Riverside South Development Corporation

Design Brief Phase 1

3700 Twin Falls Place, Riverside South

September 2023
Revised February 2024
Revised April 2, 2024
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1 Introduction

1.1 Purpose

The purpose of this Design Brief is to provide stakeholder regulators with the project background together with the design philosophy and criteria for municipal roadway and site plan approvals. This report will provide logical framework to assist reviewers with evaluation of the design of the development.

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:

- **Assessment of Adequacy of Public Services 3700 Twin Falls Place Riverside South – by IBI Group, August 2022**. This report reviews and makes recommendations for water supply, wastewater

collection provides a macro level servicing plan of the Mosquito Creek area of the Riverside South Community area. The study is currently under review.

- **Riverside South Community Infrastructure Servicing Study Update Phase 1 Mosquito Creek Study Area – by IBI, Stantec, GHD, Paterson Group and GEO Morphix, August 18, 2023**. The report provides a macro level servicing plan of the Mosquito Creek area of the Riverside South Community area, building on the conclusions of the MDP Update.
- **Riverside South Community Master Drainage Plan Update Mosquito Creek Study Area: Volume 1 Existing Conditions Report (2020) and Volume 2 Master Drainage Plan Update (August 18, 2023) – by IBI, GHD, Paterson Group and GEO Morphix**. The report provides the conceptual stormwater management infrastructure for the Mosquito Creek area.

1.4 Subject Property

The site is located north of Spratt Road and west of Limebank Road as shown on **Figure 1.1** Location Plan. The current draft plan of subdivision for the subject property is shown on **Figure 1.2** which consists of 20 blocks with 3 local roads and the Leitrim Road realignment. Leitrim Road will be a fully urbanized roadway while the local streets will have a rural road section with sidewalks on one side. There is an existing high tension power line running in a northeast direction from the Spratt/Limebank intersection.

1.5 Phasing

Phase 1 of the 3700 Twin Falls development includes Street No. 1 (Gastops Street), the Re-alignment of Leitrim Road and a small portion of Street No. 3 at the northwest corner including the SWM outlet in Block 18 as shown on **Figure 1.4** Phasing Plan. The Leitrim Re-alignment is being constructed on interim basis as a 2 lane rural road with a sidewalk per the local sections, the interim road is named Mosquito Drive. Phase 1-A consists of Block 2 adjacent to Limebank Road with an area of 2.79 hectares. Development of Block 2 requires the construction of the Mosquito Drive from Limebank Road to Gastops Street and Gastops Street along the Block 2 frontage with a turning circle at the north end. As part of Phase 1-A the ditches need to be extended in the remainder of the Phase 1 lands, referred as Phase 1-B, and the SWM outlet in Block 18 will be constructed, access roads will be constructed adjacent to the ditches and the SWM outlet.

1.6 Existing Infrastructure

Figure 1.3 shows the location of existing infrastructure in the vicinity of the site. There is a 375 mm sanitary sewer and a 305 mm watermain on Limebank Road. A 375 mm sanitary stub and 300 mm watermain stub has been provided to service the 3700 Twin Falls development however they are located approximately 75 meters north of the proposed Limebank/Leitrim intersection and will need to be decommissioned. While there is a storm sewer on Limebank Road, all the stormwater runoff from the site will be directed to Mosquito Creek.

1.7 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.

1.8 Geotechnical Considerations

The subject lands are included in the:

- **Report No. PG4958-2, Revision 3 July 28, 2023 Geotechnical Investigation Proposed Commercial Development, Employment Lands – Riverside South Development Corporation by Paterson Group**.

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 the 3700 Twin Falls development including Block 2. Drawing PG4958-9 Remissible Grade Raise Plan ids included in **Appendix A**.

2 Water Supply

2.1 Existing Conditions

As noted in **Section 1.5** there is an existing 305 mm watermain on Limebank Road, an existing 305mm stub was provided for the development however it is located approximately 75 meters north of the proposed Limebank/Leitrim intersection and will need to be decommissioned. **Figure 1.3** shows the location of the existing watermains.

2.2 Assessment of Adequacy of Public Services 3700 Twin Falls Place Riverside South (IBI Group, August 2023)

A hydraulic model of the water system for 3700 Twin Falls Place was conducted in the Assessment of Adequacy of Public Services report using boundary conditions provided by the City of Ottawa. A 305 mm watermain is proposed on Leitrim Road Re-alignment with connection to the existing 305 mm watermain on Limebank Road in accordance with the 2022 Infrastructure Servicing Update Phase 1 for the Mosquito Creek Area. In order to provide two watermain feeds to the 3700 Twin Falls Place development, a second watermain on Limebank Road is proposed that will be installed on the west side of the road paralleling the existing 305 mm watermain on the east side of the road and connecting to an existing watermain on Spratt Road. **Figure 2.1** Conceptual Water Services from the Assessment of Adequacy of Public Services report is included in **Appendix B**.

2.3 Design Criteria

2.3.1 Water Demands

Water demands for the site are 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
- Light Industrial Day Demand 35,000 l/ha/day
- Light Industrial Peak Daily Demand 52,500 l/ha/day
- Light Industrial Peak Hour Demand 94,500 l/ha/day

A water demand for Phase 1 was calculated using the Concept Plan per Figure 1.3 in Appendix A and using a light industrial rate for the commercial and office building.

- Average Day 11.04 l/s
- Maximum Day 16.56 l/s
- Peak Hour 29.81 l/s

For Phase 1-A an average water demand for Block 2 would be 1.1 l/s based on a light industrial area of 2.79 hectares however Section 4.3.1 of the City of Ottawa Design Guidelines – Water Distribution requires two feedermains for a service area with a basic demand of 50 m^3/day (0.58 l/s) or greater. As it is not proposed to construct the second watermain on Limebank Road as outlined in **Section 2.2** the Phase 1 development will be limited to a basic day demand of 0.58 l/s. The water demands for Phase 1 are summarized as follows;

- Average Day 0.58 l/s
- Maximum Day 0.87 l/s
- Peak Hour 1.57 l/s

2.3.2 System Pressure

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

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	Maximum pressure at any point in the distribution system shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls will be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.
Water Age	A total travel time of 5 days or less during basic day demand is reasonable. A residence time of 8 days should not be exceeded.

2.3.3 Fire Flow Rates

There are no proposed building layouts for the subject lands at this time. The boundary conditions in **Section 2.3.4** have conditions for a 10,000 l/min and a 13,000 l/min fire demand to evaluate the fire flow rates that can be accommodated on the site.

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.

Table 2-1 Water Supply Boundary Conditions

	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 condition at the connection to the existing watermain on Limebank Road which is identified as Connection 2 in section 2.3.4.

2.4 Proposed Water Plan

2.4.1 Watermain Layout

For Phase 1-A a 305 mm watermain is proposed on Mosquito Drive per the RSCISSU-Phase 1 Mosquito Creek Area, the watermain connects to the existing 305 mm watermain on Limebank Road and is extended west to Gastops Street. On Gastops Street a 203 mm watermain will be extended north along the frontage of Block 2, a temporary flusher unit per Detail W3.2 at the north end. For the remainder of Phase 1 (Phase 1-B) the watermain on Mosquito Drive will be extended to the north limit of the site and the 203mm watermain on Gastops will be extended west to Mosquito Drive. A connection to the second watermain feed is proposed south of Mosquito Drive running adjacent to the Hydro One corridor and running along the south limit of the future block. The watermain is capped at the Limebank Road ROW and a gravel access road will be constructed over the main. As Phase 1-B is not planned to be constructed in the near future it is not proposed to construct the second watermain along Limebank Road to Spratt Road at this time as another developer may construct it for development east of Limebank Road. It is acknowledged that Phase 1-B cannot be constructed without the second watermain feed in place.

2.4.2 Modeling Results

The hydraulic model was run under basic day, maximum day with fire flows and under peak hour conditions for both the overall Phase 1 and Phase 1-A. 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:

Table 2-2 Hydraulic model results

Phase	Scenario	Existing Zone	SUC Zone Reconfiguration
Phase 1	Basic Day (Max HGL) Pressure Range	381.8 to 395.8 kPa	544.5 to 558.0 kPa
	Basic Day Water Age	N/A	N/A
	Peak Hour Pressure Range	316.3 to 328.9 kPa	517.0 to 529.5 kPa
	Max Day + 10,000 l/min Fire Flow Minimum Design Flow Available @ 140 kPa Residual Pressure	155.4 l/s	N/A
	Max Day + 13,000 l/min Fire Flow Minimum Design Flow Available @ 140 kPa Residual Pressure	152.1 l/s	221.5 l/s
Phase 1A	Basic Day (Max HGL) Pressure Range	382.2 to 393.9 kPa	544.8 to 550.7 kPa
	Basic Day Water Age	27.2 hours	27.2 hours
	Peak Hour Pressure Range	318.5 to 330.2 kPa	519.3 to 531.1 kPa
	Max Day + 10,000 l/min Fire Flow Minimum Design Flow Available @ 140 kPa Residual Pressure	100.3 l/s	142.5 l/s

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

Maximum Pressure — Under existing conditions and under the SUC Zone Reconfiguration all nodes in Phase 1 including Phase 1-A have basic day pressures less than 552 kPa. Pressure reducing control will not be required for Phase 1.

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

Fire Flow — For Phase 1 under the existing boundary conditions with the 10,000 l/min (167.7 l/s) fire there are 3 nodes on Gastops which do not meet the design fire flow, the maximum fire flow available @ 140 kPa residual pressure is 155.4 l/s. There are 6 nodes that do not meet the design flow under the 13,000 l/min (216.7 l/s) design flow scenario with the maximum fire flow of 152.1 l/s available @ 140 kPa residual pressure. Under the SUC zone reconfiguration all nodes can meet the design fire flow with a residual system pressure of

140 kPa therefore under existing conditions the building type will need to match the fire flows available.

For Phase 1-A under the existing boundary conditions with the 10,000 l/min (167.7 l/s) fire, the design fire flow available @ 140 kPa residual pressure varies from 100.3 l/s at the most northerly hydrant location on Gastops Street to 222.4 l/s at the hydrant adjacent to Limebank Road. As Phase 1-A is a serviced from a single watermain feed an analysis using the methodology of Technical Bulletin ISTB-2018-02 Appendix I – Guideline on Coordination of Hydrant Placement with Required Fire Flow has been undertaken. Under existing conditions, a fire flow of 5,700 l/min is applied to the hydrant node H2 on Leitrim Road which represents a hydrant within 75 meters from a building and a flow of 3,800 l/min is applied to hydrant node H3 on the south end of Gastops Street which represents a hydrant between 75 to 150 meters from a building. The water model is run with the two flows added and the minimum residual pressure is 197.4 kPa which is greater than the required minimum pressure of 140 kPa per Section 2.3.2. Based on this result a building within 100 m from the hydrants on Leitrim Road and within 150 meters from the southern hydrant on Gastops Street a combined fire flow of 9,500 l/min (158.3 l/s) is available under existing conditions. A building located further than 100 m north of Leitrim would have a lower fire flow, undertaking the same analysis for hydrant nodes H4 and H5 at the north end of Gastops a flow of 3,800 l/min is applied to node H4 however a flow of 2,910 l/min can only be applied to node H5 to maintain a residual pressure of 140 kPa so that a building situated at the north end of the site may have only a 6,720 l/min fire flow available under existing conditions. Under the SUC Zone Reconfiguration the analysis is conducted at hydrant nodes H4 and H5 which results in a residual pressure of 146.7 kPa for the 9,500 l/min fire flow, therefore after the SUC Zone Reconfiguration a building situated at the south end of Block 2 will have an available fire flow of 9,500 l/min (158.3 l/s). When the second watermain feed on Limebank Road is constructed and the watermain on Gastops Street is looped the fire flows will increase substantially, in the Assessment of Adequacy of Public Services 3700 Twin Falls Place a fireflow of 13,000 l/min (216.7 l/s) is available at Block 2 under the SUC Zone Reconfiguration. The location, size and type of future building will determine the fire flow demand, using fire resistive building materials, sprinkler systems and possible firewalls the fire demand for a large building can be lower than 10,000 l/min.

Water Age

Phase 1 has two water connections from Limeback Road and is a looped system so water age was not analyzed. In Phase 1-A with one watermain connection under existing and future conditions the water age for the northerly node on Gastops Street is 27.2 hours from the boundary condition at Limebank and Spratt Roads with a demand of 0.58 l/s. A lower demand for Block 2 will result in a longer water age, a flushing unit per City Detail W3.2 is proposed at the end of the Phase 1-A watermain on Gastops Street.

3 Wastewater Collection

3.1 Existing Conditions

As noted in **Section 1.5**, there is an existing 375 mm sanitary sewer on Limebank Road, an existing 375 mm stub was provided for the development however it is located approximately 75 meters north of the proposed Limebank/Leitrim intersection and will need to be decommissioned. **Figure 1.3** shows the location of the existing watermains.

3.2 Assessment of Adequacy of Public Services 3700 Twin Falls Place Riverside South (IBI Group, August 2023)

As stated in the Assessment of Adequacy report the 2022 Infrastructure Servicing Update Phase 1 for the Mosquito Creek Area Infrastructure Servicing Study Update provided a macro level wastewater servicing plan for the 3700 Twin Falls Place development known as the Employment Lands in the Study Update. Major sanitary sewers are shown on Figure 400 Sanitary Drainage Area Plan, a copy of the drainage plan and the Sanitary Sewer Design Sheet is included in **Appendix C** with the Employment Lands areas highlighted on the design sheet. The Employment Lands is represented by Area 136A in the Phase 1 ISSU, the site outlets to the existing 375 mm sanitary sewer on Limebank Road via a 375 mm sanitary sewer on the Leitrim Road Re-alignment. **Figure 3.1** in **Appendix C** shows the Conceptual Sanitary Plan for the 3700 Twin Falls Place development.

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
- Average Industrial flow = 35,000 l/s/ha
- Peak ICI flow factor = 1.0 if ICI area is ≤ 20% total area
  = 1.5 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

Minimum allowable pipe slopes are presented in the below table.

Table 3-1 Minimum Sanitary Pipe Slopes per OSDG

Pipe Diameter (mm)	Slope (%)
200	0.320
250	0.240
300	0.186
375	0.140
450	0.111
525 and larger	0.100

3.4 Recommended Sanitary Plan

For Phase 1 a 375 mm sanitary sewer is proposed on Mosquito Drive connecting to the existing 375 mm sanitary sewer on Limebank Road per the RSCISSU-Phase 1 Mosquito Creek Area. After the stub to Future Street No. 2 the pipe sizes are reduced based on the design flows. A 200 mm sanitary sewer is proposed on the north/south and west/east legs of Gastops Street connecting to the Mosquito Drive sewer at both ends. A copy of the sanitary sewer design sheet and sanitary drainage area plan is included in **Appendix C**

During construction, a temporary inlet control device (ICD) will be placed in MH 120A which is the first MH upstream of the outlet to prevent excessive groundwater from entering the existing system during construction. The ICD will remain in place until preliminary acceptance at which time it will be removed. Calculations are included in **Appendix C** in which the size of the ICD is based on the allotted flow for the full development with the hydraulic head set at finished grade.

4 Stormwater Management

4.1 Existing Conditions

Runoff from Phase 1 drains to Mosquito Creek, either via Tributary 3 or 4.

4.2 Assessment of Adequacy of Public Services 3700 Twin Falls Place Riverside South (IBI Group, August 2023)

The storm servicing of 3700 Twin Falls Place was outlined in the Assessment of Adequacy of Public Services Report, including a PCSWMM evaluation to support the conceptual design of the on-site SWM measures, the ditch network and the dual drainage of the ultimate build out of Leitrim Road.

The 2023 Phase 1 ISSU and Assessment of Adequacy of Public Services Report built upon the recommendations of the 2021 MDP Update, with a refinement to the future ultimate Leitrim Road right-of-way (ROW) to an urbanized cross-section complete with storm sewer, following input from the City. Otherwise, the drainage system for the subject site is comprised of a ditch conveyance network. Local streets are provided with one sidewalk. Catch basins will be installed on the side of the street provided with the sidewalk, outletting to the road-side ditch. The drainage system (the ditch network and associated culverts) was designed assuming that the infiltration component of the development block's on-site SWM measure was fully saturated with groundwater and therefore no benefit was applied in the sizing of the SWM measure itself or the conveyance network.

Refer to Drawing 500 Storm Drainage Area Plan from the Phase 1 ISSU enclosed in **Appendix D** which outlines the proposed conveyance network.

4.3 Storm Servicing Concept

The storm servicing concept for Phase 1 3700 Twin Falls Place remains generally consistent with that outlined in the Phase 1 ISSU and APSR; however, given that the timing for the overall realignment of Leitrim Road, now referred to as Mosquito Drive, is unknown, an interim cross-section is being proposed (refer to **Drawing 136974-011**). The interim cross-section is provided with ditches on the southwestern side and a sidewalk on the northeastern side. The ditch extends within the ultimate Mosquito Drive right-of-way to Tributary 4. Ditches on Gastops Street tie-in to the interim Mosquito Drive ditch at two locations. The location of the ditch tie-in to Tributary 4 is the same as that proposed under ultimate build out conditions in the Phase 1 ISSU and APSR. Frequent flows in the ditch will be diverted to an oil-grit separator, prior to tying-in to Tributary 4, a refinement from the ISSU and APSR. Whereas the Phase 1 Mosquito Drive right-of-way is interim, Phase 1 of Gastops Street is being provided with the ultimate right-of-way and the ditches are considered permanent.

Per the Phase 1 ISSU and APSR, water quality treatment for the development blocks is being provided via on-site SWM measures at each block. For further information on the proposed on-site SWM measures at each block, which include water quantity, quality and LID features, please refer to the conceptual design outlined in the Phase 1 ISSU and APSR. Detailed design of the measures will be completed for the individual site plans supporting each development block.

Runoff from roads will be collected directly and treated via filtration by the typical roadside ditches, with further treatment provided by the end-of-ditch oil-grit separator (OGS). A high point is proposed in the outlet ditch that will divert frequent runoff (corresponding to the 25 mm storm event, considered the water quality event) to the OGS unit for water quality treatment. Treated runoff will outlet to the ditch approximately 20 m downstream. Flow greater than the 25 mm event cascades over a high point in the ditch, bypassing the OGS unit. Refer to **Drawing 136974-105** for the plan and profile of the end-of-ditch configuration, with further details on **Drawing 136974-203** and **710**.

It should be noted that under full build out conditions of the 3700 Twin Falls site, presented in the APSR, an OGS is proposed for water quality treatment of the runoff conveyed by the future pipe in Mosquito Drive. At the time of the design of such conditions, the configuration of the two OGS units can be reviewed, with the opportunity to combine the units explored. The configuration of the OGS unit servicing the ditch proposed in this report will allow for the installation of the pipe and OGS as outlined in the APSR.

The proposed works tie-in to a southeasterly reach of Tributary 4. Rip rap protection of the Phase 1 ditch is proposed at its downstream end and as it ties-in to the existing reach (refer to **Drawings 136974-105** and **203**). Based on similar project experience, the outside bends within this receiving reach may be prone to erosion, and a vegetated rip rap treatment is proposed on the side slopes of these locations. The potential locations and the proposed treatment are presented on **Drawing 136974-710**. Given the banks of the reach are maturely vegetated, it is recommended that following construction and spring freshet conditions, these locations be field assessed by the fluvial geomorphologist, and the proposed erosion mitigation measures be adjusted accordingly.

4.4 Regulatory Requirements and Design Targets

The 2021 MDP Update outlined regulatory requirements and design targets for proposed development tributary to Mosquito Creek within the existing CDP lands. This section discusses regulatory requirements with respect to erosion control, water budget and water quality control.

The MDP Update was completed and approved with LIDs incorporated in the erosion analysis. This was reviewed and updated in the Phase 1 ISSU; during the review process the City of Ottawa expressed reservation related to LIDs that rely on infiltration in clay soils and the LIDs were then removed from the Phase 1 ISSU analysis for the infrastructure sizing and erosion analysis. The latter indicated that no erosion mitigation measures are required for the Phase 1 build out, which includes 3700 Twin Falls Place.

The water balance established in the MDP Update reflected a scenario without LIDs and a scenario with LIDs. The water budget concluded that across the entire MDP study area, the runoff volume is anticipated to increase by 101%. With the implementation of LIDs, that increase would be 66%. The water budget was refined for the Phase 1 ISSU and APSR, based on the advancement of the Phase 1 design, including that of 3700 Twin Falls. The LIDs considered within 3700 Twin Falls Place were those on the development blocks. Referring to Appendix D of the APSR, the updated water budget indicates that, accounting for LIDs, the overall increase in runoff volume is 62%.

In terms of quality control, the target is that an Enhanced Level of Protection be provided, which corresponds to long term 80% TSS removal. As noted above, across 3700 Twin Falls Place, it is proposed that water quality control be provided for the blocks via the on-site SWM measures; for the right-of-way via roadside ditches and an end-of-ditch oil grit separator; and ultimately the storm sewer servicing urbanized Mosquito Drive would be provided with an end-of-pipe oil grit separator.

4.4.1 Right-of-Way Water Quality

Water quality treatment for the right-of-way is proposed to be provided via the roadside ditches and an end-of-ditch oil grit separator. The latter has been sized to provide treatment of the rights-of-way for the full 3700 Twin Falls development under long-term interim conditions (that is, prior to the construction of urbanized Mosquito Drive and accompanying storm sewer), considered to be the most conservative development conditions. It assumes that any contributing runoff from external lands, such as development east of Limebank Road, is treated. The unit has been sized for 80% TSS removal, acknowledging that there is also treatment provided in the upstream ditches. Refer to manufacturer OGS sizing report in **Appendix D**. Per the manufacturer's website, the unit "removes oil, trash and TSS (suspended solids and their associated metals, nutrients, bacteria), from stormwater runoff".

4.5 Hydrological and Hydraulic Evaluation

The PCSWMM modeling completed to reflect the Phase 1 development is based on the modeling completed for the Phase 1 ISSU. The boundary condition at the confluence of Tributary 4 in Mosquito Creek has been considered as a fixed elevation as determined in the ISSU modeling.

Mosquito Drive, Gastops Street, a portion of Street 3 as well as blocks fronting them have been considered as developed in this evaluation for conservatism in ditch sizing. External areas flowing to Tributary 4 have been extracted from the City of Ottawa's existing conditions PCSWMM model and included in the evaluation. Under existing conditions, it should be noted that lands east of Limebank Road do not drain to the subject site. The storm drainage area plan supporting the PCSWMM modeling is provided on **Drawing 136974-500** in **Appendix D**.

An additional scenario supporting the sizing of the OGS unit was considered. In this scenario, Street 3 and the blocks fronting it (all of which are external to Phase 1) have been considered as developed and have been modeled, consistent with the APSR. A schematic of the PCSWMM model is included in **Appendix D**. Refer to the APSR for modeling details.

4.5.1 Hydrological Evaluation

Selected modeling routines and input parameters are discussed in the following sections. Model files are included in the digital submission.

Storm and Drainage Area Parameters

The main hydrological parameters are presented in Table 4-1 for Phase 1 drainage areas and Table 4-2 for external lands tributary to Phase 1 works.

- Design Storms: The following storms were applied in the evaluation:
    - 13 mm 4 hour Chicago and 25 mm 4 hour Chicago for performance of on-site SWM measures
    - 100 year 3 hour Chicago storm events (10 minute time step); and
    - 100 year 24 hour SCS Type II storm events.
- **Area**: Phase 1 was divided into sub-drainage areas based on the proposed drainage scheme. Development blocks, runoff from which will be intercepted by the Phase 1 ditches along Gastops Street, have been delineated based on the latest draft plan. Lands external to Phase 1 that will have runoff

intercepted by the associated ditches have been delineated per available LiDAR. Refer to the storm drainage area plan supporting the PCSWMM modeling on **Drawing 136974-500** in **Appendix D**.

It should be noted that given that the ditches proposed for Phase 1 works are intended to be permanent, development blocks that could be serviced by the proposed ditches have been considered under post-development conditions.

