SITE SERVICING AND STORMWATER MANAGEMENT REPORT - SOUTH NEPEAN TOWN CENTRE BLOCK 3

July 2, 2024

Prepared for:
Mattamy Homes

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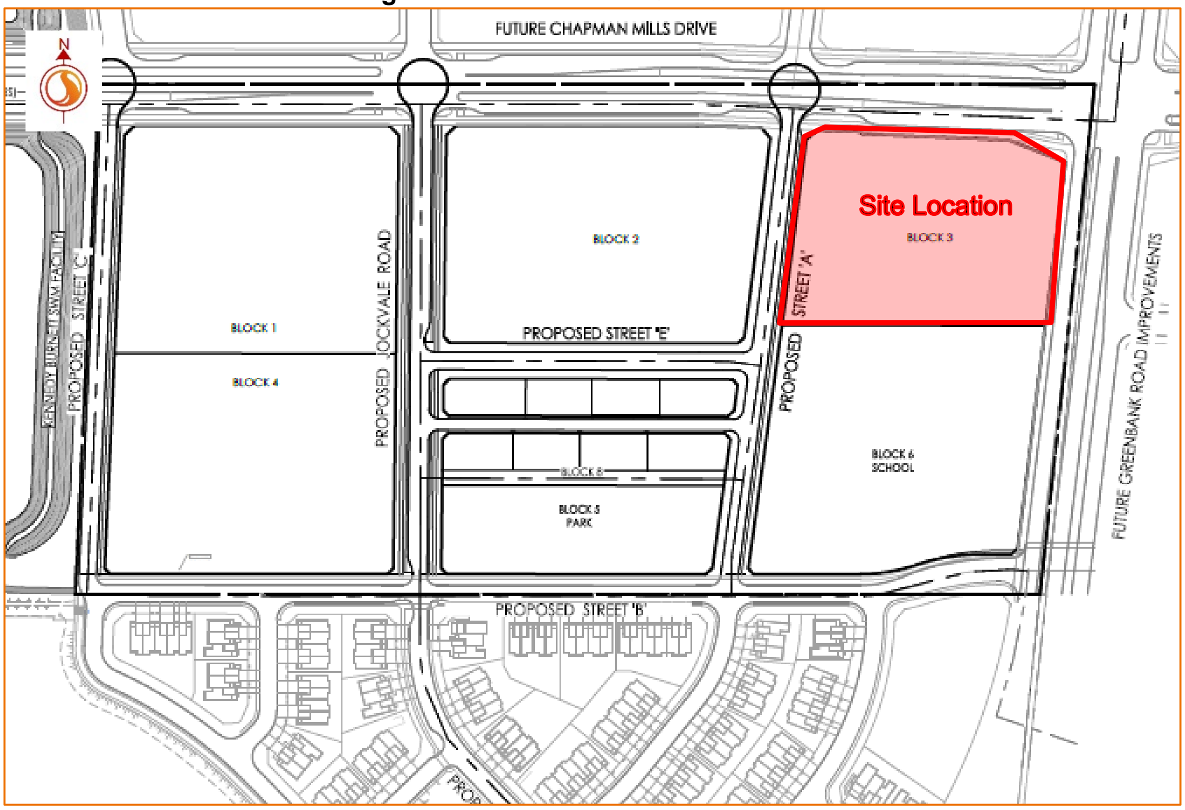
1 Introduction

Mattamy Homes Ltd. has commissioned Stantec Consulting Ltd. to prepare the following Site Servicing and Stormwater Management Report for the South Nepean Town Centre (SNTC) Block 3 site plan development. The subject property is located at the northeast quadrant of the SNTC subdivision, west of Greenbank Road in the Barrhaven neighbourhood within the City of Ottawa, as indicated in **Figure 1.1** below.

The block is currently zoned as Mixed-Use Centre MC [2668] and measures 1.24 ha in area. The site is bordered by Verulam Street to the west, Greenbank Road to the east, the future extension of Chapman Mills Drive to the north, and a future school block (SNTC Block 6) to the south.

The proposed development comprises of six (6) stacked townhome blocks and two (2) back-to-back townhome blocks, for a total of 92 townhome units and associated private streets. The objective of this report is to provide a servicing scenario for the site that is free of conflicts, provides on-site servicing in accordance with City of Ottawa design guidelines, and utilizes the existing local infrastructure in accordance with the various background studies as well as the South Nepean Town Centre Site Servicing and Stormwater Management Report as outlined in **Section 2**.

Figure 1.1: Location of SNTC Block 3



2 Background

The following documents were referenced in the preparation of this report:

- City of Ottawa Design Guidelines – Water Distribution, City of Ottawa, July 2010, including all subsequent technical bulletins
- City of Ottawa Sewer Design Guidelines (SDG), City of Ottawa, October 2012, including all subsequent technical bulletins
- Design Guidelines for Drinking Water Systems, Ministry of the Environment, Conservation and Parks (MECP), May 2019
- Water Supply for Public Fire Protection, Fire Underwriters Survey (FUS), 2020
- Fire Protection Water Supply Guideline for Part 3 in the Ontario Building Code, Office of the Fire Marshal (OFM), October 2020.
- South Nepean Town Centre (SNTC) Site Servicing and Stormwater Management Report, Stantec Consulting Ltd., November 2020
- Geotechnical Investigation – Block 3 – SNTC Lands 3288 Greenbank Road – Ottawa, Ontario, Paterson Group, August 28, 2023
- Chapman Mills Drive Extension (Longfields Drive to Strandherd Drive) and Bus Rapid Transit Corridor (Greenbank Road to Borrisokane Road) Environmental Assessment Study Environmental Study Report, IBI with Stantec, November 18, 2016
- Greenbank Road and South West Transitway Extension – Marketplace Avenue to Barnsdale Road, Preliminary Design Drawings, Stantec Consulting, February 2023.

3 Water Servicing

As part of the detailed subdivision design, a potable water hydraulic analysis was completed to demonstrate that the water distribution network for the subdivision would adequately meet the domestic and fire supply requirements for the future development blocks. Results are documented in the SNTC Development Site Servicing and SWM Report (Stantec, November 2020). Block 3 will be serviced by the public water distribution network constructed as part of the SNTC subdivision development.

3.1 Background

The SNTC development is currently within Pressure Zone 3SW (previously Pressure Zone BARR) of the City of Ottawa's water distribution system. This zone is fed by the Barrhaven Pump Station and Barrhaven Reservoir Pump Station, with the Moodie Drive Elevated Tank providing balancing storage for peak flows and demands. The development is located within the future SUC Pressure Zone following a zone reconfiguration, which will be completed by the City of Ottawa.

The Block 3 site will be serviced by two connections to the existing 200mm diameter public watermain located in Verulam Street.

3.2 Water Demands

3.2.1 DOMESTIC WATER DEMANDS

The City of Ottawa Water Distribution Guidelines (July 2010) Technical Bulletins were used to determine water demands based on projected population densities for residential areas and peaking factors. The population was estimated using an occupancy of 2.7 persons per townhome.

The potable water analysis estimated for Block 3 as part of the overall SNTC subdivision design assumed 310 apartment units with 1.8 persons/apartment unit, generating a total population of 558 persons. Excerpts from the subdivision report are included in **Appendix A**. The proposed site plan development will have 92 townhome units in Block 3, which results in a population of 248 persons, less than assumed as part of the subdivision design.

A daily rate of 280 L/cap/day has been used to estimate average daily (AVDY) potable water demand. Maximum day (MXDY) demands were determined by multiplying the AVDY demands by a factor of 2.5 for residential areas. Peak hourly (PKHR) demands were determined by multiplying the MXDY by a factor of 2.2 for residential areas. The estimated demands for the site are summarized in **Table 3.1** below and detailed in **Appendix A.2**.

Table 3.1: Estimated Water Demands

No. of Units	Population	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
92	248	0.8	2.0	4.4

3.2.2 FIRE FLOW DEMANDS

Wood frame construction was considered in the assessment for fire flow requirements according to the Fire Underwriter's Survey (FUS) Guidelines. The FUS Guidelines indicate that low hazard occupancies include dwellings, apartments, dormitories, hotels, and schools. As such, a limited combustible building contents credit was applied. Based on the FUS 2020 methodology in assuming the townhomes to be wood frame, limited combustible, and not sprinklered, the worst-case required fire flows at the site are 15,000 L/min (250 L/s) for Block 2.

On site fire protection will be provided by private hydrants and existing public hydrants located with a maximum of 90 m spacing and within 90 m of all building entrances. The internal private streets have been designed with a fire route providing access to all hydrants and residential units.

3.2.3 BOUNDARY CONDITIONS

Boundary conditions for both existing and zone reconfiguration conditions were provided for the entire SNTC development by the City of Ottawa as included in **Appendix A.1** and summarized in **Table 3.2**. These boundary conditions have been used to evaluate the level of service based on the estimated domestic design flows.

Boundary conditions for a fire flow requirement of 250 L/s have been interpolated from the boundary conditions provided and are summarized in **Table 3.2** below.

Table 3.2: Hydraulic Analysis Boundary Conditions (SNTC Subdivision)

Scenario	Pre-SUC		Post-SUC	
Connection	**Jockvale/Greenbank**	**Greenbank/Bending Way**	**Jockvale/Greenbank**	**Greenbank/Bending Way**
Min. HGL (m)	140.4	140.0	145.4	144.6
Max. HGL (m)	157.5	157.4	147.8	147.6
MXDY+FF (200 L/s)	147.6	144.3	145.1	135.6
MXDY+FF (250 L/s)	141.7	133.6	144.4	130.1
MXDY+FF (283 L/s) (m)	137.8	126.5	144.0	126.5

3.3 Proposed Watermain Servicing and Layout

The proposed watermain alignment and sizing for Block 3 has been designed to tie into the adjacent watermains within the SNTC subdivision development and to provide required domestic and fire flows.

Private watermains with a diameter of 200 mm are proposed within Block 3 and will be fed by the existing 200 mm diameter municipal watermain on Verulam Street. Two connections are proposed to provide the necessary fire flows to the development and looping. **Drawing SSP-1** details the proposed private watermain design and connections.

Block 7 and Block 8 are greater than 600 m^2 in area and will require fire walls in accordance with the Ontario Building Code (OBC). Fire wall locations are identified on **Drawing GP-1.**

3.4 Hydraulic Assessment

3.4.1 LEVEL OF SERVICE

The City of Ottawa Water Distribution Design Guidelines state that the desired range of system pressures under normal demand conditions (i.e. basic day, maximum day and peak hour) should be in the range of 350 to 552 kPa (50 to 80 psi) and no less than 275 kPa (40 psi) at the ground elevation in the streets (i.e. at hydrant level). The maximum pressure at any point in the distribution system in occupied areas outside of the public right-of-way is 552 kPa (80 psi).

As per the OBC & Guide for Plumbing, if pressures greater than 552 kPa (80 psi) are anticipated, pressure relief measures are required. The maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi). Under emergency fire flow conditions, the minimum pressure objective in the distribution system is 138 kPa (20 psi).

3.4.2 MODEL DEVELOPMENT

The proposed watermains within site were modeled in a H2OMAP hydraulic model to simulate the proposed water network. Hazen-Williams coefficients ("C-Factors") were applied to the new watermain in accordance with the City of Ottawa's Water Distribution Design Guidelines and as shown in **Table 3.3** below.

Table 3.3: Proposed Watermain C-Factors

Pipe Diameter (mm)	C-Factor
150	100
200 to 250	110
300 to 600	120
> 600	130

3.5 Hydraulic Model Results

The H2OMAP model for the proposed site consists of both existing and post-reconfiguration scenarios. The existing scenario assumes Block 3 development under existing Zone 3SW conditions, and the post reconfiguration assumes development under SUC Zone reconfiguration (3C). The overall results can be found in **Appendix A.4**.

The results from the existing zone analysis show that the maximum pressure modeled for Block 3 is approximately 620 kPa (90.0 psi) and the minimum pressure during the peak hour scenario was approximately 436 kPa (63.3 psi) within the block, as shown in **Figure 3.1** and **Figure 3.2** respectively. The average day pressures are above the serviceable limit of 345 kPa to 552 kPa (50 psi to 80 psi) and therefore all proposed units will require pressure reducing valves.

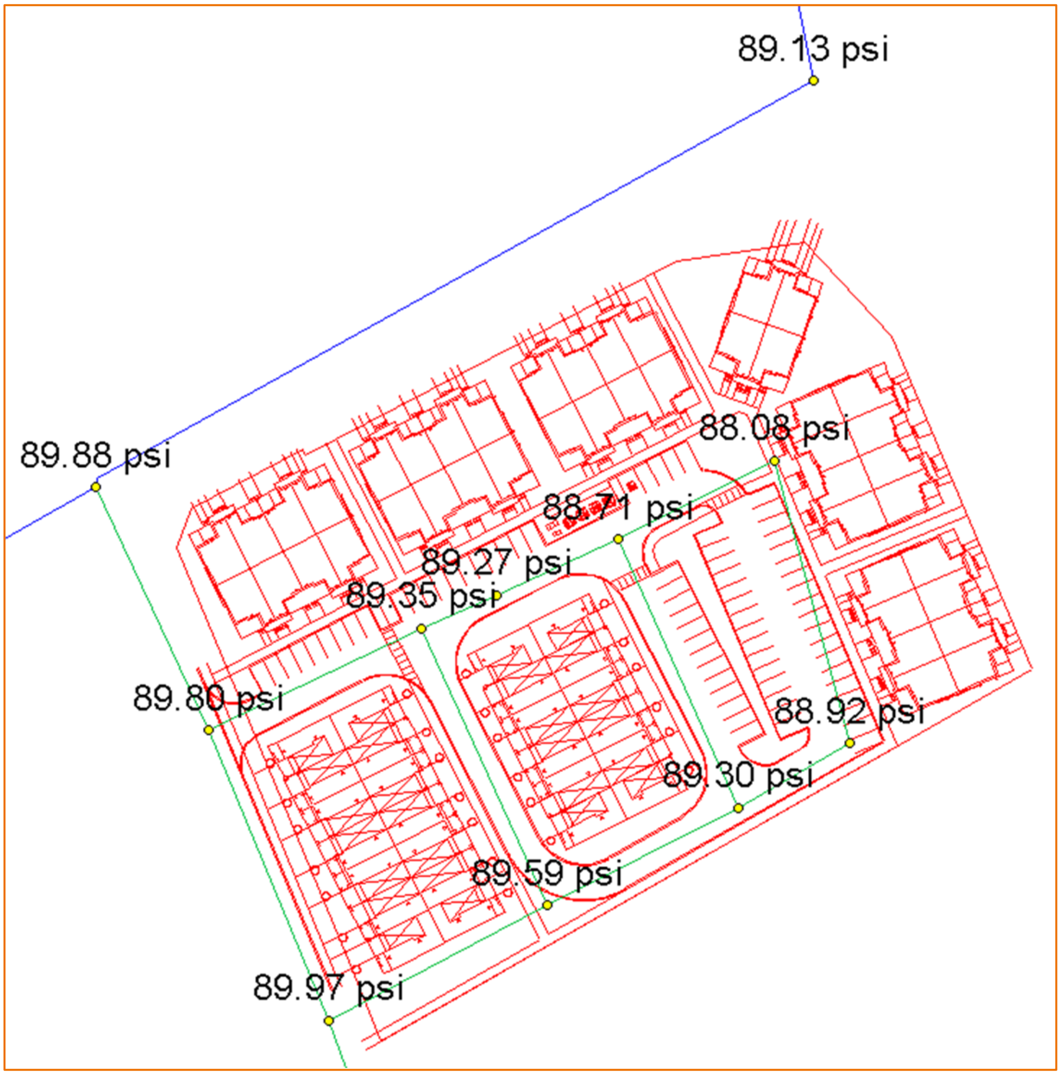


Figure 3.1: Existing Zone - AVDY Pressure Results

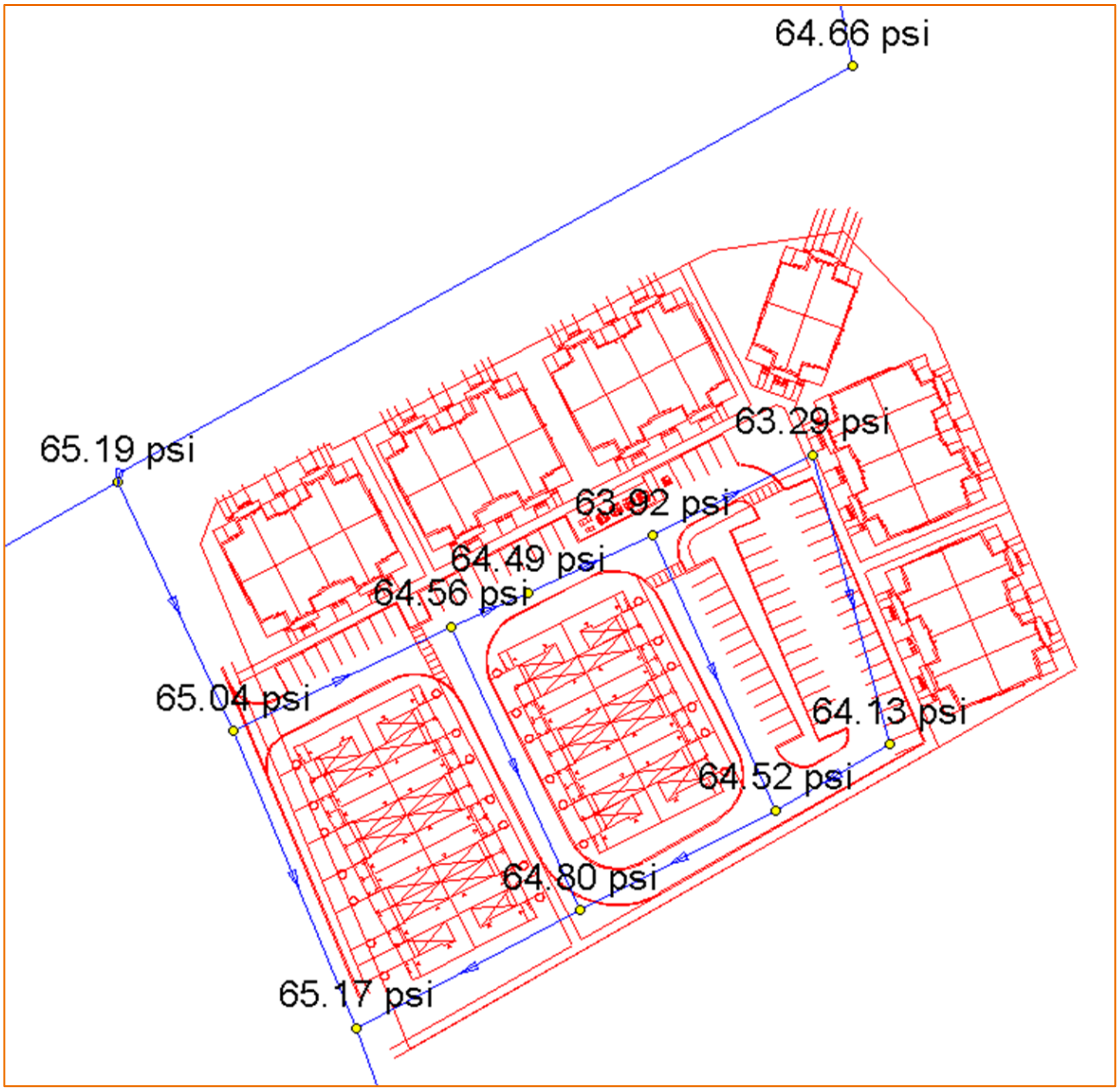


Figure 3.2: Existing Zone - PKHR Pressure Results

Post SUC zone reconfiguration, the maximum pressure modeled was approximately 525 kPa (76.1 psi) and the minimum pressure during peak hour was approximately 482 kPa (69.9 psi) within the proposed Block 3 development as shown in **Figure 3.3** and **Figure 3.4** respectively. These pressures are within the City of Ottawa allowable serviceable limits of 345 kPa to 552 kPa (50 psi to 80 psi). Should the pressure zone reconfiguration take place prior to construction, the dwellings will not require pressure reducing valves.

