey (FUS) method of determining fire flow rates cannot be used as wood frame buildings separated by less than 3 meters is considered on fire unit. As the side yard distances between houses are usually less than 3 meters then all adjacent houses are considered one fire unit which results in a very large fire flow which is impractical to achieve. At the locations where the rear yard to side yard distance is less than 10 meters, a fire flow can be determined if a 3 meter separation is provided between adjacent units. For example, on **Figure 2.1** Lots 28 and 29 back onto Lot 24, if a 3 meter separation is provided between Lots 27 and 28 then Lots 28 and 29 can be considered a single fire unit and an FUS calculation can be carried out. The FUS calculation will usually result in a required fire flow that is close to the 10,000 l/min rate, the actual fire flow rates will be confirmed during detailed design. The locations of potential 3 meter building separations is shown on **Figure 2.1**.

There are several multi-unit buildings proposed at the north end of the north block. Without details of the building, a conservative fire flow rate of 15,000 l/min (250 l/s) is used in the fire flow analysis for these buildings.

2.3.4 Boundary Conditions

The City of Ottawa has provided five boundary conditions in the Riverside South area for various projects. There are two boundary conditions which are near the site. One at River Road at Summerhill Street opposite the north block and another on Borbridge Avenue at Southbridge Street. There are two sets of boundary conditions provided, one for pre-configuration and another for post-configuration. As the post configuration values are higher than the pre-configuration, the post configuration value for maximum HGL is used in the analysis for maximum pressure and the pre-configuration peak hour and max day plus fire values are used for minimum pressure and fire flow. A copy of the boundary condition is included in Appendix B and summarized as follows for the two adjacent locations.

	CONNECTION RIVER ROAD & SUMMERHILL	CONNECTION BORBRIDGE & SOUTHBRIDGE
Max HGL (Basic Day)	147.8 m	147.8 m
Peak Hour	123.9 m	123.9 m
Max Day + Fire (10,000 l/min Fire Flow)	111.9 m	121.3 m
(15,000 l/min Fire Flow)	117.3 m	117.3 m

2.3.5 Hydraulic Model

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

2.4 Proposed Water Plan

2.4.1 Modeling Results

The hydraulic model was run under basic day, maximum day with fire flows and under peak hour conditions. Water pipes are sized to provide sufficient pressure and to deliver the required fire flows.

Results of the hydraulic model are include in **Appendix B**, with the Phase 12 nodes highlighted, and summarized as follows:

Scenario

Basic Day (Max HGL) Pressure Range	569.7 to 585.9 kPa
Peak Hour Pressure Range	325.2 to 350.5 kPa
Max Day + 10,000 l/min Fire Flow	180.4 l/s to 398.4 l/s
Max Day + 15,000 l/min Fire Flow	271.8 l/s to 280.7 l/s

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

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Maximum Pressure	All nodes have basic day pressures over 552 kPa, therefore pressure reducing control is required for this development.
Minimum Pressure	All nodes in the model exceed the minimum value of 276 kPa (40 psi).
Fire Flow	All townhouse and single family lots exceed the fire flow requirement of 166.7 l/s (10,000 l/min). The nodes at the multi-unit residential building exceed 250 l/s (15,000 l/min).

2.4.2 Watermain Layout

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

The north block is serviced by three connections to the existing 300 mm watermains on River Road. 200 mm watermains are required to service the single family lots and 250 mm watermains for the multi-unit area at the north end. For the south block, two connections to the recently constructed 400 mm watermain on River Road are required, 200 mm watermains will service the site.

3 SANITARY SEWERS

3.1 Existing Conditions

As noted earlier in Section 1.5, sanitary flows from the subject site will be routed either to the existing River Road/Summerhill Street sub-trunk sanitary sewer and/or to the existing sanitary stub left during the Phase 9 Lands development in Ballinville Circle. Again, at the time of detailed design the feasibility of directing all sanitary flows from the subject lands to the River Road/Summerhill Street sub-trunk sewer will likely be examined.

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.

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 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**.

3.3 River Road Reconstruction (2018 IBI)

Drainage area plan 114373-400 and the sanitary sewer design sheet for this project have been included in **Appendix C** as they demonstrate that the southern portion of the subject lands have been included in the design calculations for the sanitary sewer recently extended in River Road, the subject lands are identified as drainage area 8A.

3.4 Summerhill Village Phase 1 (2011 IBI)

Drainage area plan 3766-501 and the sanitary sewer design sheet for this project have been included in **Appendix C** as they demonstrate that a portion of the northern lands have been included in the design calculations for the existing sanitary sewer in Summerhill Street. The proposed connection is at MH100A at the intersection of River Road and Summerhill Street. The lands are identified as drainage area "FROM MSS 2b."

3.5 Riverside South Phase 9 (2012 JLR)

Drainage area plan D1-SAN and the sanitary sewer design sheet for this project have been included in **Appendix C** as they demonstrate that the north portion of the northern lands have been included in the design calculations for the existing sanitary sewer in Ballinville Circle. The proposed connection is at stub 73A. The lands are identified as drainage area "Future Phase 12 Residential".

3.6 Design Criteria

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

- Average residential flow = 280 l/c/d

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- Peak residential flow factor = (Harmon Formula) x 0.80
- Average commercial flow = 28,000 l/s/ha
- Average institutional flow = 28,000 l/s/ha
- Peak ICI flow factor = 1.5 if ICI area is ≤ 20% total area
1.0 if ICI area is > 20% total area
- Inflow and Infiltration Rate = 0.33 l/s/ha
- Minimum Full Flow Velocity = 0.60 m/s
- Maximum Full Flow Velocity = 3.0 m/s
- Minimum Pipe Size = 200 mm diameter

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

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

3.7 Recommended Sanitary Plan

As noted above the whole of the subject lands have been accounted for in the design and construction of the existing adjacent sanitary sewer systems. The current approved plans call for 3 separate connections to existing sanitary sewer systems. A preliminary sanitary plan is included in **Figure 3.1** in **Appendix C**.

No external sanitary flows are anticipated to cross the subject lands. As such, all sanitary sewers are proposed to be at normal depth and size.

4 STORMWATER MANAGEMENT

4.1 Existing Conditions

The ultimate storm runoff outlet from the property is the Riverside South Pond 5 which is currently under construction and is located west of River Road.

The lands currently drain westward directly into the Rideau River.

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

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

The 2017 ISSU report recommended that stormwater runoff from the study area be routed to Riverside South Pond 5, which is currently under construction. Minor storm runoff is proposed to be routed to the trunk storm sewer on River Road. For reference a copy of Drawing STM1, Storm Sewers from the 2017 study is included in **Appendix D**.

4.3 River Road Reconstruction (2018 IBI)

Drainage area plans 114373-500, 114373-501 and the storm sewer design sheet for this project have been included in **Appendix D** as they demonstrate that the whole of the subject lands have been included in the design calculations for the trunk storm sewer recently extended in River Road, the subject lands are identified as drainage area 154 and EXT-1.

It should be noted that during the modelling for the River Road trunk sewers that the subject lands were included in the model with 100 year capture into the minor storm system. Flows in excess of the 100 year event will be provided with an emergency route direct to the Rideau River.

4.4 Summerhill Village Phase 1 (2011 IBI)

Drainage area plan 3766-500A and the storm sewer design sheet for this project have been included in **Appendix D** as they demonstrate that the norther lands have been included in the design calculations for the trunk storm sewer in River Road. The design proposed two connections to River Road.

4.5 Minor Storm Sewer Design Criteria

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

- Sewer Sizing: Rational Method
- Design Return Period: 1:2 year (local streets)
1:5 year (collector streets)
- Initial Time of Concentration 10 minutes

- Manning's: 0.013
- Minimum Velocity: 0.80 m/s
- Maximum Velocity: 3.00 m/s

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

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

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

4.6 Recommended Minor Storm Plan

As noted above the whole of the subject lands have been accounted for in the design and construction of the existing adjacent trunk storm sewer systems. The current approved plans call for 3 separate connections to existing storm sewer systems. A preliminary storm plan is included in **Figure 4.1** in **Appendix D**.

In an effort to reduce disruptions to River Road and cost, the detailed design phase will likely include an analysis to explore the possibility of eliminating the northernmost storm connection for the northern section of lands. A preliminary storm plan demonstrating this concept is also included in **Figure 4.1A** in **Appendix D**.

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.

IBI GROUP

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
URBAN DALE CORPORATION INC.
- RIVERSIDE SOUTH PHASE 12
RIVERSIDE SOUTH COMMUNITY
RIDEAU RIVER AREA
Prepared for: URBAN DALE CORPORATION INC.

4.7 Dual Drainage

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

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

5 EROSION AND SEDIMENTATION CONTROL PLAN

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

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

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

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

6 APPROVALS AND PERMIT REQUIREMENTS

6.1 City of Ottawa

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

6.2 Province of Ontario

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

6.3 Conservation Authority

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

6.4 Federal Government

At this time it is understood that there are no required permits, authorizations or approvals needed expressly for this development from the Federal Government; however, this will be confirmed through subsequent consultation with Parks Canada as a minimum.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusion

All infrastructure which is needed to help service the subject site already exists. The development plan will include connections to the infrastructure to adequately service the site with water supply, wastewater collection and disposal and management of stormwater runoff. The extension of the existing watermains through the subject site will provide a reliable source of both drinking water and fire flows. The ultimate wastewater outlets are already in place. A new stormwater management facility, Pond 5, is currently under construction and once completed will provide the necessary treatment for runoff from the subject site. Development of the subject property will include the recommended storm sewer plan. Therefore, there are suitable public services 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 Urbandale property known as Riverside South Phase 12 be accepted and that the development of the property move forward.



Lance Erion, P. Eng.
Associate

APPENDIX A

Development Servicing Study Checklist

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

GENERAL CONTENT

	ITEM DESCRIPTION	LOCATION
	Executive Summary (for larger reports only)	N/A
√	Date and revision number of the report	Front Cover
√	Location Map and plan showing municipal address, boundary, and layout of proposed development.	Figure 1.1
√	Plan showing the site and location of all existing services.	Figure 1.3
√	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 2.2, 3.2, 3.3, 4.3 Figure 1.1
√	Summary of Pre-consultation Meeting with City and other approval agencies.	Section 1.6
√	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible 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
√	<u>Concept level master grading plan</u> to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Section 1.8 Detail Design
√	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
	Proposed phasing of the development, if applicable.	N/A
√	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.8

√	<p>All preliminary and formal site plan submissions should have the following information:</p> <ul style="list-style-type: none"> • 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
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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 feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities and timing of implementation.	N/A
√	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 2.3
√	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Detailed Design

DEVELOPMENT SERVICING REPORT: WASTEWATER

ITEM DESCRIPTION		LOCATION
√	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 3.3
√	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Section 3.2
√	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age condition of sewers.	Detail Design
√	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 3.2, Appendix C
√	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 3.1, 3.2, 3.4
	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix "C") format.	Section 3.3 & Detail Design
√	Description of proposed sewer network including sewers, pumping stations and forcemains.	Section 3.1, 3.4 & Figure 3.1 in Appendix C
√	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	Section 1.9
√	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	Section 3.1
√	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
√	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
√	Special considerations such as contamination, corrosive environment etc.	Detail Design

DEVELOPMENT SERVICING REPORT: STORMWATER CHECKLIST

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

√	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 4.5
√	Water quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 4.5
√	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 4.3, 4.4, 4.5
√	Set-back from private sewage disposal systems.	N/A
√	Watercourse and hazard lands setbacks.	Section 1.9, 4.8
√	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Section 1.6
√	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Section 4.2
√	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 4.5 Detail Design
√	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Section 1.9, 4.8
	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Detail Design
√	Any proposed diversion of drainage catchment areas from one outlet to another.	Section 1.7, 4.4
√	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Section 4.2, 4.4, Appendix D
	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
√	Identification of potential impacts to receiving watercourses	N/A
√	Identification of municipal drains and related approval requirements.	Section 1.9
√	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 4.5 Detail Design
√	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Section 4.5 Detail Design
	Inclusion of hydraulic analysis including hydraulic grade line elevations.	Section 4.6
√	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 5
√	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
√	Identification of fill constraints related to floodplain and geotechnical investigation.	Section 1.8,

APPROVAL AND PERMIT REQUIREMENTS: CHECKLIST

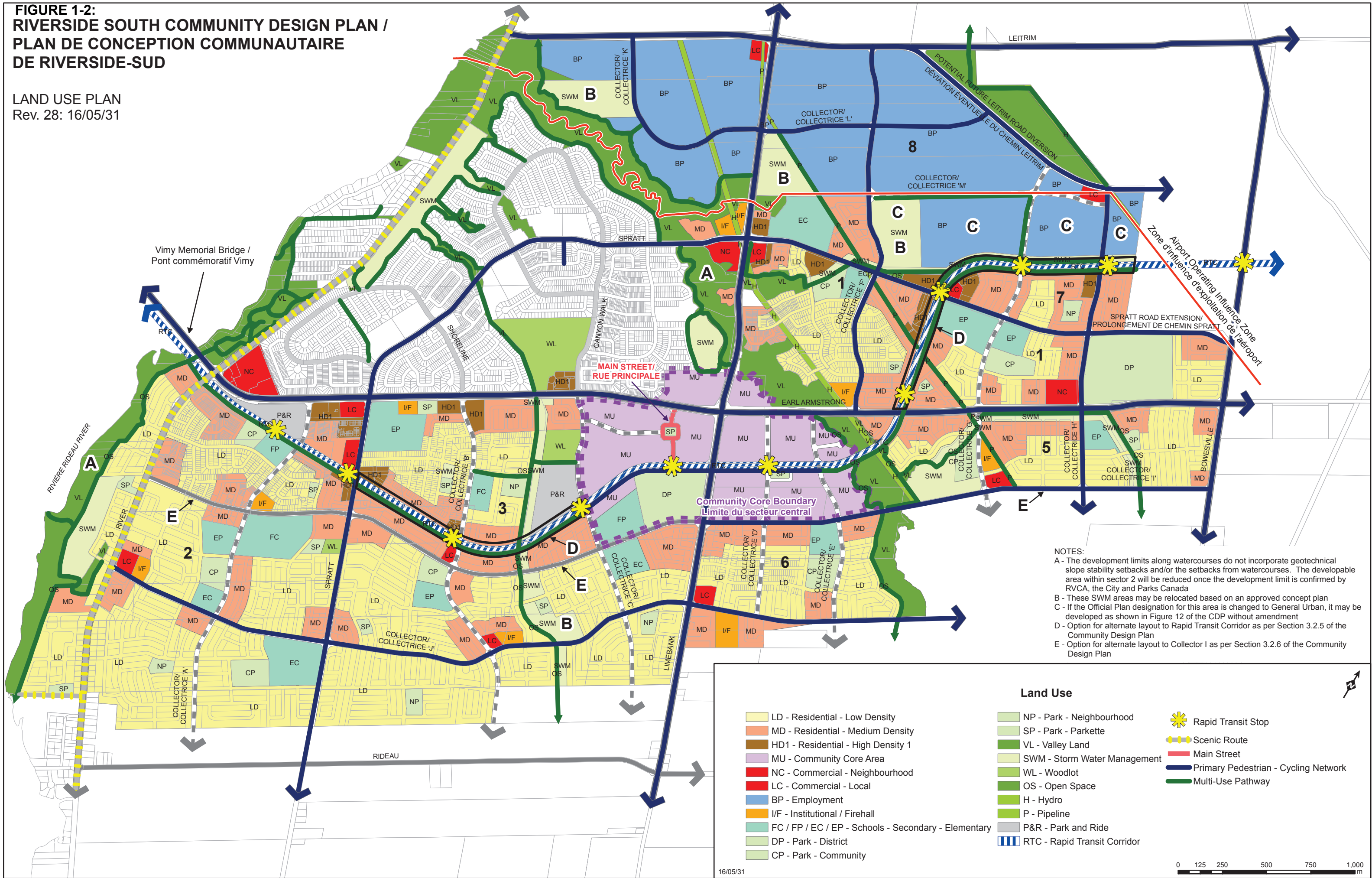
ITEM DESCRIPTION		LOCATION
√	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Section 1.6, 1.9
	Application for Certification of Approval (CofA) under the Ontario Water resources Act.	Section 1.6 Detail Design
√	Changes to Municipal Drains	N/A
√	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	Section 6

CONCLUSION CHECKLIST

ITEM DESCRIPTION		LOCATION
√	Clearly stated conclusions and recommendations	Section 7.1 & 7.2
	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	Detail Design
√	All draft and final reports shall be signed and stamped by professional Engineer registered in Ontario.	Completed

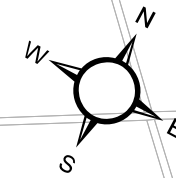
**FIGURE 1-2:
RIVERSIDE SOUTH COMMUNITY DESIGN PLAN /
PLAN DE CONCEPTION COMMUNAUTAIRE
DE RIVERSIDE-SUD**

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





NOTES:
 A - The development limits along watercourses do not incorporate geotechnical slope stability setbacks and/or the setbacks from watercourses. The developable area within sector 2 will be reduced once the development limit is confirmed by RVCA, the City and Parks Canada
 B - These SWM areas may be relocated based on an approved concept plan
 C - If the Official Plan designation for this area is changed to General Urban, it may be developed as shown in Figure 12 of the CDP without amendment
 D - Option for alternate layout to Rapid Transit Corridor as per Section 3.2.5 of the Community Design Plan
 E - Option for alternate layout to Collector I as per Section 3.2.6 of the Community Design Plan

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



Legend

-  Rideau River Study Area
-  Riverside South Community Boundary

Client / Project:

CITY OF OTTAWA
RIVERSIDE SOUTH ISSU UPDATE
OTTAWA, ON

Title:

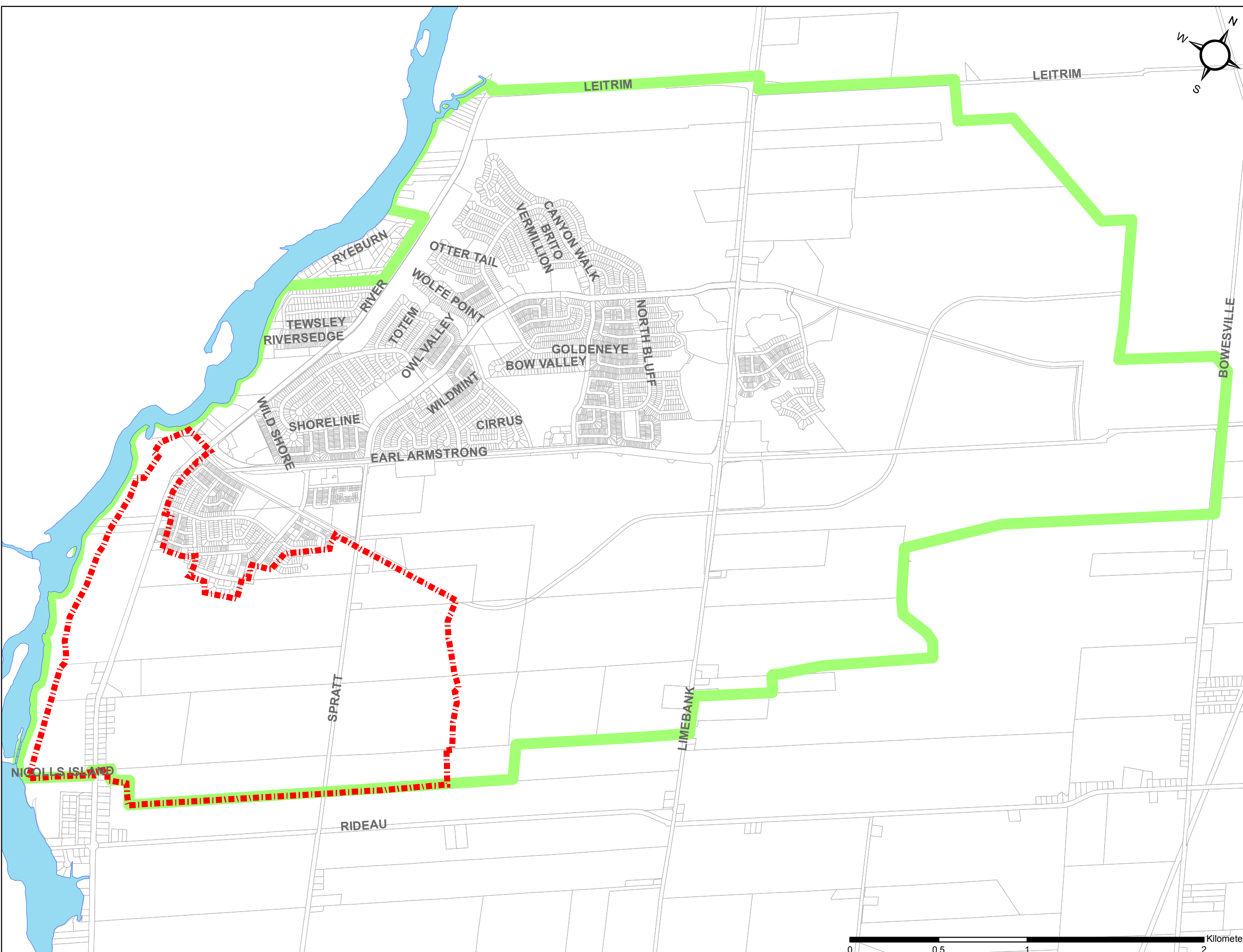
RIVERSIDE SOUTH COMMUNITY
AND STUDY AREA BOUNDARY

Project No.:

163401101

Figure No.:

1-1



Riverside South Community Infrastructure Servicing Study Update – Rideau River Area

Introduction

June 9, 2017

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)

Riverside South Community Infrastructure Servicing Study Update – Rideau River Area

Introduction

June 9, 2017

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)

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Scale

1:2000

Project Title

RIVERSIDE SOUTH PHASE 12

Drawing Title

LOCATION PLAN

Sheet No.

