REPORT
PROJECT: 136794.6.04.03

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
EMPLOYMENT LANDS & BLOCKS 13 AND 14
RIVERSIDE SOUTH

Prepared for RIVERSIDE SOUTH DEVELOPMENT CORPORATION
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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 draft plan 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.

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. The following reports, however, were referenced prior to completing this assessment:

1. **Riverside South Community Infrastructure Servicing Study Update (RSCISSU) – by Stantec, September 30, 2008.** The report provides a macro level servicing plan of the Riverside South Community area.
2. **Servicing Brief, Riverside South Phase 16, 4020 Spratt Road prepared by J.L. Richards, October 2016.** The report provides details on water supply, sanitary sewers and storm water management for the Phase 16 site (Block 14).

1.4 Subject Property

The site is located north of Spratt Road and west of Limebank Road, **Figure 1.1** Location Plan is included in **Appendix A**. The current draft plan of subdivision for the subject property is shown on **Figure 1.2** which is included in **Appendix A**. The site consists of 15 blocks with 3 local roads and the Leitrim Road realignment. Blocks 1 to 11 are identified as ESD (Employment and Special District) on the RSCDP Land Use Plan, Block 13 is I/F (Institutional/Firehall/Institutional), Block 14 is LD (Neighbourhood – Low Density), Block 12 is OS and Block 15 is a walkway block. There is a small area of land owned by others adjacent to Limebank Road. The total site area excluding OS is 50.7 hectares. There is an existing high tension power line running in a north east direction from the Spratt/Limebank intersection.

1.5 Existing Infrastructure

Figure 1.3 shows the location of existing infrastructure in the vicinity of the site. There is a 375 mm sanitary sewer on Limebank Road, a 375 mm stub has been provided to service Blocks 1 to 11. There is an existing 900 mm sanitary sewer on Spratt Road to service Blocks 13 and 14. A 300 mm watermain is on Limebank with a 300 mm stub adjacent to the sanitary stub mentioned above. There is a 750 mm feedermain and a local watermain on Spratt Road to service Blocks 13 and 14. While there are storm sewers on Limebank and Spratt Road, all the stormwater runoff from the site will be directed to Mosquito Creek.

1.6 Pre-Consultation

There was a pre-consultation meeting with the City of Ottawa for the employment lands on February 18, 2020 however, no notes were issued. There was a pre-consultation meeting for the LD Block 14 with the City of Ottawa on April 7, 2015. The meeting notes can be found in **Appendix A**. The following are some of the topics reviewed and discussed:

- Zoning information
- Official plan
- Infrastructure

1.7 Geotechnical Considerations

The subject lands are included in the

- Report No. PG4958-2, July 5, 2022. Geotechnical Investigation Proposed Commercial Development, Employment Lands – Riverside South Development Corporation by Paterson Group.
- Report No. PG1958-2R, May 29, 2014. Geotechnical Investigation Proposed Residential Development, Spratt Road at Limebank Road, by Paterson Group.

The first geotechnical report covers Blocks 1 to 11 while the latter is for Blocks 13 and 14. Generally the site is relatively flat sloping in the south and west direction. The subsurface profile includes a topsoil layer underlain by a deep silty clay deposit. The reports give a permissible

grade raise of 2 meters for Blocks 1 to 11 and 1.5 meters for Blocks 13 and 14. Slope stability analysis is provided in both reports.

2 WATER SUPPLY

2.1 Existing Conditions

As noted in Section 1.5 there is an existing 300 mm watermain on Limebank Road with an existing 300mm stub provided for Blocks 1 to 11, there is a 750 mm feedermain and local watermain on Spratt Road. **Figure 1.3** in **Appendix A** shows the location of the existing watermains.

2.2 Servicing Study Update (RSCISSU)

The employment lands are included in the 2008 Riverside South Community Infrastructure Servicing Study Update, a 300 mm watermain is shown on Limebank Road extending to Leitrim Road on Drawings WM-1. A 300 mm watermain is extended from Limebank Road through the employment lands and extending north to Leitrim Road. A copy of Drawing WM-1 Proposed Water Servicing is included in **Appendix B**.

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 280 l/cap/day
- Residential Peak Daily Demand 700 l/cap/day
- Residential Peak Hour Demand 1540 l/cap/day
- ICI Average Day Demand 28,000 l/ha/day
- ICI Peak Daily Demand 42,000 l/ha/day
- ICI Peak Hour Demand 75,600 l/ha/day

A water demand was calculated using the Concept Plan per Figure 1.3 in Appendix A using a retail rate for the commercial and office building.

- Average Day 14.6 l/s
- Maximum Day 22.2 l/s
- Peak Hour 40.3 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 138 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

There are no proposed building layouts for the employment lands at this time. Fire analysis is conducted with a 10,000 l/min fire demand and a 13,000 l/min demand to evaluate the fire flow rates that can be accommodated on the site. The proposed townhouse layout in Block 14 meets the requirement of Technical Bulletin ISTB-2014-02 for a 10,000 l/min fire flow demand.

2.3.4 Boundary Conditions

The City of Ottawa has provided two boundary conditions at the watermain connection locations for the 300 mm diameter Limebank Road at Spratt Road and on the existing watermain on Spratt Road west of the Limebank intersection. Boundary conditions are provided for the existing pressure zone and for the SUC Zone Reconstruction. A copy of the boundary condition is included in Appendix B and summarized as follows for the two adjacent locations.

	CONNECTION 1 EXISTING ZONE	CONNECTION 1 SUC ZONE	CONNECTION 2 - EXISTING ZONE	CONNECTION 2 SUC ZONE
Max HGL (Basic Day)	131.8 m	148.4 m	131.8 m	148.4 m
Peak Hour	125.3 m	145.7 m	125.3 m	145.8 m
Max Day + Fire (10,000 l/min Fire Flow)	126.4 m	145.1 m	127.4 m	146.2 m
Max Day + Fire (13,000 l/min Fire Flow)	125.3 m	144.2 m	126.8 m	145.8 m

2.3.5 Hydraulic Model

A computer model has been created for the subject site using the InfoWater 12.4 program. The model includes the hydraulic boundary conditions at the connections to existing watermains.

2.4 Proposed Water Plan

2.4.1 Watermain Layout

Figure 2.1 in Appendix B shows the proposed Conceptual Water Plan for the proposed development. A connection to the existing 300 mm watermain on Limebank at the Leitrim Road Realignment is proposed, an existing 300 mm watermain stub was provided for this site, however, it is not at the new road location and will be blanked. In order to provide two watermain feeds to the employment area, a second watermain on Limebank Road is proposed that will be installed on the west side of the road paralleling the existing 300 mm watermain on the east side of the road and connecting to an existing watermain on Spratt Road. The location of the second watermain in the Limebank Road right of way will be determined during detailed design. A 300 mm watermain is proposed to be extended through the employment lands per Drawing WM-1 from the RSCISSU. All other watermains are 200 mm diameter.

2.4.2 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 included in **Appendix B,** and summarized as follows:

Scenario	**Existing Zone**	**SUC Zone Reconfiguration**
Basic Day (Max HGL) Pressure Range	381.9 to 409.6 kPa	544.6 to 572.3 kPa
Peak Hour Pressure Range	316.5 to 345.9 kPa	516.8 to 545.8 kPa
Max Day + 10,000 l/min Fire Flow		
Minimum Design Flow	117.4 l/s	167.7 l/s
Max Day + 13,000 l/min Fire Flow		
Minimum Design Flow	-	166.2 l/s

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

Maximum Pressure — Under existing conditions all nodes are less than 552 kPa while under the SUC Zone Reconfiguration, the majority of the nodes exceed 552 kPa. Pressure reducing control will be required for the majority of the site and can be confirmed during detailed design.

Minimum Pressure — All nodes under both scenarios exceed the minimum value of 276 kPa (40 psi).

Fire Flow — Under the existing boundary conditions all nodes meet the residual pressure requirements for the 10,000 l/min (166.7 l/s) fire flow rate except for two nodes which are at dead end cul-de-sacs. Node J11 is at the long dead end cul-de-sac on Street No. 3 in the employment lands, the design fire flow under existing conditions is 117.4 l/s. The fire flow can be increased by placing hydrants closer to the street No. 2 and 3 intersection and using the method in Appendix I of Technical Bulletin ISTB-2018-02. The location, size and type of future building will determine the fire flow demand.

Under the SUC Zone Reconfiguration the nodes in Block 14 meet the 10,000 l/min for the residential site. All the nodes in the employment area meet the fire flow requirements under the 13,000 l/min fire flow scenario except for Node J11 which has a design flow of 166.2 l/s at the Street 3 cul-de-sac. As stated above the require fire flow for the Blocks 9 and 8 will be determined based on the building type and location. The SUC Zone Reconfiguration is scheduled for the later half of 2024.

3 SANITARY SEWERS

3.1 Existing Conditions

As noted in Section 1.5, there is an existing 375 mm sanitary sewer on Limebank Road with a 375 mm stub to service the employment lands. There is a 750 mm sanitary sewer on Spratt Road to service Blocks 13 and 14.

3.2 Servicing Study Update (RSCISSU)

The employment lands are included in the 2008 Riverside South Community Infrastructure Servicing Study Update, a 375 mm diameter sanitary sewer extending from Spratt Road to the employment lands is shown on Drawing SAN-1. A 375 mm sewer is shown servicing the employment lands, the drainage boundary for this sewer matches the northern property line with the NCC lands. The employment lands are represented area BP-3 in the RSCISSU with a total flow 39.8 l/s. A copy of the Drawing SAN-1 and the Sanitary Sewer Design Sheet from the RSCISSU is included in **Appendix C**.

3.3 Design Criteria

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

- Average residential flow = 280 l/c/d
- Peak residential flow factor = (Harmon Formula) x 0.80
- Average commercial flow = 28,000 l/s/ha
- Average institutional flow = 28,000 l/s/ha
- Peak ICI flow factor = 1.5 if ICI area is ≤ 20% total area
  1.0 if ICI area is > 20% total area
- Inflow and Infiltration Rate = 0.33 l/s/ha
- Minimum Full Flow Velocity = 0.60 m/s
- Maximum Full Flow Velocity = 3.0 m/s
- Minimum Pipe Size = 200 mm diameter

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

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

3.4 Recommended Sanitary Plan

Figure 3.1 in **Appendix C** shows the Conceptual Sanitary Plan for the proposed development. A connection to the existing 375 mm sanitary sewer on Limebank Road is proposed, on existing 375 mm stub that was installed for that development is not located at the new Leitrim Road alignment and will be decommissioned. The 375 mm sanitary sewer is proposed along to be extended into the site. The peak total flow from the employment lands is 36.2 l/s which compares to the flow of 39.8 l/s from the RSCISSU, a copy of the sanitary sewer calculation is included in **Appendix C.**

The existing 750 mm sanitary sewer on Spratt Road will service Blocks 13 and 14.

4 STORMWATER MANAGEMENT

4.1 Existing Conditions

Runoff from the subject property drains to Mosquito Creek, either directly or via Tributary 3 or 4.

4.2 2021 Master Drainage Plan (MDP) Update

The employment lands were accounted for in the 2021 MDP Update, part of a larger business park area. Standard practice in a business park setting is to subdivide the development to parcels that include parking lots, buildings and grassed areas. The MDP Update identified the subject property and surrounding development area to be provided with on-site infiltration measures in conjunction with on-site water quality and quantity treatment on the private development blocks. It is anticipated that these features would be privately serviced and operated in the grassed open space of a given block.

It is estimated that to provide adequate servicing, these combined SWM controls would occupy less than 8% of the development block. Target reductions in runoff volume were established for the business park land use for various storm events. The localized frequent ponding (during the 13 mm event) must be designed with a maximum drawdown time of 48 hours. This approach satisfies Transport Canada and the Airport Authority's preference for no ponds in the Primary Bird Hazard Zone (in which the subject lands are located). Quality treatment to an enhanced level is to be provided. The pro-rated on-site quantity storage requirements within the business park are 320 m^3/ha for the development area.

The business park area is proposed to be provided with a rural road cross-section serviced with road-side ditches. The on-site SWM measures are to be provided with an overland outlet through a shallow depression with a maximum 100 year depth of ponding of 0.6 m. This would tie-in to the proposed roadside ditch network. The topography generally falls from east to west, which facilitates surface drainage to Mosquito Creek. The servicing of the area does not include storm sewers or end-of-pipe treatment facilities.

The MDP Update proposed that the downstream end of Tributary 4 be maintained and the treated runoff from the business park lands be directed to it.

Blocks 13 and 14 were also accounted for in the 2021 MDP Update. Block 13 is considered institutional/firehall (I/F), while Block 14 is medium density (MD) residential land use. The blocks outlet to Tributary 3 directly, with on-site water quality treatment to an Enhanced Level of Protection provided via an OGS unit. The MDP Update identified that low and medium density residential development is to be provided with LIDs in the form of an enhanced rear yard perforated pipe system. The standard City rear yard perforated pipe installation would be modified to increase the depth of the trench, increasing the opportunity for storage and infiltration. The installation would also be modified to incorporate a pipe connection to the street catch basin that is perched, providing further opportunity for runoff to back up in the perforated pipe, seep into the clear stone trench and infiltrate.

4.3 Storm Servicing Concept

The storm servicing concept for the employment lands and Block 13 and 14 remains consistent with that outlined in the 2021 MDP Update.

The delineation of the subject employment lands subcatchments has been refined to reflect the legal plan. The lands are considered employment and special district (ESD). Under ultimate build out conditions, lands to the north and east will drain towards the subject site. The delineation of these lands has been refined to reflect the latest secondary plan land use designation. The lands are considered ESD with a natural environment area (NEA) towards the northeast. The on-site

LID and quantity/quality measures have been updated accordingly and a conceptual ditch network has been developed. The ditch network outlets to Tributary 4.

The delineation of Block 13 and 14 subcatchments has been updated to reflect the latest legal plan and adjusted to reflect the limit of hazard lands. The LIDs proposed in Block 14, medium density development, have been refined to reflect the proposed lotting. Runoff from both blocks outlets to Tributary 3. It should be noted that the existing watercourse that crosses the southern portion of Block 13 (along Spratt Road) requires closure. The limit of hazard lands along the western edge of Block 13 will have to be confirmed at the detailed design of entombment.

4.4 Hydrological and Hydraulic Evaluation

The PCSWMM model developed for the MDP Update has been updated to reflect the above-noted refinements. Subcatchments are presented on **Figure 4.1** (enclosed in **Appendix D**) and are summarized below. Further detail on the SWM servicing of the employment lands and Blocks 13 and 14 is outlined in the following sections.

Table 4.1 Summary of subcatchments – Employment lands and Block 13 and 14

SUBCATCHMENT AREA ID	LAND USE	AREA (HA)	IMPERVIOUSNESS (%) [TIME OF CONCENTRATION (MIN)]	WIDTH (M)
4_B1	ESD	5.36	83	500
4_B2	ESD	2.87	89	360
4_B3	ESD	7.48	81	740
4_B4	ESD	2.33	89	430
4_B5	ESD	2.44	89	400
4_B6	ESD	1.82	81	240
4_B7	ESD	3.76	90	660
4_B8	ESD	4.91	87	340
4_B9	ESD	4.05	92	220
4_B10	ESD	3.63	91	290
4_B11	ESD	8.16	92	230
4_S15	ESD	4.05	84	270
3_B13A	I/F	0.46	99	102
3_B13B	I/F	0.67	99	150
3_B14	MD	1.38	93	311

Table 4.2 Summary of subcatchments – External lands tributary to the Employment Lands

SUBCATCHMENT AREA ID	LAND USE	AREA (HA)	IMPERVIOUSNESS (%) [TIME OF CONCENTRATION (MIN)]	WIDTH (M)
4_S12	ESD	4.71	93	1059
4_S13	ESD	8.46	92	1903
4_S14	ESD	11.55	84	2599
4_S15	ESD	4.05	84	270
4_S16	ESD	15.88	93	3573
4_S17	ESD	14.52	91	3266
4_S18	ESD	20.38	93	4586
4_S19	NEA	7.61	[28]	N/A
4_S20A	NEA	7.71	[63]	N/A
4_S20B	NEA	2.80	[41]	N/A
4_S21	ESD	11.03	93	2481

4.4.1 Employment Lands

4.4.1.1 Combined SWM Measures

As noted above, the approach to combined SWM measures on each development block in the employment lands remains consistent with the MDP Update. The target size for the on-site LID measure is under 8% of the development block, and the on-site storage requirement is 320 cu-m/ha. The combined SWM measure outlined in the MDP Update has been carried forward, with refinements to account for site specific servicing and geotechnical testing at the subject site. Refer to the conceptual profile on **Figure 4.6** (enclosed in **Appendix D**). Water quality treatment is to be provided to an Enhanced Level of Protection, corresponding to 40 m^3/ha per MOE guidelines.

The below table summarizes the targets associated with the combined on-site SWM measures and what is provided. Water quantity storage is provided via surface ponding, while water quality storage is provided within the clear stone layer.

Table 4.3 Employment Lands Summary of combined SWM measures

SUBCATCHMENT AREA ID	AREA (HA)	REQUIRED SURFACE AREA (HA) 7.7%	REQUIRED WATER QUANTITY STORAGE (M^3) 320 M^3/HA	REQUIRED WATER QUALITY STORAGE (M^3) 40 M^3/HA	PROVIDED WATER QUALITY STORAGE (M^3)
4_B1	5.36	0.41	1715	214	660
4_B2	2.87	0.22	918	115	354
4_B3	7.48	0.58	2394	299	922
4_B4	2.33	0.18	746	93	287

SUBCATCHMENT AREA ID	AREA (HA)	REQUIRED SURFACE AREA (HA) 7.7%	REQUIRED WATER QUANTITY STORAGE (M^3) 320 M^3/HA	REQUIRED WATER QUALITY STORAGE (M^3) 40 M^3/HA	PROVIDED WATER QUALITY STORAGE (M^3)
4_B5	2.44	0.19	781	98	300
4_B6	1.82	0.14	582	73	224
4_B7	3.76	0.29	1203	150	464
4_B8	4.91	0.38	1571	196	605
4_B9	4.05	0.31	1296	162	499
4_B10	3.63	0.28	1162	145	448
4_B11	8.16	0.63	2611	326	1005
4_S12	4.71	0.36	1507	188	435
4_S13	8.46	0.65	2707	338	781
4_S14	11.55	0.89	3696	462	1067
4_S15	4.05	0.31	1296	162	499
4_S16	15.88	1.22	5082	635	1467
4_S17	14.52	1.12	4646	581	1341
4_S18	20.38	1.57	6522	815	1883
4_S21	11.03	0.85	3530	441	1019

The footprint provided for the combined SWM feature is 7.7% and the available water quantity storage corresponds to 320 m^3/ha. In terms of water quality, at each location the available volume in the clear stone layer exceeds the required water quality volume. This is due to the sizing requirement for the LIDs.

The MDP Update set a target to limit the drawdown time of frequent ponding (considered during the 13 mm storm event) to a maximum of 48 hours to satisfy Transport Canada and the Airport Authority's preference for no ponds in this area, considered part of the Primary Bird Hazard Zone. At all locations there is no surface storage utilized during the 13 mm storm event.

The MDP Update determined runoff volume (RV) reduction targets for LIDs based on land use. The targets and performance are summarized below.

Table 4.4 Employment Lands LIDs – Average runoff volume reduction

STORM EVENT	MDP UPDATE TARGET		CURRENT EVALUATION	
	% REDUCTION	CORRESPONDING RV (MM)	% REDUCTION	CORRESPONDING RV (MM)
25 mm	85%	21	96%	24
2 year	76%	32	81%	34
100 year	32%	30	32%	30

The runoff volume reduction is 96% for the 25 mm storm, corresponding to 24 mm of runoff volume; 81% for the 2 year storm, corresponding to 34 mm of runoff volume; and 32% for the 100 year storm, corresponding to 30 mm of runoff volume. The targets set forth in the MDP Update are satisfied.

The depth of ponding and release rate to the ditch during the 100 year event is summarized below.

Table 4.5 Employment Lands 100 year depth of ponding and release rate to ditch network

SUBCATCHMENT AREA ID	100 YEAR 12 HOUR SCS	
	MAX. DEPTH (M)	RELEASE RATE TO DITCH (L/S)
4_B1	0.48	109
4_B2	0.55	62
4_B3	0.46	149
4_B4	0.58	52
4_B5	0.57	54
4_B6	0.56	40
4_B7	0.55	82
4_B8	0.51	103
4_B9	0.55	88
4_B10	0.56	80
4_B11	0.49	168
4_S12	0.59	106
4_S13	0.56	185
4_S14	0.50	239
4_S15	0.51	84
4_S16	0.54	341
4_S17	0.53	310
4_S18	0.52	432
4_S21	0.55	239

At all locations the 100 year depth of ponding is less than 0.6 m, the target maximum depth in the MDP Update. The 100 year release rate from each area corresponds to 21 l/s/ha.

4.4.1.2 Ditch Network

Outflow from the combined SWM measures cascades to a roadside ditch network that outlets to Tributary 4. The ditch network starts in the employment and special district lands east of Limebank Road and continues west, ultimately discharging to Tributary 4. The proposed network is presented conceptually on **Figures 4.1** and **4.2**, with the latter indicating proposed culvert dimensions and cross-section locations. There are two proposed culvert crossings of Limebank

Road, refer to **Figures 4.3** and **4.4**. Ditch cross-sections are included in **Figure 4.5**. Figures are enclosed in **Appendix D**.

The elevation of the ditches generally follows existing terrain. The overall longitudinal slope is greater than 0.15%. At the upstream end of the system, ditches with a v-notch geometry are proposed. Moving downstream, trapezoidal ditches with a 0.6 m or 0.8 m wide bottom are proposed. Cross-sectional geometry is indicated on **Figure 4.5**. At all locations 3H:1V side slopes are proposed. The ditches are generally located within or along the right-of-way. Fill is required on select development blocks to provide a minimum 15 cm freeboard from 100 year water surface elevations.

The ditch that receives runoff from east of Limebank as well as localized runoff from the subject employment lands extends southwesterly from Limebank Road to Tributary 4 along the northwestern property boundary of the subject site (refer to cross-section 2-2 on **Figure 4.5**). As proposed, the ditch straddles the two properties, RSDC to the south and NCC to the north.

It should be noted that the evaluation was set up to direct runoff from all drainage areas to ditches for conservatism in the ditch sizing. At the detailed design stage, consideration can be given to providing development blocks adjacent to Tributary 4 and Mosquito Creek with independent outlets directly to the respective adjacent watercourse. It should further be noted that maintenance access to Mosquito Creek is to be maintained for development blocks along the Creek.

Flow through the culverts for the 2, 5 and 100 year storm events is tabulated in **Table 4.6** below and 100 year water surface elevations are tabulated in **Table 4.7**, as well as indicated on the cross-sections on **Figure 4.5**. The 100 year depth of flow throughout the ditch network ranges from 0.24 m to 1.14 m, with an average depth of 0.61 m. The culverts have generally been sized to convey the 100 year flow with no surcharging, or minimal surcharging.

At the proposed northern culvert crossing of Limebank Road, the culvert and proposed watermain will conflict and therefore the watermain will have to be installed above or below the culvert.