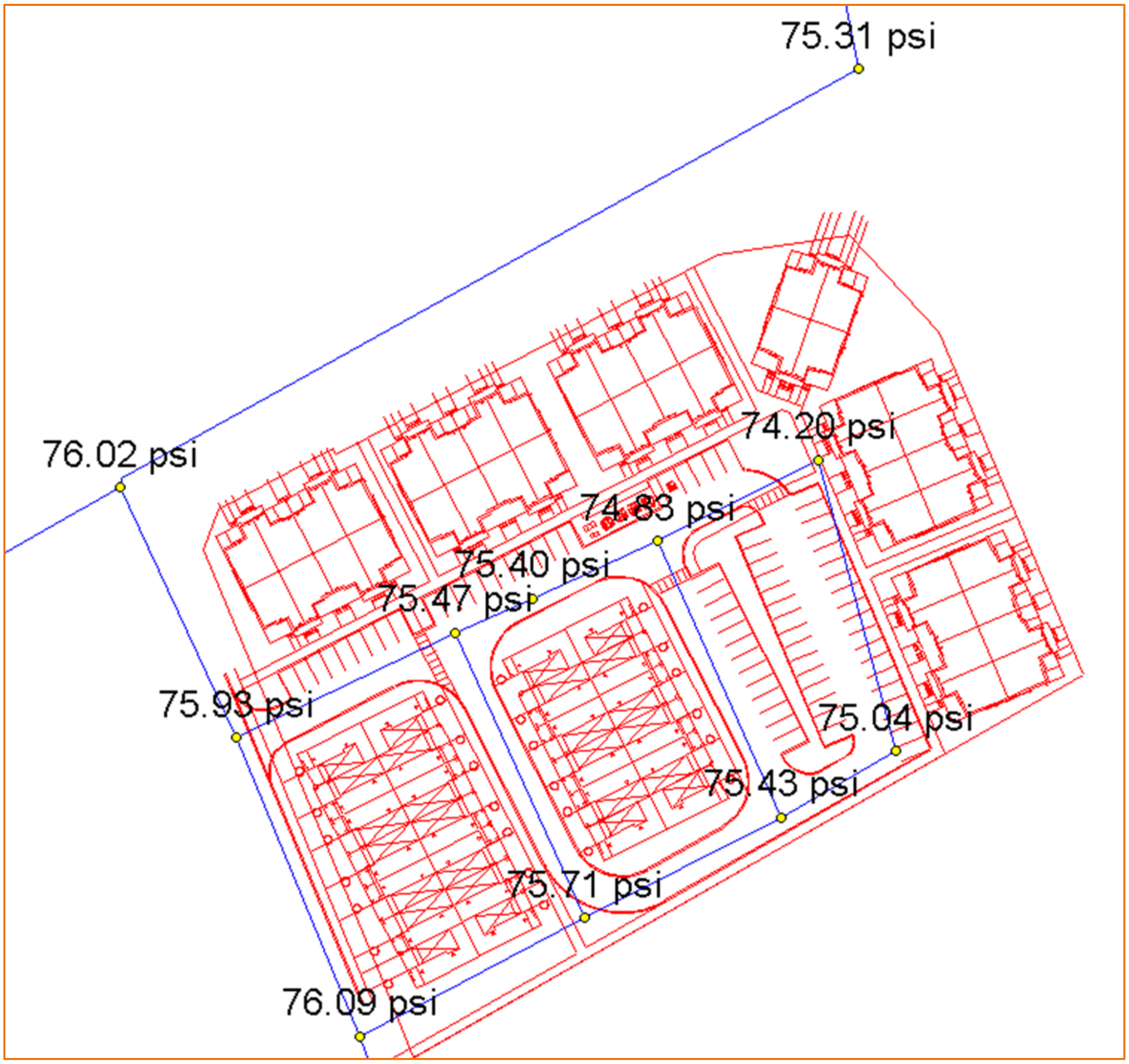


Figure 3.3: Post-SUC Zone Configuration - AVDY Pressure Results

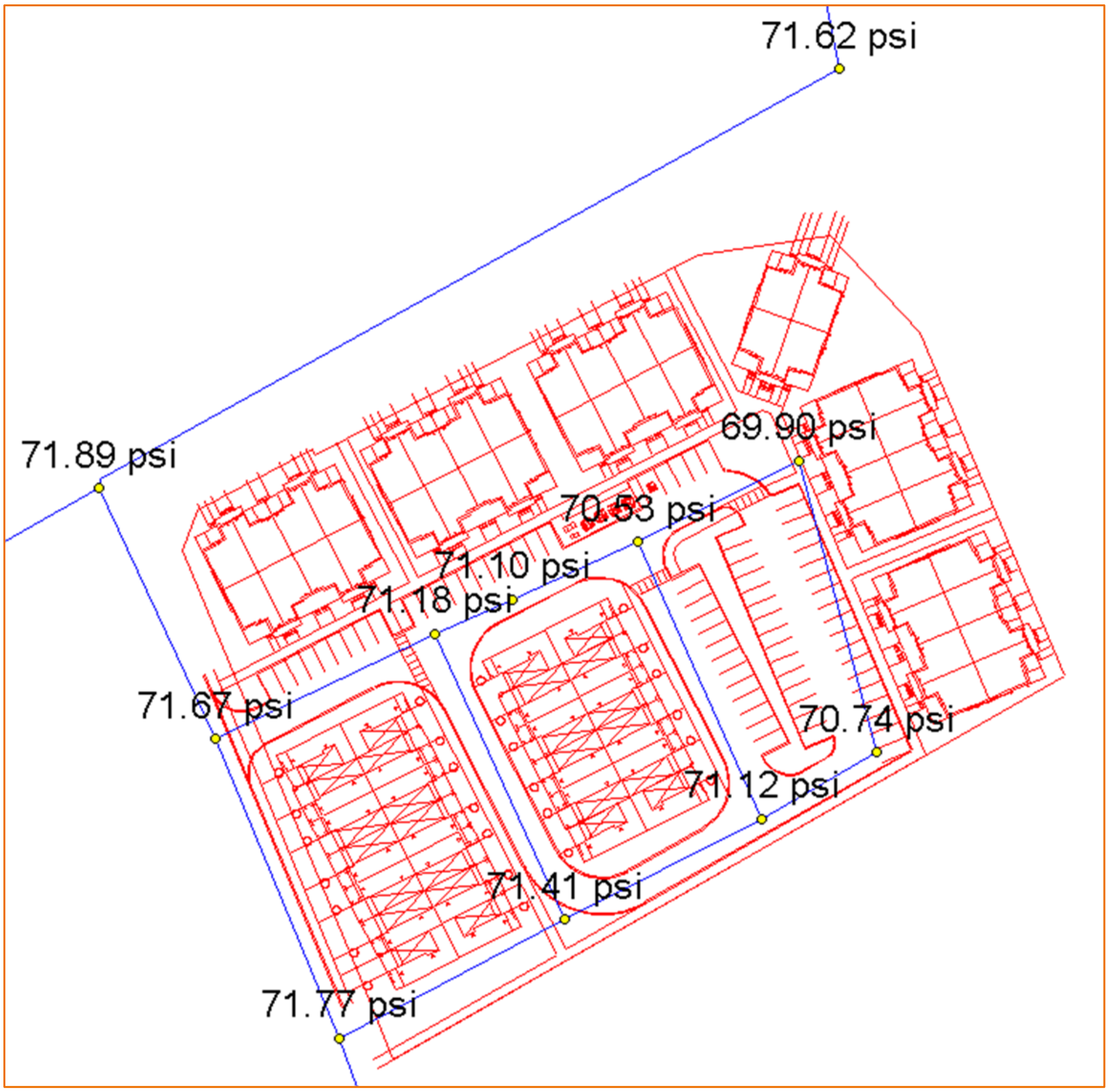


Figure 3.4: Post-SUC Zone Configuration - PKHR Pressure Results

The hydraulic model was used to assess the fire flow conditions of the proposed site. The model was carried out to determine the anticipated amount of flow that could be provided under maximum day demands and a fire flow requirement of 250 L/s as the worst-case scenario for fire flow.

Analysis of the remainder of the watermain network on site indicates that flows in excess of 309 L/s for the existing zone condition and 300 L/s for the post reconfiguration condition can be delivered while maintaining a residual pressure of 138 kPa (20 psi) as shown in **Figure 3.5** and **Figure 3.6**.

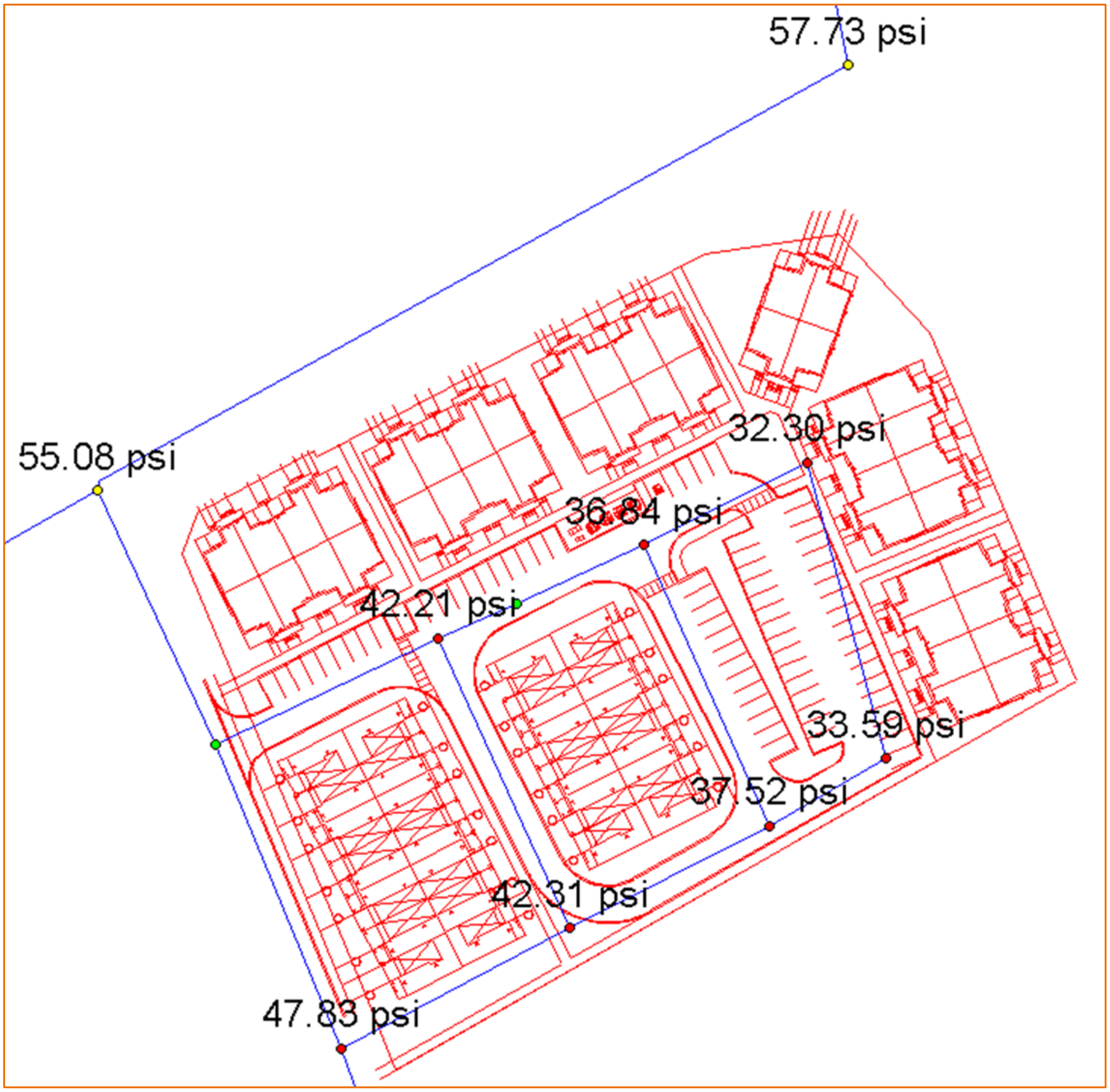


Figure 3.5: Existing Zone - MXDY+FF Residual Pressure Results

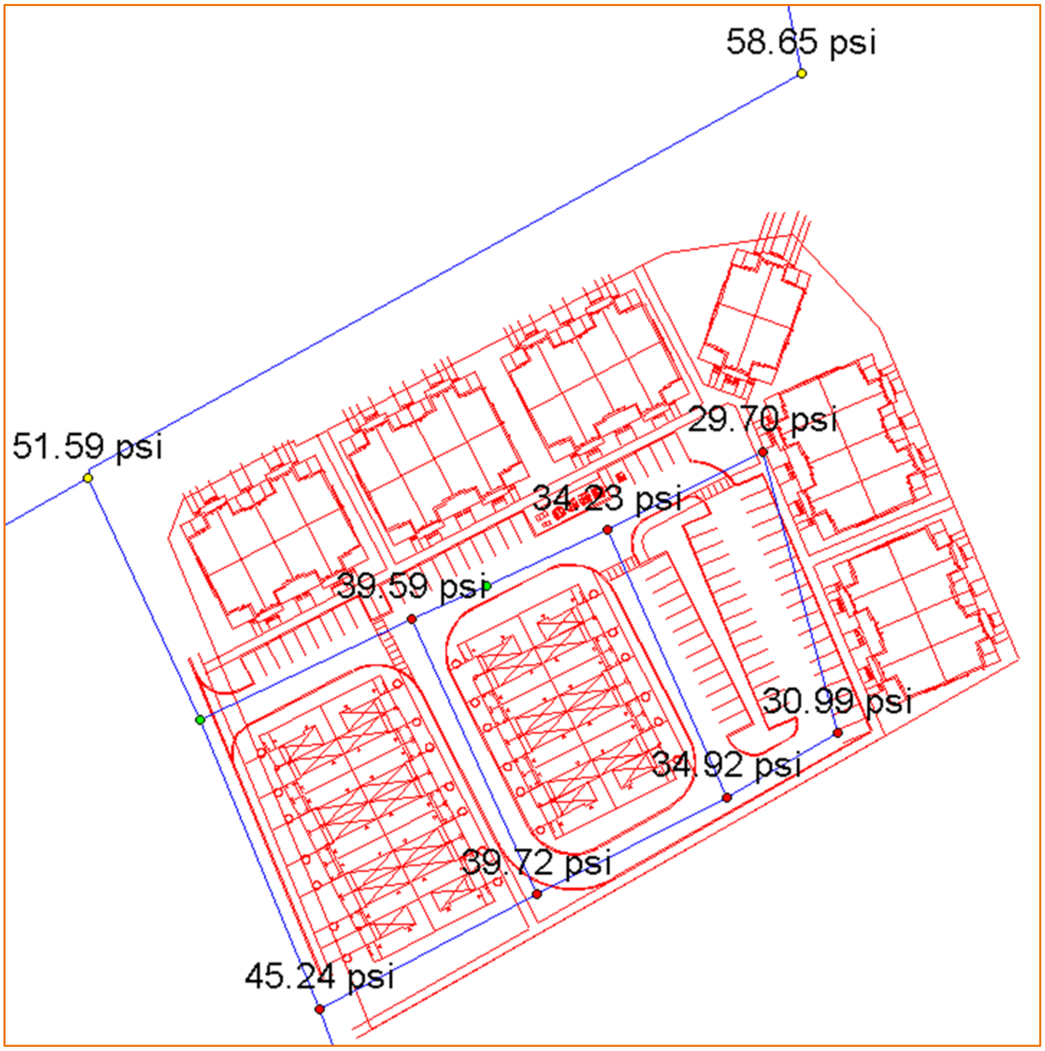


Figure 3.6: Post-SUC Zone Configuration - MXDY+FF Residual Pressure Results

3.6 Summary of Findings

Based on the findings of the report, pressure reducing valves will be required in all proposed units under existing 3SW zone conditions to meet maximum pressure guidelines as per City of Ottawa standards under typical demand conditions (peak hour and average day conditions). If construction of the development occurs post SUC Zone reconfiguration, pressure reducing values will not be required.

The results indicate that sufficient fire flows are available within the proposed watermain network under emergency fire demand conditions (maximum day + fire flow) for both existing and post zone reconfiguration scenarios, while meeting the minimum pressure requirements as per City of Ottawa standards.

4 Wastewater Servicing

4.1 Background

The proposed development within Block 3 of the SNTC subdivision will be serviced by the 200 mm diameter sanitary sewer on Verulam Street with a connection to the existing 200 mm stub. Servicing requirements for Block 3 were outlined in the SNTC Site Servicing and Stormwater Management Report (Stantec, November 2020), which included an estimated sanitary peak flow allocation for Block 3 of 6.5 L/s, assuming high density residential land use with 250 units/ha and 1.8 persons/unit for a total of 558 persons (Site Area = 1.24 ha).

The proposed Block 3 site consist of eight townhome blocks with a total of 92 townhome units. The design population for Block 3 is 248 persons.

4.2 Design Criteria

As outlined in the City of Ottawa Sewer Design Guidelines and the MECP Design Guidelines for Sewage Works, the following criteria are used to calculate the estimated wastewater flow rates and to determine the size and location of the sanitary service laterals:

- Minimum velocity = 0.6 m/s (0.8 m/s for upstream sections)
- Maximum velocity = 3.0 m/s
- Manning roughness coefficient for all smooth wall pipes = 0.013
- Minimum size of sanitary sewer service = 135 mm
- Minimum grade of sanitary sewer service = 1.0 % (2.0 % preferred)
- Average wastewater generation = 280 L/person/day (per City Design Guidelines)
- Peak Factor = based on Harmon Equation; maximum of 4.0 (residential)
- Harmon correction factor = 0.8
- Infiltration allowance = 0.33 L/s/ha (per City Design Guidelines)
- Minimum cover for sewer service connections = 2.0 m
- Population density for townhome units = 2.7 persons/unit

4.3 Proposed Servicing

Block 3 will be serviced by a network of 200 mm diameter gravity sanitary sewers, which will direct wastewater peak flows (approximately 3.3 L/s with allowance for infiltration) to the existing 200 mm diameter PVC sanitary sewer in Verulam Street. The receiving sewers within Verulam Street and downstream have been sized to accommodate wastewater from Block 3. Design flows are less than those assumed as part of the subdivision design. The sanitary sewer design sheet for the proposed sanitary sewers within the Block 3 site plan development and the sanitary design sheet and sanitary drainage area plan for the SNTC subdivision are included in **Appendix B**.

Full port backwater valves are to be installed on all sanitary services within the site to prevent any surcharge from the downstream sewer mains from impacting the proposed site.

5 Stormwater Management

The following section describes the stormwater management (SWM) design for Block 3 in accordance with the background documents and governing criteria for the SNTC subdivision established in the SNTC Site Servicing and Stormwater Management Report (Stantec, November 2020).

5.1 Proposed Conditions

The proposed 1.24 ha development is located within the northeast corner of the SNTC subdivision and comprises a total of 92 townhome units. The storm sewer collection system for Block 3 will discharge to the existing 525 mm diameter storm sewer stub and into the 750 mm diameter storm sewer on Verulam Street (see **Drawing SD-1**).

Stormwater collected from the SNTC subdivision is ultimately discharged to the Kennedy Burnett SWM Facility outlet channel. Quality control of stormwater runoff for the SNTC subdivision development is being provided by a hydrodynamic separator / Oil-Grit Separator (HDS) designed as part of Claridge's Development to the south to provide 'Enhanced' level of treatment (80 % TSS Removal) prior to discharging into the outlet channel for the Kennedy-Burnett SWM Facility.

As part of the SNTC subdivision development, offsite flows from lands north of the development were temporarily stored on the Block 3 parcel. The offsite lands fall within the drainage area for the Kennedy Burnett Pond cells north of Chapman Mills Drive. This temporary storage on Block 3 was required until the Kennedy Burnett Pond improvements were completed. The Kennedy Burnett Pond expansion has been completed and the offsite flows are being diverted to their ultimate outlet. These works are taking place as part of a separate process in coordination with City Operations. The ultimate and interim storm drainage plans for the SNTC subdivision and the approved design of the diversion channel are included in **Appendix C**.

5.2 Criteria and Constraints

The overall approach for storm servicing and stormwater management for the proposed development is outlined in the SNTC Servicing and SWM Report by Stantec (November 2020), excerpts can be found in **Appendix C.3**. The following summarizes the SWM criteria and constraints that will govern the detailed design of the proposed site as per the latest revision of the City of Ottawa Sewer Design Guidelines as well as the conclusions made in the SNTC Site Servicing and SWM Report.