FIGURE 1.1

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DRAFT PLAN OF SUBDIVISION OF PART OF LOTS 20, 21 AND 22 AND PART OF THE ROAD ALLOWANCE BETWEEN LOTS 20 AND 21

(Closed by By-Law 2008-244, Inst. OC1049346)

BROKEN FRONT CONCESSION (RIDEAU FRONT)

Geographic Township of Gloucester
CITY OF OTTAWA

Prepared by Annis, O'Sullivan, Vollebek Ltd.
Scale 1: 1000

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
The boundaries of the lands to be subdivided and their relationship to adjoining lands have been accurately and correctly shown.
Date _____
Andre Roy
ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

This is to certify that I am the owner / agent of the lands to be subdivided and that this plan was prepared in accordance with my instructions.
Date _____
Marcel Denomme
Vice President of Land Development
Urbanideale Corporation
I have the authority to bind the corporation

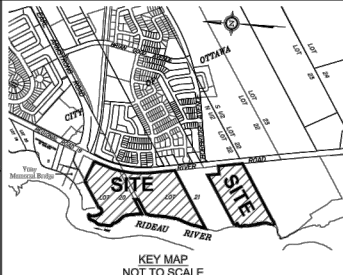
ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 OF THE PLANNING ACT

- (a) see plan
- (b) see plan
- (c) see plan
- (d) single and multi-family residential housing, open space and storm water management lands
- (e) see plan
- (f) see plan
- (g) see plan
- (h) City of Ottawa
- (i) see site report
- (j) see plan
- (k) sanitary, storm sewers, municipal water, toll, hydro, cable and gas to be available
- (l) see plan

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

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

LELY XU, MCIIP RPP, LEED GREEN ASSOC. (A) MANAGER
DEVELOPMENT REVIEW SOUTH BRANCH
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

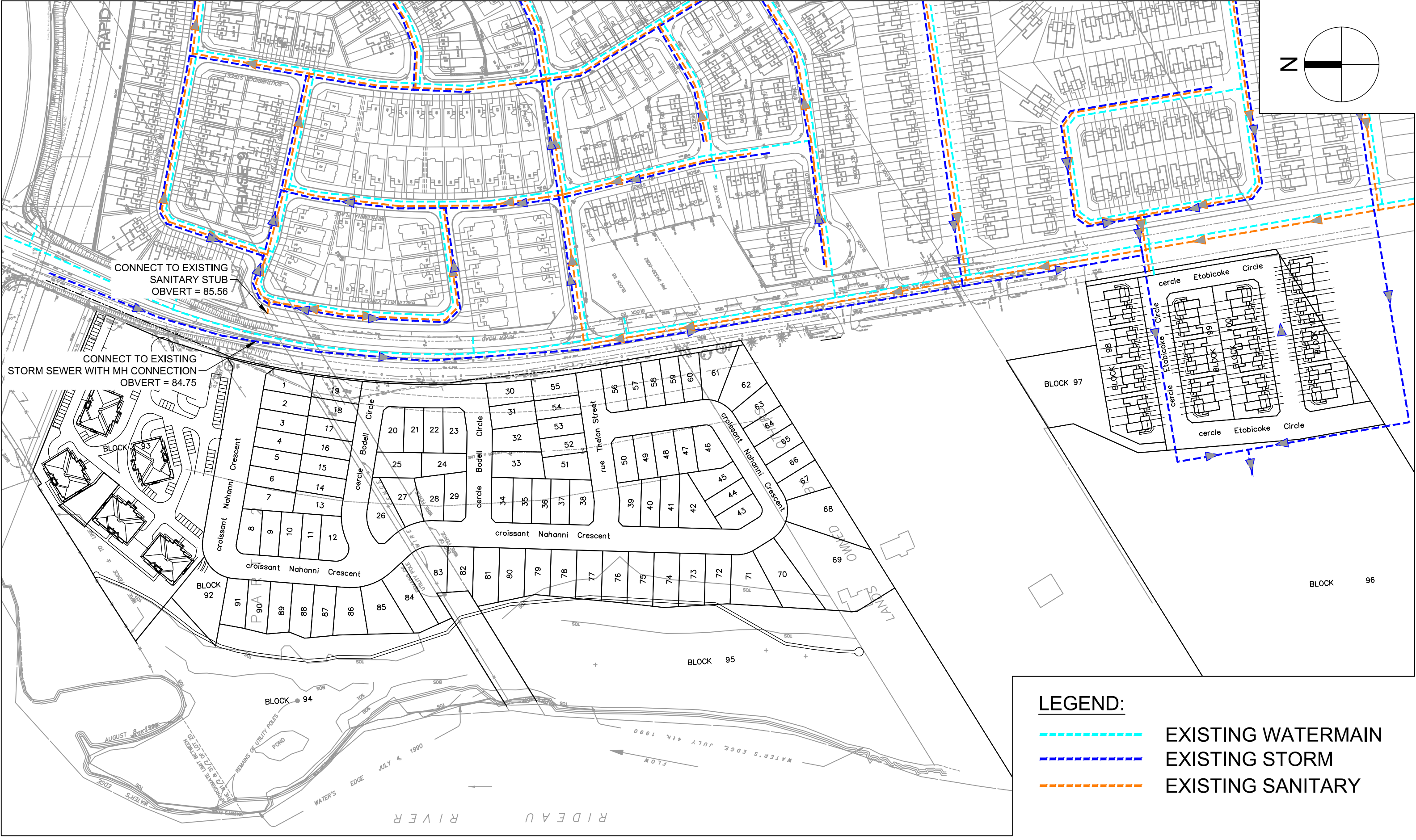


Distances shown on this plan are in metres and can be converted to feet by dividing by 0.3048



ANNIS, O'SULLIVAN, VOLLEBEK LTD.
14 Cornwall Gate, Suite 500
Mississauga, Ont. M5E 1S8
Phone: (905) 721-0850 / Fax: (905) 721-1079
www.annis-osullivan.com

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LEGEND:

- EXISTING WATERMAIN
- EXISTING STORM
- EXISTING SANITARY



Scale

NTS

Project Title

RIVERSIDE SOUTH PHASE 12

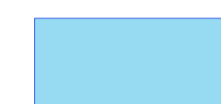



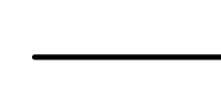





Drawing Title

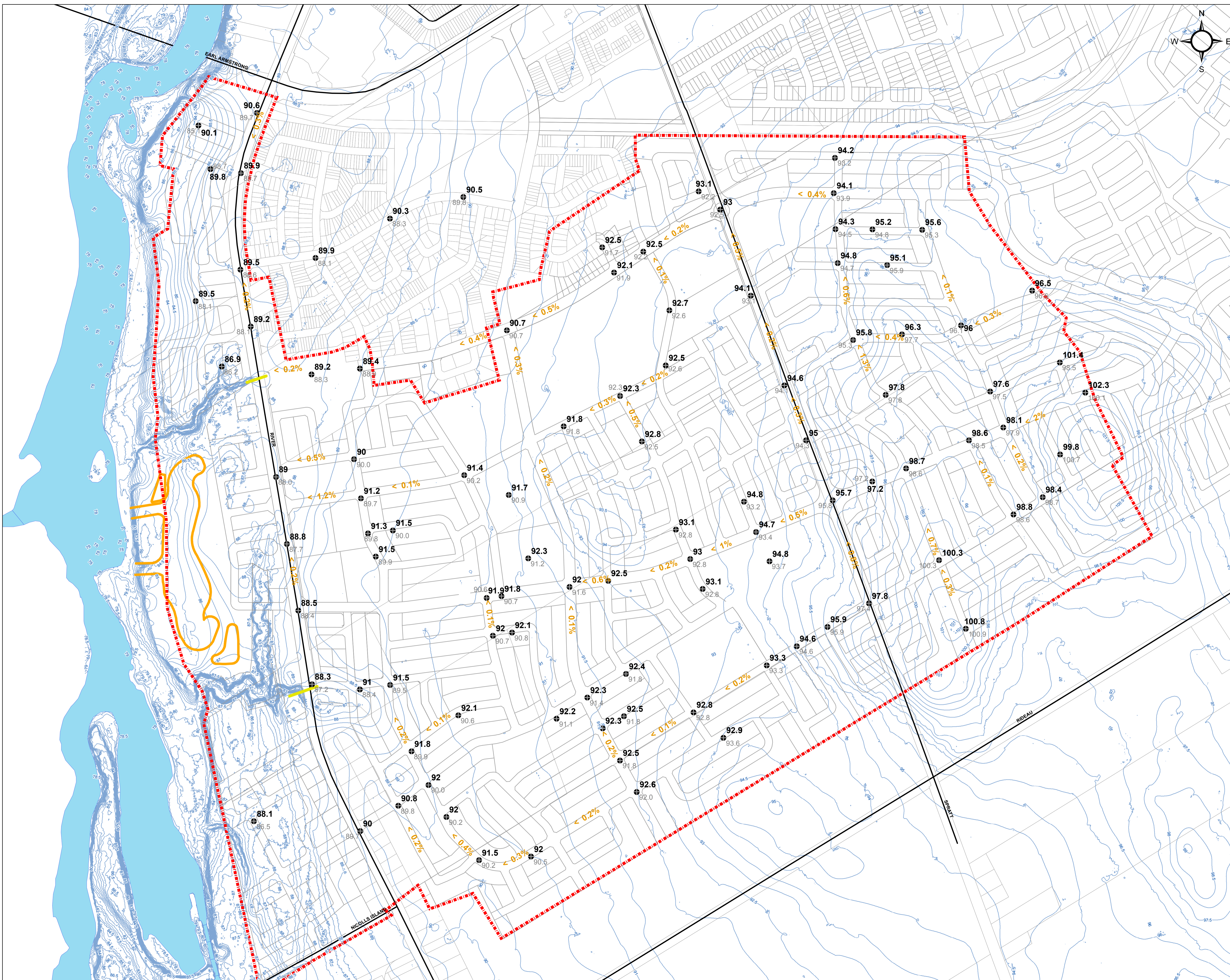
SITE TOPOGRAPHY

Sheet No.

FIGURE 1.4

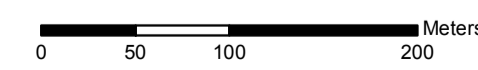
Legend

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

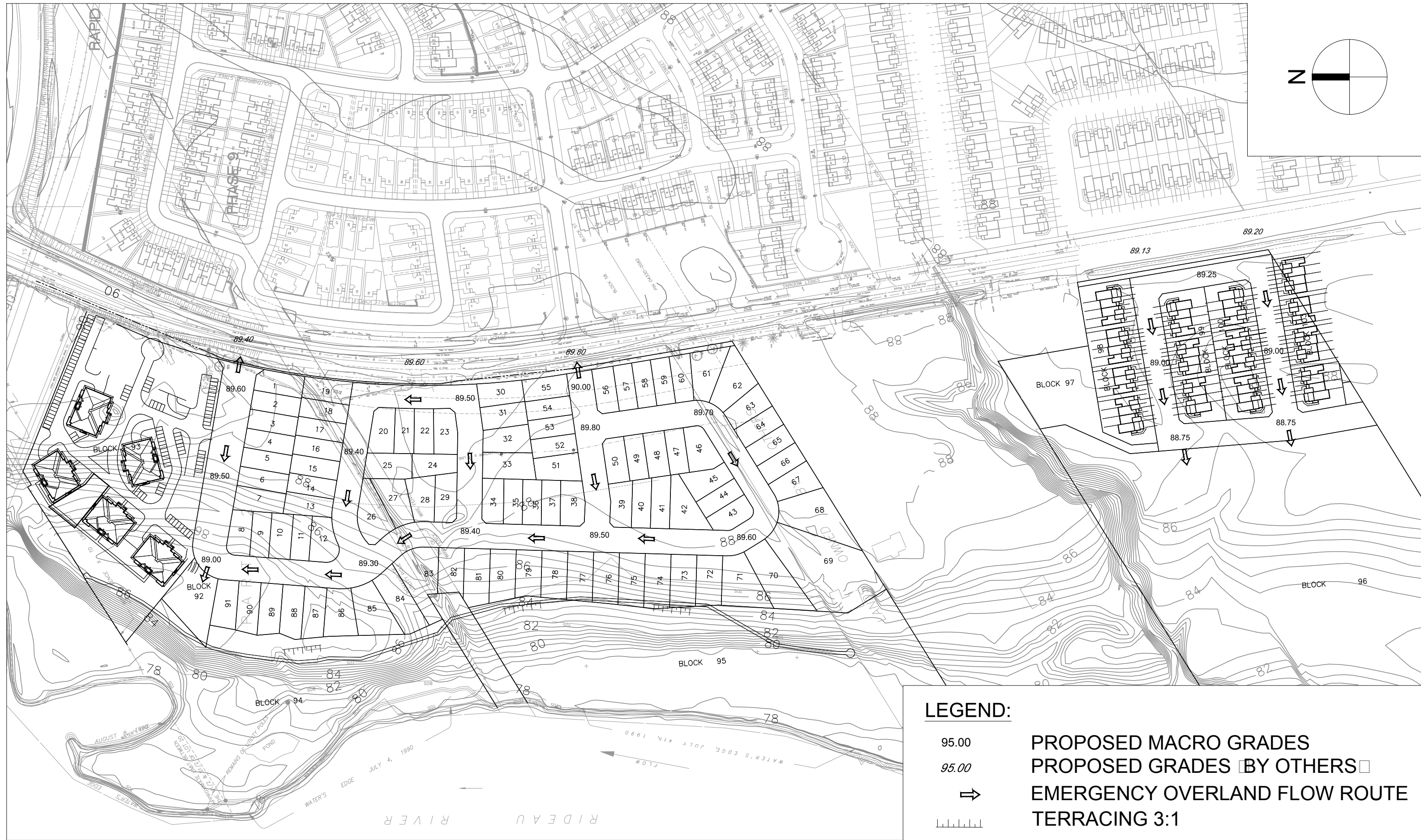


Client / Project:
CITY OF OTTAWA
RIVERSIDE SOUTH ISSU UPDATE
OTTAWA, ON

Title:
MACRO-GRADING PLAN

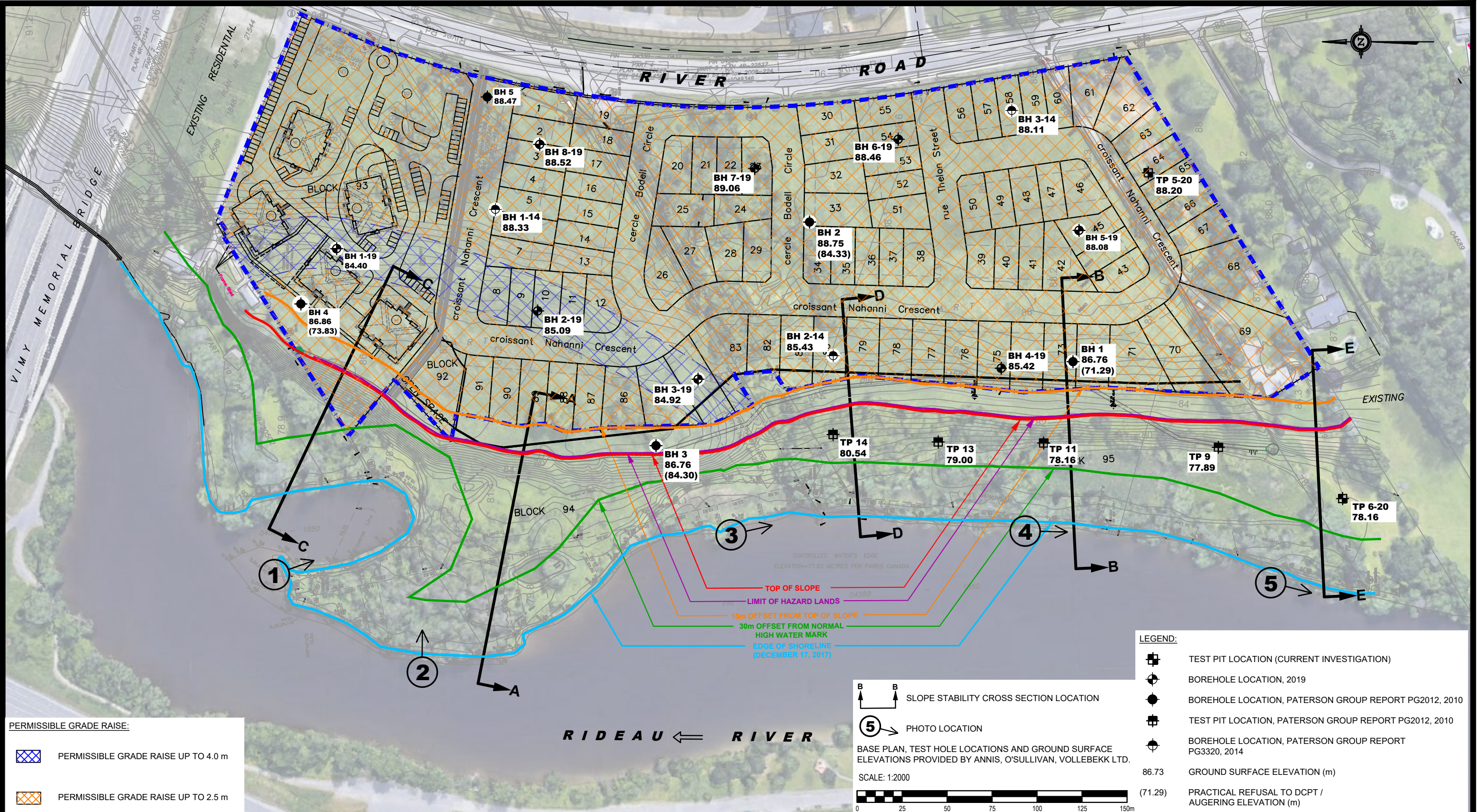
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163401101	
Drawing No.:	Sheet: Revision:
GCP-1	1 of 7 0

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LEGEND:

- 95.00 PROPOSED MACRO GRADES
- 95.00 PROPOSED GRADES BY OTHERS
- ➔ EMERGENCY OVERLAND FLOW ROUTE
- ▨ TERRACING 3:1

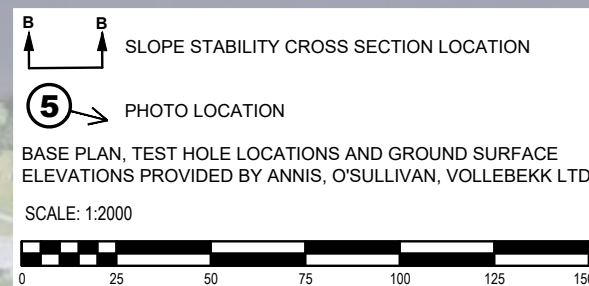


PERMISSIBLE GRADE RAISE:

	PERMISSIBLE GRADE RAISE UP TO 4.0 m
	PERMISSIBLE GRADE RAISE UP TO 2.5 m

LEGEND:

	TEST PIT LOCATION (CURRENT INVESTIGATION)
	BOREHOLE LOCATION, 2019
	BOREHOLE LOCATION, PATERSON GROUP REPORT PG2012, 2010
	TEST PIT LOCATION, PATERSON GROUP REPORT PG2012, 2010
	BOREHOLE LOCATION, PATERSON GROUP REPORT PG3320, 2014
	86.73 GROUND SURFACE ELEVATION (m)
	(71.29) PRACTICAL REFUSAL TO DCPT / AUGERING ELEVATION (m)



patersongroup
consulting engineers

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

NO.	REVISIONS	DATE	INITIAL
1	REVISED PROPERTY BOUNDARY NEW 2020 TEST PITS ADDED	11/17/2020	KP

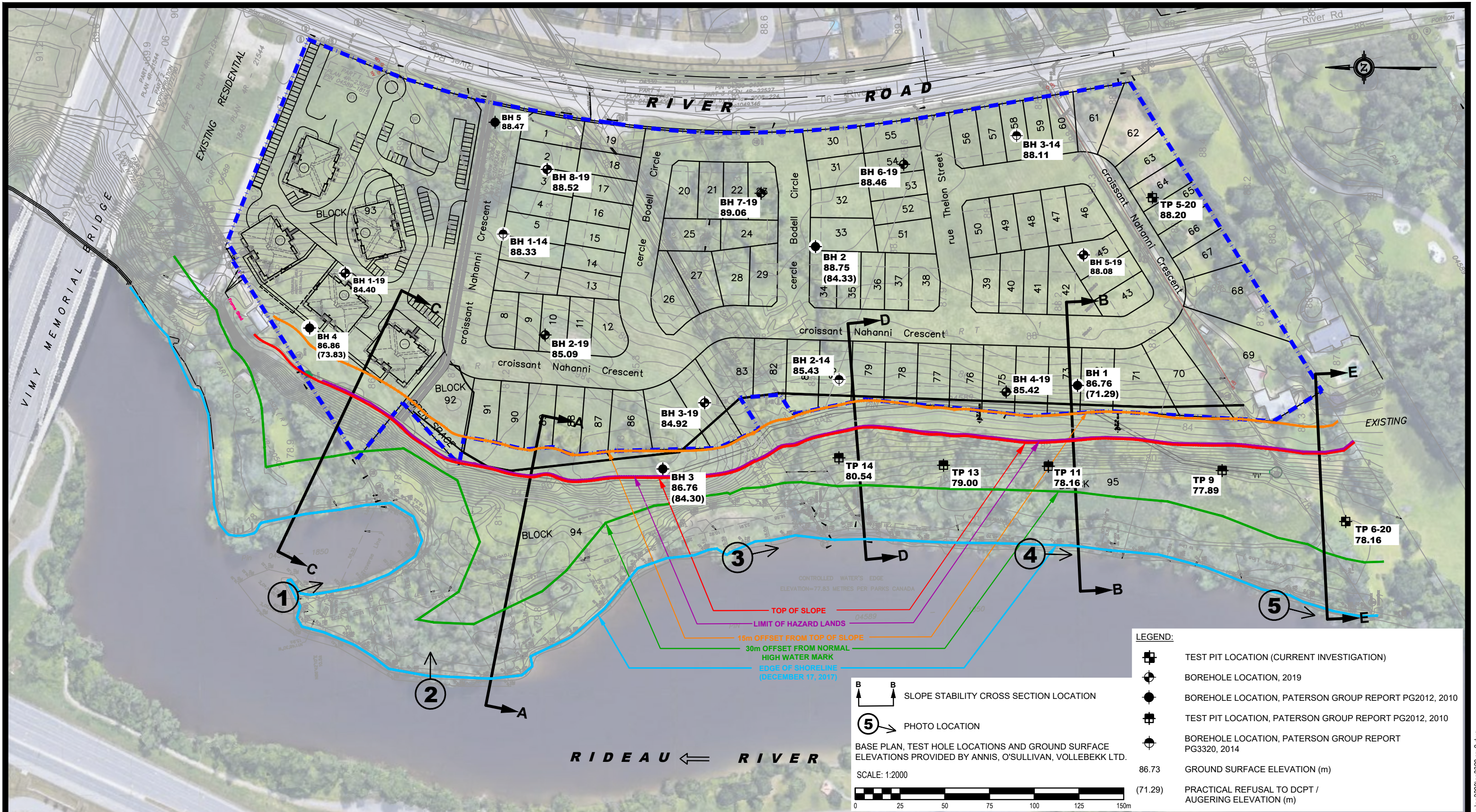
URBANDALE CORPORATION
SUPPLEMENTAL GEOTECHNICAL INVESTIGATION
RIVERSIDE SOUTH - PHASE 12, 708 TO 720 RIVER ROAD

OTTAWA, ONTARIO

Title: **PERMISSIBLE GRADE RAISE PLAN**

Scale:	1:2000	Date:	06/2019
Drawn by:	MPG	Report No.:	PG3320-2
Checked by:	KP	Dwg. No.:	PG3320-4
Approved by:	DJG	Revision No.:	1

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patersongroup
consulting engineers

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

NO.	REVISIONS	DATE	INITIAL
2	REVISED PROPERTY BOUNDARY NEW 2020 TEST PITS ADDED	11/17/2020	KP
1	REVISED SHORELINE, EXTENDED CROSS SECTIONS	17/03/2020	RG

OTTAWA,
Title:

URBANDALE CORPORATION
SUPPLEMENTAL GEOTECHNICAL INVESTIGATION
RIVERSIDE SOUTH - PHASE 12, 708 TO 720 RIVER ROAD

ONTARIO

TEST HOLE LOCATION PLAN

Scale:	1:2000	Date:	03/2020
Drawn by:	RCG	Report No.:	PG3320-2
Checked by:	KP	Dwg. No.:	PG3320-2
Approved by:	DJG	Revision No.:	2

MEMO

Date:

To /
Destinataire Sean Moore, Planner

From /
Expéditeur Natasha Baird, Project Manager, Infrastructure
Approvals

Subject /
Objet **Pre-Application Consultation**
708 River Road, Ward 22

File No. PC2018-0225

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

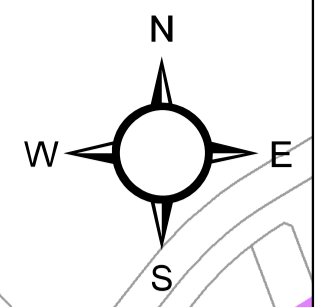
1. The Servicing Study Guidelines for Development Applications are available at the following address: <http://ottawa.ca/en/development-application-review-process-0/servicing-study-guidelines-development-applications>
2. Servicing and site works shall be in accordance with the following documents:
 - ⇒ Ottawa Sewer Design Guidelines (October 2012)
 - ⇒ Ottawa Design Guidelines – Water Distribution (2010)
 - ⇒ Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
 - ⇒ City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
 - ⇒ City of Ottawa Environmental Noise Control Guidelines (January, 2016)
 - ⇒ City of Ottawa Park and Pathway Development Manual (2012)
 - ⇒ City of Ottawa Accessibility Design Standards (2012)
 - ⇒ Ottawa Standard Tender Documents (latest version)
 - ⇒ Ontario Provincial Standards for Roads & Public Works (2013)

3. Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).
4. The servicing (stormwater, sanitary and water), for the subject lands, is to be based on the Riverside South Community Infrastructure Servicing Study Update – Rideau River Area (June 2017) and the Riverside South Community Master Drainage Plan Update – Rideau River Study Area (March 2016).
5. The development will not be permitted until Pond 5 is constructed and has an approved outlet, the sanitary sewer and watermain are extended to 750 River Road.
6. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:
 - i. Location of service
 - ii. Type of development and the amount of fire flow required (as per FUS, 1999).
 - iii. Average daily demand: ___ l/s.
 - iv. Maximum daily demand: ___ l/s.
 - v. Maximum hourly daily demand: ___ l/s.
7. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.
8. This area has a grade raise restriction of 1.8m.
9. I will need the following studies and plans:
 - Assessment of Adequacy of Public Services Brief
 - Watermain Analysis
 - Draft Plan of Subdivision











- geotechnical report
- slope stability analysis

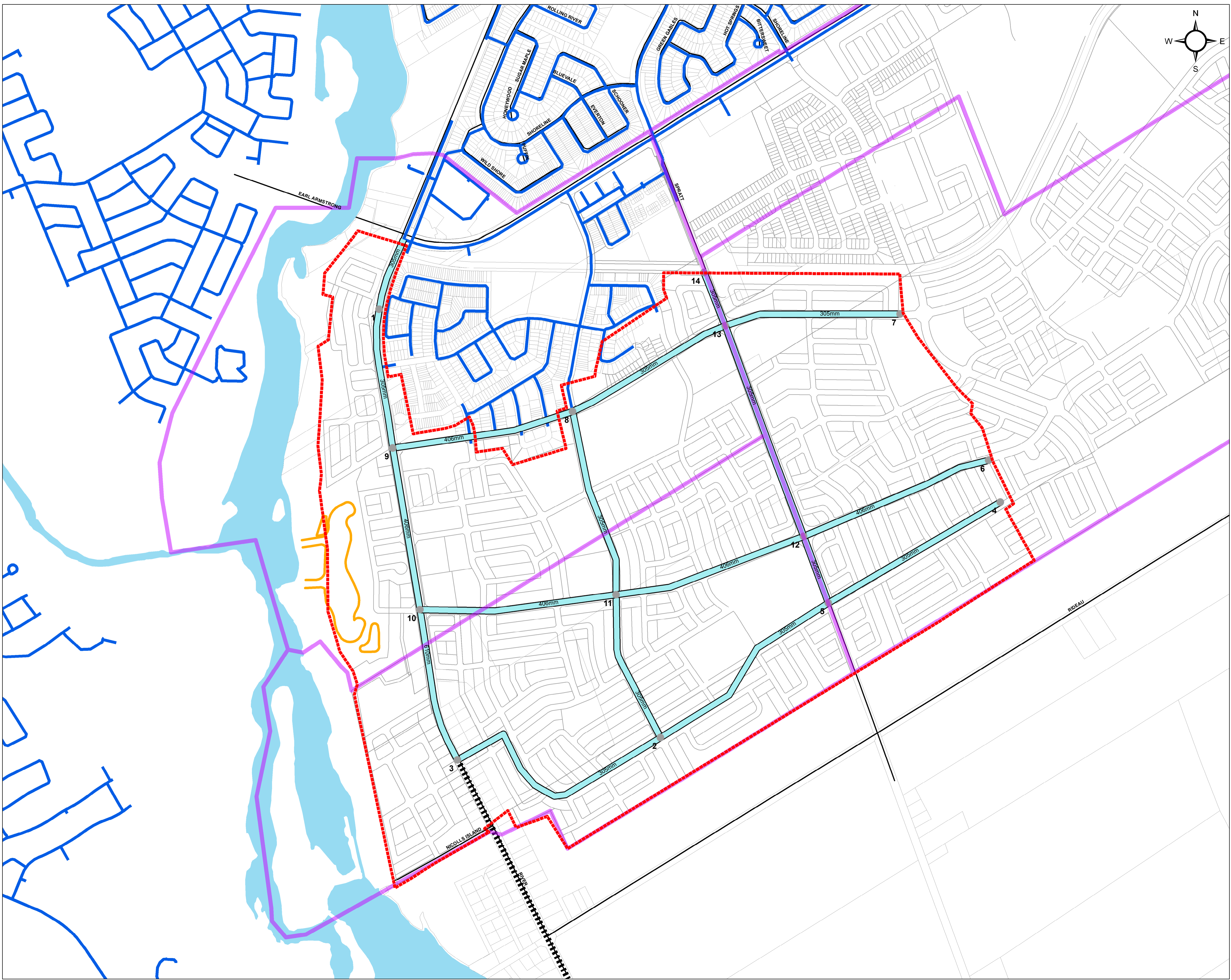
Should you have any questions or require additional information, please contact me directly at (613) 580-2424, 27995 or by email at natasha.baird@ottawa.ca.