- **Imperviousness**: PCSWMM provides an opportunity to specify the imperviousness of subcatchments. For this evaluation, an imperviousness of 93% and 70% for developed blocks and roadways respectively have been carried (consistent with the Phase 1 ISSU and APSR). For undeveloped lands, imperviousness consistent with the City's existing conditions PCSWMM model has been used.
- **Infiltration:** Infiltration losses were selected to be consistent with the OSDG. The Horton values are as follows: Max. infiltration rate = 76.2 mm/h, Min. infiltration rate = 13.2 mm/h, Decay constant = 4.14 1/hr. For undeveloped subcatchments, values consistent with the City of Ottawa's existing conditions model have been used.
- **Subcatchment Width:** The catchment width was based on the estimated conveyance route length of the drainage area and multiplied by two. The multiplier of two was only used if the drainage area had runoff contribution from both sides of the drainage area. This approach is consistent with the OSDG.
- **Slope:** The average surface slope was based upon the average slope for both impervious and pervious area. An average slope of 1% has been used for subcatchment flow routing.
- **Initial Abstraction (Detention Storage):** Detention storage depths of 1.57 mm and 4.67 mm were used for impervious and pervious areas, respectively. These values are consistent with the OSDG. For undeveloped subcatchments, values consistent with the City of Ottawa's existing conditions model have been used.
- **Manning's Roughness:** Manning's roughness coefficients of 0.013 and 0.250 are being applied for impervious and pervious areas, respectively.
- **Baseflow:** No baseflow components were assumed for any of the areas contributing runoff to the minor system within the PCSWMM model.
- **Combined SWM Measures:** The conceptual combined SWM measures were evaluated in the Phase 1 ISSU and carried forward to the APSR and the Phase 1 detailed design. On-site storage in the proposed SWM measures proposed at the development blocks has been considered at 600 cu-m/ha. The measures are provided with an overland outlet through a shallow depression tying-in to the proposed roadside ditch network, which itself outlets to Tributary 4. Flow connectivity is indicated on **Drawing 136974-500**. Further details on the conceptual design of the measures are provided in the Phase 1 ISSU and APSR and detailed design will be completed for the individual site plans supporting each development block.

Summary of Modeling Files

The following is a reference list of the PCSWMM files enclosed in digital submission.

- 13 mm 4 hour Chicago – EMP-RSDC-PH1_4H13MM_V03-NOLID.PCZ
- 25 mm 4 hour Chicago – EMP-RSDC-PH1_4H25MM_V03-NOLID.PCZ
- 100 year 3 hour Chicago – EMP-RSDC-PH1_3H100CHI_V03-NOLID.PCZ
- 100 year 24 hour SCS – EMP-RSDC-PH1_24H100SCS_V03-NOLID.PCZ

The file supporting the OGS sizing:

- 25 mm 4 hour Chicago – EMP-RSDC-PH1_4H25MM_V03WQ-NOLID.PCZ

4.5.2 Results of Hydrological Evaluation

A summary of input parameters and 100 year flows from drainage areas to the conveyance network is presented in the below table.

No ponding is expected during the 2 year storm on the proposed roads. The flow of the largest roadway drainage area serviced by a catch basin during the 2 year storm is 17 l/s. The capture of the catch basin is restricted by the lead which has a capacity of 85 l/s, refer to supporting calculations in **Appendix D**.

Table 4-1 Summary of subcatchment input parameters – Phase 1 3700 Twin Falls Place

Catchment ID	Land Use	Area (ha)	Imp (%)	Width (m)	Available Surface Storage for Development Areas[1] (cu-m/ha)	100 year Flow to Conveyance Network (l/s) (3 hour Chicago Storm)
4_B1	IL	3.70	93	180	600	72
4_B2	IL	2.75	93	200	600	54
4_B3	IL	5.11	93	420	600	100
4_B4	IL	2.81	93	250	600	55
4_B5	IL	1.16	93	180	600	23
4_B6	IL	1.67	93	200	600	33
4_R1_3-1	RD	0.15	70	138	N/A	71
4_R1_3-2	RD	0.20	70	179	N/A	92
4_R1_4-1	RD	0.15	70	140	N/A	72
4_R1_4-2	RD	0.18	70	159	N/A	82
4_R4_1	RD	0.46	70	286	N/A	211
4_R4_2	RD	0.89	70	558	N/A	410
4_R4_3	RD	0.90	70	562	N/A	413
4_R4_4	RD	0.36	70	224	N/A	400

(1) Within the Industrial and Logistics (IL) land use tributary to Tributary 4, this storage is proposed to be provided in the on-site SWM measure.

Table 4-2 Summary of subcatchment input parameters – External lands tributary to Phase 1 works

Catchment ID	Land Use	Area (ha)	Imp (%)	Width (m)	Available Surface Storage for Development Areas[1] (cu-m/ha)	100 year Flow to Conveyance Network (l/s) (3 hour Chicago Storm)
4_B7	IL	0.82	93	200	600	16
4_B8	IL	1.04	93	200	600	21
4_B9	IL	1.38	93	260	600	27
4_B10	IL	1.31	93	200	600	26
4_S15	IL	3.43	93	320	600	67
4_R1_1-1	RD	0.15	70	140	N/A	72
4_R1_1-2	RD	0.18	70	162	N/A	83
4_R1_2-1	RD	0.21	70	189	N/A	97
4_R1_2-2	RD	0.24	70	217	N/A	111
4_R3_1-1	RD	0.14	70	128	N/A	66
4_R3_1-2	RD	0.18	70	162	N/A	83
4_R4_5	RD	0.76	70	478	N/A	352
1	Existing	0.15	0.11[2]	70	N/A	71
2	Existing	0.63	0.11[2]	126	N/A	66
3	Existing	0.31	0.11[2]	9	N/A	7

(1) Within the Industrial and Logistics (IL) land use tributary to Tributary 4, this storage is proposed to be provided in the on-site SWM measure.
(2) Per City of Ottawa existing conditions model.

4.5.3 Hydraulic Evaluation

Runoff from the roads and outflow from the on-site SWM measures cascade to a ditch network that outlets to Tributary 4. There are two culverts crossing Mosquito Drive, and four culverts crossing service roads. The proposed network is presented schematically on **Drawing 136974-500** and in detail on **Drawings 136974-100-105**.

The elevation of the ditches generally follows existing terrain. The overall longitudinal slope of the subdivision ditches ranges from 0.1% to 0.5%. Ditches are proposed with a v-notch geometry with 3H:1V. The ditches are located within the Phase 1 right-of-way.

4.5.4 Results of Hydraulic Evaluation

Resulting water levels are contained within the Phase 1 right of way. Should individual site plans incorporate building elements such as depressed loading a corresponding minimum building elevation 0.3 m above adjacent 100 year surface elevation should be considered.

Flow and water levels through culverts for the 100-year storm event are tabulated in Table 4-3 below. Water surface elevations are also indicated on the ditch profiles on **Drawings 136974-100-105**. The 100 year depth of flow throughout the subdivision ditch network ranges from 0.29 m to 1.06 m, with an average depth of 0.69 m. Through Block 18 (the outlet), the 100 year water level falls from 89.66 m to 88.74 m at the tie-in to Tributary 4. Adequate freeboard to the top of bank is maintained through the outlet block, with the top of bank ranging from 90.00 m to 90.25 m.

During the 100-year storm event, culverts 4C-30-1, 4C-28-1, 4C-24-1, 4C-10-1, and 4C-05-2 are surcharged; however, there are no locations where road overtopping occurs.

Table 4-3 Summary of flow and water levels through proposed culverts

Location	PCSWMM Conduit	Material	Geometry		100 Year Peak Flow (l/s)	Proposed Centerline Grade (m)	100 Year Water Surface Elevation (m)	
							U/S	D/S
Crossing Mosquito Drive, just west of Limebank	4C-33	CSP	Circular	0.6 m	238	92.10	91.22	91.00
On Mosquito Drive, in vicinity of hydro corridor	4C-30-1	CSP	Circular	0.6 m	263	91.75	91.00	90.88
On Mosquito Drive, at future Street 2	4C-28-1	CSP	Circular	0.6 m	342	91.55	90.87	90.70
Crossing Gastops at Mosquito Drive	4C-24-1	CSP	Circular	0.6 m	445	91.15	90.68	90.42
Crossing Mosquito Drive at Gastops	4C-10-1	CSP	Circular	0.6 m	269	91.10	90.67	90.42

Location	PCSWMM Conduit	Material	Geometry		100 Year Peak Flow (l/s)	Proposed Centerline Grade (m)	100 Year Water Surface Elevation (m)	
							U/S	D/S
On Mosquito Drive upstream of outlet	4C-05-2	CSP	Circular	0.8 m	877	91.00	90.39	89.81

5 Erosion and Sedimentation Control Plan

5.1 General

During construction, existing stream and conveyance systems can be exposed to significant sediment loadings. Although construction is only a temporary situation, it is proposed to introduce a number of mitigative construction techniques to reduce unnecessary construction sediment loadings. These will include:

- Until the local storm sewers are constructed, groundwater in trenches will be pumped into a filter mechanism prior to release to the environment. After sewer construction any construction dewatering will be routed to the nearest storm sewer;
- bulkhead barriers will be installed at the nearest downstream manhole in each sewer which connects to an existing downstream sewer;
- seepage barriers will be constructed in any temporary drainage ditches;
- sediment capture filter socks will remain on open surface structures such as maintenance holes and catchbasins until these structures are commissioned and put into use; and
- silt fence on the site perimeter.

5.2 Trench Dewatering

Any trench dewatering using pumps will be discharged into a filter trap made up of geotextile filters and straw bales similar in design to the OPSD 219.240 Dewatering Trap. These will be constructed in a bowl shape with the fabric forming the bottom and the straw bales forming the sides. Any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filters as needed, including sediment removal and disposal and material replacement as needed.

A Permit to Take Water (PTTW) is in place for this project and adjacent projects. The contractor will be required to meet all the requirements of the PTTW.

5.3 Seepage Barriers

In order to further reduce sediment loading to the stormwater management facility and existing watercourses, seepage barriers will be installed on any surface water courses at appropriate locations that may become evident during construction. These barriers will be Light Duty Straw Bale Barriers per OPSD 219.100 and Heavy Duty Silt Fence Barriers per OPSD 219.130; locations are shown on the Sediment and Erosion Control Plan included in **Appendix E**. They are typically made of layers of straw bales or geotextile fabric staked in place. All seepage barriers will be inspected and maintained as needed.

5.4 Surface Structure Filters

All catchbasins convey surface water to ditches. Until streets are asphalted and curbed where required, all catchbasins will be constructed with sediment capture filter socks located between the structure frame and cover. These will stay in place and be maintained during construction and build until it is appropriate to remove same

6 Conclusions and Recommendations

This report has demonstrated that watermains, ditches and sanitary sewers can be extended to service the subject site in accordance with the Assessment of Adequacy of Public Services Report and the Phase 1 ISSU.

ARCADIS

Project Title

RIVERSIDE SOUTH
3700 TWIN FALLS PLACE
PHASE 1

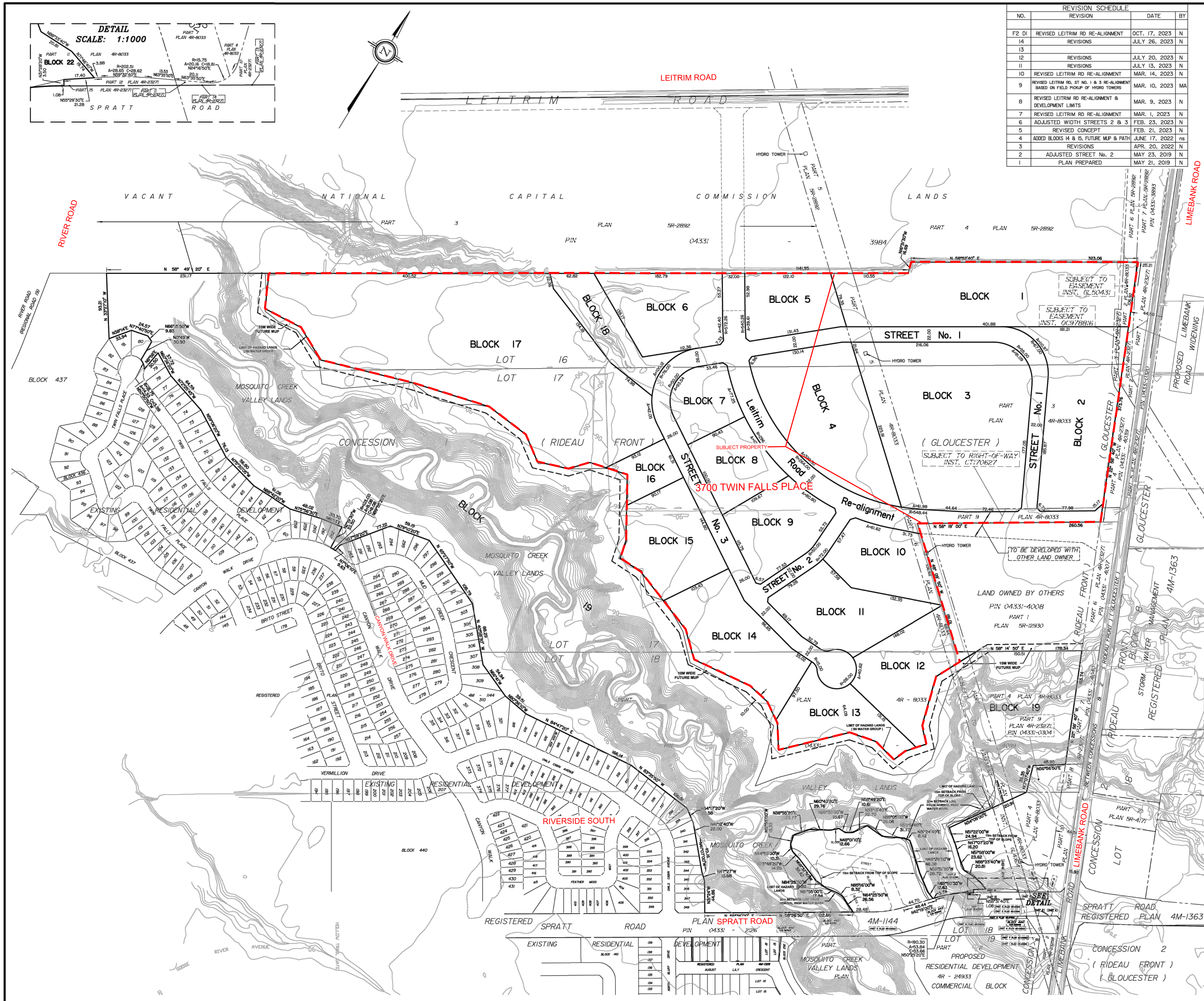
Drawing Title

LOCATION PLAN

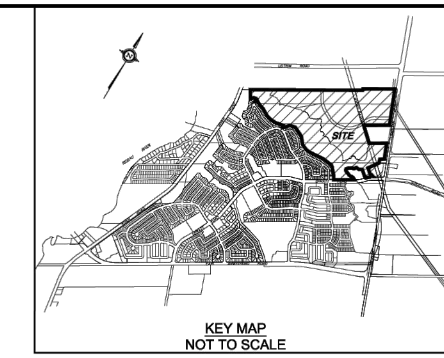
Sheet No.

1.1

2023-11-24



REVISION SCHEDULE			
NO.	REVISION	DATE	BY
F2 DI	REVISED LEITRIM RD RE-ALIGNMENT	OCT. 17, 2023	N
14	REVISIONS	JULY 26, 2023	N
13			
12	REVISIONS	JULY 20, 2023	N
11	REVISIONS	JULY 13, 2023	N
10	REVISED LEITRIM RD RE-ALIGNMENT	MAR. 14, 2023	N
9	REVISED LEITRIM RD, ST NO. 1 & 3 RE-ALIGNMENT BASED ON FIELD PICKUP OF HYDRO TOWERS	MAR. 10, 2023	MA
8	REVISED LEITRIM RD RE-ALIGNMENT & DEVELOPMENT LIMITS	MAR. 9, 2023	N
7	REVISED LEITRIM RD RE-ALIGNMENT	MAR. 1, 2023	N
6	ADJUSTED WIDTH STREETS 2 & 3	FEB. 23, 2023	N
5	REVISED CONCEPT	FEB. 21, 2023	N
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



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.

Scale 1 : 2500

100 75 50 25 0 50 100 Metres

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

SURVEYOR'S CERTIFICATE

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

Date

T. Hartwick
ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

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

Date

Marcel Denomme
Authorized Signing Officer
Riverside South Development Corp.
I have 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	3.701 / 9.15
2	2.750 / 6.80
3	5.112 / 12.63
4	2.813 / 6.95
5	1.157 / 2.86
6	1.667 / 4.12
7	0.817 / 2.02
8	1.043 / 2.58
9	1.375 / 3.40
10	1.305 / 3.22

AREA SCHEDULE	
BLOCK	AREA Ha / Ac
11	1.655 / 4.09
12	1.626 / 4.02
13	1.224 / 3.02
14	1.944 / 4.80
15	1.612 / 3.98
16	0.494 / 1.22
17	8.736 / 21.59
18	1.014 / 2.51
19	34.178 / 84.45
STREETS	5.532 / 13.67
TOTAL	79.755 / 197.08

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

Job No. 17806-19 Urbandale Pt Lts16 17 18 CI RF GL DPS F2 DI N

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: Chris.Cormier Last Saved At: Nov. 24, 23

ARCADIS

Project Title
RIVERSIDE SOUTH
3700 TWIN FALLS PLACE
PHASE 1

Drawing Title
DRAFT PLAN

Sheet No.
1.2

2023-11-24

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: Chris.Cormier Last Saved At: Nov. 24, 23

LEITRIM ROAD

RIVER ROAD

LIMEBANK ROAD

BLOCK 17

BLOCK 18

BLOCK 6

BLOCK 5

BLOCK 1

STREET No. 1

HYDRO TOWER

BLOCK 7

Leitrim

BLOCK 4

BLOCK 3

SUBJECT PROPERTY

3700 TWIN FALLS PLACE

BLOCK 8

STREET No. 1

BLOCK 2

BLOCK 16

STREET No. 3

Road

Re-alignment

BLOCK 9

BLOCK 15

BLOCK 10

HYDRO TOWER

STREET No. 2

BLOCK 11

BLOCK 14

BLOCK 12

BLOCK 13

BLOCK 19

BLOCK

19

CANYON WALK DRIVE

RIVERSIDE SOUTH

SPRATT ROAD

LIMEBANK ROAD

HYDRO TOWER

LEGEND:

EXISTING WATERMAIN

EXISTING SANITARY

EXISTING STORM

ARCADIS

Project Title

RIVERSIDE SOUTH
3700 TWIN FALLS PLACE
PHASE 1

Drawing Title

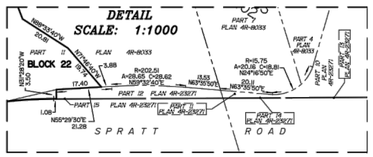
LOCATION OF
EXISTING INFRASTRUCTURE

Sheet No.

1.3

2023-11-24

J:\136974_RSS_Employme\7.0_Production\7.03_Design\04_Civil_LAND_Adequacy Report\FIGURE 1.4 PHASING PLAN.dwg Layout Name: PHASING PLAN Last Saved By: MMline Last Saved At: Apr. 4, 24



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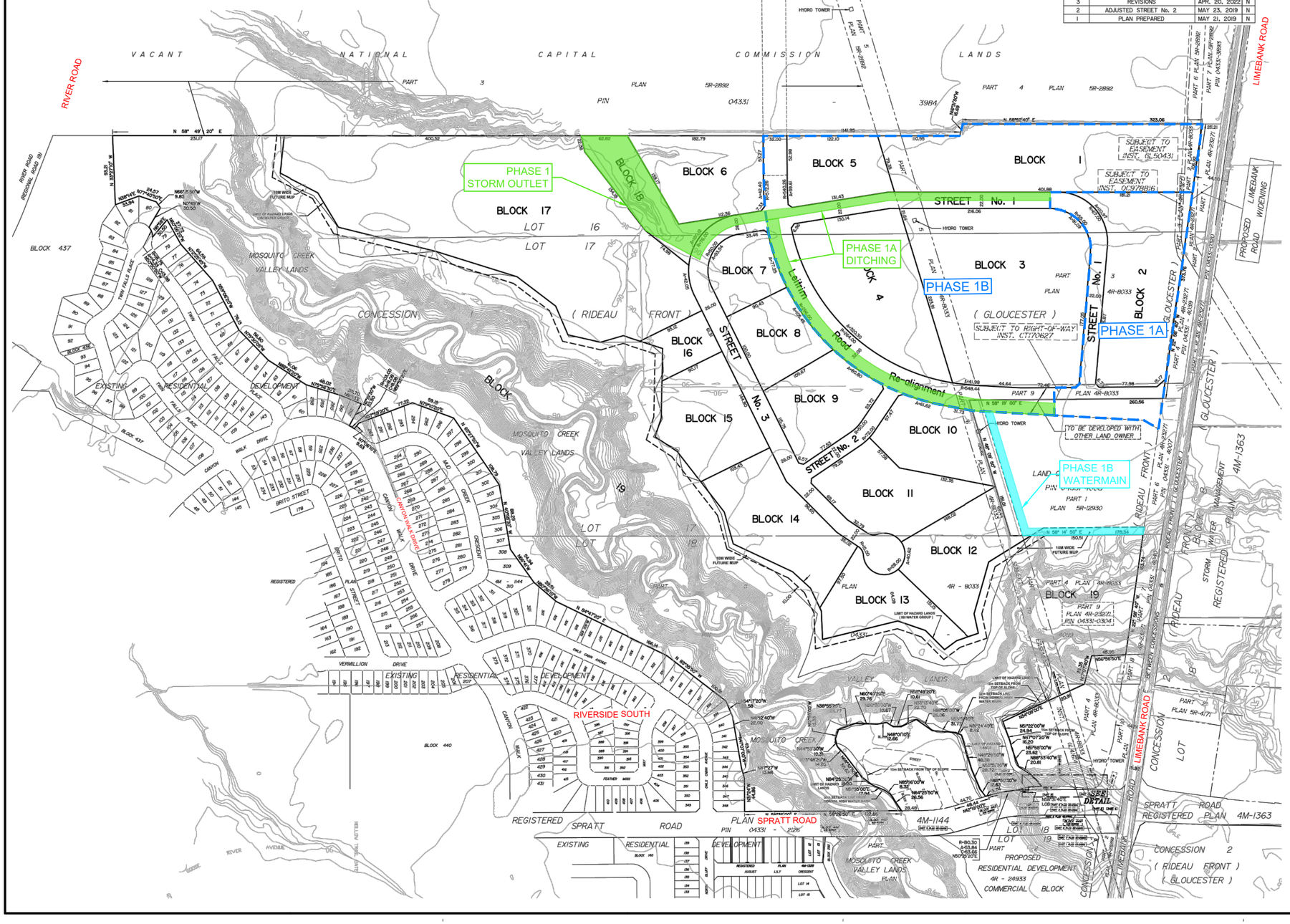

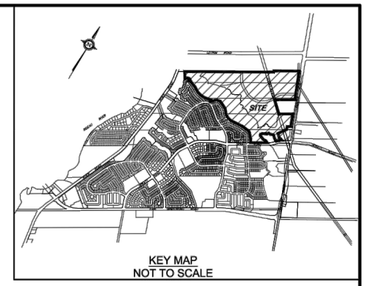

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Email: Nepean@annvlld.com
Ontario Land Surveyors

Job No. 17806-19 Urbandale Pt Lts16 I7 I8 Cl RF GL DPS F2 DI N

Project Title
RIVERSIDE SOUTH
3700 TWIN FALLS PLACE
PHASE 1

Drawing Title
PHASING PLAN

Sheet No.
1.4
2024-04-02

Appendix

A Background Information and Figures

- **Riverside South Secondary Plan Schedule A Designation Plan**
- **Drawing PG4958-3 Initial Permissible Grade Raise Limits, Paterson Group**

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
Direction générale de la planification, de l'immobilier et du développement économique
Analyse géospatiale, technologie et solutions

Vimy Memorial Bridge / Pont commémoratif Vimy

SPRATT

SHORELINE

CANYON WALK

EARL ARMSTRONG

MAIN STREET/ RUE PRINCIPALE

ruisseau Mosquito Creek

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

COLLECTOR/ COLLECTRICE 'F'

COLLECTOR/ COLLECTRICE 'G'

COLLECTOR/ COLLECTRICE 'H'

COLLECTOR/ COLLECTRICE 'I'

COLLECTOR/ COLLECTRICE 'J'

COLLECTOR/ COLLECTRICE 'A'

COLLECTOR/ COLLECTRICE 'B'

COLLECTOR/ COLLECTRICE 'C'

COLLECTOR/ COLLECTRICE 'D'

COLLECTOR/ COLLECTRICE 'E'

