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Site Servicing Report

105, 4051, 4050 Sencha Terrace & 2 Unaddressed Parcels

Prepared for: Claridge Homes (South Nepean) Inc.

SITE SERVICING REPORT

105, 4051, 4050 Sencha Terrace and 2 Unaddressed Parcels

Prepared By:

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September 20, 2021

Novatech File: 121116
Ref: R-2021-127

NOVATECH
Engineers, Planners & Landscape Architects

September 20, 2021

City of Ottawa
Planning, Infrastructure and Economic Development Department
Planning Services Branch
110 Laurier Ave. West, 4th Floor
Ottawa, Ontario
K1P 1J1

Attention: **Tracey Scaramozzino, Planner II**

Reference: **Site Servicing Report – 105, 4051, 4050 Sencha Terrace & 2 Unaddressed Parcels**
Novatech File No.: 121116

Novatech has prepared this Site Servicing Report on behalf of Claridge Homes (South Nepean) Inc. to support a Zoning By-law Amendment application for several parcels known municipally as 105, 4051, 4050 Sencha Terrace & 2 Unaddressed Parcels. Claridge Homes (South Nepean) Inc.

This report will provide an analysis of the existing infrastructure surrounding the site to ensure there is adequate capacity for the proposed development and show conceptual servicing for the blocks.

Should you have any questions or comments, please do not hesitate to contact us.

Sincerely,

NOVATECH

Steve Zorgel, P.Eng.

Project Coordinator, Land Development

Encl.

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1.0 INTRODUCTION

Novatech was retained by Claridge Homes (South Nepean) Inc. to prepare a Site Servicing Report in support of a Zoning By-law Amendment application to allow for the development with greater height than what is currently permitted on the properties municipally known as 105, 4051, 4050 Sencha Terrace & 2 Unaddressed Parcels (Subject Site). As part of the Zoning By-Law Amendment this report will provide an analysis of the existing infrastructure surrounding the site to ensure there is adequate capacity for the proposed development and show conceptual servicing for the blocks.

1.1 Site Location and Local Context

The Subject Site forms part of the Burnett Lands Subdivision by Claridge Homes (South Nepean) Inc. (City File No. D07-16-17-000), which is approximately 15.6 hectares in total on the west side of Greenbank Road and north of the Jock River. The subdivision was draft plan approved on June 12, 2020. and is currently under development for new roads and services to support residential dwellings. The subdivision was approved for a development of 430 townhouse/condominium units, and 225 retirement home units.

The lands within the Burnett Lands Subdivision that are subject to this application are the future development blocks along the frontage of the future Greenbank Road realignment (i.e. Blocks 11, 12, 15, 16, 19, 20, and 24).

The Subject Site is surrounded by the following:

- Vacant land and future residential uses (referred to as the 'Caivan Lands' – City File No. D07-16-19-0015) to the north,
- Jock River to the south,
- St. Joseph Catholic High School and residential uses to the east, and
- Future residential uses under development by Claridge to the west.

The block of Caivan Lands immediately to the north of the Subject Site are zoned Institutional and Mixed Use. It is understood that the Block is being reserved for a future school.

When Greenbank Road is re-aligned to run through the site, it is understood that the 'old' Greenbank Road will remain as a local road to provide access to the school. South of the site is a large open space block and the Jock River as shown on **Figure 1**-Keyplan.

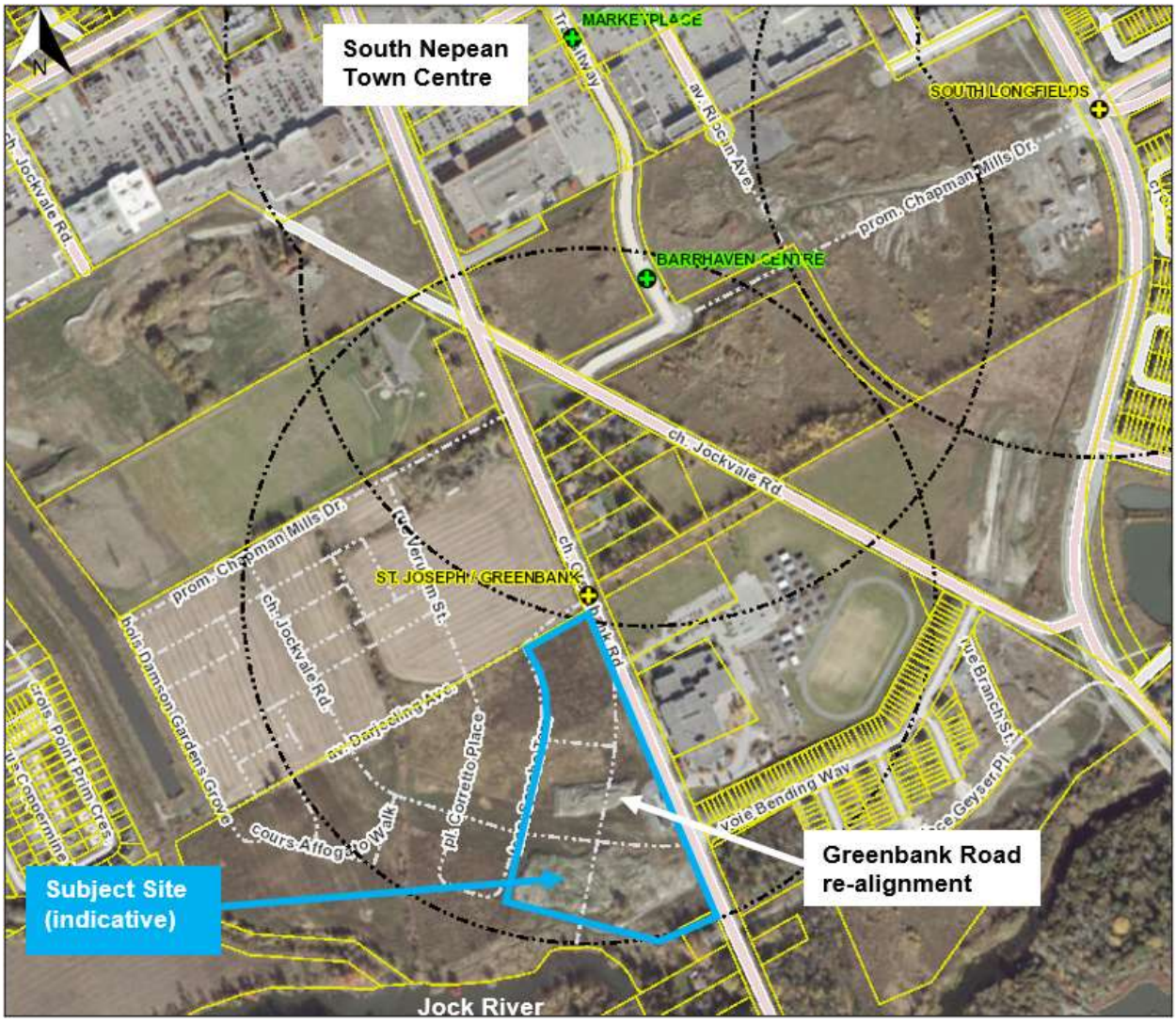
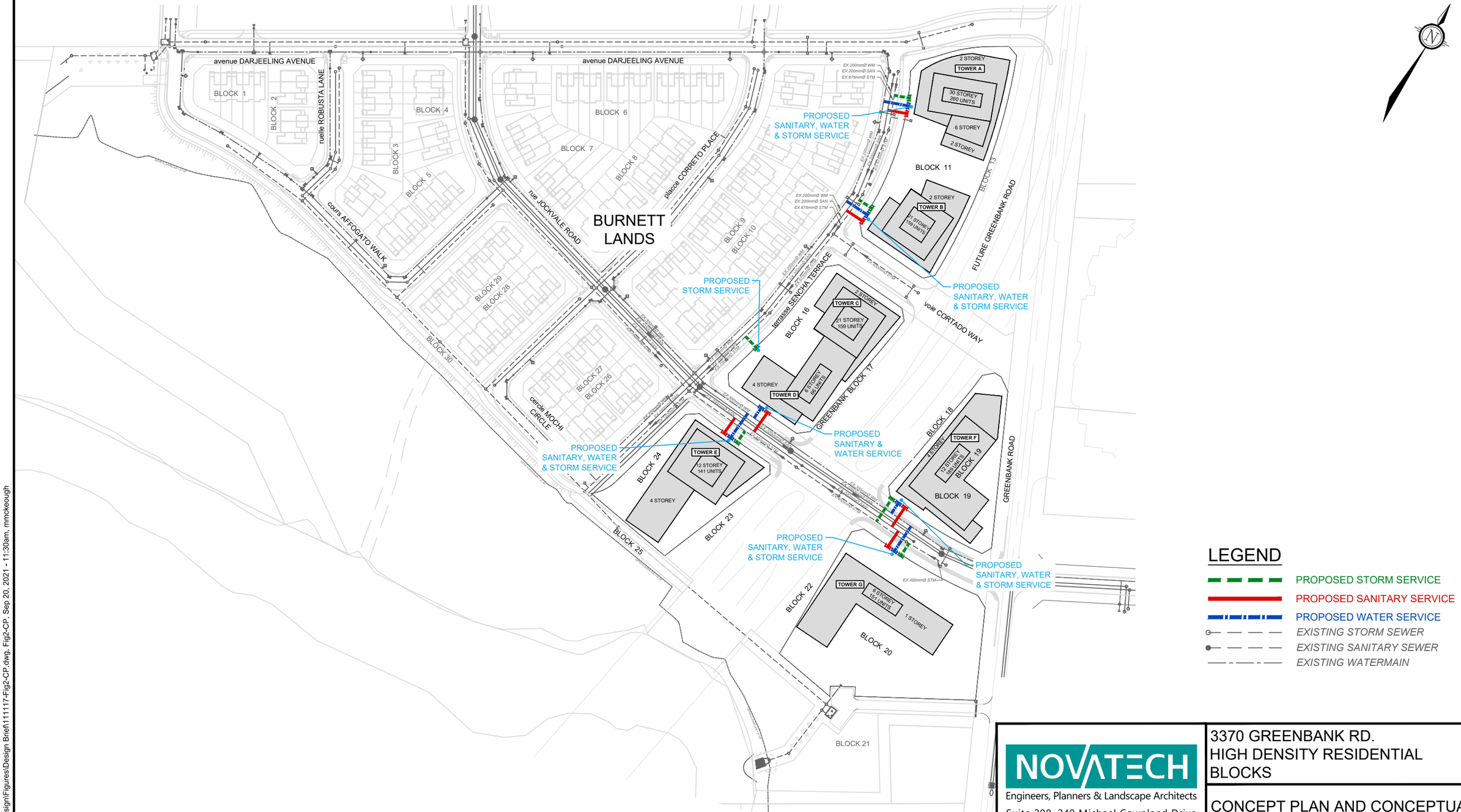


Figure 1: Keyplan - Subject site and surrounding area.

Plans are to develop high density residential apartment buildings as shown on **Figure 2** – Concept Plan and Conceptual Servicing Layout, which will consist of 1125 apartment units.