APPENDIX B



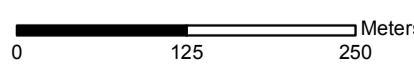
Legend

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



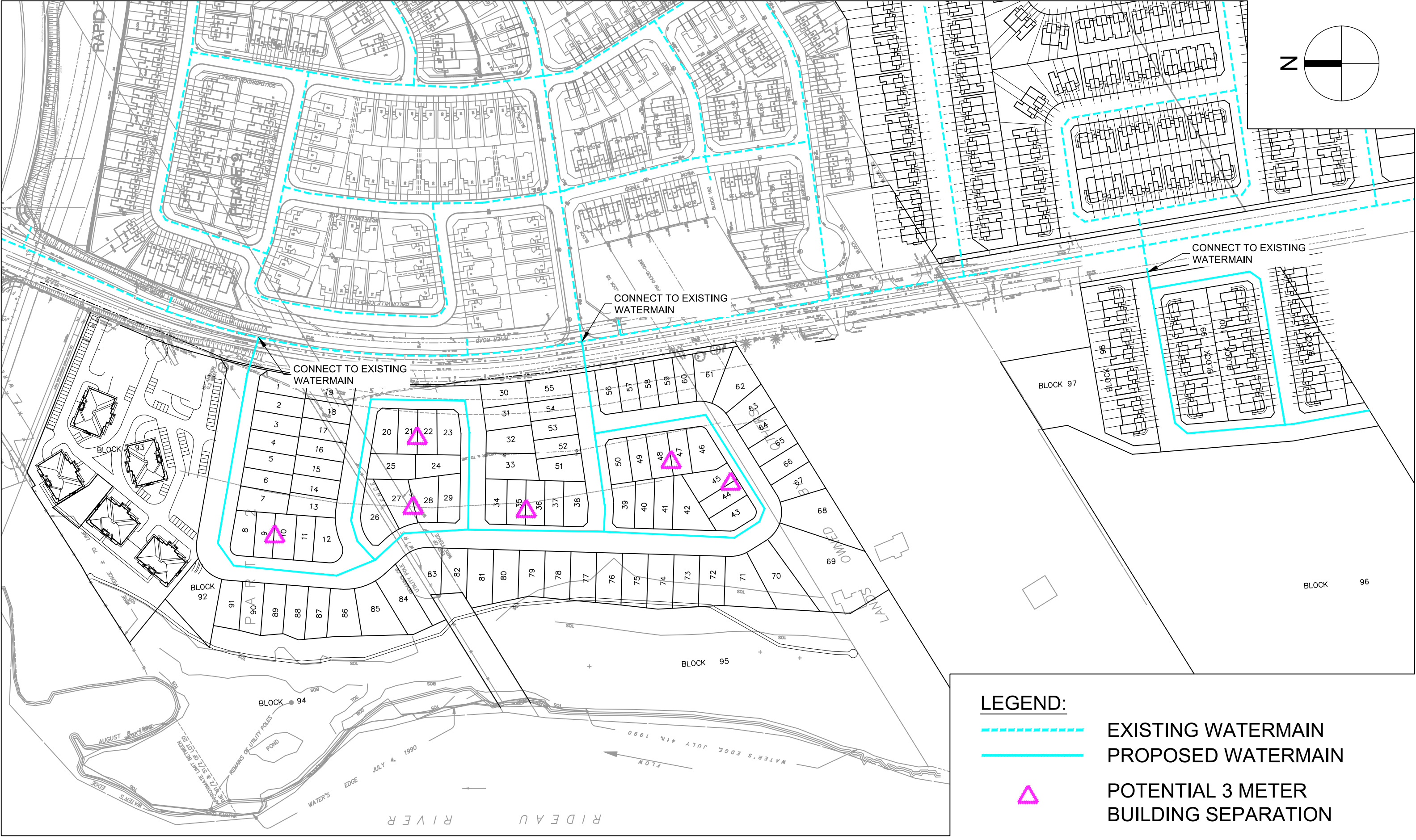
Client / Project:
CITY OF OTTAWA
RIVERSIDE SOUTH ISSU UPDATE
OTTAWA, ON

Title:
POTABLE WATER SERVICING PLAN


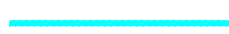

Project No.: **163401101** Scale: 

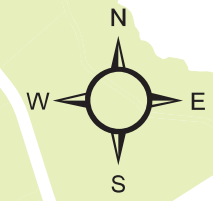
Drawing No.: **WAT-1** Sheet: **7 of 7** Revision: **0**

J:\120031_RSPhase12_5.9 Drawings\99civil\Current\Assessment Report\120031-fig-2.1-WATER.dwg Layout Name: WATER Plot Scale: 1:5.13 Plotted At: 11/13/2020 Last Saved By: Chris.Cormier Last Saved At: Nov. 13, 20



LEGEND:

-  EXISTING WATERMAIN
-  PROPOSED WATERMAIN
-  POTENTIAL 3 METER BUILDING SEPARATION



Legend

- Rideau River Study Area
- Riverside 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:

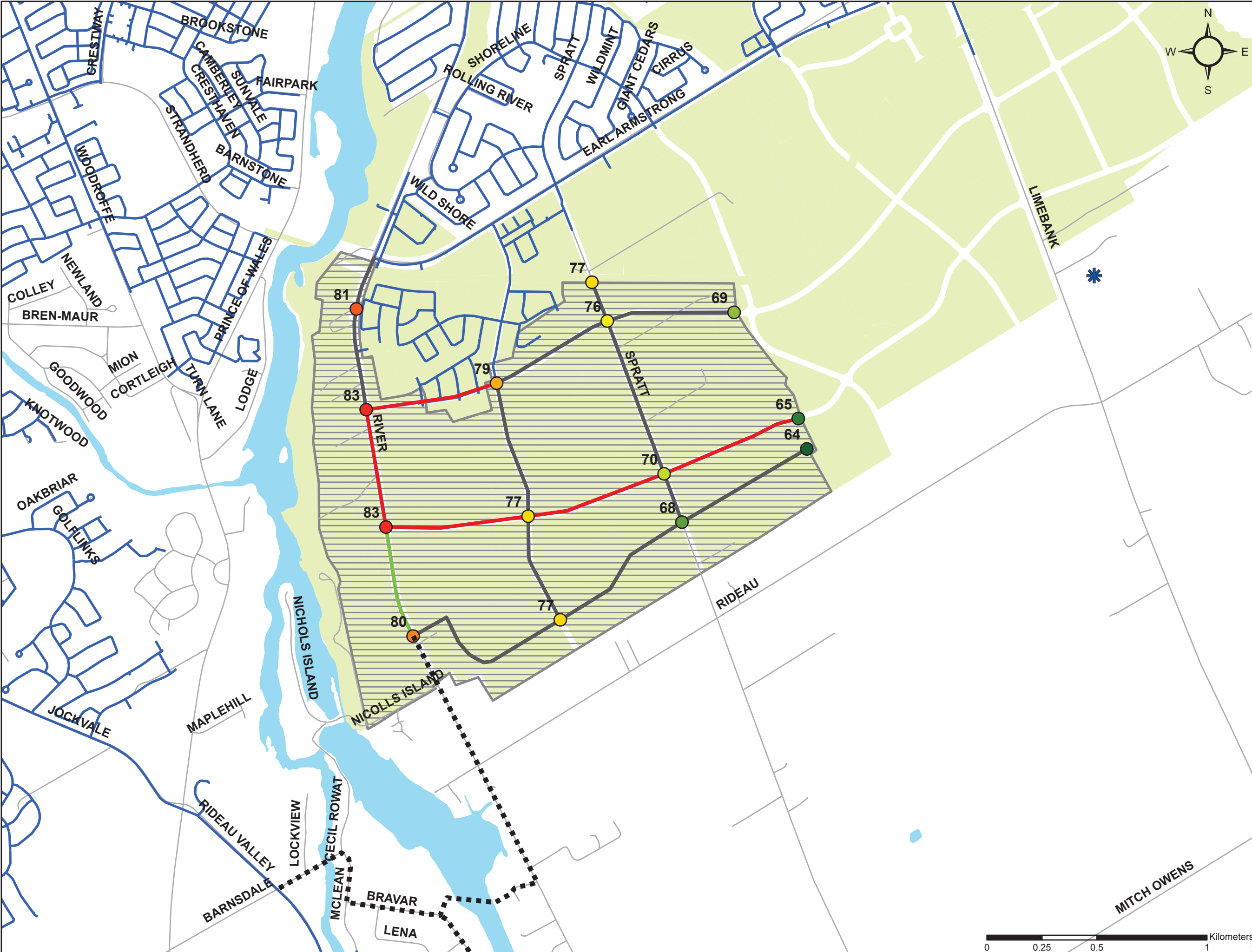
Maximum Pressure During BSDY

Project No.:

163401101

Figure No.:

5-4



BOUNDARY CONDITIONS



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

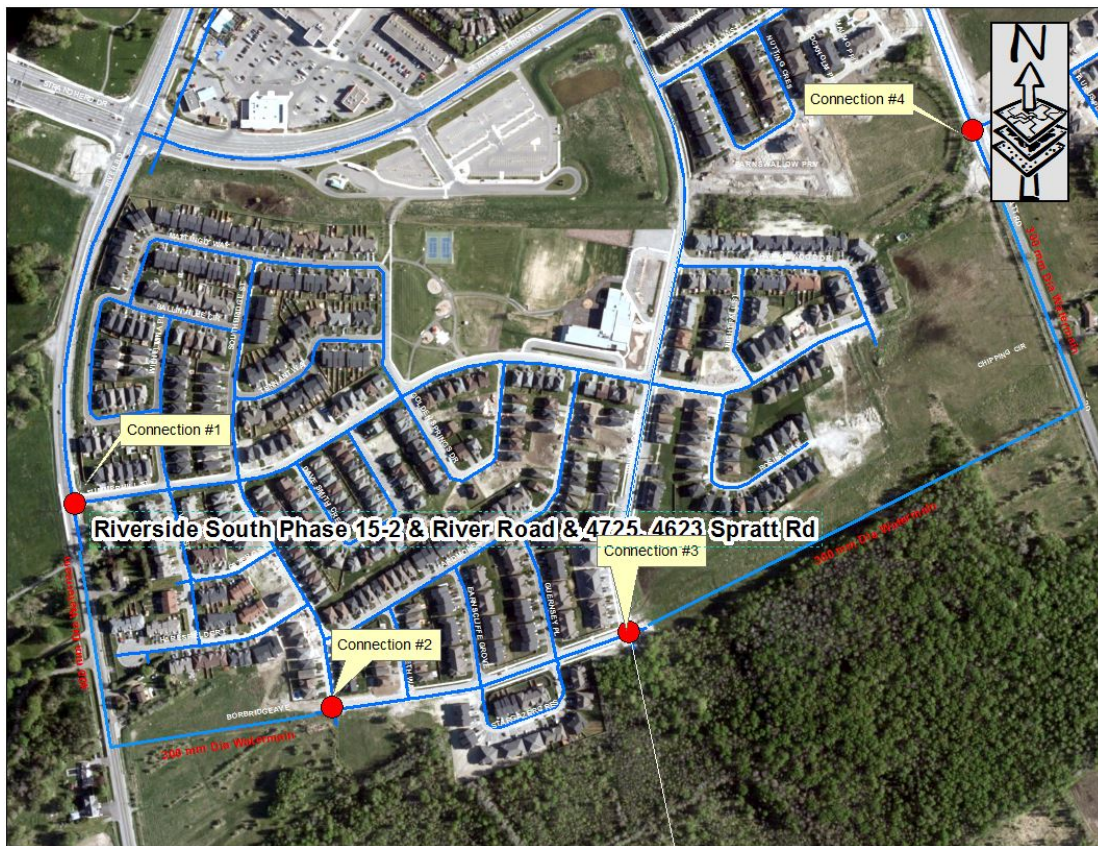
Date of Boundary Conditions: 2018-Dec-06

Provided Information:

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

Number Of Connections: 5

Location:



BOUNDARY CONDITIONS



Location 4263 Spratt Road – Connection 5



BOUNDARY CONDITIONS



Results:

Pre_Configuration

Connection #: 1

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

¹Elevation: **89.71 m**

Connection #: 2

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

¹Elevation: **90.00 m**

BOUNDARY CONDITIONS



Connection #: 3

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

¹Elevation: **99.99 m**

Connection #: 4

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

¹Elevation: **91.79 m**

Connection #: 5

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

¹Elevation: **92.06 m**

BOUNDARY CONDITIONS



Post_Configuration

Connection #: 1

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

¹Elevation: **89.71 m**

Connection #: 2

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

¹Elevation: **90.00 m**

BOUNDARY CONDITIONS



Connection #: 3

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

¹Elevation: **99.99 m**

Connection #: 4

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

¹Elevation: **91.79 m**

Connection #: 5

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

¹Elevation: **92.06 m**

BOUNDARY CONDITIONS



Notes:

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

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

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

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

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.



IBI GROUP
333 PRESTON STREET
OTTAWA, ON
K1S 5N4

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : RIVERSIDE SOUTH PHASE 12
LOCATION : CITY OF OTTAWA
DEVELOPER : RIVERSIDE SOUTH DEVELOPMENT CORPORATION

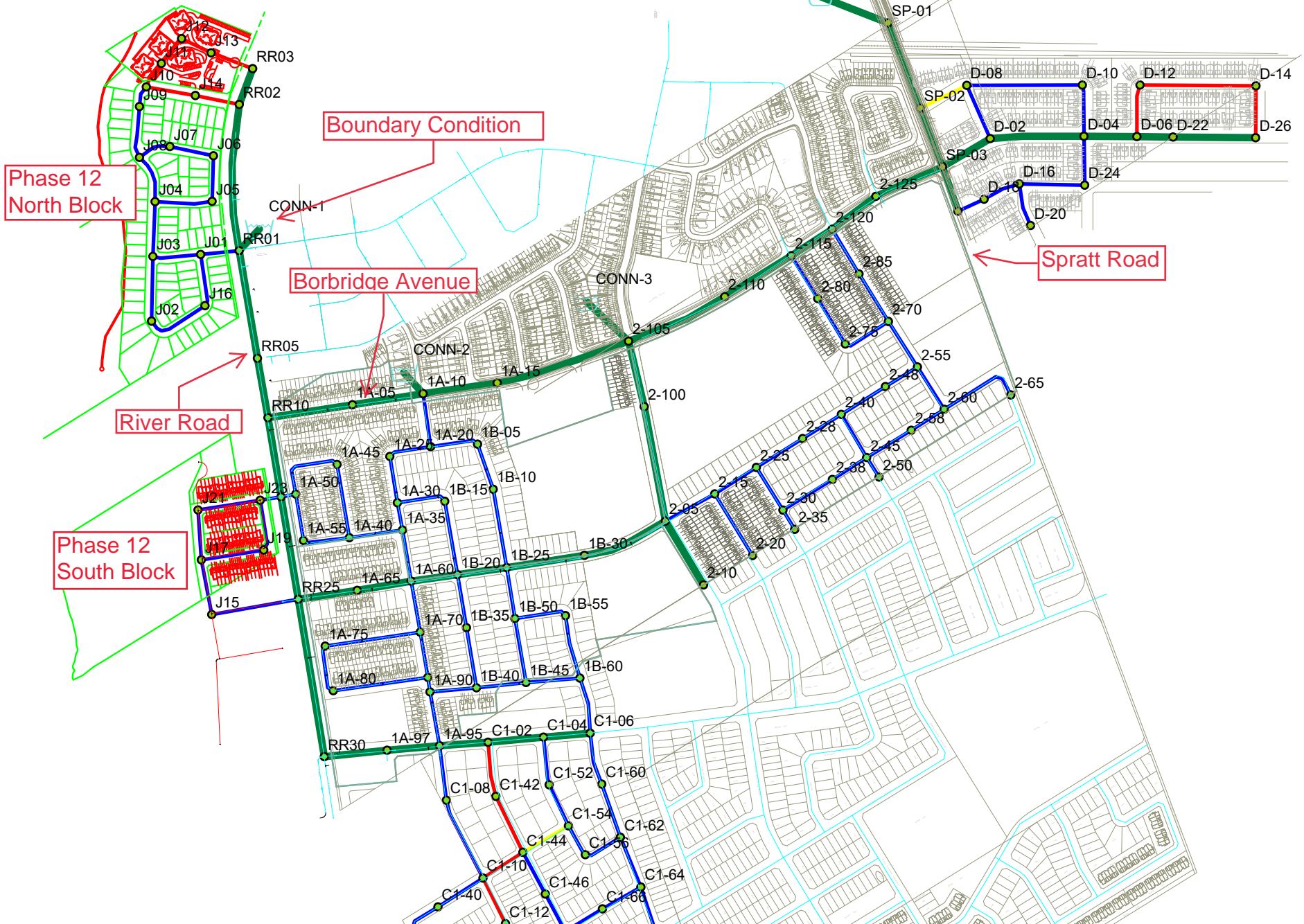
FILE: 120031.5.7
DATE PRINTED: 12-Nov-20
DESIGN: LE
PAGE: 1 OF 1

NODE	RESIDENTIAL				NON-RESIDENTIAL			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			MAXIMUM HOURLY DEMAND (l/s)			FIRE DEMAND (l/min)
	UNITS			POP'N	INDTRL (ha.)	COMM. (ha.)	INST. (ha.)	Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total	
	SF	SD & TH	APT														
RSS Phase 12																	
J01	11			37				0.15	0.00	0.15	0.38	0.00	0.38	0.83	0.00	0.83	10,000
J02	15			51				0.21	0.00	0.21	0.52	0.00	0.52	1.14	0.00	1.14	10,000
J03	8			27				0.11	0.00	0.11	0.28	0.00	0.28	0.61	0.00	0.61	10,000
J04	8			27				0.11	0.00	0.11	0.28	0.00	0.28	0.61	0.00	0.61	10,000
J05	7			24				0.10	0.00	0.10	0.24	0.00	0.24	0.53	0.00	0.53	10,000
J06	5			17				0.07	0.00	0.07	0.17	0.00	0.17	0.38	0.00	0.38	10,000
J07	5			17				0.07	0.00	0.07	0.17	0.00	0.17	0.38	0.00	0.38	10,000
J08	9			31				0.12	0.00	0.12	0.31	0.00	0.31	0.68	0.00	0.68	10,000
J09	7			24				0.10	0.00	0.10	0.24	0.00	0.24	0.53	0.00	0.53	10,000
J10	2			7				0.03	0.00	0.03	0.07	0.00	0.07	0.15	0.00	0.15	10,000
J11			36	65				0.26	0.00	0.26	0.66	0.00	0.66	1.44	0.00	1.44	15,000
J12			12	22				0.09	0.00	0.09	0.22	0.00	0.22	0.48	0.00	0.48	15,000
J13			12	22				0.09	0.00	0.09	0.22	0.00	0.22	0.48	0.00	0.48	15,000
J14	6			20				0.08	0.00	0.08	0.21	0.00	0.21	0.45	0.00	0.45	10,000
J16	8			27				0.11	0.00	0.11	0.28	0.00	0.28	0.61	0.00	0.61	10,000
J17		12		32				0.13	0.00	0.13	0.33	0.00	0.33	0.72	0.00	0.72	10,000
J19		15		41				0.16	0.00	0.16	0.41	0.00	0.41	0.90	0.00	0.90	10,000
J21		12		32				0.13	0.00	0.13	0.33	0.00	0.33	0.72	0.00	0.72	10,000
J23		15		41				0.16	0.00	0.16	0.41	0.00	0.41	0.90	0.00	0.90	10,000
Total	91	54	60	563						2.28			5.73			12.54	