LIMEBANK

RIVIÈRE RIDEAU RIVER

RIDEAU RIVER

Town Centre Boundary
Limite du centre ville

400m

200m

BRT

LRT

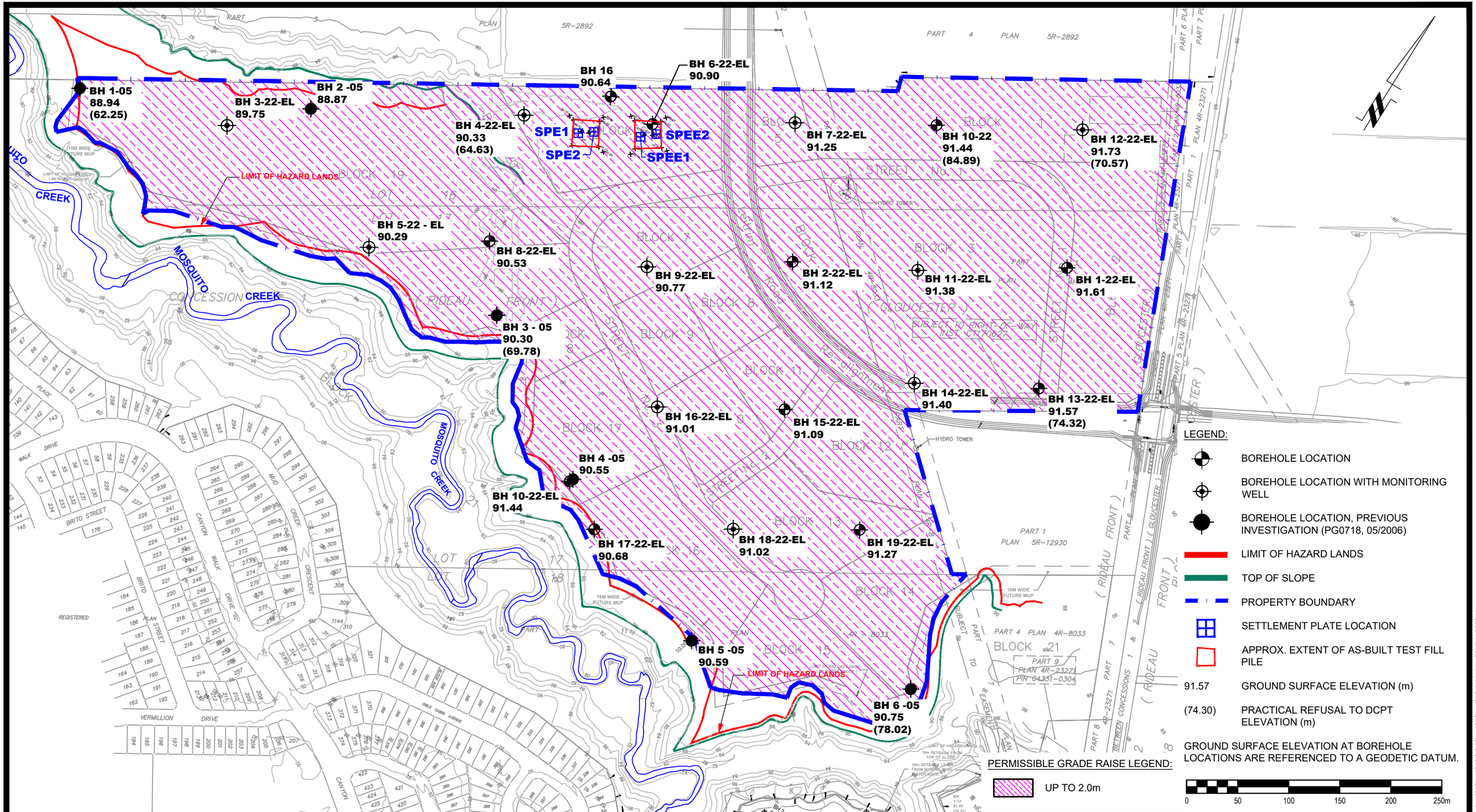
DESIGNATION / DÉSIGNATION

- 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
- IL - Industrial and Logistics / Industrie et Logistique
- 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

2023-10-31 DRAFT



PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7S9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
3	AS PER REVISED CONCEPTUAL SITE PLAN	28/07/2023	NP
2	AS PER REVISED CONCEPTUAL SITE PLAN	15/03/2023	NP
1	AS PER REVISED CONCEPTUAL SITE PLAN	06/02/2023	NP

RIVERSIDE SOUTH DEVELOPMENT CORP.

GEOTECHNICAL INVESTIGATION
PROPOSED COMMERCIAL DEVELOPMENT
3700 TWIN FALLS PLACE

OTTAWA, ONTARIO

Title:

PERMISSIBLE GRADE RAISE PLAN

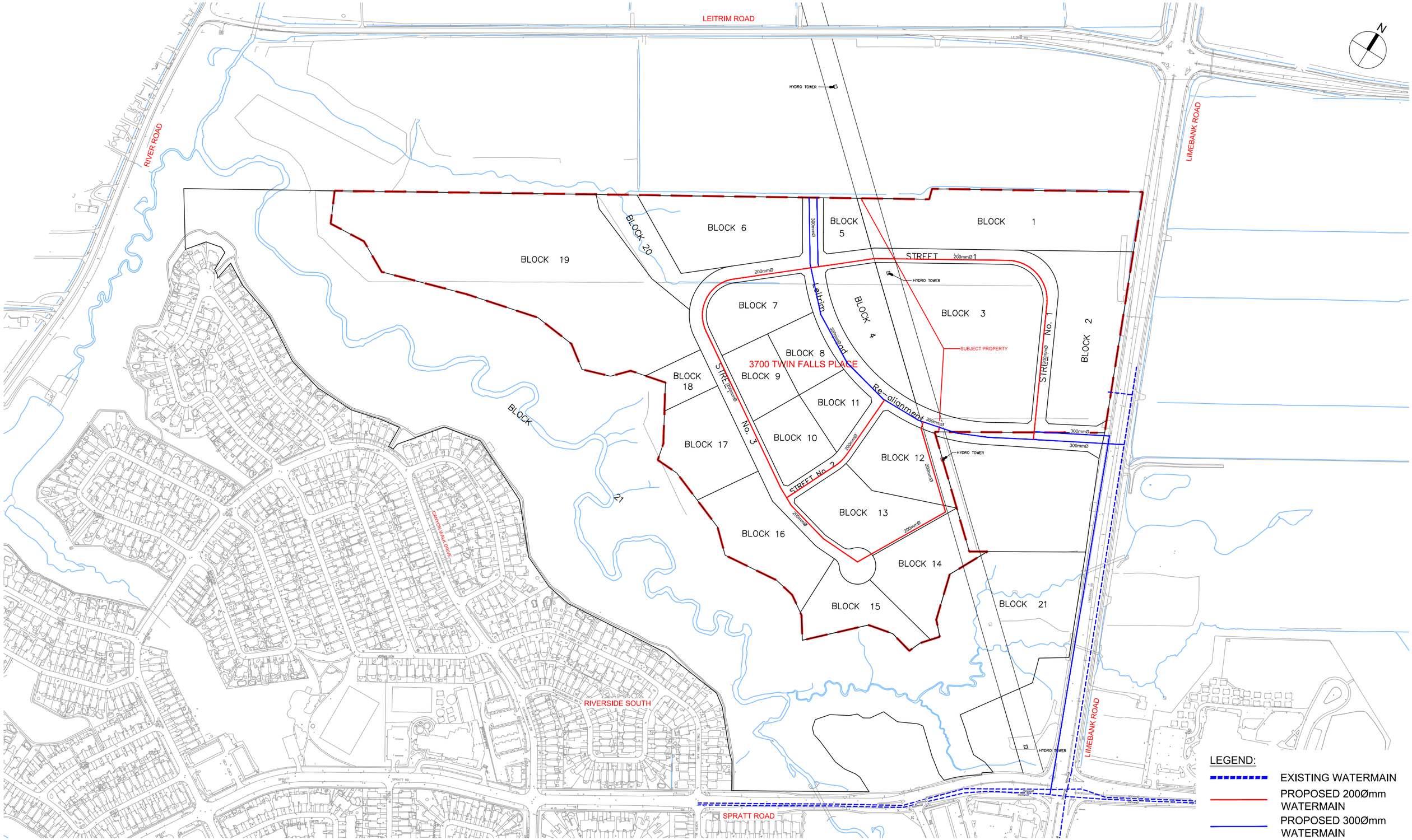
Scale: 1:4000	Date: 04/2022
Drawn by: NFRV	Report No.: PG4958-2
Checked by: NP	Dwg. No.: PG4958-9
Approved by: DG	Revision No.: 3

p:\autocad drawings\geotechnical\pg49xx\pg4958\pg4958 8.9.10\pg4958pg4958-1 thlp (rev.03) (july 2023).dwg

Appendix

B Water Supply Supporting Information

- **Figure 2.1 Conceptual Water Plan**
- **City of Ottawa Boundary Conditions**
- **Watermain Demand Calculation Sheet**
- **Modeling Output Files**



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: Chris.Cormier Last Saved At: Aug. 4, 23

IBI

Scale: N.T.S.

Project Title: RIVERSIDE SOUTH
3700 TWIN FALLS PLACE

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 : RIVERSIDE SOUTH - 3700 TWIN FALLS PLACE - PHASE 1
LOCATION : CITY OF OTTAWA
DEVELOPER : RIVERSIDE SOUTH DEVELOPMENT CORPORATION

FILE: 136974
DATE PRINTED: 02-Apr-24
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)
PHASE 1 LANDS																		
J3	OTHER					3.90			0.00	1.58	1.58	0.00	2.37	2.37	0.00	4.27	4.27	13,000
J4	2					2.79			0.00	1.13	1.13	0.00	1.70	1.70	0.00	3.05	3.05	13,000
J5	5					1.16			0.00	0.47	0.47	0.00	0.71	0.71	0.00	1.27	1.27	13,000
J6	6					1.67			0.00	0.68	0.68	0.00	1.02	1.02	0.00	1.84	1.84	13,000
J12	9					1.38			0.00	0.56	0.56	0.00	0.84	0.84	0.00	1.51	1.51	13,000
J28	10					1.31			0.00	0.53	0.53	0.00	0.80	0.80	0.00	1.43	1.43	13,000
J30	3					5.11			0.00	2.07	2.07	0.00	3.11	3.11	0.00	5.59	5.59	13,000
J32	1					3.70			0.00	1.50	1.50	0.00	2.25	2.25	0.00	4.05	4.05	13,000
J34	4, 7					3.63			0.00	1.47	1.47	0.00	2.21	2.21	0.00	3.97	3.97	13,000
J36	8					2.58			0.00	1.05	1.05	0.00	1.58	1.58	0.00	2.84	2.84	13,000
TOTALS											11.04			16.56			29.81	
PHASE 1A LANDS																		
H5	2					1.43			0.00	0.58	0.58	0.00	0.87	0.87	0.00	1.57	1.57	10,000

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
- Light Industrial 35,000 l / ha / day

MAX. DAILY DEMAND
- Residential 700 l / cap / day
- Light Industrial 52,500 l / ha / day

MAX. HOURLY DEMAND
- Residential 1,540 l / cap / day
- Light Industrial 94,500 l / ha / day

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

3700 TWINS FALLS PHASE 1 WATER MODEL

LEITRIM ROAD

GASTOPS STREET

J32

204.00

J4

204.00

J5

204.00

J30

204.00

J6

297.00

J8

204.00

J34

297.00

J36

297.00

J12

297.00

J28

297.00

J3

297.00

J2

LIMEBANK ROAD

MOSQUITO DRIVE

J13

204.00

297.00

297.00

BOUNDARY CONDITION

J14

297.00

CON2

297.00

CON1

297.00

SPRATT ROAD

BOUNDARY CONDITION

3700 TWINS FALLS PHASE 1
BASIC DAY PRESSURES
EXISTING CONDITIONS

385.01 kPa
387.45 kPa
383.07 kPa
392.38 kPa
393.40 kPa
381.83 kPa
395.36 kPa
386.64 kPa
393.90 kPa
390.55 kPa
382.11 kPa
392.94 kPa
391.98 kPa

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J1	0.00	91.60	131.80	393.93
2	☐	J12	0.56	91.75	131.75	391.98
3	☐	J13	0.00	92.80	131.79	382.11
4	☐	J14	0.00	91.50	131.80	394.89
5	☐	J15	0.00	91.60	131.80	393.93
6	☐	J2	0.00	92.80	131.77	381.83
7	☐	J28	0.53	91.90	131.76	390.55
8	☐	J3	1.58	92.30	131.76	386.64
9	☐	J30	2.07	92.65	131.74	383.07
10	☐	J32	1.50	92.20	131.74	387.45
11	☐	J34	1.47	91.55	131.75	393.90
12	☐	J36	1.05	91.65	131.75	392.94
13	☐	J4	1.11	92.45	131.74	385.01
14	☐	J5	0.47	91.70	131.74	392.38
15	☐	J6	0.68	91.60	131.75	393.40
16	☐	J8	0.00	91.40	131.75	395.36

3700 TWINS FALLS PHASE 1
BASIC DAY PRESSURES
SUC ZONE RECONFIGURATION

547.67 kPa
550.12 kPa
545.74 kPa
555.05 kPa
556.07 kPa
544.50 kPa
558.03 kPa
549.31 kPa
556.57 kPa
553.22 kPa
555.61 kPa
554.65 kPa
544.78 kPa

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J1	0.00	91.60	148.40	556.59
2	☐	J12	0.56	91.75	148.35	554.65
3	☐	J13	0.00	92.80	148.39	544.78
4	☐	J14	0.00	91.50	148.40	557.56
5	☐	J15	0.00	91.60	148.40	556.60
6	☐	J2	0.00	92.80	148.37	544.50
7	☐	J28	0.53	91.90	148.36	553.22
8	☐	J3	1.58	92.30	148.36	549.31
9	☐	J30	2.07	92.65	148.34	545.74
10	☐	J32	1.50	92.20	148.34	550.12
11	☐	J34	1.47	91.55	148.35	556.57
12	☐	J36	1.05	91.65	148.35	555.61
13	☐	J4	1.11	92.45	148.34	547.67
14	☐	J5	0.47	91.70	148.34	555.05
15	☐	J6	0.68	91.60	148.35	556.07
16	☐	J8	0.00	91.40	148.35	558.03

3700 TWINS FALLS PHASE 1
PEAK HOUR PRESSURES
EXISTING CONDITIONS

318.18 kPa
320.61 kPa
316.36 kPa
325.67 kPa
326.93 kPa
316.34 kPa
328.90 kPa
320.69 kPa
327.47 kPa
324.52 kPa
318.10 kPa
326.61 kPa
325.78 kPa

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J1	0.00	91.60	125.30	330.23
2	☐	J12	1.51	91.75	125.00	325.78
3	☐	J13	0.00	92.80	125.26	318.10
4	☐	J14	0.00	91.50	125.29	331.10
5	☐	J15	0.00	91.60	125.30	330.23
6	☐	J2	0.00	92.80	125.08	316.34
7	☐	J28	1.43	91.90	125.02	324.52
8	☐	J3	4.27	92.30	125.03	320.69
9	☐	J30	5.59	92.65	124.93	316.36
10	☐	J32	4.05	92.20	124.92	320.61
11	☐	J34	3.97	91.55	124.97	327.47
12	☐	J36	2.82	91.65	124.98	326.61
13	☐	J4	3.01	92.45	124.92	318.18
14	☐	J5	1.27	91.70	124.93	325.67
15	☐	J6	1.83	91.60	124.96	326.93
16	☐	J8	0.00	91.40	124.96	328.90

		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	509.64	297.00	120.00	20.78	0.30	0.22	0.43	Open	0
2	☐	P13	J3	J2	130.60	297.00	120.00	-20.78	0.30	0.06	0.43	Open	0
3	☐	P15	J3	J30	127.57	204.00	110.00	9.46	0.29	0.09	0.73	Open	0
4	☐	P17	J5	J32	163.11	204.00	110.00	3.19	0.10	0.02	0.10	Open	0
5	☐	P21	J5	J8	163.27	204.00	110.00	-4.46	0.14	0.03	0.18	Open	0
6	☐	P25	J8	J6	114.50	297.00	120.00	1.83	0.03	0.00	0.00	Open	0
7	☐	P33	J12	J36	81.59	297.00	120.00	13.08	0.19	0.01	0.18	Open	0
8	☐	P35	J28	J12	98.15	297.00	120.00	14.59	0.21	0.02	0.22	Open	0
9	☐	P37	J13	J14	299.74	297.00	120.00	-8.97	0.13	0.03	0.09	Open	0
10	☐	P39	J14	J15	124.95	297.00	120.00	-8.97	0.13	0.01	0.09	Open	0
11	☐	P43	J15	CON1	1.00	297.00	120.00	-8.97	0.13	0.00	0.08	Open	0
12	☐	P45	J1	CON2	1.00	297.00	120.00	-20.78	0.30	0.00	0.43	Open	0
13	☐	P63	J13	J28	371.11	204.00	110.00	8.97	0.27	0.24	0.66	Open	0
14	☐	P65	J28	J3	162.89	297.00	120.00	-7.05	0.10	0.01	0.06	Open	0
15	☐	P67	J30	J4	102.54	204.00	110.00	3.87	0.12	0.01	0.14	Open	0
16	☐	P69	J32	J4	124.10	204.00	110.00	-0.86	0.03	0.00	0.01	Open	0
17	☐	P71	J34	J8	88.79	297.00	120.00	6.29	0.09	0.00	0.05	Open	0
18	☐	P73	J36	J34	111.66	297.00	120.00	10.26	0.15	0.01	0.12	Open	0

3700 TWINS FALLS PHASE 1
PEAK HOUR PRESSURES
SUC ZONE RECONFIGURATION

518.75 kPa
521.19 kPa
516.93 kPa
527.49 kPa
526.24 kPa
516.99 kPa
529.46 kPa
521.28 kPa
528.03 kPa
525.08 kPa
518.09 kPa
527.17 kPa
526.34 kPa

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J1	0.00	91.60	145.80	531.11
2	☐	J12	1.51	91.75	145.46	526.34
3	☐	J13	0.00	92.80	145.67	518.09
4	☐	J14	0.00	91.50	145.69	531.03
5	☐	J15	0.00	91.60	145.70	530.14
6	☐	J2	0.00	92.80	145.56	516.99
7	☐	J28	1.43	91.90	145.48	525.08
8	☐	J3	4.27	92.30	145.50	521.28
9	☐	J30	5.59	92.65	145.40	516.93
10	☐	J32	4.05	92.20	145.39	521.19
11	☐	J34	3.97	91.55	145.43	528.03
12	☐	J36	2.82	91.65	145.45	527.17
13	☐	J4	3.01	92.45	145.39	518.75
14	☐	J5	1.27	91.70	145.40	526.24
15	☐	J6	1.83	91.60	145.43	527.49
16	☐	J8	0.00	91.40	145.43	529.46

		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	509.64	297.00	120.00	21.99	0.32	0.24	0.47	Open	0
2	☐	P13	J3	J2	130.60	297.00	120.00	-21.99	0.32	0.06	0.47	Open	0
3	☐	P15	J3	J30	127.57	204.00	110.00	9.52	0.29	0.09	0.74	Open	0
4	☐	P17	J5	J32	163.11	204.00	110.00	3.13	0.10	0.02	0.09	Open	0
5	☐	P21	J5	J8	163.27	204.00	110.00	-4.40	0.13	0.03	0.18	Open	0
6	☐	P25	J8	J6	114.50	297.00	120.00	1.83	0.03	0.00	0.00	Open	0
7	☐	P33	J12	J36	81.59	297.00	120.00	13.02	0.19	0.01	0.18	Open	0
8	☐	P35	J28	J12	98.15	297.00	120.00	14.53	0.21	0.02	0.22	Open	0
9	☐	P37	J13	J14	299.74	297.00	120.00	-7.76	0.11	0.02	0.07	Open	0
10	☐	P39	J14	J15	124.95	297.00	120.00	-7.76	0.11	0.01	0.07	Open	0
11	☐	P43	J15	CON1	1.00	297.00	120.00	-7.76	0.11	0.00	0.07	Open	0
12	☐	P45	J1	CON2	1.00	297.00	120.00	-21.99	0.32	0.00	0.47	Open	0
13	☐	P63	J13	J28	371.11	204.00	110.00	7.76	0.24	0.19	0.50	Open	0
14	☐	P65	J28	J3	162.89	297.00	120.00	-8.20	0.12	0.01	0.08	Open	0
15	☐	P67	J30	J4	102.54	204.00	110.00	3.93	0.12	0.01	0.14	Open	0
16	☐	P69	J32	J4	124.10	204.00	110.00	-0.92	0.03	0.00	0.01	Open	0
17	☐	P71	J34	J8	88.79	297.00	120.00	6.23	0.09	0.00	0.05	Open	0
18	☐	P73	J36	J34	111.66	297.00	120.00	10.20	0.15	0.01	0.11	Open	0

3700 TWIN FALLS PHASE 1
MAX DAY + FIRE (10,000 l/min)
RESIDUAL PRESSURES
EXISTING CONDITIONS

121.69 kPa

107.64 kPa

BELOW 140 kPa

157.19 kPa

133.37 kPa

188.47 kPa

268.89 kPa

213.31 kPa

261.90 kPa

221.16 kPa

257.01 kPa

279.24 kPa

233.48 kPa

243.48 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	☐	J12	167.51	250.25	J12	139.96	106.03	250.25	139.96	140.02
2	☐	J13	166.67	340.03	J13	139.96	107.08	340.03	139.96	139.65
3	☐	J2	166.67	309.08	J2	139.96	107.08	309.08	139.96	140.11
4	☐	J28	167.47	273.21	J28	139.96	106.18	273.21	139.96	140.05
5	☐	J3	169.04	288.84	J30	136.77	106.61	286.23	139.96	143.25
6	☐	J30	169.78	178.74	J30	139.96	106.93	178.74	139.96	139.96
7	☐	J32	168.92	155.38	J32	139.96	106.48	155.38	139.96	139.96
8	☐	J34	168.88	223.81	J34	139.96	105.83	223.81	139.96	139.98
9	☐	J36	168.24	237.29	J36	139.96	105.93	237.29	139.96	140.00
10	☐	J4	168.34	160.19	J4	139.96	106.73	160.19	139.96	139.96
11	☐	J5	167.37	164.42	J5	139.96	105.98	164.42	139.96	139.72
12	☐	J6	167.68	195.04	J6	139.96	105.88	195.04	139.96	139.97
13	☐	J8	166.67	213.48	J6	138.00	105.68	212.33	139.96	141.95