- Design using the dual drainage principle. (City of Ottawa SDG)
- Minor system capture rate from Block 3 up to the 100-year storm with 5-year boundary conditions is to be restricted to **219.5 L/s**. (SNTC Site Servicing and SWM Report)
- Where there is footing drainage connected to the storm collection system, separation of at least 0.3 m between the 5-year storm with 100-year boundary conditions hydraulic grade line (HGL) and building under side of footing (USF) must be provided. (City)

- Where there is footing drainage connected to the storm collection system, maximum 'climate change' HGL to be lower than proposed basement elevations. (City)
- Total maximum depth of flow under static and dynamic conditions shall be less than 0.35 m. (City)
- Design storm sewers along local roadways to convey the 2-year peak flow respectively under free-flow conditions using 2004 City of Ottawa I-D-F parameters and an inlet time of 10 minutes. (City)
- Assess impact of 2-year storm, and the worst case 100-year storm events, on the major & minor drainage system. (City)
- Building openings to be above the 100-year water level. (City)
- There must be at least 30 cm of vertical clearance between the spill elevation on the private street and the lowest building opening that is in the proximity of the flow route or ponding area. (City)
- Minimum roadway profile grades at 0.5 %. (City)
- Minimum roadway slope of 0.1 % from crest-to-crest for overland flow route. (City)
- Provide adequate emergency overflow conveyance off-site. (City)
- Site is currently occupied by an interim capture area for off-site drainage which will be decommissioned. (SNTC SWM Report)

5.3 Design Methodology

The design methodology for the SWM component of the development is as follows:

- Create a PCSWMM model that generates major and minor system hydrographs and assesses the minor system hydraulic grade line and the major system flow depths.
- Size inlet control devices for the proposed catch basins to avoid surface ponding during the 2-year storm while meeting the required 0.3 m 100-year HGL to USF clearance and the 219 L/s minor system allowable release rate in the 100-year storm.
- Ensure that total dynamic and static surface ponding depths do not exceed 0.35 m during the 100-year storm scenario.
- Confirm that climate change storm simulation does not result in flooding of properties.

The site is designed using the "dual drainage" principle, whereby the minor (pipe) system is designed to convey the peak rate of runoff from the 2-year design storm and runoff from larger events is conveyed by both minor (pipe) and major (overland) channels, such as roadways and walkways, safely to the appropriate outlet without impacting proposed or existing downstream properties.

In keeping with the minor system target peak outflow, Inlet Control Devices (ICDs) or orifice plates have been specified for all catch basins to limit the inflow to the minor system, which outlets to the 750 mm diameter storm sewer on Verulam Street. Restricted inlet rates to the sewer are necessary to meet the target peak outflows.

Drawing SD-1 outlines the proposed storm sewer alignment, ICD locations, drainage divides, and labels. The storm sewer design sheet is included in **Appendix C.1**.

5.4 Modeling Rationale

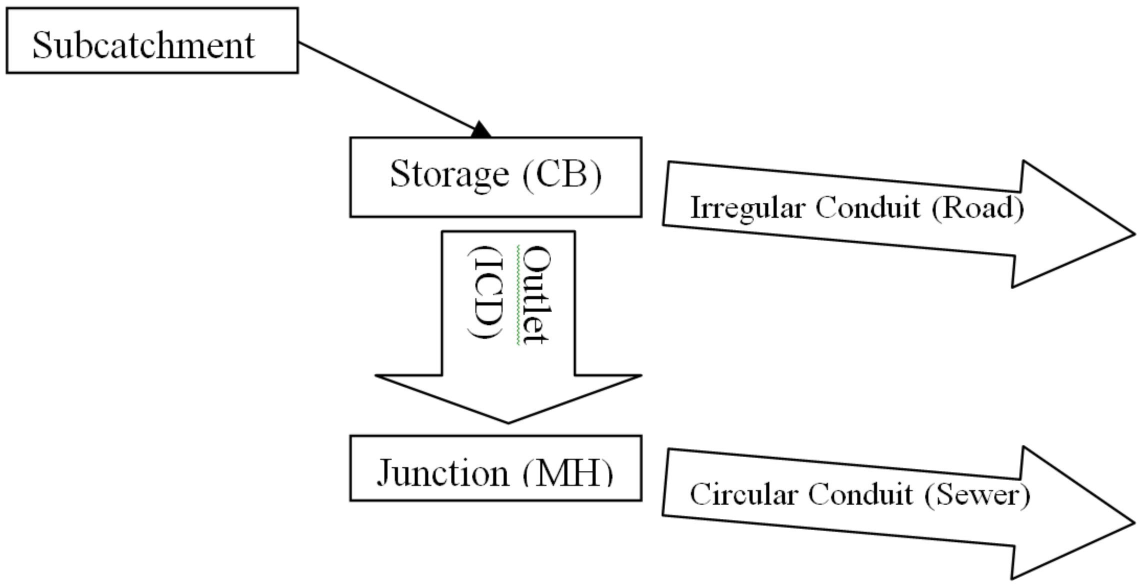
A comprehensive hydrologic modeling exercise was completed with PCSWMM, accounting for the estimated major and minor systems to evaluate the storm sewer infrastructure and major system segments. The use of PCSWMM for modeling of the site hydrology and hydraulics allowed for an analysis of the systems' response during various storm events. The following assumptions were applied to the detailed model:

- Hydrologic parameters as per Ottawa Sewer Design Guidelines, including Horton infiltration, Manning's 'n', and depression storage values.
- 3-hour Chicago Storm distribution for the 2-year, 5-year and 100-year analysis.
- To 'stress test' the system a 'climate change' scenario was created by adding 20% of the individual intensity values of the 100-year storm at their specified time step.
- Percent imperviousness calculated based on actual soft and hard surfaces for the proposed catchments and converted to equivalent Runoff Coefficient using the relationship C = (Imp. X 0.7) + 0.2.
- Subcatchment areas are defined from high-point to high-point where sags occur.
- Width parameter was taken as twice the length of the street/swale segment for two-sided catchments and as the length of the street/swale segment for one-sided catchments. Irregular shaped catchments were calculated by measuring the flow length on the drawing and the width parameter was calculated respectively, or alternatively set at 225 x subcatchment area per recommendations of the OSDG.
- Catch basin inflow restricted with inlet-control devices (ICDs) as necessary to maintain the minor system target peak outflow.
- Surface storage in road sags calculated based on grading plans (**Drawing SD-1**).

5.4.1 SWMM DUAL DRAINAGE METHODOLOGY

The proposed development is modeled in one modeling program as a dual conduit system (see **Figure 5.1**), with: 1) circular conduits representing the sewers & storage nodes representing manholes; 2) irregular conduits using street-shaped cross-sections to represent the approximate overland road network and storage nodes representing catchbasins. The dual drainage systems are connected via outlet/orifice link objects from storage node (i.e. CB) to storage node (i.e. MH) and represent inlet control devices (ICDs). Subcatchments are linked to the storage node on the surface so that generated hydrographs are directed there firstly.

Figure 5.1: Schematic Representing Model Object Roles



Storage nodes are used in the model to represent catch basins as well as major system junctions. For storage nodes representing catch basins (CBs), the invert of the storage node represents the invert of the CB and the rim of the storage node represents the top of the CB plus an allowable flow depth on the segment. For the purpose of this SWM plan, CB inverts have been set 1.38 m below the top of the CB. An additional depth of 0.40 m has been added to rim elevations to allow routing from one surface storage to the next.

Storage nodes that represent catch basins at sags, are connected by weirs that discharge at the spill elevation for each subcatchment area. The widths of each weir were calculated based on the respective elevation across the length of the spill location.

The storage value assigned to the storage node represents the available ponding volume above the catch basin. The maximum ponding volumes are calculated using the cone equation in the drawing and equivalent surface areas are inputted into the storage curves within PCSWMM using the trapezoidal equation. If the available storage volume in a storage node is exceeded, flows spill to the downstream storage node and continue routing through the system until ultimately flows either re-enter the minor system or reach the outfall of the major system.

Inlet control devices, as represented by orifice links, have been used to represent the proposed vertical circular orifices sized to restrict minor system capture rates to the 2-year for local streets.

5.4.2 DESIGN STORMS

The 3-hour Chicago distribution was selected to estimate the 2-year capture rates for the proposed subcatchments, and to assess the 100-year HGL across the proposed development.

To 'stress test' the system a 'climate change' scenario was created by adding 20% of the individual intensity values of the 100-year storm at their specified time step.

5.4.3 BOUNDARY CONDITIONS

The detailed PCSWMM hydrology and the proposed storm sewers were used to assess the peak inflows and hydraulic grade line (HGL) in the proposed site. Dynamic boundary conditions in the form of backwater elevations were obtained from Stantec's SNTC subdivision PCSWMM model (November 2020) from the outlet for Block 3 (Node 202).

5.4.4 MODELING PARAMETERS

Table 5.1 presents the general subcatchment parameters used:

Table 5.1: General Subcatchment Parameters

Subcatchment Parameter	Value
Infiltration Method	Horton
Max. Infil. Rate (mm/hr)	76.2
Min. Infil. Rate (mm/hr)	13.2
Decay Constant (1/hr)	4.14
N Imperv	0.013
N Perv	0.25
Dstore Imperv (mm)	1.57
Dstore Perv (mm)	4.67

Table 5.2 presents the individual parameters that vary for each of the subcatchments tributary to the storm outlet.

Table 5.2: Subcatchment Parameters

Area ID	Area (ha)	Width (m)	Slope (%)	% Impervious	Runoff Coefficient
C103A	0.22	50	3.0	87.1	0.81
C105A	0.22	50	3.0	78.6	0.75
C105B	0.31	70	3.0	77.1	0.74
C108A	0.13	29	3.0	84.3	0.79
UNC-1	0.13	94	3.0	65.7	0.66
UNC-2	0.13	123	3.0	77.1	0.74
UNC-3	0.10	86	3.0	74.3	0.72

Table 5.3 summarizes the storage node parameters used in the model. All catch basins have been modeled as having an outlet invert as depicted on **Drawings SSP-1**. Static ponding depths, areas, and volumes within the proposed development area are as per **Drawings SD-1**.

Table 5.3: Storage Node Parameters

Storage Node	Invert Elevation (m)	Rim Elevation (m)	Total Depth (m)
C103A-S	92.73	94.51	1.78
C105A-S	93.15	94.93	1.78
C105B-S	92.74	94.52	1.78
C108A-S	92.77	94.55	1.78

*The rim of the storage node represents the maximum allowable flow depth elevation above the storage node (equal to the top of the catch basin plus an additional 0.40 m).

5.4.5 HYDRAULIC PARAMETERS

As per the City of Ottawa Sewer Design Guidelines, 2012, Manning's roughness values of 0.013 were used for sewer modeling and overland flow corridors representing roadways.

Storm sewers were modeled to confirm flow capacities, assess hydraulic grade lines (HGLs) and to determine minor system peak outflows to the outlet. The detailed storm sewer design sheet is included in **Appendix C.1**. Exit losses at manholes were set for all pipe segments based on the flow angle through the structure. Exit losses were assigned as per City guidelines (Appendix 6b), see **Table 5.4** below.

Table 5.4: Exit Loss Coefficients for Bends at Manholes

Degrees	Coefficient
11	0.060
22	0.140
30	0.210
45	0.390
60	0.640
90	1.320
180	0.020

The table below presents the parameters for the orifice link objects within the proposed residential blocks which represent ICDs. It should be noted that the proposed ICDs will consist of slide type vertical circular orifices. A coefficient of 0.572 was applied when using orifices to conform to head/discharge curves as supplied by the manufacturer for IPEX Tempest HF model ICDs.

Table 5.5: Orifice Parameters for Proposed Catchments

Orifice Name	Catchbasin ID	Tributary Area ID	Minor System Node	ICD Type
C103A-IC	CB103A	C103A	STM-103	127 mm Orifice
C105A-IC	CB105A	C105A	STM-105	121 mm Orifice
C105B-IC	CB105B	C105B	STM-105	152 mm Orifice
C108A-IC	CB108A	C108A	STM-108	121 mm Orifice

5.5 Modeling Results and Discussion

The following sections summarize the key hydrologic and hydraulic model results. For detailed model results or inputs please refer to the electronic model files.

5.5.1 PROPOSED INLET CONTROL DEVICES

Table 5.6 summarizes the orifice link maximum flow rates and heads across the proposed development.

Table 5.6: Proposed Phase Orifice Link Results

Orifice Name	Catchbasin ID	Tributary Area ID	ICD Type	2yr Head (m)	100yr Head (m)	2yr Flow (L/s)	100yr Flow (L/s)
C103A-IC	CB103A	C103A	127 mm Orifice	1.41	1.58	37.3	39.6
C105A-IC	CB105A	C105A	121 mm Orifice	1.41	1.61	33.9	36.3
C105B-IC	CB105B	C105B	152 mm Orifice	1.31	1.62	51.1	57.1
C108A-IC	CB108A	C108A	121 mm Orifice	0.71	1.58	23.5	36.0

5.5.2 PROPOSED DEVELOPMENT HYDRAULIC GRADE LINE ANALYSIS

The 100-year hydraulic grade line (HGL) elevation across the proposed development was estimated using the PCSWMM model for the worst-case HGL using the 3-hour Chicago storm for the 100-year runoff with the 100-year water level in MH 202 as a boundary condition. The boundary conditions used are based on the SNTC subdivision model.

The climate change scenario was assessed using the 100-year runoff intensities (worst-case HGL) increased by 20% with the 100-year water level in MH 202 as a boundary condition. The HGL values for manhole 202 were obtained from Stantec's SNTC PCSWMM model (November 2020), excerpts of the stormwater management section can be found in **Appendix C.5**. **Table 5.7** below presents the clearance between the proposed storm sewers worst case HGL and the nearest proposed under side of footing (USF). The storm sewer design sheet is included in **Appendix C.1**.

Table 5.7: Worst-Case 100-Year HGL Results

STM MH	USF (m)	100-Year, 3hr Chicago Storm		100-year+20%, 3hr Chicago Storm	
		HGL (m)	Clearance (m)	HGL (m)	Clearance (m)
101	92.88	91.78	1.10	91.79	1.09
102	92.94	91.84	1.10	91.85	1.09
103	92.94	92.01	0.93	92.01	0.93
104	93.37	92.08	1.29	92.08	1.29
105	93.56	92.31	1.25	92.31	1.25
106	93.91	92.31	1.60	92.31	1.60
107	92.82	92.05	0.77	92.05	0.77
108	92.82	92.23	0.59	92.23	0.59
EX 202	92.53	91.62	0.91	91.65	0.88

The model results indicate that there is sufficient clearance between the worst-case HGL and the proposed USFs within Block 3. Detailed grading of the site has been completed to ensure that the maximum hydraulic grade line is kept at least 0.30 m below the underside-of-footing (USF) of the adjacent units connected to the storm sewer during the worst case 100-year storm event and below proposed basement elevations during the ‘climate change’ event.

5.5.3 OVERLAND FLOW

Table 5.8 presents the maximum total surface water depths (static ponding depth + dynamic flow) above the top-of-grate of the proposed catch basins for the 100-year, 3-hr Chicago storm and the ‘climate change’ storm. Based on the model results, the total ponding depth (static + dynamic) does not exceed the required 0.35 m maximum during the 100-year event. Tables summarizing the total surface water depths over the proposed catch basins are included in **Appendix C.2** which show that no significant ponding occurs over the proposed local streets during the 2-year storm event.

Table 5.8: Proposed Phase –Maximum Static and Dynamic Surface Water Depths

Storage node ID	Structure ID	Top of Grate Elevation (m)	2-year, 3-hour Chicago		100-year, 3-hour Chicago		100-year, 3-hour Chicago+20%	
			Max HGL (m)	Total Surface Water Depth (m)	Max HGL (m)	Total Surface Water Depth (m)	Max HGL (m)	Total Surface Water Depth (m)
C103A-S	CB103A	94.11	94.14	0.03	94.31	0.20	94.35	0.24
C105A-S	CB105A	94.53	94.56	0.03	94.76	0.23	94.81	0.28
C105B-S	CB105B	94.12	94.05	-	94.36	0.24	94.41	0.29
C108A-S	CB108A	94.15	93.48	-	94.35	0.20	94.38	0.23

As noted in the table, there is ponding in CB103A and CB105A during the 2-year 3-hour Chicago storm event. As the depths are only at 3 cm and lasting no more than 10 minutes, the 2-year ponding is considered negligible.

5.5.4 RESULTS

The following section summarizes the key hydrologic and hydraulic model results for the proposed site and demonstrates the proposed stormwater management plan meets target peak rates established in the SNTC subdivision servicing and stormwater management report. For detailed model results or inputs please refer to the example input file in **Appendix C.2** and the electronic model files.

Table 5.9: Target and Resultant Major and Minor System Release Rates

Storm event	Minor System Release Rate per Subdivision Design (L/s)	Uncontrolled 100 yr Flow to Subdivision* (UNC 1) (L/s)	Adjusted Target Minor System Release Rate (L/s)	Target Major System Release Rate per Subdivision Design (L/s)	Block 3 Minor System Release Rate (L/s)	Block 3 Major System Release Rate (L/s)
2-year, 3-hour Chicago	220	48	172	0	146	0
5-year, 3-hour Chicago					161	0
100-year, 3-hour Chicago					169	0
100-year, 3-hour Chicago+20%	N/A			N/A	172	44

* The subdivision design accounted for 12.3 L/s of uncontrolled flow (0.032 ha, C=0.62) from Block 3 to Verulam Street in the 100-year storm event. As noted in **Section 5.5.5** below, with the detailed design of Block 3, a total of 60.1 L/s of uncontrolled flow is directed towards Verulam Street in the 100-year 3-hour Chicago storm event. The difference of 47.8 L/s has been subtracted from the allowable minor system release rate for Block 3 resulting in a revised minor system target of 172 L/s.

The modeled minor system release rate of 169.2 L/s in the 100-year 3-hour Chicago storm event falls within the design target of 172 L/s and overall stormwater flow contributions to Verulam Street match the allowable release rate of 220 L/s.

5.5.5 UNCONTROLLED FLOW TO ADJACENT RIGHTS-OF-WAY

The SNTC Site Servicing and Stormwater Management report for the overall subdivision assumed a smaller uncontrolled area from Block 3 sheet draining to adjacent ROW's than proposed. Half of the proposed roofs within Block 3 fronting adjacent streets are now considered to be uncontrolled as a conservative design approach.

Note that the variance in uncontrolled area proposed to be directed to Chapman Mills and Greenbank Road versus that assumed as part of the subdivision design, has no impact on the Block 3 site servicing design. The storm collection systems for Chapman Mills and Greenbank Road will be designed to capture any uncontrolled runoff from the Block 3 development based on the final approved design.

The table below compares the conceptual areas assumed to sheet flow uncontrolled from Block 3 onto Verulam Street, Chapman Mills Road, and Greenbank Road ROWs as part of the SNTC subdivision design (Stantec, November 2020), and the detailed design information for Block 3 as depicted on the storm drainage plan.

Table 5.10: Block 3 Uncontrolled Area Comparison

Receiving ROW	SNTC Subdivision (Nov 2020) Total Uncontrolled Contributing Area (ha)	SNTC Subdivision (Nov 2020) Weighted Runoff Coefficient (C)	Actual Block 3 Total Uncontrolled Contributing Area (ha)	Actual Block 3 Weighted Runoff Coefficient (C)
Verulam Street	0.032	0.62	0.13	0.66
Chapman Mills Road	0.104	0.70	0.13	0.74
Greenbank Road	-	-	0.10	0.72

Uncontrolled flows proposed to be directed to the adjacent public roadways from Block 3 are summarized in **Table 5.11**.

Table 5.11: Uncontrolled Peak Runoff to Adjacent ROW's

Receiving ROW	100-year, 3-hour Chicago Peak Runoff (L/s)
Verulam Street	60.1
Chapman Mills Road	63.8
Greenbank Road	46.1

As noted above, the detailed design of Chapman Mills Drive has not yet been initiated. The minor system for Chapman Mills Drive will be designed to capture and convey 100-year flows in accordance with the Chapman Mills Environmental Study Report and will account for any direct runoff from adjacent lands including Block 3.

The redesign of Greenbank Road is currently underway. Coordination is ongoing with the project team for the City's Greenbank Road and Southwest Transitway Extension project. Uncontrolled flows from Block 3 will be accounted for as part of the stormwater management design. See correspondence included in **Appendix C.4.**

Section 5.5.4 details the adjustment made to the target release rate for Block 3 to account for the additional uncontrolled flows directed to Verulam Street.

6 Grading

The proposed Block 3 development site measure approximately 1.24 ha in area. The topography across the site under existing conditions slopes towards the southwest. An interim stormwater management dry pond is located along the western portion of the site which will be decommissioned prior to development of the block. The objective of the grading design strategy is to satisfy the stormwater management requirements, adhere to permissible grade raise restrictions, and provide for minimum cover requirements for sewers.