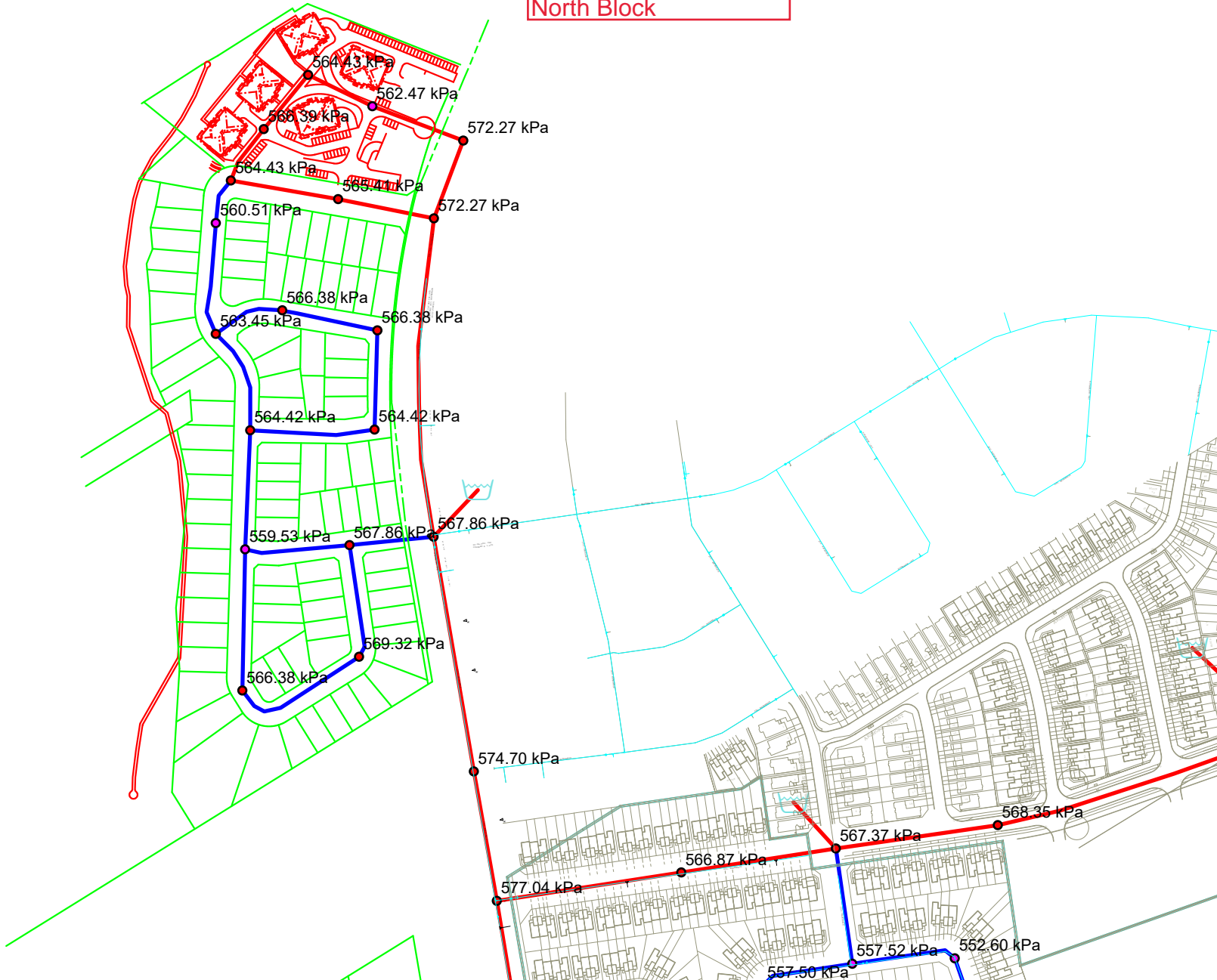
ASSUMPTIONS

RESIDENTIAL DENSITIES	AVG. DAILY DEMAND	MAX. HOURLY DEMAND
- Single Family (SF)	3.4 p / p / u	- Residential 1.925 l / cap / day - ICI 135.000 l / ha / day
- Semi Detached (SD) & Townhouse (TH)	2.7 p / p / u	
- Apartment (APT)	1.8 p / p / u	
-Other	66 u / p / ha	
	MAX. DAILY DEMAND	FIRE FLOW
	- Residential 875 l / cap / day - ICI 75.000 l / ha / day	- SF, SD, TH & ST 10.000 l / min - Back to Back TH 12.000 l / min - ICI/MD 15.000 l / min

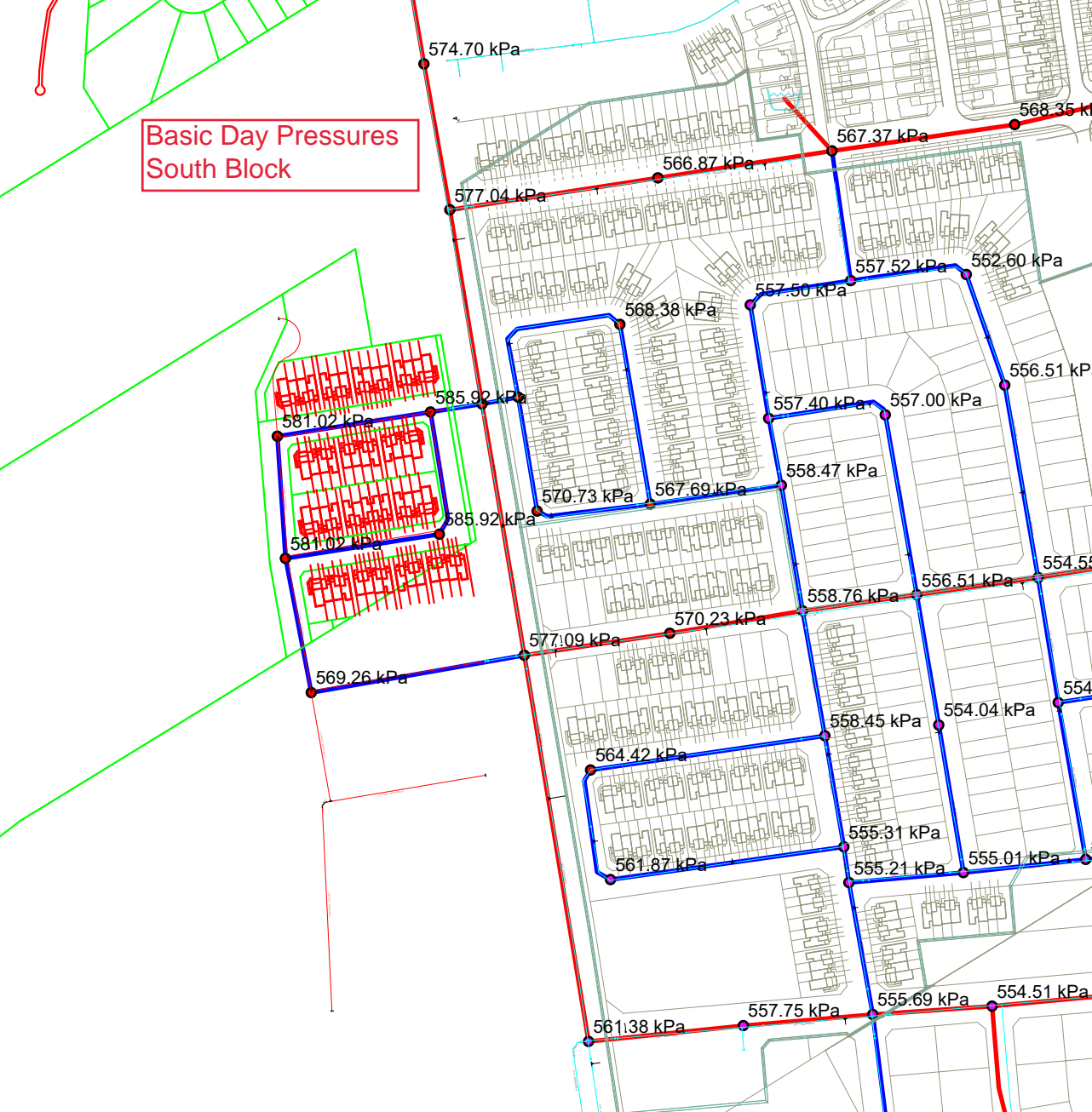
RIVERSIDE SOUTH OVERALL WATER MODEL



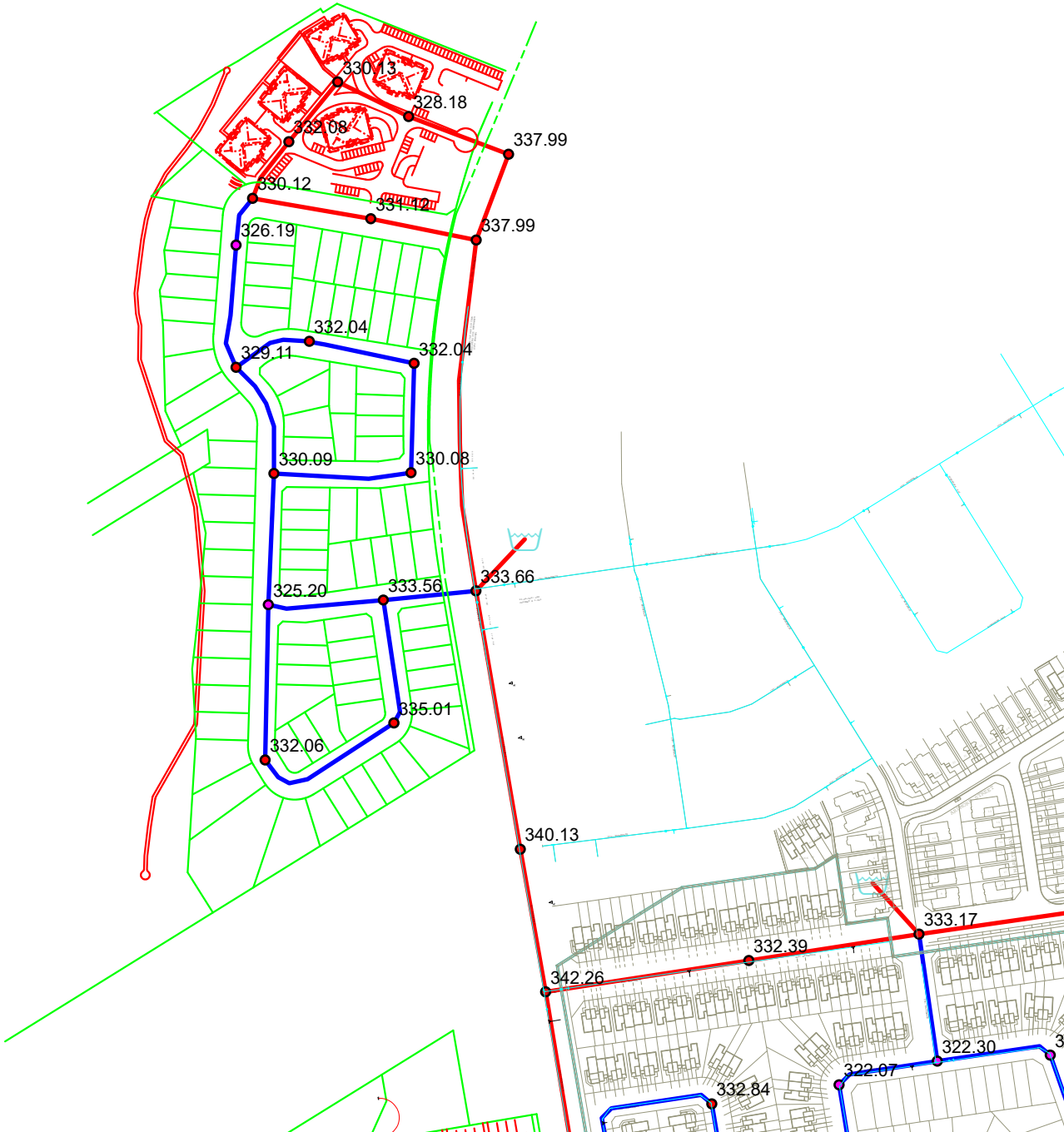
Basic Day Pressures
North Block



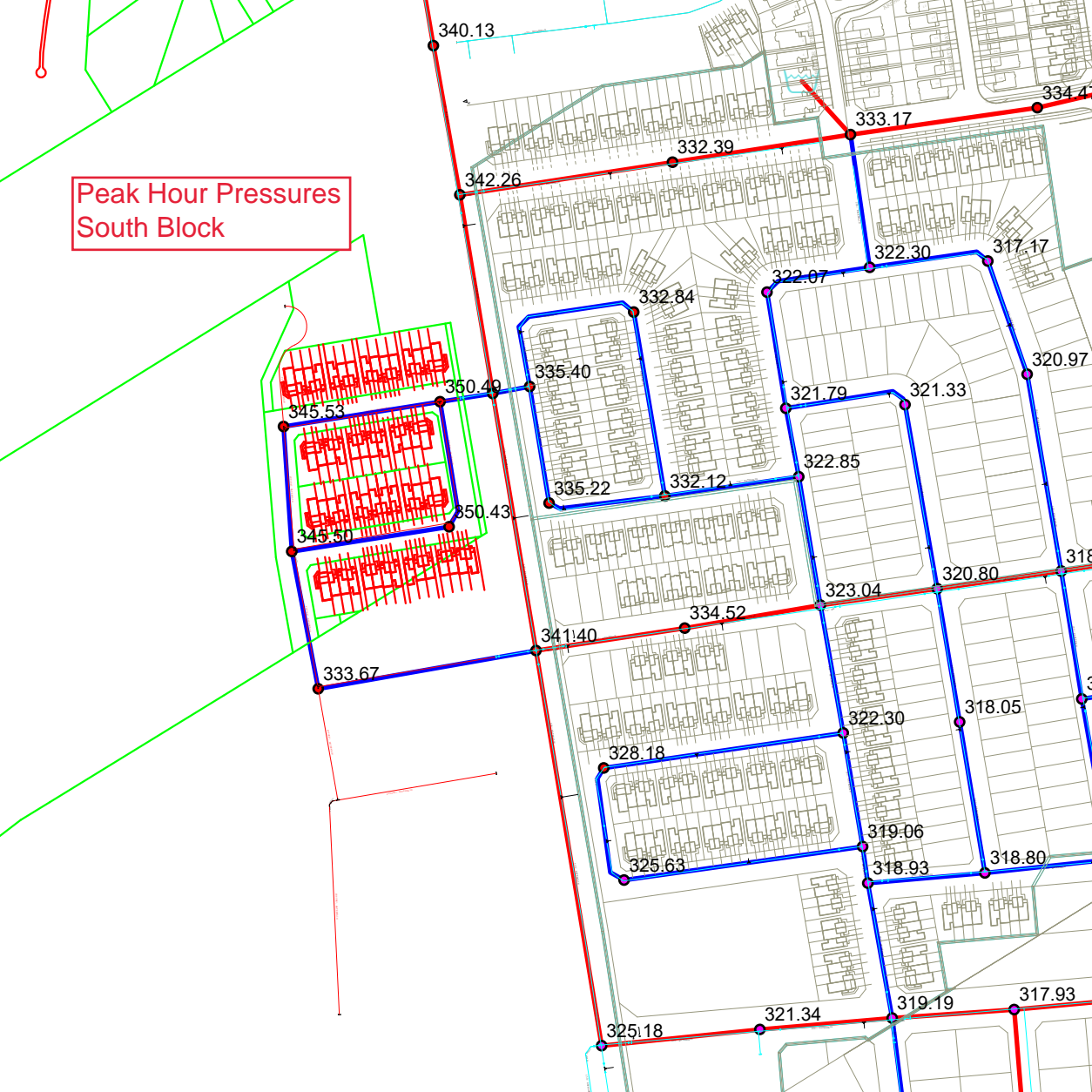
Basic Day Pressures
South Block



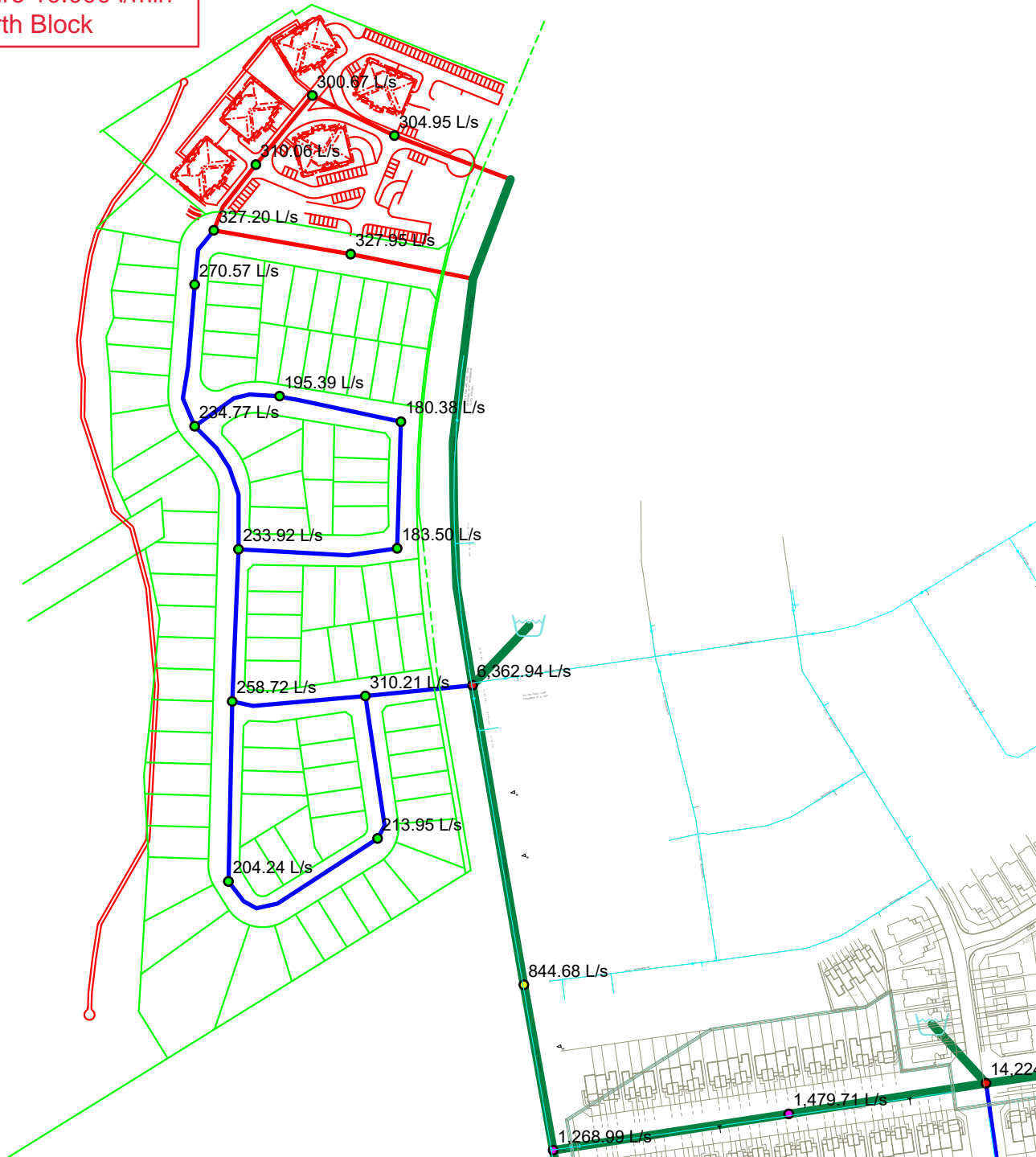
Peak Hour Pressures
North Block



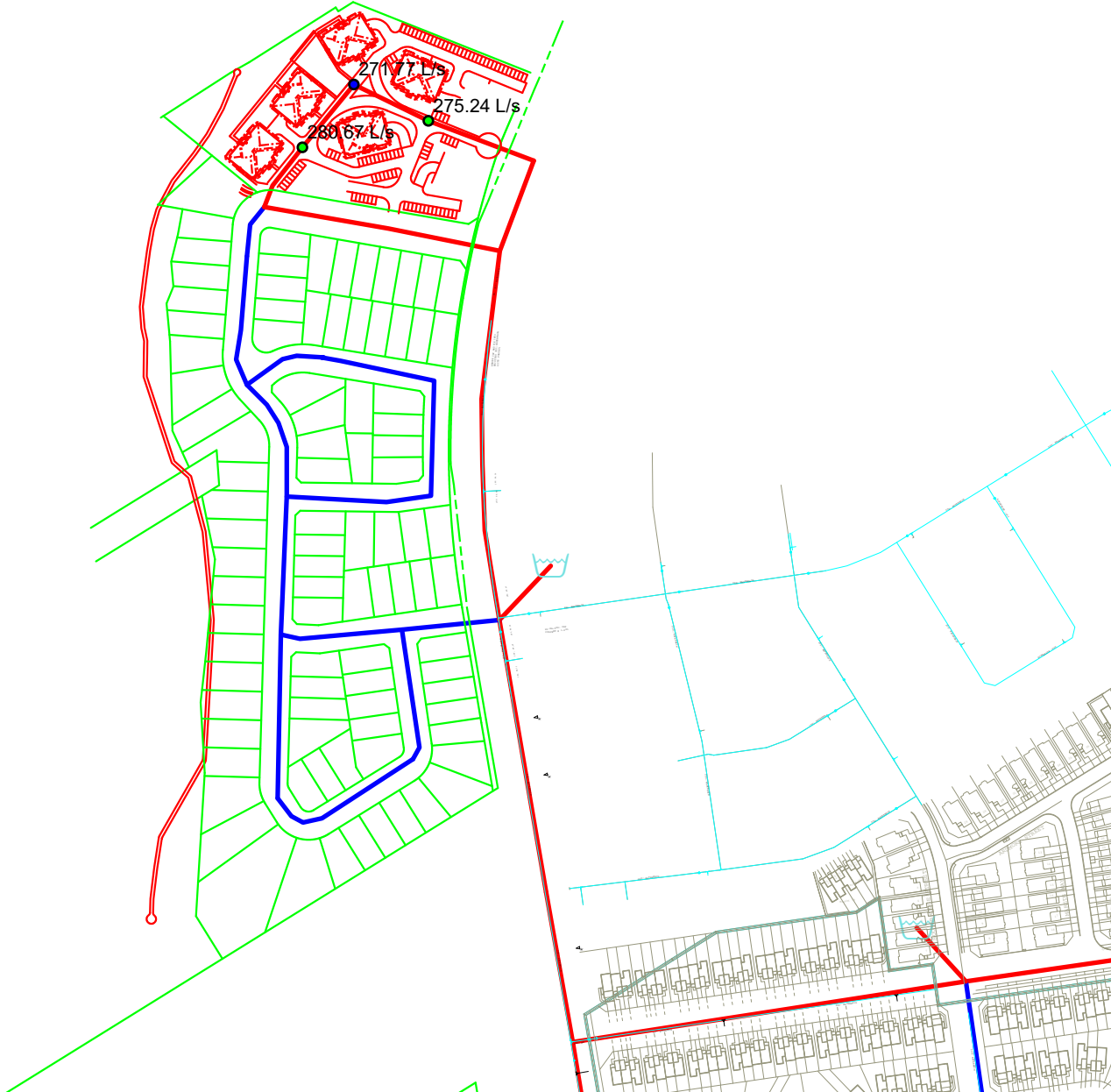
Peak Hour Pressures
South Block



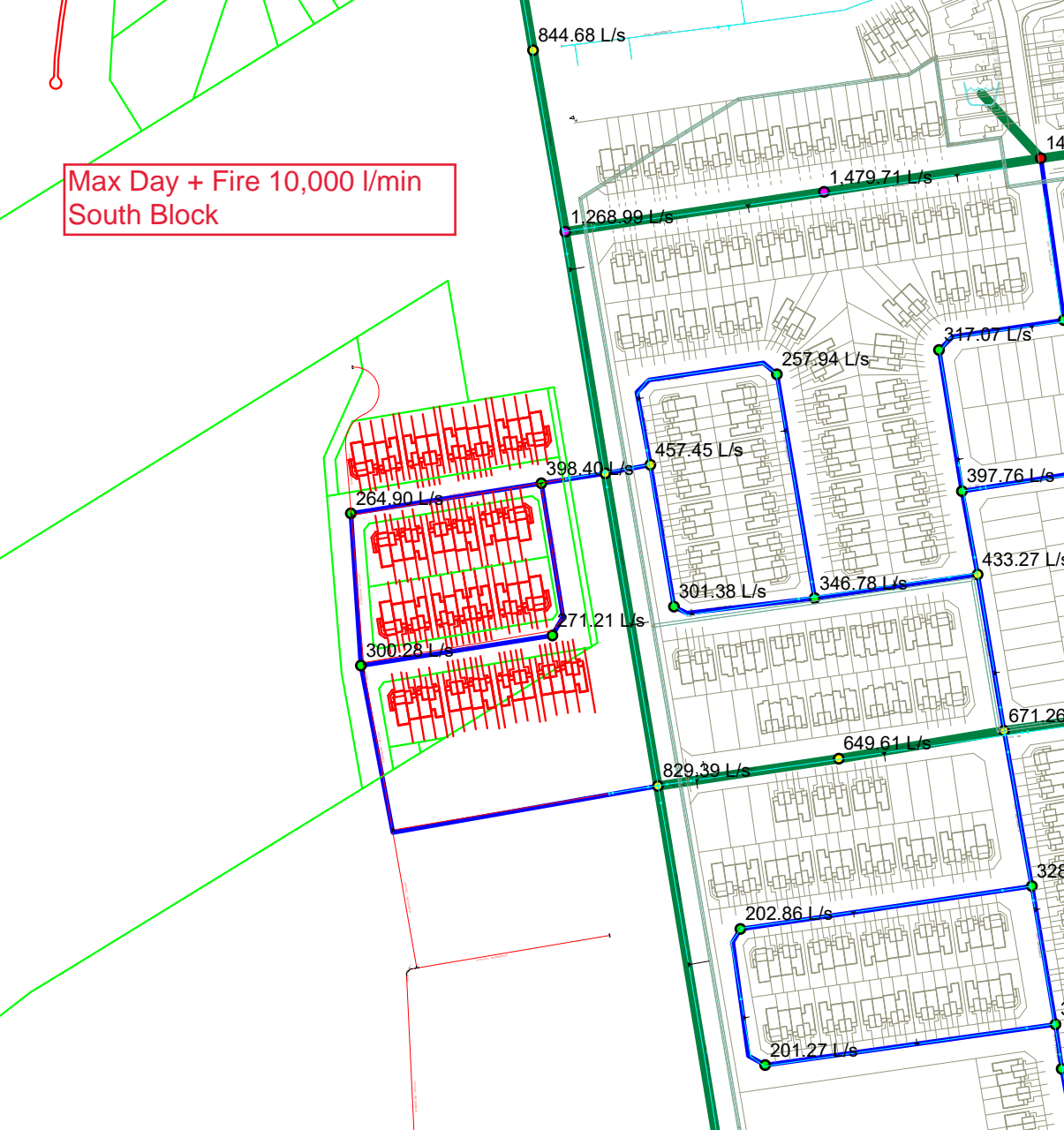
Max Day + Fire 10.000 l/min
Fireflows North Block