LEGEND

- PROPOSED STORM SERVICE
- PROPOSED SANITARY SERVICE
- PROPOSED WATER SERVICE
- *EXISTING STORM SEWER*
- *EXISTING SANITARY SEWER*
- *EXISTING WATERMAIN*

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3370 GREENBANK RD. HIGH DENSITY RESIDENTIAL BLOCKS

CONCEPT PLAN AND CONCEPTUAL SERVICING LAYOUT

SCALE 1 : 2000 (0, 20, 40, 60, 80)

DATE SEPT 2021 | JOB 121116 | FIGURE FIGURE 2

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1.2 Additional Reports

This report provides information on the considerations and approach by which Novatech has designed and evaluated the proposed servicing within the Burnett Lands and high-density residential blocks. This report should be read in conjunction with the following:

- *Burnett Lands Stormwater Management Report (Novatech, October 9, 2020, Ref: R-2020-083);*
- *Burnett Lands, 3370 Greenbank Road, Detailed Noise Control Study, (Novatech, Ref: R-2020-084);*
- *Kennedy-Burnett Stormwater Management Facility Retrofit, Detailed Design Report, (Novatech, June 29, 2020, Ref: R-2019-219);*
- *South Nepean Town Centre (SNTC), Site Servicing and Stormwater Management Report, prepared by Stantec, dated February 20, 2020, Ref: 160401085;*
- *South Nepean Collector Sewer Alignment & Finalization Report – Phase 2, prepared by Novatech, dated December 2014;*
- *South Nepean Collector: Phase 2, Hydraulics Review/Assessment, Technical Memorandum, prepared by Novatech, dated August 20, 2015*
- *South Nepean Collector Sewer– Phase 2, Preliminary Design Report, prepared by Novatech, dated March 2, 2016;*
- *Hydrology Report – July 2004: Jock River Flood Risk Mapping (within the City of Ottawa) prepared by the Rideau Valley Conservation Authority, dated July 2004;*
- *Jock River Reach 1 Subwatershed Study and Barrhaven South Master Servicing Study;*
- *Hydraulics Report – November 2004: Jock River Flood Risk Mapping (within the City of Ottawa) prepared by the Rideau Valley Conservation Authority, dated November 2004;*
- *Kennedy-Burnett Potable Water Master Servicing Study, by Stantec, dated April 29, 2014;*
- *Greenbank (Burnett Municipal Drain) Headwaters Report, prepared by Bowfin Environmental Consulting and Muncaster Environmental Planning Inc., dated March 2016;*
- *Geotechnical Investigation Proposed Residential Development Burnett Lands, Greenbank Road at the Jock River, Ottawa Ontario, Prepared by Golder Associates Ltd., dated December 2016 (Report No. 1523044-1000;*
- *Technical Memorandum, Tree Setback Recommendations, Burnett Lands Residential Development, 3370 Greenbank Road, Ottawa, ON, Prepared by Golder Associates Ltd., dated November 20, 2018 Report No.: 1523044-1100;*
- *Addendum No.1, Geotechnical Investigation, Proposed Residential Development, Burnett Lands, Greenbank Road at the Jock River, Ottawa, ON, Prepared by Golder Associates Ltd., dated May 22, 2020, Report No.: 20145094;*

1.3 Consultations and Approvals

There have been multiple consultations with the City of Ottawa, the Ministry of the Environment (MOE) and the Rideau Valley Conservation Authority (RVCA) regarding the proposed development under the title Burnett Lands, 3370 Greenbank Road, Ottawa File No.: D07-16-17-0001

MOE

The MOE was contacted with respect to Burnett Lands and issued the following Environmental Compliance Approval for the sanitary and storm sewers and stormwater management structures (oil/ grit separators) included in **Appendix D**:

- ECA Number 5210-BWT783, dated January 8th, 2021

RVCA

The RVCA was contacted with respect to Burnett Lands and issued the following RVCA permit letters included in **Appendix D**:

- Permit No. RV5-3820-Alteration to a Watercourse Under Section 28 of the Conservation Authorities Act for the filling in of the watercourse formerly known as the Burnett Municipal Drain, at 3370 Greenbank Road, Lot 13, Concession 3, former Township of Nepean, now in the City of Ottawa.
- Permit No. RV5-3720-Development Under Section 28 of the Conservation Authorities Act for a balance cut and fill, at 3370 Greenbank Road, Lot 13, Concession 3, former Township of Nepean, now in the City of Ottawa.
- ECA Clearance Letter-The RVCA was contacted with respect to Burnett Lands subdivision design and stormwater management and issued an email, dated November 26, 2020, included in **Appendix D** stating no objections.

2.0 EXISTING CONDITIONS

2.1 Topography & Drainage

The Subject Site is currently undeveloped and consists of open space. Access to the site is currently provided at Greenbank Road via Darjeeling Avenue and a temporary haul road at Jockvale Road. The site has a gentle slope from northeast to southwest, with most overland flow being directed towards the Jock River.

2.2 Subsurface Conditions

Paterson Group has completed a geotechnical investigation in support of the proposed development. The report is titled "Geotechnical Investigation, Proposed Multi-Storey Buildings, 3370 Greenbank Road, Ottawa Ontario, dated August 12, 2021 (Report No. PG5705-2)." The fieldwork for this investigation was carried out between June 28, 2021 to July 9, 2021. Previous geotechnical investigations were also conducted at the subject site by others in 2015 and 2016 consisting of a total of 7 boreholes which were advanced to a maximum depth of 9.3m below existing ground surface. The principal findings of the Geotechnical Investigation are as follows:

- The subsurface profile encountered at the test hole locations consists of topsoil underlain by a silty clay deposit and glacial till deposit. An approximate 0.9 to 1.1 m thick fill layer was observed at surface at boreholes BH 6-21 and BH 7-21. The fill material was generally observed to consist of brown silty clay with sand and trace amounts of gravel and topsoil.

- A hard to very stiff, brown silty clay was generally observed underlying the topsoil in all boreholes with the exception of borehole BH 1-21, BH 6-21, BH 7-21, BH 15-7, and BH 15-17 within the southeast corner of the site. The thickness of the silty clay deposit generally increases from east to west across the site, extending to approximate depths ranging from 0.6m at boreholes BH 5-21 within the eastern half of the site, to 3.0m at borehole BH 12-21 at the western half of the site.
- The glacial till deposit was encountered in all boreholes and was generally observed to consist of a brown to grey, silty sand to silty clay with gravel, cobbles, and boulders.
- Bedrock was cored at boreholes BH 1-21, BH 2-21, BH 8-21, and BH 10-21 through BH 13-21, and was encountered at approximate depths ranging from 5.6m at borehole BH1-21 within the southeast corner of the site, to 9.7m at borehole BH 10-21 at the northwestern corner of the site
- The bedrock was observed to consist of grey dolostone interbedded with grey limestone and sandstone and was generally of fair to excellent quality based on the RQDs of the bedrock core. The bedrock was cored to approximate depths ranging from 9.3 to 17.8 m below the existing ground surface.
- The long-term groundwater level is anticipated at a depth of approximately 2.5m to 3.5m below ground surface and are subject to seasonal fluctuations.

3.0 SANITARY SERVICING

3.1 Previous Studies and Existing Sanitary System

As per the South Nepean Collector Functional Design Update (FDU) prepared by Dillon Consulting (July 2012), the South Nepean Collector (SNC) has been sized to accommodate the peak sanitary flows from the proposed Burnett Lands development including Blocks 11, 16, 19, 20 and 24. Refer to **Figure 1**, Existing Sanitary Network and Collection Areas, and Table 5.1, Allocation of Commercial/Institutional and Residential Demands to SNC by Collection Area, of the FDU, located in **Appendix B**. The noted figure and table confirm the development is located within the Sanitary Drainage Area 8A of the SNC.

A technical memorandum updating the sanitary design flows for Phase 2 of the SNC was prepared in August 2015 by Novatech. Design flows were updated to reflect current day operation and future development peak design flows. Excerpts can be found in **Appendix B**.

The SNC was completed in the spring of 2017 and currently runs along Jockvale Road through the Burnett Lands.

3.2 Proposed Sanitary Sewer Outlet

All the high-density residential blocks will outlet into the SNC at existing manhole 28 at the Jockvale Road/ Sencha Terrace intersection. The proposed outlet (SNC) is consistent with the SNC report and approved Burnett Lands reports listed in Section 1.2.

3.3 Design Criteria

The design criteria used to determine the sanitary flows for the Burnett Lands are based on the City of Ottawa's sewer design guidelines (2012) and Technical Bulletin ISTB-2018-01 and are as follows:

- Residential Average Flow = 280L/capita/day

- Residential Peaking Factor = Harmon Equation (max peaking factor = 4.0)
- Institutional Demand = 28,000L/gross ha/day
- Institutional Peaking Factor = 1.5 (if ICI in contributing area >20%), 1.0 (if ICI in contributing area <20%)
- Peak Extraneous Flows (Infiltration) = 0.33L/s/ha
- Population Density = 2.7 people/townhouse, 1.8 people/apartment
- Minimum Pipe Slope (200mm/250mm) = 0.32% / 0.24%
- Minimum Full Flow Velocity = 0.6m/s
- Maximum Full Flow Velocity = 3.0m/s.

3.4 Proposed Sanitary System

It is proposed Block 11 will outlet to Sencha Terrace sanitary sewer and the remainder of the high-density residential blocks will outlet to the sanitary sewer on Jockvale Road.

Details of the service sizes will be confirmed at the site plan stage. Conceptually, servicing layout and connection points have been shown on **Figure 2** – Concept Plan and Conceptual Servicing Layout.

Proposed sanitary flows have been updated for the Burnett Lands based on revised unit counts within the high-density residential blocks.

Proposed sanitary flows versus the previously calculated sanitary flows in the SNC Technical memo (August 2015) are listed in **Table 3.1**

Table 3.1: Sanitary Flow Summary

	Proposed Burnett Lands including Subject Site	Previously Approved– SNC Technical Memo*
Area (ha)	9.74	9.74
Number of towns	157	-
Number of Apartment Units	1125	-
Population	2481	1577.9 (based on 162 persons/ha)
Peak Flow (L/s)	27.40**	19.9 ***

*Design Criteria as per *South Nepean Collector: Phase 2, Hydraulics Review/Assessment, Technical Memorandum, prepared by Novatech, dated August 20, 2015.*

**Peak Flow is based on the sum of 2 outlets on the sanitary design sheet for the Burnett Lands and current design standards. Refer to Appendix A for design sheets. Excludes flow from Caivan lands.

***Peak Flows are based on a peaking factor of 2.68 as per the *South Nepean Collector: Phase 2, Hydraulics Review/Assessment, Technical Memorandum, prepared by Novatech, dated August 20, 2015 and an infiltration rate of 0.28L/s/ha.*

There is an increase in the calculated peak sanitary design flow (7.50 L/s) to what was previously approved and accounted for within the Burnett Lands approved report, as shown in Table 3.1.

The sanitary sewers on Sencha Terrace and Jockvale Road can accommodate the increase in flows from these blocks and no upgrades are required for these sewers. For detailed calculations refer to the Sanitary Sewer Design Sheet located in **Appendix A**.

Since the calculated peak sanitary design flow from the Burnett Lands outletting to the SNC is more than what was previously approved under the Burnett Lands, a review of the spare capacity in the SNC was completed using as-built information of the SNC and flow under old and current

design criteria (listed in section 3.3). A summary of the previously calculated flows outletting to the SNC and the spare capacity in the system is summarized in Table 3.2.

Table 3.2: Capacity Summary

	Approved SNC Technical Memo (August 2015)	SNC Technical Memo (August 2015) under current standards****	As-built SNC capacity
Pipe Size mm	1050	1050	1050
Grade %	0.1	0.1	0.08
Sewer Capacity (L/s)**	901.0	901.0	806.2
Peak Design Flow (L/s)	489.7***	367.0****	

**As Built information is based on the City of Ottawa's South Nepean Collector (SNC) Sewer Phase 2- Strandherd Drive to Jockvale Road Drawing, dated September 27 2017.*

**Sewer Capacity is based on the sanitary design sheet and current design standards. Refer to Appendix A for design sheets.

****Peak Flows are based on a peaking factor of 2.68 as per the *South Nepean Collector: Phase 2, Hydraulics Review/Assessment, Technical Memorandum, prepared by Novatech, dated August 20, 2015 and an infiltration rate of 0.28L/s/ha.*

*****Peak Flows are based on current design criteria as per technical bulletin ISTB-2018-01 and has a peaking factor of 2.35 and an infiltration rate of 0.33L/s/ha

Table 3.2 shows the as-built capacity in the SNC within the Burnett lands as well as sanitary flow based on older and current City design criteria. Under current design criteria and Technical Bulletin ISTB-2018-01, the SNC sewer has increased in available capacity and the total available flow is 439.2 L/s.