The grading design also follows the recommendations outlined in the SNTC Site Servicing and Stormwater Management Report (Stantec, November 2020) and directs majority of the overland drainage towards Verulam Street and ultimately into the outlet of the Kennedy Burnett SWM Facility.

The grading plan (**Drawing GP-1**) was prepared considering the grade raise restrictions identified in the geotechnical investigation. Areas where grades are expected to exceed the maximum permissible grade raise will be subject to either a pre-loading/surcharge program, or lightweight fill and/or other approved means outside of the proposed rights-of-way to reduce the risks of unacceptable long-term post-construction differential settlements.

7 Utilities

As the subject site lies within a residential development community, Hydro, Bell, Gas, and Cable servicing for the proposed site will be readily available within subsurface infrastructure within the neighbouring rights-of-way. Exact size, location and routing of hydro utilities will be finalized after design circulation.

8 Approvals

A Ministry of Environment Conservation and Parks (MECP) Permit to Take Water (PTTW) or reporting on the Environmental Activity and Sector Registry (EASR) may be required for the site as some of the proposed works may be below the groundwater elevation shown in the geotechnical report. The geotechnical consultant shall determine whether a PTTW or EASR reporting is required prior to construction.

The extension of the municipal sanitary sewer within Verulam Street is an approved alteration per the City of Ottawa Municipal Consolidated Linear Infrastructure Environmental Compliance Approval, ECA Number 008-W601.

9 Erosion Control

To protect downstream water quality and prevent sediment build-up in catch basins and storm sewers, erosion and sediment control measures must be implemented during construction. The following recommendations will be included in the contract documents and communicated to the Contractor.

1. Implement best management practices to provide appropriate protection of the existing and proposed drainage system and the receiving water course(s).
2. Limit the extent of the exposed soils at any given time.
3. Re-vegetate exposed areas as soon as possible.
4. Minimize the area to be cleared and grubbed.
5. Protect exposed slopes with geotextiles, geogrid, or synthetic mulches.
6. Install silt barriers/fencing around the perimeter of the site to prevent the migration of sediment offsite.
7. Install track out control mats (mud mats) at the entrance/egress as shown in **Drawing ECDS-1** to prevent migration of sediment into the public ROW.
8. Provide sediment traps and basins during dewatering works.
9. Install sediment traps (such as SiltSack® by Terrafix) between catch basins and frames.
10. Schedule the construction works at times which avoid flooding due to seasonal rains.

The Contractor will also be required to complete inspections and guarantee the proper performance of their erosion and sediment control measures at least after every rainfall. The inspections are to include:

- Verification that water is not flowing under silt barriers.
- Cleaning and changing the sediment traps placed on catch basins.

Refer to **Drawing ECDS-1** for the proposed location of silt fences, sediment traps, and other erosion control measures.

10 Geotechnical Investigation

A geotechnical investigation for the development was completed by Paterson Group Inc. in September 2023. The report summarizes the existing soil conditions within the Block 3 site and construction recommendations. For details which are not summarized below, please see the Paterson report included in the submission package.

Subsurface soil conditions within Block 3 were determined through field investigations conducted from October 19 to 22, 2020, in addition to the previous investigations, also completed by Paterson within the subdivision, between October 2012 and February 2019. In total, five (5) boreholes were drilled in the October 2020 investigation, and one historical borehole BH 11-1 and test pit were located within the limits of Block 3.

In general, soil stratigraphy consisted of cultivated topsoil/organic layer followed by a silty clay deposit overlying a compact to dense glacial till layer. Bedrock was estimated to occur between depths of 9 to 11 m. Based on moisture levels and colour of the recovered soil samples, the long-term groundwater table is expected to be 2.5 to 3 m below the original ground surface, though as groundwater levels fluctuate seasonally, they could vary at the time of construction.

Based on the observed soil conditions, a permissible grade raise restriction of 2.3 m and 3.0 m above existing grade was recommended for the west side and east side of the site respectively. Areas where grades are expected to exceed the maximum permissible grade raise will be subject to either a pre-loading/surcharge program, or lightweight fill and/or other approved means outside of the proposed rights-of-ways to reduce the risks of unacceptable long-term post-construction differential settlements.

The recommended rigid pavement structure is further presented in **Table 10.1** below.

Table 10.1: Recommended Pavement Structure

Material	Driveways and Car-only Parking Areas	Local Residential Roadways
Wear Course – HL-3 or Superpave 12.5 Asphaltic Concrete	50 mm	40 mm
Binder Course – HL-8 or Superpave 19.0 Asphaltic Concrete	-	50 mm
BASE – OPSS Granular A Crushed Stone	150 mm	
SUBBASE – OPSS Granular B Type II	300 mm	400 mm

A perimeter foundation drainage system is recommended for the proposed buildings. The system should consist of a 150 mm diameter perforated corrugated plastic or PVC pipe which is surrounded on all sides by 150 mm of 19 mm clear crushed stone, placed at the footing level around the exterior perimeter of the below-grade structure. The clear stone should be wrapped in a non-woven geotextile. The pipe should have a positive outlet, such as a gravity connection to a storm sewer or sump pump.

11 Conclusions and Recommendations

Based on the preceding information, the following conclusions are summarized below:

11.1 Potable Water Analysis

Based on the findings of the report, pressure reducing valves will be required in all proposed units under existing 3SW zone conditions to meet maximum pressure guidelines as per City of Ottawa standards under typical demand conditions (peak hour and average day conditions). If construction of the development occurs post SUC Zone reconfiguration, pressure reducing values will not be required.

The results indicate that sufficient fire flows are available within the proposed watermain network under emergency fire demand conditions (maximum day + fire flow) for both existing and post zone reconfiguration scenarios, while meeting the minimum pressure requirements as per City of Ottawa standards

11.2 Wastewater Servicing

Block 3 will be serviced by a network of gravity sewers which will direct wastewater flows to Verulam Street. The proposed sanitary design indicates a total estimated peak outflow of 3.3 L/s will be discharged to the Verulam Street sewer. The receiving sewer system has sufficient available capacity to receive the design flows. Design guidelines for slope and velocity have been met within the proposed sewers.

11.3 Stormwater Management

- The proposed stormwater management plan complies with the goals specified in the background reports and the 2012 City of Ottawa Sewer Design Guidelines.
- Inlet control devices are proposed to limit inflow from the site area into the minor system to the 2-year storm event based on City of Ottawa IDF curves.
- All dynamic surface water depths are to be less than 0.35 m during all storm events up to the 100-year storm event.
- The storm sewer hydraulic grade line will be maintained at least 0.30 m below the underside of footing in the subdivision during design storm events.

- Minor system peak flows from the proposed site will be directed to the receiving sewer in Verulam Street and will ultimately discharge into the outlet channel for the Kennedy-Burnett SWM Facility.
- The minor system outflow rates are within the SNTC subdivision targets (November 2020).

11.4 Grading

A grading plan has been prepared to account for the required overland flow conveyance, cover over sewers, hydraulic grade line requirements, and grade raise restrictions as identified in the geotechnical investigation.

11.5 Utilities

Electrical, gas, cable, and telephone infrastructure exist within the SNTC subdivision development and has been designed by their respective utility providers to service the site plan blocks. Private utility servicing for Block 3 will be designed by the respective utilities.

APPENDICES

Appendix A Domestic Water Analysis

A.1 Boundary Conditions

Boundary Conditions
South Nepean Town Centre

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	543.00	9.05
Maximum Daily Demand	1,314.60	21.91
Peak Hour	2,867.40	47.79
Fire Flow Demand 1	12,000.00	200
Fire Flow Demand 2	16,980.00	283

Location

Results – Existing Conditions

Connection 1 – Jockvale Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	157.5	86.8
Peak Hour	140.4	62.6
Max Day plus Fire 1	147.6	72.7
Max Day plus Fire 2	144.3	68.2

[1] Ground Elevation = 96.4 m

Connection 2 – Greenbank Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	157.4	89.7
Peak Hour	140.0	65.0
Max Day plus Fire 1	137.8	61.9
Max Day plus Fire 2	126.5	45.8

[1] Ground Elevation = 94.3 m

Results – SUC Zone Reconfiguration

Connection 1 – Jockvale Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.8	73.1
Peak Hour	145.4	69.6
Max Day plus Fire 1	145.1	69.2
Max Day plus Fire 2	144.0	67.7

[1] Ground Elevation = 96.4 m

Connection 2 – Greenbank Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	147.6	75.8
Peak Hour	144.6	71.5
Max Day plus Fire 1	135.6	58.7
Max Day plus Fire 2	126.5	45.7

[1] Ground Elevation = 94.3 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.
2. Under Existing Conditions BARR PUMP #3 had to be turned on during Fire Hours.

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.

A.2 Water Demand Calculations

Domestic Water Demand Estimates - South Nepean Town Centre Block 3
Site Plan provided by Korsiak Urban Planning dated 2024-02-16
Project No. 160401845

Population densities as per Table 4.1 of the City of Ottawa Water Design Guidelines:		
Townhouses	2.7	ppu

Stantec

Block	Units	Population	Daily Rate of Demand (L/cap/day)[2]	Avg Day Demand		Max Day Demand[1]		Peak Hour Demand[1]	
				(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)
1	12	32	280	6.3	0.11	15.8	0.26	34.7	0.58
2	12	32	280	6.3	0.11	15.8	0.26	34.7	0.58
3	12	32	280	6.3	0.11	15.8	0.26	34.7	0.58
4	6	16	280	3.2	0.05	7.9	0.13	17.3	0.29
5	12	32	280	6.3	0.11	15.8	0.26	34.7	0.58
6	12	32	280	6.3	0.11	15.8	0.26	34.7	0.58
7	12	32	280	6.3	0.11	15.8	0.26	34.7	0.58
8	14	38	280	7.4	0.12	18.4	0.31	40.4	0.67
Total Site :	**92**	**248**	**-**	**48.3**	**0.81**	**120.8**	**2.01**	**265.7**	**4.43**

Notes:

1 Water demand criteria used to estimate peak demand rates for residential areas are as follows:
maximum day demand rate = 2.5 × average day demand rate
peak hour demand rate = 2.2 × maximum day demand rate (as per Technical Bulletin ISD-2010-02)

2 As per Table 4.2 from the City of Ottawa Water Design Guidelines and Technical Bulletin ISTB-2021-03, the average daily rate of water demand for residential areas: 280 L/cap/day

A.3 FUS Calculations

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec

Stantec Project #: 160401845
Project Name: South Nepean Town Centre Block 3
Date: 2024-07-02
Fire Flow Calculation #: 1
Description: Block 2 - 12 Three-storey Townhomes (Footprint Area: 470 m²)

Notes: Footprint areas as per Korsiak Urban Planning Site Plan (February 15, 2024)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		470	470	470								1410	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	> 30	0	0	0-20	Type V		NO			0%	4488
		East	3.1 to 10	20.2	3	61-80	Type V		NO			18%	
		South	20.1 to 30	27.0	3	81-100	Type V		NO			8%	
		West	3.1 to 10	20.2	3	61-80	Type V		NO			18%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											15000
		Total Required Fire Flow in L/s											250.0
		Required Duration of Fire Flow (hrs)											3.00
		Required Volume of Fire Flow (m^3)											2700

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec

Stantec Project #: 160401845
Project Name: South Nepean Town Centre Block 3
Date: 2024-07-02
Fire Flow Calculation #: 2
Description: Block 5 - 12 Three-storey Townhomes (Footprint Area: 470 m²)

Notes: Footprint areas as per Korsiak Urban Planning Site Plan (February 15, 2024)

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		470	470	470								1410	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	12000
4	Determine Occupancy Charge	Limited Combustible										-15%	10200
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	3.1 to 10	20.2	3	61-80	Type V		NO			18%	3672
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	3.1 to 10	20.2	3	61-80	Type V		NO			18%	
		West	> 30	0	0	0-20	Type V		NO			0%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											14000
		Total Required Fire Flow in L/s											233.3
		Required Duration of Fire Flow (hrs)											3.00
		Required Volume of Fire Flow (m^3)											2520

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160401845
Project Name: South Nepean Town Centre Block 3
Date: 2024-07-02
Fire Flow Calculation #: 3
Description: Block 7 - 12 Three-storey Townhomes (Footprint Area: 737 m²)

Notes: Footprint areas as per Korsiak Urban Planning Site Plan (February 15, 2024). Footprint area reduced to 482 m² with firewall at middle

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		482	482	482								1446	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	13000
4	Determine Occupancy Charge	Limited Combustible										-15%	11050
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	20.1 to 30	21	3	61-80	Type V		NO			6%	1989
		East	> 30	0	0	0-20	Type V		NO			0%	
		South	0 to 3	21	3	61-80	Type I-II - Protected Openings		YES			0%	
		West	10.1 to 20	19	3	41-60	Type V		NO			12%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											13000
		Total Required Fire Flow in L/s											216.7
		Required Duration of Fire Flow (hrs)											2.50
		Required Volume of Fire Flow (m^3)											1950

FUS Fire Flow Calculation Sheet - 2020 FUS Guidelines

Stantec Project #: 160401845
Project Name: South Nepean Town Centre Block 3
Date: 2024-07-02
Fire Flow Calculation #: 6
Description: Block 8 - 14 Three-storey Townhomes (Footprint Area: 859 m²)

Notes: Footprint areas as per Korsiak Urban Planning Site Plan (February 15, 2024). Footprint area reduced to 482 m² with firewall at south

Step	Task	Notes										Value Used	Req'd Fire Flow (L/min)
1	Determine Type of Construction	Type V - Wood Frame / Type IV-D - Mass Timber Construction										1.5	-
2	Determine Effective Floor Area	Sum of All Floor Areas										NO	-
		482	482	482								1446	-
3	Determine Required Fire Flow	(F = 220 x C x $A^{1/2}$). Round to nearest 1000 L/min										-	13000
4	Determine Occupancy Charge	Limited Combustible										-15%	11050
5	Determine Sprinkler Reduction	None										0%	0
		Non-Standard Water Supply or N/A										0%	
		Not Fully Supervised or N/A										0%	
		% Coverage of Sprinkler System										0%	
6	Determine Increase for Exposures (Max. 75%)	Direction	Exposure Distance (m)	Exposed Length (m)	Exposed Height (Stories)	Length-Height Factor (m x stories)	Construction of Adjacent Wall		Firewall / Sprinklered ?			-	-
		North	10.1 to 20	14.8	3	41-60	Type V		NO			12%	3426
		East	10.1 to 20	25.7	3	61-80	Type V		NO			13%	
		South	0 to 3	14.8	3	41-60	Type I-II - Protected Openings		YES			0%	
		West	20.1 to 30	25.7	3	61-80	Type V		NO			6%	
7	Determine Final Required Fire Flow	Total Required Fire Flow in L/min, Rounded to Nearest 1000L/min											14000
		Total Required Fire Flow in L/s											233.3
		Required Duration of Fire Flow (hrs)											3.00
		Required Volume of Fire Flow (m^3)											2520

A.4 Hydraulic Analysis

Junction Results - Average Day Demand (AVDY) Pre-Reconfiguration

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)	Pressure (kPa)
50	0.08	95.46	157.42	88.08	607.29
46	0.05	95.02	157.42	88.71	611.63
54	0.06	94.87	157.42	88.92	613.08
3	0.19	94.78	157.47	89.13	614.53
48	0.00	94.62	157.42	89.27	615.50
56	0.05	94.60	157.42	89.30	615.70
44	0.11	94.57	157.42	89.35	616.05
42	0.12	94.40	157.42	89.59	617.70
52	0.00	94.25	157.42	89.80	619.15
4	0.11	94.21	157.44	89.88	619.70
30	0.06	94.13	157.42	89.97	620.32

Link Results - Average Day Demand (AVDY)

ID	FROM	TO	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)
16	4	52	47.21	204	110	5.80	0.18
66	30	52	61.76	204	110	-3.20	0.10
72	30	42	44.89	204	110	-2.13	0.07
74	54	56	20.11	204	110	0.37	0.01
84	42	56	36.44	204	110	-0.92	0.03
88	52	44	41.35	204	110	2.60	0.08
90	44	48	12.83	204	110	1.16	0.04
92	48	46	25.84	204	110	1.16	0.04
94	46	50	23.86	204	110	0.51	0.02
98	50	54	61.47	204	110	0.43	0.01
102	44	42	61.65	204	110	1.33	0.04
104	46	56	57.48	204	110	0.60	0.02

Junction Results - Average Day Demand (AVDY) Post Reconfiguration

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)	Pressure (kPa)
50	0.08	95.46	147.66	74.20	511.59
46	0.05	95.02	147.66	74.83	515.93
54	0.06	94.87	147.66	75.04	517.38
3	0.19	94.78	147.76	75.31	519.24
48	0.00	94.62	147.66	75.40	519.86
56	0.05	94.60	147.66	75.43	520.07
44	0.11	94.57	147.66	75.47	520.35
42	0.12	94.40	147.66	75.71	522.00
52	0.00	94.25	147.66	75.93	523.52
4	0.11	94.21	147.69	76.02	524.14
30	0.06	94.13	147.65	76.09	524.62

Link Results - Average Day Demand (AVDY)

ID	FROM	TO	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)
16	4	52	47.21	204	110	7.82	0.24
66	30	52	61.76	204	110	-4.35	0.13
72	30	42	44.89	204	110	-2.99	0.09
74	54	56	20.11	204	110	0.53	0.02
84	42	56	36.44	204	110	-1.30	0.04
88	52	44	41.35	204	110	3.46	0.11
90	44	48	12.83	204	110	1.54	0.05
92	48	46	25.84	204	110	1.54	0.05
94	46	50	23.86	204	110	0.67	0.02
98	50	54	61.47	204	110	0.59	0.02
102	44	42	61.65	204	110	1.81	0.06
104	46	56	57.48	204	110	0.82	0.03

Fire Flow Results - Max Day + 250 L/s Pre-reconfiguration

ID	Static Demand (L/s)	Static Pressure (kPa)	Static Pressure (psi)	Static Head (m)	Fire Flow Demand (L/s)	Residual Pressure (psi)	Available Flow (L/s)	Available Pressure (psi)
3	0.46	447.40	64.89	140.43	250.00	57.73	1017.34	20
30	0.15	424.65	61.59	137.45	250.00	47.83	473.61	20
4	0.26	433.34	62.85	138.42	250.00	55.08	744.98	20
42	0.28	423.13	61.37	137.57	250.00	42.31	391.06	20
44	0.26	422.10	61.22	137.63	250.00	42.21	391.52	20
46	0.13	417.41	60.54	137.61	250.00	36.84	340.61	20
50	0.20	413.07	59.91	137.60	250.00	32.30	309.13	20
54	0.13	418.79	60.74	137.60	250.00	33.59	315.70	20
56	0.13	421.41	61.12	137.59	250.00	37.52	344.10	20

Fire Flow Results - Max Day + 250 L/s Post-reconfiguration

ID	Static Demand (L/s)	Static Pressure (kPa)	Static Pressure (psi)	Static Head (m)	Fire Flow Demand (L/s)	Residual Pressure (psi)	Available Flow (L/s)	Available Pressure (psi)
3	0.46	465.67	67.54	142.29	250.00	58.65	1032.96	20
30	0.15	422.51	61.28	137.23	250.00	45.24	466.94	20
4	0.26	437.89	63.51	138.89	250.00	51.59	743.65	20
42	0.28	421.89	61.19	137.44	250.00	39.72	383.84	20
44	0.26	421.20	61.09	137.55	250.00	39.59	384.23	20
46	0.13	416.37	60.39	137.50	250.00	34.23	332.62	20
50	0.20	412.03	59.76	137.50	250.00	29.70	300.49	20
54	0.13	417.68	60.58	137.48	250.00	30.99	307.38	20
56	0.13	420.30	60.96	137.48	250.00	34.92	336.29	20

Junction Results - Peak Hour Demand (PKHR) Pre-Reconfiguration

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)	Pressure (kPa)
50	0.43	95.46	139.98	63.29	436.37
46	0.29	95.02	139.98	63.92	440.71
54	0.29	94.87	139.98	64.13	442.16
48	0.00	94.62	139.99	64.49	444.64
56	0.29	94.60	139.98	64.52	444.85
44	0.58	94.57	139.99	64.56	445.13
3	1.01	94.78	140.27	64.66	445.82
42	0.63	94.40	139.98	64.80	446.78
52	0.00	94.25	140.00	65.04	448.44
30	0.34	94.13	139.98	65.17	449.33
4	0.58	94.21	140.07	65.19	449.47

Link Results - Peak Hour Demand (PKHR)

ID	FROM	TO	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)
16	4	52	47.21	204	110	13.27	0.41
66	30	52	61.76	204	110	-6.95	0.21
72	30	42	44.89	204	110	-3.82	0.12
74	54	56	20.11	204	110	0.56	0.02
84	42	56	36.44	204	110	-1.55	0.05
88	52	44	41.35	204	110	6.33	0.19
90	44	48	12.83	204	110	2.85	0.09
92	48	46	25.84	204	110	2.85	0.09
94	46	50	23.86	204	110	1.28	0.04
98	50	54	61.47	204	110	0.85	0.03
102	44	42	61.65	204	110	2.90	0.09
104	46	56	57.48	204	110	1.28	0.04

Junction Results - Peak Hour Demand (PKHR) Post-Reconfiguration

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)	Pressure (kPa)
50	0.43	95.46	144.63	69.90	481.94
46	0.29	95.02	144.63	70.53	486.29
54	0.29	94.87	144.63	70.74	487.74
48	0.00	94.62	144.64	71.10	490.22
56	0.29	94.60	144.63	71.12	490.36
44	0.58	94.57	144.64	71.18	490.77
42	0.63	94.40	144.63	71.41	492.35
3	1.01	94.78	145.16	71.62	493.80
52	0.00	94.25	144.66	71.67	494.15
30	0.34	94.13	144.61	71.77	494.84
4	0.58	94.21	144.78	71.89	495.66

Link Results - Peak Hour Demand (PKHR)

ID	FROM	TO	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)
16	4	52	47.21	204	110	18.54	0.57
66	30	52	61.76	204	110	-9.95	0.30
72	30	42	44.89	204	110	-6.08	0.19
74	54	56	20.11	204	110	0.99	0.03
84	42	56	36.44	204	110	-2.56	0.08
88	52	44	41.35	204	110	8.59	0.26
90	44	48	12.83	204	110	3.86	0.12
92	48	46	25.84	204	110	3.86	0.12
94	46	50	23.86	204	110	1.71	0.05
98	50	54	61.47	204	110	1.28	0.04
102	44	42	61.65	204	110	4.15	0.13
104	46	56	57.48	204	110	1.86	0.06

A.5 Background Report Excerpts

3.2.1 Ground Elevations

The proposed ground elevations of the development range from approximately 95.50m to 93.30m. Proposed grading and elevations have been determined for the site and are included on **Drawing GP-1** and **Drawing GP-2**.