Table 4.6 Summary of flow through proposed culverts

PROPOSED CULVERT ID (REFER TO FIGURE 4.2)	PCSWMM CONDUIT	GEOMETRY (M)	2 YEAR 12 HOUR SCS FLOW	5 YEAR 12 HOUR SCS FLOW	100 YEAR 12 HOUR SCS FLOW
A	4C-13	0.9x1.2	258	543	1259
B	4C-11	1.2x1.5	577	1100	2295
C	4C-09	1.2x1.5	663	1383	2833
D	4C-27	0.975	254	427	819
E	4C-25	0.975	265	456	880
F	4C-06	0.450	18	55	125
G	4C-23	1.050	276	517	1023
H	4C-17-2	0.375	18	45	87
I	4C-20	0.450	19	48	103
J	4C-03-2	0.750	60	168	374

Table 4.7 100 year water surface elevation at culverts

PROPOSED CULVERT ID (REFER TO FIGURE 4.2)	PCSWMM CONDUIT	PROPOSED CENTRELINE ROAD GRADE (M)	PROPOSED BLOCK ELEVATION (M)		100 YEAR WATER SURFACE ELEVATION (M)		FREEBOARD TO BLOCK ELEVATION (M)	
			U/S	D/S	U/S	D/S	U/S	D/S
A	4C-13	93.76(1)	91.80	91.75	91.65	91.44	0.15	0.31
B	4C-11	91.40	90.87	90.74	90.72	90.57	0.15	0.17
C	4C-09	92.60	90.59	90.35	90.44	89.55	0.15	0.8
D	4C-27	92.25(1)	91.80	91.68	91.65	91.45	0.15	0.23
E	4C-25	92.05	91.57	91.56	91.42	91.18	0.15	0.38
F	4C-06	91.35	91.03	91.01	90.88	90.79	0.15	0.22
G	4C-23	91.35	91.00	90.89	90.85	90.74	0.15	0.15
H	4C-17-2	91.05	90.81	90.79	90.66	90.52	0.15	0.27
I	4C-20	91.05	90.79	90.79	90.61	90.52	0.18	0.27
J	4C-03-2	92.50	90.65	90.59	90.5	90.44	0.15	0.15

(1) Limebank Road as-built elevations

4.4.2 Blocks 13 and 14

Block 13 is institutional/firehall land use and has been accounted for in the model as two separate catchments (one on either side of the utility corridor) with 100 year on-site storage and a 2 year release rate to outflow to Tributary 3. Emergency flow routing is to Tributary 3. Water quality to an enhanced level of protection is to be provided via an OGS unit.

Block 14 is medium density residential land use and has been accounted for in the model with a 2 year release rate and major flow to Tributary 3. It is to be provided with LIDs in the form of an enhanced rear yard perforated pipe system, refer to the conceptual profile on **Figure 4.7**. Water quality to an enhanced level of protection is to be provided via an OGS unit.

Table 4.8 Blocks 13 and 14 Summary of on-site storage and minor system capture

BLOCK	SUBCATCHMENT ID	ON-SITE STORAGE	2 YEAR RELEASE RATE (L/S)
Block 13	3_B13A	100 year	45
	3_B13B	100 year	67
Block 14	3_B14	N/A	109

The MDP Update determined runoff volume (RV) reduction targets for LIDs based on land use. The targets for medium density land use and the performance of Block 14 are summarized below.

Table 4.9 Block 14 LIDs – Average runoff volume reduction

STORM EVENT	MDP UPDATE TARGET		CURRENT EVALUATION	
	% REDUCTION	CORRESPONDING RV (MM)	% REDUCTION	CORRESPONDING RV (MM)
25 mm	5%	1	13%	3
2 year	4%	2	4%	2
100 year	2%	2	2%	2

For the rear yard LID measure in medium density development, there is an average runoff volume reduction of 13% for the 25 mm storm, corresponding to 3 mm of runoff volume; 4% for the 2 year storm, corresponding to 2 mm of runoff volume; and 2% for the 100 year storm, corresponding to 2 mm of runoff volume. The targets set forth in the MDP Update are satisfied.

4.4.3 Summary of Model Files

The following PCSWMM files are included with the digital submission:

- 13 mm 4 hour Chicago – EMP_RSDC_AAPSR_LID-13MM.PCZ
- 25 mm 4 hour Chicago – EMP_RSDC_AAPSR_LID-25MM.PCZ
- 2 year 3 hour Chicago – EMP_RSDC_AAPSR_LID-2CHI.PCZ
- 100 year 3 hour Chicago – EMP_RSDC_AAPSR_LID-100CHI.PCZ
- 2 year 12 hour SCS – EMP_RSDC_AAPSR_LID-2SCS.PCZ
- 5 year 12 hour SCS – EMP_RSDC_AAPSR_LID-5SCS.PCZ
- 100 year 12 hour SCS – EMP_RSDC_AAPSR_LID-100SCS.PCZ

5 EROSION AND SEDIMENTATION CONTROL PLAN

During construction, existing conveyance systems and water courses can be exposed to sediment loading. In order to prevent site generated sediments from entering the environment, an Erosion and Sedimentation Control Plan (ESCP) will be implemented prior to development. Although a generic ESCP can be developed as part of this report and subsequent Design Briefs, the final plan will be developed and implemented by the Owner's general contractor.

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

A copy of a potential Erosion and Sedimentation Control Plan (ESCP) is shown on **Figure 6.1**, which is included in **Appendix E**.

6 APPROVALS AND PERMIT REQUIREMENTS

6.1 City of Ottawa

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

6.2 Province of Ontario

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

6.3 Conservation Authority

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

6.4 Federal Government

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 outlet and stormwater outlet are already in place. 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 Riverside South Development Corporation property known as the Employment Lands including Blocks 13 and 14 be accepted and that the development of the property move forward.

Lance Erion, P. Eng.
Associate

Appendix A

- **City of Ottawa Servicing Study Guidelines Checklist**
- **2016 Riverside South Community Design Plan – Land Use Plan**
- **Figure 1.1 – Location Plan**
- **Figure 1.2 – Draft Plan**
- **Figure 1.3 – Location of Existing Infrastructure**
- **Figure 5.1 – Proposed Macro Grading Plan**
- **April 29, 2015 Pre-Consultation Meeting Notes**

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.	Figure 1.2
√	Summary of Pre-consultation Meeting with City and other approval agencies.	Section 1.6
√	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Section 1.3
√	Statement of objectives and servicing criteria	Section 1.1, 2.3, 3.3 & 4.3
√	Identification of existing and proposed infrastructure available in the immediate area.	Figure 1.3 Section 1.5
√	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).	N/A
√	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Figure 5.1 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 1.7

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

DEVELOPMENT SERVICING REPORT: WATER

	ITEM DESCRIPTION	LOCATION
√	Confirm consistency with Master Servicing Study, if available	Section 2.2
√	Availability of public infrastructure to service proposed development	Section 2.1
√	Identification of system constraints – external water needed	Sections 2.1
√	Identify boundary conditions	Section 2.3.4
√	Confirmation of adequate domestic supply and pressure	Section 2.4.2 & 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 2.4.2
√	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 2.4.2 Appendix B
	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defining phases of the project including the ultimate design.	N/A
	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 2.4.2 Appendix B
√	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Detail Design
√	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities and timing of implementation.	N/A
√	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 2.3.1
√	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 3.4, 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 3.4 Appendix C
	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix "C") format.	Section 3.4 & 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).	N/A
√	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
√	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 4.3
√	Analysis of available capacity in existing public infrastructure.	N/A
√	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Figure 4.1

√	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.	Targets established in MDP Update summarized in Section 4.2
√	Water quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Targets established in MDP Update summarized in Section 4.2; storage requirements summarized in Section 4.4.1.1
√	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 4.3, 4.4
√	Set-back from private sewage disposal systems.	N/A
√	Watercourse and hazard lands setbacks.	Figure 4.1 and 4.2
√	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, Section 4.4.1 and Section 4.4.2
√	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 4.4.1 and 4.4.2, 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.	Figure 4.1 and 4.2
	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.	N/A
√	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Ditch network discussed in Section 4.4.1.2
	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.	N/A
√	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 4.4.1 and 4.4.2, 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.	Detail Design
	Inclusion of hydraulic analysis including hydraulic grade line elevations.	Hydraulic analysis of ditch network enclosed
√	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 1.7

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 6.3
	Application for Certification of Approval (CofA) under the Ontario Water resources Act.	Section 6.2 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

Riverside South / Riverside-sud

SECONDARY PLAN - VOLUME 2

Schedule A - Designation Plan

PLAN SECONDAIRE - VOLUME 2

Annexe A - Plan de désignation

0 125 250 500 750 1,000 m

Planning, Real Estate and Economic Development Department, Geospatial Analytics, Technology and Solutions
Services de la planification, des biens immobiliers et du développement économique
Analyse géospatiale, technologie et solutions

DRAFT

Jan 24, 2022 Rev 3

LEITRIM ROAD REALIGNMENT
NOUVEAU TRACÉ DU CHEMIN LEITRIM

BOWESVILLE

Airport Operating Influence Zone
Zone d'influence d'exploitation de l'aéroport

SPRATT ROAD EXTENSION/
PROLONGEMENT DE CHEMIN SPRATT

Vimy Memorial Bridge /
Pont commémoratif Vimy

SPRATT

SHORELINE

CANYON WALK

EARL ARMSTRONG

MAIN STREET/
RUE PRINCIPALE

ruisseau Mosquito Creek

COLLECTOR/
COLLECTRICE 'F'

COLLECTOR/
COLLECTRICE 'G'

COLLECTOR/
COLLECTRICE 'H'

COLLECTOR/
COLLECTRICE 'I'

Town Centre Boundary
Limite du centre ville

RIVIÈRE RIDEAU RIVER

RIDEAU RIVER

SPRATT

COLLECTOR/
COLLECTRICE 'J'

COLLECTOR/
COLLECTRICE 'A'

COLLECTOR/
COLLECTRICE 'B'

COLLECTOR/
COLLECTRICE 'C'

LIMEBANK

COLLECTOR/
COLLECTRICE 'D'

COLLECTOR/
COLLECTRICE 'E'

DESIGNATION / DÉSIGNATION

- LD - Neighbourhood - Low Density / Quartier de faible densité
- MD - Neighbourhood - Medium Density / Quartier de densité moyenne
- HD1 - Neighbourhood - High Density 1 / Quartier de densité élevée 1
- HD2 - Neighbourhood - High Density 2 / Quartier de densité élevée 2
- TC - Town Centre / Centre ville
- NC - Commercial - Neighbourhood / Commercial quartier
- LC - Commercial - Local / Commercial local
- ESD - Employment and Special District / Emploi et District Particulier
- I/F - Institutional / Firehall / Institutionnel / Caserne de pompiers
- FC / FP / EC / EP - Schools - Secondary - Elementary / Écoles - secondaire - élémentaire
- DP - Park - District / Parc secteur
- CP - Park - Community / Parc communautaire
- NP - Park - Neighbourhood / Park quartier
- SP - Park - Parkette / Mini-parc
- OS - Passive Open Space(s) / Espace(s) de détente
- NEA - Natural Environment Area / Zone écologique naturelle
- SWM - Stormwater Management Facility / Installation de gestion des eaux pluviales
- UNF - Urban Natural Feature / Caractéristique naturelle zone urbaine
- UC - Green Transportation and Utility Corridor(s) / Transport vert et couloir(s) de(s) service(s) public(s)
- P&R - Park and Ride / Parc-o-bus
- Multi-Use Pathway / Sentier polyvalent

- Transfer Station / Station de correspondance
- Future O-Train Station / Station O-Train (futur)
- O-Train and Station / O-Train et station
- Transitway – at grade / Transitway – Voie à niveau
- Scenic Route / Route panoramique
- Main Street / Rue principale
- Transit Street / Rue longeant la Ligne Trillium, où circulent les autobus
- Secondary Plan Boundary / Limite du Plan secondaire

Consolidation and Amendments / Amendment au plan directeur approuvé

J:\136974_RSS_Employme\7.0_Production\7.03_Design\04_Civil_LAND_Adequacy Report\136974-Fig-1.1-Location Plan.dwg Layout Name: FIGURE 1.1 LOCATION PLAN Last Saved By: ddore Last Saved At: Jul. 12, 22

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	RIVERSIDE SOUTH EMPLOYMENT LANDS AND BLOCKS 13, 14	LOCATION PLAN	FIGURE 1.1

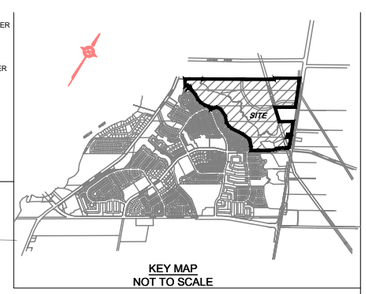
J:\136974_RSS_Employme\7.0_Production\7.03_Design\04_Civil_LAND_Adequacy Report\FIGURE 1.2 DRAFT PLAN.dwg Layout Name: DRAFT PLAN Last Saved By: ddore Last Saved At: Jul. 12, 22

REVISION SCHEDULE			
NO.	REVISION	DATE	BY
4	ADDED BLOCKS 14 & 15, FUTURE MUP & PATH	JUNE 17, 2022	ns
3	REVISIONS	APR. 20, 2022	N
2	ADJUSTED STREET No. 2	MAY 23, 2019	N
1	PLAN PREPARED	MAY 21, 2019	N

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

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

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



KEY MAP
NOT TO SCALE

DRAFT PLAN OF SUBDIVISION OF
PART OF LOTS 16, 17 And 18
CONCESSION 1 (RIDEAU FRONT)
Geographic Township of Gloucester
CITY OF OTTAWA
Prepared by ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

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

SURVEYOR'S CERTIFICATE

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

_____ Date

_____ T. Hartwick
ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

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

_____ Date

_____ Marcel Denomme
Authorized Signing Officer
Riverside South Development Corp.
I have the authority to bind the corporation.

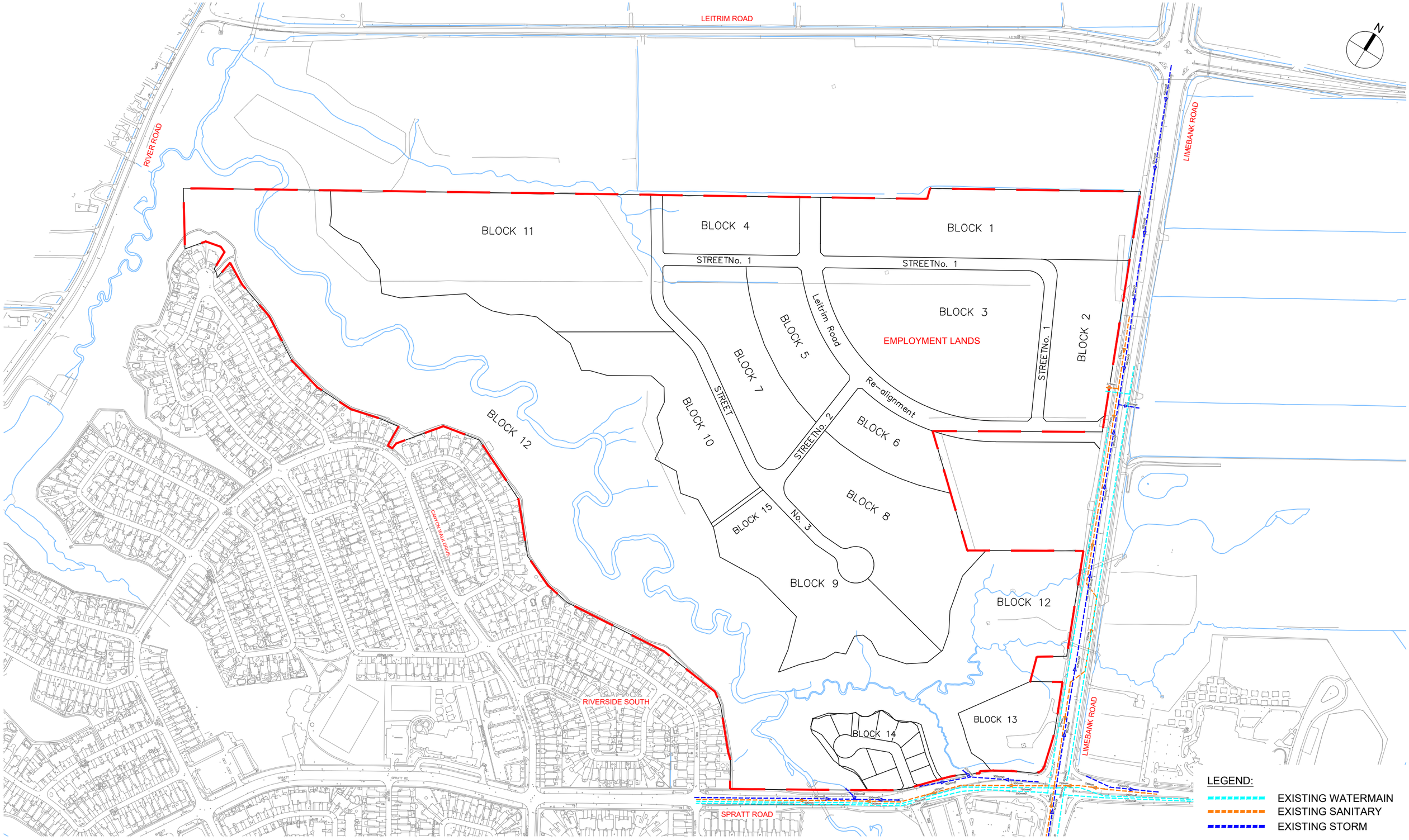
ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 OF THE PLANNING ACT

(a) see plan
(b) see plan
(c) see plan
(d) Business Park, Institutional, Valley Lands, and Storm Water Management Area
(e) see plan
(f) see plan
(g) see plan
(h) City of Ottawa
(i) see soils report
(j) see plan
(k) sanitary, storm sewers, municipal water, bell, hydro, cable and gas to be available
(l) see plan

AREA SCHEDULE	
BLOCK	AREA Ha / Ac
1	4.851 / 11.99
2	2.524 / 6.24
3	6.210 / 15.35
4	1.890 / 4.67
5	1.946 / 4.81
6	1.511 / 3.73
7	3.202 / 7.91
8	4.513 / 11.15
9	3.804 / 9.40
10	3.356 / 8.29
11	8.450 / 20.88
12	32.379 / 80.01
13	1.597 / 3.95
14	1.646 / 4.07
15	0.056 / 0.140
STREETS	5.119 / 12.65
TOTAL	83.054 / 205.24

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nsoan@asvltd.com
Ontario Land Surveyors
Job No. FIGURE 1.2 DRAFT PLAN | N

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	RIVERSIDE SOUTH EMPLOYMENT LANDS AND BLOCKS 13, 14	DRAFT PLAN	FIGURE 1.2



J:\136974_RSS_Employme\7.0_Production\7.03_Design\04_Civil_LAND_Adequacy Report\FIGURE 1.3 EXISTING INFRASTRUCTURE.dwg Layout Name: EXISTING INFRASTRUCTURE Last Saved By: ddore Last Saved At: Jul. 12, 22

IBI

Scale

N.T.S.

Project Title

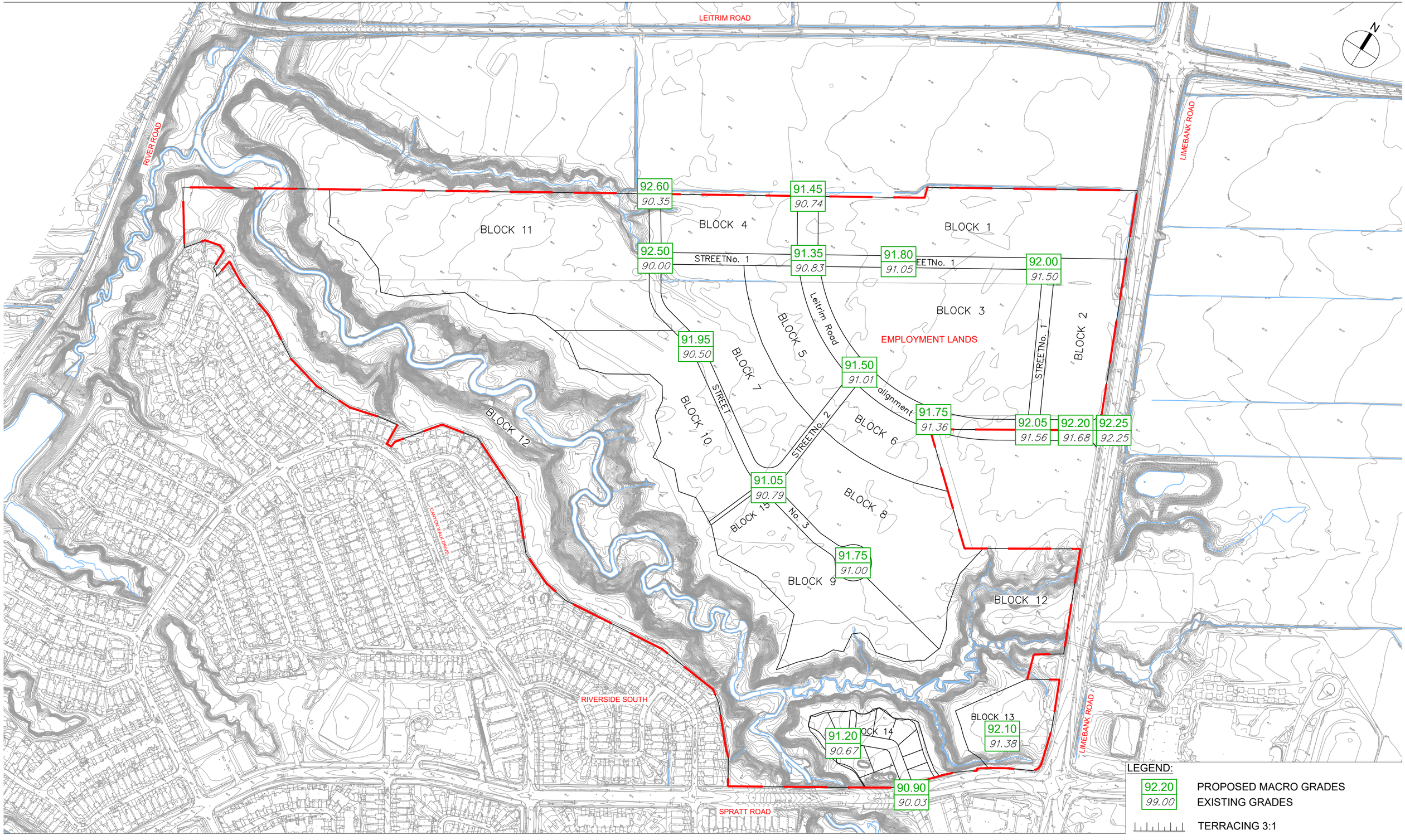
RIVERSIDE SOUTH
EMPLOYMENT LANDS
AND BLOCKS 13, 14

Drawing Title

LOCATION OF
EXISTING INFRASTRUCTURE

Sheet No.

FIGURE 1.3



J:\136974_RSS_Employme\7.0_Production\7.03_Design\04_Civil_LAND_Adequacy Report\FIGURE 5.1 CONCEPTUAL GRADING PLAN.dwg Layout Name: CONCEPTUAL GRADING PLAN Last Saved By: ddore Last Saved At: Jul. 12, 22

IBI

Scale: N.T.S.

Project Title: RIVERSIDE SOUTH EMPLOYMENT LANDS AND BLOCKS 13, 14

Drawing Title: CONCEPTUAL GRADING PLAN

Sheet No.: FIGURE 5.1

M E M O / N O T E D E S E R V I C E

To / Destinataire	File **Final** Meeting Notes – April 7, 2015	File/N° de fichier: PC 2014-0201 Part of 3700 Twin Falls Place Now 4020 Spratt Road
From / Expéditeur	Cathlyn Kaufman Development Review – Suburban - Southeast Planning and Growth Management	Date: April 29, 2015

Subject: Pre-consultation Meeting –
For Subdivision and Zoning Application
Where: City Hall, 110 Laurier Avenue, Meeting Room 4102
Date: April 7, 2015
Time: 10:30 am to 12:00 pm

Those in attendance:
City: Cathlyn Kaufman, File Lead Planner
Jacek Taracha, Senior Engineer,
Asad Yousfani, Project Manager, Transportation
Don Morse, Planner III, Urban Design
Matthew Hayley, Planner II, Environment

Applicant: Mary Jarvis, RSDC
Lucie Dalrymple, J.L. Richards and Associates (Engineering)
Curtiss Scarlett, J.L. Richards and Associates (Engineering)
Lee Jablonski, J.L. Richards and Associates (Transportation)
Katie Morphet, J.L. Richards and Associates (Planning)
Tim Chadder, J.L. Richards and Associates (Planning)
Alex Zeller, Dillon Consulting
Erin Wilson, Golder Associates
David Gilbert, Parterson Group

Regards: Gord Elliott, Project Manager, Infrastructure, Jennifer Hemmings, Parks Planner,
Jocelyn Chandler, RVCA: Martha Copestake, Forestry Planner;

Further Comments received from :
1. Municipal Addressing, April 20, 2015 (provided on Page 4)
2. Jocelyn Chandler, April 10, 2015 (Attached on Page 4)
3. Gord Elliott, April 29, 2015 (provided on Page 5)

The detailed 'Applicant's Study and Plan Identification List' will be provided as a separate document.