There is an increase in the calculated peak sanitary design flow (7.50L/s), which represents 1.7% of the available capacity in the SNC sewer. It is anticipated that this will have minimal impact on the operation and performance of the SNC sewer. The SNC can accommodate the increase in flow from the Burnett Lands and no upgrades are required to the existing SNC system.

4.0 WATERMAIN

4.1 Previous Studies

4.1.1 Stantec Potable Water Assessment

Stantec consulting was retained to analyze the regional-level impact of developments in the area including the Burnett Lands. Their report, *Kennedy-Burnett Potable Water Master Servicing Study* (April 29, 2014) proposed a backbone watermain through the Burnett Lands Development with 2 connections to adjacent developments. At the southeast limits, the watermain will connect to a future 300mm watermain (by others) located within Jockvale Road and current Greenbank Road intersection. At the northwest limits of the site, the watermain will connect to a future 300mm watermain located at the Darjeeling Avenue / Jockvale Road intersection. A backbone watermain along the realigned Greenbank Road was proposed connecting the Burnett Lands at Greenbank Road / Jockvale Road to the Caivan Lands at Chapman Mills / Greenbank Road providing additional looping.

4.1.2 Burnett Lands Development

The Burnett Lands ultimate watermain connections and backbone watermain (300mm) throughout the development are consistent with Stantec's *Kennedy-Burnett Potable Water Master Servicing Study* (April 29, 2014). The backbone (300mm) connections at Jockvale Road / Darjeeling Avenue and Jockvale Road / Greenbank Road have been completed.

The Burnett Lands has been serviced with a combination of 200mm and 300 mm looped watermain with three connections to the site to the north and one connection at the southeast limits of the site. Refer to the following excerpts from the approved Burnett Lands Detailed Servicing Report in **Appendix C**

- **Figure 3 –** Realigned Greenbank Road Watermain
- **Figure 4A –** Watermain Layout
- **Figure 4B –** Watermain Layout – Offsite (By Others)

4.2 Proposed Watermain for Subject Site

It is proposed that Block 11 will be serviced via the 200mm watermain on Sencha Terrace and the remainder of Blocks 16, 19, 20 and 24 will be serviced via the 300mm on Jockvale Road. Details of the service sizes and required looping (if necessary) will be confirmed at the site plan stage. Conceptually, servicing layout and connection points have been shown on **Figure 2** - Concept Plan and Conceptual Servicing Layout

4.3 Design Criteria

It is noted the proposed watermain works are located in a future Zone 3C pressure zone. The realignment of the pressure zone will be completed by the City of Ottawa and once complete will alter the boundary conditions for the development. Timing for the realignment is unknown at this time. The City of Ottawa has provided boundary conditions for the pre and post-realignment conditions. This report considers both conditions.

Boundary conditions were provided at the intersection of current Greenbank Road and Jockvale Road intersection as well as the intersection of Jockvale Road and existing Greenbank Road. These two connections were utilized and modelled, however, since the connection to Jockvale Road / Greenbank Road occurs through the site to the north, demand and the proposed pipe network were also considered and modelled. Boundary conditions were based on the demand

from the site to the north, however, the demand from the Burnett Lands (including the Subject Site) is very similar. It is anticipated that the small increase in demand will have minimal impact on the boundary conditions and hydraulic results.

Fire flow demands for each high-density residential block have been calculated as per the Fire Underwriter's Survey (FUS) and are included in **Appendix C**.

Demands:

- Townhouse Density 2.7 persons/unit
- Condo/Apartment Density 1.8 persons/unit
- Average Daily Demand 350 L/capita/day
- Max. Daily Demand 2.5 x Average Daily Demand
- Peak Hour Demand 2.2 x Maximum Daily Demand
- Fire Flow Demand Fire Underwriters Survey

System Requirements:

- Max. Pressure (Unoccupied Areas) 690 kPa (100 psi)
- Max. Pressure (Occupied Areas) 552 kPa (80 psi)
- Min. Pressure 276 kPa (40 psi) excluding fire flows
- Min. Pressure (Fire) 138 kPa (20 psi) including fire flows
- Max. Age (Quality) 192 hours (onsite)

Friction Factors:

- Watermain Size C-Factor
- 50mm 100
- 200-250 mm 110
- 300-400 mm 120

4.4 Watermain Analysis

Hydraulic modelling was completed using EPANET 2.0. EPANET is public domain software capable of modeling municipal water distribution systems by performing simulations of the water movement within a pressurized system. EPANET utilized the Hazen-Williams equation to predict the performance of the proposed watermain and considered the following input parameters: water demand, pipe length, pipe diameter, pipe roughness, and pipe elevation. Table 1 (Water Demand Calculations) in **Appendix C** confirms the water demands at each node in the system. Table 2 (Pipe Data) in **Appendix C** confirms the length, diameter, and roughness of each pipe in the system. Tables 3 to 6 in **Appendix C** confirms the elevation of each node in the system.

The high-pressure condition (average daily demand) was analyzed to ensure the system meets the design criteria for maximum pressure and quality. The peak hour condition was analyzed to ensure the system meets the design criteria for maximum flow and minimum pressure.

The maximum daily demand plus fire flow was not analyzed because the proposed fireflows for the proposed towers within the high-density residential blocks are less than the fireflow analyzed in the approved Burnett Lands Detailed Servicing Report. A fireflow of 167L/s was analyzed throughout the development including Sencha Terrance and Jockvale Road.

It is anticipated that there will be sufficient hydrant coverage to convey the proposed fireflows to the Subject Site. Hydrant proximity to siamese connections will be confirmed during the site plan stage.

The hydraulic modelling results for the development prior to the City reconfiguring the watermain are listed in **Table 4.1.**

Table 4.1: Water Demand Summary (Pre-Watermain Reconfiguration)

Condition	Demand (L/s)	Fire Flow (L/s)	Allowable Max/Min Pressure (kPa/psi)	Max/Min Pressure (kPa/psi)	Time (hrs)
High Pressure	9.95	N/A	690/100 (Max)	628.8/91.2	6.2
Peak Hour	54.70	N/A	276/40 (Min)	444.0/64.4	N/A

The analysis confirms that no changes are required to the watermain system that was approved and constructed as part of the Burnett Lands development after the realigned Zone 3C pressure zone under all operating conditions.

It is noted that pressure in the main is greater than 552 kPa/80psi for the entire development. Since the timing for the realignment and reconfiguration is unknown at this time, the use of pressure reducing values will be required throughout the entire development.

The hydraulic modelling results for the development after the watermain realignment of the watermain are listed in **Table 4.2**.

Table 4.2: Water Demand Summary (Post Watermain Reconfiguration)

Condition	Demand (L/s)	Fire Flow (L/s)	Allowable Max/Min Pressure (kPa/psi)	Max/Min Pressure (kPa/psi)	Time (hrs)
High Pressure	9.95	N/A	690/100 (Max)	533.0/77.3	5.4
Peak Hour	54.70	N/A	276/40 (Min)	489.5/71.0	N/A

The hydraulic analysis indicates that the system can provide adequate pressures and flow to meet the domestic and fire flow requirements for the site. Refer to **Appendix C** for detailed water demand calculations, fireflow calculations, watermain schematics and City of Ottawa boundary conditions.

5.0 STORMWATER MANAGEMENT

5.1 Previous Studies

A detailed stormwater management strategy has been developed for the proposed Burnett Lands development. The following sections outline the stormwater design concepts in support of the high-density residential blocks. Refer to the Burnett Lands Stormwater Management Report and details on the criteria for the Burnett Lands development (Novatech, October 9, 2020, Reference No. R-2020-083) for further details on the criteria from the Burnett Lands Report.

5.2 Existing Conditions

The proposed high density residential blocks are currently undeveloped and consists of open space. Access to the site is currently provided at Greenbank Road via Darjeeling Avenue and a temporary haul road at Jockvale Road. The site has a gentle slope from northeast to southwest, with most overland flow being directed towards the Jock River.

5.3 Stormwater Management Criteria-Burnett Lands

The Burnett Lands are tributary to the Jock River, which falls under the jurisdiction of the Rideau Valley Conservation Authority (RVCA). The following stormwater management criteria have been developed based on the requirements of the RVCA and the City of Ottawa Sewer Design Guidelines (October 2012) and associated Technical Bulletins.

5.4 Stormwater Management Criteria-Subject Site

Storm runoff from these blocks will be captured by the Burnett Lands storm sewer system. To simulate the stormwater management for these blocks, the subcatchment areas were directed to storage nodes, which are connected to the downstream sewers via orifices and were sized for the 2-year uncontrolled peak flow from each block. Peak flows and required storage volumes are outlined in **Table 5.1**.

Table 5.1: Peak Flows & Storage Volumes – Subject Site

Block ID	Drainage Area ID**	Area (ha)	Allowable Release Rate* (L/s)	Storage Required (100-year event)	
				Total Volume (m^3)	Per-Hectare Volume (m^3/ha)
Block 11	A22	0.47	64	52	110
Block 16	A29	0.32	43	35	111
Block 19	A34	0.37	50	41	111
Block 20	A36	0.84	114	93	110
Block 25	A32	0.47	64	52	111

**The allowable release rate is the 2-year uncontrolled flow calculated using the PCSWMM model*
**Refers to areas on the Burnett Lands approved Storm Drainage Area Plan, 111117-STM. See Appendix E.

Storage nodes were sized to provide enough storage for the 100-year event, without overflow or flooding. It was assumed that with storage volumes close to 100m^3/ha, the required storage can

be achieved on-site through a combination of low-point ponding in parking lots and roadways, and rooftop storage.

A review of the existing stormwater management system will be required during the site plan stage to ensure the proposed development doesn't increase stormwater flows from the site beyond the allowable release rate outlined above.

5.5 Storm Servicing Design

Details of the storm servicing and service sizes will be confirmed at the site plan stage. Conceptually, servicing layout and connection points have been shown on **Figure 2** - Concept Plan and Conceptual Servicing Layout**.**

6.0 CONCLUSIONS AND RECOMMENDATIONS

Sanitary Servicing

The analysis of the proposed sanitary servicing confirms the following:

- The proposed sanitary sewers on Sencha Terrace and Jockvale Road have adequate capacity to accommodate the peak sanitary flow from the proposed high-density residential blocks. Refer to **Appendix A** for detailed calculations.
- There was a slight increase in peak sanitary flow compared to the previously accounted flow in the SNC Technical memo (August 2015)
- It can be concluded that the SNC sewer can accommodate the additional sanitary flow and no upgrades or changes are required to the existing SNC system since the increase in flow only represents 1.7% of the available capacity in the SNC sewer.

Watermain

The analysis of the proposed watermain network confirms the following:

- Residential demand for the high pressure and peak hour conditions increased while estimated fireflow decreased compared to the previously approved Burnett Lands report. Therefore, only high pressure and peak hour conditions were re-analyzed.
- No changes are required to the watermain configuration as previously approved and constructed as part of the Burnett Lands development pre and post zone configuration.
- The site is located in a future Zone 3C pressure zone that once complete will increase the pressures in the system onsite for the maximum daily and peak hour conditions. The average day pressures will decrease and therefore improve the system by lowering pressures within acceptable standards (<80psi). However, until such time, pressure reducing valves will be required for the entire Burnett Lands development including the high-density residential blocks.
- This report confirms the proposed watermain can service the site pre and post zone reconfiguration.