Max Day + Fire 15,000 l/min
North Block



Max Day + Fire 10,000 l/min
South Block



Basic Day (Max HGL) - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
101	<input type="checkbox"/>	D-08	0.34	93.00	147.79	536.86	0.00
102	<input type="checkbox"/>	D-10	0.40	93.45	147.78	532.43	0.00
103	<input type="checkbox"/>	D-12	0.43	93.85	147.78	528.50	0.00
104	<input type="checkbox"/>	D-14	0.31	95.00	147.78	517.23	0.00
105	<input type="checkbox"/>	D-16	0.27	92.90	147.78	537.83	0.00
106	<input type="checkbox"/>	D-18	0.16	92.80	147.79	538.81	0.00
107	<input type="checkbox"/>	D-20	0.05	92.90	147.78	537.83	0.00
108	<input type="checkbox"/>	D-22	0.19	92.90	147.78	537.81	0.00
109	<input type="checkbox"/>	D-24	0.18	92.90	147.78	537.82	0.00
110	<input type="checkbox"/>	D-26	1.70	95.00	147.78	517.23	0.00
111	<input type="checkbox"/>	J01	0.15	89.85	147.80	567.86	0.00
112	<input type="checkbox"/>	J02	0.17	90.00	147.80	566.38	0.00
113	<input type="checkbox"/>	J03	0.11	90.70	147.80	559.53	0.00
114	<input type="checkbox"/>	J04	0.11	90.20	147.80	564.42	0.00
115	<input type="checkbox"/>	J05	0.10	90.20	147.80	564.42	0.00
116	<input type="checkbox"/>	J06	0.07	90.00	147.80	566.38	0.00
117	<input type="checkbox"/>	J07	0.07	90.00	147.80	566.38	0.00
118	<input type="checkbox"/>	J08	0.12	90.30	147.80	563.45	0.00
119	<input type="checkbox"/>	J09	0.10	90.60	147.80	560.51	0.00
120	<input type="checkbox"/>	J10	0.03	90.20	147.80	564.43	0.00
121	<input type="checkbox"/>	J11	0.26	90.00	147.80	566.39	0.00
122	<input type="checkbox"/>	J12	0.09	90.20	147.80	564.43	0.00
123	<input type="checkbox"/>	J13	0.09	90.40	147.80	562.47	0.00
124	<input type="checkbox"/>	J14	0.08	90.10	147.80	565.41	0.00
125	<input type="checkbox"/>	J15	0.00	89.70	147.79	569.26	0.00
126	<input type="checkbox"/>	J16	0.60	89.70	147.80	569.32	0.00
127	<input type="checkbox"/>	J17	0.13	88.50	147.79	581.02	0.00
128	<input type="checkbox"/>	J19	0.16	88.00	147.79	585.92	0.00
129	<input type="checkbox"/>	J21	0.13	88.50	147.79	581.02	0.00
130	<input type="checkbox"/>	J23	0.16	88.00	147.79	585.92	0.00
131	<input type="checkbox"/>	RR01	0.00	89.85	147.80	567.86	0.00
132	<input type="checkbox"/>	RR02	0.00	89.40	147.80	572.27	0.00
133	<input type="checkbox"/>	RR03	0.00	89.40	147.80	572.27	0.00
134	<input type="checkbox"/>	RR05	0.00	89.15	147.80	574.70	0.00
135	<input type="checkbox"/>	RR10	0.23	88.91	147.80	577.04	0.00
136	<input type="checkbox"/>	RR15	0.00	89.15	147.79	574.66	0.00
137	<input type="checkbox"/>	RR25	0.08	88.90	147.79	577.09	0.00
138	<input type="checkbox"/>	RR30	0.00	90.50	147.79	561.38	0.00
139	<input type="checkbox"/>	SP-01	0.00	92.55	147.80	541.41	0.00
140	<input type="checkbox"/>	SP-02	0.07	93.20	147.79	534.95	0.00
141	<input type="checkbox"/>	SP-03	0.09	93.00	147.79	536.86	0.00
142	<input type="checkbox"/>	SP-04	1.70	90.87	147.79	557.73	0.00

Peak Hour - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
101	<input type="checkbox"/>	D-08	1.86	93.00	123.81	301.89	0.00
102	<input type="checkbox"/>	D-10	2.23	93.45	123.80	297.36	0.00
103	<input type="checkbox"/>	D-12	2.35	93.85	123.79	293.36	0.00
104	<input type="checkbox"/>	D-14	1.68	95.00	123.79	282.09	0.00
105	<input type="checkbox"/>	D-16	1.50	92.90	123.80	302.78	0.00
106	<input type="checkbox"/>	D-18	0.90	92.80	123.81	303.83	0.00
107	<input type="checkbox"/>	D-20	0.30	92.90	123.80	302.78	0.00
108	<input type="checkbox"/>	D-22	1.02	92.90	123.79	302.68	0.00
109	<input type="checkbox"/>	D-24	0.96	92.90	123.80	302.75	0.00
110	<input type="checkbox"/>	D-26	1.70	95.00	123.79	282.09	0.00
111	<input type="checkbox"/>	J01	0.83	89.85	123.89	333.56	0.00
112	<input type="checkbox"/>	J02	1.14	90.00	123.89	332.06	0.00
113	<input type="checkbox"/>	J03	0.61	90.70	123.89	325.20	0.00
114	<input type="checkbox"/>	J04	0.61	90.20	123.89	330.09	0.00
115	<input type="checkbox"/>	J05	0.53	90.20	123.88	330.08	0.00
116	<input type="checkbox"/>	J06	0.38	90.00	123.88	332.04	0.00
117	<input type="checkbox"/>	J07	0.38	90.00	123.88	332.04	0.00
118	<input type="checkbox"/>	J08	0.68	90.30	123.89	329.11	0.00
119	<input type="checkbox"/>	J09	0.53	90.60	123.89	326.19	0.00
120	<input type="checkbox"/>	J10	0.15	90.20	123.89	330.12	0.00
121	<input type="checkbox"/>	J11	1.44	90.00	123.89	332.08	0.00
122	<input type="checkbox"/>	J12	0.48	90.20	123.89	330.13	0.00
123	<input type="checkbox"/>	J13	0.48	90.40	123.89	328.18	0.00
124	<input type="checkbox"/>	J14	0.45	90.10	123.89	331.12	0.00
125	<input type="checkbox"/>	J15	0.00	89.70	123.75	333.67	0.00
126	<input type="checkbox"/>	J16	0.61	89.70	123.89	335.01	0.00
127	<input type="checkbox"/>	J17	0.72	88.50	123.76	345.50	0.00
128	<input type="checkbox"/>	J19	0.90	88.00	123.76	350.43	0.00
129	<input type="checkbox"/>	J21	0.72	88.50	123.76	345.53	0.00
130	<input type="checkbox"/>	J23	0.90	88.00	123.77	350.49	0.00
131	<input type="checkbox"/>	RR01	0.00	89.85	123.90	333.66	0.00
132	<input type="checkbox"/>	RR02	0.00	89.40	123.89	337.99	0.00
133	<input type="checkbox"/>	RR03	0.00	89.40	123.89	337.99	0.00
134	<input type="checkbox"/>	RR05	0.00	89.15	123.86	340.13	0.00
135	<input type="checkbox"/>	RR10	1.26	88.91	123.84	342.26	0.00
136	<input type="checkbox"/>	RR15	0.00	89.15	123.78	339.33	0.00
137	<input type="checkbox"/>	RR25	0.45	88.90	123.74	341.40	0.00
138	<input type="checkbox"/>	RR30	0.00	90.50	123.68	325.18	0.00
139	<input type="checkbox"/>	SP-01	0.00	92.55	124.00	308.18	0.00
140	<input type="checkbox"/>	SP-02	0.36	93.20	123.88	300.61	0.00
141	<input type="checkbox"/>	SP-03	0.48	93.00	123.82	301.98	0.00
142	<input type="checkbox"/>	SP-04	1.70	90.87	123.81	322.82	0.00

Max Day + Fire - Fireflow Design Report

		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
85	<input type="checkbox"/>	C1-52	166.86	265.81	C1-52	139.96	105.58	265.81	139.96	139.96
86	<input type="checkbox"/>	C1-54	166.86	268.63	C1-54	139.96	105.43	268.63	139.96	139.96
87	<input type="checkbox"/>	C1-56	166.79	249.39	C1-56	139.96	105.73	249.39	139.96	139.96
88	<input type="checkbox"/>	C1-60	166.97	263.81	C1-60	139.96	105.28	263.81	139.96	139.96
89	<input type="checkbox"/>	C1-62	166.82	278.78	C1-62	139.96	105.78	278.78	139.96	139.96
90	<input type="checkbox"/>	C1-64	166.79	252.90	C1-64	139.96	105.93	252.90	139.96	139.96
91	<input type="checkbox"/>	C1-66	166.82	221.78	C1-66	139.96	105.83	221.78	139.96	139.98
92	<input type="checkbox"/>	C1-68	166.75	231.65	C1-68	139.96	106.03	231.65	139.96	139.99
93	<input type="checkbox"/>	C1-70	166.71	197.54	C1-70	139.96	106.13	197.54	139.96	139.97
94	<input type="checkbox"/>	C1-72	166.77	207.76	C1-72	139.96	106.28	207.76	139.96	139.97
95	<input type="checkbox"/>	C1-74	166.84	214.80	C1-74	139.96	106.18	214.80	139.96	139.97
96	<input type="checkbox"/>	C1-76	166.81	224.43	C1-76	139.96	105.98	224.43	139.96	139.98
97	<input type="checkbox"/>	C1-78	166.78	213.46	C1-78	139.96	106.08	213.46	139.96	139.97
98	<input type="checkbox"/>	D-02	166.99	401.65	D-14	124.12	107.67	374.85	139.96	156.40
99	<input type="checkbox"/>	D-04	166.98	311.53	D-14	133.58	108.63	302.67	139.96	146.36
100	<input type="checkbox"/>	D-06	166.85	253.39	D-14	135.06	108.78	247.80	139.96	144.87
101	<input type="checkbox"/>	D-08	167.01	266.46	D-08	139.96	107.28	266.46	139.96	139.96
102	<input type="checkbox"/>	D-10	167.07	218.65	D-10	139.96	107.73	218.65	139.96	139.96
103	<input type="checkbox"/>	D-12	167.10	217.55	D-12	139.96	108.13	217.55	139.96	139.96
104	<input type="checkbox"/>	D-14	166.98	196.50	D-14	139.96	109.28	196.50	139.96	139.96
105	<input type="checkbox"/>	D-16	166.94	225.03	D-20	139.96	107.18	225.03	139.96	139.96
106	<input type="checkbox"/>	D-18	166.83	262.75	D-18	139.96	107.08	262.75	139.96	139.97
107	<input type="checkbox"/>	D-20	166.72	144.10	D-20	139.96	107.18	144.10	139.96	139.96
108	<input type="checkbox"/>	D-22	166.86	251.12	D-14	125.02	107.76	235.24	139.96	155.56
109	<input type="checkbox"/>	D-24	166.85	231.05	D-24	139.96	107.18	231.05	139.96	139.96
110	<input type="checkbox"/>	J01	167.05	310.21	J01	139.96	104.13	310.21	139.96	139.96
111	<input type="checkbox"/>	J02	167.19	204.24	J02	139.96	104.28	204.24	139.96	139.96
112	<input type="checkbox"/>	J03	166.95	258.72	J03	139.96	104.98	258.72	139.96	139.96
113	<input type="checkbox"/>	J04	166.95	233.92	J04	139.96	104.48	233.92	139.96	139.96
114	<input type="checkbox"/>	J05	166.91	183.50	J05	139.96	104.48	183.50	139.96	139.96
115	<input type="checkbox"/>	J06	166.84	180.38	J06	139.96	104.28	180.38	139.96	139.96
116	<input type="checkbox"/>	J07	166.84	195.39	J07	139.96	104.28	195.39	139.96	139.96
117	<input type="checkbox"/>	J08	166.98	234.77	J08	139.96	104.58	234.77	139.96	139.96
118	<input type="checkbox"/>	J09	166.91	270.57	J09	139.96	104.88	270.57	139.96	139.96
119	<input type="checkbox"/>	J10	166.74	327.20	J10	139.96	104.48	327.20	139.96	139.97
120	<input type="checkbox"/>	J11	250.66	310.06	J11	139.96	104.28	310.06	139.96	139.96
121	<input type="checkbox"/>	J12	250.22	300.67	J12	139.96	104.48	300.67	139.96	139.96
122	<input type="checkbox"/>	J13	250.22	304.95	J13	139.96	104.68	304.95	139.96	139.96
123	<input type="checkbox"/>	J14	166.88	327.95	J14	139.96	104.38	327.95	139.96	139.96
124	<input type="checkbox"/>	J16	166.95	213.95	J16	139.96	103.98	213.95	139.96	139.96
125	<input type="checkbox"/>	J17	167.00	300.28	J17	139.96	102.78	300.28	139.96	139.96
126	<input type="checkbox"/>	J19	167.08	271.21	J19	139.96	102.28	271.21	139.96	139.96

Max Day + Fire - Fireflow Design Report

		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
127	<input type="checkbox"/>	J21	167.00	264.90	J21	139.96	102.78	264.90	139.96	139.96
128	<input type="checkbox"/>	J23	167.08	398.40	J23	139.96	102.28	398.40	139.96	139.96
129	<input type="checkbox"/>	RR01	166.67	6,362.94	J03	131.75	104.15	6,178.49	139.96	148.32
130	<input type="checkbox"/>	RR05	166.67	844.68	RR05	139.96	103.43	844.69	139.96	139.96
131	<input type="checkbox"/>	RR10	166.90	1,268.99	RR10	139.97	103.19	1,269.02	139.96	139.96
132	<input type="checkbox"/>	RR15	166.67	964.93	C1-72	133.33	105.61	941.42	139.96	147.57
133	<input type="checkbox"/>	RR25	166.75	829.39	C1-72	122.27	104.48	778.37	139.96	159.11
134	<input type="checkbox"/>	RR30	166.67	592.61	C1-72	135.87	105.87	583.56	139.96	144.36
135	<input type="checkbox"/>	SP-02	166.74	567.08	SP-02	139.96	107.48	567.08	139.96	139.96
136	<input type="checkbox"/>	SP-03	166.76	509.96	D-14	121.20	107.37	470.30	139.96	158.86

Max Day + Fire 15,000 l/min - Fireflow Design Report

		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
1	<input type="checkbox"/>	1A-97	251.72	481.71	1A-97	139.96	105.15	481.71	139.96	139.97
2	<input type="checkbox"/>	1B-30	250.12	484.92	1B-30	139.96	105.68	484.93	139.96	139.96
3	<input type="checkbox"/>	2-05	250.11	497.39	2-05	139.96	106.33	497.40	139.96	139.97
4	<input type="checkbox"/>	2-100	252.29	634.14	2-100	139.96	105.08	634.15	139.96	139.98
5	<input type="checkbox"/>	2-110	253.57	518.03	2-110	139.96	105.87	518.03	139.96	139.98
6	<input type="checkbox"/>	J11	250.66	280.67	J11	139.96	104.28	280.67	139.96	139.96
7	<input type="checkbox"/>	J12	250.22	271.77	J12	139.96	104.48	271.77	139.96	139.96
8	<input type="checkbox"/>	J13	250.22	275.24	J13	139.96	104.68	275.24	139.96	139.96
9	<input type="checkbox"/>	RR30	250.00	516.20	RR30	139.96	104.78	516.21	139.96	139.97

Peak Hour - Pipe Report

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count	Water Age (hrs)
141	<input type="checkbox"/>	311	D-24	D-16	105.66	204.00	110.00	-1.66	0.05	0.00	0.03	Open	0	0.00
142	<input type="checkbox"/>	313	D-24	D-04	78.93	204.00	110.00	0.70	0.02	0.00	0.01	Open	0	0.00
143	<input type="checkbox"/>	327	D-26	D-22	133.63	297.00	120.00	-2.80	0.04	0.00	0.01	Open	0	0.00
144	<input type="checkbox"/>	P13	J01	J03	77.80	204.00	110.00	1.91	0.06	0.00	0.04	Open	0	0.00
145	<input type="checkbox"/>	P15	J01	J16	84.58	204.00	110.00	1.50	0.05	0.00	0.02	Open	0	0.00
146	<input type="checkbox"/>	P17	J02	J03	104.57	204.00	110.00	-0.25	0.01	0.00	0.00	Open	0	0.00
147	<input type="checkbox"/>	P19	J03	J04	88.45	204.00	110.00	1.05	0.03	0.00	0.01	Open	0	0.00
148	<input type="checkbox"/>	P41	J04	J05	92.46	204.00	110.00	0.59	0.02	0.00	0.00	Open	0	0.00
149	<input type="checkbox"/>	P21	J04	J08	79.74	204.00	110.00	-0.15	0.00	0.00	0.00	Open	0	0.00
150	<input type="checkbox"/>	P43	J05	J06	73.58	204.00	110.00	0.06	0.00	0.00	0.00	Open	0	0.00
151	<input type="checkbox"/>	P45	J06	J07	75.07	204.00	110.00	-0.32	0.01	0.00	0.00	Open	0	0.00
152	<input type="checkbox"/>	P47	J07	J08	54.79	204.00	110.00	-0.70	0.02	0.00	0.01	Open	0	0.00
153	<input type="checkbox"/>	P23	J08	J09	84.07	204.00	110.00	-1.53	0.05	0.00	0.02	Open	0	0.00
154	<input type="checkbox"/>	P25	J10	J09	34.85	204.00	110.00	2.06	0.06	0.00	0.04	Open	0	0.00
155	<input type="checkbox"/>	P27	J10	J14	80.56	250.00	110.00	-2.18	0.04	0.00	0.02	Open	0	0.00
156	<input type="checkbox"/>	P33	J11	J12	51.90	250.00	110.00	-1.47	0.03	0.00	0.01	Open	0	0.00
157	<input type="checkbox"/>	P31	J11	J10	45.66	250.00	110.00	0.03	0.00	0.00	0.00	Open	0	0.00
158	<input type="checkbox"/>	P35	J12	J13	53.01	250.00	110.00	-1.95	0.04	0.00	0.01	Open	0	0.00
159	<input type="checkbox"/>	P37	J13	RR03	71.84	250.00	110.00	-2.43	0.05	0.00	0.02	Open	0	0.00
160	<input type="checkbox"/>	P29	J14	RR02	72.33	250.00	110.00	-2.63	0.05	0.00	0.03	Open	0	0.00
161	<input type="checkbox"/>	P57	J15	J17	89.98	204.00	110.00	-2.90	0.09	0.01	0.08	Open	0	0.00
162	<input type="checkbox"/>	P69	J16	J02	104.73	204.00	110.00	0.89	0.03	0.00	0.01	Open	0	0.00
163	<input type="checkbox"/>	P65	J17	J19	102.31	204.00	110.00	-1.79	0.05	0.00	0.03	Open	0	0.00
164	<input type="checkbox"/>	P59	J17	J21	80.61	204.00	110.00	-1.83	0.06	0.00	0.03	Open	0	0.00
165	<input type="checkbox"/>	P63	J19	J23	82.81	204.00	110.00	-2.69	0.08	0.01	0.07	Open	0	0.00
166	<input type="checkbox"/>	P61	J21	J23	101.79	204.00	110.00	-2.55	0.08	0.01	0.06	Open	0	0.00
167	<input type="checkbox"/>	P11	RR01	J01	62.52	204.00	110.00	4.24	0.13	0.01	0.16	Open	0	0.00
168	<input type="checkbox"/>	P51	RR02	RR01	237.65	297.00	120.00	-5.06	0.07	0.01	0.03	Open	0	0.00
169	<input type="checkbox"/>	P49	RR03	RR02	61.62	297.00	120.00	-2.43	0.04	0.00	0.01	Open	0	0.00
170	<input type="checkbox"/>	69	RR05	RR01	176.52	297.00	120.00	-14.75	0.21	0.04	0.23	Open	0	0.00
171	<input type="checkbox"/>	13	RR10	RR15	129.52	393.00	120.00	44.97	0.37	0.06	0.46	Open	0	0.00
172	<input type="checkbox"/>	19	RR10	1A-05	138.19	393.00	120.00	-31.48	0.26	0.03	0.24	Open	0	0.00
173	<input type="checkbox"/>	11	RR10	RR05	97.51	297.00	120.00	-14.75	0.21	0.02	0.23	Open	0	0.00
174	<input type="checkbox"/>	15	RR15	RR25	167.66	393.00	120.00	31.43	0.26	0.04	0.23	Open	0	0.00
175	<input type="checkbox"/>	P67	RR15	J23	34.23	204.00	110.00	6.14	0.19	0.01	0.33	Open	0	0.00

APPENDIX C

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

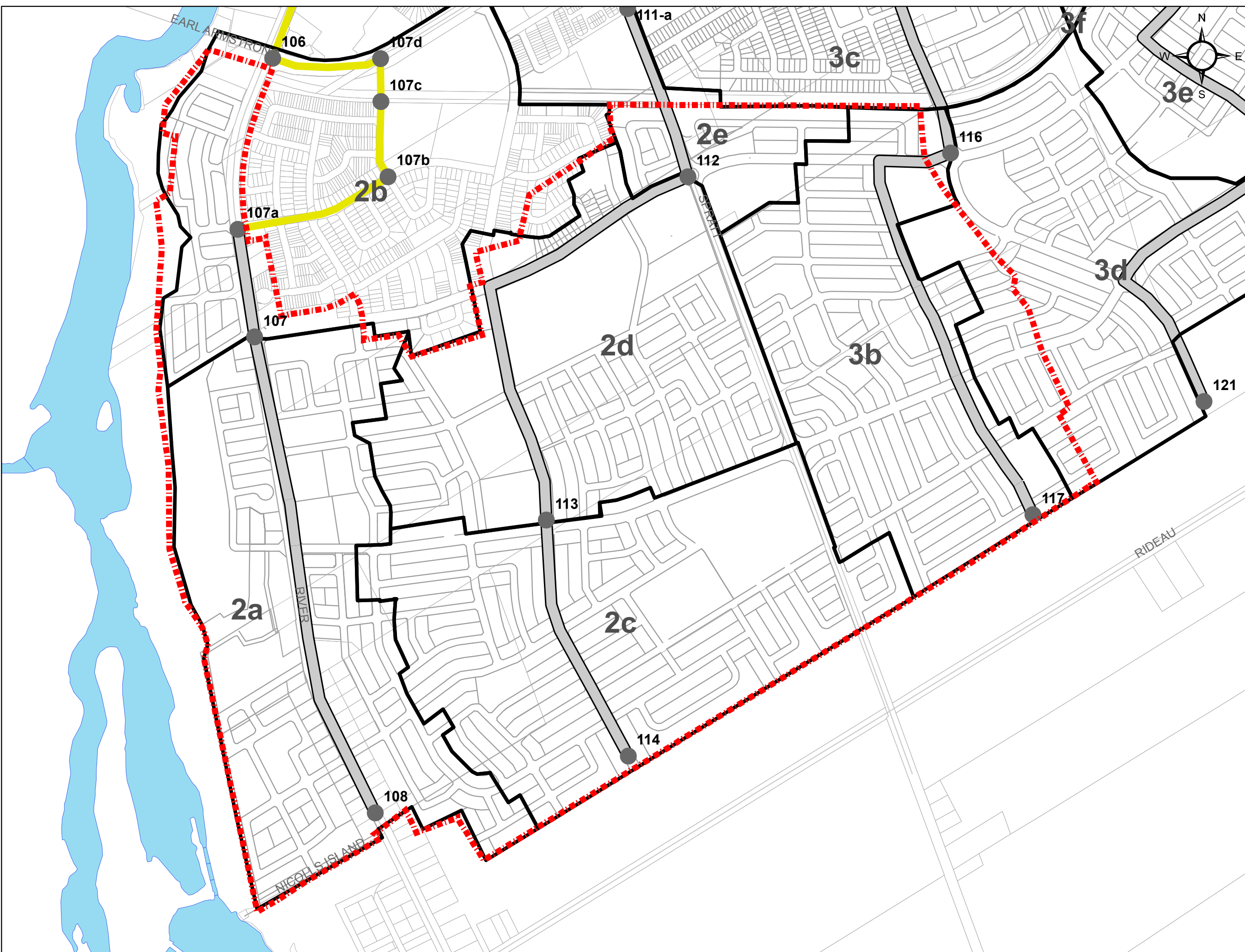
Title:
SANITARY DRAINAGE PLAN

Project No.: 163401101
 Drawing No.: SAN-1
 Scale: 0 125 250 500 Meters
 Sheet: 6 of 7
 Revision: 0