3700 TWINS FALLS PHASE 1
MAX DAY + FIRE (13,000 l/min)
RESIDUAL PRESSURES
EXISTING CONDITIONS

-13.81 kPa

-38.03 kPa

BELOW 140 kPa

44.54 kPa

87.94 kPa

-0.05 kPa

223.49 kPa

126.99 kPa

209.92 kPa

140.55 kPa

199.80 kPa

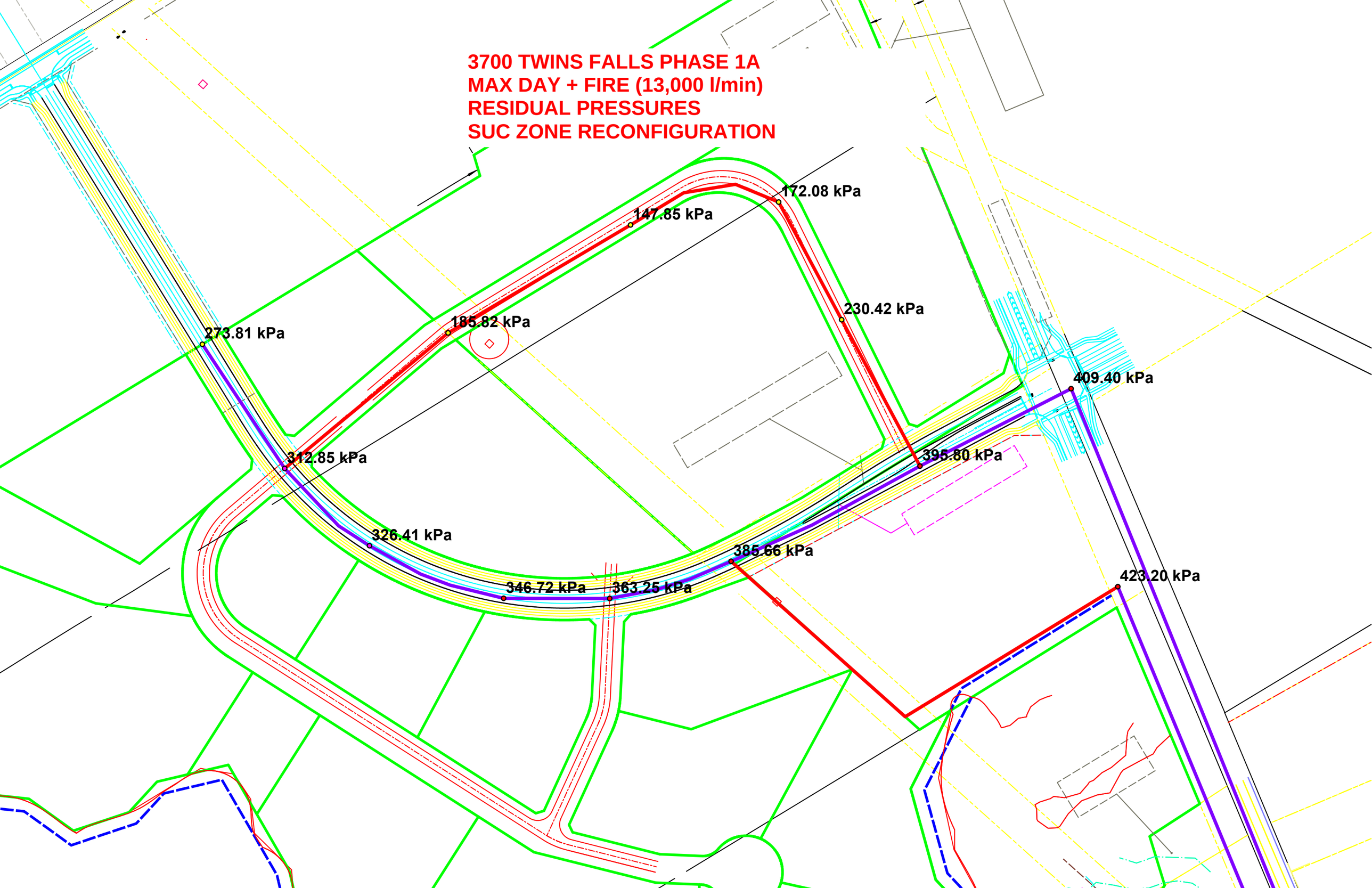
237.77 kPa

160.86 kPa

177.39 kPa

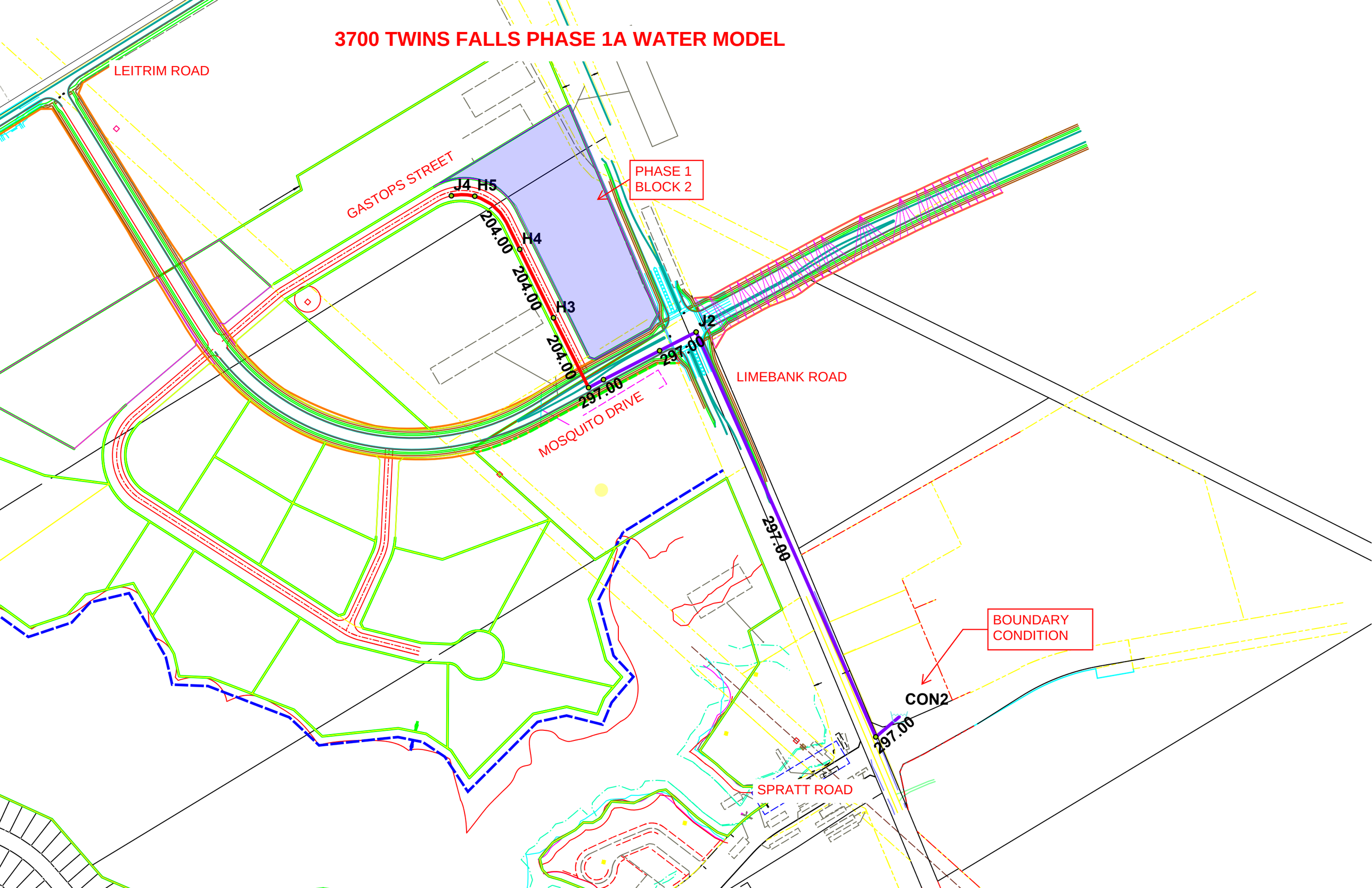
		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
1	☐	J12	217.51	245.06	J12	139.96	106.03	245.06	139.96	139.97
2	☐	J13	216.67	330.60	J13	139.96	107.08	330.60	139.96	139.96
3	☐	J2	216.67	302.59	J2	139.96	107.08	302.59	139.96	140.00
4	☐	J28	217.47	267.49	J28	139.96	106.18	267.49	139.96	139.98
5	☐	J3	219.04	282.82	J30	136.74	106.60	280.14	139.96	143.21
6	☐	J30	219.78	174.93	J30	139.96	106.93	174.93	139.96	139.97
7	☐	J32	218.92	152.13	J32	139.96	106.48	152.13	139.96	139.98
8	☐	J34	218.88	219.24	J34	139.96	105.83	219.24	139.96	139.98
9	☐	J36	218.24	232.40	J36	139.96	105.93	232.40	139.96	139.96
10	☐	J4	218.34	156.78	J4	139.96	106.73	156.78	139.96	139.99
11	☐	J5	217.37	161.03	J5	139.96	105.98	161.03	139.96	139.98
12	☐	J6	217.68	191.04	J6	139.96	105.88	191.04	139.96	139.97
13	☐	J8	216.67	209.11	J6	138.00	105.68	207.95	139.96	141.92

3700 TWINS FALLS PHASE 1A
MAX DAY + FIRE (13,000 l/min)
RESIDUAL PRESSURES
SUC ZONE RECONFIGURATION

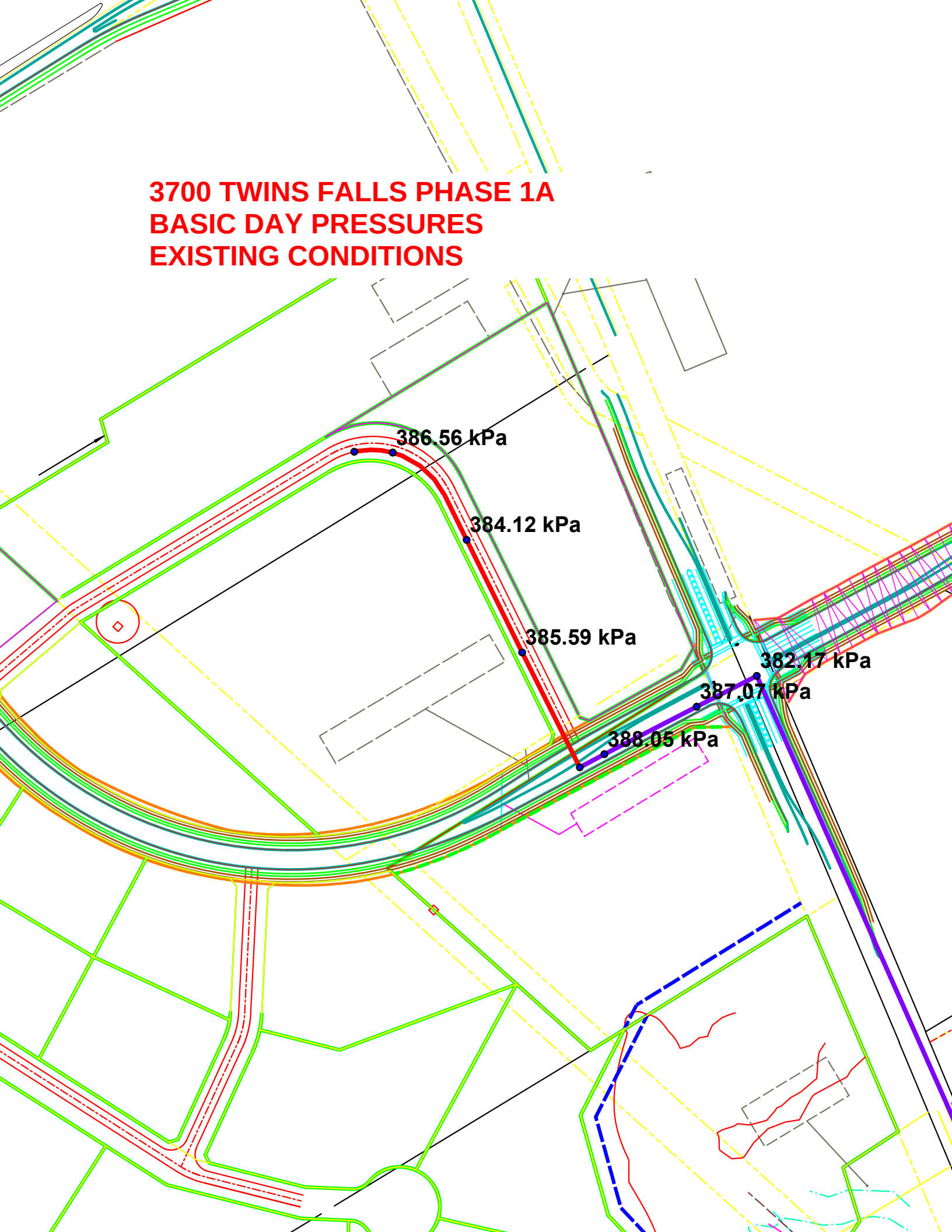


		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
1	☐	J12	217.51	355.78	J12	139.96	106.03	355.78	139.96	140.06
2	☐	J13	216.67	484.84	J13	139.96	107.08	484.84	139.96	139.96
3	☐	J2	216.67	444.88	J2	139.96	107.08	444.88	139.96	140.18
4	☐	J28	217.47	389.07	J28	139.96	106.18	389.07	139.96	140.10
5	☐	J3	219.04	412.77	J30	137.45	106.68	411.24	139.96	142.63
6	☐	J30	219.78	256.20	J30	139.96	106.93	256.20	139.96	139.97
7	☐	J32	218.92	221.49	J32	139.96	106.48	221.49	139.96	140.15
8	☐	J34	218.88	316.84	J34	139.96	105.83	316.84	139.96	140.00
9	☐	J36	218.24	336.66	J36	139.96	105.93	336.66	139.96	140.03
10	☐	J4	218.34	229.45	J4	139.96	106.73	229.45	139.96	139.96
11	☐	J5	217.37	233.35	J5	139.96	105.98	233.35	139.96	139.96
12	☐	J6	217.68	276.36	J6	139.96	105.88	276.36	139.96	139.98
13	☐	J8	216.67	302.46	J6	138.00	105.68	301.60	139.96	141.97

3700 TWINS FALLS PHASE 1A WATER MODEL

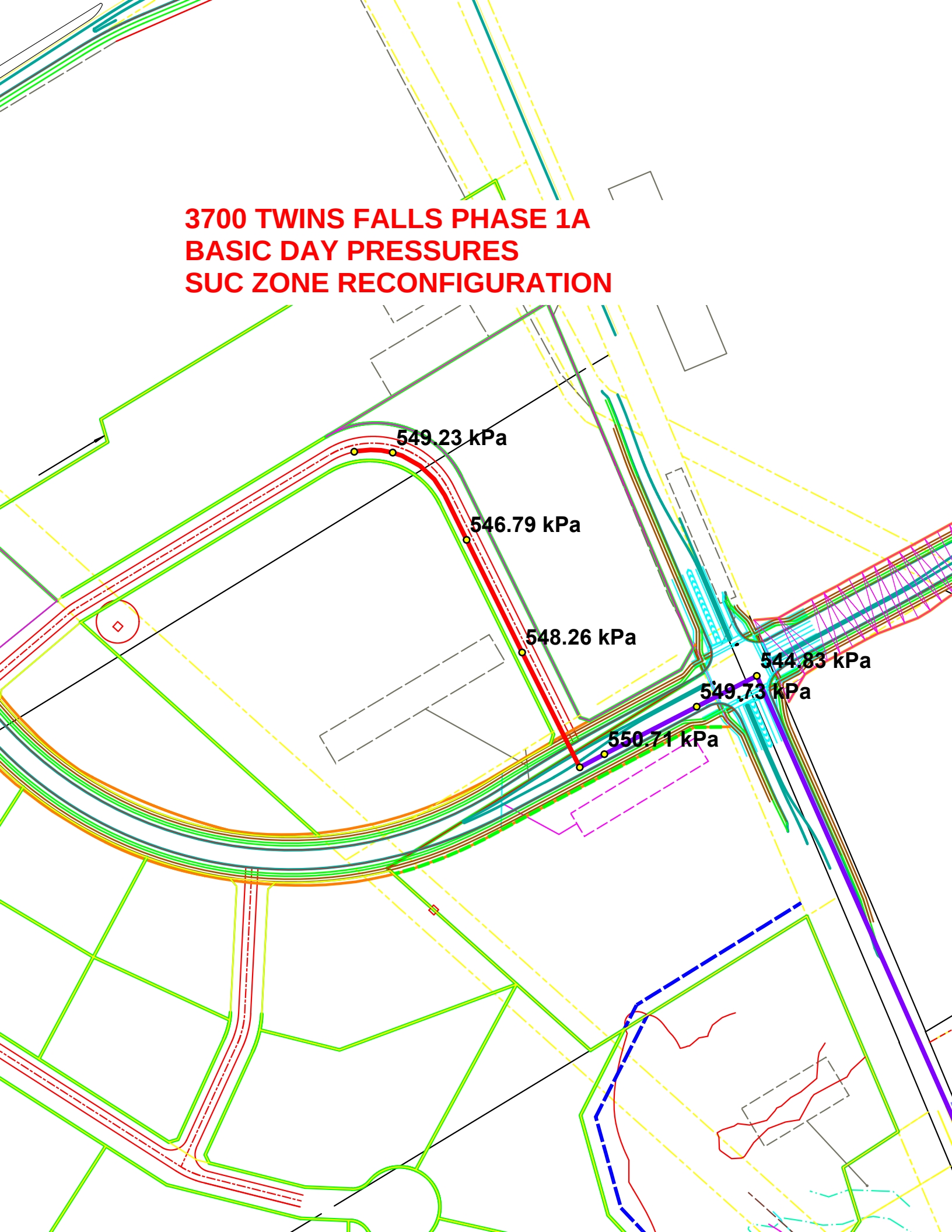


3700 TWINS FALLS PHASE 1A
BASIC DAY PRESSURES
EXISTING CONDITIONS



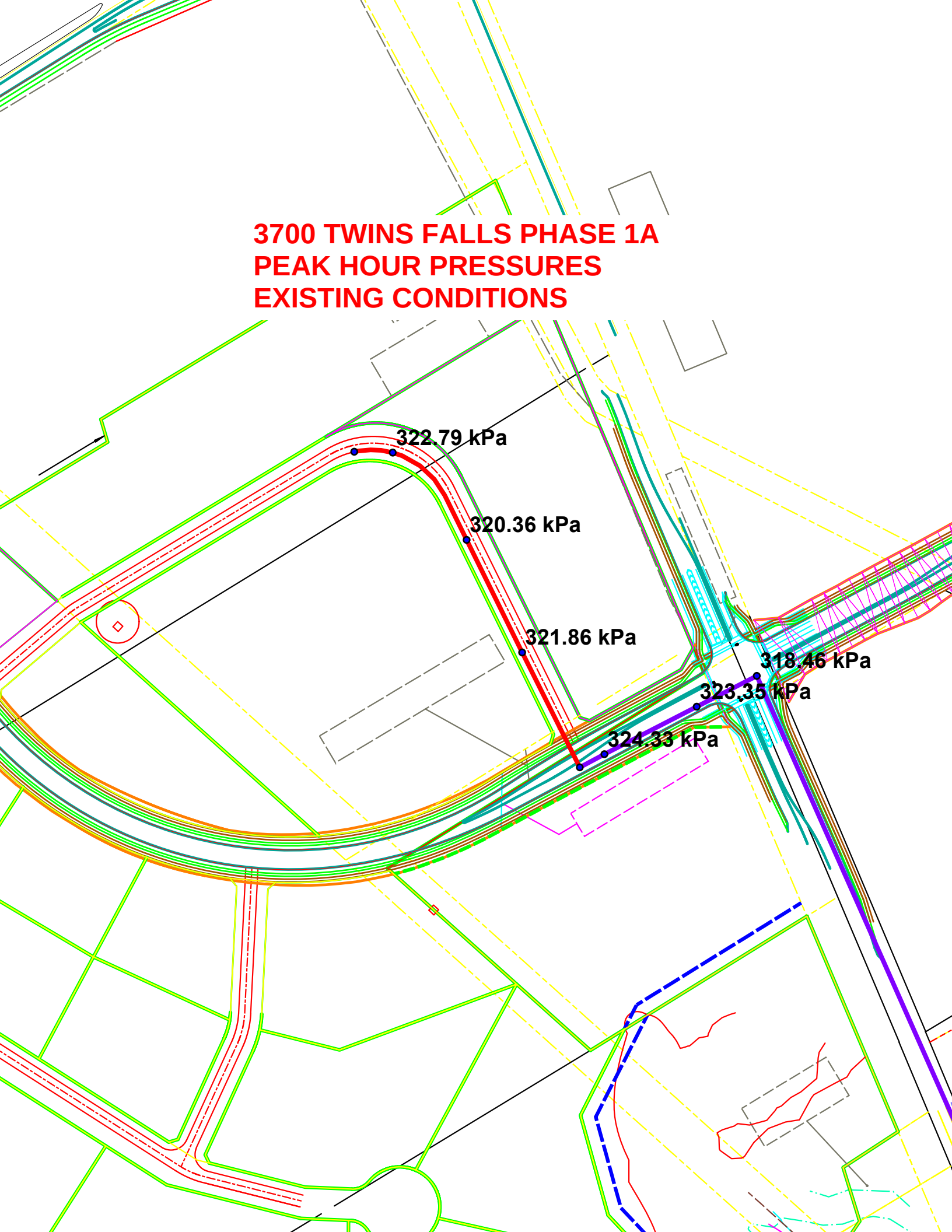
		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
1	☐	H1	0.00	92.30	131.80	387.07	19.66
2	☐	H2	0.00	92.20	131.80	388.05	22.07
3	☐	H3	0.00	92.45	131.80	385.59	24.13
4	☐	H4	0.00	92.60	131.80	384.12	25.50
5	☐	H5	0.00	92.35	131.80	386.56	26.80
6	☐	J1	0.00	91.60	131.80	393.93	1.18
7	☐	J2	0.00	92.80	131.80	382.17	18.09
8	☐	J3	0.00	92.30	131.80	387.07	22.72
9	☐	J4	0.58	92.20	131.80	388.03	27.23

3700 TWINS FALLS PHASE 1A
BASIC DAY PRESSURES
SUC ZONE RECONFIGURATION



		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
1	☐	H1	0.00	92.30	148.40	549.73	19.66
2	☐	H2	0.00	92.20	148.40	550.71	22.07
3	☐	H3	0.00	92.45	148.40	548.26	24.13
4	☐	H4	0.00	92.60	148.40	546.79	25.50
5	☐	H5	0.00	92.35	148.40	549.23	26.80
6	☐	J1	0.00	91.60	148.40	556.60	1.18
7	☐	J2	0.00	92.80	148.40	544.83	18.09
8	☐	J3	0.00	92.30	148.40	549.73	22.72
9	☐	J4	0.58	92.20	148.40	550.70	27.23

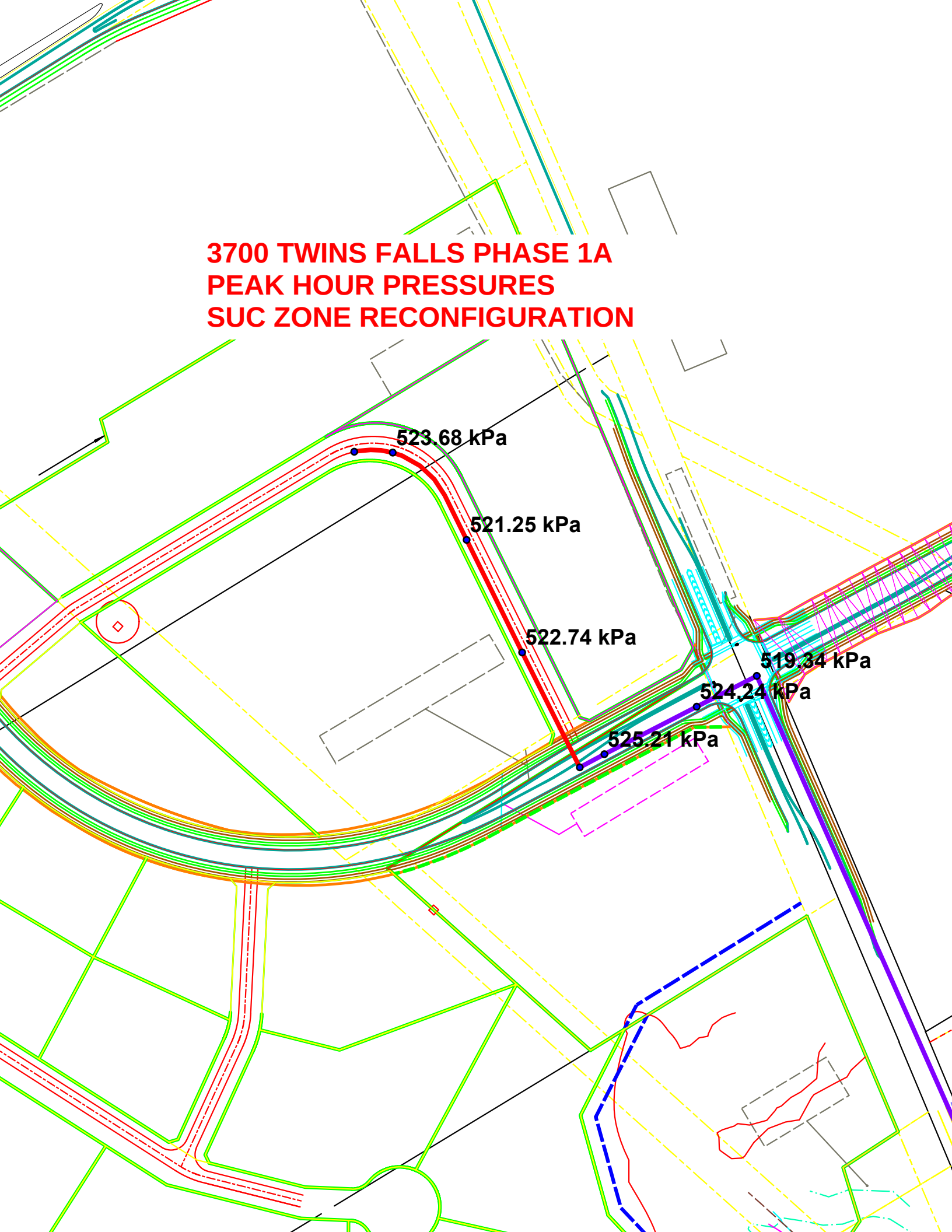
3700 TWINS FALLS PHASE 1A
PEAK HOUR PRESSURES
EXISTING CONDITIONS



		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
1	☐	H1	0.00	92.30	125.30	323.35	0.00
2	☐	H2	0.00	92.20	125.30	324.33	0.00
3	☐	H3	0.00	92.45	125.30	321.86	0.00
4	☐	H4	0.00	92.60	125.29	320.36	0.00
5	☐	H5	0.00	92.35	125.29	322.79	0.00
6	☐	J1	0.00	91.60	125.30	330.23	0.00
7	☐	J2	0.00	92.80	125.30	318.46	0.00
8	☐	J3	0.00	92.30	125.30	323.35	0.00
9	☐	J4	1.57	92.20	125.29	324.26	0.00