Stormwater Management

- The stormwater management design for the high-density residential blocks conforms to the criteria established in the approved Burnett Lands report listed in Section 1.2.
- Storm runoff from these blocks will be captured by the Burnett Lands storm sewer system. To simulate the stormwater management for these blocks, the subcatchment areas were directed to storage nodes, which are connected to the downstream sewers via orifices and were sized for the 2-year uncontrolled peak flow from each block. Peak flows and required storage volumes are outlined in **Table 5.1**.
- Storage nodes were sized to provide enough storage for the 100-year event, without overflow or flooding. It was assumed that with storage volumes close to 100m^3/ha, the required storage can be achieved on-site through a combination of low-point ponding in parking lots and roadways, and rooftop storage.

The preceding report is respectfully submitted for review and approval. Please contact the undersigned should you have questions or require additional information.

NOVATECH

Prepared by:

Jacob Lyon, B.Eng

Engineering Intern, Land Development

Reviewed by:

Steve Zorgel, P.Eng.

Project Coordinator, Land Development

Appendix A

Design Sheets

Appendix B

Sanitary Report Excerpts

SANITARY SEWER DESIGN SHEET

BURNETT LANDS SUBDIVISION c/w High Residential Blocks

DEVELOPER: CLARIDGE HOMES

NOVATECH
Engineers, Planners & Landscape Architects

PROJECT : 111117/121116
DESIGNED BY: SAZ
CHECKED BY: MSP

DATE PREPARED: MAR, 2014
DATE REVISED: Dec. 2015
DATE REVISED: Nov. 25/16
DATE REVISED: Jan. 26/18
DATE REVISED: May 23/18
DATE REVISED: Nov. 9/18
DATE REVISED: May 29/19
DATE REVISED: June 22/20
DATE REVISED: August 24/20
DATE REVISED: April 23/21 (as-built)
DATE REVISED: Sept 20/21 (as-built)

LOCATION										CUMULATIVE		PEAK FACTOR M	POPULATION FLOW Q(p) (L/s)	PEAK EXTRAN. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	PROPOSED SEWER											
STREET	AREA	FROM MH	TO MH	CONDOS	TOWNS	Medium Res Blocks	SCHOOL AREA (ha)	POPULATION (in 1000's)	AREA (ha.)	POPULATION (in 1000's)	AREA (ha.)					LENGTH (m)	PIPE SIZE (mm)	PIPE ID (mm)	TYPE OF PIPE	Roughness Coef.	GRADE (%)	As-Built Upstream Invert (m)	As-Built Downstream Invert (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak/ Qcap	d/ D_{full}
Offsite Caivan Lands	R116A / R117A	Off-116	Off-115					0.608	1.82	0.608	1.820	3.34	6.59	0.60	7.19	76.1	200	201.2	DR 35	0.013	0.40			21.1	0.66	0.34	0.41
Offsite Caivan Lands	G115A / R118A	Off-115	101					0.313	1.70	0.921	3.520	3.26	9.72	1.16	10.89	67.2	200	201.2	DR 35	0.013	0.40		89.37	21.1	0.66	0.52	0.50
Darjeeling Avenue	101	101	103		5			0.0135	0.49	0.935	4.010	3.26	9.86	1.32	11.18	91.1	250	251.5	DR 35	0.013	0.31	89.31	89.03	33.5	0.67	0.33	0.38
Darjeeling Avenue	103	103	105					0.0000	0.14	0.935	4.150	3.26	9.86	1.37	11.23	73.2	250	251.5	DR 35	0.013	0.26	89.03	88.84	30.8	0.62	0.36	0.41
Darjeeling Avenue	109	109	107		13			0.0351	0.54	0.035	0.540	3.67	0.42	0.18	0.60	105.5	200	201.2	DR 35	0.013	0.36	89.26	88.88	20.0	0.63	0.03	0.08
Darjeeling Avenue	107	107	105		1			0.0027	0.12	0.038	0.660	3.67	0.45	0.22	0.67	50.9	200	201.2	DR 35	0.013	0.41	88.87	88.66	21.4	0.67	0.03	0.12
Jockvale Road	105	105	601		7			0.0189	0.24	0.991	5.050	3.24	10.41	1.67	12.15	39.4	250	251.5	DR 35	0.013	0.28	88.65	88.54	31.9	0.64	0.38	0.41
Jockvale Road		601	SNC					0.0000		0.991	5.050	3.24	10.41	1.67	12.15	3.0	250	251.5	DR 35	0.013	1.00	88.49	88.46	60.4	1.22	0.20	0.30
Jockvale Road	601	601	603		7			0.0189	0.26	0.019	0.260	3.71	0.23	0.09	0.31	36.8	200	201.2	DR 35	0.013	0.57	89.86	89.65	25.2	0.79	0.01	0.08
Jockvale Road		603	307					0.0000		0.019	0.260	3.71	0.23	0.09	0.31	7.2	200	201.2	DR 35	0.013	0.42	89.61	89.58	21.5	0.68	0.01	0.08
Robusta Lane	201	201	203		14			0.0378	0.40	0.038	0.400	3.67	0.45	0.13	0.58	44.2	200	201.2	DR 35	0.013	0.38	90.65	90.48	20.7	0.65	0.03	0.08
Robusta Lane	203	203	205		1			0.0027	0.05	0.041	0.450	3.67	0.48	0.15	0.63	9.4	200	201.2	DR 35	0.013	0.74	90.47	90.40	28.7	0.90	0.02	0.08
Robusta Lane	205	205	301		2			0.0054	0.13	0.046	0.580	3.66	0.54	0.19	0.74	21.5	200	201.2	DR 35	0.013	0.32	90.39	90.33	18.7	0.59	0.04	0.12
Allogato Walk	301	301	303					0.0000	0.12	0.046	0.700	3.66	0.54	0.23	0.78	66.3	200	201.2	DR 35	0.013	0.36	90.27	90.03	20.0	0.63	0.04	0.12
Affogato Walk	303	303	305		1			0.0027	0.09	0.049	0.790	3.65	0.58	0.26	0.84	10.9	200	201.2	DR 35	0.013	0.64	90.00	89.93	26.7	0.84	0.03	0.12
Affogato Walk	305	305	307		17			0.0459	0.49	0.095	1.280	3.60	1.10	0.42	1.52	73.0	200	201.2	DR 35	0.013	0.37	89.91	89.64	20.3	0.64	0.08	0.19
Jockvale Road	307	307	605		4			0.0108	0.26	0.124	1.800	3.57	1.44	0.59	2.03	74.0	200	201.2	DR 35	0.013	0.32	89.58	89.35	18.7	0.59	0.11	0.21
Mochi Circle	401	401	605		18			0.0486	0.61	0.049	0.610	3.65	0.58	0.20	0.78	66.8	200	201.2	DR 35	0.013	0.54	89.77	89.41	24.5	0.77	0.03	0.12
Correto Place	501	501	503		4			0.0108	0.21	0.011	0.210	3.73	0.13	0.07	0.20	21.4	200	201.2	DR 35	0.013	0.65	90.02	89.88	26.9	0.85	0.01	0.00
Correto Place	503	503	505		5			0.0135	0.15	0.024	0.360	3.69	0.29	0.12	0.41	30.7	200	201.2	DR 35	0.013	0.36	89.87	89.76	19.9	0.63	0.02	0.08
Correto Place	505	505	507		14			0.0378	0.39	0.062	0.750	3.64	0.73	0.25	0.98	47.8	200	201.2	DR 35	0.013	0.40	89.76	89.57	21.0	0.66	0.05	0.12
Correto Place	507	507	605		11			0.0297	0.32	0.092	1.070	3.60	1.07	0.35	1.42	51.4	200	201.2	DR 35	0.013	0.35	89.57	89.39	19.7	0.62	0.07	0.19
Jockvale Road	605	605	607					0.0000	0.13	0.265	3.610	3.48	2.98	1.19	4.18	74.0	200	201.2	DR 35	0.013	0.32	89.35	89.12	18.7	0.59	0.22	0.30
Mochi Circle	403	403	607		8			0.0216	0.38	0.022	0.380	3.70	0.26	0.13	0.38	66.6	200	201.2	DR 35	0.013	0.75	89.63	89.13	28.9	0.91	0.01	0.08
Sencha Terrace	701	701	703		4	419		0.7650	0.87	0.765	0.870	3.30	8.18	0.29	8.46	32.1	200	201.2	DR 35	0.013	0.78	90.17	89.92	29.4	0.92	0.29	0.34
Sencha Terrace	703	703	705		4			0.0108	0.16	0.776	1.030	3.29	8.28	0.34	8.62	37.6	200	201.2	DR 35	0.013	0.35	89.92	89.79	19.6	0.62	0.44	0.47
Sencha Terrace	705	705	707		3			0.0081	0.10	0.784	1.130	3.29	8.36	0.37	8.74	26.8	200	201.2	DR 35	0.013	0.34	89.79	89.70	19.3	0.61	0.45	0.47
Sencha Terrace	707	707	709		8			0.0216	0.66	0.806	1.790	3.29	8.58	0.59	9.17	55.3	200	201.2	DR 35	0.013	0.38	89.70	89.49	20.5	0.65	0.45	0.47
Sencha Terrace	709	709	607		6			0.0162	0.54	0.822	2.330	3.28	8.74	0.77	9.51	57.1	200	201.2	DR 35	0.013	0.33	89.49	89.30	19.2	0.60	0.49	0.50
Jockvale Road	607	607	609					0.0000		1.108	6.320	3.22	11.55	2.09	13.63	4.6	250	251.5	DR 35	0.013	0.65	89.07	89.04	48.8	0.98	0.28	0.34
Block 19 / 20 / Jockvale Road	613	613	611			340		0.6120	1.36	0.612	1.360	3.34	6.63	0.45	7.08	74.1	250	251.5	DR 35	0.013	0.65		90.65	48.7	0.98	0.15	0.25
Jockvale Road	611	611	609			366		0.6588	0.53	1.271	1.890	3.18	13.11	0.62	13.74	71.1	250	251.5	DR 35	0.013	1.55	90.64	89.54	75.1	1.51	0.18	0.29
Jockvale Road / Mochi Circle / Sencha Terrace		609	SNC					0.0000		2.379	8.210	3.02	23.29	2.71	26.00	2.8	250	251.5	DR 35	0.013	1.00	88.96	88.94	60.4	1.22	0.43	0.44

As Built

High Density Residential Blocks

Notes:

1. Q(d) = Q(p) + Q(i) , where
   - Q(d) = Design Flow (L/sec)
   - Q(p) = Population Flow (L/sec)
   - Q(i) = Extraneous Flow (L/sec) = 0.33L/s/effective gross ha

Residential

Q(p) = (PxqxM/86,400), where
- P = Population (2.7 persons per town/semi, 2.1 person per multi-unit zen, 1.8 persons per apartment)
- q = Average per capita flow = 280 L/cap/day
- M = Harmon Formula (maximum of 4.0)

Institutional

Q(p) = (PxqxM/86,400), where
- P = Population Demand = 28,000L/gross ha/day
- M = 1.5 (if ICI in contributing area >20%), 1.0 (if ICI in contributing area <20%)

SANITARY SEWER DESIGN SHEET

South Nepean Collector - Phase 2 & 3

Theoretical Future Full Service Peak Wastewater Flow

NOVATECH
Engineers, Planners & Landscape Architects

PROJECT #:	115075
DESIGNED BY:	CMS
CHECKED BY:	MJP
DATE:	August 20, 2015
Revised: (Updated Criteria)	1-Sep-21