Legend

-  Rideau River Study Area
-  Recommended 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:

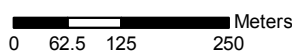
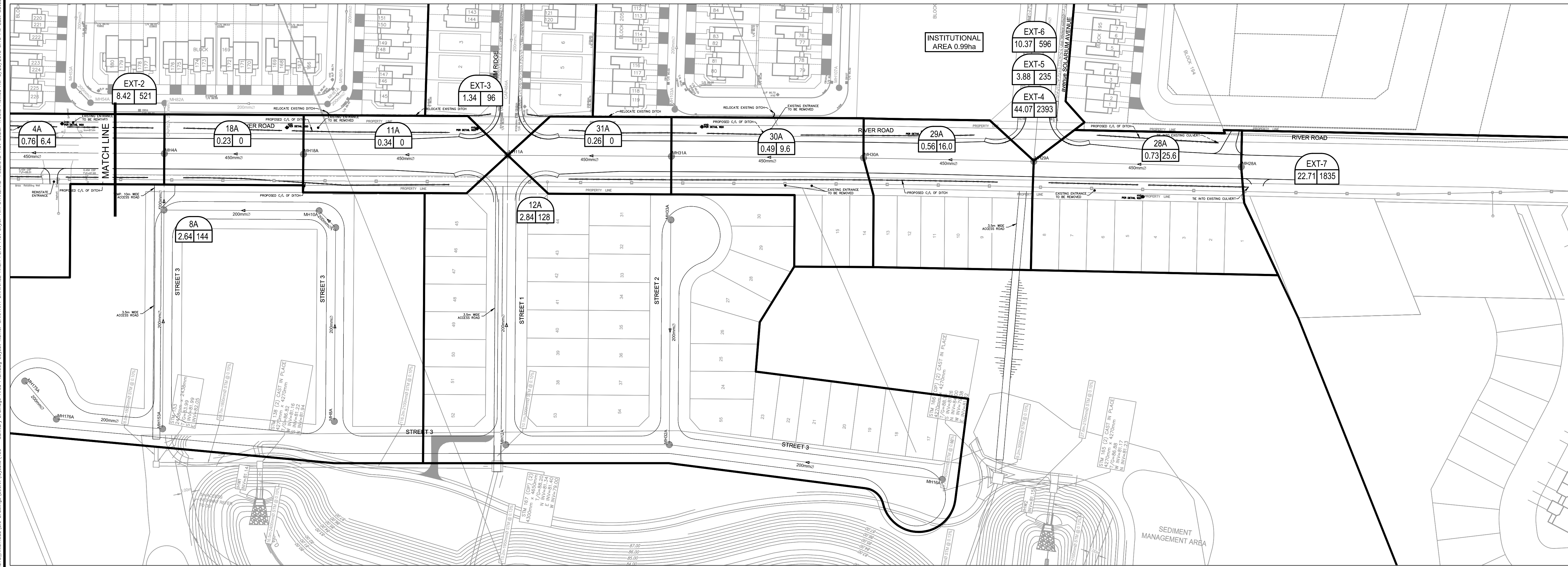
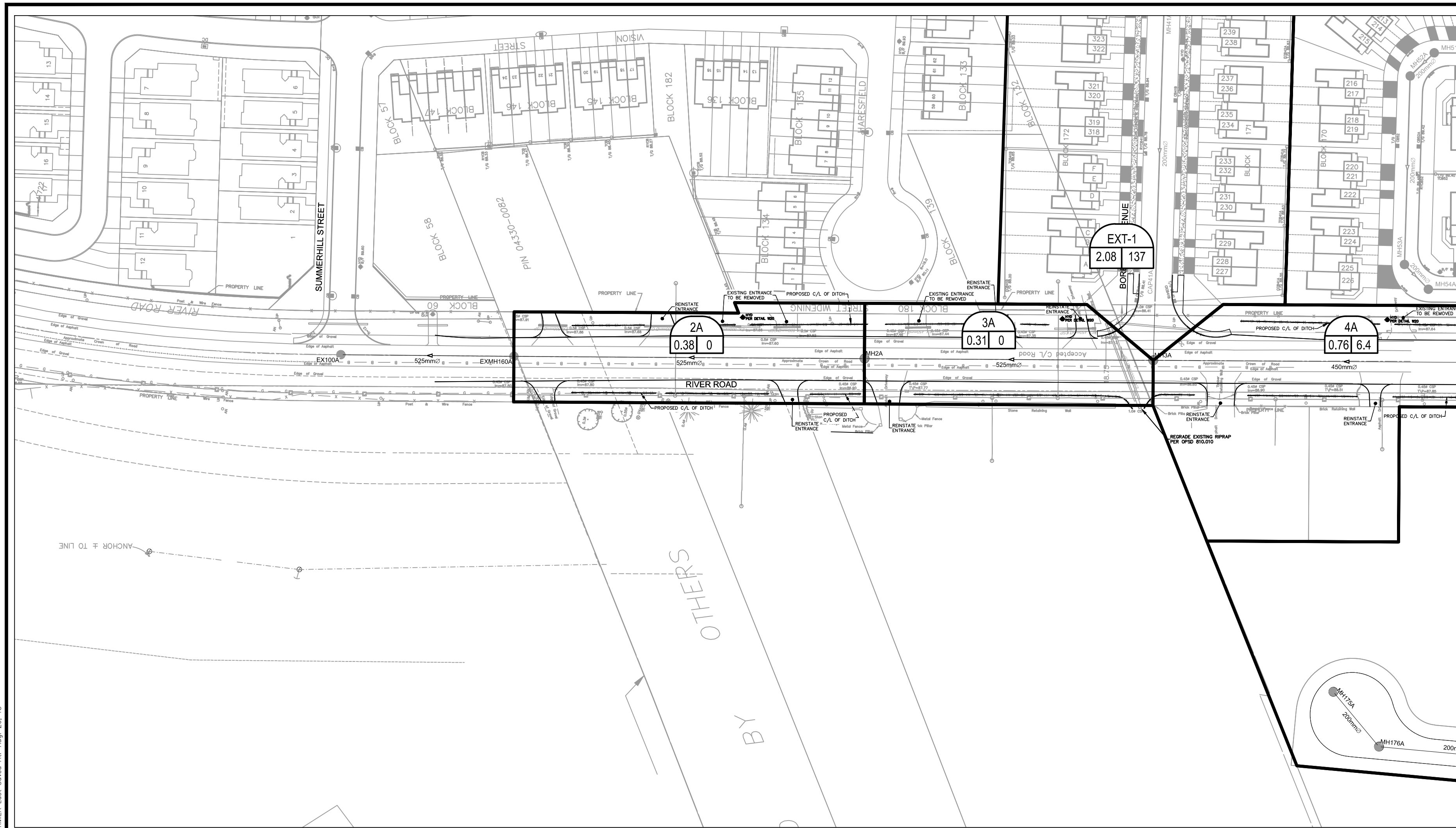


Figure No.:

4-2



NOTES:

1. ALL CULVERTS TO BE GALVANIZED CSP 68x13 CORR. x2.8mm THICK CLASS "B" BEDDING. ALL JOINTS TO BE WRAPPED WITH NON-WOVEN GEOTEXTILE, MINIMUM 1.0m WIDTH.

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5	REVISED AS PER CITY COMMENTS	LE	20-08-18
4	PRELIM. ISSUED TO CONTRACTOR	LE	16-08-18
3	ISSUED FOR TENDER	LE	06-07-18
2	REVISED AS PER CITY COMMENTS	LE	29-06-18
1	ISSUED FOR CITY REVIEW	LE	27-04-18

IBI IBI GROUP
 400 - 333 Preston Street
 Ottawa ON K1S 5N4 Canada
 tel 613 225 1311 fax 613 225 9868
 ibigroup.com

Project Title
RIVER ROAD RECONSTRUCTION

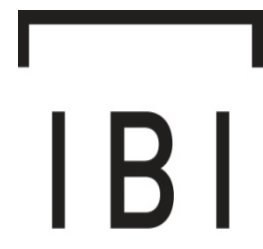
Professional Engineer
 C. M. ERWIN
 13375508
 2008/18
 PROVINCE OF ONTARIO

Drawing Title
SANITARY DRAINAGE AREA PLAN

Scale
 1:1000

Design	LE	Date	APR 2018
Drawn	CC	Checked	TB
Project No.	114373	Drawing No.	400

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IBI GROUP
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Ottawa, Ontario K1S 5N4 Canada
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SANITARY SEWER DESIGN SHEET

River Road
City of Ottawa
Riverside South Development Corporation

STREET	LOCATION			RESIDENTIAL										ICI AREAS						INFILTRATION ALLOWANCE			TOTAL FLOW		PROPOSED SEWER DESIGN								
	AREA ID	FROM MH	TO MH	AREA w/ Units (Ha)	UNIT TYPES				AREA w/o Units (Ha)	POPULATION		PEAK FACTOR	CORR. FACTOR	PEAK FLOW (L/s)	AREA (Ha)			PEAK FLOW (L/s)	AREA (Ha)		FLOW		IND	CUM	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (m/s)	AVAILABLE CAPACITY			
					SF	SD	TH	APT		IND	CUM				INSTITUTIONAL	COMMERCIAL	INDUSTRIAL		IND	CUM	(L/s)	(L/s)								L/s	(%)		
River Road	EXT - 7			22.71				1,835.0	1,835.0	3.61	0.80	17.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.69										
	28A	MH28A	MH29A	0.73	8			25.6	1,860.6	3.61	0.80	17.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.15	103.03	101.51	450	0.12	0.628	77.89	75.59%			
Solarium Avenue	EXT - 4, 5, 6	STUB	MH29A	58.32	652		474		3,224.0	3,224.0	3.42	0.80	28.55	0.99	0.99	0.00	0.00	0.00	0.00	0.48	59.31	59.31	19.57	0.00	0.00	48.60	81.80	25.00	375	0.20	0.717	33.20	40.58%
River Road	29A	MH29A	MH30A	0.56	5			16.0	5,100.6	3.24	0.80	42.80	0.00	0.99	0.00	0.00	0.00	0.00	0.48	0.56	83.31	27.49	0.00	0.00	70.78	103.03	83.34	450	0.12	0.628	32.26	31.31%	
	30A	MH30A	MH31A	0.49	3			9.6	5,110.2	3.24	0.80	42.88	0.00	0.99	0.00	0.00	0.00	0.00	0.48	0.49	83.80	27.65	0.00	0.00	71.01	103.03	93.99	450	0.12	0.628	32.02	31.08%	
River Road	31A	MH31A	MH11A	0.25				0.0	5,110.2	3.24	0.80	42.88	0.00	0.99	0.00	0.00	0.00	0.00	0.48	0.25	84.05	27.74	0.00	0.00	71.09	103.03	80.00	450	0.12	0.628	31.94	31.00%	
Atrium Ridge	EXT - 3	STUB	MH11A	1.34			40		96.0	96.0	4.00	0.80	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.34	1.34	0.44	0.00	0.00	1.44	41.91	25.04	200	1.50	1.292	40.47	96.57%	
Street No. 1 West	12A	STUB	MH11A	2.84	40				128.0	128.0	4.00	0.80	1.33	0.00	0.00	0.00	0.00	0.00	0.00	2.84	2.84	0.94	0.00	0.00	2.26	24.19	22.70	200	0.50	0.746	21.93	90.64%	
River Road	11A	MH11A	MH18A	0.34				0.0	5,334.2	3.22	0.80	44.51	0.00	0.99	0.00	0.00	0.00	0.00	0.48	0.34	88.57	29.23	0.00	0.00	74.22	103.03	100.00	450	0.12	0.628	28.81	27.96%	
	18A	MH18A	MH4A	0.23				0.0	5,334.2	3.22	0.80	44.51	0.00	0.99	0.00	0.00	0.00	0.00	0.48	0.23	88.80	29.30	0.00	0.00	74.30	103.03	68.01	450	0.12	0.628	28.73	27.89%	
Capricorn Circle	EXT - 2	STUB	MH4A	8.42	69		125		520.8	520.8	3.97	0.80	5.35	0.00	0.00	0.00	0.00	0.00	0.00	8.42	8.42	2.78	0.00	0.00	8.13	20.24	18.89	200	0.35	0.624	12.11	59.83%	
Street 3 West	8A	STUB	MH4A	2.64			60		144.0	144.0	4.00	0.80	1.49	0.00	0.00	0.00	0.00	0.00	0.00	2.64	2.64	0.87	0.00	0.00	2.36	24.19	17.13	200	0.50	0.746	21.83	90.23%	
River Road	4A	MH4A	MH3A	0.76	2			6.4	6,005.4	3.17	0.80	49.36	0.00	0.99	0.00	0.00	0.00	0.00	0.48	0.76	100.62	33.20	0.00	0.00	83.05	103.03	129.23	450	0.12	0.628	19.99	19.40%	
Borbridge Avenue	EXT - 1	STUB	MH3A	2.08			57		136.8	136.8	4.00	0.80	1.42	0.00	0.00	0.00	0.00	0.00	0.00	2.08	2.08	0.69	0.00	0.00	2.11	19.36	20.00	200	0.32	0.597	17.25	89.12%	
River Road	3A	MH3A	MH2A	0.31				0.0	6,142.2	3.16	0.80	50.34	0.00	0.99	0.00	0.00	0.00	0.00	0.48	0.31	103.01	33.99	0.00	0.00	84.81	155.42	97.77	525	0.12	0.696	70.61	45.43%	
	2A	MH2A	EX. MH160A	0.38				0.0	6,142.2	3.16	0.80	50.34	0.00	0.99	0.00	0.00	0.00	0.00	0.48	0.38	103.39	34.12	0.00	0.00	84.94	155.42	118.68	525	0.12	0.696	70.48	45.35%	
		EX MH106A	EX MH 100A	0.19				0.0	6,142.2	3.16	0.80	50.34	0.00	0.99	0.00	0.00	0.00	0.00	0.48	0.19	103.58	34.18	0.00	0.00	85.00	141.88	58.85	525	0.10	0.635	56.88	40.09%	

Design Parameters: Residential SF 3.2 p/p/u TH/SD 2.4 p/p/u APT 1.9 p/p/u Other 81 p/p/Ha	ICI Areas INST 28,000 L/Ha/day COM 28,000 L/Ha/day IND 35,000 L/Ha/day	Peak Factor 1.5 1.5 MOE Chart	Notes: 1. Mannings coefficient (n) = 0.013 2. Demand (per capita): 280 L/day 3. Infiltration allowance: 0.33 L/s/Ha 4. Residential Peaking Factor: Harmon Formula = $1 + (14 / (4 + P^{0.5}))$ where P = population in thousands Correction Factor = 0.8	Designed: LME	Checked:	Dwg. Reference: 114373-501	No. 1. 2. 3.	Revision Submission No. 1 Submission No. 2 Submission No. 3	Date 27/04/2018 3/07/2018 20/08/2018	File Reference: 114373.5.7.1	Date: 2018-08-20	Sheet No: 1 of 1
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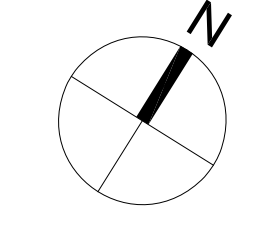
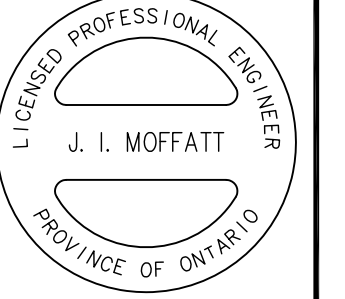
LEGEND:
 POPULATION
 AREA IN HECTARES
 SINGLETS 3.2 ppu
 TOWNHOUSES 2.4 ppu

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6	ISSUED FOR MOE APPROVAL		11:09:23
5	SUBMISSION NO. 5 FOR CITY REVIEW	JM	11:08:19
4	SUBMISSION NO. 4 FOR CITY REVIEW	JM	11:07:15
3	SUBMISSION NO. 3 FOR CITY REVIEW	JM	11:05:30
2	REVISED PER CITY COMMENTS - LEGAL & J.L. RICHARDS PLANS	JM	11:03:11
1	ISSUED FOR CITY COMMENTS	JM	10:07:23



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 333 Preston Street
 Tower 1, Suite 400
 Ottawa, Ontario
 Canada K1S 5N4
 Tel (613)225-1311
 FAX (613)225-9866

Project Title
**SUMMERHILL VILLAGE
 PHASE 1**



Drawing Title
**SANITARY DRAINAGE
 AREA PLAN**

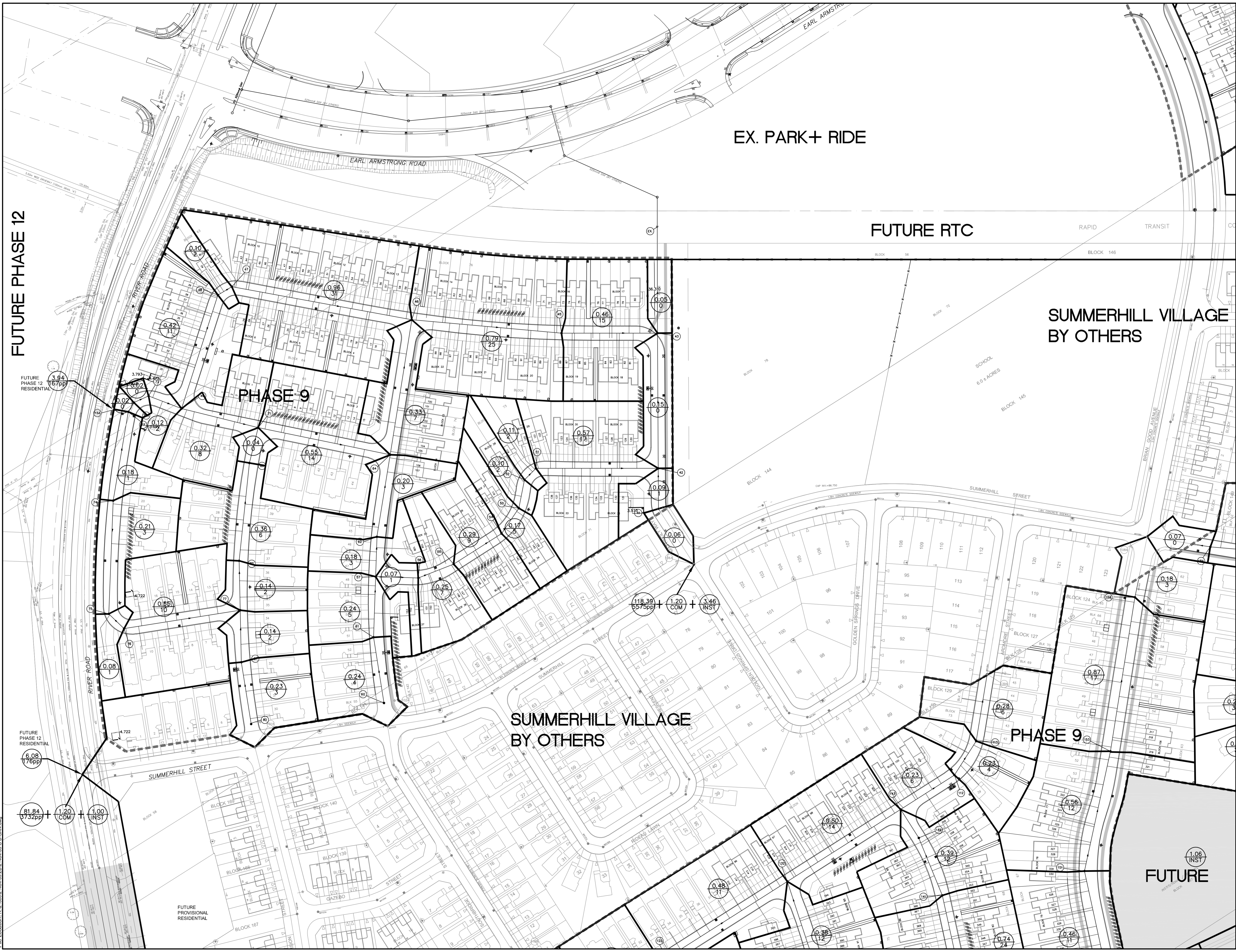
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Design	J.I.M.	Date	JULY '10
Drawn	M.M.	Checked	P.K.
Project No.	3766	Drawing No.	501










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FUTURE PHASE 12

File Location: R:\210002\464-09.LD\21464-09 C.D-SAN.dwg



LEGEND

-  PROPOSED ELBOW CATCHBASIN
-  PROPOSED TEE CATCHBASIN
-  CATCH BASIN
-  HYDRANT
-  SANITARY SEWER & MANHOLE
-  LOT NUMBER
-  DRAINAGE BOUNDARY
-  AREA IN HECTARES / NUMBER OF UNITS
-  PHASING LIMIT

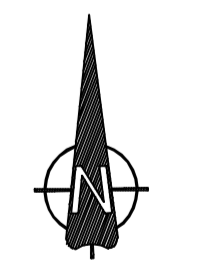
NO.	ISSUE	DATE
10	REVISED LOT NUMBERS	OCT. 16, 2012
9	ISSUED FOR MYLARS	AUG. 23, 2012
8	REVISED STORM SEWER ON SPRAITT ROAD AND STUBS ON POPIN STREET	JUNE 27, 2012
7	ISSUED FOR CONSTRUCTION	MAY 30, 2012
6	REVISED PER CITY COMMENTS & LEGAL	MAY 18, 2012
5	REVISED PER CITY COMMENTS / TENDER	MAR. 05, 2012
4	REVISED PER CITY COMMENTS	DEC. 09, 2011
3	REVISED PER CITY COMMENTS	SEPT. 06, 2011
2	REVISED PER CITY COMMENTS & LEGAL	APR. 28, 2011
1	SUBMITTED TO CITY FOR REVIEW	OCT. 13, 2010

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 SCALE: 1:1000

RIVERSIDE SOUTH DEVELOPMENT CORPORATION (RSDC)

J.L. Richards & Associates Limited
 864 Lady Ellen Place
 Ottawa, ON Canada
 K1Z 5M2
 Tel: 613 728 3571
 Fax: 613 728 6012