3.2.2 Water Demands

The current subdivision plan for the development consists of four public roadways with two rows of rear-lane townhomes, 4 blocks intended for future residential development, a community park block and a school block. The residential blocks lie within CDP areas noted as mid-rise residential and mid-rise mixed-use areas (2-4 and 4-6 storeys buildings), as well as a high density mixed-use area. Net unit density targets have been applied to each block to develop estimated domestic demand rates for the region in consideration with an average townhouse unit population density of 2.7ppu and average apartment population density of 1.8ppu.

The contributing area was assessed at a residential density of 100 units/ha for mid-rise 2-4 storey residential areas (Block 2), 200 units/ha for mid-rise 4-6 storey residential areas, and 250 units/ha for high-rise residential areas (Block 3). A residential density of 140 units/ha was assumed for Block 1. Detailed design for Block 4 is currently under review at the City of Ottawa and as such, the actual unit count of 116 townhomes was used in the calculations in accordance with the proposed site plan.

Water demands for the development were estimated using the City of Ottawa's Water Distribution Design Guidelines. For residential developments, the average day (AVDY) per capita water demand is 350 L/cap/day. For maximum day (MXDY) demand, AVDY was multiplied by a factor of 2.5 and for peak hour (PKHR) demand, MXDY was multiplied by a factor of 2.2. For commercial and institutional use, the AVDY is based on the area of land use at 28,000 L/ha/day as shown in the following tables. For institutional use, AVDY was multiplied by a factor of 1.5 for MXDY demand and MXDY was multiplied by a factor of 1.8 for PKHR demand (see detailed calculations in **Appendix A.2**). The calculated domestic water consumption for the proposed SNTC Development is represented in **Table 3.1** and **Table 3.2**.

A 300mm watermain connection through Claridge's Burnett Lands located to the south of the site is required to maintain looping. As such, water demands for Claridge's development to the south have also been included in the hydraulic model. The water demands for Claridge's Burnett Lands Development were taken from the latest Novatech Site Servicing and Stormwater Management Report completed in October 2020 (see **Appendix A.6**). Claridge's domestic demands are represented in **Table 3.3.**

Table 3.1: SNTC Development Residential Water Demands

Area ID	Units	Person/Unit	Population	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Block 1	225	2.7	608	2.46	6.15	13.54

Area ID	Units	Person/Unit	Population	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Block 2	172	2.7	464	1.88	4.70	10.35
Block 3	310	1.8	558	2.26	5.65	12.43
Block 4	116	2.7	313	1.27	3.17	6.98
Block 8-15	42	2.7	113	0.46	1.15	2.53
		Total	**2,056**	**8.33**	**20.82**	**45.83**

Table 3.2: SNTC Development Institutional Water Demands

Area ID	Area (ha)	Demand (L/ha/day)	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Block 5	0.62	28,000	0.20	0.30	0.54
Block 6	1.62	28,000	0.52	0.79	1.42
		Total	**0.72**	**1.09**	**1.96**

Table 3.3: Claridge's Burnett Lands Water Demands

Area ID	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
Claridge Homes (3370 Greenbank Road)	4.53	11.33	24.93

3.2.3 Fire Flow Requirements

As part of the Kennedy-Burnett Potable Water Master Servicing Study, an assessment using the City's 2013 Water Master Plan Update model was carried out. The MSS analysis concluded that under both pre and post zone reconfiguration, available fire flows in the NTC lands are projected to be greater than 15,000 L/min along all the larger diameter watermain (305mm and greater). Background report excerpts are included in **Appendix A.6**.

A maximum fire flow of 16,000 L/min (267 L/s) was estimated for the worst-case townhome units (Block 10) within the proposed Blocks 8 to 15. FUS calculations can be found in **Appendix A.3.** A fire flow requirement of 10,000 L/min has been assumed for the future development blocks. However, it is recommended that the maximum fire flow requirement assumption be revisited at the detailed design stage of each block as development proceeds to ensure sufficient fire flows are available within the adjacent watermains.

As per the City's Technical Bulletin ISTB-2018-02, the maximum flow contribution from one given hydrant is 5,700 L/min (95 L/s) within a distance of 75 m, and 3,800 L/min (63 L/s) between 75 m and 150 m. As a result, hydrant placement in the vicinity of the townhome units within Block 10 was considered to ensure the maximum required fire flow of 16,000 L/min can be achieved.

Appendix B Wastewater Servicing

B.1 Sanitary Sewer Design Sheet

Stantec

SUBDIVISION:

SNTC Block 3

DATE: 2024-03-20
REVISION: 2
DESIGNED BY: mjs
CHECKED BY: mw

SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160401845

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	280 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	28,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (ICI >20%):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE	3.4	INSTITUTIONAL	28,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.33 l/s/Ha	HARMON CORRECTION FACTOR	0.8
PERSONS / APARTMENT	1.8				

LOCATION			RESIDENTIAL AREA AND POPULATION								
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (ha)	UNITS SINGLE	UNITS TOWN	UNITS APT	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)
R6A	6	5	0.14	0	12	0	32	0.14	32	3.68	0.4
R5A	5	4	0.21	0	18	0	49	0.35	81	3.61	0.9
G4A	4	3	0.00	0	0	0	0	0.35	81	3.61	0.9
R9A	9	3	0.13	0	6	0	16	0.13	16	3.71	0.2
G3A	3	2	0.00	0	0	0	0	0.48	97	3.60	1.1
R8A	8	7	0.11	0	12	0	32	0.11	32	3.68	0.4
R6B	6	7	0.28	0	24	0	65	0.28	65	3.63	0.8
R7A	7	2	0.18	0	13	0	35	0.57	132	3.57	1.5
G2A	2	1	0.00	0	0	0	0	1.05	230	3.50	2.6
R10A, G10A	10	38	0.09	0	7	0	19	0.09	19	3.71	0.2

AREA ID NUMBER	COMMERCIAL AREA (ha)	COMMERCIAL ACCU. AREA (ha)	INDUSTRIAL (L) AREA (ha)	INDUSTRIAL (L) ACCU. AREA (ha)	INDUSTRIAL (H) AREA (ha)	INDUSTRIAL (H) ACCU. AREA (ha)	INSTITUTIONAL AREA (ha)	INSTITUTIONAL ACCU. AREA (ha)	GREEN / UNUSED AREA (ha)	GREEN / UNUSED ACCU. AREA (ha)	C+I+I PEAK FLOW (l/s)	INFILTRATION TOTAL AREA (ha)	INFILTRATION ACCU. AREA (ha)	INFILTRATION INFILT. FLOW (l/s)	TOTAL FLOW (l/s)
R6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.14	0.14	0.0	0.4
R5A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.21	0.35	0.1	1.1
G4A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.0	0.02	0.37	0.1	1.1
R9A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.13	0.13	0.0	0.2
G3A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.06	0.0	0.04	0.54	0.2	1.3
R8A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.11	0.11	0.0	0.4
R6B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.28	0.28	0.1	0.9
R7A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.18	0.57	0.2	1.7
G2A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.0	0.03	1.14	0.4	3.0
R10A, G10A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.0	0.32	0.32	0.1	0.3

AREA ID NUMBER	PIPE LENGTH (m)	DIA (mm)	MATERIAL	CLASS	SLOPE (%)	CAP. (FULL) (l/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
R6A	8.8	200	PVC	SDR 35	0.65	27.0	**1.61%**	0.85	0.26
R5A	44.8	200	PVC	SDR 35	0.35	19.8	**5.39%**	0.62	0.27
G4A	19.3	200	PVC	SDR 35	0.35	19.8	**5.42%**	0.62	0.27
R9A	43.0	200	PVC	SDR 35	0.65	27.0	**0.88%**	0.85	0.23
G3A	40.4	200	PVC	SDR 35	0.35	19.8	**6.63%**	0.62	0.29
R8A	22.0	200	PVC	SDR 35	0.35	19.8	**2.14%**	0.62	0.21
R6B	56.6	200	PVC	SDR 35	0.35	19.8	**4.32%**	0.62	0.26
R7A	55.2	200	PVC	SDR 35	0.35	19.8	**8.68%**	0.62	0.32
G2A	34.9	200	PVC	SDR 35	0.35	19.8	**15.07%**	0.62	0.37
		200							
R10A, G10A	53.4	200	PVC	SDR 35	0.65	27.0	**1.23%**	0.85	0.24

B.2 Background Report Excerpts

Stantec

SUBDIVISION:

Nepean Town Centre Development Corporation

DATE: 2023-09-11
REVISION: 3
DESIGNED BY: MS
CHECKED BY: AMP

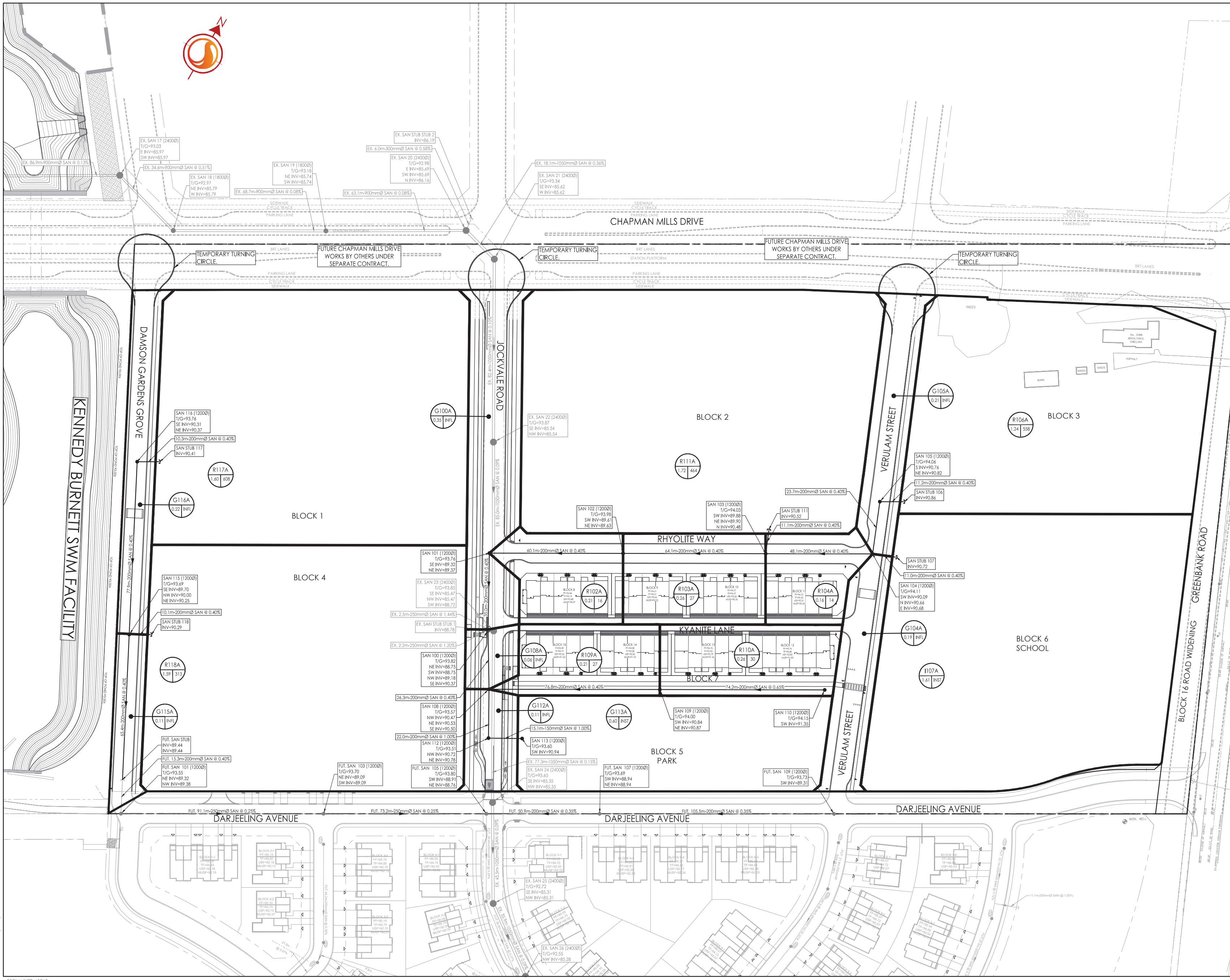
SANITARY SEWER DESIGN SHEET
(City of Ottawa)

FILE NUMBER: 160401085

DESIGN PARAMETERS

MAX PEAK FACTOR (RES.)=	4.0	AVG. DAILY FLOW / PERSON	280 l/p/day	MINIMUM VELOCITY	0.60 m/s
MIN PEAK FACTOR (RES.)=	2.0	COMMERCIAL	28,000 l/ha/day	MAXIMUM VELOCITY	3.00 m/s
PEAKING FACTOR (INDUSTRIAL):	2.4	INDUSTRIAL (HEAVY)	55,000 l/ha/day	MANNINGS n	0.013
PEAKING FACTOR (ICI >20%):	1.5	INDUSTRIAL (LIGHT)	35,000 l/ha/day	BEDDING CLASS	B
PERSONS / SINGLE	3.4	INSTITUTIONAL	28,000 l/ha/day	MINIMUM COVER	2.50 m
PERSONS / TOWNHOME	2.7	INFILTRATION	0.33 l/s/Ha	HARMON CORRECTION FACTOR	0.8
PERSONS / APARTMENT	1.8				

LOCATION			RESIDENTIAL AREA AND POPULATION									COMMERCIAL		INDUSTRIAL (L)		INDUSTRIAL (H)		INSTITUTIONAL		GREEN / UNUSED		C+I+I	INFILTRATION			TOTAL	PIPE								
AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (ha)	SINGLE	UNITS TOWN	APT	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	FLOW (l/s)	LENGTH (m)	DIA (mm)	MATERIAL	CLASS	SLOPE (%)	CAP. (FULL) (l/s)	CAP. V PEAK FLOW (%)	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
R106A	106	105	1.24	0	0	310	558	1.24	558	3.36	6.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.24	1.24	0.4	6.5	11.2	200	PVC	SDR 35	0.40	21.1	**30.7%**	0.67	0.49
G105A	105	104	0.00	0	0	0	0	1.24	558	3.36	6.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.21	0.0	0.21	1.45	0.5	6.6	23.7	200	PVC	SDR 35	0.40	21.1	**31.0%**	0.67	0.49
I107A	107	104	0.00	0	0	0	0	0.00	0	3.80	0.0	0.00	0.00	0.00	0.00	0.00	0.00	1.61	1.61	0.00	0.00	0.8	1.61	1.61	0.5	1.3	11.0	200	PVC	SDR 35	0.40	21.1	**6.2%**	0.67	0.31
G104A, R104A	104	103	0.16	0	5	0	14	1.41	572	3.35	6.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.19	0.40	0.8	0.35	3.42	1.1	8.1	48.1	200	PVC	SDR 35	0.40	21.1	**38.4%**	0.67	0.52
R111A	111	103	1.72	0	172	0	464	1.72	464	3.39	5.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.72	1.72	0.6	5.7	11.1	200	PVC	SDR 35	0.40	21.1	**26.8%**	0.67	0.47
R103A	103	102	0.26	0	10	0	27	3.39	1063	3.23	11.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.40	0.8	0.26	5.40	1.8	13.7	64.1	200	PVC	SDR 35	0.40	21.1	**64.7%**	0.67	0.61
R102A	102	101	0.21	0	6	0	16	3.60	1079	3.22	11.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.40	0.8	0.21	5.61	1.9	13.9	60.1	200	PVC	SDR 35	0.40	21.1	**65.8%**	0.67	0.62
	101	100	0.00	0	0	0	0	3.60	1079	3.22	11.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.40	0.8	0.00	5.61	1.9	13.9	35.0	200	PVC	SDR 35	0.40	21.1	**65.8%**	0.67	0.62
R110A	110	109	0.26	0	11	0	30	0.26	30	3.68	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.26	0.26	0.1	0.4	74.2	200	PVC	SDR 35	0.65	27.0	**1.6%**	0.85	0.26
R109A	109	108	0.21	0	10	0	27	0.47	57	3.64	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.21	0.47	0.2	0.8	76.8	200	PVC	SDR 35	0.40	21.1	**3.9%**	0.67	0.27
G113A	113	112	0.00	0	0	0	0	0.00	0	3.80	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.60	0.00	0.00	0.3	0.60	0.60	0.2	0.5	15.1	150	PVC	DR 28	1.00	15.3	**3.2%**	0.86	0.33
G112A	112	108	0.00	0	0	0	0	0.00	0	3.80	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.11	0.11	0.3	0.11	0.71	0.2	0.5	22.0	200	PVC	SDR 35	1.00	33.4	**1.6%**	1.05	0.32
G108A	108	100	0.00	0	0	0	0	0.47	57	3.64	0.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.06	0.17	0.3	0.06	1.24	0.4	1.4	26.3	200	PVC	SDR 35	0.40	21.1	**6.5%**	0.67	0.31
G100A	100	23	0.00	0	0	0	0	4.07	1136	3.21	11.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.21	0.35	0.92	1.1	0.35	7.20	2.4	15.3	2.5	250	PVC	SDR 35	1.44	72.8	**21.0%**	1.47	0.97
			4.07	0	214	310	1136					0.00		0.00		0.00		2.21		0.92			7.20					1050							
R117A	117	116	1.60	0	225	0	608	1.60	608	3.34	6.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.60	1.60	0.5	7.1	10.3	200	PVC	SDR 35	0.40	21.1	**33.6%**	0.67	0.51
G116A	116	115	0.00	0	0	0	0	1.60	608	3.34	6.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.22	0.0	0.22	1.82	0.6	7.2	77.9	200	PVC	SDR 35	0.40	21.1	**34.0%**	0.67	0.51
R118A	118	115	1.59	0	116	0	313	1.59	313	3.46	3.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	1.59	1.59	0.5	4.0	10.1	200	PVC	SDR 35	0.40	21.1	**19.1%**	0.67	0.42
G115A	115	EX101	0.00	0	0	0	0	3.20	921	3.26	9.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.33	0.0	0.11	3.52	1.2	10.9	80.7	200	PVC	SDR 35	0.40	21.1	**51.5%**	0.67	0.57
																												250							
			3.20	0	341	0	921					0.00		0.00		0.00		0.00		0.33			3.52												



Stantec

Stantec Consulting Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

Legend

- PROPOSED SANITARY SEWER
- R100A / 0.38 / 14 — SANITARY DRAINAGE AREA ID# / POPULATION / SANITARY DRAINAGE AREA ha.
- SANITARY DRAINAGE BOUNDARY
- EXISTING/FUTURE SANITARY SEWER
- G100A / 0.38 / INFL — SANITARY DRAINAGE AREA ID# / INFILTRATION FLOWS USED / SANITARY DRAINAGE AREA ha.
- I100A / 0.38 / INST — SANITARY DRAINAGE AREA ID# / INSTITUTIONAL FLOWS USED / SANITARY DRAINAGE AREA ha.
- SERVICE LATERAL LOCATION (SANITARY AND WATER).