Location			Areas				Population				Individual Design Flows			Cumulative Design Flows				
Area I.D.	Existing / Proposed Land Use	Upstream Node	Gross Commercial Area (ha)	Gross Institutional Area (ha)	Gross Residential Area (ha)	Total Gross Area (ha)	Residential Population Density (people / ha)	Individual Residential Population	Cumulative Residential Population	Residential Peaking Factor (Harmon Eqn[1])	Commercial Peak Flow Rate[2] (28,000 L/ha/d) (L/s)	Institutional Peak Flow Rate[2] (28,000 L/ha/d) (L/s)	Infiltration / Inflow Rate (0.33 L/s/ha) (L/s)	Commercial (L/s)	Institutional (L/s)	Infiltration / Inflow (L/s)	Residential Peak Flow Rate (280 L/cap/d) (L/s)	Cumulative Peak Design Flow (L/s)
A1	Commercial	130	12.80			12.80					6.2	0.0	4.2	6.2	0.0	4.2	0.0	10.4
A2-A	Commercial	130	85.18			85.18					41.4	0.0	28.1	47.6	0.0	32.3	0.0	80.0
A2-B	Commercial	130	32.46			32.46					15.8	0.0	10.7	63.4	0.0	43.0	0.0	106.5
A3-A	Low Density Residential	130			16.18	16.18	95.2	1540	1540	3.14	0.0	0.0	5.3	63.4	0.0	48.4	19.6	131.4
A3-B	Institutional	130		10.30		10.30			1540	3.14	0.0	5.0	3.4	63.4	5.0	51.8	19.6	139.8
A3-C	Medium Density Residential	130			5.19	5.19	162.0	841	2381	3.02	0.0	0.0	1.7	63.4	5.0	53.5	29.1	151.0
A3-D	Commercial	130	0.58			0.58			2381	3.02	0.3	0.0	0.2	63.7	5.0	53.7	29.1	151.5
A3-E	Low Density Residential	130			35.68	35.68	95.2	3397	5778	2.75	0.0	0.0	11.8	63.7	5.0	65.5	64.3	198.5
A3-F	Medium Density Residential	130			8.26	8.26	162	1338	7116	2.68	0.0	0.0	2.7	63.7	5.0	68.2	77.2	214.1
A3-G	Institutional	130		0.90		0.90			7116	2.68	0.0	0.4	0.3	63.7	5.4	68.5	77.2	214.9
A4	Low Density Residential	130			34.44	34.44	95.2	3279	10395	2.55	0.0	0.0	11.4	63.7	5.4	79.9	107.4	256.4
A2-C	Commercial (ex. snow dump)	120	15.25			15.25			10395	2.55	7.4	0.0	5.0	71.1	5.4	84.9	107.4	268.8
A3-H	Low Density Residential	120			6.09	6.09	95.2	580	10974	2.53	0.0	0.0	2.0	71.1	5.4	86.9	112.5	276.0
A5	Commercial	110	17.72			17.72			10974	2.53	8.6	0.0	5.8	79.7	5.4	92.7	112.5	290.4
A6-A	Commercial	100	15.18			15.18			10974	2.53	7.4	0.0	5.0	87.1	5.4	97.7	112.5	302.8
A6-B	Institutional	100		6.05		6.05			10974	2.53	0.0	2.9	2.0	87.1	8.4	99.7	112.5	307.8
A6-C	Medium Density Residential	90			4.87	4.87	162.0	789	11763	2.51	0.0	0.0	1.6	87.1	8.4	101.4	119.5	316.3
A6-D	Low Density Residential	90			17.56	17.56	95.2	1672	13435	2.46	0.0	0.0	5.8	87.1	8.4	107.1	133.9	336.6
A6-E	Low Density Residential	90			6.94	6.94	95.2	661	14096	2.44	0.0	0.0	2.3	87.1	8.4	109.4	139.6	344.5
A7-A	Commercial	90	13.62			13.62			14096	2.44	6.6	0.0	4.5	93.7	8.4	113.9	139.6	355.6
A7-B	High Density Residential	90			11.01	11.01	135.0	1486	15582	2.41	0.0	0.0	3.6	93.7	8.4	117.6	152.1	371.7
A7-C	Medium Density Residential	90			6.97	6.97	162.0	1129	16711	2.38	0.0	0.0	2.3	93.7	8.4	119.9	161.4	383.4
A7-D	Medium Density Residential	90			11.74	11.74	162.0	1902	18613	2.35	0.0	0.0	3.9	93.7	8.4	123.7	141.6	367.4
A7-E1/E2	Medium Density Residential	90			9.24	9.24	162.0	1497	20110	2.32	0.0	0.0	3.0	93.7	8.4	126.8	189.0	417.9
A8-A	Commercial	80	28.45			28.45			20110	2.32	13.8	0.0	9.4	107.5	8.4	136.2	189.0	441.1
A8-B	High Density Residential	80			39.34	39.34	135.0	5311	25421	2.24	0.0	0.0	13.0	107.5	8.4	149.2	230.5	495.6
A8-C	Institutional	80		10.52		10.52			25421	2.24	0.0	5.1	3.5	107.5	13.5	152.6	230.5	504.2
A8-D	Low Density Residential	80			16.87	16.87	120.9	2040	27461	2.21	0.0	0.0	5.6	107.5	13.5	158.2	246.1	525.3
ROW Along SNC Sewer Alignment	-	80				14.34			27461	2.21	0.0	0.0	4.7	107.5	13.5	162.9	246.1	530.1
TOTAL		***80***	***221.24***	***27.77***	***230.38***	***493.73***	***-***	***27461***	***27461***	***2.52***	***107.5***	***13.5***	***162.9***	***107.5***	***13.5***	***162.9***	***246.1***	***530.1***

Residential Land Use	Population Density (Units / ha)	Persons per Unit	Persons per ha
Low Density (singles and semis)	26 – 28 (28 used)	2.7 – 3.4 (3.4 used)	95.2
Medium Density (row/townhouse)	50 – 60 (60 used)	2.7	162.0
High Density (apartments)	60 – 75 (75 used)	1.8	135.0

Notes:

1. Harmon Equation = $1 + [14 / (4+(P/1000)^{1/2})] \times K$

Where: P = population; K = correction factor = 1.0

2. Instituional / Commercial Peaking Factor = 1.5

3. Updated Criteria based on City of Ottawa Technical Bulletin ISTB-2018-01.

Residential — Infiltration Flow (L/sec) = 0.33L/s/effective gross ha; Average per capita flow = 280 L/cap/day

Institutional — P = Population Demand = 28.000L/gross ha/day; M = 1.5 (if ICI in contributing area >20%), 1.0 (if ICI in contributing area <20%); K = correction factor = 0.8

Reported Design Flows / Assumptions:

1. Area A4: Existing single family units currently serviced by Jockvale pump station to be redirected to SNC

2. Area A8-D: proposed 600 medium density residential units

Appendix C

Watermain Boundary Conditions, FUS Calculations, and Modelling Results

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.

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121116
Project Name: Burnett: High Density Blocks
Date: 8/24/2021
Input By: Jacob Lyon
Reviewed By: Steve Zorgel

Legend: Input by User; No Information or Input Required

Building Description: Tower A- 30 Story Tower with 6 Story Podium
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Wood frame		1.5	0.6	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)	Yes	0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	2065			
		Total Floors/Storeys (Podium)	6			
		Tower Footprint (m^2)	750			
		Total Floors/Storeys (Tower)	24			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			3,098	
	F	**Base fire flow without reductions**				7,000
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**5,950**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-2,975**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Total	**-50%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	30.1- 45 m		5%	**1,488**
		East Side	> 45.1m		0%	
		South Side	20.1 - 30 m		10%	
		West Side	20.1 - 30 m		10%	
				Cumulative Total	**25%**	
Results						
6	(1) + (2) + (3)	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**4,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**67**
				or	USGPM	1,057
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	1.5
		Required Volume of Fire Flow (m^3)			m^3	360

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121116
Project Name: Burnett: High Density Blocks
Date: 8/24/2021
Input By: Jacob Lyon
Reviewed By: Steve Zorgel

Legend: Input by User; No Information or Input Required

Building Description: Tower B- 21 Storey Tower with 2 Storey Podium
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Wood frame		1.5	0.6	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)	Yes	0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	1510			
		Total Floors/Storeys (Podium)	2			
		Tower Footprint (m^2)	790			
		Total Floors/Storeys (Tower)	19			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			2,085	
	F	**Base fire flow without reductions**				6,000
		$F = 220\ C\ (A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	5,100
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	-2,550
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Total	**-50%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	20.1 - 30 m		10%	1,275
		East Side	> 45.1m		0%	
		South Side	20.1 - 30 m		10%	
		West Side	30.1- 45 m		5%	
				Cumulative Total	**25%**	
Results						
6	(1) + (2) + (3)	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**4,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**67**
				or	USGPM	1,057
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	1.5
		Required Volume of Fire Flow (m^3)			m^3	360

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

Engineers, Planners & Landscape Architects

Novatech Project #: 121116
Project Name: Burnett: High Density Blocks
Date: 8/24/2021
Input By: Jacob Lyon
Reviewed By: Steve Zorgel

Legend: Input by User; No Information or Input Required

Building Description: Tower C/D-21 Storey Tower with 6 Storey Podium
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Wood frame		1.5	0.6	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)	Yes	0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	2680			
		Total Floors/Storeys (Podium)	6			
		Tower Footprint (m^2)	785			
		Total Floors/Storeys (Tower)	15			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			4,020	
	F	**Base fire flow without reductions**				8,000
		$F = 220\ C\ (A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	6,800
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	-3,400
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Total	**-50%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	20.1 - 30 m		10%	1,700
		East Side	> 45.1m		0%	
		South Side	20.1 - 30 m		10%	
		West Side	30.1- 45 m		5%	
				Cumulative Total	**25%**	
Results						
6	(1) + (2) + (3)	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**5,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**83**
				or	USGPM	1,321
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	1.75
		Required Volume of Fire Flow (m^3)			m^3	525

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121116
Project Name: Burnett: High Density Blocks
Date: 8/24/2021
Input By: Jacob Lyon
Reviewed By: Steve Zorgel

Legend: Input by User; No Information or Input Required

Building Description: Tower E-12 Storey Tower with 4 Storey Podium
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Wood frame		1.5	0.6	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)	Yes	0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	2015			
		Total Floors/Storeys (Podium)	4			
		Tower Footprint (m^2)	900			
		Total Floors/Storeys (Tower)	8			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			3,023	
	F	**Base fire flow without reductions**				**7,000**
		$F = 220\ C\ (A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	**5,950**
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	**-2,975**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Total	**-50%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	20.1 - 30 m		10%	**893**
		East Side	> 45.1m		0%	
		South Side	> 45.1m		0%	
		West Side	30.1- 45 m		5%	
				Cumulative Total	**15%**	
Results						
6	(1) + (2) + (3)	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**4,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**67**
				or	USGPM	1,057
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	1.5
		Required Volume of Fire Flow (m^3)			m^3	360

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121116
Project Name: Burnett: High Density Blocks
Date: 8/24/2021
Input By: Jacob Lyon
Reviewed By: Steve Zorgel

Legend: Input by User; No Information or Input Required

Building Description: Tower F-12 Storey Tower with 4 Storey Podium
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Wood frame		1.5	0.6	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)	Yes	0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	2200			
		Total Floors/Storeys (Podium)	4			
		Tower Footprint (m^2)	1400			
		Total Floors/Storeys (Tower)	8			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			3,300	
	F	**Base fire flow without reductions**				8,000
		$F = 220\ C\ (A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	6,800
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	-3,400
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Total	**-50%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	> 45.1m		0%	680
		East Side	30.1- 45 m		5%	
		South Side	30.1- 45 m		5%	
		West Side	> 45.1m		0%	
					10%	
Results						
6	(1) + (2) + (3)	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**4,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**67**
				or	USGPM	1,057
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	1.5
		Required Volume of Fire Flow (m^3)			m^3	360

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 121116
Project Name: Burnett: High Density Blocks
Date: 8/24/2021
Input By: Jacob Lyon
Reviewed By: Steve Zorgel

Legend: Input by User; No Information or Input Required

Building Description: Tower G- 6 Storey Tower with 1 Storey Podium
Fire Resistive Construction