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count	Water Age (hrs)
1	☐	P11	J1	J2	509.60	297.00	120.00	1.57	0.02	0.00	0.00	Open	0	0.00
2	☐	P13	J3	H2	19.59	297.00	120.00	-1.57	0.02	0.00	0.00	Open	0	0.00
3	☐	P15	J3	H3	89.98	204.00	110.00	1.57	0.05	0.00	0.03	Open	0	0.00
4	☐	P45	J1	CON2	35.56	297.00	120.00	-1.57	0.02	0.00	0.00	Open	0	0.00
5	☐	P67	H3	H4	87.81	204.00	110.00	1.57	0.05	0.00	0.03	Open	0	0.00
6	☐	P69	H4	H5	83.18	204.00	110.00	1.57	0.05	0.00	0.03	Open	0	0.00
7	☐	P71	H5	J4	27.28	204.00	110.00	1.57	0.05	0.00	0.03	Open	0	0.00
8	☐	P73	H2	H1	72.67	297.00	120.00	-1.57	0.02	0.00	0.00	Open	0	0.00
9	☐	P75	H1	J2	47.30	297.00	120.00	-1.57	0.02	0.00	0.00	Open	0	0.00

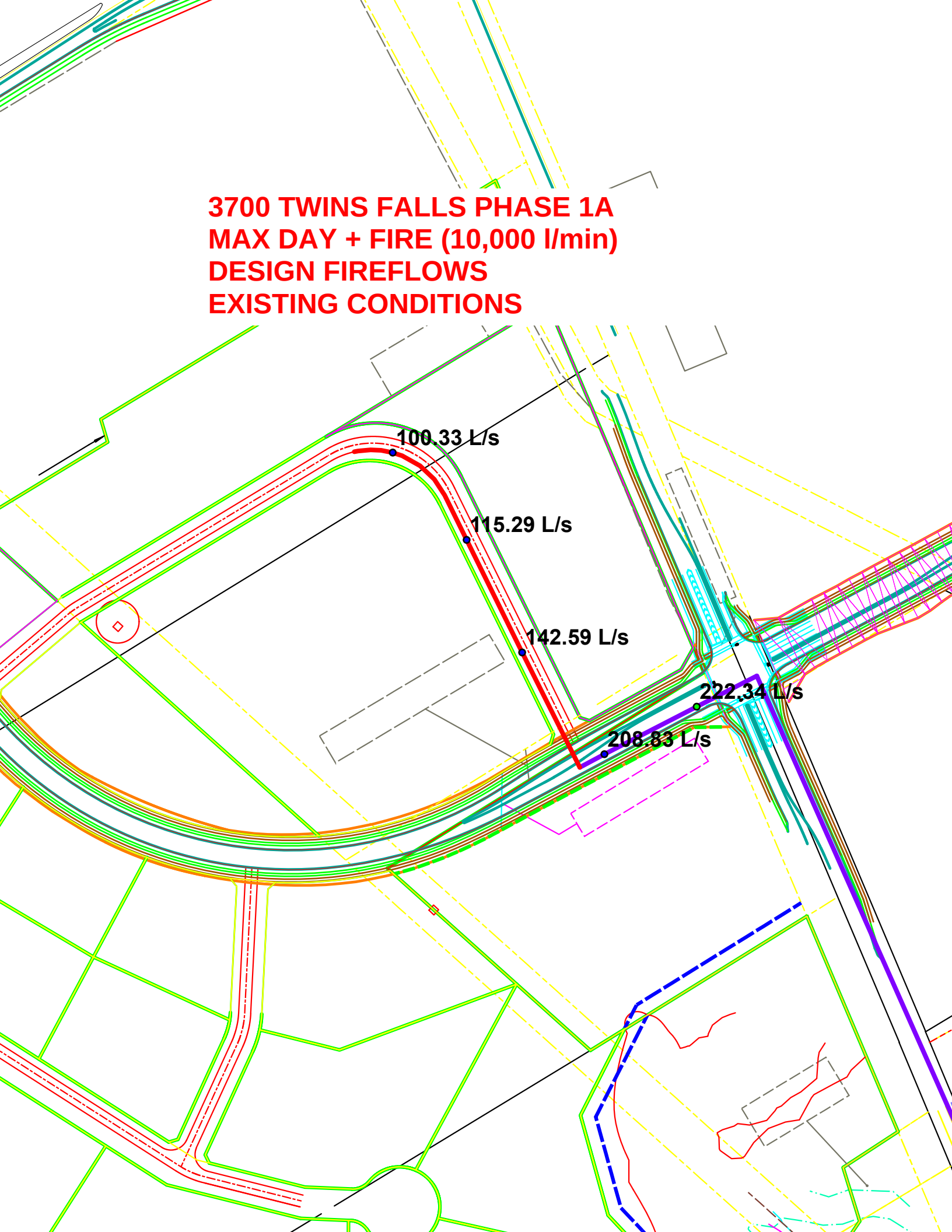
3700 TWINS FALLS PHASE 1A
PEAK HOUR PRESSURES
SUC ZONE RECONFIGURATION



		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
1	☐	H1	0.00	92.30	145.80	524.24	0.00
2	☐	H2	0.00	92.20	145.80	525.21	0.00
3	☐	H3	0.00	92.45	145.80	522.74	0.00
4	☐	H4	0.00	92.60	145.79	521.25	0.00
5	☐	H5	0.00	92.35	145.79	523.68	0.00
6	☐	J1	0.00	91.60	145.80	531.12	0.00
7	☐	J2	0.00	92.80	145.80	519.34	0.00
8	☐	J3	0.00	92.30	145.80	524.23	0.00
9	☐	J4	1.57	92.20	145.79	525.14	0.00

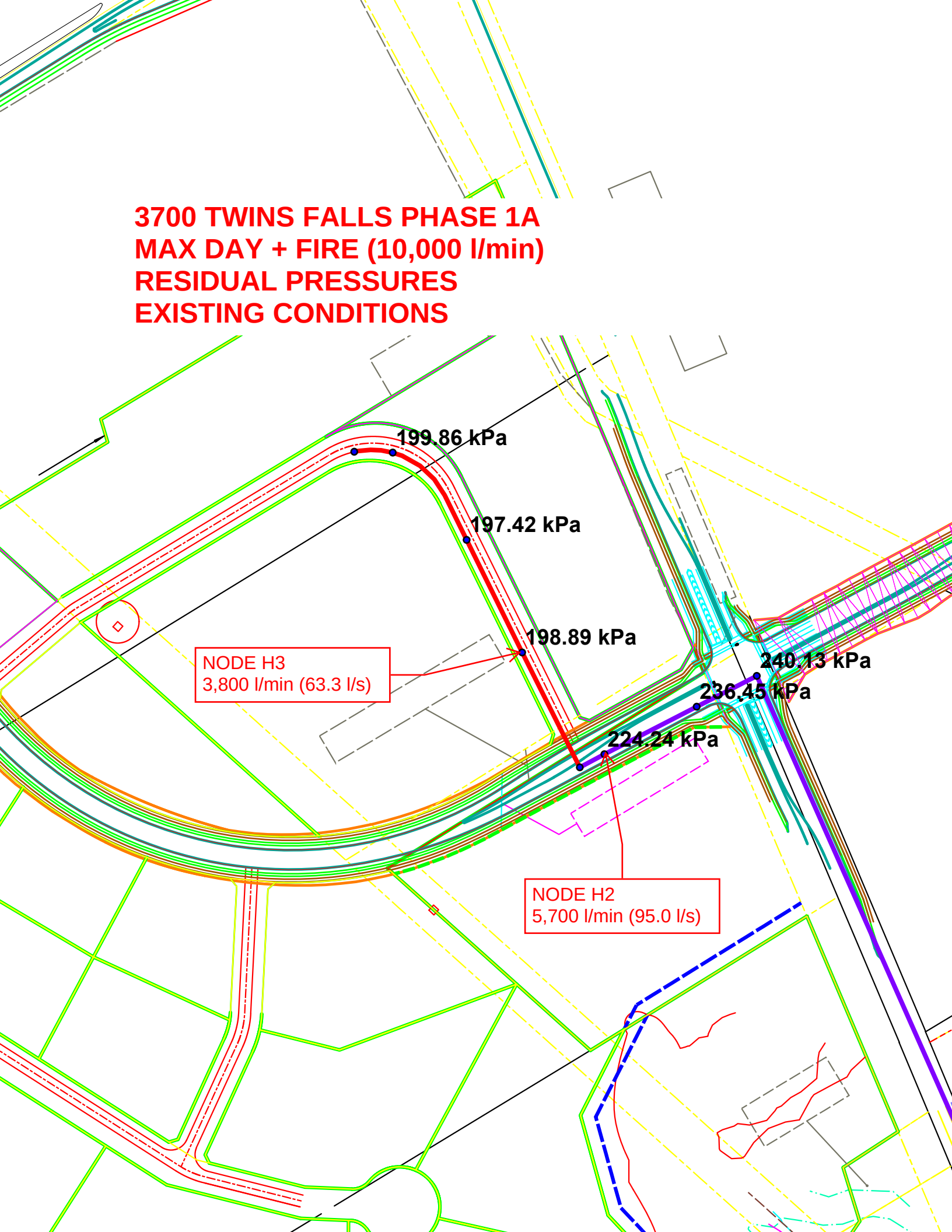
		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count	Water Age (hrs)
1	☐	P11	J1	J2	509.60	297.00	120.00	1.57	0.02	0.00	0.00	Open	0	0.00
2	☐	P13	J3	H2	19.59	297.00	120.00	-1.57	0.02	0.00	0.00	Open	0	0.00
3	☐	P15	J3	H3	89.98	204.00	110.00	1.57	0.05	0.00	0.03	Open	0	0.00
4	☐	P45	J1	CON2	35.56	297.00	120.00	-1.57	0.02	0.00	0.00	Open	0	0.00
5	☐	P67	H3	H4	87.81	204.00	110.00	1.57	0.05	0.00	0.03	Open	0	0.00
6	☐	P69	H4	H5	83.18	204.00	110.00	1.57	0.05	0.00	0.03	Open	0	0.00
7	☐	P71	H5	J4	27.28	204.00	110.00	1.57	0.05	0.00	0.03	Open	0	0.00
8	☐	P73	H2	H1	72.67	297.00	120.00	-1.57	0.02	0.00	0.00	Open	0	0.00
9	☐	P75	H1	J2	47.30	297.00	120.00	-1.57	0.02	0.00	0.00	Open	0	0.00

3700 TWINS FALLS PHASE 1A
MAX DAY + FIRE (10,000 l/min)
DESIGN FIREFLOWS
EXISTING CONDITIONS

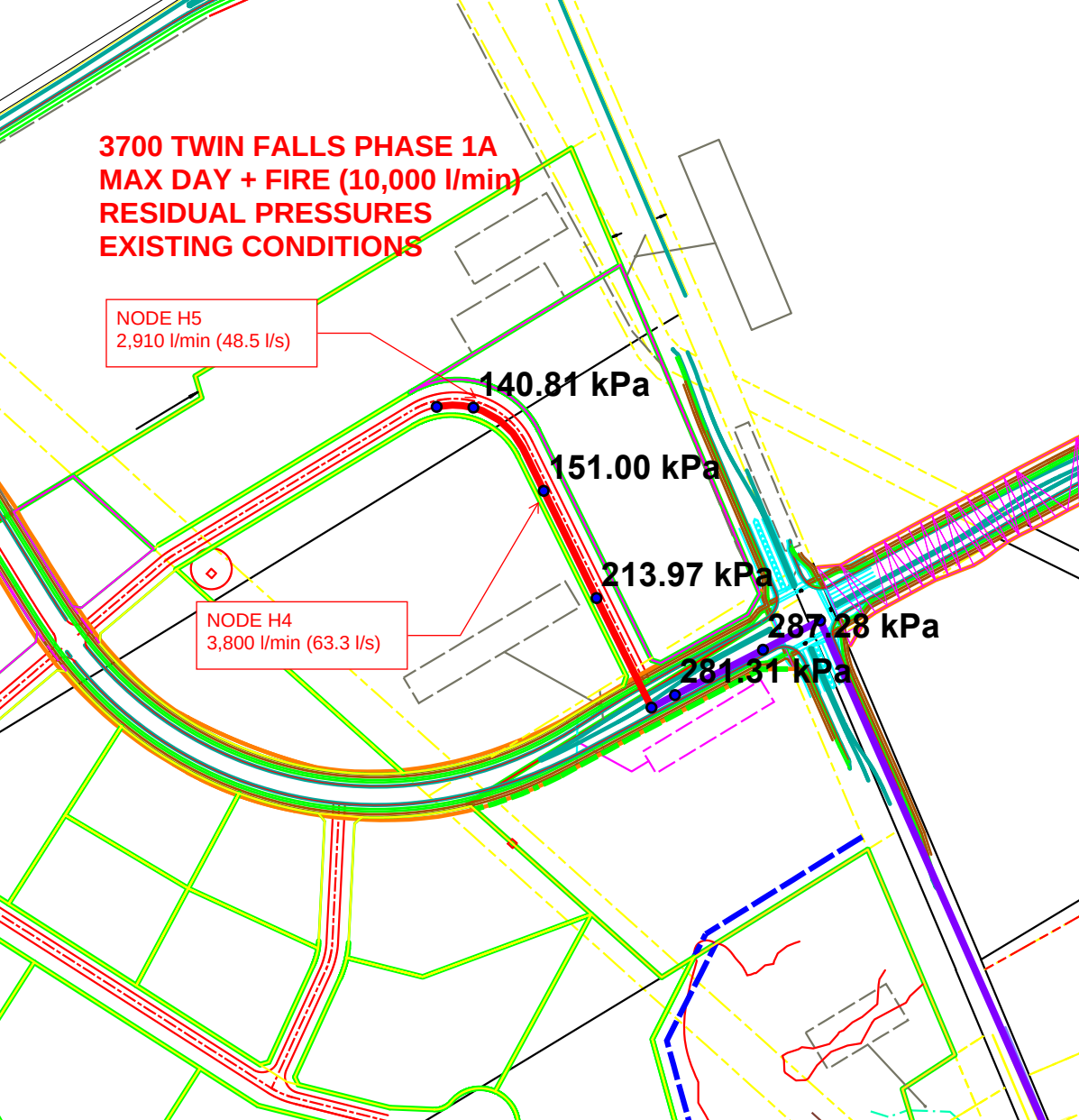


		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
1	☐	H1	166.67	224.11	H4	137.01	106.58	222.34	139.96	142.92
2	☐	H2	166.67	211.03	H4	136.03	106.48	208.83	139.96	143.90
3	☐	H3	166.67	143.16	H4	138.49	106.73	142.59	139.96	141.12
4	☐	H4	166.67	115.29	H4	139.96	106.88	115.29	139.96	139.96
5	☐	H5	166.67	100.33	H5	139.96	106.63	100.33	139.96	139.96

3700 TWINS FALLS PHASE 1A
MAX DAY + FIRE (10,000 l/min)
RESIDUAL PRESSURES
EXISTING CONDITIONS

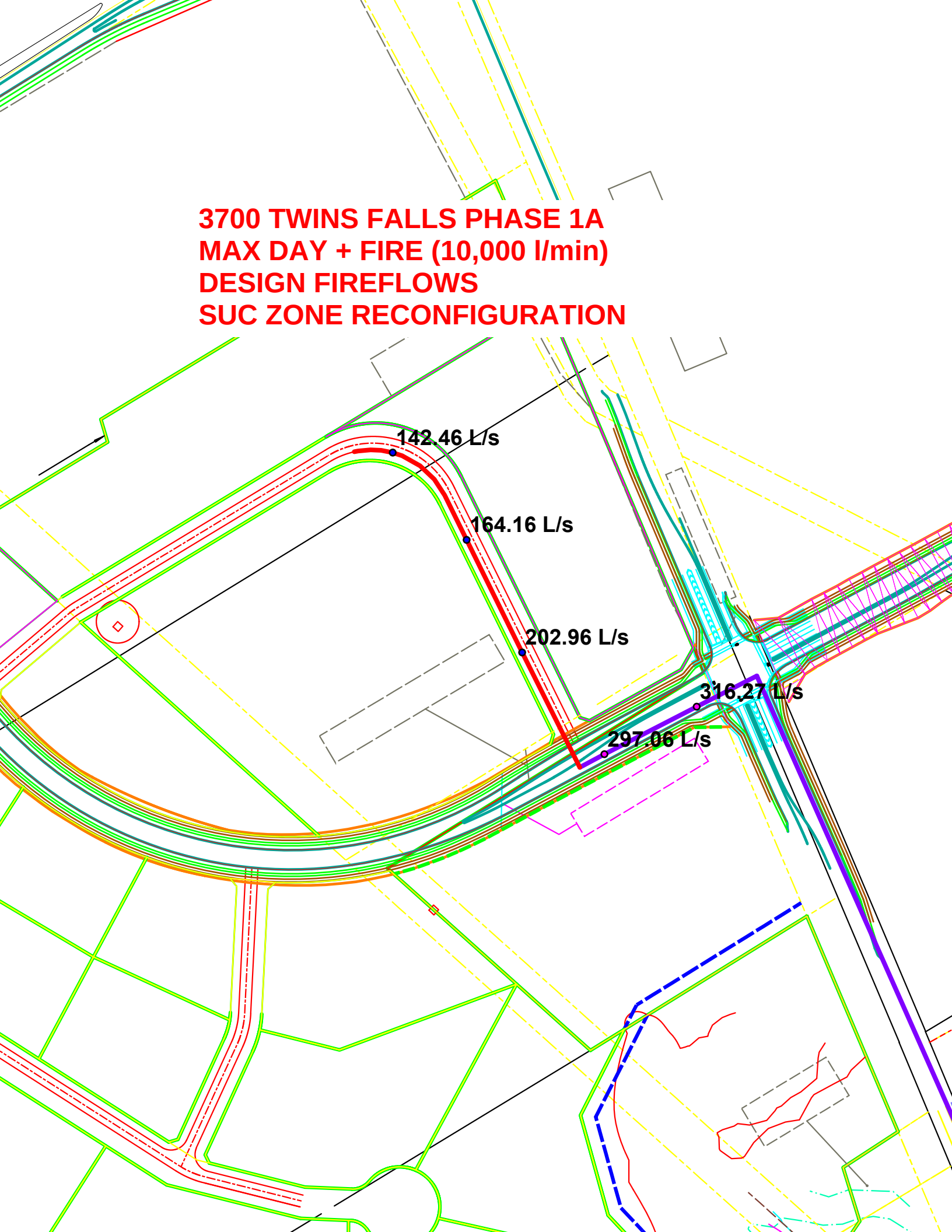


		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
1	☐	H1	0.00	92.30	116.43	236.45	0.00
2	☐	H2	95.00	92.20	115.08	224.24	0.00
3	☐	H3	63.33	92.45	112.75	198.89	0.00
4	☐	H4	0.00	92.60	112.75	197.42	0.00
5	☐	H5	0.00	92.35	112.75	199.86	0.00
6	☐	J1	0.00	91.60	126.74	344.36	0.00
7	☐	J2	0.00	92.80	117.30	240.13	0.00
8	☐	J3	0.00	92.30	115.02	222.60	0.00
9	☐	J4	0.87	92.20	112.75	201.33	0.00


3700 TWIN FALLS PHASE 1A
MAX DAY + FIRE (10,000 l/min)
RESIDUAL PRESSURES
EXISTING CONDITIONS
NODE H5
2,910 l/min (48.5 l/s)
140.81 kPa
151.00 kPa
213.97 kPa
287.28 kPa
281.31 kPa
NODE H4
3,800 l/min (63.3 l/s)

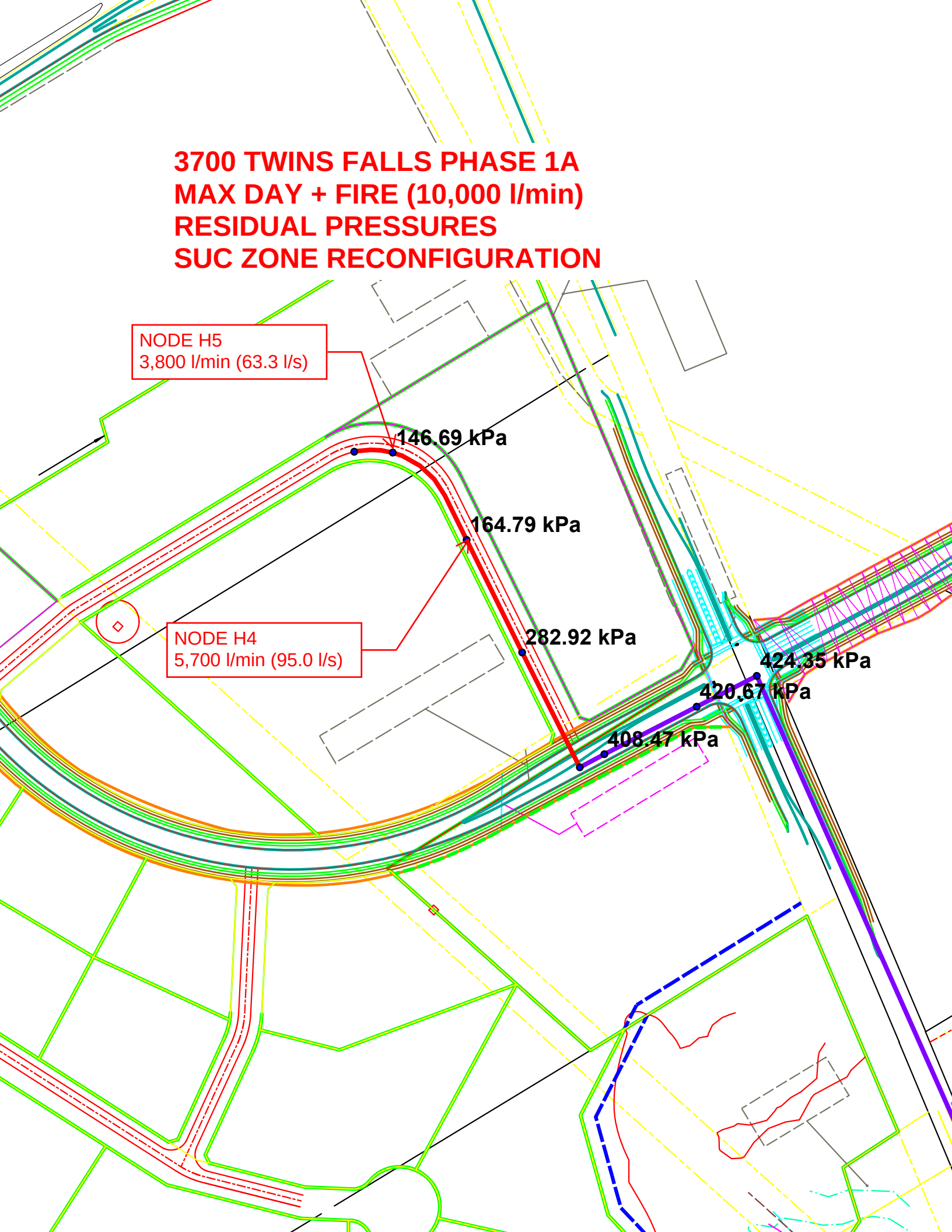
		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
1	☐	H1	0.00	92.30	121.62	287.28	0.00
2	☐	H2	0.00	92.20	120.91	281.31	0.00
3	☐	H3	0.00	92.45	114.29	213.97	0.00
4	☐	H4	63.30	92.60	108.01	151.00	0.00
5	☐	H5	48.50	92.35	106.72	140.81	0.00
6	☐	J1	0.00	91.60	127.05	347.41	0.00
7	☐	J2	0.00	92.80	122.08	286.90	0.00
8	☐	J3	0.00	92.30	120.72	278.45	0.00
9	☐	J4	0.87	92.20	106.72	142.28	0.00

3700 TWINS FALLS PHASE 1A
MAX DAY + FIRE (10,000 l/min)
DESIGN FIREFLOWS
SUC ZONE RECONFIGURATION



		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	☐	H1	166.67	317.58	H4	137.01	106.58	316.27	139.96	142.92
2	☐	H2	166.67	298.70	H4	136.03	106.48	297.06	139.96	143.90
3	☐	H3	166.67	203.38	H4	138.49	106.73	202.96	139.96	142.09
4	☐	H4	166.67	164.16	H4	139.96	106.88	164.16	139.96	139.91
5	☐	H5	166.67	142.46	H5	139.96	106.63	142.46	139.96	139.34