Purpose:

A pre-application consultation meeting for Subdivision and Zoning applications for under 50 unit plan of subdivision know as Riverside South – Phase 16. The number of units is to be confirmed.

Location Summary Details:

The parcel, referenced as part of 3700 Twin Falls Place, will be re-addressed to have a Spratt Road address. This parcel is part of a large landholding which is bisected by Mosquito Creek and a small ravine. The area being proposed to be developed is 2.72 hectares on the north side of Spratt Road, south side of Mosquito Creek and approximately 200 metres west of Limebank Road.

Note: At the meeting it was determined that the parcel to the east of this site located in the north west quadrant of the intersection of Limebank Road and Spratt Road will be developed in the future through the following possible planning applications : severance, site plan and zoning.

Items discussed in an Open Forum

1. Proposed Development is based on Pre-application consultation dated September 2014 and draft subdivision concept plan received by the City in March 2015.
   Number of Townhouses: under 50 units? To be confirmed
   Ravine Setback Block – 15 metre top of bank/slope ore limit of hazard lands whichever is the greater.
   Valley Lands of Mosquito Creek and the small ravine to the east are outside of the subdivision.
2. Engineering points raised:
   - it is recognized that the stormwater (SW) from this subdivision will drain to Mosquito Creek via a storm sceptor at a location that will be determined.
   - the outfall of the municipally owned storm scepter which is outside of the subdivision will be shown as a block on the Draft 4M-plan and set out in a Draft Condition.
   - there much discussion around if watermain looping would be required and this is to be determined once the number of units is confirmed. If the total number of units is 50 or more that watermain will have to be looped.
   - since the Master Servicing Study contemplated that this parcel and the parcel to the east would be developed together there was further consideration given to how the service the parcels separately.
   - it was noted that the water main in the north section of Limebank Road is not live.
   - Jacek to confirm the watermain connection to the existing 350 mm dia HDPE pipe in Spratt Road.
   - Spratt Road will have to be ripped up to allow connection to sanitary sewer and the watermain.
   - The issue of stormwater management storage requirements and what to design to is to be.
   It is confirmed, after, the meeting, that the original 50m3/ha sag storage is OK providing that the 0.30 allowed ponding depth and the inlet capacity of 94 l/s/ha is maintained.
   After conversation with RVCA on April 16, 2015, there will be a requirement that the existing Spratt Road storm sewer to be redirected via the subdivision to the proposed oil and grit separator (sceptor unit).
3. Geotechnical discussion
   - the limit of development will be determined and best location for the storm sceptor have to be further examined as to the possible 'best' recommended location given slope issues and possible environmental constraints such as significant trees
4. RVCA – both the limit of development, storm sceptor location and outfall design will be subject to RVCA review and possible permits as determined.

5. Transportation Discussion

- due to the size of this subdivision and the fact that there is an existing intersection with traffic signals that will be used to access this subdivision, a Traffic Memo was requested.
- it was noted that the proposed public street within the subdivision is to align with the existing intersection.
- after Draft Plan approval and before subdivision registration, there will be a requirement for Road Modification Design at 80% complete to be submitted and approved.
- Cul-de-sac design was reviewed. 18 m radius with 16.50 m Right-of-way. Pavement width would be 8.5 metres of asphalt with 4 metres of boulevard on each side. This would allow a 14 metre radius of asphalt in the cul-de-sac which is what the Fire Department and City Operations requires for turning the large vehicles.

6. Park Dedication Requirement

- will be based on the units proposed and will be tracked through a condition of subdivision registration of the accumulation of parkland for a District Park.
- An approved Riverside South modified Area Park Plan (mAPP) will required to be in place prior to the registration of the subdivision.

7. Urban Design Comments:

- the proposed layout is similar to the existing Riverside South (RS) CDP and this area of Riverside South will probably be minimally impacted by the updated that is being done for the RS CDP.
- design of units will be to the internal public street but noise walls should be avoided.
- consider the unique location of the site as it is surrounded by ravine lands and the Mosquito Creek valley land. Design should be keep open with minimal fencing requirements where possible.
- the area is shown as low density but medium density could be considered for this parcel.
- the site layout will be refined as the lotting layout was not totally being accessed via the internal public road.

8. Environmental Matters:

- An Environment Impact Statement is required to look at the following items and this is not an all inclusive list as there may be other item found once the seasonal studies are completed:
    - should consider significant valley lands and woodlands.
    - species at risk (Endangered and Threatened Species)
    - woods – distinctive trees
- there was some questions about the proposed subdivision design and it was recognized that the subdivision layout will be refined.
- the EIS will need to include a discussion of where the stormwater outlet can/will be located from an environmental prespective.
- Tree Conservation Report required.

9. Archaeological Resource Assessment

- Mosquito Creek considered an important waterway.

Therefore for property within 300 metres of waterway and 100 metres of important overland route (Limebank Road) – an archaeological assessment is required.

- there has been some field work done.
- 3 copies required with Draft Plan application together with proof the Assessment has been submitted to Province.
- Study will probably include both Parcels as the properties are being assessed together.

10. Planning Process: Subdivision and Zoning can move forward at same time. It was noted that until the Limit of Development is clearly defined there may be a need to put the Zoning Application ‘On Hold’ until the development limit is accepted and approved.

Other Items:

Note: As a follow-up to the meeting, the Riverside South CDP dated January 15, 2015 does show the subject parcel as medium density. If the planning application are submitted in advance of the Riverside South CDP update, this proposed medium density land use should be recognized.

Additional Information and Comments:

1. Municipal Addressing: (April 20, 2015)
    - Parcel 1 west of small green corridor on RS CDP – 4020 Spratt Road.
    - Parcel 2 east of small green corridor on RS CDP – 4010 Spratt Road

2. RVCA: Jocelyn Chandler (April 10, 2015)

I have had a preliminary look at the proposed subdivision lands and draft meeting minutes and have the following comments on behalf of the RVCA:

1. The main stem of Mosquito Creek R-3 which is at the south-west boundary of the site will require site specific delineation of constraint lines as follows:

    - 30 m from NHWM
    - 15 from Top of slope
    - Geotechnical as per MNR & city of Ottawa Guidelines
    - Meanderbelt

2. Tributary 3 at the north-west boundary of the site will require site specific delineation of constraint lines as above. At one time there were proposed works related to erosion thresholds proposed along this reach. What is the status of these works (or proposed works). Might this change through completion of the MSS Update?
3. Tributary 3C/D as shown in red on the attached map appears to have been considered during the fisheries assessment and DFO work. It was expected to be filled and was accounted for in the compensation calculations (to be confirmed). It is our understanding that because this work was already reviewed and approved under the Fisheries Act, no other fisheries assessment under DFO will be required.
4. If Trib 3C/D is to be filled, a permit to alter (fill/close) this watercourse will be required under O.Reg 174/06, and any upstream drainage accounted for.
5. Based on above the north-east boundary will require rational (will Trib C/D be retained?... therefore setbacks required or will it be closed and the lot line with the adjacent future development to be established.
6. It is our understanding that stormwater will be collected and outletted to Mosquito Creek directly. Quality controls must be 80% TSS removal. Quantity as per thresholds identified in RSS MSS.
7. Location of these stormwater outlets must be discussed directly with RVCA watercourse regulations staff (Hal Stimson).
8. A permit under O.Reg 174/06 will be required prior to any works on the bed or banks of any watercourses.
9. We strongly advise that sediment curtains and orange construction fencing must be set up along the constraint boundaries adjacent the watercourses prior to undertaking any works on the site.

3. Infrastructure Comments: Gord Elliott (April 29, 2015)

Per our conversation yesterday I have the following additional comments that need further discussion with RSDC, I left a message with Mary Jarvis but as of today have not rec'd a return call.

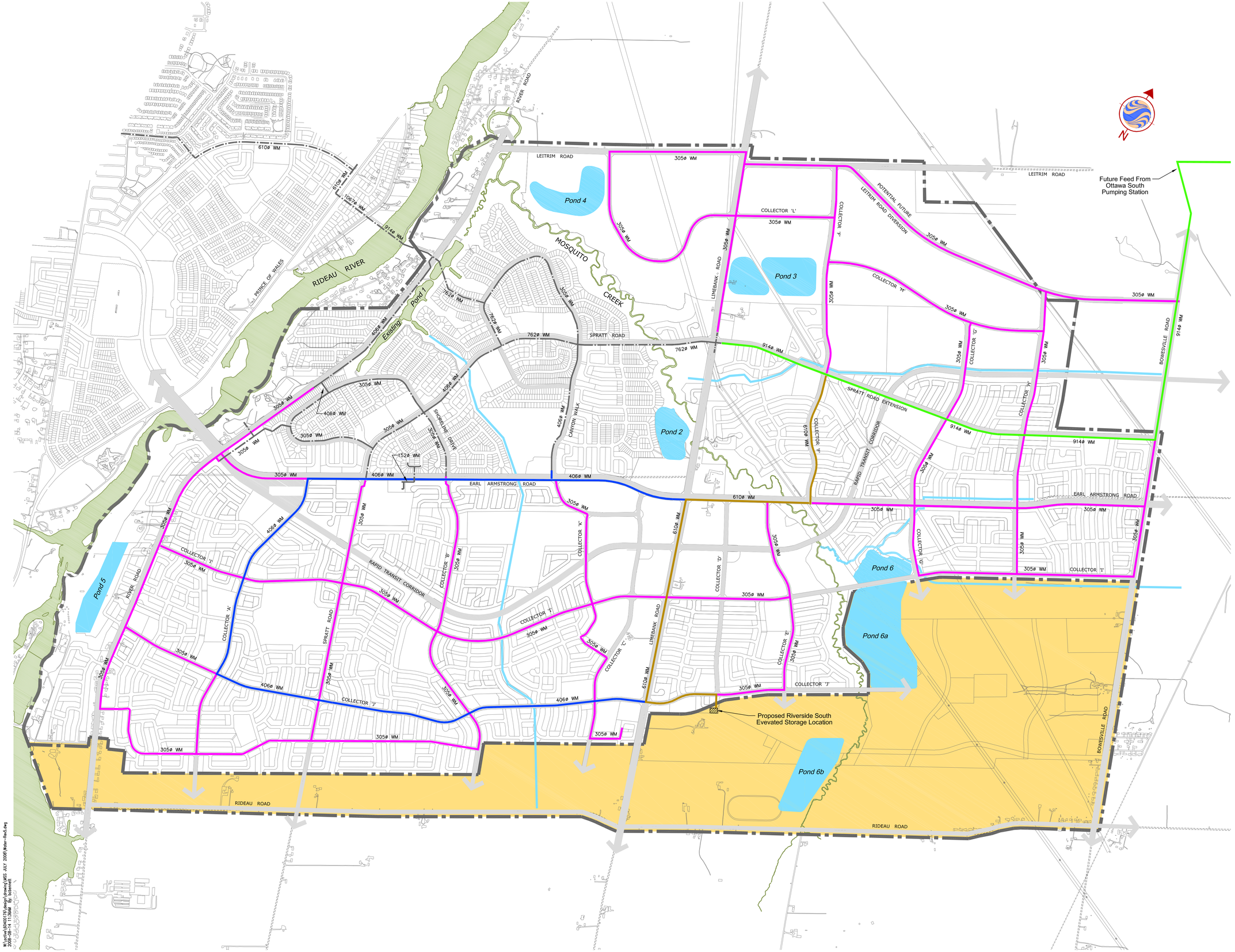
1. RSDC should have further discussion with the City & RVCA on land development benefits of filling Tributary# 3D. Some of the benefits may include eliminating most of the set back requirements to the ravine, providing more developable land, provides opportunity for a "servicing corridor" and watermain looping to both blocks of land (currently isolated by the ravine), potential for one SWM treatment location + one outlet pipe to Mosquito creek and it may provide better access for both site (ie existing traffic lights @ plaza vs restricted rt in rt out).

2. I have rec'd confirmation from Chris Hamilton in Drinking Water Services Division (see separate e-mail) that the existing 350 HDPE pipe in Spratt Rd will remain in service and this project must connect to the 350 pipe in Spratt Rd.

Further discussion on this matter with Mary and the consultants is suggested.

Appendix B

- Drawing WM-1 Proposed Water Servicing (RSCISSU)
- Figure 2.1 Conceptual Water Plan
- City of Ottawa Boundary Conditions
- Watermain Demand Calculation Sheet
- Modeling Output Files



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Fax. 613.722.2799
www.stantec.com

Legend

- Proposed SWM Facility
- Overland Flow Corridor
- Riverside South (Urban Boundary Limit)
- Existing Watermain
- Proposed 305Ø Watermain
- Proposed 406Ø Watermain
- Proposed 610Ø Watermain
- Proposed 914Ø Watermain
- Special Study Area (SSA)

Note:

1. See "River Ridge Water Supply Assessment" (Stantec - January 2005)

5	FINAL SUBMISSION	BCB	NG	JULY 30/08
4	FINAL REPORT (DRAFT)	BCB	NG	MAR 5/08
3	GENERAL REVISIONS	BCB	PM	JAN 25/08
2	REVISED TRANSIT ALIGNMENT	DRP	DRP	MAY 17/06
1	REVISED AS PER CITY COMMENTS	DFE	JK	FEB 14/05
Revision		By	Appd.	YY.MM.DD

File Name: 60400176-MSS	BCB	JK	FW	FEB. 2007
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Seal

Client/Project

Riverside South Development Corporation

Riverside South Community
Master Servicing Study Update
Ottawa ON Canada

Title

PROPOSED WATER SERVICING

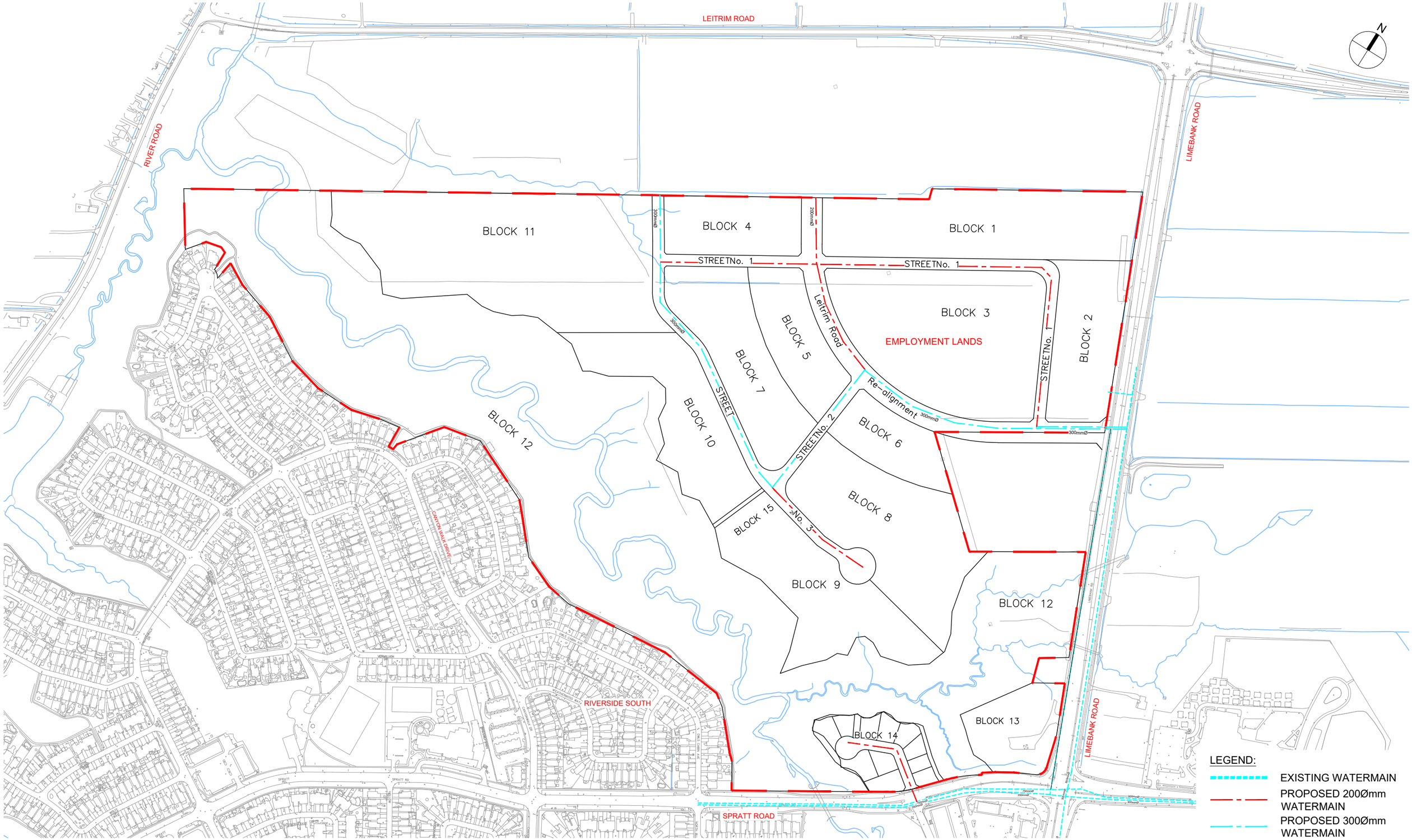
Project No. 60400176

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

Drawing No. WM-1

Sheet 7 of 7

Revision 5



J:\136974_RSS_Employme\7.0_Production\7.03_Design\04_Civil_LAND_Adequacy Report\FIGURE 2.1 CONCEPTUAL WATER SERVICES.dwg Layout Name: CONCEPTUAL WATER SERVICES Last Saved By: ddore Last Saved At: Jul. 12, 22

IBI

Scale

N.T.S.

Project Title

RIVERSIDE SOUTH
EMPLOYMENT LANDS
AND BLOCKS 13, 14

Drawing Title

CONCEPTUAL WATER SERVICES

Sheet No.

FIGURE 2.1

Boundary Conditions
Employment Lands

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	786	13.10
Maximum Daily Demand	1,968	32.80
Peak Hour	4,332	72.20
Fire Flow Demand #1	10,000	166.67
Fire Flow Demand #2	13,000	216.67

Location

Results – Existing Conditions

Connection 1 – Spratt Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	131.8	56.9
Peak Hour	125.3	47.7
Max Day plus Fire 1	126.4	49.3
Max Day plus Fire 2	125.3	47.7

Ground Elevation = 91.7 m

Connection 2 – Limebank Rd. / Spratt Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	131.8	56.9
Peak Hour	125.3	47.7
Max Day plus Fire 1	127.4	50.7
Max Day plus Fire 2	126.8	49.9

Ground Elevation = 91.8 m

Results – SUC Zone Reconfiguration

Connection 1 – Spratt Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	148.4	80.5
Peak Hour	145.7	76.7
Max Day plus Fire 1	145.1	75.9
Max Day plus Fire 2	144.2	74.6

Ground Elevation = 91.7 m

Connection 2 – Limebank Rd. / Spratt Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	148.4	80.5
Peak Hour	145.8	76.8
Max Day plus Fire 1	146.2	77.4
Max Day plus Fire 2	145.8	76.9

Ground Elevation = 91.8 m

Notes

1. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
    a. If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
    b. Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

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 : RSS EMPLOYMENT LANDS
LOCATION : CITY OF OTTAWA
DEVELOPER : RIVERSIDE SOUTH DEVELOPMENT CORPORATION

FILE: 136974
DATE PRINTED: 04-Jul-22
DESIGN: LE
PAGE : 1 OF 1

NODE	BLOCK	RESIDENTIAL UNITS SF	RESIDENTIAL UNITS SD & TH	RESIDENTIAL UNITS MD (ha)	POP'N	NON-RESIDENTIAL INDTRL (ha.)	NON-RESIDENTIAL COMM. (ha.)	NON-RESIDENTIAL INST. (ha.)	AVERAGE DAILY DEMAND (l/s) Res.	AVERAGE DAILY DEMAND (l/s) Non-res.	AVERAGE DAILY DEMAND (l/s) Total	MAXIMUM DAILY DEMAND (l/s) Res.	MAXIMUM DAILY DEMAND (l/s) Non-res.	MAXIMUM DAILY DEMAND (l/s) Total	MAXIMUM HOURLY DEMAND (l/s) Res.	MAXIMUM HOURLY DEMAND (l/s) Non-res.	MAXIMUM HOURLY DEMAND (l/s) Total	FIRE DEMAND (l/min)
J2	2						2.52		0.00	0.82	0.82	0.00	1.23	1.23	0.00	2.21	2.21	13,000
J3	3						6.21		0.00	2.01	2.01	0.00	3.02	3.02	0.00	5.43	5.43	13,000
J4	1						4.85		0.00	1.57	1.57	0.00	2.36	2.36	0.00	4.24	4.24	13,000
J5	5						1.95		0.00	0.63	0.63	0.00	0.95	0.95	0.00	1.71	1.71	13,000
J7	11						4.85		0.00	1.57	1.57	0.00	2.36	2.36	0.00	4.24	4.24	13,000
J8	4						1.89		0.00	0.61	0.61	0.00	0.92	0.92	0.00	1.65	1.65	13,000
J9	7, 10						6.57		0.00	2.13	2.13	0.00	3.19	3.19	0.00	5.75	5.75	13,000
J11	8, 9						8.31		0.00	2.69	2.69	0.00	4.04	4.04	0.00	7.27	7.27	13,000
J12	6						1.51		0.00	0.49	0.49	0.00	0.73	0.73	0.00	1.32	1.32	13,000
J13	OTHER						3.63		0.00	1.18	1.18	0.00	1.76	1.76	0.00	3.18	3.18	13,000
J14	13						1.60		0.00	0.52	0.52	0.00	0.78	0.78	0.00	1.40	1.40	13,000
J17	14		21		57				0.18	0.00	0.18	0.46	0.00	0.46	1.01	0.00	1.01	10,000
J18	14		18		49				0.16	0.00	0.16	0.39	0.00	0.39	0.87	0.00	0.87	10,000
											14.56			22.19			40.28	