Notes

1. FUTURE UNDERGROUND INFRASTRUCTURE ON DARJEELING AVENUE, SANITARY SEWERS TO BE CONSTRUCTED BY OTHERS AND WILL BE EXISTING PRIOR TO CONSTRUCTION OF SNTC LANDS.

5	REVISED AS PER CITY COMMENTS	MJS	AMP	20.11.06
4	REVISED AS PER CITY COMMENTS	MJS	AMP	20.10.22
3	REVISED AS PER CITY COMMENTS	MJS	AMP	20.09.09
2	REVISED AS PER CITY COMMENTS	MJS	AMP	20.07.10
1	ISSUED TO CITY FOR REVIEW	MJS	AMP	20.02.20
Revision		By	Appd.	YY.MM.DD

File Name: 160401085-SA.dwg	MJS	KS	MJS	20.01.02
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

LICENSED PROFESSIONAL ENGINEER A.M. PAEREZ FERNANDEZ 100105130 2020-11-06 PROVINCE OF ONTARIO

Client/Project

NEPEAN TOWN CENTRE DEVELOPMENT CORPORATION

SNTC LANDS

OTTAWA, ON, CANADA

Title

SANITARY DRAINAGE PLAN

Project No.	Scale	
160401085	1:750	
Drawing No.	Sheet	Revision
SA-1	23 of 31	5

D07-16-19-0015

PLAN # 18118

ORIGINAL SHEET - ARCH D

V:\01604\active\160401085_Cavion_SNTC Lands\design\drawing\DETAILED DESIGN\Detailed Draft Plan Design\160401085-SA.dwg
2020/11/06 10:53 AM By: Sharp, Mike

Appendix C Stormwater Management

C.1 Storm Sewer Design Sheet

Stantec	SNTC BLOCK 3	STORM SEWER DESIGN SHEET (City of Ottawa)
	DATE: 2024-07-02	
	REVISION: 2	
	DESIGNED BY: AR	FILE NUMBER: 160401845
	CHECKED BY: MW	

DESIGN PARAMETERS

$I = a / (t+b)^c$ (As per City of Ottawa Guidelines, 2012)

	1:2 yr	1:5 yr	1:10 yr	1:100 yr					
a =	732.951	998.071	1174.184	1735.688	MANNING'S n =	0.013		BEDDING CLASS =	B
b =	6.199	6.053	6.014	6.014	MINIMUM COVER:	2.00	m		
c =	0.810	0.814	0.816	0.820	TIME OF ENTRY	10	min		

LOCATION / DRAINAGE AREA

AREA ID NUMBER	FROM M.H.	TO M.H.	AREA (2-YEAR) (ha)	AREA (5-YEAR) (ha)	AREA (10-YEAR) (ha)	AREA (100-YEAR) (ha)	AREA (ROOF) (ha)	C (2-YEAR) (-)	C (5-YEAR) (-)	C (10-YEAR) (-)	C (100-YEAR) (-)
	106	105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C105B, C105A	105	104	0.00	0.53	0.00	0.00	0.00	0.00	0.74	0.00	0.00
	104	103	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C103A	103	102	0.00	0.22	0.00	0.00	0.00	0.00	0.81	0.00	0.00
	106	107	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C108A-1	108	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C108A	108	107	0.00	0.13	0.00	0.00	0.00	0.00	0.79	0.00	0.00
	107	102	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	102	101	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

FROM M.H.	TO M.H.	A x C (2-YEAR) (ha)	ACCUM AxC (2YR) (ha)	A x C (5-YEAR) (ha)	ACCUM. AxC (5YR) (ha)	A x C (10-YEAR) (ha)	ACCUM. AxC (10YR) (ha)	A x C (100-YEAR) (ha)	ACCUM. AxC (100YR) (ha)	T of C (min)	I_{2-YEAR} (mm/h)	I_{5-YEAR} (mm/h)	$I_{10-YEAR}$ (mm/h)	$I_{100-YEAR}$ (mm/h)	$Q_{CONTROL}$ (L/s)	ACCUM. $Q_{CONTROL}$ (L/s)	Q_{ACT} (CIA/360) (L/s)
106	105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	0.0
105	104	0.000	0.000	0.392	0.392	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	113.4
104	103	0.000	0.000	0.000	0.392	0.000	0.000	0.000	0.000	10.75	74.03	100.38	117.65	171.96	0.0	0.0	109.3
103	102	0.000	0.000	0.178	0.570	0.000	0.000	0.000	0.000	11.15	72.64	98.47	115.40	168.65	0.0	0.0	155.9
										11.68							
106	107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	0.0
										10.00							
C108A-1	108	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	0.0
108	107	0.000	0.000	0.103	0.103	0.000	0.000	0.000	0.000	10.00	76.81	104.19	122.14	178.56	0.0	0.0	29.7
										10.23							
107	102	0.000	0.000	0.000	0.103	0.000	0.000	0.000	0.000	10.23	75.93	102.99	120.72	176.48	0.0	0.0	29.4
										11.37							
102	101	0.000	0.000	0.000	0.673	0.000	0.000	0.000	0.000	11.68	70.91	96.10	112.61	164.55	0.0	0.0	179.6
										12.15							

PIPE SELECTION

FROM M.H.	TO M.H.	LENGTH (m)	PIPE WIDTH OR DIAMETE (mm)	PIPE HEIGHT (mm)	PIPE SHAPE (-)	MATERIAL (-)	CLASS (-)	SLOPE %	Q_{CAP} (FULL) (L/s)	% FULL (-)	VEL. (FULL) (m/s)	VEL. (ACT) (m/s)	TIME OF FLOW (min)
106	105	7.5	300	300	CIRCULAR	PVC	-	0.50	68.0	**0.00%**	0.97	0.00	0.00
105	104	42.2	450	450	CIRCULAR	CONCRETE	-	0.30	162.9	**69.62%**	0.99	0.94	0.75
104	103	22.4	450	450	CIRCULAR	CONCRETE	-	0.30	162.9	**67.08%**	0.99	0.93	0.40
103	102	37.4	450	450	CIRCULAR	CONCRETE	-	0.45	199.5	**78.15%**	1.22	1.19	0.52
106	107	57.7	300	300	CIRCULAR	PVC	-	0.50	68.0	**0.00%**	0.97	0.00	0.00
C108A-1	108	2.6	200	200	CIRCULAR	PVC	-	1.00	33.3	**0.00%**	1.05	0.00	0.00
108	107	11.0	300	300	CIRCULAR	PVC	-	0.50	68.0	**43.72%**	0.97	0.79	0.23
107	102	52.2	375	375	CIRCULAR	PVC	-	0.50	116.6	**25.21%**	1.11	0.76	1.14
102	101	30.3	525	525	CIRCULAR	CONCRETE	-	0.30	245.7	**73.08%**	1.10	1.06	0.48
			525	525									

C.2 PCSWMM Model Output

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

****
Element Count
****
Number of rain gages 2
Number of subcatchments ... 7
Number of nodes 17
Number of links 17
Number of pollutants 0
Number of land uses 0

****
Raingage Summary
****

Name	Data Source	Data Type	Recording Interval
CHI002	CHI002	INTENSITY	10 min.
CHI100	CHI100	INTENSITY	10 min.

****
Subcatchment Summary
****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
C103A	0.22	49.50	87.14	3.0000	CHI100	C103A-S
C105A	0.22	49.50	78.57	3.0000	CHI100	C105A-S
C105B	0.31	69.75	77.14	3.0000	CHI100	C105B-S
C108A	0.13	29.25	84.29	3.0000	CHI100	C108A-S
UNC-1	0.13	94.33	65.71	3.0000	CHI100	Verulam
UNC-2	0.13	123.29	77.14	3.0000	CHI100	CM
UNC-3	0.10	85.53	74.29	3.0000	CHI100	Greenbank

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
CM	OUTFALL	94.91	0.00	0.0	
Greenbank	OUTFALL	95.48	0.00	0.0	
MH202	OUTFALL	91.32	0.53	0.0	
OF1	OUTFALL	93.92	0.00	0.0	
Verulam	OUTFALL	94.27	0.00	0.0	
101	STORAGE	91.10	3.29	0.0	
102	STORAGE	91.19	3.13	0.0	
103	STORAGE	91.43	3.02	0.0	
104	STORAGE	91.53	3.34	0.0	
105	STORAGE	91.72	3.25	0.0	
106	STORAGE	91.91	3.12	0.0	
107	STORAGE	91.60	2.85	0.0	
108	STORAGE	91.73	2.50	0.0	
C103A-S	STORAGE	92.73	1.78	0.0	
C105A-S	STORAGE	93.15	1.78	0.0	
C105B-S	STORAGE	92.74	1.78	0.0	
C108A-S	STORAGE	92.77	1.78	0.0	

****
Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
402-401	102	101	CONDUIT	30.3	0.3007	0.0130
403-402	103	102	CONDUIT	37.4	0.4471	0.0130
403-402_(1)	104	103	CONDUIT	22.4	0.2991	0.0130
405-403	105	104	CONDUIT	42.2	0.3007	0.0130
406-405	106	105	CONDUIT	7.5	0.4937	0.0130
OR4	101	MH202	CONDUIT	15.8	0.5063	0.0130
Pipe_22	106	107	CONDUIT	57.7	0.5008	0.0130
Pipe_22_(1)	108	107	CONDUIT	11.0	0.5004	0.0130
Pipe_30	107	102	CONDUIT	52.2		

0.5000 0.0130

C103A-IC	C103A-S	103	ORIFICE
C105A-IC	C105A-S	105	ORIFICE
C105B-IC	C105B-S	105	ORIFICE
C108A-IC	C108A-S	108	ORIFICE
W1	C105A-S	C105B-S	WEIR
W2	C108A-S	Verulam	WEIR
W3	C103A-S	OF1	WEIR
W4	C105B-S	C103A-S	WEIR

****
Cross Section Summary
****

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
402-401	CIRCULAR	0.53	0.22	0.13	0.53	1	235.85
403-402	CIRCULAR	0.45	0.16	0.11	0.45	1	190.64
403-402_(1)	CIRCULAR	0.45	0.16	0.11	0.45	1	155.94
405-403	CIRCULAR	0.45	0.16	0.11	0.45	1	156.35
406-405	CIRCULAR	0.30	0.07	0.07	0.30	1	67.95
OR4	CIRCULAR	0.53	0.22	0.13	0.53	1	306.04
Pipe_22	CIRCULAR	0.30	0.07	0.07	0.30	1	68.44
Pipe_22_(1)	CIRCULAR	0.30	0.07	0.07	0.30	1	68.41
Pipe_30	CIRCULAR	0.38	0.11	0.09	0.38	1	123.99

****
Analysis Options
****

```
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
```

```
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 03/15/2024 00:00:00
Ending Date .............. 03/16/2024 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... NO
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.088        71.667
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.012         9.506
Surface Runoff ...........         0.075        61.017
Final Storage ............         0.002         1.233
Continuity Error (%) .....        -0.125


**************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.075         0.753
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.075         0.751
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.003
Continuity Error (%) .....         0.006


********************************
Highest Flow Instability Indexes
********************************
```

All links are stable.

```
*********************************
Most Frequent Nonconverging Nodes
*********************************
```

Convergence obtained at all time steps.

```
*************************
Routing Time Step Summary
*************************
```

```
Minimum Time Step           :     1.00 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
% of Time in Steady State   :     0.00
Average Iterations per Step :     2.00
% of Steps Not Converging   :     0.00
```

```
***************************
Subcatchment Runoff Summary
***************************
```

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
C103A	71.67	0.00	0.00	5.68	61.15	3.55	64.70	0.14	106.07	0.903
C105A	71.67	0.00	0.00	9.52	55.14	5.85	60.99	0.13	101.55	0.851
C105B	71.67	0.00	0.00	10.17	54.14	6.22	60.36	0.19	144.53	0.842
C108A	71.67	0.00	0.00	6.95	59.15	4.32	63.47	0.08	62.77	0.886
UNC-1	71.67	0.00	0.00	15.11	46.14	9.50	55.64	0.07	60.11	0.776
UNC-2	71.67	0.00	0.00	10.03	54.17	6.38	60.55	0.08	63.82	0.845
UNC-3	71.67	0.00	0.00	11.29	52.16	7.17	59.33	0.06	46.08	0.828

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
CM	OUTFALL	0.00	0.00	94.91	0 00:00	0.00
Greenbank	OUTFALL	0.00	0.00	95.48	0 00:00	0.00
MH202	OUTFALL	0.02	0.30	91.62	0 01:07	0.30
OF1	OUTFALL	0.00	0.00	93.92	0 00:00	0.00
Verulam	OUTFALL	0.00	0.00	94.27	0 00:00	0.00
101	STORAGE	0.31	0.68	91.78	0 01:10	0.68
102	STORAGE	0.31	0.65	91.84	0 01:11	0.65
103	STORAGE	0.31	0.57	92.01	0 01:14	0.57
104	STORAGE	0.31	0.55	92.08	0 01:14	0.55
105	STORAGE	0.31	0.59	92.31	0 01:14	0.59
106	STORAGE	0.29	0.40	92.31	0 01:14	0.40
107	STORAGE	0.30	0.44	92.05	0 01:12	0.44
108	STORAGE	0.30	0.50	92.23	0 01:11	0.50
C103A-S	STORAGE	0.05	1.58	94.31	0 01:13	1.58
C105A-S	STORAGE	0.06	1.61	94.76	0 01:13	1.61
C105B-S	STORAGE	0.05	1.62	94.36	0 01:13	1.62
C108A-S	STORAGE	0.03	1.58	94.35	0 01:11	1.58

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
CM	OUTFALL	63.82	63.82	0 01:10	0.0806	0.0806	0.000

Greenbank	OUTFALL	46.08	46.08	0	01:10	0.0573	0.0573	0.000
MH202	OUTFALL	0.00	169.15	0	01:12	0	0.541	0.000
OF1	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 ltr
Verulam	OUTFALL	60.11	60.11	0	01:10	0.0715	0.0715	0.000
101	STORAGE	0.00	169.06	0	01:12	0	0.541	-0.028
102	STORAGE	0.00	168.95	0	01:13	0	0.542	0.013
103	STORAGE	0.00	130.38	0	01:14	0	0.455	-0.041
104	STORAGE	0.00	90.78	0	01:14	0	0.314	-0.031
105	STORAGE	0.00	93.47	0	01:13	0	0.32	0.022
106	STORAGE	0.00	6.38	0	01:02	0	0.00561	-2.415
107	STORAGE	0.00	38.61	0	01:12	0	0.0877	0.480
108	STORAGE	0.00	35.97	0	01:11	0	0.083	0.012
C103A-S	STORAGE	106.07	106.07	0	01:10	0.142	0.142	0.024
C105A-S	STORAGE	101.55	101.55	0	01:10	0.132	0.132	0.018
C105B-S	STORAGE	144.53	144.53	0	01:10	0.187	0.187	-0.012
C108A-S	STORAGE	62.77	62.77	0	01:10	0.083	0.083	0.021

```
**********************
Node Surcharge Summary
**********************

No nodes were surcharged.


*********************
Node Flooding Summary
*********************

No nodes were flooded.


**********************
Storage Volume Summary
```

****

Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
101	0.000	9.5	0.0	0.0	0.001	20.5	0 01:10	169.15
102	0.000	10.0	0.0	0.0	0.001	20.7	0 01:11	169.06
103	0.000	10.3	0.0	0.0	0.001	19.0	0 01:14	130.38
104	0.000	9.3	0.0	0.0	0.001	16.4	0 01:14	90.79
105	0.000	9.6	0.0	0.0	0.001	18.1	0 01:14	93.46
106	0.000	9.3	0.0	0.0	0.000	12.9	0 01:14	7.19
107	0.000	10.5	0.0	0.0	0.001	15.6	0 01:12	38.59
108	0.000	12.1	0.0	0.0	0.001	19.8	0 01:11	35.97
C103A-S	0.001	0.6	0.0	0.0	0.036	33.2	0 01:13	39.60
C105A-S	0.001	0.7	0.0	0.0	0.034	37.2	0 01:13	36.33
C105B-S	0.001	0.6	0.0	0.0	0.044	38.7	0 01:13	57.14
C108A-S	0.000	0.3	0.0	0.0	0.012	34.7	0 01:11	35.97

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
CM	12.61	7.39	63.82	0.081

Greenbank	12.42	5.34	46.08	0.057
MH202	19.36	32.34	169.15	0.541
OF1	0.00	0.00	0.00	0.000
Verulam	12.54	6.60	60.11	0.072
System	11.39	51.67	337.02	0.751

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
402-401	CONDUIT	169.06	0 01:12	1.06	0.72	0.69
403-402	CONDUIT	130.38	0 01:14	1.36	0.68	0.61
403-402_(1)	CONDUIT	90.79	0 01:14	1.04	0.58	0.54
405-403	CONDUIT	90.78	0 01:14	1.00	0.58	0.55
406-405	CONDUIT	6.82	0 01:40	0.42	0.10	0.40
OR4	CONDUIT	169.15	0 01:12	1.20	0.55	0.65
Pipe_22	CONDUIT	2.68	0 01:14	0.46	0.04	0.18
Pipe_22_(1)	CONDUIT	35.97	0 01:11	0.87	0.53	0.57
Pipe_30	CONDUIT	38.59	0 01:12	0.82	0.31	0.46
C103A-IC	ORIFICE	39.60	0 01:13			1.00
C105A-IC	ORIFICE	36.33	0 01:13			1.00
C105B-IC	ORIFICE	57.14	0 01:13			1.00
C108A-IC	ORIFICE	35.97	0 01:11			1.00
W1	WEIR	0.00	0 00:00			0.00
W2	WEIR	0.00	0 00:00			0.00
W3	WEIR	0.00	0 00:00			0.00
W4	WEIR	0.00	0 00:00			0.00

****
Flow Classification Summary
****

	Adjusted	---------- Fraction of Time in Flow Class ----------								
	/Actual		Up	Down	Sub	Sup	Up	Down	Norm	Inlet
Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl

402-401	1.00	0.02	0.01	0.00	0.97	0.00	0.00	0.00	0.86	0.00
403-402	1.00	0.02	0.00	0.00	0.02	0.00	0.00	0.96	0.00	0.00
403-402_(1)	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.00	0.00
405-403	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
406-405	1.00	0.04	0.00	0.00	0.03	0.00	0.00	0.93	0.00	0.00
OR4	1.00	0.02	0.00	0.00	0.93	0.05	0.00	0.00	0.00	0.00
Pipe_22	1.00	0.97	0.01	0.00	0.02	0.00	0.00	0.01	0.02	0.00
Pipe_22_(1)	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00
Pipe_30	1.00	0.02	0.00	0.00	0.03	0.00	0.00	0.95	0.03	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Tue Jul 2 12:41:09 2024
Analysis ended on: Tue Jul 2 12:41:11 2024
Total elapsed time: 00:00:02

C.3 Background Report Excerpts

5.3.4 Future Development Blocks SWM Criteria

Table 5.13 below presents the parameters for the outlet link objects in the model, which represent the minor system capture rate for the future private blocks within the Caivan SNTC Development.

Table 5.13: SWM Criteria of Future Blocks

Storm Drainage Area	Description	Minor System Outlet	100-Year Minor System Capture (L/s)	Major System Flow Direction	100-Year Major System Overflows (L/s)
L204A	Block6-School	STM201	284.0	100-yr on-site storage. Emergency overland to Verulam Street.	N/A
L205A	Block3-HD-RES	STM202	219.5	100-yr on-site storage. Emergency overland to Verulam Street.	N/A
L215A	Block2-B2BTH	STM213	194.2	50m^3/ha on-site storage. Major Flow to Rhyolite Way.	365
L219B	Block1-RL-TH	STM219	179.2	50m^3/ha on-site storage. Major Flow to Damson Gardens Grove.	337
L221A	Block4-RL-TH	STM218	272.8	50m^3/ha on-site storage. Major Flow to Damson Gardens Grove.	347
L216A	Block5-Park	STM207	93.5	100-yr on-site storage. Emergency overland to Jockvale.	N/A

In order to assist with review of the future blocks' site plan control submissions, the table below summarizes the conceptual uncontrolled areas from each of the future blocks assumed in the subdivision SWM design to sheet flow uncontrolled onto the neighbouring ROW's. Should the future site plan designs have uncontrolled areas that exceed the conceptual areas in the subdivision design, it will be the responsibility of the site plan design engineer to verify whether the additional flow can be accommodated within the downstream ROWs.