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Wood frame		1.5	0.6	
		Ordinary construction		1		
		Non-combustible construction		0.8		
		Modified Fire resistive construction (2 hrs)	Yes	0.6		
		Fire resistive construction (> 3 hrs)		0.6		
2	**Floor Area**					
	A	Podium Level Footprint (m^2)	2160			
		Total Floors/Storeys (Podium)	1			
		Tower Footprint (m^2)	1950			
		Total Floors/Storeys (Tower)	5			
		Protected Openings (1 hr)	Yes			
		Area of structure considered (m^2)			3,135	
	F	**Base fire flow without reductions**				7,000
		$F = 220\ C\ (A)^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**			**Reduction/Surcharge**		
	(1)	Non-combustible		-25%	-15%	5,950
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**			**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	-2,975
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
				Cumulative Total	**-50%**	
5	**Exposure Surcharge (cumulative %)**				**Surcharge**	
	(3)	North Side	30.1- 45 m		5%	298
		East Side	> 45.1m		0%	
		South Side	> 45.1m		0%	
		West Side	> 45.1m		0%	
				Cumulative Total	**5%**	
Results						
6	(1) + (2) + (3)	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**3,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**50**
				or	USGPM	793
7	**Storage Volume**	Required Duration of Fire Flow (hours)			Hours	1.25
		Required Volume of Fire Flow (m^3)			m^3	225

Table 1
Watermain Demand Calculations

Node	Number of Units		Pop.	Demand (L/s)		
	Town	Apartment Condo		High Pres.	Max Daily	Peak Hour
N1	5		14	0.06	0.14	0.31
N2	7		19	0.08	0.19	0.42
N3	10		27	0.11	0.27	0.60
N4	4		11	0.04	0.11	0.25
N5	7		19	0.08	0.19	0.42
N6	6		17	0.07	0.17	0.38
N7	2		6	0.02	0.06	0.13
N8	6	419	771	3.12	7.81	17.18
N9	8		22	0.09	0.22	0.49
N12	9		25	0.10	0.25	0.56
N13	4		11	0.04	0.11	0.25
N14	20		54	0.22	0.55	1.20
N15	18		49	0.20	0.50	1.09
N16	19		52	0.21	0.53	1.16
N17	4		11	0.04	0.11	0.25
N18	10		27	0.11	0.27	0.60
N19	8		22	0.09	0.22	0.49
N20	10		27	0.11	0.27	0.60
N21		366	659	2.67	6.67	14.68
N23			0	0.00	0.00	0.00
N24			0	0.00	0.00	0.00
N25		340	612	2.48	6.20	13.64
	157	**1125**	**2455**	**9.95**	**24.86**	**54.70**
ON3				0.00	0.00	0.00
ON4				0.00	0.00	0.00
ON5				0.00	0.00	0.00
ON6				2.46	6.15	13.54
ON7 - Added to N1				1.27	3.17	6.98
ON10				1.88	4.70	10.35
ON11				0.66	1.45	3.07
ON12				2.78	6.44	13.85
ON13				0.00	0.00	0.00
	0	**0**	**0**	**9.05**	**21.91**	**47.79**

Offsite Demand Accounted from Caivan Lands, Refer to Report, South Nepean Town Centre (SNTC) - Site Servcing and Stormwater Management

High Residential Demand

1. Residential Population density: 2.7 people/town, 1.8 people/apartment
2. Residential High Pressure demand = 350L/s/p/d
3. Residential Maximum Daily demand = 2.5 x High Pressure Demand
4. Residential Peak Hour Demand = 2.2 x Maximum Daily Demand
5. Institutional Demand: 28,000 L/gross ha/day
6. Institutional Max Day = 1.5 x High Pressure Demand

Table 2
Pipe Data

Pipe	Length (m)	Diameter (mm)	Roughness
1	83	300	120
2	75	300	120
3	44	300	120
4	55	300	120
5	59	300	120
6	39	300	120
7	33	300	120
8	38	200	110
9	71	200	110
12	56	200	110
13	54	200	110
14	74	300	120
15	74	300	120
16	81	300	120
17	84	200	110
18	79	200	110
19	43	200	110
20	110	200	110
21	67	200	110
22	93	200	110
23	59	200	110
24	105	200	110
25	89	200	110
26	75	300	120
27	88	300	120
28	56	300	120
29	15	200	110
OP13	57	300	120
OP14	61	300	120
OP15	125	300	120
OP16	129	200	110
OP17	58	200	110
OP18	58	200	110
OP19	244	200	110
OP21	158	300	120
OP22	187	300	120
OP24	146	300	120
OP25	92	300	120
OP26	171	200	110
OP27	161	200	110

Offsite Demand Accounted from Caivan Lands, Refer to Report, South Nepean Town Centre (SNTC) - Site Servcing and Stormwater Management Report, July 10, 2020, Completed by Stantec, Ref. #160401085

Table 3
Pre Configuration Condition
High Pressure Check

Node	Elevation (m)	Demand (LPS)	Head (m)	Pressure (m)	Pressure (PSI)	Age (hrs)
Resvr R1*	157.5	-16.27	157.50	0.0	0.0	0.0
Resvr R2*	157.4	-2.72	157.40	0.0	0.0	0.0
Junc N1	93.7	1.33	157.40	63.8	90.4	2.8
Junc N2	93.9	0.08	157.40	63.5	90.0	3.0
Junc N3	93.8	0.11	157.40	63.6	90.2	1.6
Junc N4	93.6	0.04	157.40	63.8	90.5	2.0
Junc N5	93.8	0.08	157.40	63.6	90.2	2.6
Junc N6	93.8	0.07	157.40	63.7	90.3	2.2
Junc N7	94.0	0.02	157.40	63.5	90.0	2.5
Junc N8	93.5	3.12	157.40	63.9	90.6	3.7
Junc N9	93.6	0.09	157.40	63.8	90.5	5.0
Junc N12	93.4	0.10	157.40	64.0	90.8	4.6
Junc N13	93.3	0.04	157.40	64.1	91.0	4.3
Junc N14	93.4	0.22	157.40	64.1	90.8	3.4
Junc N15	93.6	0.20	157.40	63.9	90.5	2.9
Junc N16	93.5	0.21	157.40	64.0	90.7	3.1
Junc N17	93.2	0.04	157.40	64.2	91.0	6.1
Junc N18	93.1	0.11	157.40	64.3	91.2	4.3
Junc N19	93.5	0.09	157.40	63.9	90.6	6.2
Junc N20	93.8	0.11	157.40	63.7	90.3	5.4
Junc N21	94.2	2.67	157.40	63.2	89.7	5.1
Junc N23	93.7	0.00	157.40	63.7	90.3	2.3
Junc N24	93.5	0.00	157.40	64.0	90.7	3.2
Junc N25	94.5	2.48	157.40	63.0	89.3	0.4
Junc ON3	94.8	0.00	157.48	62.7	88.9	0.1
Junc ON4	94.2	0.00	157.44	63.2	89.7	0.3
Junc ON5	93.2	0.00	157.41	64.3	91.1	0.6
Junc ON6	93.9	2.46	157.41	63.5	90.0	1.4
Junc ON10	93.7	1.88	157.41	63.7	90.4	1.1
Junc ON11	93.5	0.66	157.40	63.9	90.6	1.4
Junc ON12	94.1	2.78	157.41	63.3	89.8	0.5
Junc ON13	93.9	0.00	157.40	63.6	90.1	1.5

*** Boundary Condition**

Maximum Pressure
Maximum Time
Offsite Nodes

Table 4
Pre Configuration Condition
Peak Hour Check

Node	Elevation (m)	Demand (LPS)	Head (m)	Pressure (m)	Pressure (PSI)
Resvr R1*	140.4	-49.20	140.40	0.0	0.0
Resvr R2*	140.0	-53.29	140.00	0.0	0.0
Junc N1	93.7	7.29	139.67	46.0	65.3
Junc N2	93.9	0.42	139.68	45.8	64.9
Junc N3	93.8	0.60	139.69	45.9	65.0
Junc N4	93.6	0.25	139.68	46.1	65.3
Junc N5	93.8	0.42	139.68	45.9	65.1
Junc N6	93.8	0.38	139.67	45.9	65.1
Junc N7	94.0	0.13	139.62	45.7	64.8
Junc N8	93.5	17.18	139.59	46.1	65.4
Junc N9	93.6	0.49	139.63	46.1	65.3
Junc N12	93.4	0.56	139.67	46.3	65.6
Junc N13	93.3	0.25	139.71	46.5	65.9
Junc N14	93.4	1.20	139.70	46.4	65.7
Junc N15	93.6	1.09	139.69	46.1	65.4
Junc N16	93.5	1.16	139.68	46.2	65.6
Junc N17	93.2	0.25	139.71	46.5	66.0
Junc N18	93.1	0.60	139.70	46.6	66.1
Junc N19	93.5	0.49	139.68	46.2	65.5
Junc N20	93.8	0.60	139.68	45.9	65.1
Junc N21	94.2	14.68	139.75	45.6	64.6
Junc N23	93.7	0.00	139.64	45.9	65.1
Junc N24	93.5	0.00	139.67	46.2	65.5
Junc N25	94.5	13.64	139.87	45.4	64.4
Junc ON3	94.8	0.00	140.22	45.4	64.4
Junc ON4	94.2	0.00	139.92	45.7	64.8
Junc ON5	93.2	0.00	139.73	46.6	66.1
Junc ON6	93.9	13.54	139.69	45.8	64.9
Junc ON10	93.7	10.35	139.69	46.0	65.3
Junc ON11	93.5	3.07	139.69	46.2	65.4
Junc ON12	94.1	13.85	139.69	45.6	64.7
Junc ON13	93.9	0.00	139.68	45.8	65.0

*** Boundary Condition**

Minimum Pressure
Offsite Nodes

Prepared By:
NOVATECH
Date: September 2021
M:\2021\121116\DATA\Calculations\Sewer Calcs\Water\20210825-High Res Blocks\Scenario 2 - Pre-Configured Zone\PeakHour.xls

NOVATECH
Engineers, Planners & Landscape Architects

3370 Greenbank Road
Hydraulic Analysis-
High Density Residential Blocks

JOB NO. 121116

Table 5
Post Configuration Condition
High Pressure Check

Node	Elevation (m)	Demand (LPS)	Head (m)	Pressure (m)	Pressure (PSI)	Age (hrs)
Resvr R1*	147.8	-22.26	147.80	0.0	0.0	0.0
Resvr R2*	147.6	3.27	147.60	0.0	0.0	0.0
Junc N1	93.7	1.33	147.62	54.0	76.5	1.9
Junc N2	93.9	0.08	147.62	53.7	76.1	3.3
Junc N3	93.8	0.11	147.62	53.8	76.3	1.1
Junc N4	93.6	0.04	147.62	54.0	76.6	1.4
Junc N5	93.8	0.08	147.62	53.9	76.4	1.7
Junc N6	93.8	0.07	147.62	53.9	76.4	1.4
Junc N7	94.0	0.02	147.61	53.7	76.1	1.6
Junc N8	93.5	3.12	147.61	54.1	76.7	2.1
Junc N9	93.6	0.09	147.61	54.0	76.6	5.4
Junc N12	93.4	0.10	147.61	54.2	76.9	3.7
Junc N13	93.3	0.04	147.61	54.4	77.1	2.5
Junc N14	93.4	0.22	147.61	54.3	76.9	2.1
Junc N15	93.6	0.20	147.62	54.1	76.7	1.9
Junc N16	93.5	0.21	147.62	54.2	76.8	1.8
Junc N17	93.2	0.04	147.61	54.4	77.2	3.3
Junc N18	93.1	0.11	147.61	54.5	77.3	2.5
Junc N19	93.5	0.09	147.62	54.1	76.7	4.2
Junc N20	93.8	0.11	147.62	53.9	76.4	3.8
Junc N21	94.2	2.67	147.60	53.4	75.8	2.7
Junc N23	93.7	0.00	147.62	53.9	76.5	1.5
Junc N24	93.5	0.00	147.62	54.2	76.8	2.0
Junc N25	94.5	2.48	147.60	53.2	75.4	3.0
Junc ON3	94.8	0.00	147.76	53.0	75.1	0.1
Junc ON4	94.2	0.00	147.69	53.5	75.8	0.2
Junc ON5	93.2	0.00	147.65	54.5	77.3	0.5
Junc ON6	93.9	2.46	147.64	53.7	76.2	1.1
Junc ON10	93.7	1.88	147.63	54.0	76.5	0.8
Junc ON11	93.5	0.66	147.63	54.1	76.7	0.9
Junc ON12	94.1	2.78	147.63	53.6	75.9	0.4
Junc ON13	93.9	0.00	147.63	53.8	76.3	1.0