ASSUMPTIONS

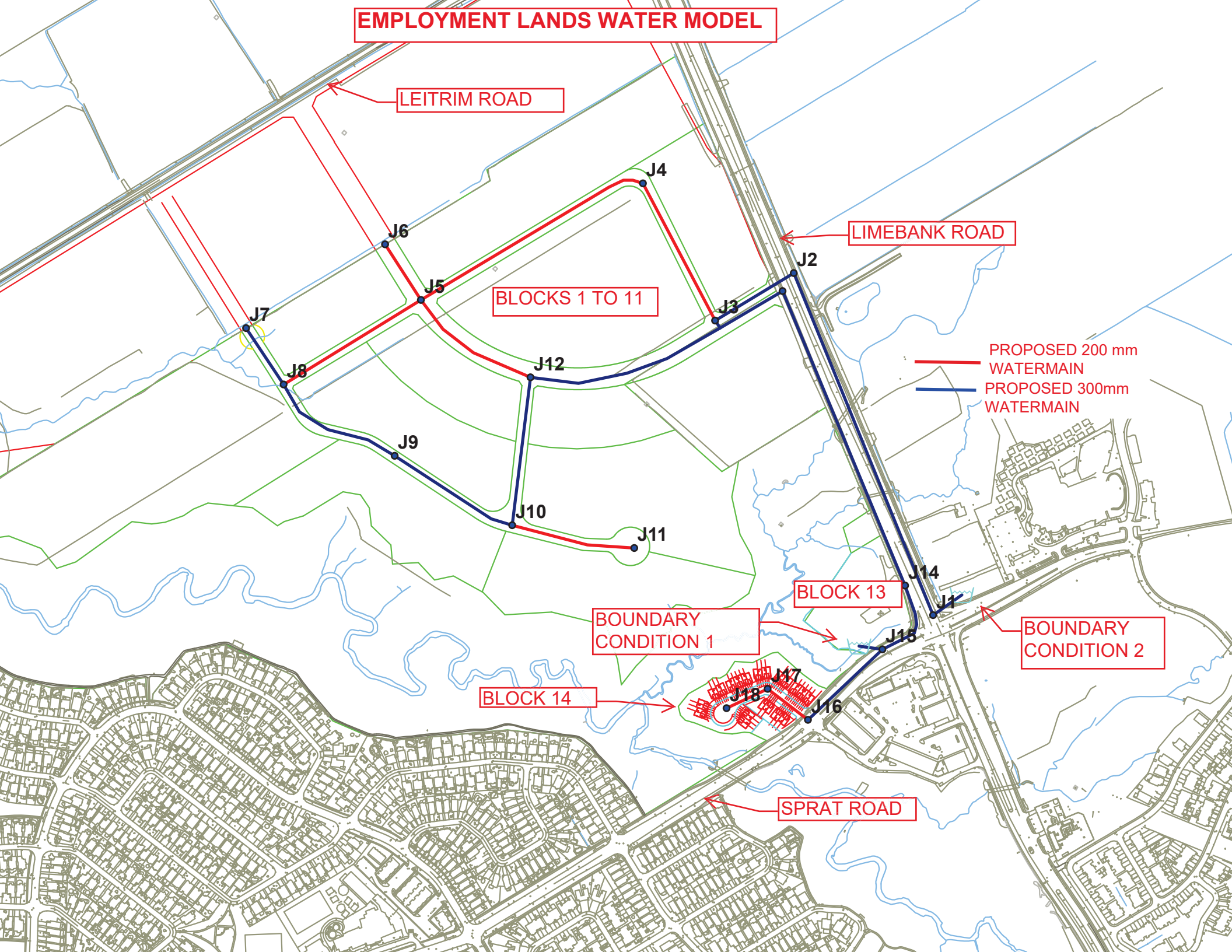
RESIDENTIAL DENSITIES
- Single Family (SF) 3.4 p / p / u
- Semi Detached (SD) & Townhouse (TH) 2.7 p / p / u
- Apartment (APT) 1.8 p / p / u
-Medium Density Area (MD) 130 p / p / ha

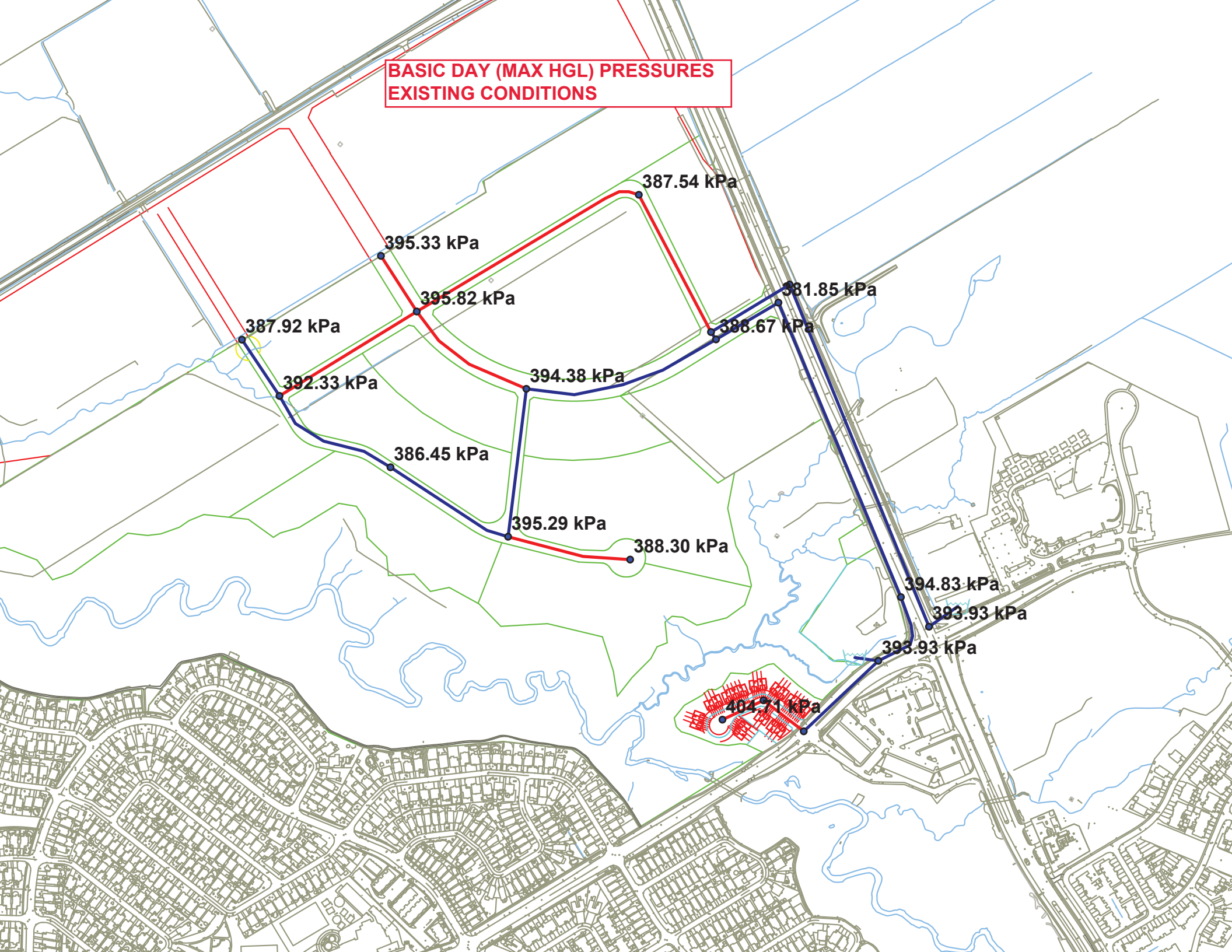
AVG. DAILY DEMAND
- Residential 280 l / cap / day
- ICI 28,000 l / ha / day

MAX. DAILY DEMAND
- Residential 700 l / cap / day
- ICI 42,000 l / ha / day

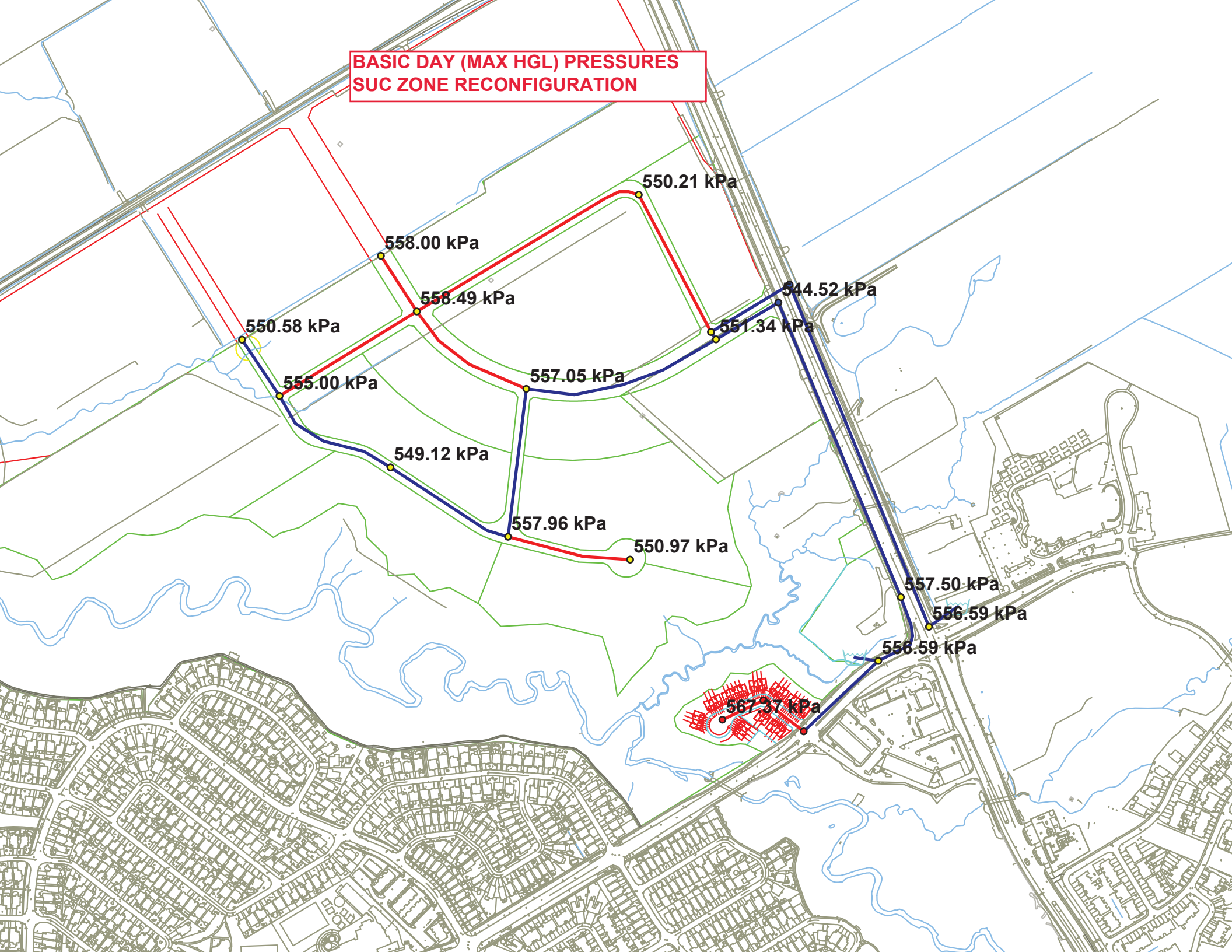
MAX. HOURLY DEMAND
- Residential 1,540 l / cap / day
- ICI 75,600 l / ha / day

FIRE FLOW
- SF, SD, TH & ST 10,000 l / min
l / min
- ICI 13,000 l / min

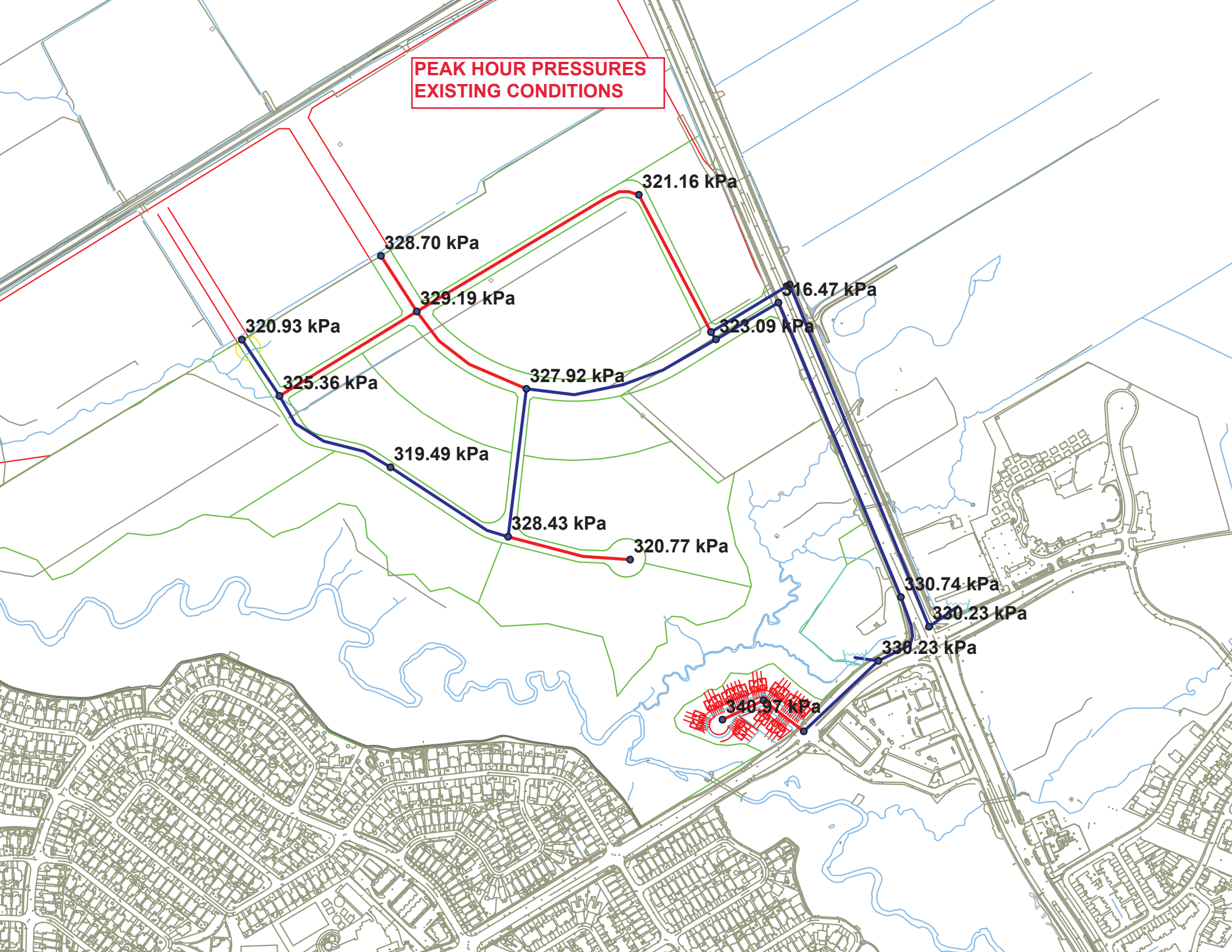

EMPLOYMENT LANDS WATER MODEL
LEITRIM ROAD
LIMEBANK ROAD
SPRAT ROAD
BLOCKS 1 TO 11
BLOCK 13
BLOCK 14
BOUNDARY CONDITION 1
BOUNDARY CONDITION 2
PROPOSED 200 mm WATERMAIN
PROPOSED 300mm WATERMAIN
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10
J11
J12
J14
J15
J16
J17
J18


BASIC DAY (MAX HGL) PRESSURES
EXISTING CONDITIONS
387.54 kPa
395.33 kPa
395.82 kPa
387.92 kPa
381.85 kPa
388.67 kPa
392.33 kPa
394.38 kPa
386.45 kPa
395.29 kPa
388.30 kPa
394.83 kPa
393.93 kPa
393.93 kPa
404.71 kPa

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J1	0.00	91.60	131.80	393.93
2	☐	J10	0.00	91.40	131.74	395.29
3	☐	J11	2.69	92.10	131.73	388.30
4	☐	J12	0.49	91.50	131.75	394.38
5	☐	J13	1.18	92.80	131.77	381.85
6	☐	J14	0.52	91.50	131.79	394.83
7	☐	J15	0.00	91.60	131.80	393.93
8	☐	J16	0.00	90.00	131.80	409.61
9	☐	J17	0.18	90.50	131.80	404.71
10	☐	J18	0.16	90.50	131.80	404.71
11	☐	J2	0.82	92.80	131.77	381.87
12	☐	J20	0.00	92.10	131.76	388.67
13	☐	J3	2.01	92.10	131.76	388.67
14	☐	J4	1.57	92.20	131.75	387.54
15	☐	J5	0.63	91.35	131.74	395.82
16	☐	J6	0.00	91.40	131.74	395.33
17	☐	J7	1.57	92.15	131.74	387.92
18	☐	J8	0.61	91.70	131.74	392.33
19	☐	J9	2.13	92.30	131.74	386.45

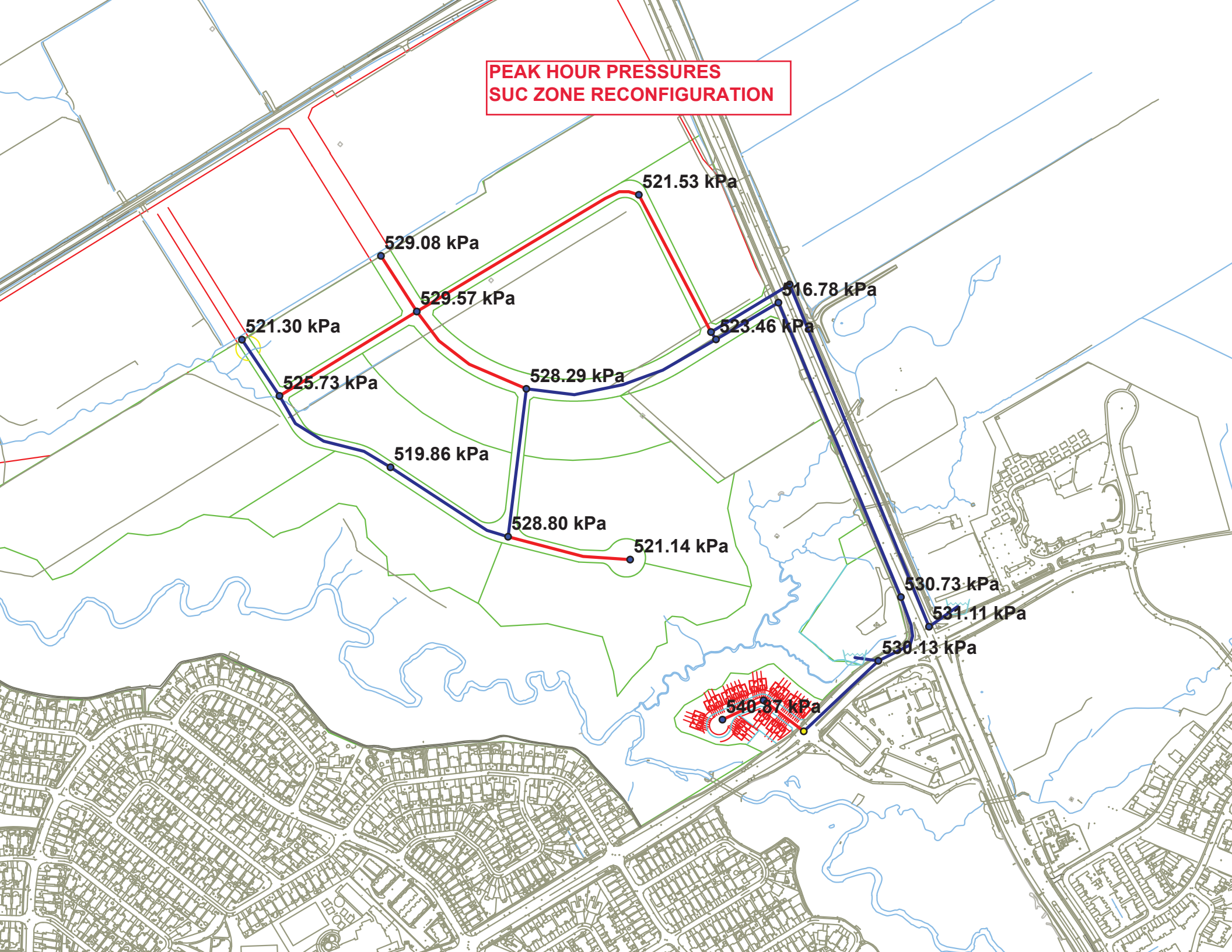

BASIC DAY (MAX HGL) PRESSURES
SUC ZONE RECONFIGURATION
550.21 kPa
558.00 kPa
558.49 kPa
550.58 kPa
544.52 kPa
551.34 kPa
555.00 kPa
557.05 kPa
549.12 kPa
557.96 kPa
550.97 kPa
557.50 kPa
556.59 kPa
556.59 kPa
567.37 kPa

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J1	0.00	91.60	148.40	556.59
2	☐	J10	0.00	91.40	148.34	557.96
3	☐	J11	2.69	92.10	148.33	550.97
4	☐	J12	0.49	91.50	148.35	557.05
5	☐	J13	1.18	92.80	148.37	544.52
6	☐	J14	0.52	91.50	148.39	557.50
7	☐	J15	0.00	91.60	148.40	556.59
8	☐	J16	0.00	90.00	148.40	572.27
9	☐	J17	0.18	90.50	148.40	567.37
10	☐	J18	0.16	90.50	148.40	567.37
11	☐	J2	0.82	92.80	148.37	544.54
12	☐	J20	0.00	92.10	148.36	551.34
13	☐	J3	2.01	92.10	148.36	551.34
14	☐	J4	1.57	92.20	148.35	550.21
15	☐	J5	0.63	91.35	148.34	558.49
16	☐	J6	0.00	91.40	148.34	558.00
17	☐	J7	1.57	92.15	148.34	550.58
18	☐	J8	0.61	91.70	148.34	555.00
19	☐	J9	2.13	92.30	148.34	549.12


PEAK HOUR PRESSURES
EXISTING CONDITIONS
321.16 kPa
328.70 kPa
329.19 kPa
320.93 kPa
316.47 kPa
323.09 kPa
325.36 kPa
327.92 kPa
319.49 kPa
328.43 kPa
320.77 kPa
330.74 kPa
330.23 kPa
330.23 kPa
340.97 kPa

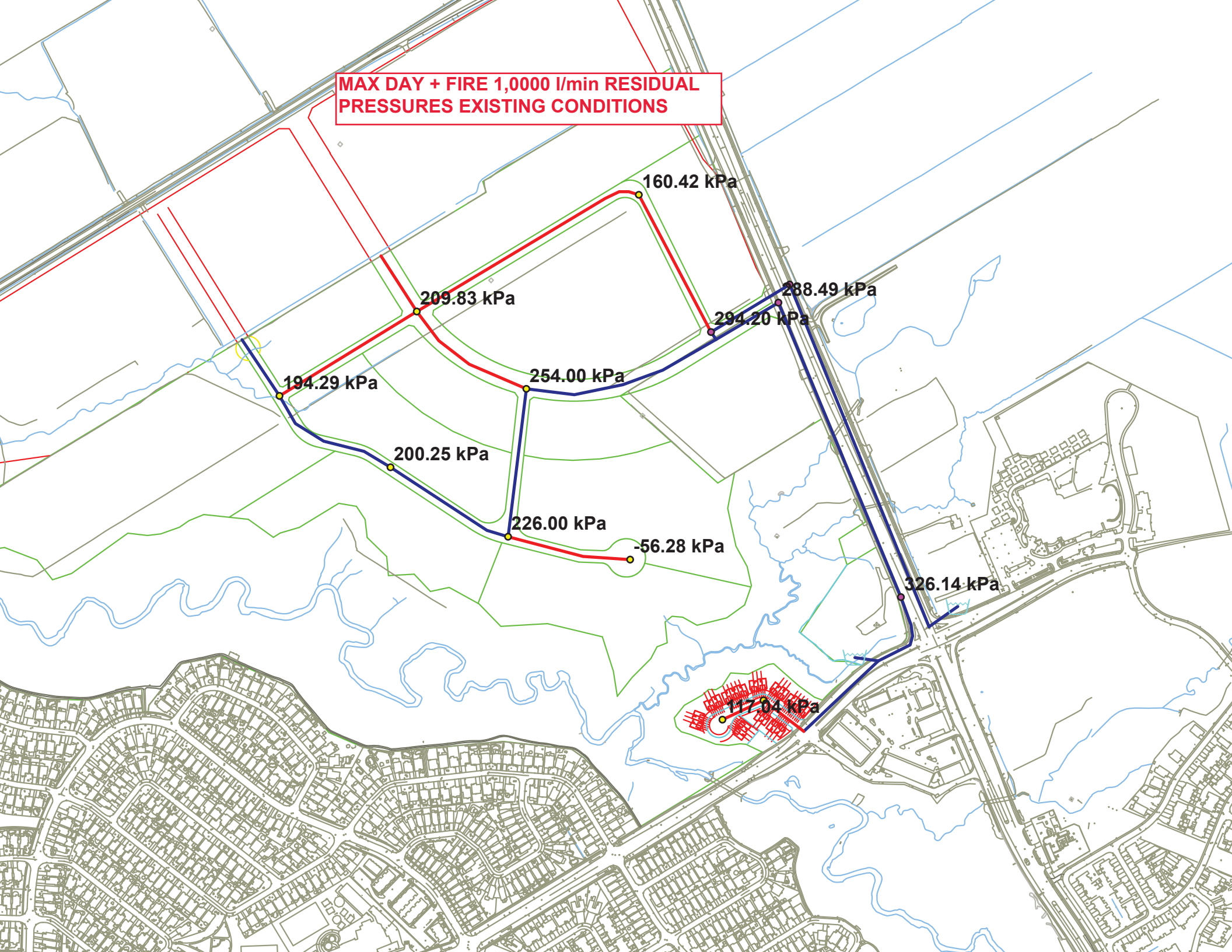
		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J1	0.00	91.60	125.30	330.23
2	☐	J10	0.00	91.40	124.92	328.43
3	☐	J11	7.27	92.10	124.83	320.77
4	☐	J12	1.32	91.50	124.96	327.92
5	☐	J13	3.18	92.80	125.10	316.47
6	☐	J14	1.40	91.50	125.25	330.74
7	☐	J15	0.00	91.60	125.30	330.23
8	☐	J16	0.00	90.00	125.30	345.90
9	☐	J17	1.01	90.50	125.30	340.97
10	☐	J18	0.87	90.50	125.30	340.97
11	☐	J2	2.21	92.80	125.11	316.60
12	☐	J20	0.00	92.10	125.07	323.09
13	☐	J3	5.43	92.10	125.07	323.09
14	☐	J4	4.24	92.20	124.97	321.16
15	☐	J5	1.71	91.35	124.94	329.19
16	☐	J6	0.00	91.40	124.94	328.70
17	☐	J7	4.24	92.15	124.90	320.93
18	☐	J8	1.65	91.70	124.90	325.36
19	☐	J9	5.75	92.30	124.90	319.49