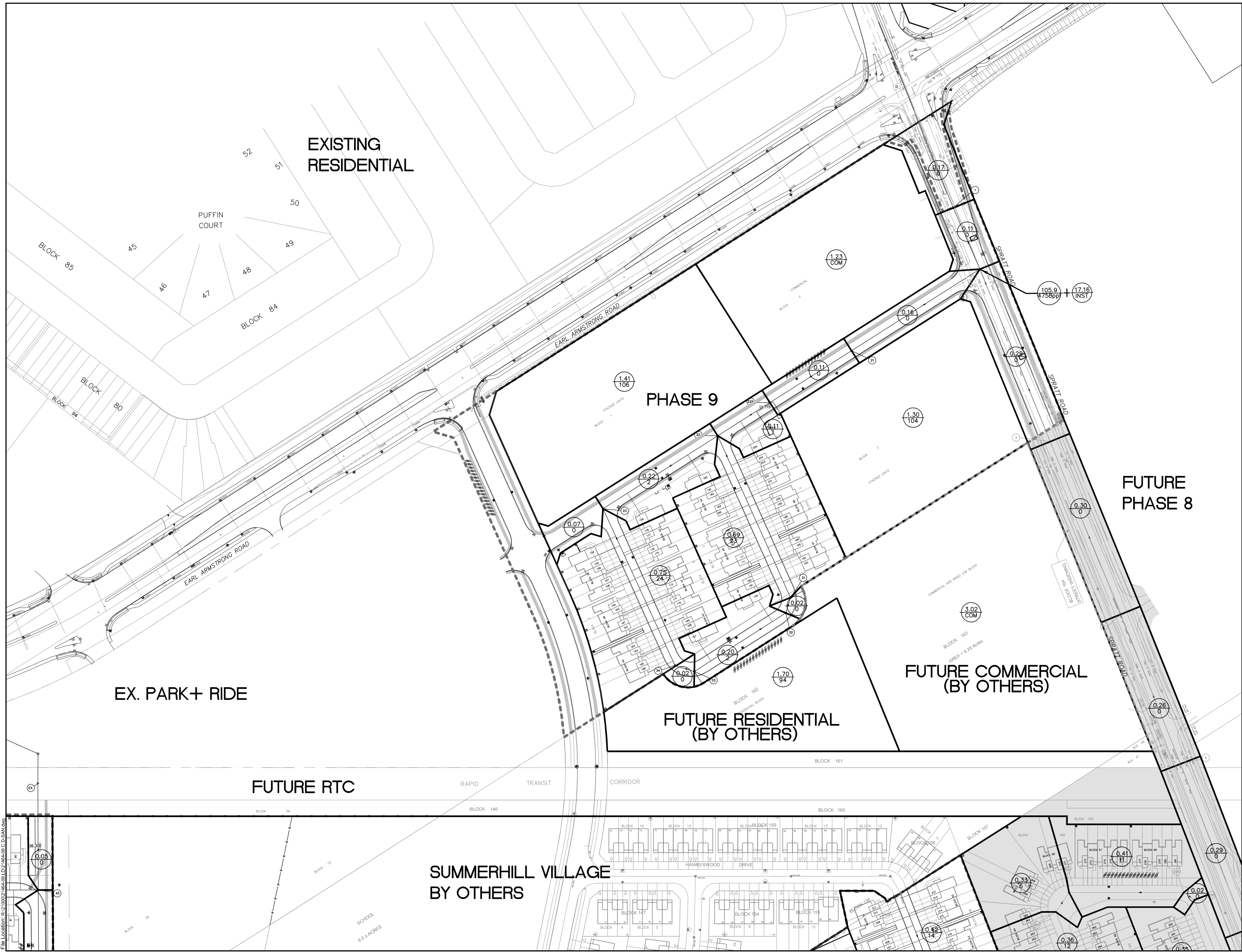
PROFESSIONAL STAMP PROJECT NORTH



PROJECT: **RIVERSIDE SOUTH PHASE 9**
 CITY OF OTTAWA

DRAWING: **SANITARY DRAINAGE PLAN**

DESIGN: G.D.	DRAWING NO: D1-SAN
DRAWN: T.S.	JLR NO:
CHECKED: J.P.	21464-09
PLOTTED: Jan 10, 2019	



LEGEND

- PROPOSED ELBOW CATCHBASIN
- PROPOSED TEE CATCHBASIN
- CATCH BASIN
- HYDRANT
- SANITARY SEWER & MANHOLE
- 113 LOT NUMBER
- DRAINAGE BOUNDARY
- AREA IN HECTARES
NUMBER OF UNITS
- PHASING LIMIT

NO.	ISSUE	DATE
10	REVISED LOT NUMBERS	OCT. 16, 2012
9	ISSUED FOR MYLARS	AUG. 23, 2012
8	REVISED STORM SEWER ON SPRATT ROAD AND STUBS ON POPIN STREET	JUNE 27, 2012
7	ISSUED FOR CONSTRUCTION	MAY 30, 2012
6	REVISED PER CITY COMMENTS & LEGAL	MAY 18, 2012
5	REVISED PER CITY COMMENTS / TENDER	MAR. 05, 2012
4	REVISED PER CITY COMMENTS	DEC. 09, 2011
3	REVISED PER CITY COMMENTS	SEPT. 06, 2011
2	REVISED PER CITY COMMENTS & LEGAL	APR. 28, 2011
1	SUBMITTED TO CITY FOR REVIEW	OCT. 13, 2010

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SCALE: 1:1000

RIVERSIDE SOUTH DEVELOPMENT CORPORATION (RSDC)

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 864 Lady Ellen Place
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 Fax: 613 728 6012

PROFESSIONAL STAMP PROJECT NORTH

PROJECT: RIVERSIDE SOUTH PHASE 9

CITY OF OTTAWA

DRAWING: SANITARY DRAINAGE PLAN

DESIGN: G.D.	DRAWING NO.: D2-SAN
DRAWN: T.S.	JLR NO.:
CHECKED: J.P.	21464-09
PLOTTED: Jan 10, 2019	

File Location: R:\210002-162-09-10-1684-09 C D-SAN.dwg



LEGEND

- PROPOSED ELBOW CATCHBASIN
- PROPOSED TEE CATCHBASIN
- CATCH BASIN
- HYDRANT
- SANITARY SEWER & MANHOLE
- LOT NUMBER
- DRAINAGE BOUNDARY
- AREA IN HECTARES
NUMBER OF UNITS
- PHASING LIMIT

NO.	ISSUE	DATE
10	REVISED LOT NUMBERS	OCT. 16, 2012
9	ISSUED FOR MYLARS	AUG. 23, 2012
8	REVISED STORM SEWER ON SPRAITT ROAD AND STUBS ON POPIN STREET	JUNE 27, 2012
7	ISSUED FOR CONSTRUCTION	MAY 30, 2012
6	REVISED PER CITY COMMENTS & LEGAL	MAY 18, 2012
5	REVISED PER CITY COMMENTS / TENDER	MAR. 05, 2012
4	REVISED PER CITY COMMENTS	DEC. 09, 2011
3	REVISED PER CITY COMMENTS	SEPT. 06, 2011
2	REVISED PER CITY COMMENTS & LEGAL	APR. 28, 2011
1	SUBMITTED TO CITY FOR REVIEW	OCT. 13, 2010

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RIVERSIDE SOUTH DEVELOPMENT CORPORATION (RSDC)

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 864 Lady Ellen Place
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 Tel: 613 728 3571
 Fax: 613 728 6012

J.L. Richards
 ENGINEERS-ARCHITECTS-PLANNERS

PROFESSIONAL STAMP

PROJECT NORTH

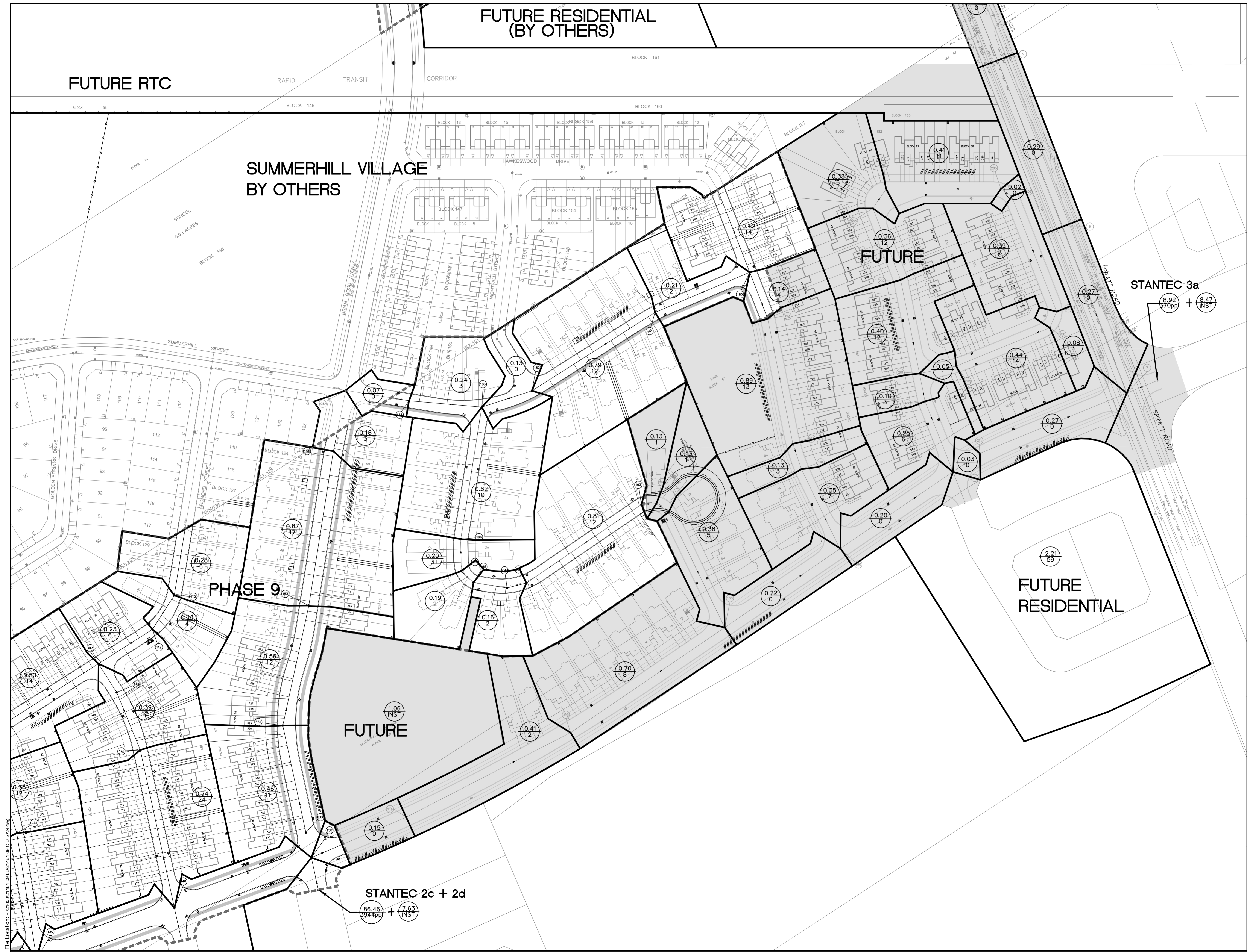
PROJECT: **RIVERSIDE SOUTH PHASE 9**

CITY OF OTTAWA

DRAWING: **SANITARY DRAINAGE PLAN**

DESIGN: G.D.	DRAWING NO.: D3-SAN
DRAWN: T.S.	JLR NO.:
CHECKED: J.P.	21464-09
PLOTTED: Jan 10, 2019	

File Location: R:\210002-164-09.LD2\164-09 C.D-SAN.dwg



LEGEND

- PROPOSED ELBOW CATCHBASIN
- PROPOSED TEE CATCHBASIN
- CATCH BASIN
- HYDRANT
- SANITARY SEWER & MANHOLE
- LOT NUMBER
- DRAINAGE BOUNDARY
- AREA IN HECTARES / NUMBER OF UNITS
- PHASING LIMIT

NO.	ISSUE	DATE
10	REVISED LOT NUMBERS	OCT. 16, 2012
9	ISSUED FOR MYLARS	AUG. 23, 2012
8	REVISED STORM SEWER ON SPRATT ROAD AND STUBS ON POPIN STREET	JUNE 27, 2012
7	ISSUED FOR CONSTRUCTION	MAY 30, 2012
6	REVISED PER CITY COMMENTS & LEGAL	MAY 18, 2012
5	REVISED PER CITY COMMENTS / TENDER	MAR. 05, 2012
4	REVISED PER CITY COMMENTS	DEC. 09, 2011
3	REVISED PER CITY COMMENTS	SEPT. 06, 2011
2	REVISED PER CITY COMMENTS & LEGAL	APR. 28, 2011
1	SUBMITTED TO CITY FOR REVIEW	OCT. 13, 2010

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RIVERSIDE SOUTH DEVELOPMENT CORPORATION (RSDC)

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 864 Lady Ellen Place
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PROFESSIONAL STAMP PROJECT NORTH

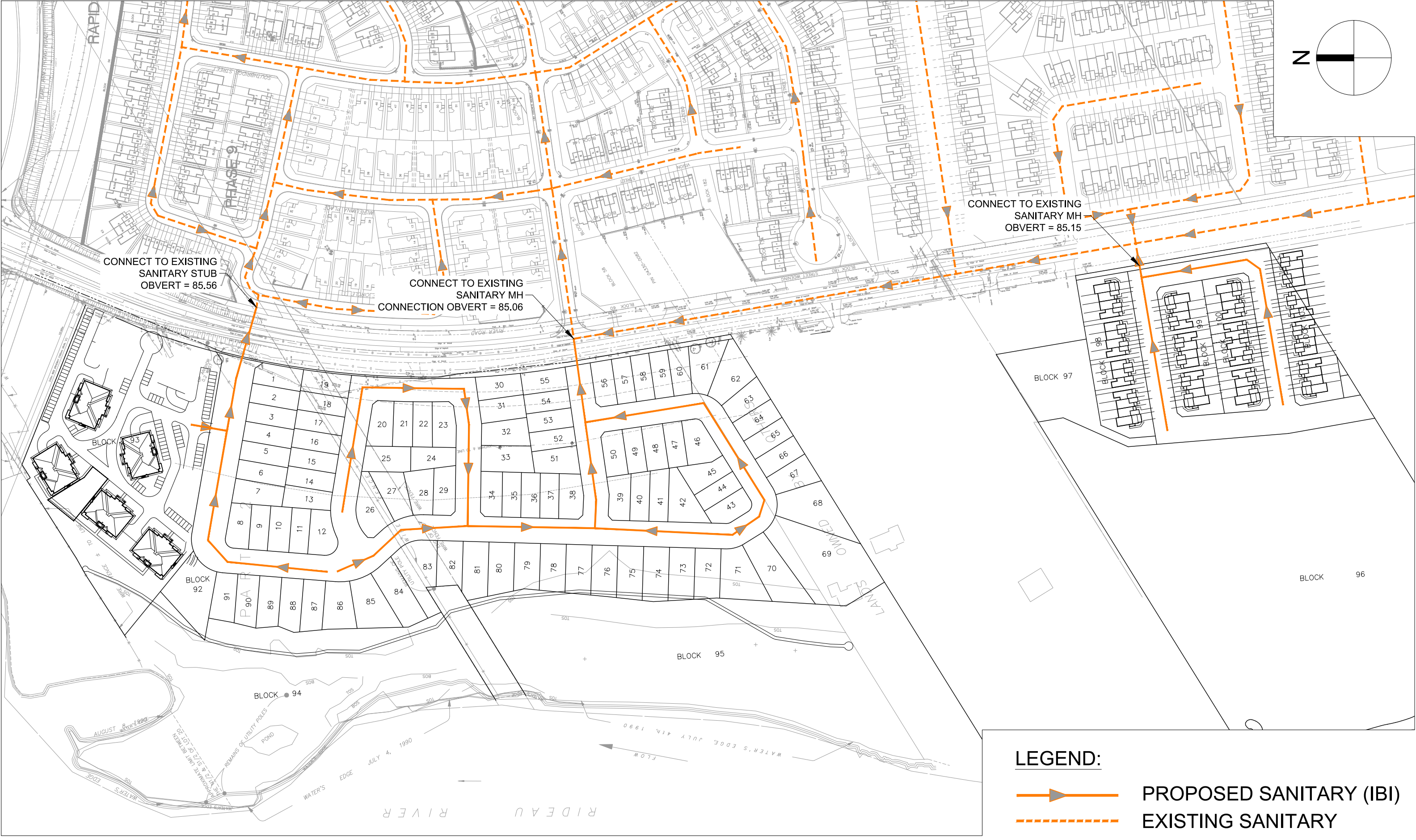
PROJECT: RIVERSIDE SOUTH PHASE 9
 CITY OF OTTAWA

DRAWING: SANITARY DRAINAGE PLAN

DESIGN: G.D.	DRAWING NO.: D4-SAN
DRAWN: T.S.	JLR NO.:
CHECKED: J.P.	21464-09
PLOTTED: Jan 10, 2019	

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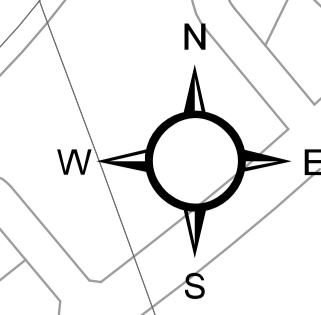
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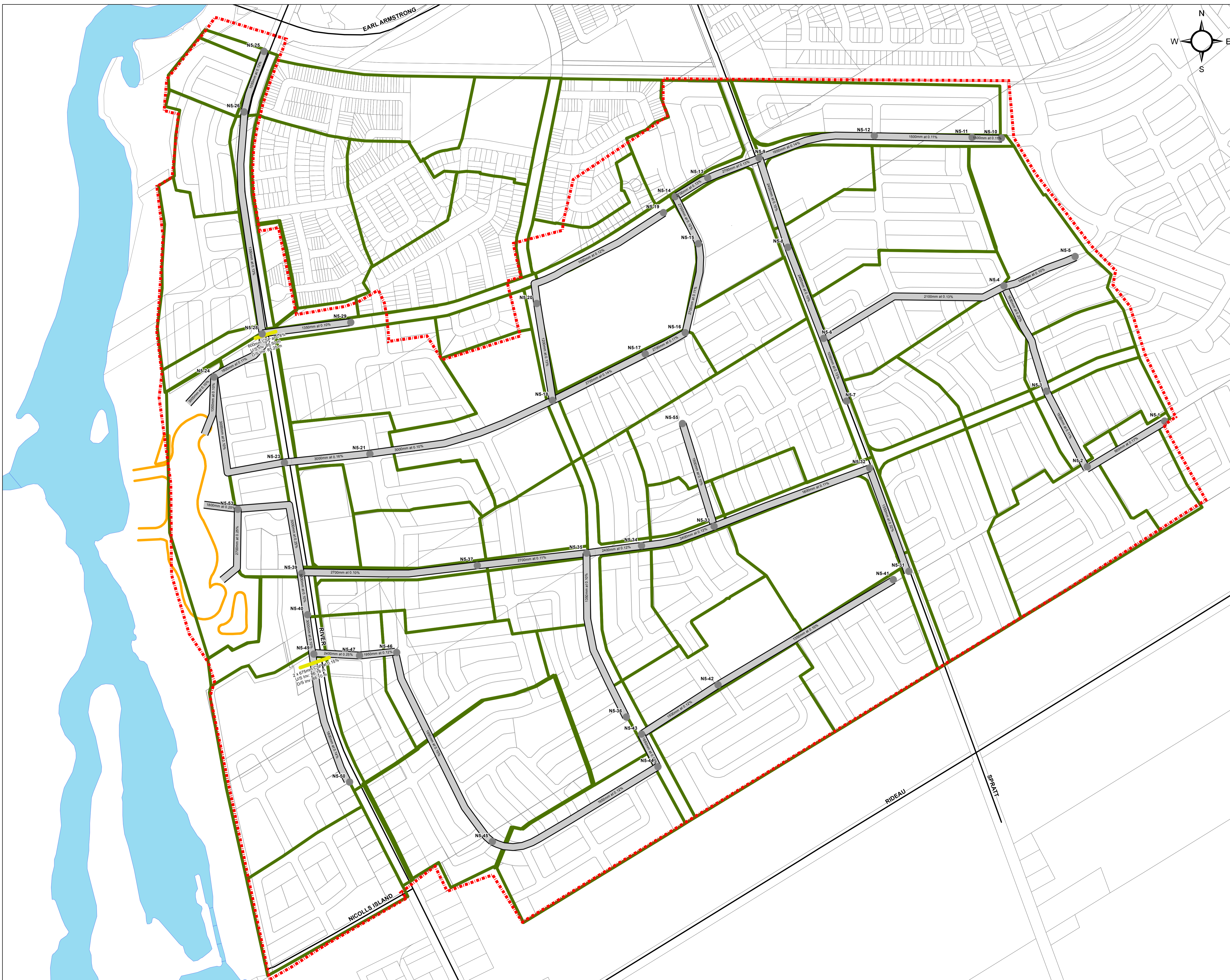
-  PROPOSED SANITARY (IBI)
-  EXISTING SANITARY

APPENDIX D



Legend

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

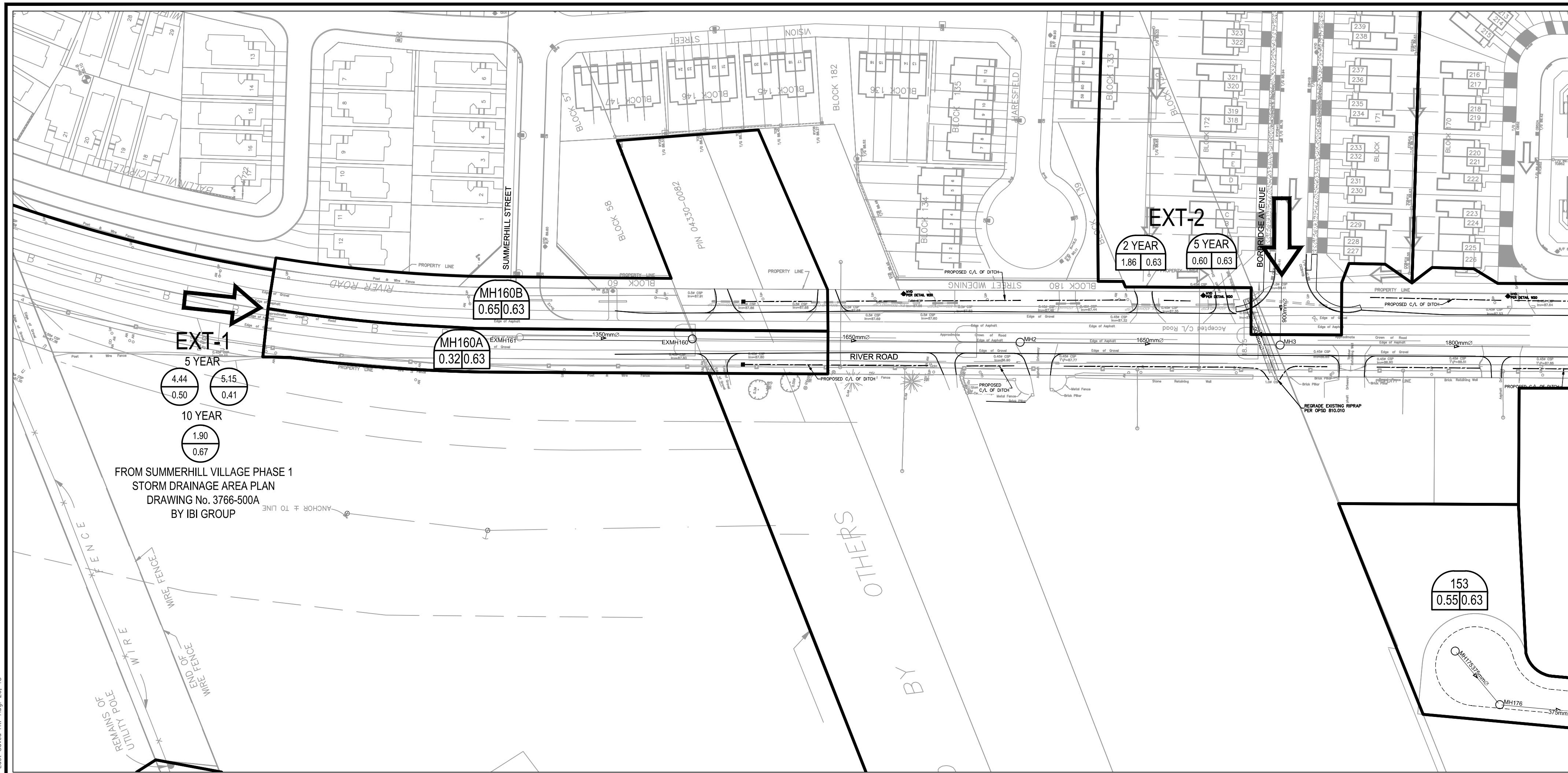


Note:
 The presented imperviousness values represent directly connected imperviousness

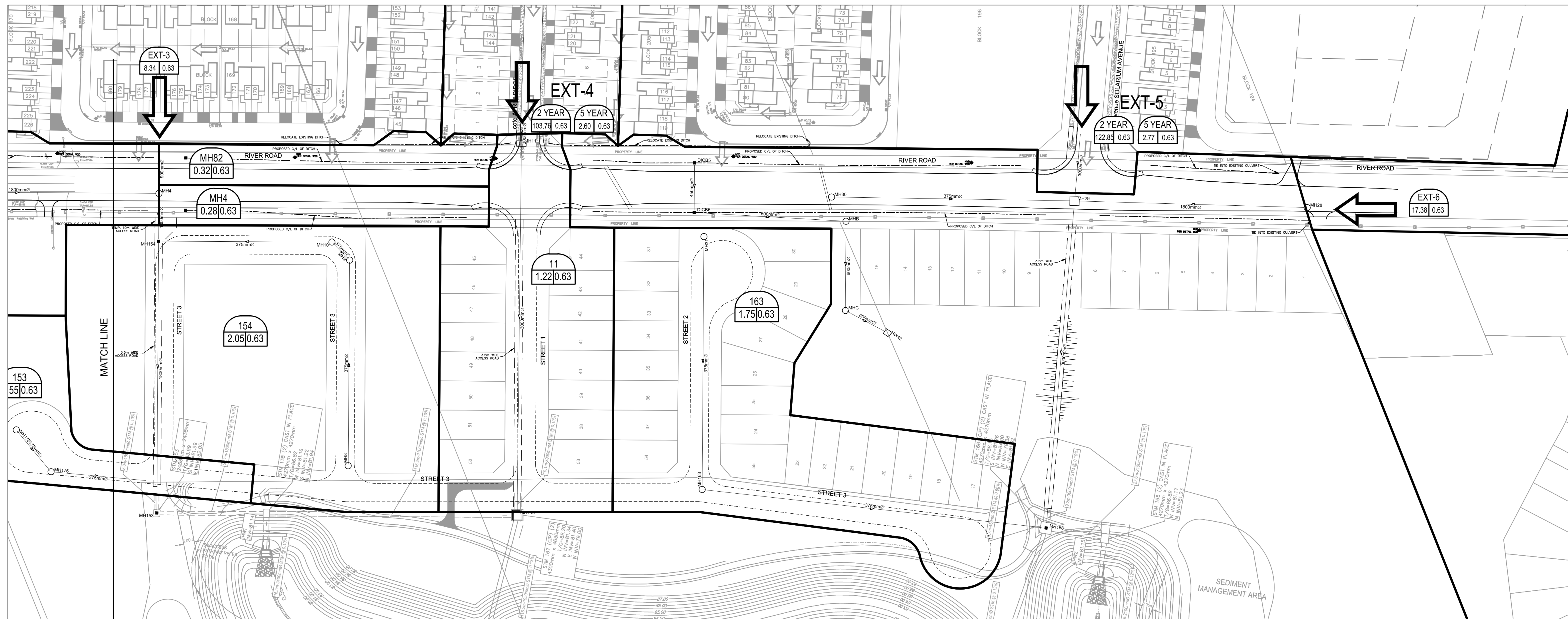
Client / Project:
CITY OF OTTAWA
RIVERSIDE SOUTH ISSU UPDATE
OTTAWA, ON

Title:
STORM SEWERS

Project No.: 163401101
 Scale:
 Drawing No.: STM-1
 Sheet: 3 of 7
 Revision: 0



FROM SUMMERHILL VILLAGE PHASE 1
STORM DRAINAGE AREA PLAN
DRAWING No. 3766-500A
BY IBI GROUP



NOTES:

1. ALL CULVERTS TO BE GALVANIZED CSP 68x13 CORR. x2.8mm THICK CLASS "B" BEDDING. ALL JOINTS TO BE WRAPPED WITH NON-WOVEN GEOTEXTILE, MINIMUM 1.0m WIDTH.