*** Boundary Condition**

Maximum Pressure
Maximum Time
Offsite Nodes

Prepared By:
NOVATECH
Date: September 2021

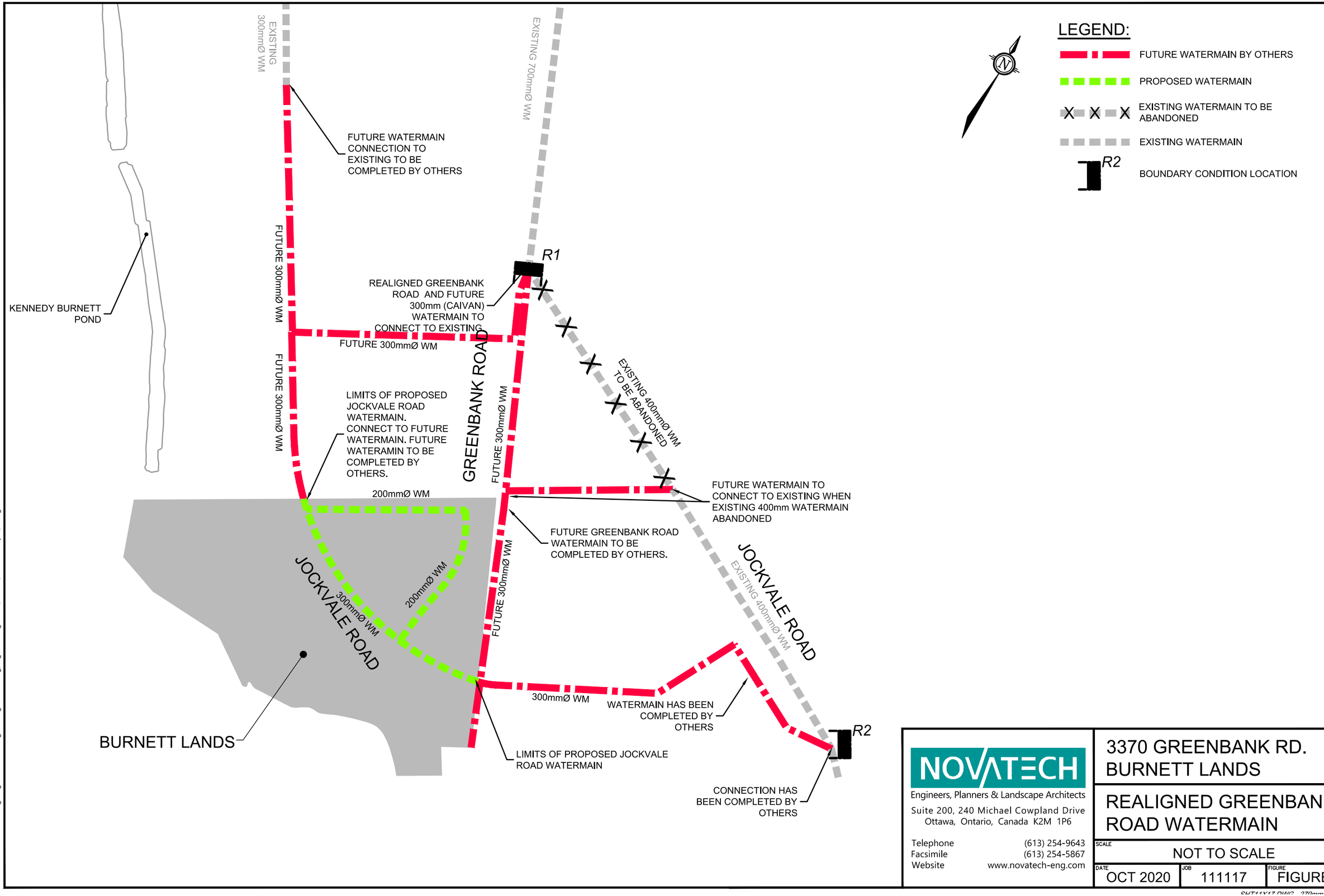
Table 6
Post Configuration Condition
Peak Hour Check

Node	Elevation (m)	Demand (LPS)	Head (m)	Pressure (m)	Pressure (PSI)
Resvr R1*	145.4	-58.16	145.40	0.0	0.0
Resvr R2*	144.6	-44.33	144.60	0.0	0.0
Junc N1	93.7	7.29	144.40	50.8	72.0
Junc N2	93.9	0.42	144.41	50.5	71.6
Junc N3	93.8	0.60	144.41	50.6	71.7
Junc N4	93.6	0.25	144.41	50.8	72.0
Junc N5	93.8	0.42	144.40	50.6	71.8
Junc N6	93.8	0.38	144.40	50.7	71.8
Junc N7	94.0	0.13	144.34	50.4	71.5
Junc N8	93.5	17.18	144.31	50.8	72.0
Junc N9	93.6	0.49	144.34	50.8	72.0
Junc N12	93.4	0.56	144.38	51.0	72.3
Junc N13	93.3	0.25	144.42	51.2	72.5
Junc N14	93.4	1.20	144.41	51.1	72.4
Junc N15	93.6	1.09	144.41	50.9	72.1
Junc N16	93.5	1.16	144.40	51.0	72.2
Junc N17	93.2	0.25	144.41	51.2	72.6
Junc N18	93.1	0.60	144.41	51.3	72.8
Junc N19	93.5	0.49	144.41	50.9	72.2
Junc N20	93.8	0.60	144.41	50.7	71.8
Junc N21	94.2	14.68	144.43	50.3	71.3
Junc N23	93.7	0.00	144.37	50.7	71.9
Junc N24	93.5	0.00	144.40	51.0	72.2
Junc N25	94.5	13.64	144.51	50.1	71.0
Junc ON3	94.8	0.00	145.15	50.4	71.4
Junc ON4	94.2	0.00	144.75	50.5	71.7
Junc ON5	93.2	0.00	144.49	51.3	72.8
Junc ON6	93.9	13.54	144.44	50.5	71.6
Junc ON10	93.7	10.35	144.43	50.8	72.0
Junc ON11	93.5	3.07	144.42	50.9	72.1
Junc ON12	94.1	13.85	144.42	50.4	71.4
Junc ON13	93.9	0.00	144.41	50.6	71.7

*** Boundary Condition**

Minimum Pressure
Offsite Nodes

Prepared By:
NOVATECH
Date: September 2021
M:\2021\121116\DATA\Calculations\Sewer Calcs\Water\20210825-High Res Blocks\Scenario 2 - Post-Configured Zone\PeakHour.xls



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Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

3370 GREENBANK RD. BURNETT LANDS

REALIGNED GREENBANK ROAD WATERMAIN

SCALE: NOT TO SCALE
DATE: OCT 2020
JOB: 111117
FIGURE: FIGURE 3

REFER TO FIGURE 4B

FOR CONNECTION AND RESERVOIR LOCATION SEE FIGURE 4B

REFER TO FIGURE 4B

FOR CONNECTION AND RESERVOIR LOCATION SEE FIGURE 4B

REFER TO FIGURE 4B

avenue DARJEELING AVENUE

avenue DARJEELING AVENUE

N1 93.65 P1 N2 93.92 P2 N3 94.82 P3 N4 93.60 P4 N5 93.76 P5 N6 94.75 P6 N23 93.70 P7 N7 93.95

P29 96.45 N24 H15

BLOCK 1

BLOCK 2

P25

BLOCK 4

P16

H1

H2

BLOCK 6

H3

H4

P8

H5 N8 93.50

BLOCK 11
26 TOWNHOUSE UNITS

P24

cours AFFOGATO WALK

H14

ruelle ROBUSTA LANE

BLOCK 3

BLOCK 5

BLOCK 7

BLOCK 8

P18

93.60 N15 H9

93.45 N16 H10

P9

BLOCK 13

93.75 N20

P15

placce CORRETO PLACE

BLOCK 9
BLOCK 10

H6

93.56 N9 93.38 BLOCK 12

P10 N10

P23

P22

H13

93.50 N19

P17

voie CORTADO WAY

P11 94.05 N11

N14 93.35 H8

P12

BLOCK 15

N12 93.40

rue JOCKVALE ROAD

P14

terrasse SENCHA TERRACE

BLOCK 16

P21

BLOCK 30

93.07 N18

H7

P13

N13 93.21

MULTI STOREY 60 UNITS

BLOCK 17

REALIGNED GREENBANK ROAD

BLOCK 18

BLOCK 19

MULTI STOREY 60 UNITS

H12

BLOCK 28
BLOCK 29

BLOCK 26
BLOCK 27

P19

P26

H16 94.16 N21

MOCHI CIRCLE

P20

H11

93.02 N17

MULTI STOREY 75 UNITS

BLOCK 24

BLOCK 23

BLOCK 25

H17

P27

94.45 N25

MULTI STOREY 130 UNITS

BLOCK 20

P28

R2

22

LEGEND

P12	PROPOSED 50mmØ WATERMAIN PIPE
P12	PROPOSED 200mmØ WATERMAIN PIPE
P4	PROPOSED 300mmØ WATERMAIN PIPE
OP4 300mmØ	OFFSITE WATERMAIN PIPE ID AND SIZE (BY OTHERS)
N4	WATERMAIN NODE - ONSITE
ON4	WATERMAIN NODE - OFFSITE
	RESERVOIR
	HYDRANT
97.75	GROUND ELEVATION
	FIREFLOWS THAT CANNOT BE CAPPED AS PER TECHNICAL BULLETIN ISDTB-2014-02