		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
1	☐	P11	J1	J2	540.33	297.00	120.00	18.78	0.27	0.19	0.35	Open	0
2	☐	P13	J3	J2	134.17	297.00	120.00	-16.57	0.24	0.04	0.28	Open	0
3	☐	P15	J3	J4	226.76	204.00	110.00	7.11	0.22	0.10	0.43	Open	0
4	☐	P17	J5	J4	373.19	204.00	110.00	-2.88	0.09	0.03	0.08	Open	0
5	☐	P19	J5	J6	96.71	204.00	110.00	0.00	0.00	0.00	0.00	Open	0
6	☐	P21	J5	J8	235.56	204.00	110.00	4.38	0.13	0.04	0.17	Open	0
7	☐	P23	J8	J7	98.87	297.00	120.00	4.24	0.06	0.00	0.02	Open	0
8	☐	P25	J9	J8	201.22	297.00	120.00	1.51	0.02	0.00	0.00	Open	0
9	☐	P27	J10	J9	200.49	297.00	120.00	7.26	0.10	0.01	0.06	Open	0
10	☐	P29	J11	J10	182.17	204.00	110.00	-7.27	0.22	0.08	0.45	Open	0
11	☐	P31	J10	J12	218.02	297.00	120.00	-14.53	0.21	0.05	0.22	Open	0
12	☐	P33	J12	J5	200.54	204.00	110.00	3.21	0.10	0.02	0.10	Open	0
13	☐	P35	J12	J20	294.76	297.00	120.00	-19.06	0.28	0.11	0.36	Open	0
14	☐	P37	J13	J14	466.62	297.00	120.00	-18.22	0.26	0.16	0.33	Open	0
15	☐	P39	J14	J15	124.95	297.00	120.00	-19.62	0.28	0.05	0.38	Open	0
16	☐	P43	J15	CON1	1.00	297.00	120.00	-21.50	0.31	0.00	0.46	Open	0
17	☐	P45	J1	CON2	1.00	297.00	120.00	-18.78	0.27	0.00	0.35	Open	0
18	☐	P47	J15	J16	149.92	297.00	120.00	1.88	0.03	0.00	0.00	Open	0
19	☐	P49	J16	J17	74.18	204.00	110.00	1.88	0.06	0.00	0.04	Open	0
20	☐	P51	J17	J18	66.36	204.00	110.00	0.87	0.03	0.00	0.01	Open	0
21	☐	P53	J20	J13	105.87	297.00	120.00	-15.04	0.22	0.02	0.23	Open	0
22	☐	P55	J20	J3	12.95	297.00	120.00	-4.02	0.06	0.00	0.02	Open	0

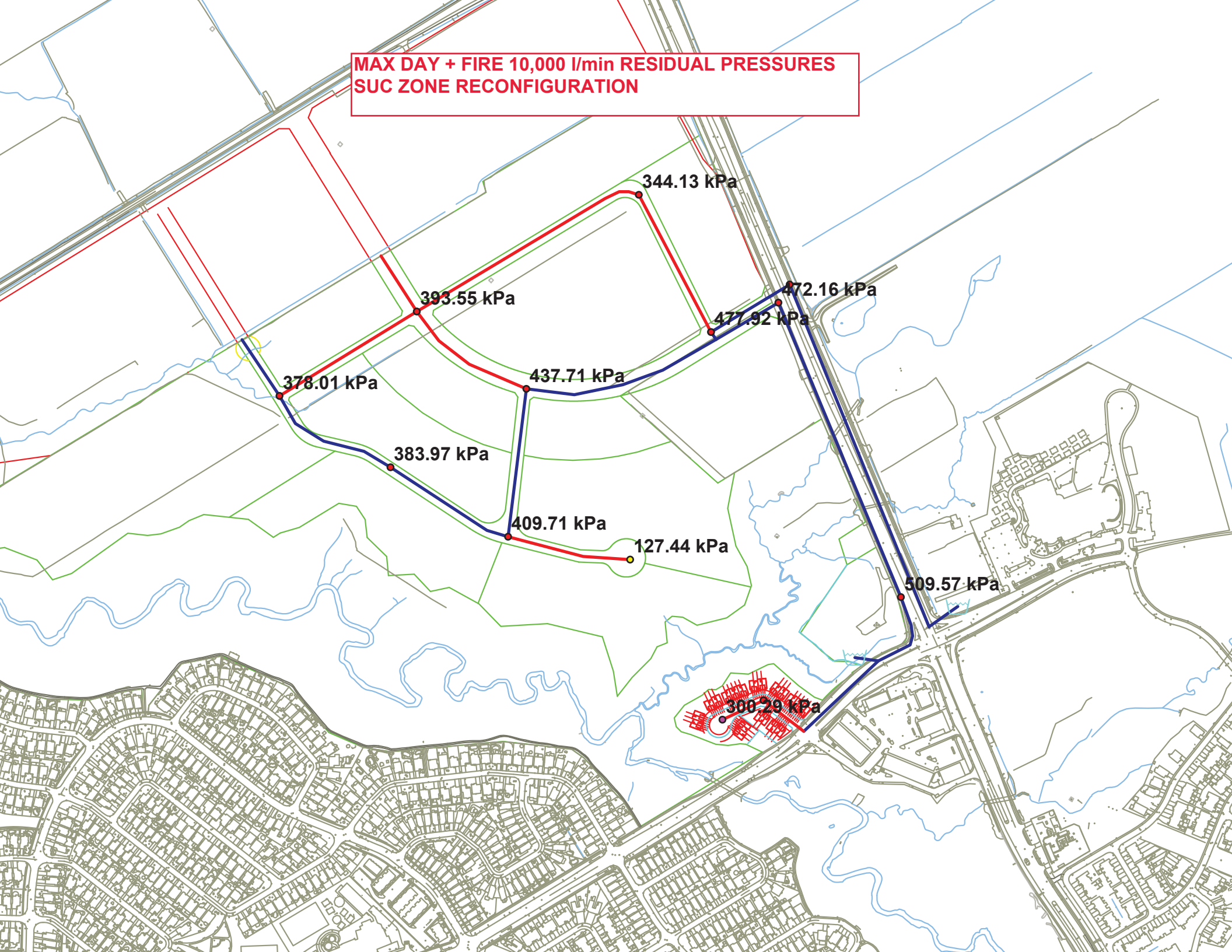

PEAK HOUR PRESSURES
SUC ZONE RECONFIGURATION
521.53 kPa
529.08 kPa
529.57 kPa
521.30 kPa
516.78 kPa
523.46 kPa
525.73 kPa
528.29 kPa
519.86 kPa
528.80 kPa
521.14 kPa
530.73 kPa
531.11 kPa
530.13 kPa
540.87 kPa

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J1	0.00	91.60	145.80	531.11
2	☐	J10	0.00	91.40	145.36	528.80
3	☐	J11	7.27	92.10	145.28	521.14
4	☐	J12	1.32	91.50	145.41	528.29
5	☐	J13	3.18	92.80	145.54	516.78
6	☐	J14	1.40	91.50	145.66	530.73
7	☐	J15	0.00	91.60	145.70	530.13
8	☐	J16	0.00	90.00	145.70	545.81
9	☐	J17	1.01	90.50	145.70	540.88
10	☐	J18	0.87	90.50	145.70	540.87
11	☐	J2	2.21	92.80	145.57	517.07
12	☐	J20	0.00	92.10	145.52	523.46
13	☐	J3	5.43	92.10	145.52	523.47
14	☐	J4	4.24	92.20	145.42	521.53
15	☐	J5	1.71	91.35	145.39	529.57
16	☐	J6	0.00	91.40	145.39	529.08
17	☐	J7	4.24	92.15	145.35	521.30
18	☐	J8	1.65	91.70	145.35	525.73
19	☐	J9	5.75	92.30	145.35	519.86

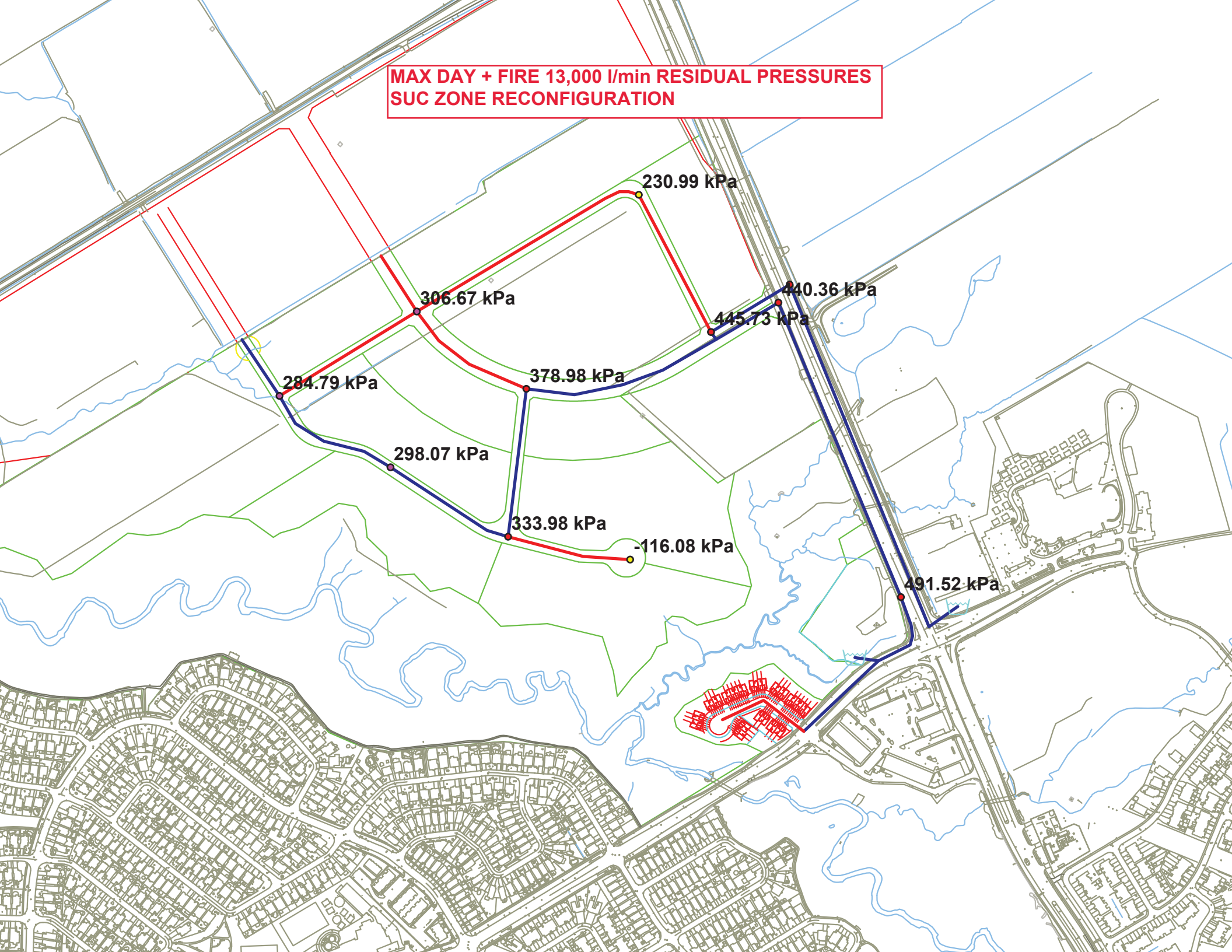
		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count
1	☐	P11	J1	J2	540.33	297.00	120.00	20.92	0.30	0.23	0.43	Open	0
2	☐	P13	J3	J2	134.17	297.00	120.00	-18.71	0.27	0.05	0.35	Open	0
3	☐	P15	J3	J4	226.76	204.00	110.00	7.12	0.22	0.10	0.43	Open	0
4	☐	P17	J5	J4	373.19	204.00	110.00	-2.88	0.09	0.03	0.08	Open	0
5	☐	P19	J5	J6	96.71	204.00	110.00	0.00	0.00	0.00	0.00	Open	0
6	☐	P21	J5	J8	235.56	204.00	110.00	4.38	0.13	0.04	0.17	Open	0
7	☐	P23	J8	J7	98.87	297.00	120.00	4.24	0.06	0.00	0.02	Open	0
8	☐	P25	J9	J8	201.22	297.00	120.00	1.51	0.02	0.00	0.00	Open	0
9	☐	P27	J10	J9	200.49	297.00	120.00	7.26	0.10	0.01	0.06	Open	0
10	☐	P29	J11	J10	182.17	204.00	110.00	-7.27	0.22	0.08	0.45	Open	0
11	☐	P31	J10	J12	218.02	297.00	120.00	-14.53	0.21	0.05	0.22	Open	0
12	☐	P33	J12	J5	200.54	204.00	110.00	3.21	0.10	0.02	0.10	Open	0
13	☐	P35	J12	J20	294.76	297.00	120.00	-19.06	0.28	0.11	0.36	Open	0
14	☐	P37	J13	J14	466.62	297.00	120.00	-16.08	0.23	0.12	0.27	Open	0
15	☐	P39	J14	J15	124.95	297.00	120.00	-17.48	0.25	0.04	0.31	Open	0
16	☐	P43	J15	CON1	1.00	297.00	120.00	-19.36	0.28	0.00	0.37	Open	0
17	☐	P45	J1	CON2	1.00	297.00	120.00	-20.92	0.30	0.00	0.44	Open	0
18	☐	P47	J15	J16	149.92	297.00	120.00	1.88	0.03	0.00	0.00	Open	0
19	☐	P49	J16	J17	74.18	204.00	110.00	1.88	0.06	0.00	0.04	Open	0
20	☐	P51	J17	J18	66.36	204.00	110.00	0.87	0.03	0.00	0.01	Open	0
21	☐	P53	J20	J13	105.87	297.00	120.00	-12.90	0.19	0.02	0.18	Open	0
22	☐	P55	J20	J3	12.95	297.00	120.00	-6.16	0.09	0.00	0.05	Open	0


MAX DAY + FIRE 1,0000 l/min RESIDUAL
PRESSURES EXISTING CONDITIONS
160.42 kPa
209.83 kPa
288.49 kPa
294.20 kPa
254.00 kPa
194.29 kPa
200.25 kPa
226.00 kPa
-56.28 kPa
326.14 kPa
117.04 kPa

		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	☐	J10	166.67	227.42	J11	132.83	105.66	222.90	139.96	147.13
2	☐	J11	170.71	117.14	J11	139.96	106.38	117.14	139.96	139.97
3	☐	J12	167.40	266.59	J9	132.94	105.87	261.34	139.96	147.11
4	☐	J13	168.43	389.45	J13	139.96	107.08	389.45	139.96	140.07
5	☐	J14	167.45	657.69	J14	139.96	105.78	657.69	139.96	139.97
6	☐	J17	167.13	210.44	J18	139.96	104.78	210.44	139.96	140.14
7	☐	J18	167.06	158.03	J18	139.96	104.78	158.03	139.96	139.93
8	☐	J2	167.90	395.45	J2	139.96	107.08	395.45	139.96	140.11
9	☐	J3	169.69	393.40	J4	139.26	106.41	392.63	139.96	140.79
10	☐	J4	169.03	179.50	J4	139.96	106.48	179.50	139.96	140.27
11	☐	J5	167.62	211.61	J5	139.96	105.63	211.61	139.96	139.97
12	☐	J8	167.59	200.08	J8	139.96	105.98	200.08	139.96	139.97
13	☐	J9	169.86	208.70	J9	139.96	106.58	208.70	139.96	139.97


MAX DAY + FIRE 10,000 l/min RESIDUAL PRESSURES
SUC ZONE RECONFIGURATION
344.13 kPa
393.55 kPa
472.16 kPa
477.92 kPa
437.71 kPa
378.01 kPa
383.97 kPa
409.71 kPa
127.44 kPa
509.57 kPa
300.29 kPa

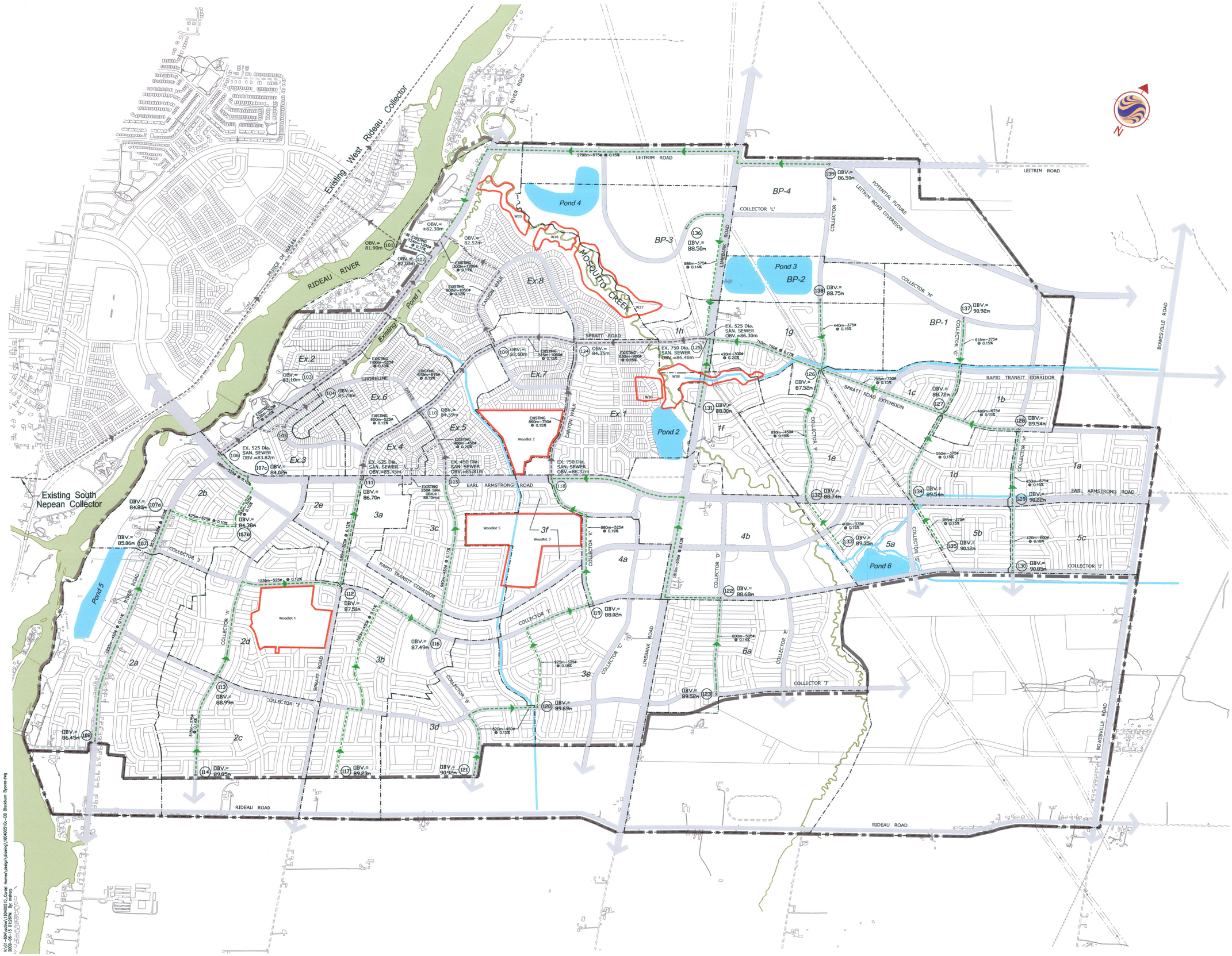
1	☐	J10	166.67	326.21	J11	132.83	105.66	322.84	139.96	147.32
2	☐	J11	170.71	167.72	J11	139.96	106.38	167.72	139.96	139.84
3	☐	J12	167.40	382.14	J9	134.21	106.00	378.94	139.96	146.08
4	☐	J13	168.43	565.31	J13	139.96	107.08	565.31	139.96	140.24
5	☐	J14	167.45	934.52	J14	139.97	105.78	934.52	139.96	139.97
6	☐	J17	167.13	294.79	J18	139.96	104.78	294.79	139.96	140.65
7	☐	J18	167.06	221.36	J18	139.96	104.78	221.36	139.96	140.24
8	☐	J2	167.90	573.17	J2	139.96	107.08	573.17	139.96	140.33
9	☐	J3	169.69	565.66	J4	139.95	106.48	565.65	139.96	140.30
10	☐	J4	169.03	257.51	J4	139.96	106.48	257.51	139.96	139.97
11	☐	J5	167.62	301.97	J5	139.96	105.63	301.97	139.96	140.06
12	☐	J8	167.59	287.57	J8	139.96	105.98	287.57	139.96	140.08
13	☐	J9	169.86	301.55	J9	139.96	106.58	301.55	139.96	140.05


MAX DAY + FIRE 13,000 l/min RESIDUAL PRESSURES
SUC ZONE RECONFIGURATION
230.99 kPa
306.67 kPa
440.36 kPa
445.73 kPa
284.79 kPa
378.98 kPa
298.07 kPa
333.98 kPa
-116.08 kPa
491.52 kPa

		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	☐	J10	216.67	323.18	J11	132.83	105.66	319.79	139.96	147.16
2	☐	J11	220.71	166.15	J11	139.96	106.38	166.15	139.96	139.97
3	☐	J12	217.40	378.61	J9	134.16	105.99	375.36	139.96	145.93
4	☐	J13	218.43	559.82	J13	139.96	107.08	559.82	139.96	140.10
5	☐	J14	217.45	924.28	J14	139.97	105.78	924.28	139.96	139.94
6	☐	J2	217.90	568.03	J2	139.96	107.08	568.03	139.96	140.16
7	☐	J3	219.69	560.44	J4	139.92	106.48	560.40	139.96	140.18
8	☐	J4	219.03	255.13	J4	139.96	106.48	255.13	139.96	139.96
9	☐	J5	217.62	299.20	J5	139.96	105.63	299.20	139.96	139.99
10	☐	J8	217.59	284.89	J8	139.96	105.98	284.89	139.96	139.99
11	☐	J9	219.86	298.72	J9	139.96	106.58	298.72	139.96	139.98