Table 5.14: Future Blocks – Conceptual Uncontrolled Runoff

Block	Receiving ROW	Total Uncontrolled Contributing Area (ha)	Weighted Runoff Coefficient (C)
1	Chapman Mills Drive	0.104	0.70
	Jockvale Road	0.213	0.62
	Damson Gardens Grove	0.225	0.66
2	Chapman Mills Drive	0.154	0.70
	Verulam Street	0.142	0.62

Block	Receiving ROW	Total Uncontrolled Contributing Area (ha)	Weighted Runoff Coefficient (C)
	Rhyolite Way	0.120	0.54
	Jockvale Road	0.157	0.64
3	Chapman Mills Drive	0.104	0.70
	Verulam Street	0.032	0.62
4	Jockvale Road	0.118	0.59
	Darjeeling Avenue	0.077	0.64
	Damson Gardens Grove	0.124	0.67
6	Verulam Street	0.055	0.61

1. The above uncontrolled areas represent the lumped area from each future block to each adjacent ROW which differ from how the areas are broken down in the PCSWMM model for the subdivision (i.e. catchments tributary to ROW catchbasin/ICDs)

5.4 QUALITY CONTROL

Darjeeling Avenue is a shared road between the Claridge Burnett Lands Development and the Caivan SNTC Lands Development which will be constructed as part of the Burnett Lands Development. Approximately 1.63 ha of the Burnett Lands development and all of the Caivan Lands will drain to Darjeeling Avenue, the K-B SWMF outlet channel, and ultimately to the Fraser Clarke Drain that discharges into the Jock River.

Storm runoff from the proposed Caivan SNTC Lands Development and Darjeeling Avenue will be directed to the outlet channel of the Kennedy-Burnett SWMF through a shared storm sewer. An Enhanced (80% TSS removal) level of water quality control will be provided by using a hydrodynamic separator (HDS) (i.e. Vortechs units or approved equivalent) upstream of the storm outfall as designed by Novatech in their *Stormwater Management Report Burnett Lands – 3370 Greenbank Road* submitted in October 2020 and summarized as follows.

- A total drainage area of 12.34 ha at 70% imperviousness was used to size the HDS unit as shown in excerpts from Novatech's SWM Report for Burnett Lands included in **Appendix C.5**.
- Storm runoff from Darjeeling Avenue and the proposed Caivan SNTC Development will be treated by an Off-line Vortechs Model PC1421 unit (or approved equivalent) located upstream of the outfall to the Kennedy-Burnett SWM Facility outlet channel as shown on **Drawing SD-1**.

5.5 INTERIM CONDITION EXTERNAL DRAINAGE MANAGEMENT

The existing Burnett Municipal Drain, which is tributary to the Jock River bisects the site from north to south. The drain consists primarily of an open channel between the Barrhaven Town Centre

Future Blocks - Conceptual Uncontrolled Runoff

Block	Receiving ROW	Total Uncontrolled Contibuting Area (ha)	Weighted Runoff Coefficient
1	Chapman Mills Dr	0.104	0.70
	Jockvale Rd	0.213	0.62
	Damson Gardens Grove	0.225	0.66
2	Chapman Mills Dr	0.154	0.70
	Verulam Street	0.142	0.62
	Rhyolite Way	0.120	0.54
	Jockvale Rd	0.157	0.64
3	Chapman Mills Dr	0.104	0.70
	Verulam Street	0.032	0.62
4	Jockvale Rd	0.118	0.59
	Darjeeling Ave	0.077	0.64
	Damson Gardens Grove	0.124	0.67
6	Verulam Street	0.055	0.61

FUTURE BLOCKS - SWM CRITERIA

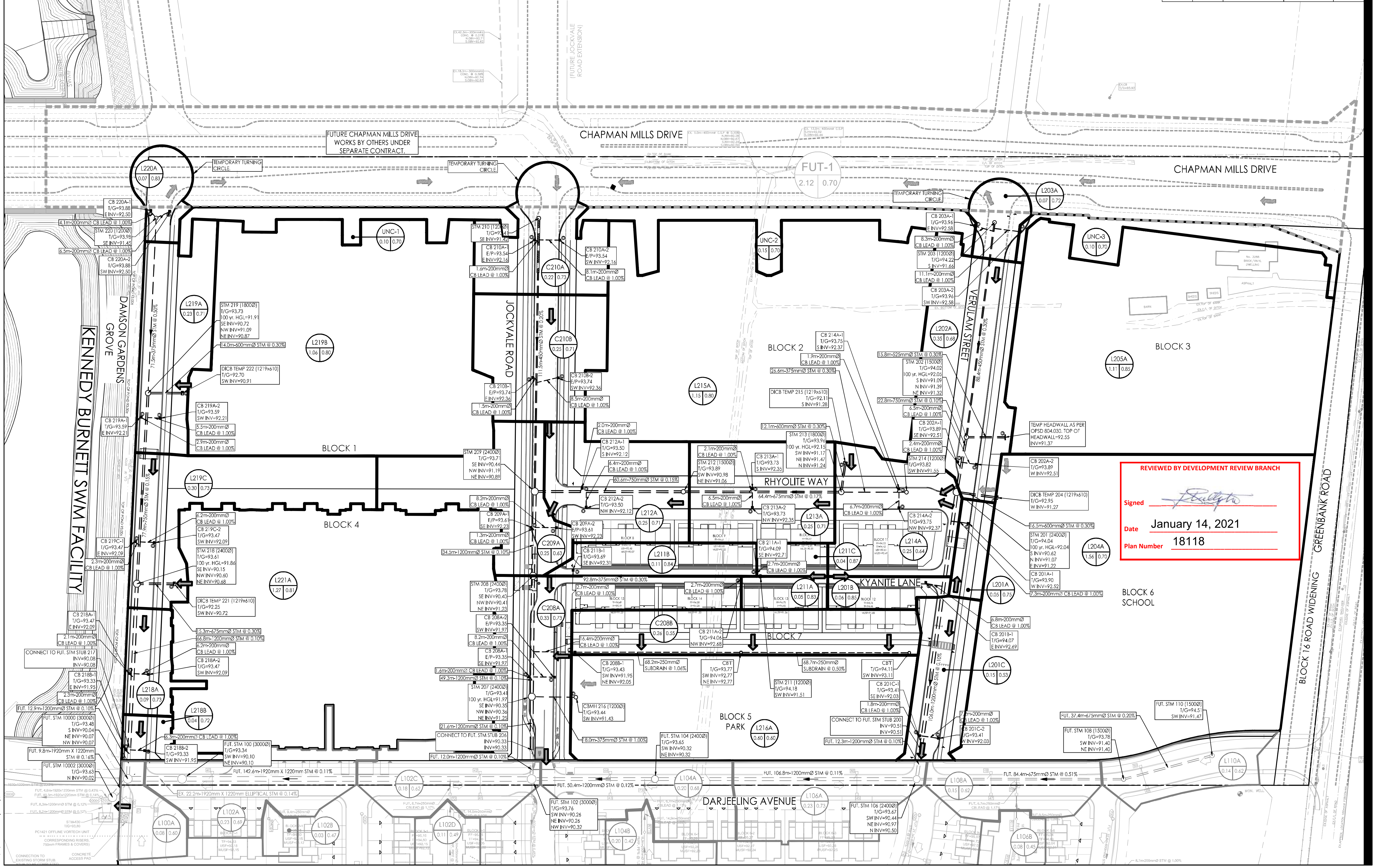
Drainage Area ID	Description	Minor System Outlet Node	100-year Minor System Capture Rate (L/s)	Major System Flow Direction	100-year Major System Flow (L/s)
L204A	Block6-School	STM201	284.0	100-yr on-site storage. Emergency overland to Street A.	N/A
L205A	Block3-HD-RES	STM202	219.5	100-yr on-site storage. Emergency overland to Street A.	N/A
L215A	Block2-B2BTH	STM213	194.2	50m3/ha on-site storage. Major Flow to Street E.	365
L219B	Block1-RL-TH	STM219	179.2	50m3/ha on-site storage. Major Flow to Street C.	337
L221A	Block4-RL-TH	STM218	272.8	50m3/ha on-site storage. Major Flow to Street C.	347
L216A	Block5-Park	STM207	93.5	100-yr on-site storage. Emergency overland to Jockvale.	N/A

INTERIM ICD TABLE

STRUCTURE ID	BLOCK ID	ICD TYPE	MAX HEAD (m)	Q 100YR. FLOW (L/s)
DICB TEMP 222	BLOCK 1	300mmØ ORIFICE	1.85	174.9
DICB TEMP 221	BLOCK 4	525mmØ ORIFICE	1.21	152.1
DICB TEMP 215	BLOCK 2	450mmØ ORIFICE	0.98	139.7
TEMP HEADWALL	BLOCK 3	350mmØ ORIFICE	1.72	257.9
DICB TEMP 204	BLOCK 6	350mmØ ORIFICE	1.38	200.0
CBMH 216	BLOCK 5	178mmØ ORIFICE	1.66	70.1

Tributary Area ID	Minor System Node	ICD Type	100yr Head (m)	100yr Flow (L/s)
C208A	208	127mm ORIFICE	1.6	41.9
C208A	208	127mm ORIFICE	1.6	41.9
C208B	208	152mm ORIFICE	1.9	66.2
C209A	209	127mm ORIFICE	1.6	42.3
C209A	209	127mm ORIFICE	1.6	42.3
C210A	210	108mm ORIFICE	1.6	30.2
C210A	210	108mm ORIFICE	1.6	30.2
C210B	210	127mm ORIFICE	1.5	41.1
C210B	210	127mm ORIFICE	1.5	41.1
L201A	201	83mm ORIFICE	1.5	17.6
L201B	201	83mm ORIFICE	1.5	17.3
L201C	201	94mm ORIFICE	1.5	22.3
L201C	201	94mm ORIFICE	1.5	22.3
L202A	202	108mm ORIFICE	1.6	30.2
L202A	202	108mm ORIFICE	1.6	30.2
L203A	203	83mm ORIFICE	1.2	15.8
L203A	203	83mm ORIFICE	1.2	15.8
L211A	211	83mm ORIFICE	1.4	17.1

Tributary Area ID	Minor System Node	ICD Type	100yr Head (m)	100yr Flow (L/s)
L211B	211	94mm ORIFICE	1.5	22.6
L211C	211	83mm ORIFICE	1.4	17.0
L212A	212	94mm ORIFICE	1.7	23.9
L212A	212	94mm ORIFICE	1.7	23.9
L213A	213	94mm ORIFICE	1.6	23.4
L213A	213	94mm ORIFICE	1.6	23.4
L214A	214	94mm ORIFICE	1.7	23.7
L214A	214	94mm ORIFICE	1.7	23.7
L216A	216	178mm ORIFICE	2.2	93.5
L218A	218	94mm ORIFICE	1.6	23.1
L218A	218	94mm ORIFICE	1.6	23.1
L218B	218	83mm ORIFICE	1.6	18.3
L218B	218	83mm ORIFICE	1.6	18.3
L219A	219	94mm ORIFICE	1.6	23.2
L219A	219	94mm ORIFICE	1.6	23.2
L219C	219	108mm ORIFICE	1.6	30.8
L219C	219	108mm ORIFICE	1.6	30.8
L220A	220	94mm ORIFICE	1.0	18.3
L220A	220	94mm ORIFICE	1.0	18.3



Stantec

Stantec Consulting Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

Legend

L202A	AREA ID
0.60	RUNOFF COEFFICIENT
1.13	STORM DRAINAGE AREA ha.
	STORM DRAINAGE BOUNDARY
	EXISTING/FUTURE STORM DRAINAGE BOUNDARY
L202A 1.13 0.60	EXISTING/FUTURE MINOR DRAINAGE AREA
	DIRECTION OF MAJOR OVERLAND FLOW
	DIRECTION OF EMERGENCY OVERLAND FLOW
	PROPOSED STORM SEWER
	PROPOSED CATCHBASIN MANHOLE
	PROPOSED CATCHBASIN
	PROPOSED 1200mmX600mm DICB
	PROPOSED SUBDRAIN CATCHBASIN
	EXISTING/FUTURE STORM SEWER
	EXISTING/FUTURE CATCHBASIN MANHOLE
	EXISTING/FUTURE CATCHBASIN
	EXISTING/FUTURE SUBDRAIN CATCHBASIN
	CIRCULAR ORIFICE (SEE ICD TABLE SD-1)
	THERMAL INSULATION AS PER CITY STD W22.
FF=99.99	FINISHED FIRST FLOOR ELEVATION
TF=99.84	TOP OF FOUNDATION WALL ELEVATION
USF=97.14	UNDERSIDE OF FOOTING ELEVATION
MUSF=97.00	MINIMUM UNDERSIDE OF FOOTING ELEVATION

Notes

1. THE PROPOSED UNITS WITHIN BLOCKS 8 TO 15 WILL HAVE NO BASEMENTS. CLAY IS TO BE USED AS BACKFILL ADJACENT TO THE FOUNDATION AND THE UNITS WILL NOT HAVE FOUNDATION DRAINAGE AS PER GEOTECHNICAL REPORT SECTION 6.1.
2. FUTURE UNDERGROUND INFRASTRUCTURE ON DARJEELING AVENUE, STORM SEWERS, TO BE CONSTRUCTED BY OTHERS AND WILL BE EXISTING PRIOR TO CONSTRUCTION OF SNTC LANDS.
3. ALL MAINTENANCE HOLES LOCATED IN PONDING AREAS SHALL HAVE WATER TIGHT FRAME AND COVER AS PER CITY STD S24, S24.1 AND S25. COVERS AS PER S24 AND S24.1 SHALL BE COMPLETE WITH 25mmø APPROVED RUBBER PLUG. STORM MH'S 201, 207, 208, 209, 213, 214, 218, FUT/EX 10000 AND FUT/EX 106. SANITARY MH'S 101, 108, 112, AND FUT/EX 22.

		By	Appd.	YY.MM.DD
5	REVISED AS PER CITY COMMENTS	MJS	AMP	20.11.06
4	REVISED AS PER CITY COMMENTS	MJS	AMP	20.10.22
3	REVISED AS PER CITY COMMENTS	MJS	AMP	20.09.09
2	REVISED AS PER CITY COMMENTS	MJS	AMP	20.07.10
1	ISSUED TO CITY FOR REVIEW	MJS	AMP	20.02.20

Revision

File Name: 160401085-SD.dwg	MJS	KS	MJS	20.01.02
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

LICENSED PROFESSIONAL ENGINEER
A.M. PAEREZ FERNANDEZ
100105130
2020-11-06
PROVINCE OF ONTARIO

Client/Project

NEPEAN TOWN CENTRE DEVELOPMENT CORPORATION

SNTC LANDS

OTTAWA, ON, CANADA

Title

ULTIMATE CONDITION STORM DRAINAGE PLAN

Project No. 160401085

Scale 1:750 (0, 7.5, 22.5, 37.5m)

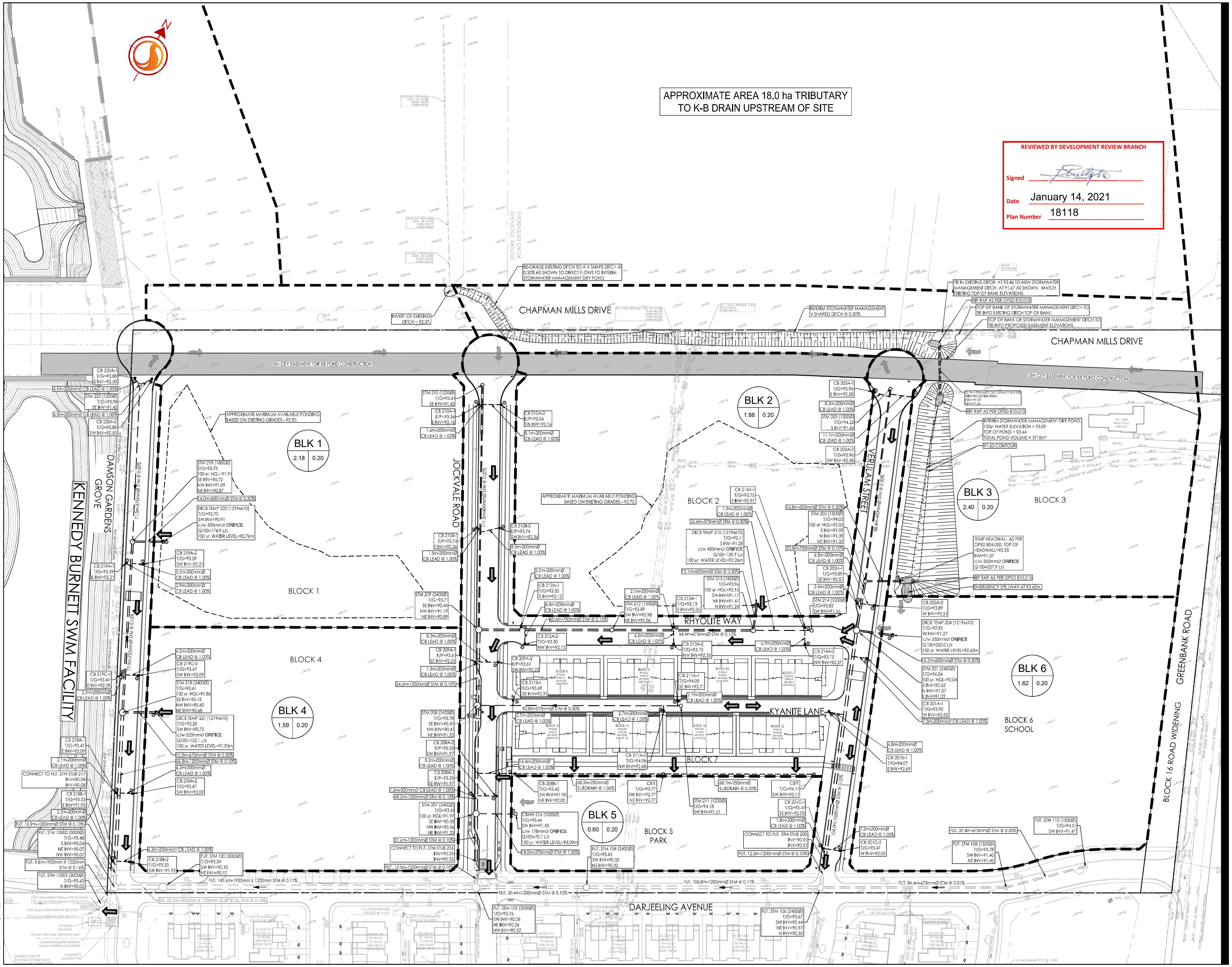
Drawing No. SD-1

Sheet 21 of 31

Revision 5

D07-16-19-0015

PLAN # 18118



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Legend

L202A — AREA ID
1.13 — INTERIM STORM DRAINAGE AREA ha.
0.60 — RUNOFF COEFFICIENT
INTERIM STORM DRAINAGE BOUNDARY
DIRECTION OF MAJOR OVERLAND FLOW
DIRECTION OF EMERGENCY OVERLAND FLOW
PROPOSED STORM SEWER
PROPOSED CATCHBASIN MANHOLE
PROPOSED CATCHBASIN
PROPOSED 1200mmX600mm DICB
PROPOSED SUBDRAIN CATCHBASIN
EXISTING/FUTURE STORM SEWER
EXISTING/FUTURE CATCHBASIN MANHOLE
EXISTING/FUTURE CATCHBASIN
EXISTING/FUTURE SUBDRAIN CATCHBASIN
CIRCULAR ORIFICE (SEE SEE ICD TABLE SD-1)
THERMAL INSULATION AS PER CITY STD W22.