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8			
7			
6			
5	REVISED AS PER CITY COMMENTS	LE	20-08-18
4	PRELIM. ISSUED TO CONTRACTOR	LE	16-08-18
3	ISSUED FOR TENDER	LE	06-07-18
2	REVISED AS PER CITY COMMENTS	LE	29-06-18
1	ISSUED FOR CITY REVIEW	LE	27-04-18

IBI IBI GROUP
400 - 303 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

Project Title
RIVER ROAD RECONSTRUCTION

Professional Engineer
C. M. ERWIN
13379508
20/08/18
PROVINCE OF ONTARIO

Drawing Title
STORM DRAINAGE AREA PLAN

Scale
1:1000

Design	LE	Date	APR 2018
Drawn	CC	Checked	TB
Project No.	114373	Drawing No.	500

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NOTES:
 1. ALL CULVERTS TO BE GALVANIZED CSP 68x13 CORR. x2.8mm THICK CLASS "B" BEDDING. ALL JOINTS TO BE WRAPPED WITH NON-WOVEN GEOTEXTILE, MINIMUM 1.0m WIDTH.

No.	REVISIONS	By	Date
14			
13			
12			
11			
10			
9			
8	REVISED AS PER CITY COMMENTS	LE	20-11-18
7	ISSUED FOR CONSTRUCTION	LE	18-09-18
6	REVISED AS PER CITY COMMENTS	LE	12-09-18
5	REVISED AS PER CITY COMMENTS	LE	20-08-18
4	PRELIM. ISSUED TO CONTRACTOR	LE	16-08-18
3	ISSUED FOR TENDER	LE	06-07-18
2	REVISED AS PER CITY COMMENTS	LE	29-06-18
1	ISSUED FOR CITY REVIEW	LE	27-04-18

IBI GROUP
 400 - 303 Preston Street
 Ottawa ON K1S 5N4 Canada
 tel 613 225 1311 fax 613 225 9868
 ibigroup.com

Project Title
RIVER ROAD RECONSTRUCTION

Professional Engineer
E. M. ERNAN
 13379508
 2011/18
 PROVINCE OF ONTARIO

Drawing Title
EXTERNAL STORM DRAINAGE AREA PLAN

Scale
 1:4000

Design	LE	Date	APR 2018
Drawn	CC	Checked	TB

Project No.	114373	Drawing No.	501
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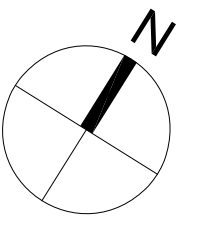
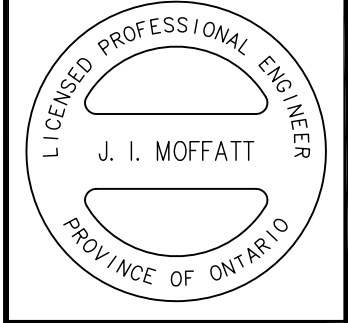
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	RUNOFF COEFFICIENT
	SINGLES 0.40
	TOWNHOUSE 0.50
	PARK 0.20
	SCHOOL 0.40
	MIXED 0.45
	REAR YARD DRAINAGE DIRECTION
	EXTERNAL DRAINAGE AREA FLOW DIRECTION

14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2	ISSUED FOR MOC APPROVAL		11:09:23
1	SUBMISSION NO. 5 FOR CITY REVIEW	JM	11:08:19
No.	REVISIONS	By	Date



IBI GROUP
 333 Preston Street
 Tower 1, Suite 400
 Ottawa, Ontario
 Canada K1S 5N4
 Tel (613)225-1311
 FAX (613)225-9868

Project Title
**SUMMERHILL VILLAGE
 PHASE 1**

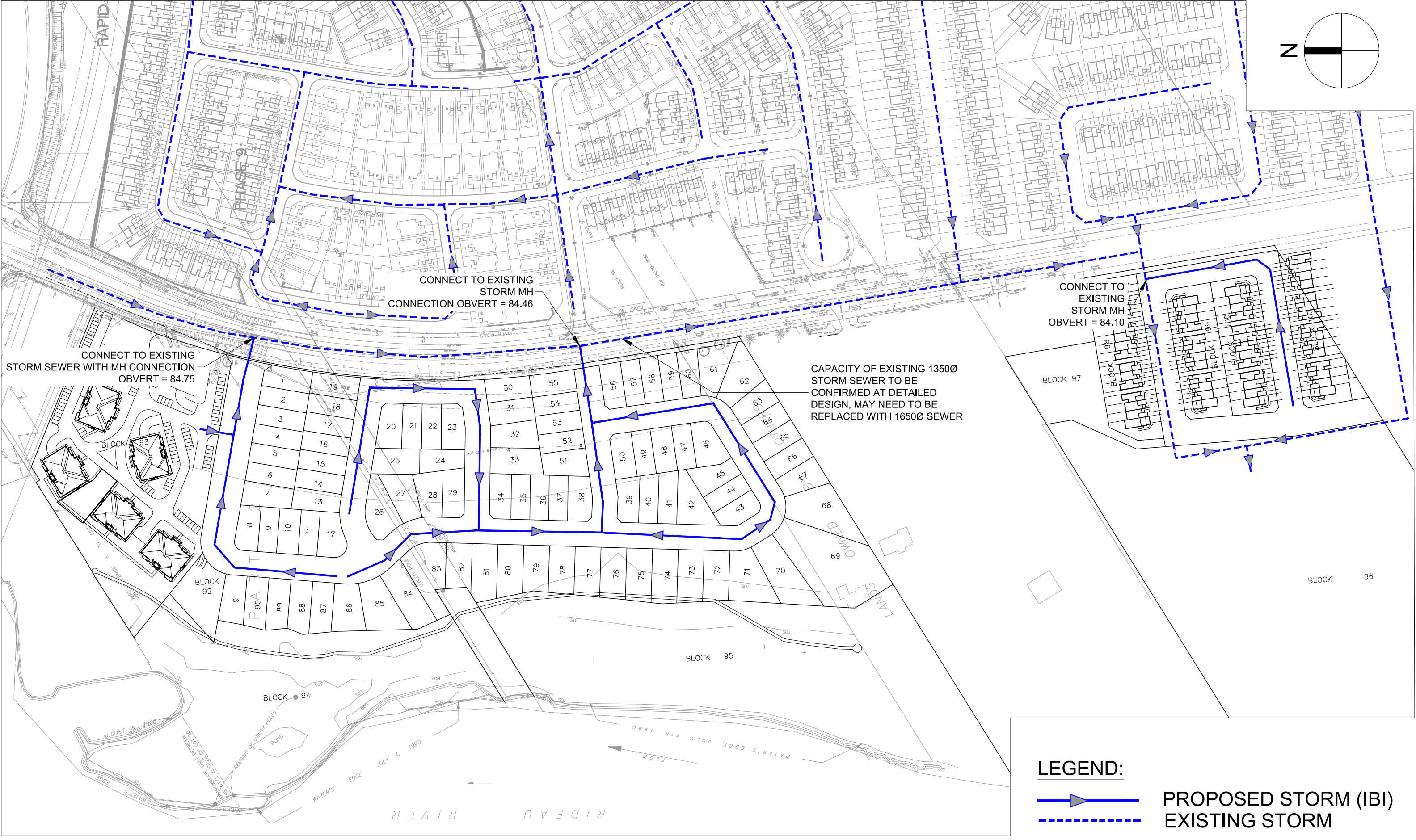


Drawing Title
**STORM DRAINAGE
 AREA PLAN**

Scale
 1:1500

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Drawn	M.M.	Checked	P.K.
Project No.	3766	Drawing No.	500A

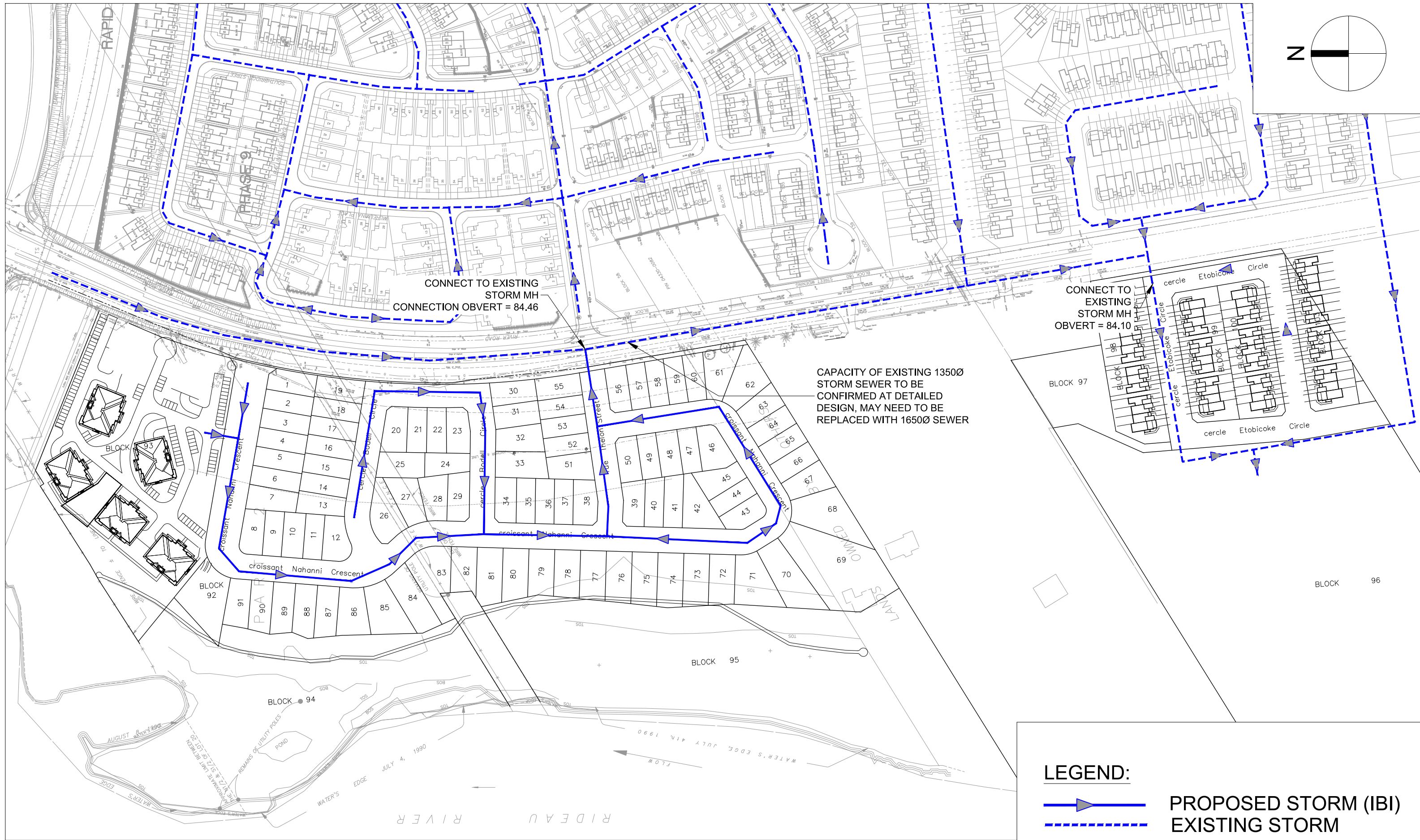
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LEGEND:

- PROPOSED STORM (IBI)
- EXISTING STORM

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LEGEND:

—▲— PROPOSED STORM (IBI)

- - - EXISTING STORM

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.		F.E.A. Approved		Paid	2013 DC Project Outstanding Cost			
									Unit Cost	Total Cost							
South Leitrim																	
	Leitrim Storm Sewers (STM5)																
	Final Servicing report, Leitrim Development Area, 2007	Residential Storm	825	230	1800	672	Green	Pre 2013	-	-			Existing Sewer Under FEA				
	Final Servicing report, Leitrim Development Area, 2007	Residential Storm	230	730	3000	510	Green	Pre 2013	-	-			Existing Sewer Under FEA				
	Final Servicing report, Leitrim Development Area, 2007	Residential Storm	730	770	3000	398	Green	Pre 2013	-	-			Existing Sewer Under FEA				
	Final Servicing 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 Servicing 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 oversized. The oversized costs and applicable sewers were 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 Servicing report, Leitrim Development Area, 2007	Residential Storm	401	400	1800	349	Green	Pre 2013	\$ 501	\$ 174,892			Existing Sewer Not Under FEA				
	Final Servicing 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 Servicing report, Leitrim Development Area, 2007	Residential Storm	616	629	1800	348	Green	2015	\$ 501	\$ 174,391							
	Final Servicing report, Leitrim Development Area, 2007	Residential Storm	629	636	1950	376	Green	2015	\$ 988	\$ 371,448							
	Final Servicing 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											2021		\$ 915,536	\$ 915,536		
	Final Servicing 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 Servicing report, Leitrim Development Area, 2007	Industrial Storm	1260	1270	1800	300	Green	2025	\$ 501	\$ 150,337							
	Final Servicing report, Leitrim Development Area, 2007	Industrial Storm	1270	1285	1950	280	Green	2025	\$ 988	\$ 276,611							
	Final Servicing 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 Servicing report, Leitrim Development Area, 2007	Industrial Storm	1102	1100	1800	201	Green	2015	\$ 501	-			FEA (no internal order)				
	Final Servicing report, Leitrim Development Area, 2007	Industrial Storm	1100	830	2100	315	Green	2015	\$ 1,509	-			FEA (no internal order)				
	Final Servicing 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	-	-							

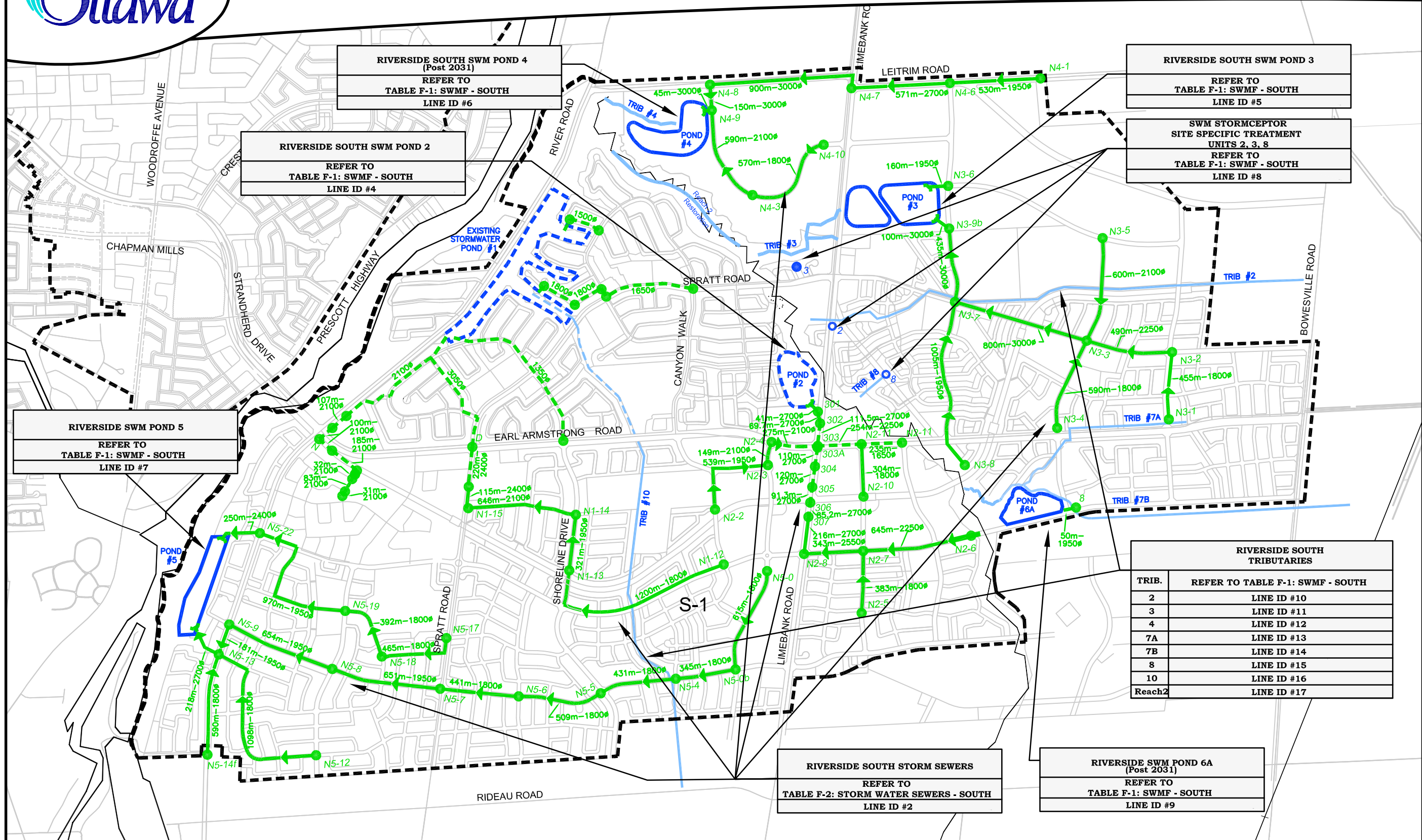
Table F-2: Storm Water Sewers - South

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.		F.E.A. Approved		Paid	2013 DC Project Outstanding Cost
									Unit Cost	Total 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.		F.E.A. Approved		Paid	2013 DC Project Outstanding Cost
									Unit Cost	Total 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												
	Riverside 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 Burnett 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



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

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

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

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

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

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

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



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

Scale: 1:10,000
0 100 300 500m

STM4

Rev. No. 1
Date: April, 2014
Revision 1

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 (H DFA) was completed by Stantec and identified recommendations for each reach of the ravines adjacent to Pond 5. Based on the recommendations of the H DFA, 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 H DFA recommendations.

Observations noted in the H DFA 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.

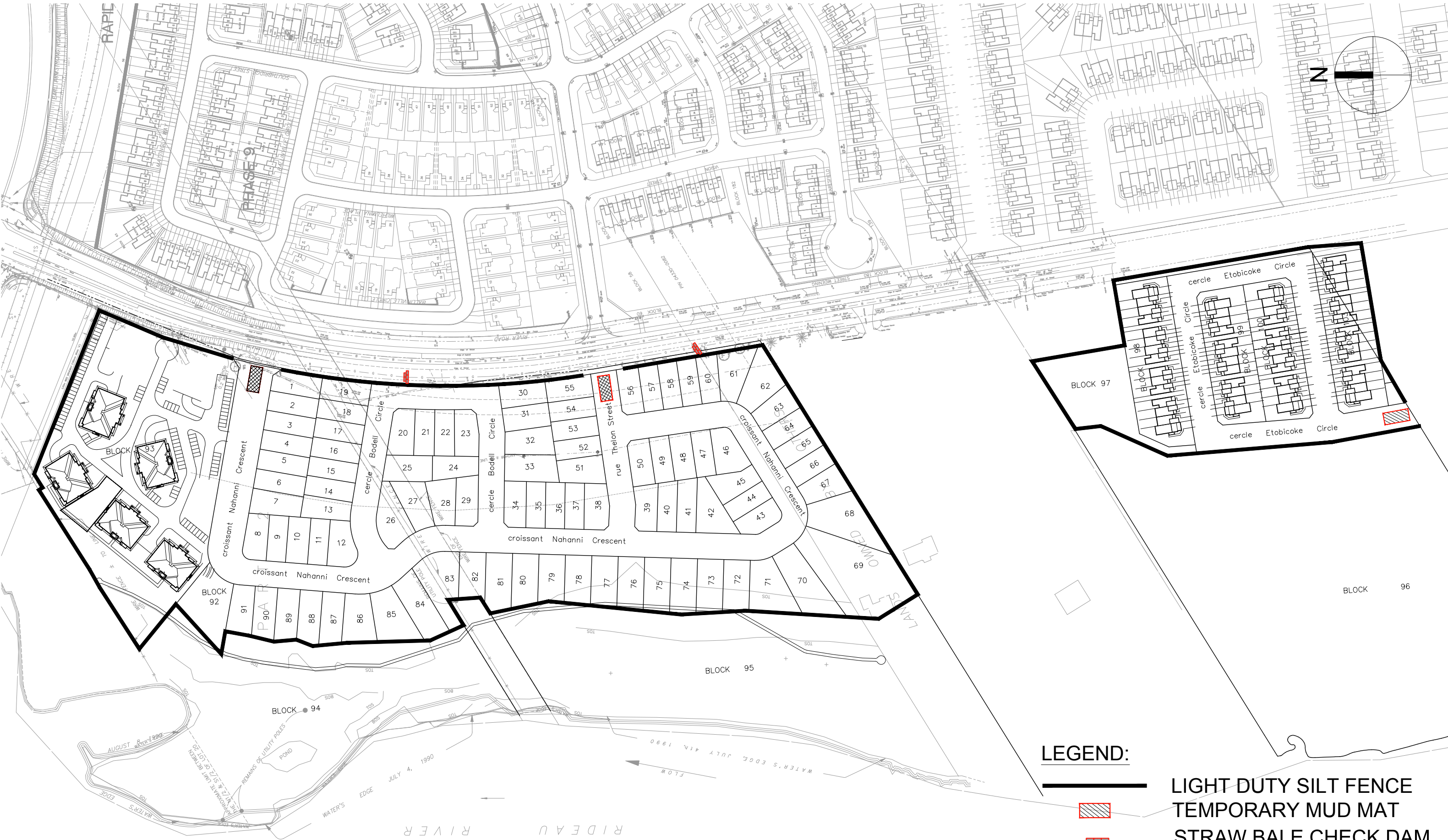
The combined base flow and storm runoff from this system would need to remain below the existing conditions peak flow for each storm event to ensure the erosion thresholds are not exceeded. The approximate pre-development flow rates for each of these reaches is summarized in **Table 6-1** below:

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

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Last Saved At: Nov. 13, 20



LEGEND:

-  LIGHT DUTY SILT FENCE
-  TEMPORARY MUD MAT
-  STRAW BALE CHECK DAM



Scale

NTS

Project Title

RIVERSIDE SOUTH PHASE 12

Drawing Title

EROSION & SEDIMENTATION CONTROL PLAN

Sheet No.

FIGURE 6.1