Appendix C

- **Drawing SAN-1 Sanitary Servicing Plan (RSCISSU)**
- **Sanitary Sewer Design Sheet (RSCISSU)**
- **Sanitary Sewer Design Sheet**
- **Figure 3.1 – Conceptual Sanitary Plan**



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Fax. 613.722.2799
www.stantec.com

Legend

- Proposed SWM Facility
- Overland Flow Corridor
- Riverside South (Urban Boundary Limit)
- Existing Sanitary Sewer
- Proposed Sanitary Sewer
- (106) OBV.= 83.82m — Existing Manhole Node
- (135) OBV.= 85.77m — Sanitary Manhole Node
- Sub-drainage Area Limit
- 4a — Sub-drainage Area I.D.
- W35 — Wood Lot

7	REALIGNMENT AT LRT CROSSING	MJS	NG	JUNE 9/09
6	FINAL SUBMISSION	BCB	NG	JULY 30/08
5	FINAL REPORT (DRAFT)	BCB	NG	MAR 5/08
4	GENERAL REVISIONS	BCB	PM	JAN 25/08
3	REVISED TRANSIT ALIGNMENT	DRP	DRP	MAY 17/06
2	REVISED SIZES AND ELEVATIONS	DRP	DRP	NOV 23/05
1	SECOND SUBMISSION	GBU	DFE	MAY 25/05
Revision		By	Appd.	YY.MM.DD
File Name: 163400917		BCB	NG	PM FEB. 2007
		Dwn.	Chkd.	Dsgn. YY.MM.DD

Seal

Client/Project

CLARIDGE HOMES

Riverside South Community
Master Servicing Study Update

Ottawa ON Canada

Title

SANITARY SERVICING PLAN

Project No. 163400917

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

Drawing No. SAN-1

Sheet 2 of 3

Revision 7

Stantec

Riverside South Community
Infrastructure Servicing Study

Revision Date: March 4, 2008
Date: February 15, 2005
Designed by: DRP
Checked By: RRC

SANITARY SEWER DESIGN SHEET

CITY CRITERIA & DENSITIES
Approved area

File Number: 604 - 00176

DESIGN PARAMETERS

Average Daily Flow / Person:	350	l/p/day	Commercial:	0.579	l/s/ha
Minimum Velocity:	0.60	m/s	Industrial:	0.405	l/s/ha
n =	0.013		Institutional:	0.579	l/s/ha
Max Peaking Factor:	4.0		Infiltration:	0.280	l/s/ha
Min. Peacking Factor:	2.0				
Peacking Factor Industrial:	Based on Appendix 4-B		Low Density:	@ 3.2	pers/unit
Peacking Factor Comm. / Inst.:	1.5		Medium Density:	@ 2.4	pers/unit
			High Density:	@ 1.9	pers/unit

Existing Sanitary Sewer Lines

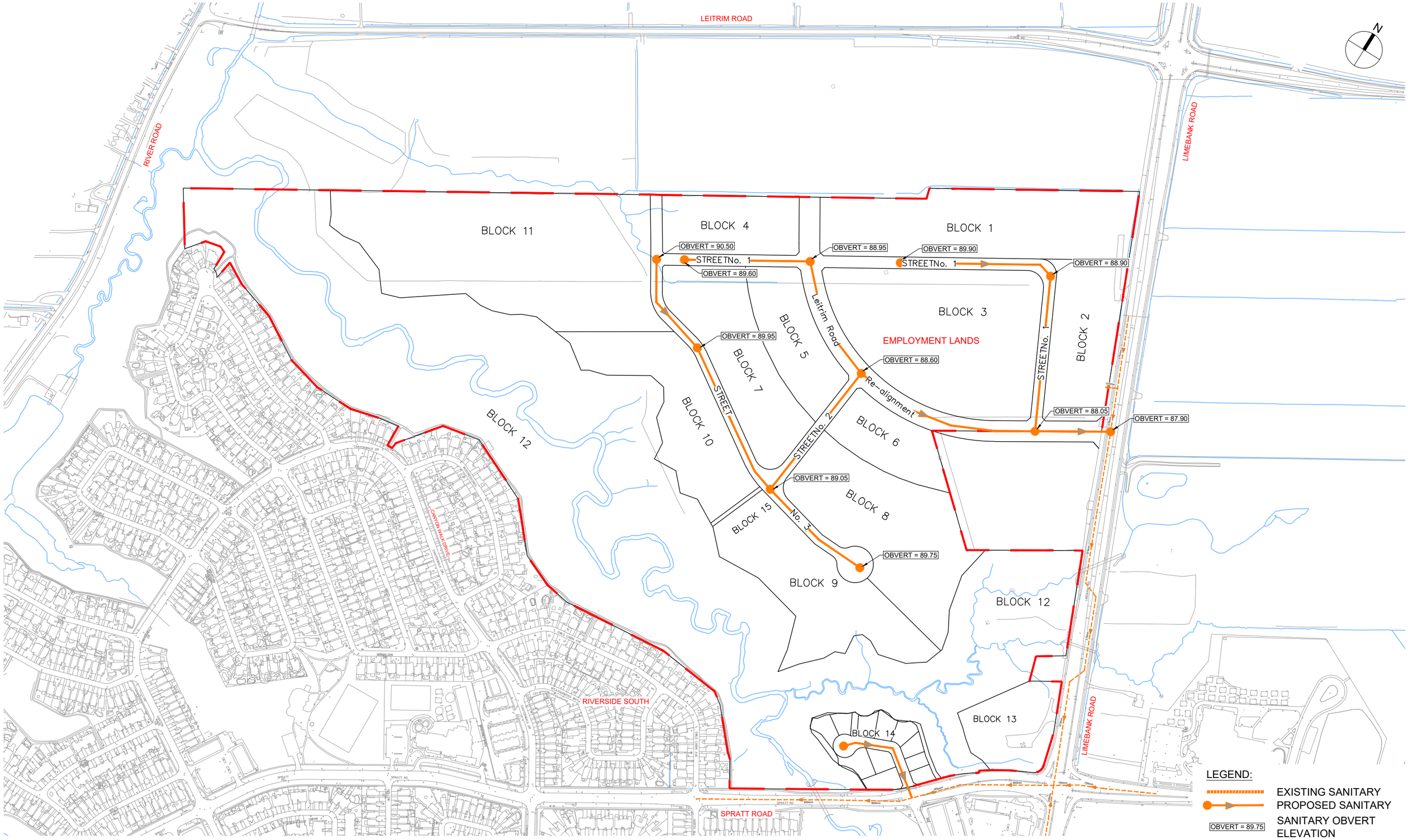
ID Area	From MH	To MH	RESIDENTIAL AREA (ha)	LOW Area (ha)	LOW Pop.	LOW Accum. Pop.	MED Area (ha)	MED Pop.	MED Accum. Pop.	HIGH Area (ha)	HIGH Pop.	HIGH Accum. Pop.	Units	Accum. Units	Total Accum. Pop.	Peak Factor	Peak Flow (l/s)	COMMERCIAL Area (ha)	COMMERCIAL Accum. Area (ha)	INDUSTRIAL Area (ha)	INDUSTRIAL Accum. Area (ha)	INSTITUTIONAL Area (ha)	INSTITUTIONAL Accum. Area (ha)	C+I+I Peak Flow (l/s)	PARK / ROAD Area (ha)	PARK / ROAD Accum. Area (ha)	INFILTRATION Total Area (ha)	INFILTRATION Accum. Area (ha)	Infilt. Flow (l/s)	Total Flow (l/s)	PIPE Distance (m)	Diameter (mm)	Slope (%)	Capacity (Full) (l/s)	Velocity (Full) (m/s)	Velocity (Actual) (m/s)	Upstream Obvert Elevation (m)	Upstream Invert Elevation (m)	Downtream Obvert Elevation (m)	Downtream Invert Elevation (m)
2a	108	107	68.33	64.83	3194	3194	3.50	223	223	0	0	0	1091	1091	3417	3.4	47.0	1.20	1.20	0	0	1.00	1.00	1.9	5.66	5.66	76.19	76.19	21.3	70.2	1255	450	0.12	103.0	0.63	0.68	87.96	87.51	86.46	86.01
2b	107	107a	34.10	21.11	1040	4234	12.99	830	1053	0	0	0	671	1762	5287	3.2	69.0	0	1.20	0	0	0	1.00	1.9	19.35	25.01	53.45	129.64	36.3	107.2	257	525	0.12	155.4	0.70	0.75	86.46	85.93	86.15	85.62
	107a	107b	0.00	0.00	0	4234	0.00	0	1053	0	0	0	0	1762	5287	3.2	69.0	0.00	1.20	0	0	0	1.00	1.9	0.00	25.01	0.00	129.64	36.3	107.2	**636**	**525**	**0.12**	**155.4**	**0.70**	**0.75**	86.15	85.62	85.38	84.86
	107b	107c	0.00	0.00	0	4234	0	0	1053	0	0	0	0	1762	5287	3.2	69.0	0	1.20	0	0	0	1.00	1.9	0.00	25.01	0.00	129.64	36.3	107.2	**500**	**525**	**0.15**	**173.8**	**0.78**	**0.82**	85.38	84.86	84.63	84.11
	107c	106	0.00	0.00	0	4234	0	0	1053	0	0	0	0	1762	5287	3.2	69.0	0	1.20	0	0	0	1.00	1.9	0.00	25.01	0.00	129.64	36.3	107.2	**590**	**525**	**0.14**	**167.9**	**0.75**	**0.80**	84.63	84.11	83.81	83.28
Ex3	106	103	17.90	10.04	413	4647	7.86	564	1617	0	0	0	364	2126	6264	3.2	80.0	5.35	6.55	0	0	0	1.00	6.6	0.00	25.01	23.25	152.89	42.8	129.4	**835**	**525**	**0.10**	**141.9**	**0.63**	**0.73**	83.82	83.30	83.10	82.58
Ex2	103	102	16.42	16.42	573	5220	0	0	1617	0	0	0	179	2305	6837	3.1	86.3	0	6.55	0	0	0	1.00	6.6	5.11	30.12	21.53	174.42	48.8	141.7	**1100**	**525**	**0.10**	**141.9**	**0.63**	**0.74**	83.10	82.58	82.00	81.48
																																						Ex. Obv. @ SAN 102	82.20
																																						Ex. Inv. @ SAN 102	81.00
2c	114	113	46.31	44.35	2186	2186	1.96	125	125	0	0	0	735	735	2311	3.5	33.1	0	0	0	0	0	0	0.0	6.96	6.96	53.27	53.27	14.9	48.0	615	375	0.14	68.4	0.60	0.65	89.73	89.35	88.87	88.49
2d	113	112	44.89	26.13	1286	3472	18.76	1198	1323	0	0	0	901	1636	4795	3.3	63.4	0	0	0	0	8.69	8.69	7.5	5.13	12.09	58.71	111.98	31.4	102.3	1230	525	0.12	155.4	0.70	0.74	88.87	88.34	87.39	86.87
2e-3a	112	111	18.65	1.86	90	3562	11.60	740	2063	5.19	591	591	647	2283	6216	3.2	79.5	2.40	2.40	0	0	8.47	17.16	17.0	4.77	16.86	34.29	146.27	41.0	137.4	680	525	0.12	155.4	0.70	0.79	87.39	86.87	86.57	86.05
Ex4	111	110	14.93	13.31	90	3652	1.62	468	2531	0	0	591	223	2506	6774	3.1	85.6	0.91	3.31	0	0	0	17.16	17.8	0	16.86	15.84	162.11	45.4	148.8	**600**	**525**	**0.12**	**155.4**	**0.70**	**0.80**	85.45	84.93	84.73	84.21
																																						Ex. Obv. @ SAN	85.45
																																						Ex. Inv. @ SAN	84.93
3b	117	116	60.37	43.08	2122	2122	17.29	1104	1104	0	0	0	1123	1123	3226	3.4	44.6	0.60	0.60	0	0	2.83	2.83	3.0	7.17	7.17	70.97	70.97	19.9	67.5	1580	450	0.11	98.6	0.60	0.65	89.23	88.78	87.49	87.04
3c	116	115	43.75	21.27	1050	3172	19.43	1241	2345	3.05	348	348	1028	2151	5865	3.2	75.6	0	0.60	0	0	0	2.83	3.0	8.51	15.68	52.26	123.23	34.5	113.0	990	450	0.17	122.6	0.75	0.86	87.49	87.04	85.81	85.36
Ex5	115	110	20.60	14.47	480	3652	6.13	302	2647	0	0	348	276	2427	6647	3.1	84.2	0.80	1.40	0	0	3.16	5.99	6.4	2.21	17.89	26.77	150.00	42.0	132.7	**480**	**450**	**0.20**	**133.0**	**0.81**	**0.94**	85.81	85.36	84.85	84.40
																																						Ex. Obv. @ SAN	85.81
																																						Ex. Inv. @ SAN	85.36
Ex6	110	109	25.47	20.32	822	8126	5.15	288	5466	0	0	939	377	5310	14531	2.8	164.4	0	4.71	0	0	2.39	25.54	26.3	2.71	37.46	30.57	342.68	96.0	286.6	**675**	**675**	**0.12**	**303.8**	**0.82**	**0.95**				
3d	121	120	44.62	39.50	1946	1946	5.12	326	326	0	0	0	744	744	2272	3.5	32.6	0.60	0.60	0	0	1.00	1.00	1.4	6.70	6.70	52.92	52.92	14.8	48.8	820	450	0.15	115.2	0.70	0.67	90.92	90.47	89.69	89.24
3e	120	119	45.28	36.39	1792	3738	8.89	566	892	0	0	0	796	1540	4630	3.3	61.4	0	0.60	0	0	10.12	11.12	10.2	24.79	31.49	80.19	133.11	37.3	108.9	925	525	0.18	190.3	0.85	0.88	89.69	89.16	88.02	87.50
3f-4a	119	118	28.00	0	0	3738	10.30	658	1550	17.70	1157	1157	854	2394	6445	3.1	82.0	0	0.60	0	0	0	11.12	10.2	9.44	40.93	37.44	170.55	47.8	139.9	880	525	0.19	195.6	0.88	0.95	88.02	87.50	86.35	85.83
																																						Ex. Obv. @ SAN	86.32
																																						Ex. Inv. @ SAN	85.57
6a	123	122	53.24	36.74	1811	1811	16.50	1054	1054	0	0	0	1005	1005	2865	3.5	40.1	1.20	1.20	0.00	0	4.15	4.15	4.6	12.11	12.11	70.70	70.70	19.8	64.6	600	525	0.14	167.9	0.75	0.69	89.52	89.00	88.68	88.16
4b	122	118	62	0	0	1811	0	0	1054	62.45	4079	4079	2045	3050	6944	3.1	87.5	0	1.20	0.00	0	0	4.15	4.6	16.96	29.07	79.41	150.11	42.0	134.2	1810	600	0.13	231.0	0.79	0.82	88.68	88.08	86.33	85.73
																																						Ex. Obv. @ SAN	86.32
																																						Ex. Inv. @ SAN	85.57
Ex1	118	124	45.64	22.12	896	6445	23.52	1687	4291	0.00	0	5236	983	6427	15972	2.8	178.0	1.55	3.35	0	0	0	15.27	16.2	0	70.00	47.19	367.85	103.0	297.1	**860**	**750**	**0.15**	**449.8**	**0.99**	**1.06**				
																																						Ex. Obv. @ SAN	85.57
																																						Ex. Inv. @ SAN	85.57
5c	130	129	24.82	19.94	982	982	4.88	312	312	0	0	0	437	437	1294	3.7	19.5	0	0	0	0	2.83	2.83	2.5	7.38	7.38	35.03	35.03	9.8	31.8	420	600	0.15	248.1	0.85	0.56	90.85	90.25	90.22	89.62
1a	129	128	27.43	19.41	957	1939	8.02	511	823	0	0	0	512	949	2762	3.5	38.9	0	0	0	0	1.00	3.83	3.3	9.41	16.79	37.84	72.87	20.4	62.6	450	675	0.15	339.6	0.92	0.68	90.22	89.54	89.54	88.87
1b	128	127	20.32	6.63	326	2265	13.69	874	1697	0	0	0	466	1415	3962	3.3	53.6	0	0	0	0	2.86	6.69	5.8	3.90	20.69	27.08	99.94	28.0	87.4	490	675	0.15	339.6	0.92	0.74	89.54	88.87	88.81	88.13
5b	135	134	17.36	9.93	490	490	7.43	475	475	0	0	0	351	351	965	3.8	14.9	0	0	0	0	0	0	0.0	2.46	2.46	19.82	19.82	5.5	20.4	385	375	0.15	70.8	0.62	0.53	90.12	89.75	89.54	89.17
1d	134	127	22.74	12.34	608	1098	10.40	665	1140	0	0	0	467	818	2238	3.5	32.2	3.20	3.20	0	0	0	0	2.8	5.30	7.76	31.24	51.06	14.3	49.2	550	375	0.15	70.8	0.62	0.67	89.54	89.17	88.72	88.34
BP-1	137	127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	59	59	51.3	6.90	6.90	66.00	66.00	18.5	69.8	725	375	0.15	70.8	0.62	0.72	90.92	90.55	89.83	89.46
1c	127	126	14.79	0	0	3363	9.29	593	3430	5.50	627	627	577	2810	7420	3.1	92.6	0.60	3.80	0	0.0	6.50	72.29	66.1	4.57	39.92	26.46	243.46	68.2	226.9	795	750	0.15	449.8	0.99	0.99	88.72	87.97	87.53	86.78
5a	133	132	19.47	12.37	608	608	7.10	454	454	0	0	0	379	379	1062	3.8	16.3	0.60	0.60	0	0	1.79	1.79	2.1	7.56	7.56	29.42	29.42	8.2	26.6	410	375	0.15	70.8	0.62	0.57	89.35	88.98	88.74	88.36
1e	132	126	29.70	20.74	1021	1629	8.96	571	1025	0	0	0	557	936	2654	3.5	37.5	0	0.60	0	0	1.40	3.19	3.3	12.16	19.72	43.26	72.68	20.3	61.1	810	450	0.15	115.2	0.70	0.71	88.74	88.29	87.52	87.07
BP-2	138	126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	10	10	8.3	4.20	4.20	13.80	13.80	3.9	12.2	440	375	0.15	70.8	0.62	0.45	88.75	88.38	88.09	87.72
1g	126	125	15.69	4.82	237	5229	10.87	694	5149	0	0	627	363	4109	11005	2.9	129.9	0	4.40	0	0.0	12.19	97.27	88.3	3.53	67.37	31.41	361.34	101.2	319.3	710	750	0.17	478.9	1.05	1.13	87.52	86.77	86.31	85.56
1f	131	125	15.61	11.07	544	544	4.54	290	290	0	0	0	291	291	834	3.8	13.0	0	0	0	0.0	0	0	0.0	1.54	1.54	17.15	17.15	4.8	17.8	420	300	0.20	45.1	0.62	0.57	88.00	87.70	87.16	86.86
BP3	136	125	0.00	0.00	0	0	0.00	0	0	0	0	0	0	0	0		0.0	0	0	0	0.0	25	25	22.0	38.40	38.40	63.70	63.70	17.8	39.8	986	375	0.14	68.4	0.60	0.62	88.50	88.13	87.09	86.72
1h	125	124	3.99	2.43	118	5891	1.56	98	5537	0	0	627	78	4478	12055	2.9	140.3	4.70	9.10	0	0.0	0	132.17	122.7	0.19	111.70	8.88	464.86	130.2	393.2	**830**	**900**	**0.15**	**731.4**	**1.11**	**1.12**	86.31	85.41	85.07	84.17
Ex7	124	109	17.26	11.40	768	13104	3.00	250	10078	2.86	327	6190	516	11421	29372	2.5	295.8	0.64	13.09	0	0.0	0	147.44	139.4	2.40	184.10	20.30	853.01	238.8	674.1	**515**	**1050**	**0.15**	**1103.3**	**1.23**	**1.30**	84.35	83.30	83.60	82.55
Ex8	109	102	56.40	54.40	2150	23380	2.00	134	15678	0	0	7129	728	17459	46187	2.3	429.7	0	17.80	0	0.0	0	172.98	165.7	5.45	227.01	61.85	1257.54	352.1	947.5	**1100**	**1050**	**0.15**	**1103.3**	**1.23**	**1.39**	83.6	82.55	82.03	80.98
BP-4	139	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	149	149	129.4	15.00	15.00	164.04	164.04	45.9	175.4	2790	675	0.15	339.6	0.92	0.92	**86.50**	85.83	82.03	81.36
	102	101	0			27614			16731			7129	0	**19221**	**51474**	2.3	469.8	0	19.00	0	0.0	0	323.02	297.0	0	267.02	0	1551.22	434.3	1201.1	**145**	**1200**	**0.11**	**1349.0**	**1.16**	**1.32**	82.03	80.83	81.90	80.70

***Note:**

Area BP-4 also accounts for additional 39ha area outside the CDP that was accounted for in calculation of Employment Area
PIPE Capacity (Full) calculated using ACTUAL PIPE SIZE
Limiting Capacity Calculated based on 1200 mm pipe @ 0.11% between Rideau Road and River
Additional sanitary flow of 29.21 L/s from Rideau Carleton Raceway (RCR) is not included in the above calculation
Net Residual Capacity at River Crossing is 118.69 l/s (1349 - 1201.1 -29.21)

Sanitary Design Flow Employment Lands Blocks 1 to 11

Area of Blocks 1 to 11	42.26	ha
Area of Streets	5.12	
Total Site Area	47.38	ha
Flow Rate for Employment Lands	28,000	l/ha/day
Peaking Factor	1.5	
Peak Flow	20.54	l/s
Infiltration Rate	0.33	l/s/ha
Infilration Flow	15.64	l/s
Total Flow	36.18	l/s



J:\136974_RSS_Employme\7.0_Production\7.03_Design\04_Civil_LAND_Adequacy Report\FIGURE 3.1 CONCEPTUAL SANITARY SERVICES.dwg Layout Name: CONCEPTUAL SANITARY SERVICES Last Saved By: ddore Last Saved At: Jul. 12, 22

IBI

Scale: N.T.S.