3700 TWINS FALLS PHASE 1A
MAX DAY + FIRE (10,000 l/min)
RESIDUAL PRESSURES
SUC ZONE RECONFIGURATION

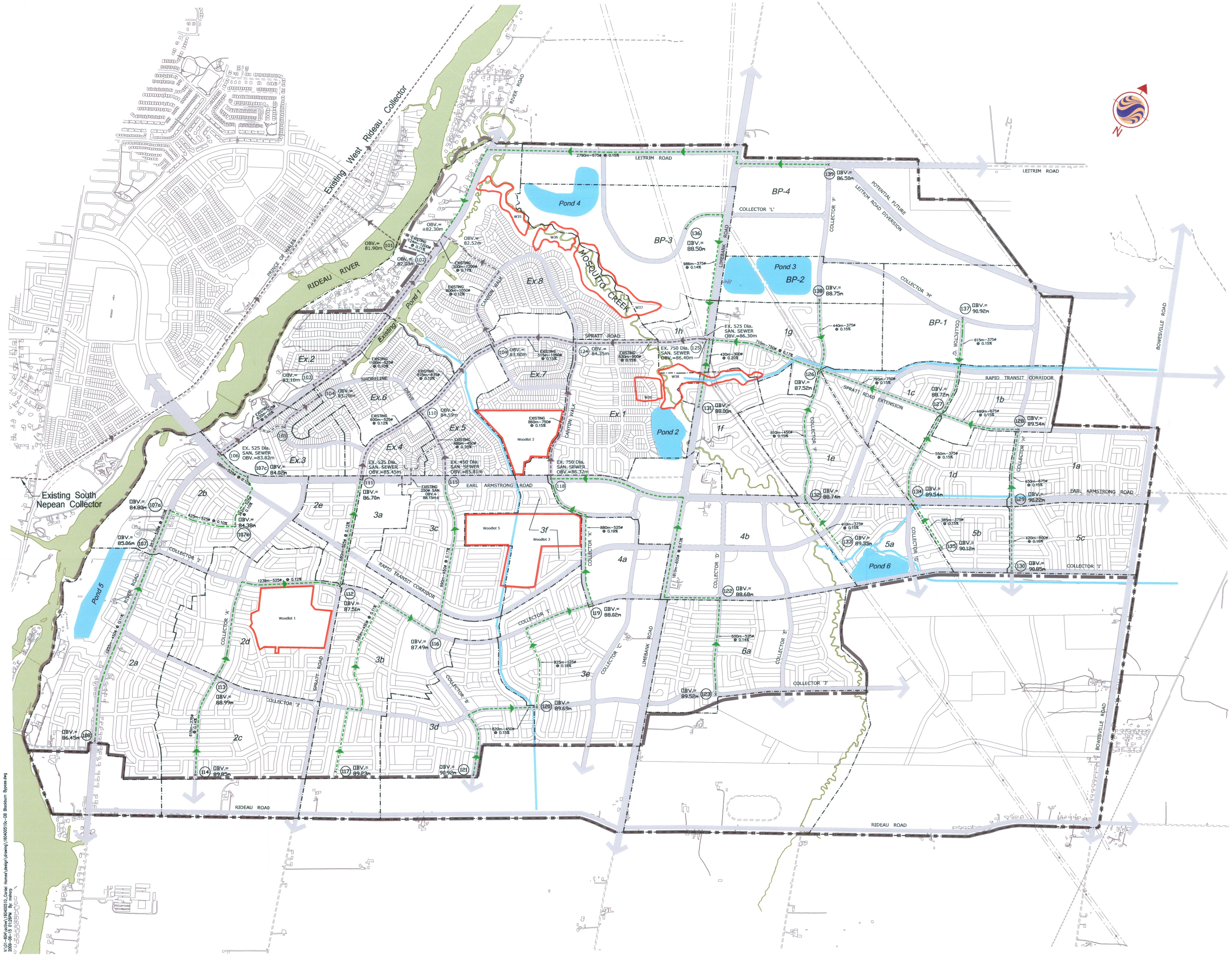


		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)	Water Age (hrs)
1	☐	H1	0.00	92.30	135.23	420.67	0.00
2	☐	H2	0.00	92.20	133.88	408.47	0.00
3	☐	H3	0.00	92.45	121.32	282.92	0.00
4	☐	H4	95.00	92.60	109.42	164.79	0.00
5	☐	H5	63.33	92.35	107.32	146.69	0.00
6	☐	J1	0.00	91.60	145.54	528.59	0.00
7	☐	J2	0.00	92.80	136.10	424.35	0.00
8	☐	J3	0.00	92.30	133.52	403.93	0.00
9	☐	J4	0.87	92.20	107.32	148.16	0.00

Appendix

C Wastewater Collection Supporting Information

- **Drawing 400 Sanitary Drainage Area Plan (RSCISSU-Phase1 Mosquito Creek Area)**
- **Sanitary Sewer Design Sheet (RSCISSU-Phase1 Mosquito Creek Area)**
- **Figure 3.1 Conceptual Sanitary Plan**
- **Sanitary Sewer Design Sheet**
- **136974-400 – Sanitary Drainage Area Plan**
- **Temporary ICD Calculation**



Stantec

Stantec Consulting Ltd.
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Ottawa ON Canada
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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
- Existing Manhole Node (106) OBV.= 83.82m
- Sanitary Manhole Node (115) OBV.= 85.77m
- Sub-drainage Area Limit
- Sub-drainage Area I.D. 4a
- Wood Lot W35

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

V:\01-604\active\163400510_Claridge Homes\design\drawing\163400510c-DB Blackburn Bypass.dwg 2009-06-15 01:26PM By: mahorg

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

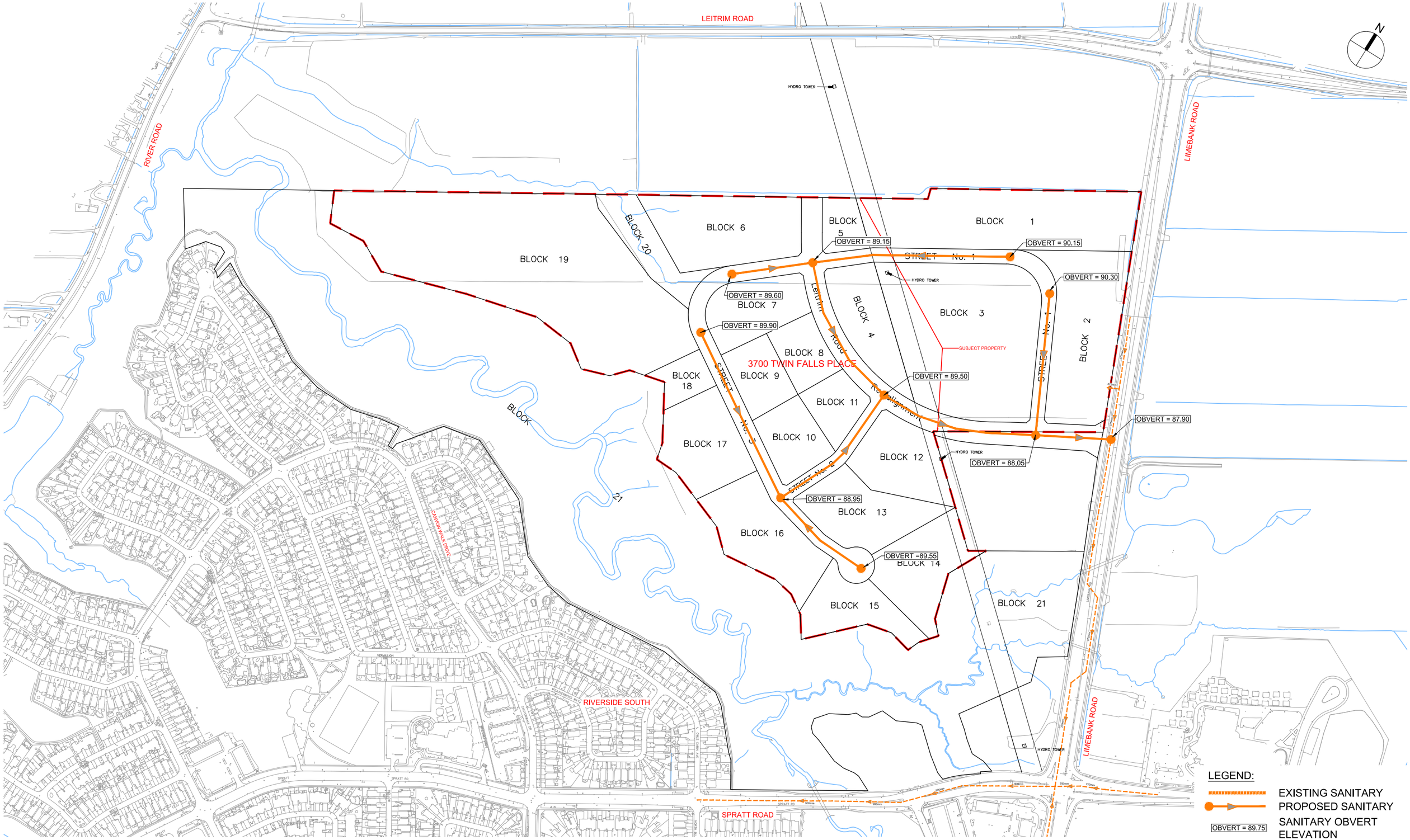
DESIGN PARAMETERS

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	18.33	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	87.31	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	69.1	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**	85.36	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**	84.83	84.11	83.81	83.28
Ex3	106	103	17.90	10.04	417	4647	7.86	564	1617	0	0	0	364	2126	6264	3.2	80.0	5.35	6.55	0	0	0	1.00	8.6	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	86.32
																																							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)



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: Chris.Cormier Last Saved At: Jul. 28, 23

IBI

Scale: N.T.S.

Project Title: RIVERSIDE SOUTH
3700 TWIN FALLS PLACE

Drawing Title: CONCEPTUAL SANITARY SERVICES

Sheet No.: FIGURE 3.1

LEGEND :

MH726A | 11.0 | 10.8
- AREA IDENTIFICATION
- INDUSTRIAL LAND USE (Ha)
- TOTAL AREA IN HECTARES

MH220A 0.27
MH220B 1.16 | 1.16
MH221A 0.08
MH231A 0.07
MH230A 0.29
EXT-1 2.96 | 1.67
MH201A 0.11
MH202A 0.10
MH202B 0.82 | 0.82
MH202C 2.81 | 2.81
MH203A 0.17
MH204A 0.20
MH204B 1.04 | 1.04
MH205A 0.14
MH206A 0.19
MH207A 0.13
MH208A 0.12
MH209A 0.18
MH210A 0.42
MH205B 1.36 | 1.36
EXT-2 19.01 | 17.29
MH208B 1.31 | 1.31
MH94B 3.70 | 3.70
MH94A 0.28
MH95A 0.19
MH97A 0.00
MH98B 0.00
MH98A 5.11 | 5.11
MH99B 0.07
MH99A 2.75 | 2.75
MH100A 0.22
MH101A 0.21
MH120A 0.51
MH210B 3.43 | 3.43

BLOCK 1, BLOCK 2, BLOCK 3, BLOCK 4, BLOCK 5, BLOCK 6, BLOCK 7, BLOCK 8, BLOCK 9, BLOCK 10, BLOCK 11, BLOCK 12, BLOCK 13, BLOCK 14, BLOCK 15, BLOCK 16, BLOCK 17, BLOCK 18, BLOCK 19

MAUDREY CRES, CANTIWALK DR, OWLS CABIN AVE, LIVERBANK RD, 14+700, 14+800, 14+900, 15+000

1:1500 0 15 45 75m

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

CLIENT

Riverside South

ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION 1 FOR CITY REVIEW	2023-11-24
2	SUBMISSION 2 FOR CITY REVIEW	2024-02-21
3	ISSUED FOR TENDER	2024-02-23
4	SUBMISSION 3 FOR CITY REVIEW	2024-04-02

KEY PLAN

CONSULTANTS

SEAL

LICENSED PROFESSIONAL ENGINEER
L. M. ERION
13379508
2024/04/02
PROVINCE OF ONTARIO

PRIME CONSULTANT
ARCADIS
333 Preston Street - Suite 500
Ottawa ON K1S 5N4 Canada
tel 613 225 1311
www.arcadis.com

PROJECT
RIVERSIDE SOUTH
3700 TWIN FALLS PLACE
PHASE 1

PROJECT NO: 136974	
DRAWN BY: **C.C.**	CHECKED BY: **L.E.**
PROJECT MGR: **L.E.**	APPROVED BY: **L.E.**

SHEET TITLE
SANITARY DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
400	4

SCALE CHECK 1 in 19072 50mm

D07-16-22-0014

File Location: J:\136974_RSS_Employmt\7.0_Production\7.03_Design\04_CivilSheets\400 SANITARY DRAINAGE AREA PLAN.dwg Last Saved: April 3, 2024 by MMilina Plotted: Wednesday, April 3, 2024 10:24:10 PM by Chris Cormier

ARCADIS ARCADIS
400-333 Preston Street
IBI GROUP Ottawa, Ontario K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868

SANITARY SEWER DESIGN SHEET

3700 Glen Falls Place - Phase 1
CITY OF OTTAWA
Riverside South

LOCATION				RESIDENTIAL										ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN							
				AREA w/ Units (Ha)	UNIT TYPES				AREA w/o Units (Ha)	POPULATION		RES PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)						ICI PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)		FLOW				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY (full)	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH		SF	TH/SD	1 Bed APT	2 Bed APT		IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL				IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(m)	(mm)	(%)	(m/s)	L/s	(%)
														IND	CUM	IND	CUM	IND	CUM														
Mosquito Drive	Block 5	MH220A	MH221A	1.43						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	1.16	1.16	1.50	0.70	1.43	1.43	0.47		0.0	1.18	20.24	75.00	200	0.35	0.624	19.07	94.19%
		MH221A	MH201A	0.08						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	1.16	1.50	0.70	0.08	1.51	0.50		0.0	1.20	20.24	28.15	200	0.35	0.624	19.04	94.06%
Street No. 3	EXT-1	CAP240A	MH201A	2.98						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	1.67	1.67	1.50	1.01	2.98	2.98	0.98		0.0	2.00	20.24	18.69	200	0.35	0.624	18.24	90.13%
Gastops Street		MH230A	MH231A	0.29						0.0	0.0	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.29	0.29	0.10		0.00	0.10	20.24	85.00	200	0.35	0.62	20.15	99.53%
		MH231A	MH201A	0.07						0.0	0.0	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.07	0.36	0.12		0.00	0.12	20.24	33.94	200	0.35	0.62	20.12	99.41%
Mosquito Drive		MH201A	MH202A	.0.11						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	2.83	1.50	1.72	.0.11	4.96	1.64		0.0	3.36	20.24	37.73	200	0.35	0.624	16.89	83.42%
	Block 4, 7	MH202A	MH203A	3.73						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	3.63	6.46	1.50	3.93	3.73	8.69	2.87		0.0	6.79	31.02	32.83	250	0.25	0.612	24.23	78.10%
		MH203A	MH204A	0.17						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	6.46	1.50	3.93	0.17	8.86	2.92		0.0	6.85	31.02	53.81	250	0.25	0.612	24.17	77.92%
	Block 8	MH204A	MH205A	1.24						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	1.04	7.50	1.50	4.56	1.24	10.10	3.33		0.0	7.89	31.02	64.21	250	0.25	0.612	23.13	74.56%
	Block 9	MH205A	MH206A	1.52						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	1.38	8.88	1.50	5.40	1.52	11.62	3.83		0.0	9.23	45.12	42.68	300	0.20	0.618	35.89	79.54%
		MH206A	MH207A	0.19						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	8.88	1.50	5.40	0.19	11.81	3.90		0.0	9.29	45.12	57.11	300	0.20	0.618	35.82	79.40%
Street No. 2	EXT-2	CAP260A	MH207A	19.01						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	17.09	17.09	1.50	10.38	19.01	19.01	6.27		0.0	16.66	70.84	20.65	375	0.15	0.621	54.18	76.49%
Mosquito Drive		MH207A	MH208A	0.13						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	25.97	1.50	15.78	0.13	30.95	10.21		0.0	25.99	70.84	38.73	375	0.15	0.621	44.85	63.31%
	Block 10	MH208A	MH209A	1.43						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	1.31	27.28	1.50	16.58	1.43	32.38	10.69		0.0	27.26	70.84	38.57	375	0.15	0.621	43.58	61.52%
		MH209A	MH210A	0.18						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	27.28	1.50	16.58	0.18	32.56	10.74		0.0	27.32	70.84	52.35	375	0.15	0.621	43.52	61.43%
		MH210A	CAP110A	3.85						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	3.43	30.71	1.50	18.66	3.85	36.41	12.02		0.0	30.68	70.84	102.00	375	0.15	0.621	40.17	56.70%
		CAP110A	MH120A							0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	30.71	1.50	18.66	0.00	36.41	12.02		0.0	30.68	70.84	18.00	375	0.15	0.621	40.17	56.70%
Gastops Street	Block 1	MH94A	MH95A	3.98						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	3.70	3.70	1.50	2.25	3.98	3.98	1.31		0.0	3.56	20.24	90.00	200	0.35	0.624	16.68	82.41%
		MH95A	CAP97B	0.19						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	3.70	1.50	2.25	0.19	4.17	1.38		0.0	3.62	20.24	77.04	200	0.35	0.624	16.62	82.10%
	EXT 1	CAP96A	MH97A	4.17						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	3.70	1.50	2.25	4.17	8.34	2.75		0.0	5.00	20.24	8.49	200	0.35	0.624	15.24	75.30%
		MH97A	MH98A	0.09						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	3.70	1.50	2.25	0.09	8.43	2.78		0.0	5.03	20.24	32.94	200	0.35	0.624	15.21	75.15%
	Block 3	MH98A	MH99A	5.20						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	5.11	8.81	1.50	5.35	5.20	13.63	4.50		0.0	9.85	20.24	29.05	200	0.35	0.624	10.39	51.33%
	Block 2	MH99A	MH100A	2.82						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	2.75	11.56	1.50	7.02	2.82	16.45	5.43		0.0	12.45	20.24	34.00	200	0.35	0.624	7.79	38.48%
		MH100A	MH101A	0.22						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	11.56	1.50	7.02	0.22	16.67	5.50		0.0	12.53	20.24	101.84	200	0.35	0.624	7.72	38.12%
		MH101A	MH120A	0.21						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	11.56	1.50	7.02	0.21	16.88	5.57		0.0	12.59	20.24	107.09	200	0.35	0.624	7.65	37.78%
Mosquito Drive		MH120A	MH122A	0.51						0.0	0.0	3.80	0.00	0.00	0.0	0.00	0.0	0.00	42.27	1.50	25.68	0.51	53.29	17.59		0.0	43.27	70.84	118.73	375	0.15	0.621	27.57	38.92%

Design Parameters:

Residential			ICI Areas		
SF	3.4	p/p/u	INST	28,000	L/Ha/day
TH/SD	2.7	p/p/u	COM	28,000	L/Ha/day
1 Bed	1.4	p/p/u	IND	35,000	L/Ha/day
2 Bed	2.1	p/p/u	Other	17000	L/Ha/day
Other	60	p/p/Ha			

Notes:

1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day 200 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+(P/1000)^0.5))0.8
   where K = 0.8 Correction Factor
5. Industrial, Commercial and Institutional Peak Factors based on total area, 1.5 if greater than 20%, otherwise 1.0

Designed: LME

Checked:

Dwg. Reference: 136974-400

No.	Revision	Date
1.	Phase 1 - Submission No. 1	2023-11-23
2	Phase 1 - Submission No. 2	2024-02-21
3	Phase 1 - Submission No. 3	2024-04-02

File Reference: 136974-6.04.04 **Date:** 2024-04-04 **Sheet No:** 1 of 1

Temporary Construction ICDs
3700 Twin Falls Place - Phase 1

Structure	Flow (l/s)	Grade Elev. (m)	Pipe Invert (m)	Pipe Size (m)	Height (m)	Area (Sq m)	Orifice Size	
							Sq. mm	mm dia.
Sanitary								
MH 120A	42.30	92.30	87.70	0.375	4.41	0.0075	86	97

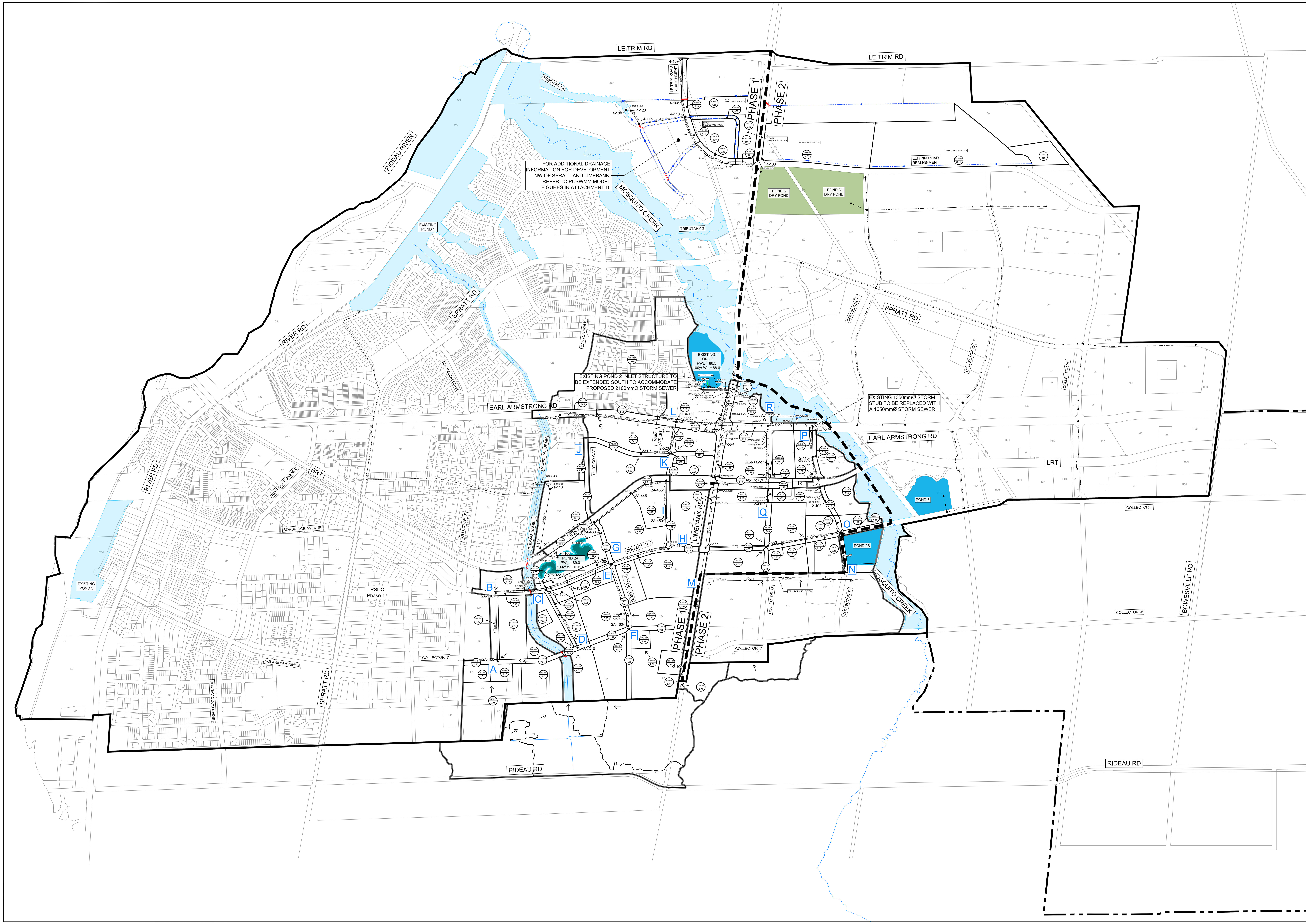
Based On Equation: Where: A=(Q/(C*(2*g*h)^.5)
C= 0.61
g= 9.81

2024-02-21

Appendix

D Stormwater Management Supporting Information

- **Drawing 125127-500 Storm Drainage Area Plan (RSCISSU-Phase1 Mosquito Creek Area)**
- Drawing **136974-500 Drainage Area Plan**
- **Supporting calculations**
- **OGS sizing per manufacturer**



LEGEND

- PROPOSED TRUNK STORM SEWER
- FUTURE TRUNK STORM SEWER
- EXISTING TRUNK STORM SEWER
- PROPOSED DITCHES
- PROPOSED CULVERTS
- MAJOR DRAINAGE DIVIDE
- CDP LANDS
- EXPANSION LANDS
- PHASING LINE
- MD — LAND USE PLAN
- RD2-402 / 0.48 — AREA ID / AREA IN HECTARES
- STORM CONNECTIVITY
- Q — REFERENCE TO PROFILE

LAND USE LEGEND:

LD Neighbourhood - Low Density
MD Neighbourhood - Medium Density
HD1 Neighbourhood - High Density 1
HD2 Neighbourhood - High Density 2
TC Town Centre
NC Commercial - Neighbourhood
LC Commercial - Local
ESD Employment and Special District
I/F Institutional / Firehall
FC/FP/EC/EP - Schools - Secondary - Elementary
DP Park - District
CP Park - Community
NP Park - Neighbourhood
SP Park - Parkette
MUP Multi-Use Pathway
NEA Natural Environment Area
SWM Storm Water Management
UNF Urban Natural Feature
OS Passive Open Space(s)
UC Green Transportation and Utility Corridor(s)
P&R Park and Ride
BRT Bus Rapid Transit
LRT Light Rail Transit

CLIENT

Ottawa

ISSUES

No.	DESCRIPTION	DATE
1	ISSU PH 1 SUBMISSION 1	2022:12:02
2	ISSU PH 1 SUBMISSION 2	2023:05:24
3	ISSU PH 1 SUBMISSION 3	2023:08:18

CONSULTANTS

SEAL

IBI GROUP
500 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

PROJECT
RIVERSIDE SOUTH COMMUNITY INFRASTRUCTURE SERVICING STUDY UPDATE PHASE 1 MOSQUITO CREEK STUDY AREA

PROJECT NO: 125127

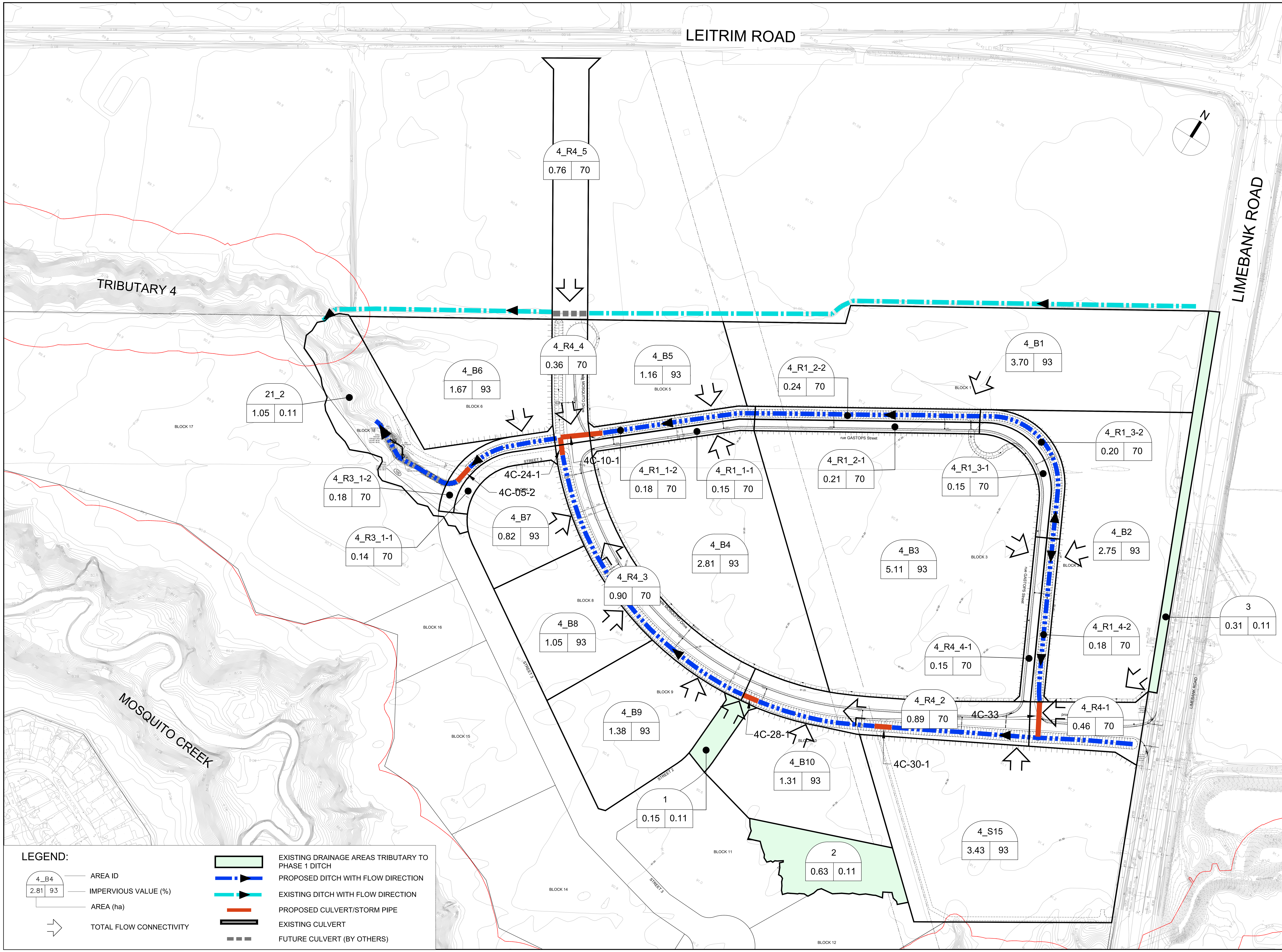
DRAWN BY: C.C.	CHECKED BY: L.E.
PROJECT MGR: M.B.	APPROVED BY: R.W.

SHEET TITLE
STORM DRAINAGE AREA PLAN

SHEET NUMBER 500 ISSUE 3

File Location: J:\125127_RsSthISSU\7.0_Production\7.03_Design\04_Civil\Sheets\125127-500.dwg Last Saved: May 19, 2023

SCALE CHECK 1 in 10mm



CLIENT

Riverside South

Arcadis Professional Services (Canada) Inc.
formerly IBI Group Professional Services (Canada) Inc.

ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION 1 FOR CITY REVIEW	2023-11-24
2	SUBMISSION 2 FOR CITY REVIEW	2024-02-21
3	ISSUED FOR TENDER	2024-02-23
4	SUBMISSION 3 FOR CITY REVIEW	2024-04-02
5	ISSUED FOR CONSTRUCTION	2024-04-25

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

CONSULTANTS

SEAL

PRIME CONSULTANT
ARCADIS
333 Preston Street - Suite 500
Ottawa ON K1S 5N4 Canada
tel 613 225 1311
www.arcadis.com

PROJECT
RIVERSIDE SOUTH
3700 TWIN FALLS PLACE
PHASE 1

PROJECT NO: 136974

DRAWN BY: C.C.	CHECKED BY: L.E.
PROJECT MGR: L.E.	APPROVED BY: L.E.

SHEET TITLE
STORM DRAINAGE AREA PLAN

SHEET NUMBER 500

ISSUE 5

File Location: J:\136974_RSS_Employme\7.0_Production\7.03_Design\04_Civil\Sheets\500 STORM DRAINAGE AREA PLAN.dwg

D07-16-22-0014

SCALE CHECK 1 in 10mm

19072

STORM SEWER DESIGN SHEET

2 YEAR FLOW FOR LARGEST DRAINAGE AREA SERVICED BY CATCH BASIN

3700 TWIN FALLS PLACE - PHASE 1

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW				
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.25	C= 0.40	C= 0.50	C= 0.57	C= 0.60	C= 0.68	C= 0.70	C= 0.73	C= 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	i (2) (mm/hr)	2yr PEAK FLOW (L/s)
2 Year Flow at Street Catchbasin																		
Leitrim Road	CICB120 *								0.135					0.23	0.23	10.00	76.81	**17.29**
* area includes one lane, sidewalk and boulvard to Hydro Duct																		
Street No. 1	CB191 **												0.053	0.13	0.13	10.00	76.81	**10.18**
** area includes one lane and sidewalk																		
Definitions:																		
Q = 2.78CiA, where:																		
Q = Peak Flow in Litres per Second (L/s)																		
A = Area in Hectares (Ha)																		
i = Rainfall intensity in millimeters per hour (mm/hr)																		
[i = 732.951 / (TC+6.199)^0.810] 2 YEAR																		
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR																		
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR																		
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR																		

Catch Basin Lead Restriction

3700 TWIN FALLS PLACE - PHASE 1

C	Diameter (m)	Head (m)	Area (m^2)	Flow (l/s)
0.61	0.2	1	0.03142	85

$Q = CA(2gh)^{0.5}$

Rip rap sizing

$$D_{50} = \frac{V^2}{2gC^2(S-1)}$$ *Isbash equation*

where:

D_{50} median rip rap diameter (m)
V average channel velocity (m/s)
g acceleration due to gravity, 9.806 m/s^2
C Isbash constant, 0.86 for high turbulence flow, 1.20 for low turbulence; assumed high for conservatism
S specific gravity of rip rap, taken as 2.65

Thickness = $1.5 \times D_{50}$ *Riprap Design and Construction Guide, British Columbia Ministry of Environment, Lands and Parks, March 2000*

100 year flow conditions
Culverts from east to west

At CB lead outlets	**Crossing Mosquito Drive, just west of Limebank**	**On Mosquito Drive, in vicinity of hydro corridor**	**On Mosquito Drive, at future Street 2**	**Crossing Gastops Street at Mosquito Drive**
Max V in ditch network (m/s) = 0.66	V (m/s) = 1.11	V (m/s) = 0.9	V (m/s) = 1.22	V (m/s) = 1.56
D_{50} (mm) = $\frac{V^2 * 1000}{2gC^2(S-1)}$	D_{50} (mm) = $\frac{V^2 * 1000}{2gC^2(S-1)}$	D_{50} (mm) = $\frac{V^2 * 1000}{2gC^2(S-1)}$	D_{50} (mm) = $\frac{V^2 * 1000}{2gC^2(S-1)}$	D_{50} (mm) = $\frac{V^2 * 1000}{2gC^2(S-1)}$
D_{50} (mm) = 18	D_{50} (mm) = 51	D_{50} (mm) = 34	D_{50} (mm) = 62	D_{50} (mm) = 102
Per OPSD 810.010, minimum thickness (mm)= 300	**Per OPSD 810.010, minimum thickness (mm)= 300**	**Per OPSD 810.010, minimum thickness (mm)= 300**	**Per OPSD 810.010, minimum thickness (mm)= 300**	**Per OPSD 810.010, minimum thickness (mm)= 300**
D_{50} (mm) = Thickness/1.5	D_{50} (mm) = Thickness/1.5	D_{50} = Thickness/1.5	D_{50} = Thickness/1.5	D_{50} = Thickness/1.5
D_{50} (mm) = 200	**D_{50} (mm) = 200**	**D_{50} = 200**	**D_{50} = 200**	**D_{50} = 200**
Exceeds calculated minimum based on velocity	Exceeds calculated minimum based on velocity	Exceeds calculated minimum based on velocity	Exceeds calculated minimum based on velocity	Exceeds calculated minimum based on velocity

Rip rap sizing

$$D_{50} = \frac{V^2}{2gC^2(S-1)}$$ *Isbash equation*

where:

D_{50} median rip rap diameter (m)
V average channel velocity (m/s)
g acceleration due to gravity, 9.806 m/s^2
C Isbash constant, 0.86 for high turbulence flow, 1.20 for low turbulence; assumed high for conservatism
S specific gravity of rip rap, taken as 2.65

Thickness = $1.5 \times D_{50}$ *Riprap Design and Construction Guide, British Columbia Ministry of Environment, Lands and Parks, March 2000*

100 year flow conditions
Culverts from east to west

Crossing Mosquito Drive at Gastops Street	**On Mosquito Drive upstream of outlet**	**Through outlet channel**
V (m/s) = 0.95	V (m/s) = 1.96	V (m/s) = 1.08
D_{50} (mm) = $\frac{V^2 * 1000}{2gC^2(S-1)}$	D_{50} (mm) = $\frac{V^2 * 1000}{2gC^2(S-1)}$	D_{50} (mm) = $\frac{V^2 * 1000}{2gC^2(S-1)}$
D_{50} (mm) = 38	D_{50} (mm) = 161	D_{50} (mm) = 49
Per OPSD 810.010, minimum thickness (mm)= 300	**Per OPSD 810.010, minimum thickness (mm)= 300**	**Carrying 200 mm D_{50}**
D_{50} = Thickness/1.5	D_{50} = Thickness/1.5	Thickness (mm) = $1.5 \times D_{50}$
D_{50} = 200	**D_{50} = 200**	**Thickness (mm) = 300**
Exceeds calculated minimum based on velocity	Exceeds calculated minimum based on velocity	

OGS Sizing PCSWMM Schematic

Legend

- Junctions
- Storages
- Outfalls

Conduits

- Ditch
- Tributaries
- Culvert / STM Pipe

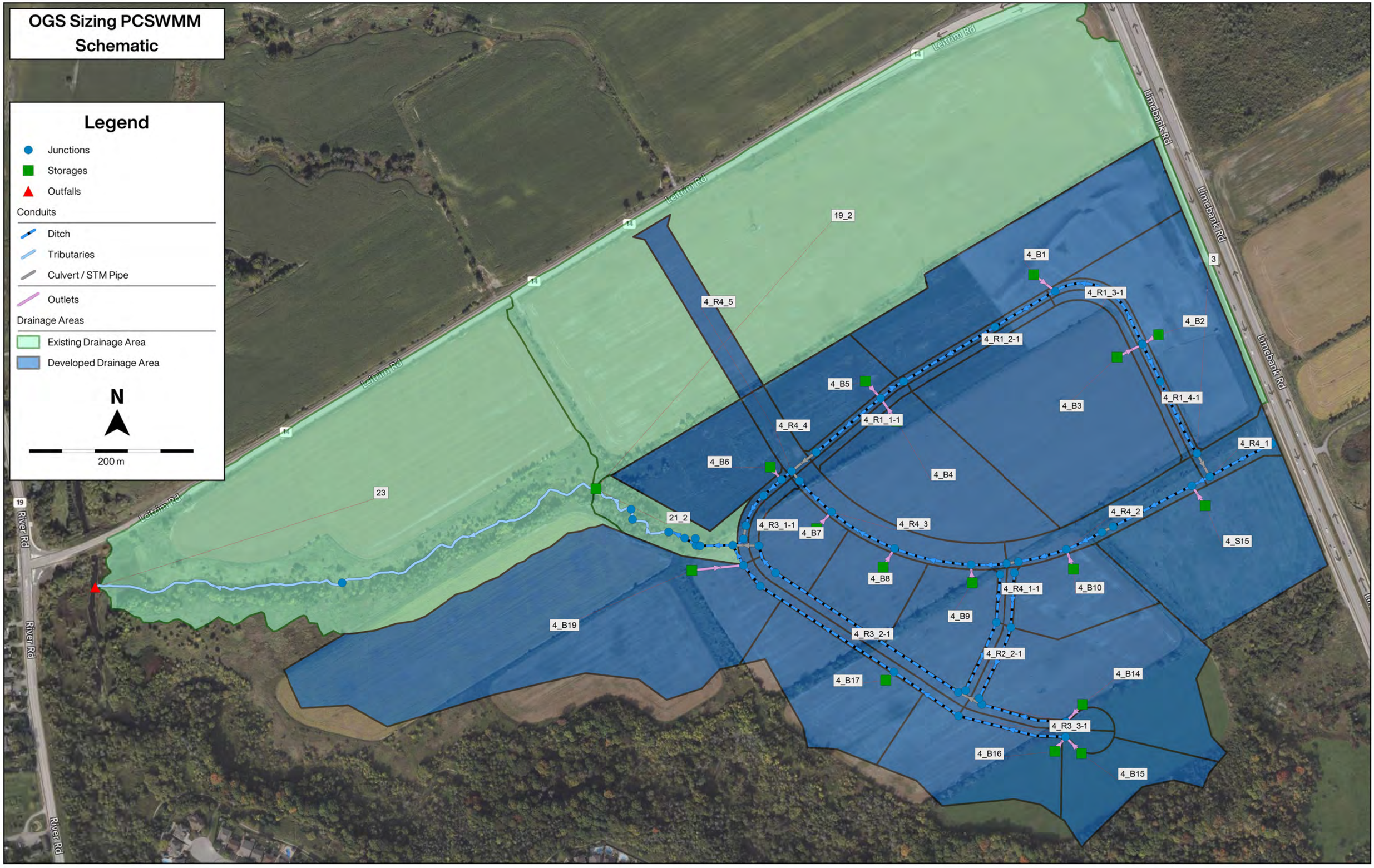
- Outlets

Drainage Areas

- Existing Drainage Area
- Developed Drainage Area

N

200 m



Hydroworks Sizing Summary

Limebank Rd
Gloucester, Ontario

02-13-2024

Recommended Size: HydroStorm HS 12

A HydroStorm HS 12 is recommended to provide 80 % annual TSS removal based on a drainage area of 6.88 (ha) with an imperviousness of 70 % and Ottawa CDA, Ontario rainfall for the 20 um to 2000 um particle size distribution.

The recommended HydroStorm HS 12 treats 97 % of the annual runoff and provides 80 % annual TSS removal for the Ottawa CDA rainfall records and 20 um to 2000 um particle size distribution.

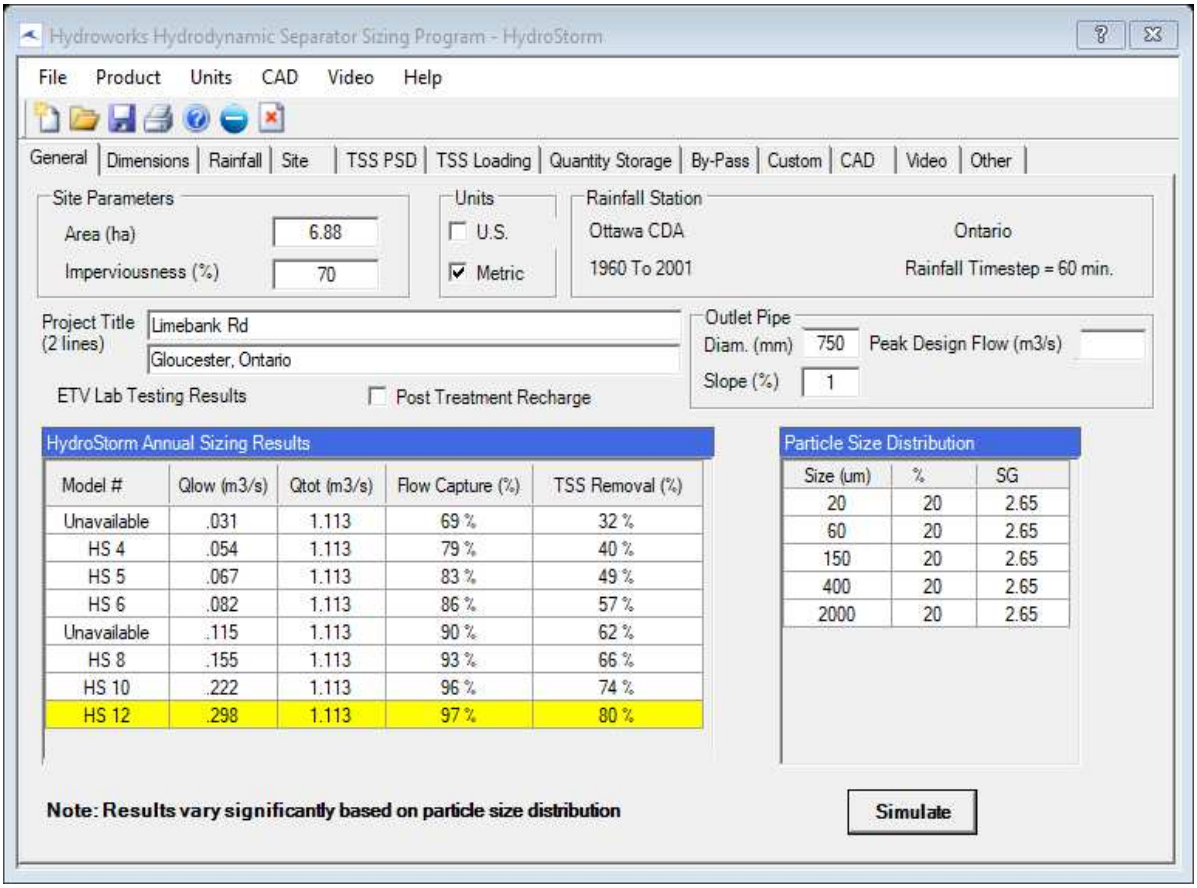
The HydroStorm has a headloss coefficient (K) of 1.04. Since a peak flow was not specified, headloss was calculated using the full pipe flow of 1.11 (m3/s) for the given 750 (mm) pipe diameter at 1% slope. The headloss was calculated to be 337 (mm) based on a flow depth of 750 (mm) (full pipe flow).

This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

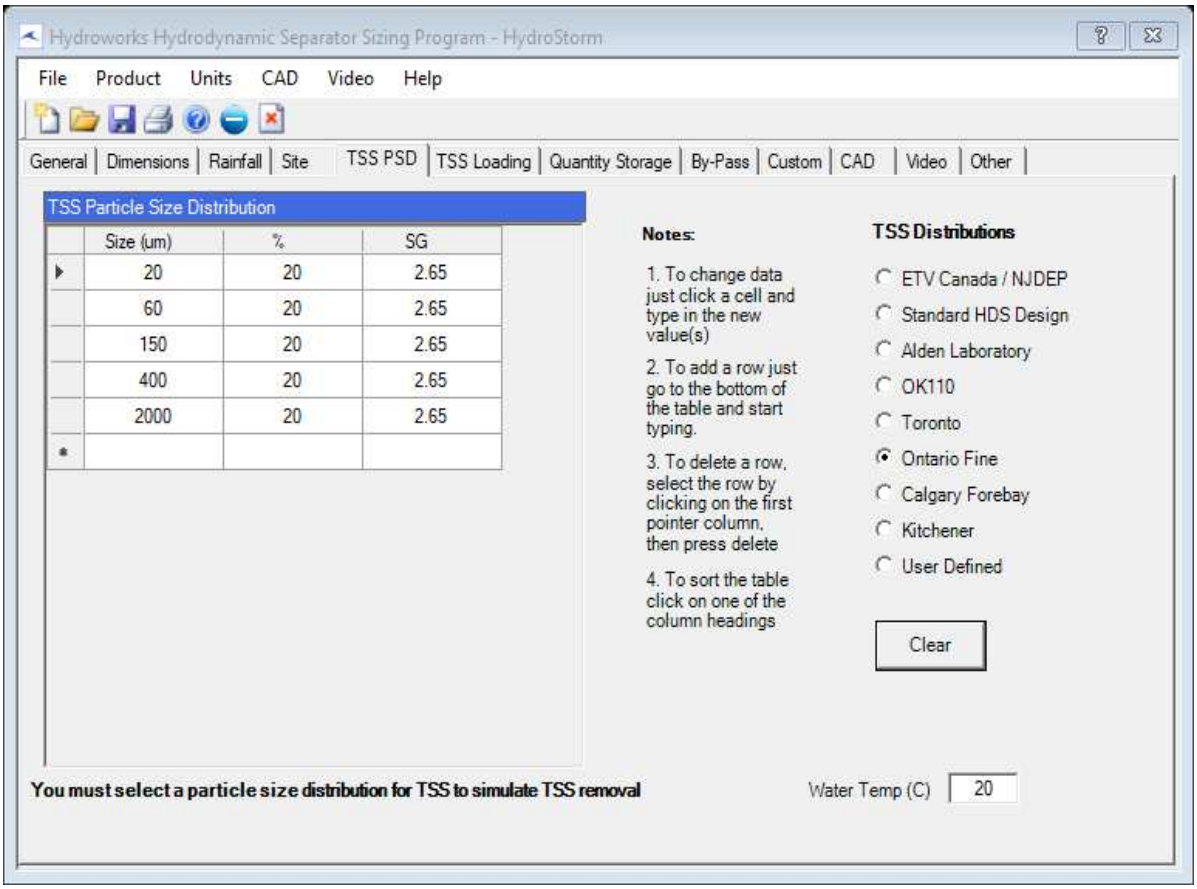
If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

The sizing program is for sizing purposes only and does not address any site specific parameters such as hydraulic gradeline, tailwater submergence, groundwater, soils bearing capacity, etc. Headloss calculations are not a hydraulic gradeline calculation since this requires a starting water level and an analysis of the entire system downstream of the HydroStorm .