FF=99.99 FINISHED FIRST FLOOR ELEVATION
TF=99.84 TOP OF FOUNDATION WALL ELEVATION
USF=97.14 UNDERSIDE OF FOOTING ELEVATION
MUSF=97.00 MINIMUM UNDERSIDE OF FOOTING ELEVATION

INTERIM ICD TABLE

STRUCTURE ID	BLOCK ID	ICD TYPE	MAX HEAD (m)	Q 100YR. FLOW (L/s)
DICB TEMP 222	BLOCK 1	300mmØ ORIFICE	1.85	174.9
DICB TEMP 221	BLOCK 4	525mmØ ORIFICE	1.21	152.1
DICB TEMP 215	BLOCK 2	450mmØ ORIFICE	0.98	139.7
TEMP HEADWALL	BLOCK 3	350mmØ ORIFICE	1.72	257.9
DICB TEMP 204	BLOCK 6	350mmØ ORIFICE	1.38	200.0
CBMH 216	BLOCK 5	178mmØ ORIFICE	1.66	70.1

Notes

1. ROUGH GRADING TO BE DONE IN BLOCKS 1, 2, 3, 4, 5, AND 6 TO ENSURE POSITIVE DRAINAGE TOWARDS INTERIM DICB'S.
2. ALL MAINTENANCE HOLES LOCATED IN PONDING AREAS SHALL HAVE WATER TIGHT FRAME AND COVER AS PER CITY STD S24, S24.1 AND S25. COVERS AS PER S24 AND S24.1 SHALL BE COMPLETE WITH 25mmø APPROVED RUBBER PLUG. STORM MH'S 201, 207, 208, 209, 213, 214, 218, FUT/EX 10000 AND FUT/EX 106. SANITARY MH'S 101, 108, 112, AND FUT/EX 22.
3. APPROXIMATE AVAILABLE PONDING CONTOUR IN BLOCKS 1 AND 2 OBTAINED FROM EXISTING GRADES.

		By	Appd.	YY.MM.DD
5	REVISED AS PER CITY COMMENTS	MJS	AMP	20.11.06
4	REVISED AS PER CITY COMMENTS	MJS	AMP	20.10.22
3	REVISED AS PER CITY COMMENTS	MJS	AMP	20.09.09
2	REVISED AS PER CITY COMMENTS	MJS	AMP	20.07.10
1	ISSUED TO CITY FOR REVIEW	MJS	AMP	20.02.20

Revision

File Name: 160401085-SD.dwg	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	MJS	KS	MJS	20.01.02

Permit-Seal

LICENSED PROFESSIONAL ENGINEER
A.M. PAEREZ FERNANDEZ
100105130
2020-11-06
PROVINCE OF ONTARIO

Client/Project

NEPEAN TOWN CENTRE DEVELOPMENT CORPORATION

SNTC LANDS

OTTAWA, ON, CANADA

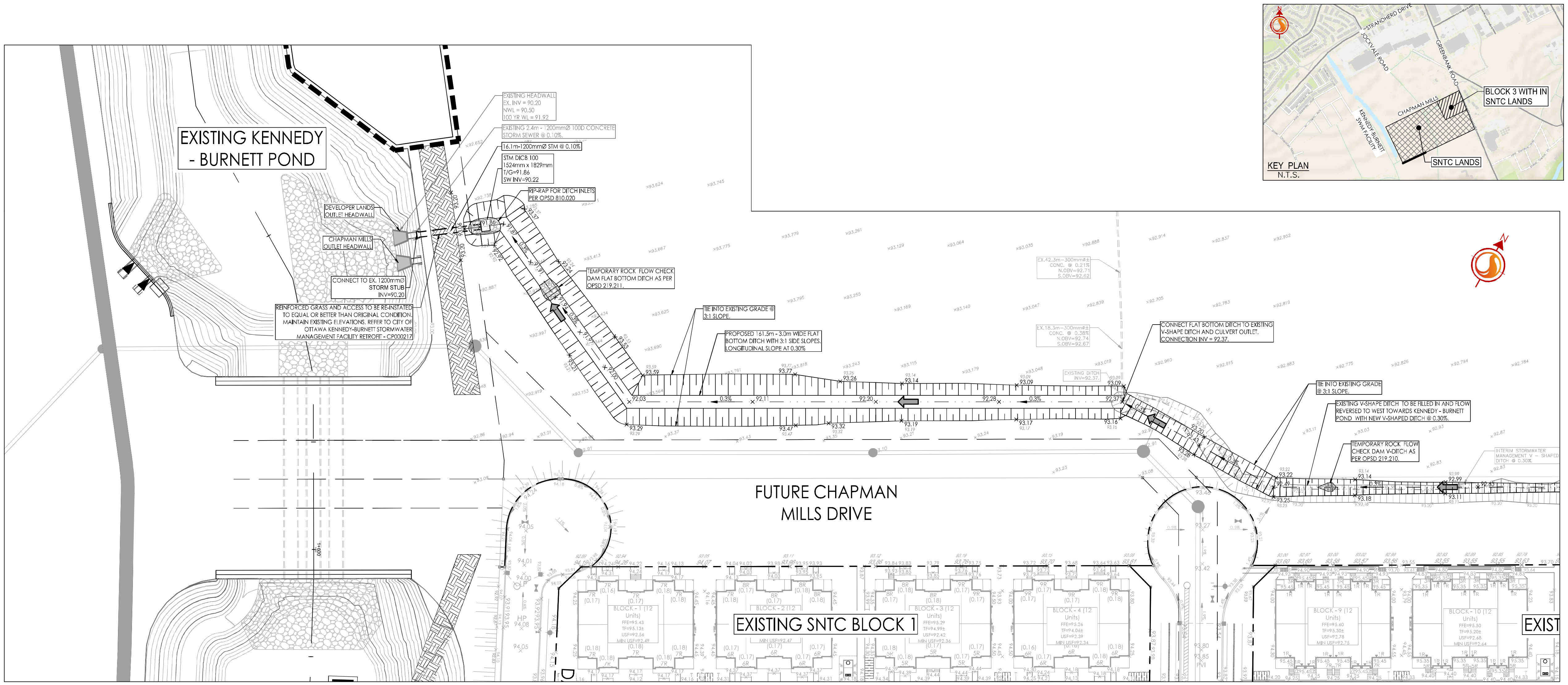
Title

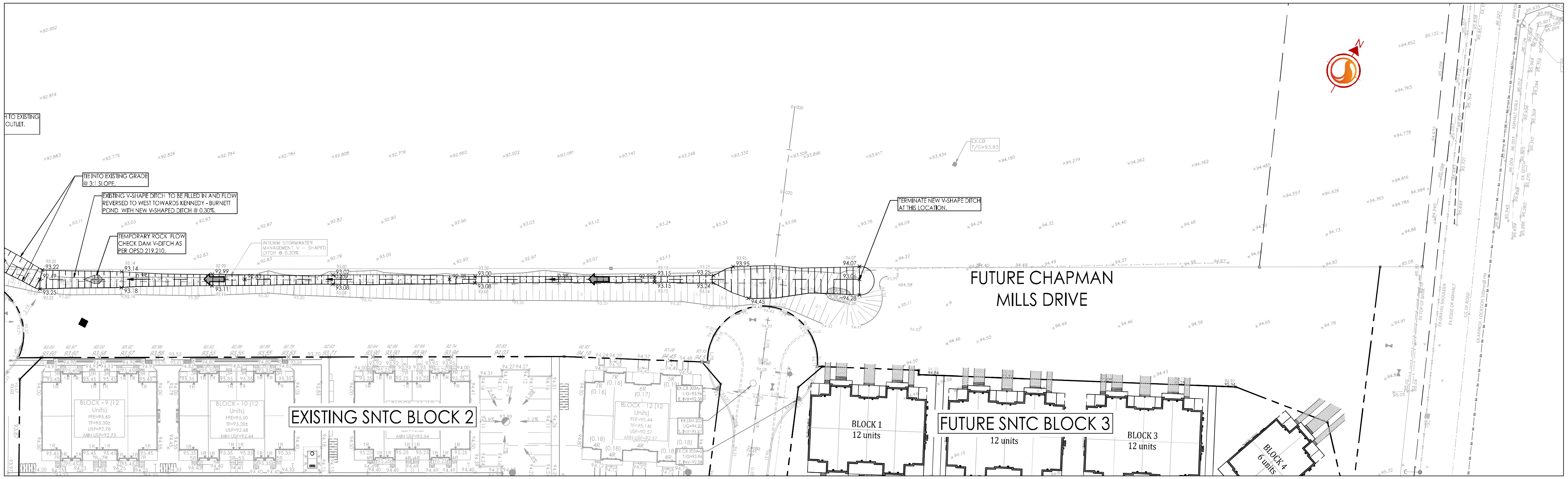
INTERIM STORM DRAINAGE PLAN

Project No. 160401085
Scale 1:750
Drawing No. SD-2
Sheet 22 of 31
Revision 5

D07-16-19-0015

PLAN # 18118





Stantec

Stantec Consulting Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
Tel. 613.722.4420
www.stantec.com

Legend

- ORIGINAL GROUND ELEVATION
- PROPOSED ELEVATION
- PROPOSED LOT CORNER ELEVATION / EXISTING ELEVATION AT LOT CORNER
- FLOW DIRECTION AND GRADE
- TERRACING 3:1 SLOPE MAXIMUM (UNLESS OTHERWISE SHOWN)
- DIRECTION OF OVERLAND FLOW
- PROPOSED DITCH

Notes

3	REVISED AS PER CITY COMMENTS	MJS	KS	24.04.02
2	REVISED AS PER CITY COMMENTS	MJS	KS	24.03.05
1	ISSUED FOR REVIEW	WAJ	KS	23.08.15
Revision		By	Appd.	YY.MM.DD

File Name: 160401845 Ditch Relocation.dwg	MJS	KS	MJS	23.06.08
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
NEPEAN TOWN CENTRE DEVELOPMENT CORPORATION
2934 BASELINE ROAD, SUITE 302, OTTAWA, ON, K2H 1B2
PH: (613) 518-1864
SNTC LANDS
BLOCK 3
OTTAWA, ON

Title
INTERIM DITCH RE-ALIGNMENT

Project No. 160401845 | Scale 1:500

Drawing No. DTCH-1 | Sheet 1 of 1 | Revision 3

ORIGINAL SHEET - ARCH D

C.4 Correspondence on Chapman Mills Transitway Expansion

From:	Chamberlain, Gordon
To:	Smadella, Karin
Cc:	Boulet, Jessie; Patrick Duquette
Subject:	RE: Coordination between Greenbank Road Southwest Transitway Extension Project and 900 Chapman Mills Drive Site Plan Design
Date:	Wednesday, June 26, 2024 7:04:39 AM
Attachments:	RE Phase 3 Pre-con Circulation - 900 Chapman Mills - PC2024-0135.msg image001.png

Hi Karin:

As discussed, and per attached email review of your previous submission received through the City - Development Review, we are coordinating the design of Greenbank Realignment and Southwest Transitway Extension with adjacent developments, including the site design for 900 Chapman Mills Drive.

We note the Uncontrolled design flows from the 900 Chapman Mills Drive site plan development (areas identified in orange below) are being considered as part of the of the stormwater management design for the GRSTWE project.

Let us know if anything further is required.

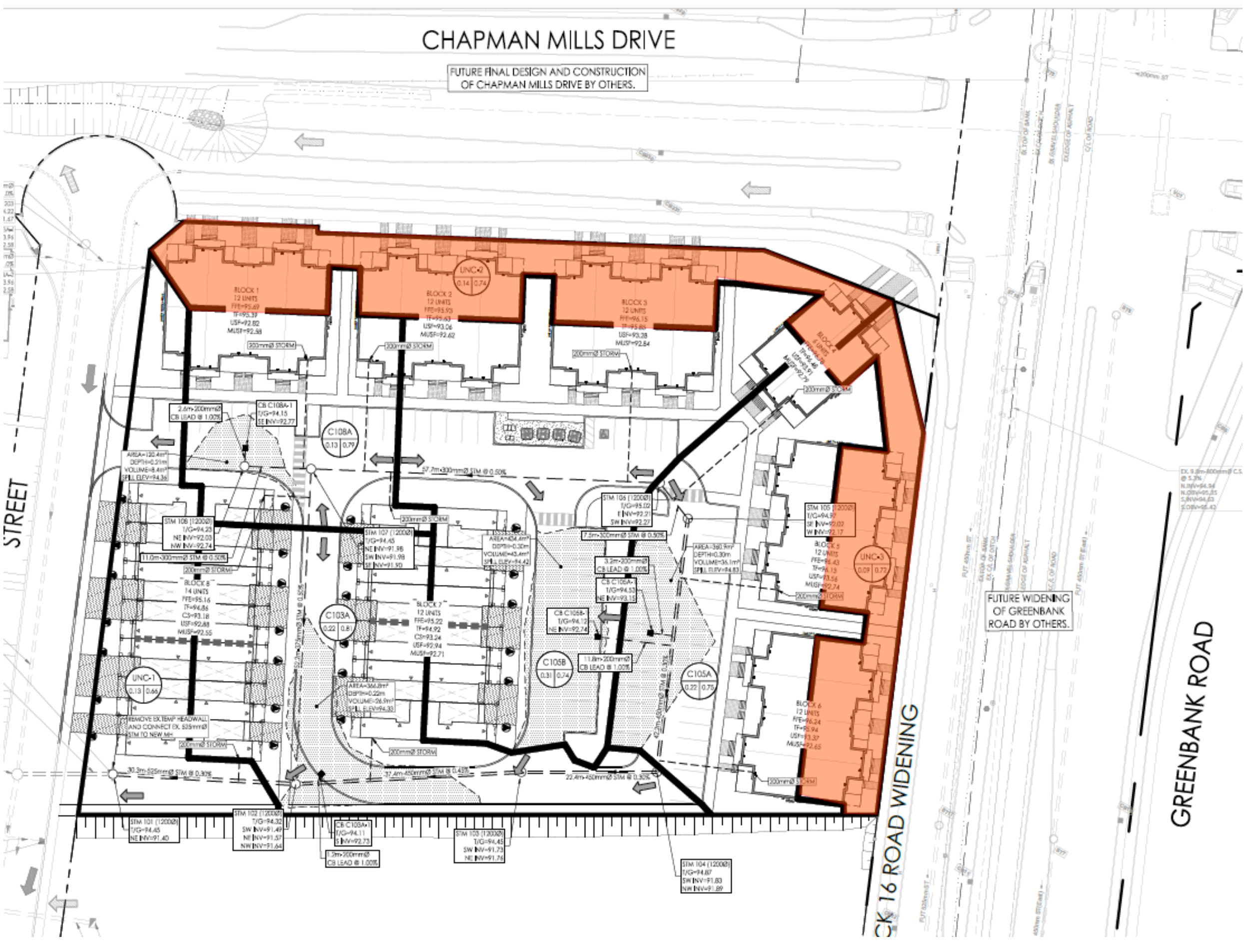
Gordon Chamberlain P. Eng
Principal, Transportation

Direct: 613 724-4390
Mobile: 613 290-4078
gordon.chamberlain@stantec.com

Stantec
300-1331 Clyde Avenue
Ottawa ON K2C 3G4

From: Smadella, Karin <Karin.Smadella@stantec.com>
Sent: Tuesday, June 25, 2024 4:14 PM
To: Chamberlain, Gordon <gordon.chamberlain@stantec.com>
Subject: RE: Coordination between Greenbank Road Southwest Transitway Extension Project and 900 Chapman Mills Drive Site Plan Design

Hi Gord – Please see below. These would be the front yards facing Chapman Mills and Greenbank as well as the front portion of the respective roof areas. These areas are being accounted for as part of the GRSTWE swm design.



Thanks,

Karin

Karin Smadella, P.Eng.

From:	Chamberlain, Gordon
To:	Duquette, Patrick (Design and Construction); Kelly, Siobhan
Cc:	Boulet, Jessie; Smadella, Karin
Subject:	RE: Phase 3 Pre-con Circulation - 900 Chapman Mills - PC2024-0135
Date:	Friday, April 26, 2024 4:00:00 PM
Attachments:	image001.png 2024-04-03 - Site Servicing Plan - PC2024-0135.240426.pdf 2024-04-03 - Grading Plan - PC2024-0135.240426.pdf

Hi Patrick:

This email is to confirm that we have reviewed the files for 900 Chapman Mills as provided by Development Review and note the following from the GRSWTE project perspective:

- The plans provided reflect/recognize the proposed property lines identified by GRSWTE at this time, however actual GRSWTE ROW requirements will be subject to GRSWTE detail design refinements (such as Traffic Signals, Utilities) which we can not confirm at this time.
- The plans reflect the current GRSWTE proposed alignment of relocated Hydro Ottawa overhead (and/or underground) lines in plan. Other utilities are anticipated to use these poles (Bell, Rogers).
- We have a minor concern with the proposed location of sidewalk connections from Block 4 to the GRSWTE sidewalks in that they will need to be coordinated with traffic signals and other utility plant typically located in these corners.
- There are no service connections to the GRSWTE corridor identified (all from Verulam Street), so no concerns/coordination required at this time.
- Grading provided generally appears to be coordinated with the GRSWTE Preliminary Design grading.

We will continue to coordinate GRSWTE works with the 900 Chapman Site, in the background and Formally through this ongoing correspondence.

Should you have any questions, please do not hesitate to ask.

Gordon Chamberlain P. Eng
Principal, Transportation

Direct: 613 724-4390
Mobile: 613 290-4078
gordon.chamberlain@stantec.com

Stantec
300-1331 Clyde Avenue
Ottawa ON K2C 3G4

From: Duquette, Patrick (Design and Construction) <Patrick.Duquette@ottawa.ca>
Sent: Wednesday, April 17, 2024 8:12 AM

To: Boulet, Jessie <Jessie.Boulet@stantec.com>
Cc: Chamberlain, Gordon <gordon.chamberlain@stantec.com>
Subject: FW: Phase 3 Pre-con Circulation - 900 Chapman Mills - PC2024-0135

Hi Jessie,

We received the following submission from Mattamy for 900 Chapman Mills. I’ve downloaded the documents and uploaded them to Vision under the Developer Plans folder.

Can you please review and let me know if you have any comments.

Thanks,
Patrick

From: Kelly, Siobhan <siobhan.kelly@ottawa.ca>
Sent: Friday, April 12, 2024 11:27 AM
To: Adams, Reed <reed.adams@ottawa.ca>; Giampa, Mike <Mike.Giampa@ottawa.ca>; Elliott, Mark <mark.elliott@ottawa.ca>; Richardson, Mark <Mark.Richardson@ottawa.ca>; Copestake, Martha <Martha.Copestake@ottawa.ca>; Smith, Molly <molly.smith@ottawa.ca>; Urban Design/Conception Urbaine <UrbanDesign@ottawa.ca>; Krabicka, Jeannette <Jeannette.Krabicka@ottawa.ca>; Stow, Nick <Nick.Stow@ottawa.ca>; Redpath, Tara <Tara.Redpath@ottawa.ca>; Permit Approvals Branch /Direction Approbations de Permis <PAB_DAP@ottawa.ca>; Martin, Marcia <Marcia.Martin@ottawa.ca>; Karunaratne, Ruvini <Ruvini.Karunaratne@ottawa.ca>; ERU /UAE <ERU-UAE@ottawa.ca>; Sedaghatjahromi, Saeid <saeid.sedaghatjahromi@ottawa.ca>; Laplante, André <Andre.Laplante@ottawa.ca>; TMconstruction <TMconstruction@ottawa.ca>; Utility Circulations <UtilityCirculations@ottawa.ca>; Duquette, Patrick (Design and Construction) <Patrick.Duquette@ottawa.ca>
Cc: Kelly, Siobhan <siobhan.kelly@ottawa.ca>; Scaramozzino, Tracey <Tracey.Scaramozzino@ottawa.ca>
Subject: Phase 3 Pre-con Circulation - 900 Chapman Mills - PC2024-0135

Good morning,

We received a Phase 3 pre-app consultation submission for **900 Chapman Mills**. Mattamy Homes is applying for site plan control approval to facilitate the development of rear lane and back-to-back townhouse dwellings (68 units total).

The goal of this review is to ensure the information and materials submitted are complete per the City’s Terms of References or Guidelines, consistent with one another, and have enough information to allow a proper application processing during the formal application review.

The submission materials are available on SharePoint:
PC2024-0135

Please provide comments directly in the Feedback Form saved on SharePoint folder linked above. The deadline for comments is **Friday, April 26 2024.**

Let me know if you have any questions.

Siobhan Kelly
Planner I | Urbaniste I
Development Review - South | Examen des demandes d'aménagement - sud
Planning, Real Estate and Economic Development Department | Département de la planification, de l’immobilier et du développement économique
City of Ottawa | Ville d'Ottawa
613.580.2424 ext./poste 27337
ottawa.ca/planning / ottawa.ca/urbanisme

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