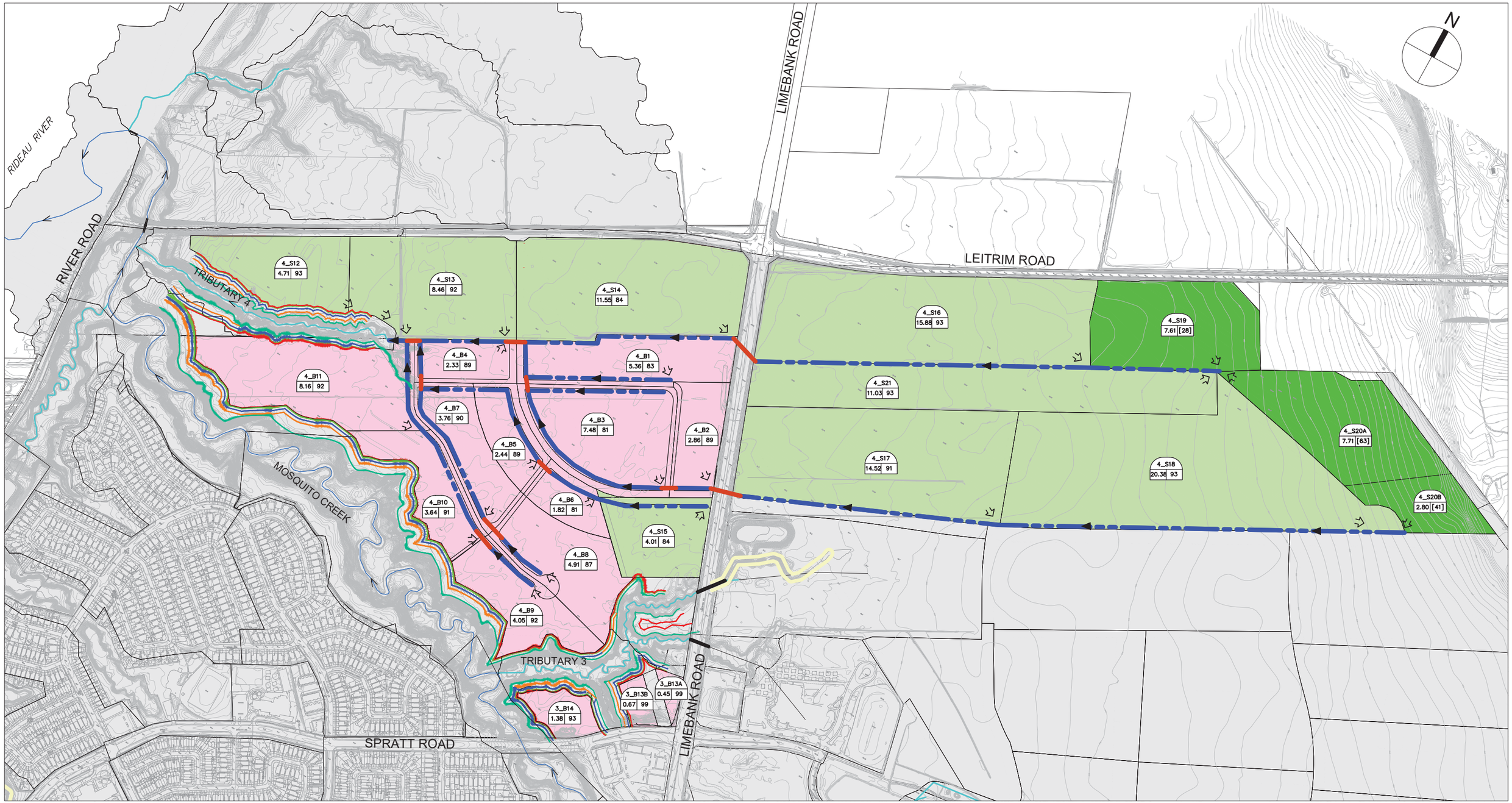
Project Title: RIVERSIDE SOUTH EMPLOYMENT LANDS AND BLOCKS 13, 14

Drawing Title: CONCEPTUAL SANITARY SERVICES

Sheet No.: FIGURE 3.1

Appendix D

- 4.1 Storm Drainage Area Plan
- 4.2 Cross-sections Plan View
- 4.3 Proposed Limebank Road Crossing (North)
- 4.4 Proposed Limebank Road Crossing (South)
- 4.5 Cross-sections
- 4.6 Business Park LID Conceptual Profile
- 4.7 Low and Medium Density Residential LID Conceptual Profile



LEGEND:

- SUBJECT SITE DRAINAGE AREAS
- EXTERNAL TRIBUTARY DRAINAGE AREAS - EMPLOYMENT AND SPECIAL DISTRICT
- EXTERNAL TRIBUTARY DRAINAGE AREAS -NATURAL ENVIRONMENT AREA
- EXTERNAL DRAINAGE AREAS
- 4_B1 / 5.36 / 83 — AREA ID; IMPERVIOUS VALUE (%) / [TIME OF CONCENTRATION (min)]; AREA (h)
- FLOW CONNECTIVITY
- PROPOSED DITCH WITH FLOW DIRECTION
- PROPOSED CULVERT
- EXISTING CULVERT

GEO Morphix (July 2019)
- MEANDER BELT WIDTH

Paterson Group (June 2020)
- TOP OF SLOPE
- STABLE SLOPE ALLOWANCE
- TOE EROSION ALLOWANCE
- EROSION ACCESS ALLOWANCE
- LIMIT OF HAZARD LANDS

IBI Group, To Be Confirmed by Others at Time of Detailed Design of Entombment
- TOP OF SLOPE
- STABLE SLOPE ALLOWANCE
- TOE EROSION ALLOWANCE
- EROSION ACCESS ALLOWANCE
- LIMIT OF HAZARD LANDS

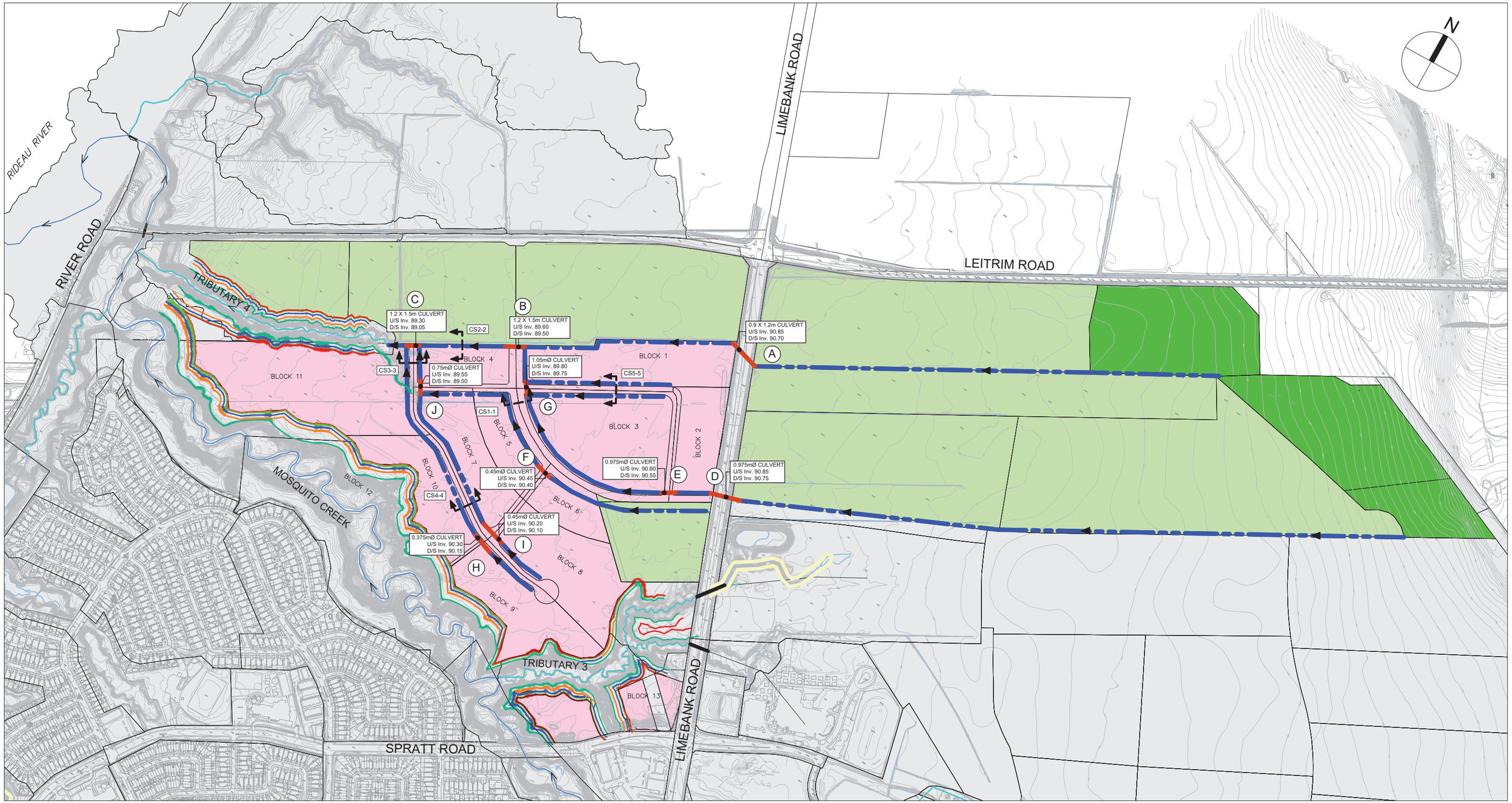
IBI

Scale: N.T.S

Project Title: RIVERSIDE SOUTH EMPLOYMENT LANDS AND BLOCKS 13, 14

Drawing Title: STORM DRAINAGE AREA PLAN

Sheet No.: FIGURE 4.1



LEGEND:

- SUBJECT SITE DRAINAGE AREAS
- EXTERNAL TRIBUTARY DRAINAGE AREAS - EMPLOYMENT AND SPECIAL DISTRICT
- EXTERNAL TRIBUTARY DRAINAGE AREAS -NATURAL ENVIRONMENT AREA
- EXTERNAL DRAINAGE AREAS
- PROPOSED DITCH WITH FLOW DIRECTION
- PROPOSED CULVERT
- EXISTING CULVERT
- (A) PROPOSED CULVERT ID
- (CS1-1) CROSS SECTION ID

GEO Morphix (July 2019)

- MEANDER BELT WIDTH

Paterson Group (June 2020)

- TOP OF SLOPE
- STABLE SLOPE ALLOWANCE
- TOE EROSION ALLOWANCE
- EROSION ACCESS ALLOWANCE
- LIMIT OF HAZARD LANDS

IBI Group, To Be Confirmed by Others at Time of Detailed Design of Entombment

- TOP OF SLOPE
- STABLE SLOPE ALLOWANCE
- TOE EROSION ALLOWANCE
- EROSION ACCESS ALLOWANCE
- LIMIT OF HAZARD LANDS

NOTE:

FOR PROPOSED CULVERT "A" AND "D" REFER TO FIGURE 4.3 AND 4.4

FOR CROSS SECTIONS REFER TO FIGURE 4.5

IBI

Scale

N.T.S

Project Title

RIVERSIDE SOUTH EMPLOYMENT LANDS AND BLOCKS 13, 14

Drawing Title

CROSS SECTIONS PLAN VIEW

Sheet No.

FIGURE 4.2

CATCH BASIN DATA / CATCH BASIN LEAD

STATION	OFFSET	CATCH BASIN TYPE	T/G ELEVATION	LENGTH (1)	LENGTH (2)	INVERT (1)	INVERT (2)
14+364.02	17.00 L	OPSD 705.020 - S3,S22,S23	92.76	22.97	6.25	91.16	91.16
14+365.01	13.50 R	OPSD 705.010 - S3,S22,S23	92.84	7.22	6.25	91.24	91.24
14+394.00	17.00 L	OPSD 705.020 - S3,S22,S23	92.87	22.97	6.25	91.27	91.27
14+399.99	13.50 R	OPSD 705.010 - S3,S22,S23	92.97	7.22	6.25	91.37	91.37
14+424.01	17.00 L	OPSD 705.010 - S3,S22,S23	93.00	22.91	6.25	91.40	91.40
14+435.02	13.50 R	OPSD 705.010 - S3,S22,S23	93.11	7.19	6.25	91.51	91.51
14+454.01	17.00 L	OPSD 705.010 - S3,S22,S23	93.12	22.87	6.25	91.52	91.52
14+469.98	13.50 R	OPSD 705.010 - S3,S22,S23	93.25	7.24	6.25	91.65	91.65
14+489.01	16.25 L	OPSD 705.010 - S3,S22,S23	93.27	22.13	6.25	91.67	91.67

CATCH BASIN DATA / CATCH BASIN LEAD

NO.	STATION	OFFSET	CATCH BASIN TYPE	T/G ELEVATION	LENGTH (1)	LENGTH (2)	INVERT (1)	INVERT (2)
CB 46	14+521.00	13.50 R	OPSD 705.010 - S3,S22,S23	93.45	7.26	6.25	91.85	91.85
CB 47	14+524.00	14.50 L	OPSD 705.010 - S3,S22,S23	93.44	20.52	7.50	91.84	91.84
CB 48	14+600.04	13.50 L	OPSD 705.010 - S3,S22,S23	93.39	19.35	7.80	91.79	91.79
CB 49	14+601.04	13.50 R	OPSD 705.010 - S3,S22,S23	93.39	7.15	6.25	91.79	91.79
CB 50	14+645.00	13.50 L	OPSD 705.010 - S3,S22,S23	93.21	18.56	7.35	91.61	91.61
CB 51	14+685.29	12.25 L	OPSD 705.010 - S3,S22,S23	93.06	17.26	7.00	91.46	91.46
CB 52	14+696.06	12.25 R	OPSD 705.010 - S3,S22,S23	93.00	7.03	7.75	91.40	91.40

NOTES:
- CATCH BASIN OFFSETS ARE FROM ALIGNMENT CONTROL LINE TO FACE OF CURB .

- CB LEAD NOTE (1) DENOTES CB LEAD LENGTH AND INVERT ELEVATION FOR FINAL CONNECTION TO THE STORM SEWER. CATCH BASIN LEAD TO BE CAPPED WITH SPIGOT PLUG. ALL CATCH BASIN LEADS TO STORM SEWER SHALL BE 200mm DIA. PVC SDR 35 INSTALLED AT 2% SLOPE UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS.

- CB LEAD NOTE (2) DENOTES CB LEAD LENGTH AND INVERT ELEVATION FOR INTERIM CONNECTION TO THE DRAINAGE DITCH. ALL CATCH BASIN LEADS SHALL OUTLET AT BOTTOM OF DITCH; SLOPE OF EACH LEAD TO BE ADJUSTED ACCORDINGLY.

- REFER TO GENERAL ARRANGEMENT DRAWINGS BY MORRISON HERSHFIELD FOR CULVERT INSTALLATION DETAILS.

STORM MAINTENANCE HOLE DATA

NO.	STRUCTURE TYPE / SIZE	COORDINATES NORTHING	COORDINATES EASTING
ST 202	OPSD 701.010 - 1200mm Ø	5017796.165	369368.870
ST 203	OPSD 701.010 - 1200mm Ø	5017704.087	369408.021
ST 204	OPSD 701.011 - 1200mm Ø C/W SAFETY PLATFORM	5017610.161	369447.652

SANITARY MAINTENANCE HOLE DATA

NO.	STRUCTURE TYPE / SIZE	COORDINATES NORTHING	COORDINATES EASTING
SA 20	OPSD 701.010 - 1200mm Ø C/W SAFETY PLATFORM	5017539.271	369474.740

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

NO.	REVISIONS	BY	DATE
0	*ISSUED FOR TENDER*	JB	12/08/08
1	ISSUED FOR CONSTRUCTION	JB	03/06/09
2	ISSUED WITH CCN # 7	JB	09/08/09
3	'AS BUILT' INFORMATION ADDED	JB	10/25/12

NOTE: The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

LIMEBANK ROAD WIDENING
BALMORAL DRIVE TO SPRATT ROAD

PLAN AND PROFILE
STA. 14+350 TO 14+700

Ottawa

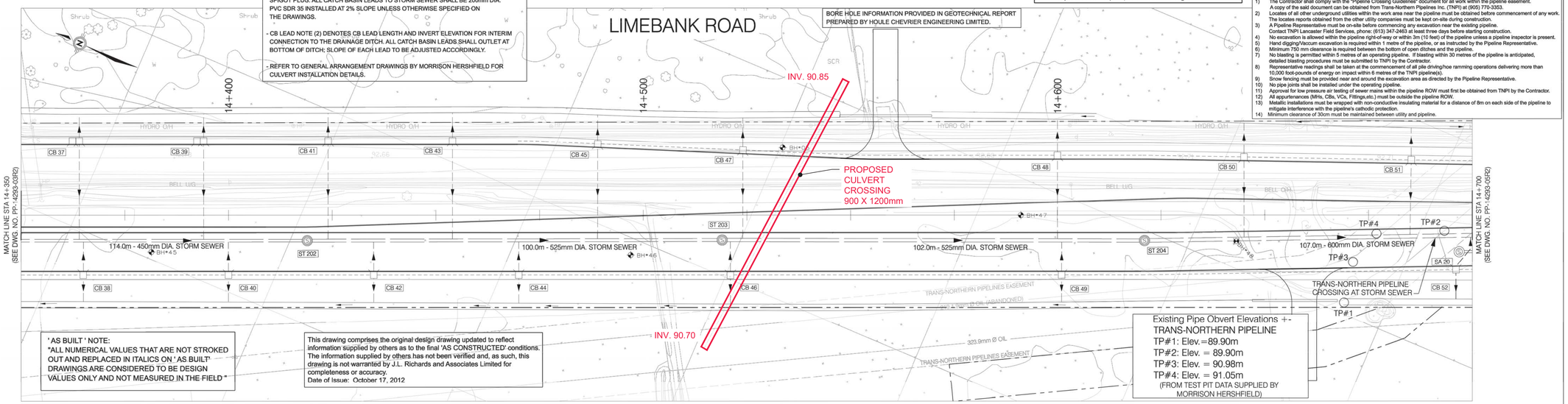
CONTRACT NO.
ISB07-5047
DWG. NO.
PP -14293 -04R2
SHEET 53 OF 149
Date: OCTOBER 2008
Scale: 0m 5 10 20

W. NEWELL, P. Eng
Director Infrastructure Services

ZIAD A. GHADBAN, P. Eng.
Manager Construction Services - Development

Dwn: MF , MGB Chkd: PDR Des: KD , JB Chkd: PDR

Trans-Northern Pipeline Crossing
1) The Contractor shall comply with the "Pipeline Crossing Guidelines" document for all work within the pipeline easement. A copy of the said document can be obtained from Trans-Northern Pipelines Inc. (TNPI) at (905) 770-3353.
2) Locates of all other underground utilities within the work area near the pipeline must be obtained before commencement of any work. The locates reports obtained from the other utility companies must be kept on-site during construction.
3) A Pipeline Representative must be on-site before commencing any excavation near the existing pipeline. Contact TNPI Lancaster Field Services, phone; (613) 347-2463 at least three days before starting construction.
4) No excavation is allowed within the pipeline right-of-way or within 3m (10 feet) of the pipeline unless a pipeline inspector is present.
5) Hand digging/Vacuum excavation is required within 1 metre of the pipeline, or as instructed by the Pipeline Representative.
6) Minimum 750 mm clearance is required between the bottom of open ditches and the pipeline.
7) No blasting is permitted within 5 metres of an operating pipeline. If blasting within 30 metres of the pipeline is anticipated, detailed blasting procedures must be submitted to TNPI by the Contractor.
8) Representative readings shall be taken at the commencement of all pile driving/hoe ramming operations delivering more than 10,000 foot-pounds of energy on impact within 6 metres of the TNPI pipeline(s).
9) Snow fencing must be provided near and around the excavation area as directed by the Pipeline Representative.
10) No pipe joints shall be installed under the operating pipeline.
11) Approval for low pressure air testing of sewer mains within the pipeline ROW must first be obtained from TNPI by the Contractor.
12) All appurtenances (MHs, CBs, VCs, Fittings,etc.) must be outside the pipeline ROW.
13) Metallic installations must be wrapped with non-conductive insulating material for a distance of 8m on each side of the pipeline to mitigate interference with the pipeline's cathodic protection.
14) Minimum clearance of 30cm must be maintained between utility and pipeline.



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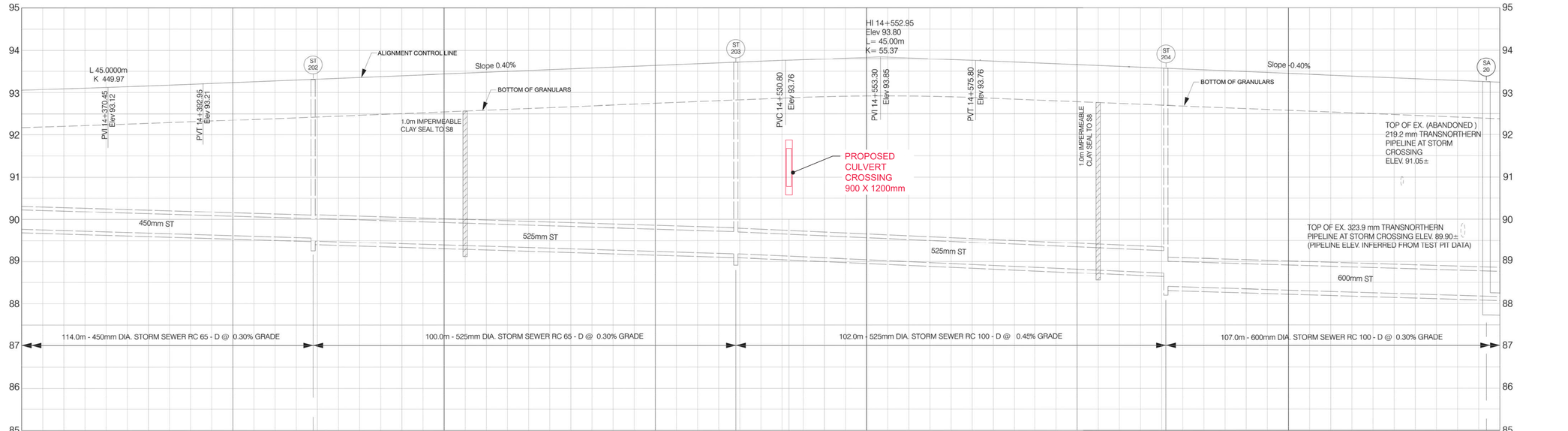
Date of Issue: October 17, 2012

Existing Pipe Obvert Elevations +-
TRANS-NORTHERN PIPELINE
TP#1: Elev.=89.90m
TP#2: Elev. = 89.90m
TP#3: Elev. = 90.98m
TP#4: Elev. = 91.05m
(FROM TEST PIT DATA SUPPLIED BY MORRISON HERSHFIELD)



LEGEND:
PROPOSED CULVERT

Scale

Project Title
RIVERSIDE SOUTH EMPLOYMENT LANDS AND BLOCKS 13, 14

Drawing Title
PROPOSED LIMEBANK ROAD CROSSING (NORTH)

Sheet No.
FIGURE 4.3

IBI

CATCH BASIN DATA

STATION	OFFSET	CATCH BASIN TYPE	T/G ELEVATION	CATCH BASIN LEAD LENGTH (1)	LENGTH (2)	INVERT (1)	INVERT (2)
4+735.00	11.75 L	OPSD 705.010 - S3,S22,S23	92.87	15.86	8.25	91.27	91.27
4+741.12	11.75 R	OPSD 705.020 - S3,S22,S23	92.84	6.91	8.25	91.24	91.24
4+784.95	11.75 L	OPSD 705.020 - S3,S22,S23	92.66	15.86	8.25	91.06	91.06
4+787.01	11.75 R	OPSD 705.010 - S3,S22,S23	92.66	6.91	8.25	91.06	91.06
4+829.99	11.75 L	OPSD 705.010 - S3,S22,S23	92.47	15.86	8.25	90.87	90.87
4+830.99	11.75 R	OPSD 705.020 - S3,S22,S23	92.47	6.91	8.25	90.87	90.87
4+875.03	11.75 L	OPSD 705.010 - S3,S22,S23	92.29	15.86	8.25	90.69	90.69
4+877.00	11.75 R	OPSD 705.020 - S3,S22,S23	92.28	6.91	8.25	90.68	90.68
4+914.99	11.75 L	OPSD 705.020 - S3,S22,S23	92.12	15.75	8.25	90.52	90.52

SUBDRAIN INSERT LOCATION TO ACCOMMODATE 200mm DIA. LEAD

CATCH BASIN DATA

NO.	STATION	OFFSET	CATCH BASIN TYPE	T/G ELEVATION	CATCH BASIN LEAD LENGTH (1)	LENGTH (2)	INVERT (1)	INVERT (2)
CB 62	14+921.00	11.75 R	OPSD 705.010 - S3,S22,S23	92.10	6.82	8.25	90.50	90.50
CB 63	14+954.96	12.00 L	OPSD 705.010 - S3,S22,S23	91.95	16.61	8.25	90.35	90.35
CB 64	14+965.98	12.25 R	OPSD 705.020 - S3,S22,S23	91.90	6.72	8.25	90.30	90.30
*CB 65	14+994.98	12.75 L	OPSD 705.020 - S3,S22,S23	91.77	17.81	8.25(E)	90.17	90.11(E&S)
*CB 66	15+011.00	13.00 R	OPSD 705.020 - S3,S22,S23	91.71	6.94	8.25(W)	90.11	89.86(S&W)
*CB 67	15+034.69	13.50 L	OPSD 705.010 - S3,S22,S23	91.60	18.77	39.00(N)	90.00	90.30(N)

NOTES:
- CATCH BASIN OFFSETS ARE FROM ALIGNMENT CONTROL LINE TO FACE OF CURB .