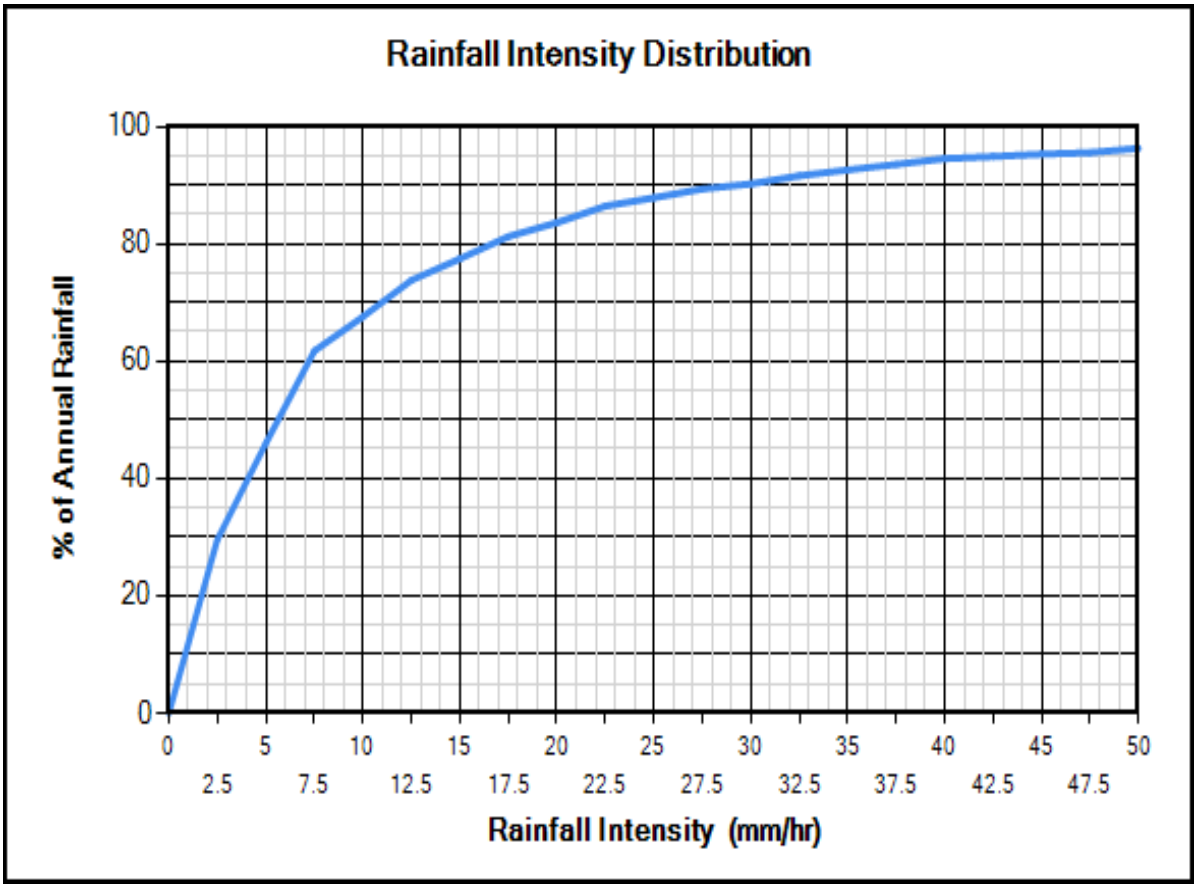
TSS Removal Sizing Summary



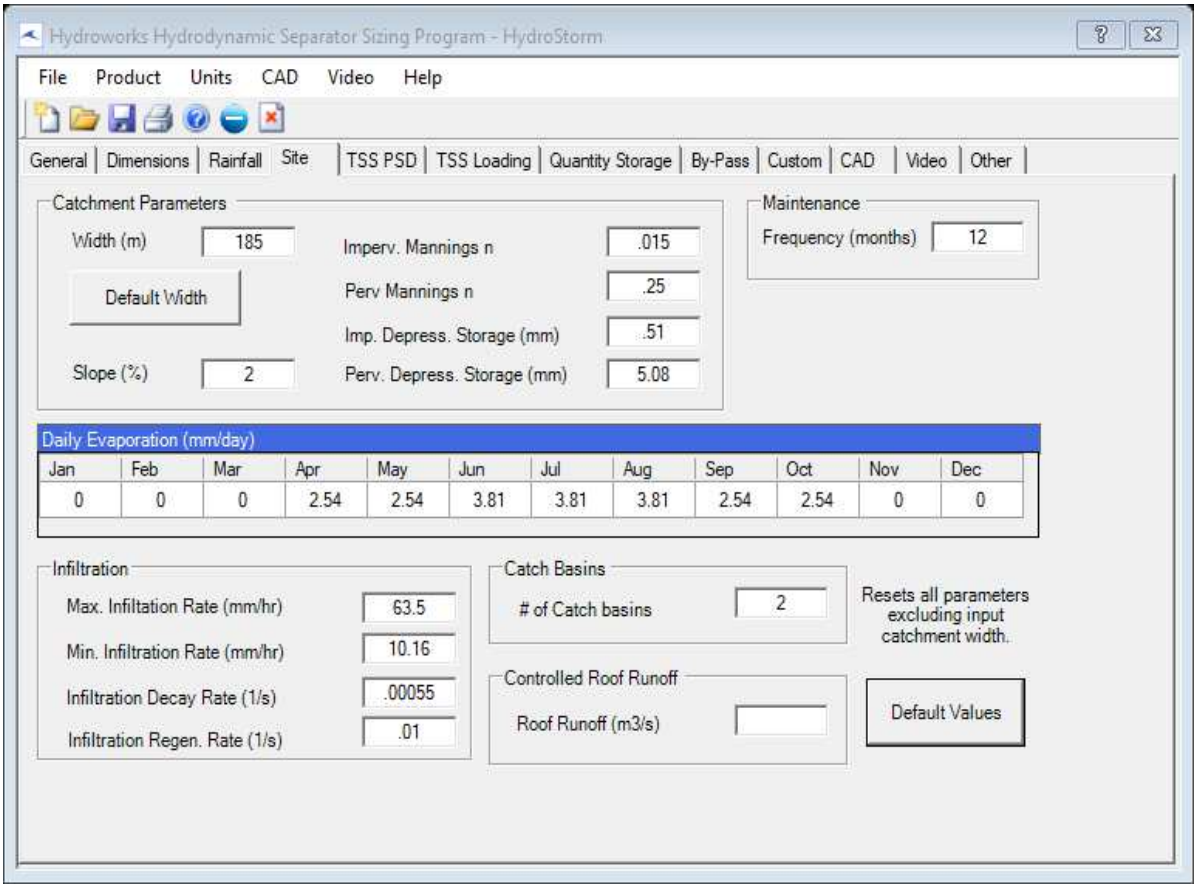
TSS Particle Size Distribution



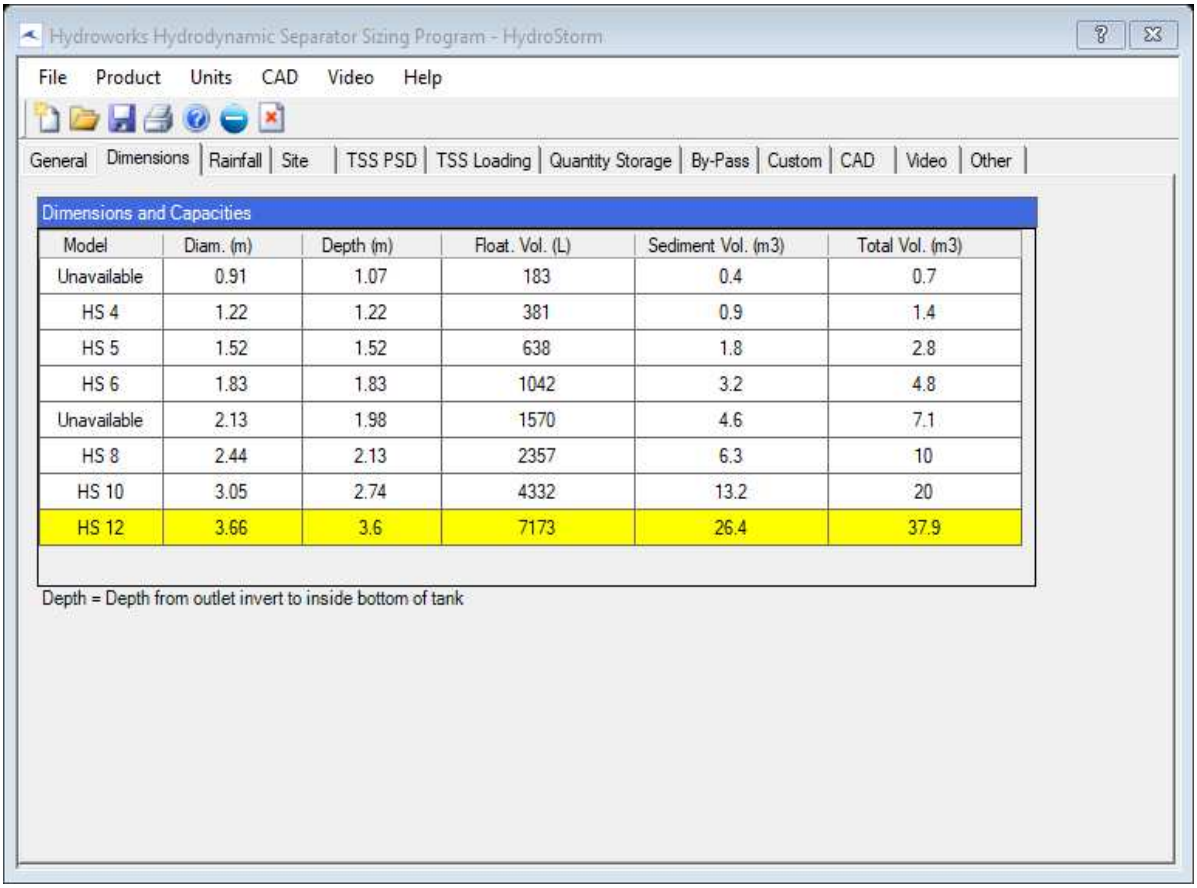
Rainfall Station - Ottawa CDA, Ontario(1960 To 2001)



Site Physical Characteristics



Dimensions And Capacities

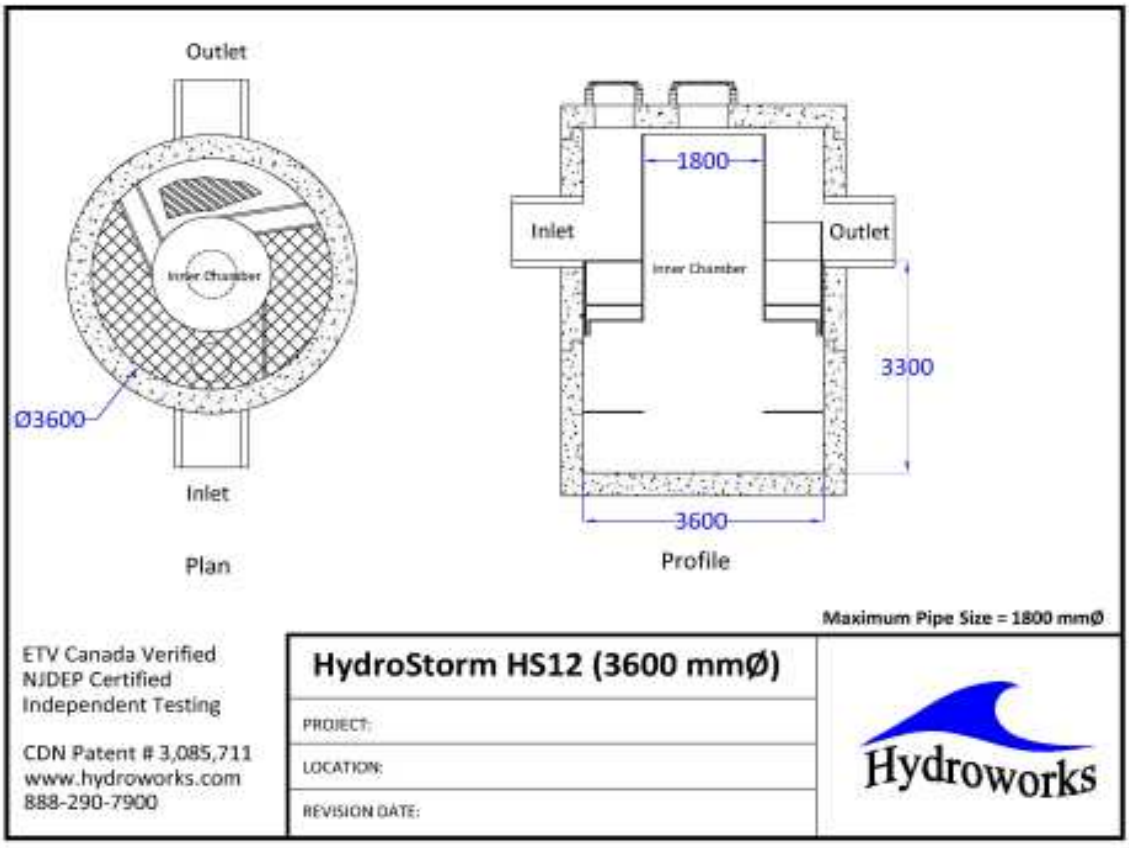


Dimensions and Capacities

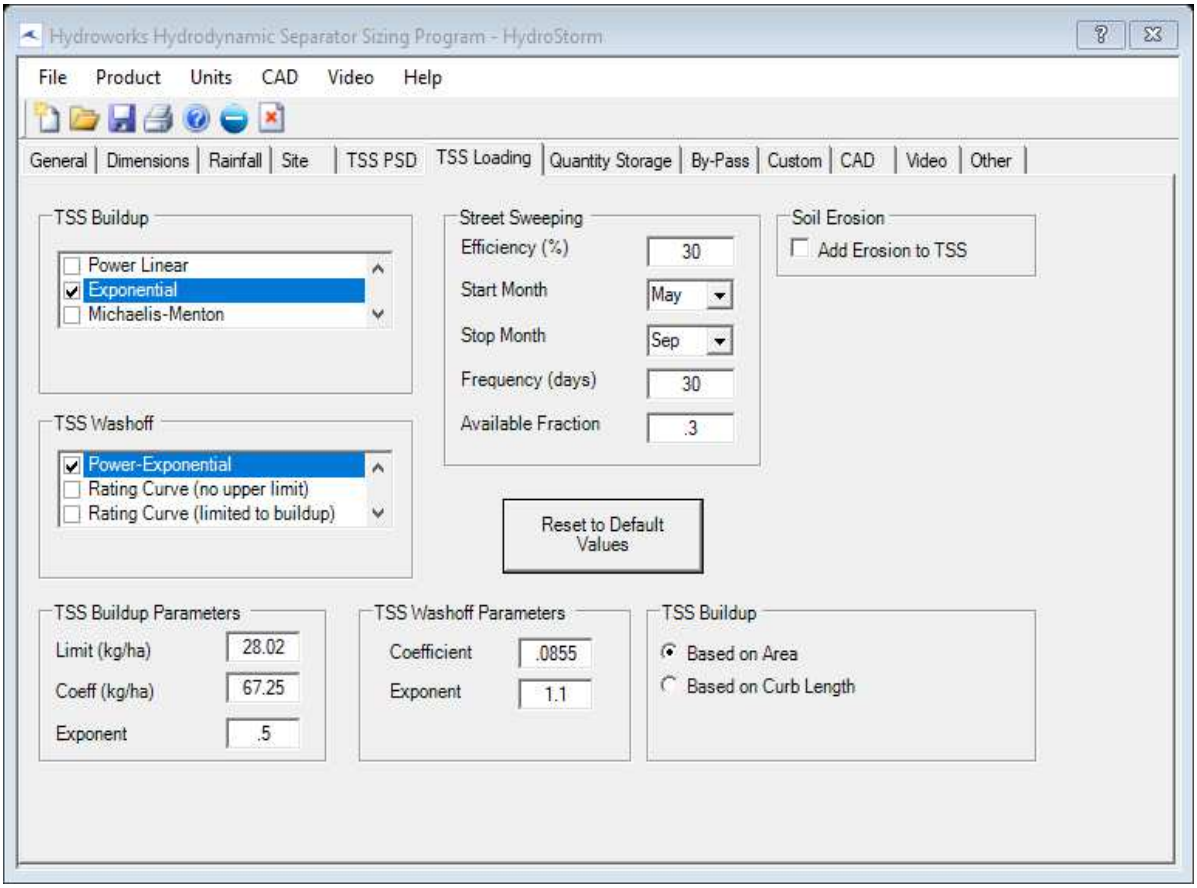
Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
Unavailable	0.91	1.07	183	0.4	0.7
HS 4	1.22	1.22	381	0.9	1.4
HS 5	1.52	1.52	638	1.8	2.8
HS 6	1.83	1.83	1042	3.2	4.8
Unavailable	2.13	1.98	1570	4.6	7.1
HS 8	2.44	2.13	2357	6.3	10
HS 10	3.05	2.74	4332	13.2	20
HS 12	3.66	3.6	7173	26.4	37.9

Depth = Depth from outlet invert to inside bottom of tank

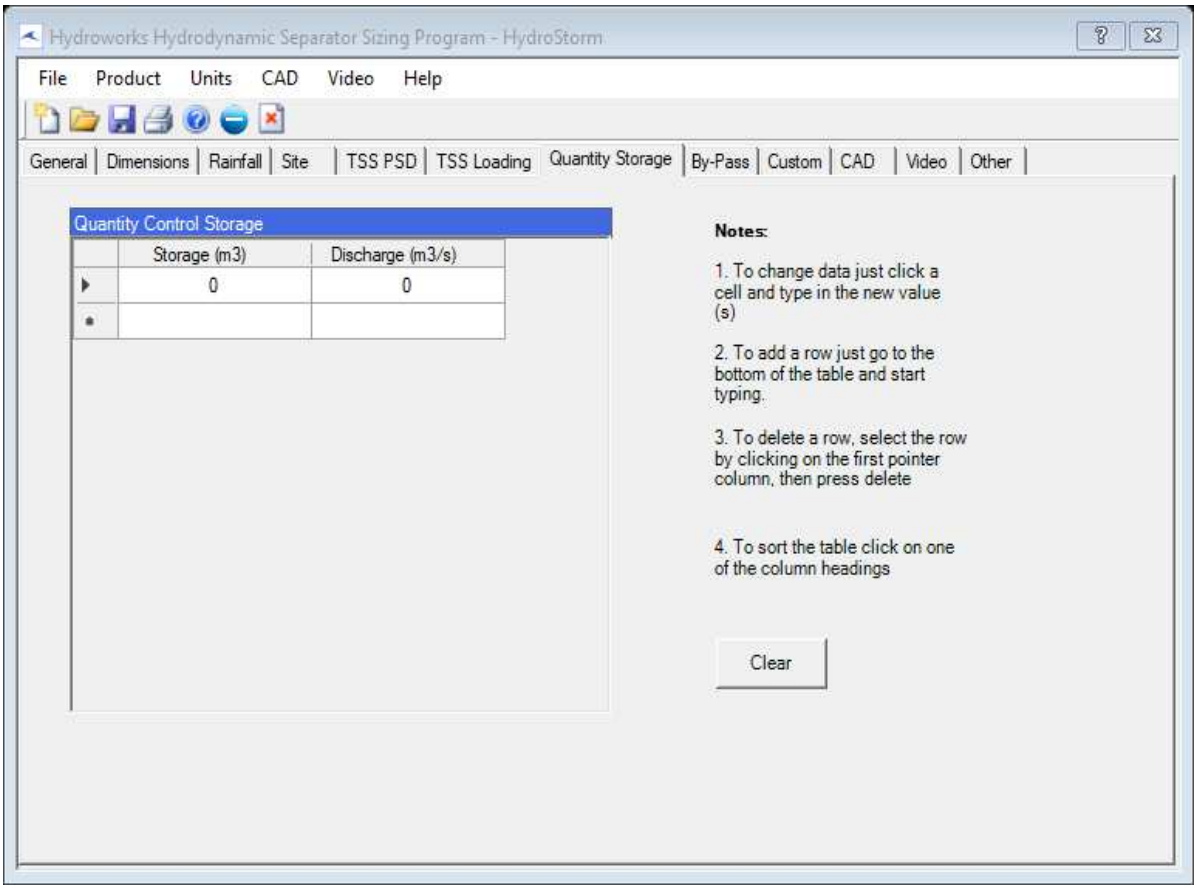
Generic HS 12 CAD Drawing



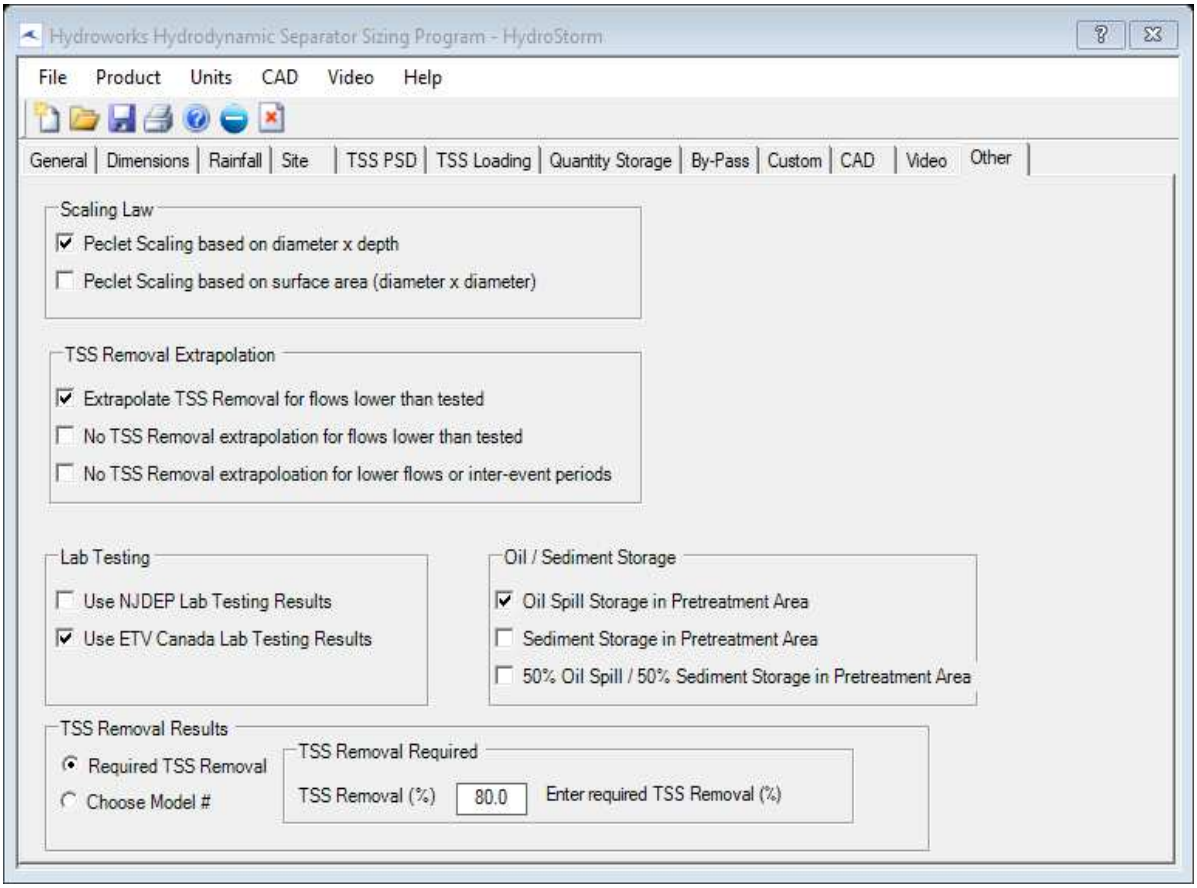
TSS Buildup And Washoff



Upstream Quantity Storage



Other Parameters



Flagged Issues

None

Hydroworks Sizing Program - Version 5.7

1-800-290-7900
www.hydroworks.com

Appendix

E Erosion and Sedimentation Control Plan

- **Erosion and Sediment Control Plan**

CLIENT

Riverside South

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ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION 1 FOR CITY REVIEW	2023-11-24
2	SUBMISSION 2 FOR CITY REVIEW	2024-02-21
3	ISSUED FOR TENDER	2024-02-23
4	SUBMISSION 3 FOR CITY REVIEW	2024-04-02

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

CONSULTANTS

1:1500 0 15 45 75m

SEAL

LICENSED PROFESSIONAL ENGINEER
M. EHON
13379508
2024/04/02
PROVINCE OF ONTARIO

PRIME CONSULTANT

ARCADIS

333 Preston Street - Suite 500
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PROJECT

RIVERSIDE SOUTH
3700 TWIN FALLS PLACE
PHASE 1

PROJECT NO:
136974

DRAWN BY: C.C.
CHECKED BY: L.E.
PROJECT MGR: L.E.
APPROVED BY: L.E.

SHEET TITLE

EROSION CONTROL PLAN

SHEET NUMBER
900

ISSUE
4

File Location: J:\136974_RSS_Employmt\7.0_Production\7.03_Design\04_Civil\Sheets\900 EROSION CONTROL PLAN.dwg Last Saved: April 4, 2024, by Chris.Cormier Plotted: Thursday, April 4, 2024 3:20:30 PM by Chris Cormier

D07-16-22-0014

SCALE CHECK 1 in 10mm

19072

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