- CB LEAD NOTE (1) DENOTES CB LEAD LENGTH AND INVERT ELEVATION FOR FINAL CONNECTION TO THE STORM SEWER. CATCH BASIN LEAD TO BE CAPPED WITH SPIGOT PLUG. ALL CATCH BASIN LEADS TO STORM SEWER SHALL BE 200mm DIA. PVC SDR 35 INSTALLED AT 2% SLOPE UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS.

- CB LEAD NOTE (2) DENOTES CB LEAD LENGTH AND INVERT ELEVATION FOR INTERIM CONNECTION TO THE DRAINAGE DITCH. ALL CATCH BASIN LEADS SHALL OUTLET AT BOTTOM OF DITCH; SLOPE OF EACH LEAD TO BE ADJUSTED ACCORDINGLY.

- REFER TO GENERAL ARRANGEMENT DRAWINGS BY MORRISON HERSHFIELD FOR CULVERT INSTALLATION DETAILS.

STORM MAINTENANCE HOLE DATA

NO.	STRUCTURE TYPE / SIZE	COORDINATES NORTHING	COORDINATES EASTING
ST 205	OPSD 701.011 - 1200mm Ø C/W SAFETY PLATFORM	5017512.291	369490.943
ST 206	OPSD 701.011 - 1200mm Ø C/W SAFETY PLATFORM	5017416.549	369531.556
ST 207	1520mm x 1830mm BOX MH C/W SAFETY PLATFORM	5017343.806	369562.369
ST 208	OPSD 701.011 - 1500mm Ø C/W SAFETY PLATFORM	5017260.463	369596.359

SANITARY MAINTENANCE HOLE DATA

NO.	STRUCTURE TYPE / SIZE	COORDINATES NORTHING	COORDINATES EASTING
SA 21	OPSD 701.010 - 1200mm Ø C/W SAFETY PLATFORM	5017459.133	369509.583
SA 21A	OPSD 701.010 - 1200mm Ø	5017437.048	369518.936
SA 22	OPSD 701.010 - 1200mm Ø	5017348.620	369556.389
SA 23	OPSD 701.010 - 1200mm Ø	5017237.505	369601.845

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

NO.	REVISIONS	BY	DATE
0	*ISSUED FOR TENDER*	JB	12/08/08
1	ISSUED FOR CONSTRUCTION	JB	03/06/09
2	ISSUED WITH CCN # 7	JB	09/08/09
3	'AS BUILT' INFORMATION ADDED	JB	10/25/12

NOTE: The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage

LIMEBANK ROAD WIDENING
BALMORAL DRIVE TO SPRATT ROAD

PLAN AND PROFILE
STA.14+700 TO STA. 15+050

W. NEWELL, P. Eng
Director Infrastructure Services

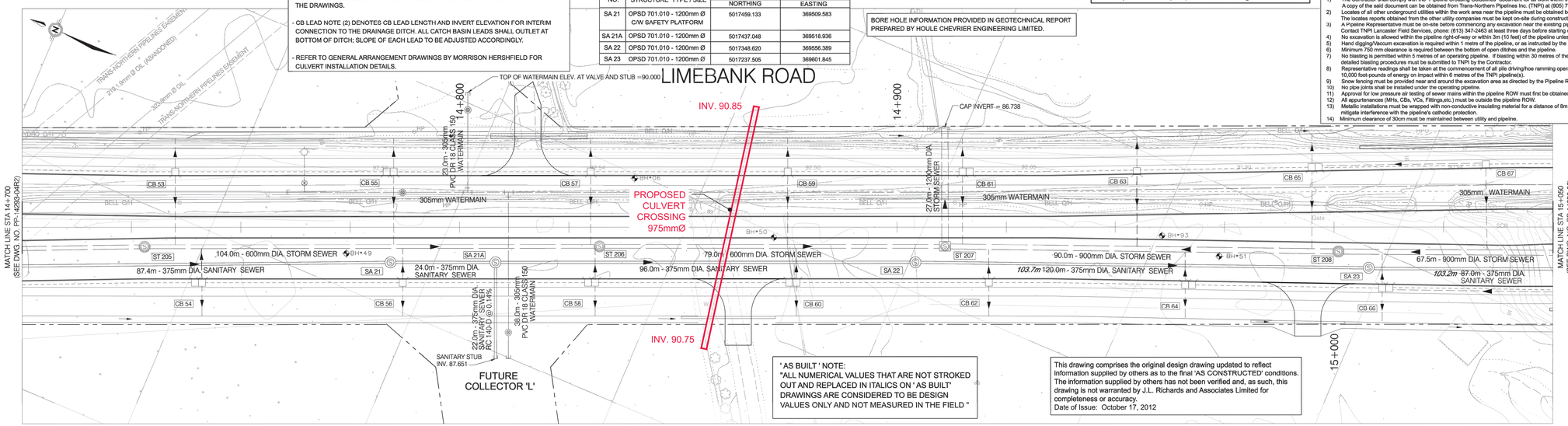
ZIAD A. GHADBAN, P. Eng.
Manager Construction Services - Development

Dwn: MF , MGB | Chkd: PDR | Des: KD , JB | Chkd: PDR

Ottawa

CONTRACT NO.
ISB07-5047
DWG. NO.
PP -14293 -05R2
SHEET 54 OF 149
Date: OCTOBER 2008
Scale: 0m 5 10 20

Trans-Northern Pipeline Crossing
1) The Contractor shall comply with the "Pipeline Crossing Guidelines" document for all work within the pipeline easement. A copy of the said document can be obtained from Trans-Northern Pipelines Inc. (TNPI) at (905) 770-3353.
2) Locates of all other underground utilities within the work area near the pipeline must be obtained before commencement of any work. The locates reports obtained from the other utility companies must be kept on-site during construction.
3) A Pipeline Representative must be on-site before commencing any excavation near the existing pipeline. Contact TNPI Lancaster Field Services, phone: (613) 347-2463 at least three days before starting construction.
4) No excavation is allowed within the pipeline right-of-way or within 3m (10 feet) of the pipeline unless a pipeline inspector is present.
5) Hand digging/Vaccum excavation is required within 1 metre of the pipeline, or as instructed by the Pipeline Representative.
6) Minimum 750 mm clearance is required between the bottom of open ditches and the pipeline.
7) No blasting is permitted within 5 metres of an operating pipeline. If blasting within 30 metres of the pipeline is anticipated, detailed blasting procedures must be submitted to TNPI by the Contractor.
8) Representative readings shall be taken at the commencement of all pile driving/hoe ramming operations delivering more than 10,000 foot-pounds of energy on impact within 6 metres of the TNPI pipeline(s).
9) Snow fencing must be provided near and around the excavation area as directed by the Pipeline Representative.
10) No pipe joints shall be installed under the operating pipeline.
11) Approval for low pressure air testing of sewer mains within the pipeline ROW must first be obtained from TNPI by the Contractor.
12) All appurtenances (MHs, CBs, VCs, Fittings,etc.) must be outside the pipeline ROW.
13) Metallic installations must be wrapped with non-conductive insulating material for a distance of 8m on each side of the pipeline to mitigate interference with the pipeline's cathodic protection.
14) Minimum clearance of 30cm must be maintained between utility and pipeline.



BORE HOLE INFORMATION PROVIDED IN GEOTECHNICAL REPORT PREPARED BY HOULE CHEVRIER ENGINEERING LIMITED.

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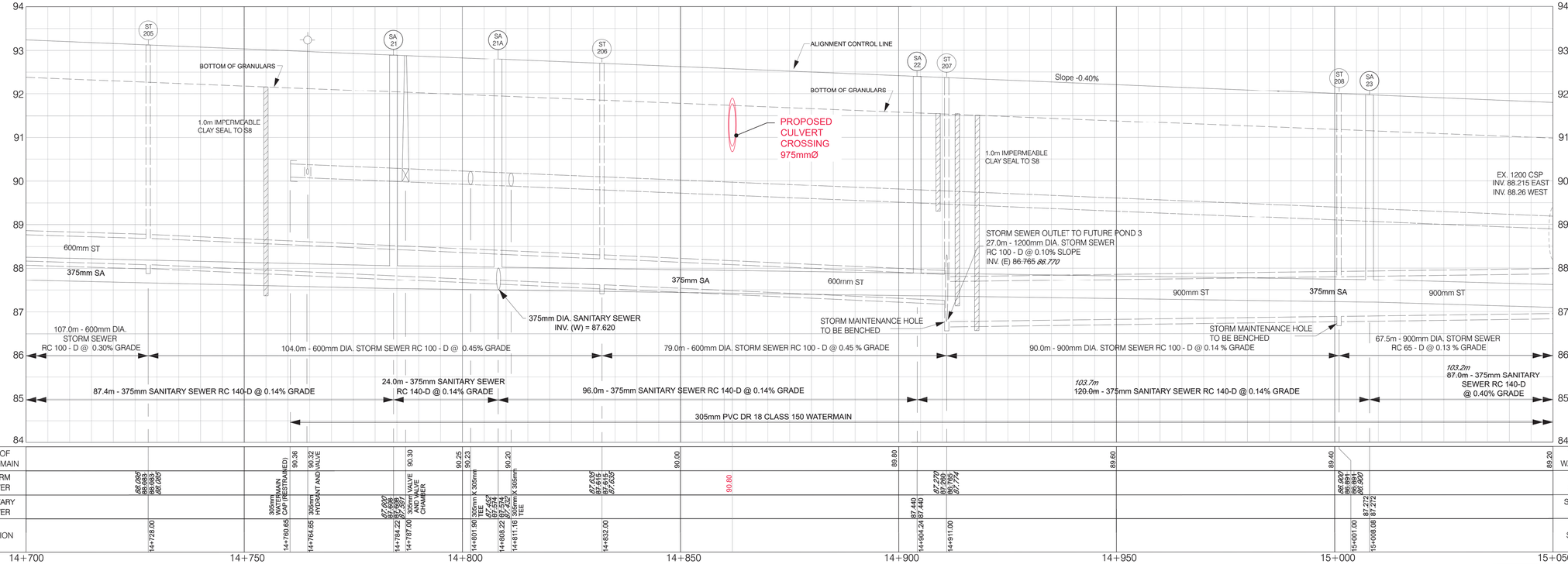
Date of Issue: October 17, 2012



LEGEND:
PROPOSED CULVERT

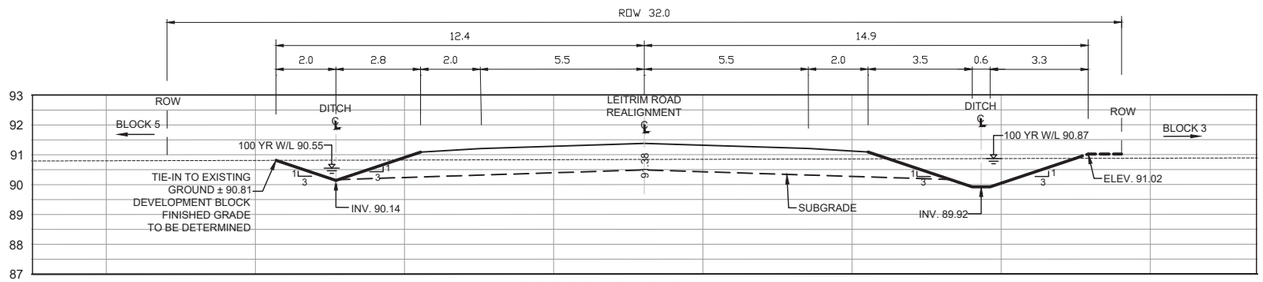
Scale

Project Title
RIVERSIDE SOUTH EMPLOYMENT LANDS AND BLOCKS 13, 14

Drawing Title
PROPOSED LIMEBANK ROAD CROSSING (SOUTH)

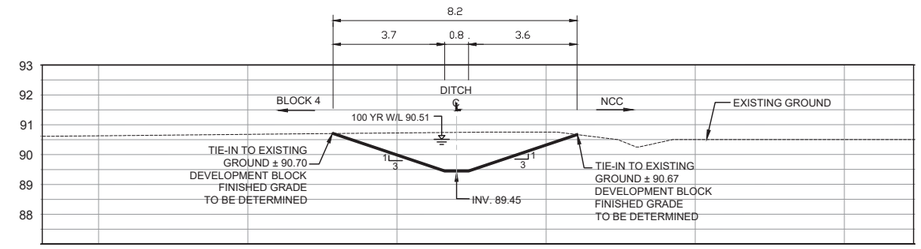
Sheet No.
FIGURE 4.4

IBI



CROSS SECTION 1-1

SCALE: 1:200.



CROSS SECTION 2-2

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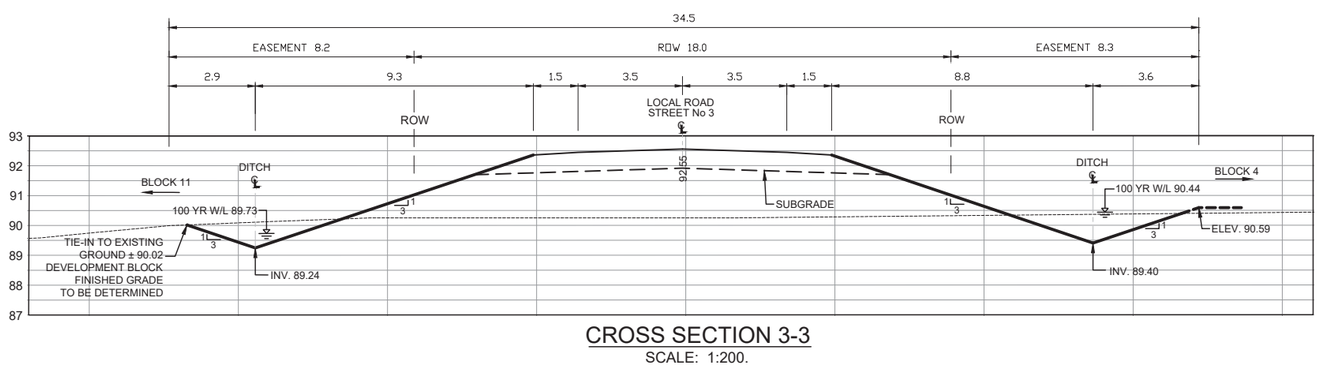

CROSS SECTION 3-3

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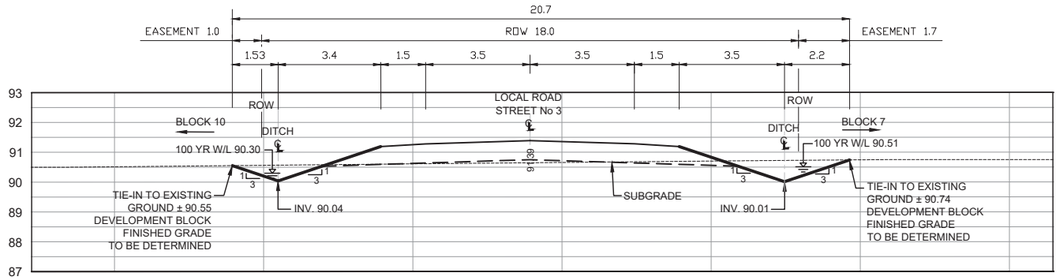

CROSS SECTION 4-4

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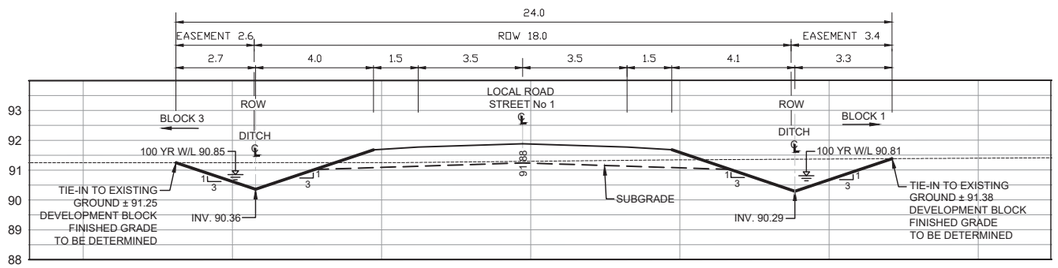


CROSS SECTION 5-5

SCALE: 1:200.

SCALE: 1:200

0 1 2 3 4 5 10m

J:\136974_RSS_Employme\7.0_Production\7.03_Design\27_Water\Sheets\136974-Figure 4.5 Cross sections.dwg Layout Name: Layout1 Plot Style: ---- Plot Scale: 1:2.5849 Plotted At: 7/12/2022 11:16 AM Last Saved By: svukic Last Saved At: Jul. 12, 22

IBI

Scale

N.T.S

Project Title

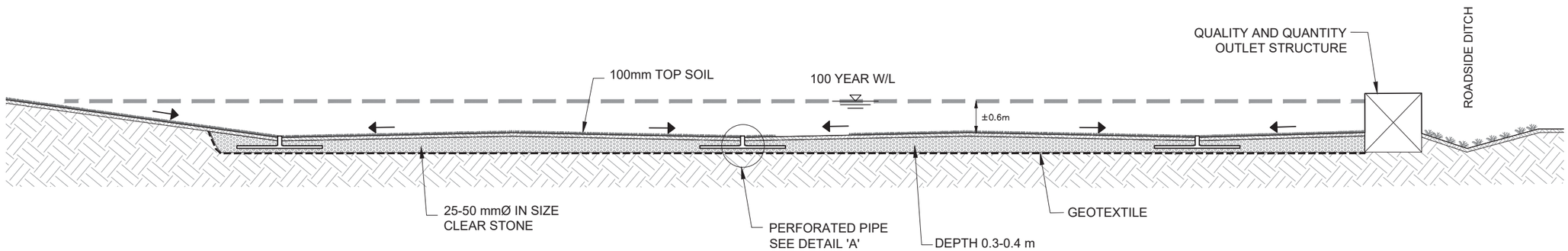
RIVERSIDE SOUTH
EMPLOYMENT LANDS
AND BLOCKS 13, 14

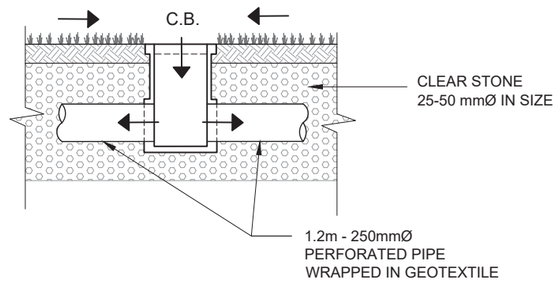
Drawing Title

CROSS - SECTIONS

Sheet No.

FIGURE 4.5





DETAIL 'A'

J:\136974_RSS_Employme\7.0_Production\7.03_Design\27_Water\Sheets\136974-Figure 4.6 Business Park Lid Conceptual Profile.dwg Layout Name: 4.6 Plot Scale: 1:8.704 Plotted At: 7/12/2022 Last Saved By: svukic Last Saved At: Jul. 12, 22

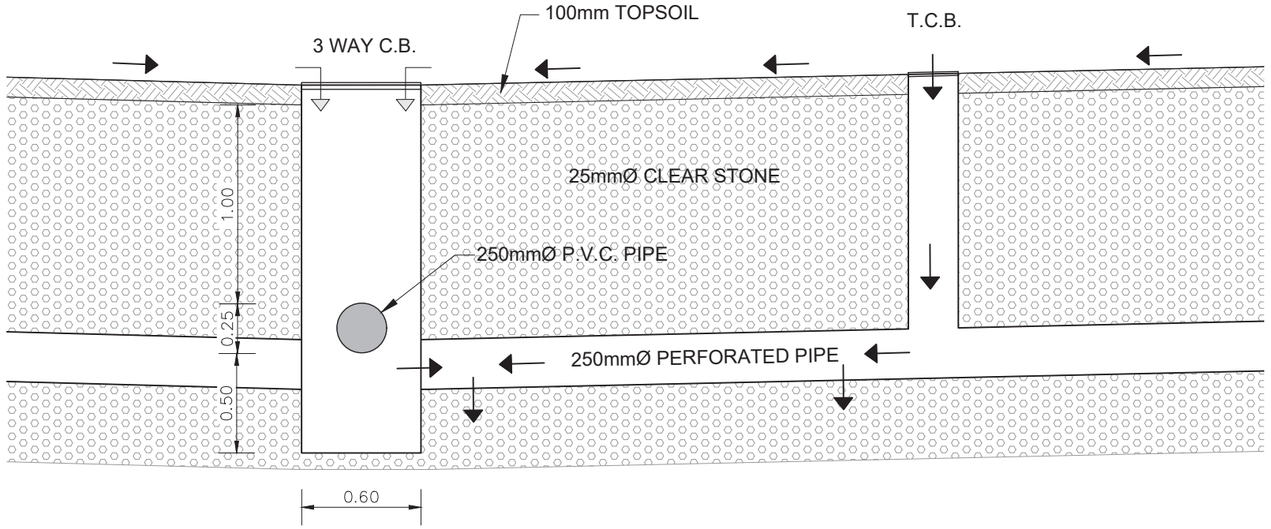
IBI

Scale
N.T.S

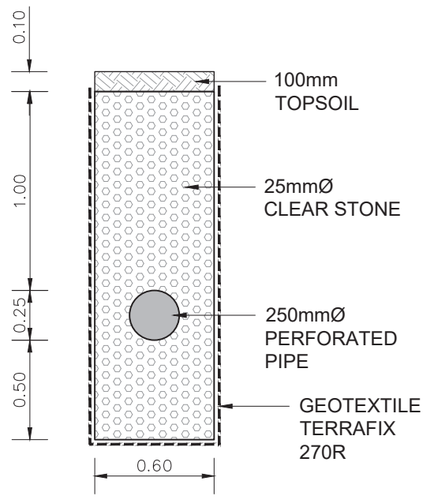
Project Title
RIVERSIDE SOUTH
EMPLOYMENT LANDS
AND BLOCKS 13, 14

Drawing Title
BUSINESS PARK
LID
CONCEPTUAL PROFILE

Sheet No.
FIGURE 4.6



PROFILE



CROSS-SECTION

IBI

Scale
N.T.S

Project Title
RIVERSIDE SOUTH
EMPLOYMENT LANDS
AND BLOCKS 13, 14

Drawing Title
LOW AND MEDIUM DENSITY
RESIDENTIAL LID
CONCEPTUAL PROFILE

Sheet No.
FIGURE 4.7

Appendix E

- Figure 6.1 - Erosion and Sedimentation Control Plan

J:\136974_RSS_Employme\7.0_Production\7.03_Design\04_Civil_LAND_Adequacy Report\FIGURE 6.1 EROSION & SEDIMENTATION.dwg Layout Name: EROSION & SEDIMENTATION Last Saved By: ddore Last Saved At: Jul. 12, 22

LEITRIM ROAD

RIVER ROAD

LIMEBANK ROAD

BLOCK 11

BLOCK 4

BLOCK 1

STREETNo. 1

STREETNo. 1

BLOCK 3

EMPLOYMENT LANDS

BLOCK 2

STREETNo. 1

Leitrim Road

BLOCK 5

BLOCK 7

STREET

BLOCK 10

Re-alignment

STREETNo. 2

BLOCK 6

BLOCK 8

BLOCK 15

No. 3

BLOCK 9

BLOCK 12

BLOCK 12

CANTOR WALK DRIVE

RIVERSIDE SOUTH

BLOCK 14

BLOCK 13

LIMEBANK ROAD

SPRATT ROAD

SPRATT RD.

N

LEGEND:

LIGHT DUTY SILT FENCE

TEMPORARY MUD MAT

STRAW BALE CHECK DAM

IBI

Scale

N.T.S.

Project Title

RIVERSIDE SOUTH
EMPLOYMENT LANDS
AND BLOCKS 13, 14

Drawing Title

EROSION & SEDIMENTATION
CONTROL PLAN

Sheet No.

FIGURE 6.1