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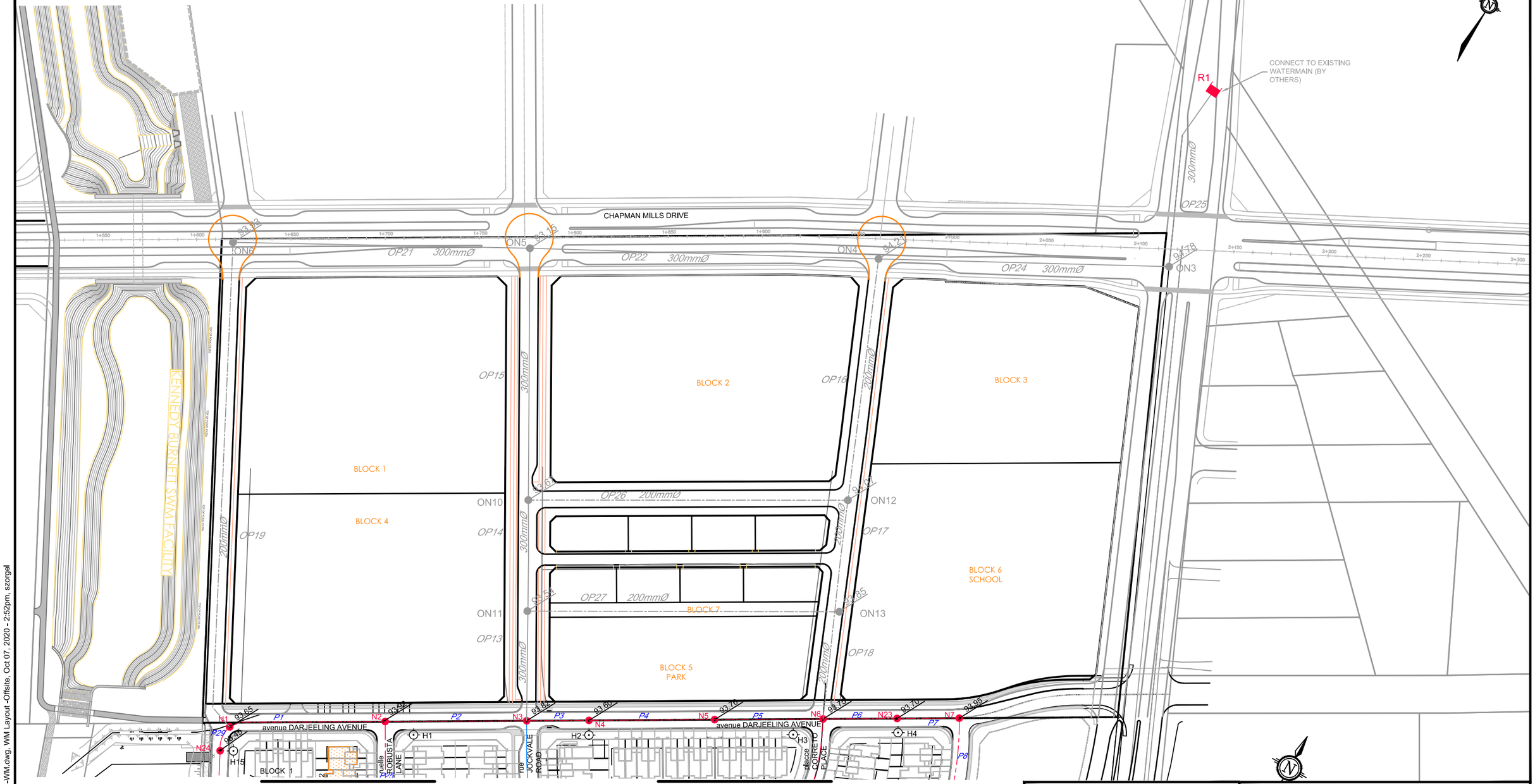
3370 GREENBANK RD. BURNETT LANDS

WATERMAIN LAYOUT

SCALE 1:1500 (0, 15m, 30m, 60m)

DATE OCT 2020 | JOB 111117 | FIGURE FIGURE 4A



LEGEND

- P12 — PROPOSED 50mmØ WATERMAIN PIPE
- P12 — PROPOSED 200mmØ WATERMAIN PIPE
- P4 — PROPOSED 300mmØ WATERMAIN PIPE
- OP4 300mmØ — OFFSITE WATERMAIN PIPE ID AND SIZE (BY OTHERS)
- N4 — WATERMAIN NODE - ONSITE
- ON4 — WATERMAIN NODE - OFFSITE
- RESERVOIR
- HYDRANT
- 97.75 — GROUND ELEVATION
- FIREFLOWS THAT CANNOT BE CAPPED AS PER TECHNICAL BULLETIN ISDTB-2014-02

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3370 GREENBANK RD. BURNETT LANDS

WATERMAIN LAYOUT - OFFSITE (BY OTHERS)

SCALE 1 : 2000 (0, 20, 40, 60, 80)

DATE OCT 2020 | JOB 111117 | FIGURE FIGURE 4B

M:\2011\111117\CADDesign\Figures\111117-Fig4-WM.dwg, WM Layout -Offsite, Oct 07, 2020 - 2:52pm, szorgel

SHT11X17.DWG - 279mmX432mm

Appendix D

Correspondence

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 5210-BWT783
Issue Date: January 8, 2021

Claridge Homes (South Nepean) Inc.
210 Gladstone Avenue
Ottawa, Ontario
K2P 0Y6

Site Location: Burnett Lands Subdivision
3370 Greenbank Road
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the establishment of wastewater infrastructure Works located in the City of Ottawa, consisting of the following:

- **sanitary sewers** on Darjeeling Avenue (from Affogato Walk to Correto Place), Robusta Lane (from Darjeeling Avenue to Affogato Walk), Affogato Walk (from Robusta Lane to Jockvale Road), Jockvale Road (from Darjeeling Avenue to approximately 55 metres west of Greenbank Road), Mochi Circle (from Jockvale Road to Jockvale Road), Correto Place (from Jockvale Road to Darjeeling Avenue), Sencha Terrace (from Jockvale Road to Darjeeling Avenue), Cortado Way (from Sencha Terrace to approximately 60 metre east of Sencha Terrace), discharging to existing sewers, located within Jockvale Road;

- **storm sewers** on Darjeeling Avenue (from Affogato Walk to approximately 45 metres east of Sencha Terrace), discharging to proposed oil grit separator, located in Block 31;

- **storm sewers** on Robusta Lane (from Darjeeling Avenue to Affogato Walk), Affogato Walk (from approximately 50 metres west of Robusta Lane to Jockvale Road), Jockvale Road (from Darjeeling Avenue to approximately 35 metres west of Greenbank Road), Mochi Circle (from Jockvale Road to Jockvale Road), Block 30 (from Affogato Walk to Mochi Circle), Block 25 (from Mochi Circle to Block 21), Block 21 (from Block 25 to Headwall 1 outlet), Correto Place (from Jockvale Road to Darjeeling Avenue), Sencha Terrace (from Jockvale Road to Darjeeling Avenue), Cortado Way (from Sencha Terrace to approximately 60 metres east of Sencha Terrace), discharging to proposed oil grit separator, located in Block 21; and

the establishment of stormwater management Works to serve Burnett Lands Subdivision and South Nepean Town

Center, located in the Ottawa, consisting of the following:

- **oil and grit separator (catchment area 10.4 hectares):** one (1) oil and grit separator, Contech Engineered Solutions, Model Vortechs VX16000 or Equivalent Equipment, located upstream of the storm outlet to the Jock River within Block 21, providing Enhanced Level of protection, having a sediment storage capacity of 5,430 litres, an oil storage capacity of 3,175 litres, a total storage volume of approximately 18, 349 litres, and a maximum treatment rate of 710 litres per second, receiving inflow from the storm sewer located downstream of Mochi Circle, discharging via a 1200 millimetre diameter outlet pipe to the Jock River; and

- **oil and grit separator (catchment area [12.34] hectares):** one (1) oil and grit separator, Contech Engineered Solutions, Vortechs PC1421 or Equivalent Equipment, located upstream of the storm outlet to the Fraser Clarke Drain at Darjeeling Avenue, providing Enhanced Level of protection, having a sediment storage capacity of 7,390 litres, an oil storage capacity of 3,817 litres, a total storage volume of approximately 25,768 litres, and a maximum treatment rate of 963 litres per second, receiving inflow from the storm sewer located at Darjeeling Avenue, discharging via a 1200 millimetre diameter outlet pipe to the downstream 1220 millimetre x 1920 millimetre elliptical sewer into the Fraser Clarke Drain;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted application and supporting documents listed in Schedule "A" forming part of this approval.

For the purpose of this environmental compliance approval, the following definitions apply:

DEFINITIONS

1. "Approval" means this entire document and any schedules attached to it, and the application;

2. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

3. "District Manager" means the District Manager of the appropriate local District Office of the Ministry, where the Works are geographically located;

4. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19, as amended;

5. "Equivalent Equipment" means a substituted equipment or like-for-like equipment that meets the required quality and performance standards of the approved named equipment.

6. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

7. "Owner" means Claridge Homes (South Nepean) Inc., and includes its successors and

assignees;

8. "OWRA" means the Ontario Water Resources Act, R.S.O. 1990, c. O.40, as amended;

9. "Works" means the sewage Works described in the Owner's application, and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL CONDITIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2. Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

4. Where there is a conflict between the documents listed in Schedule "A" and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

5. The conditions of this Approval are severable. If any condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

1. This Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

2. In the event that completion and commissioning of any portion of the Works is anticipated to be delayed beyond the specified expiry period, the Owner shall submit an application of extension to the expiry period, at least twelve (12) months prior to the end of the period. The application for extension shall include the reason(s) for the delay, whether there is any design change(s) and a review of whether the standards applicable at

the time of Approval of the Works are still applicable at the time of request for extension, to ensure the ongoing protection of the environment.

3. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

    a. change of Owner;

    b. change of address of the Owner;

    c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act,* R.S.O. 1990, c.B17 shall be included in the notification to the District Manager; or

    d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.

2. In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

3. The Owner shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

4. OPERATION AND MAINTENANCE

1. If applicable, any proposed storm sewers or other stormwater conveyance in this Approval can be constructed but not operated until the proposed stormwater management facilities in this Approval or any other Approval that are designed to service the storm sewers or other stormwater conveyance are in operation.

2. The Owner shall make all necessary investigations, take all necessary steps and obtain all necessary approvals so as to ensure that the physical structure, siting and operations of the Works do not constitute a safety or health hazard to the general public.

3. The Owner shall undertake an inspection of the condition of the Works, at least once a year, and undertake any necessary cleaning and maintenance to ensure that sediment, debris and excessive decaying vegetation are removed from the Works to prevent the excessive build-up of sediment, oil/grit, debris and/or decaying vegetation, to avoid reduction of the capacity and/or permeability of the Works, as applicable. The Owner shall also regularly inspect and clean out the inlet to and outlet from the Works to ensure

that these are not obstructed.

4. The Owner shall construct, operate and maintain the Works with the objective that the effluent from the Works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen, foam or discoloration on the receiving waters.

5. The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the Owner's administrative office for inspection by the Ministry. The logbook shall include the following:

   a. the name of the Works; and

   b. the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed and method of clean-out of the Works.

6. The Owner shall prepare an operations manual prior to the commencement of operation of the Works that includes, but is not necessarily limited to, the following information:

   a. operating and maintenance procedures for routine operation of the Works;

   b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

   c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;

   d. contingency plans and procedures for dealing with potential spills and any other abnormal situations and for notifying the District Manager; and

   e. procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.

7. The Owner shall maintain the operations manual current and retain a copy at the Owner's administrative office for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

5. TEMPORARY EROSION AND SEDIMENT CONTROL

1. The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every two (2) weeks and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at

which time they shall be removed and all disturbed areas reinstated properly.

2. The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

6. REPORTING

1. One (1) week prior to the start-up of the operation of the Works, the Owner shall notify the District Manager (in writing) of the pending start-up date.

2. The Owner shall, upon request, make all reports, manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

3. The Owner shall prepare a performance report within ninety (90) days following the end of the period being reported upon, and submit the report(s) to the District Manager when requested. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be prepared to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

    a. a description of any operating problems encountered and corrective actions taken;

    b. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works, including an estimate of the quantity of any materials removed from the Works;

    c. a summary of any complaints received during the reporting period and any steps taken to address the complaints;

    d. a summary of all spill or abnormal discharge events; and

    e. any other information the District Manager requires from time to time.

7. RECORD KEEPING

1. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation, maintenance and monitoring activities required by this Approval.

Schedule "A"

1. Application for Environmental Compliance Approval, dated November 16, 2020, received on December 1, 2020, submitted by Claridge Homes (South Nepean) Inc.;

2. Transfer of Review Letter of Recommendation, dated November 25, 2020 and signed by Jeff Shillington, P.Eng., Senior Project Manager, Development Review, City of Ottawa;

    a. Final Plans and Specifications prepared by Novatech.

    b. Pipe Data Form - Watermain, Storm Sewer, Sanitary Sewer, and Forcemain Design Supplement to Application for Approval for Water and Sewage Works.

    c. Hydraulic Design Sheets prepared by Novatech.

    d. Stormwater Management Report prepared by Novatech.

    e. Design brief, calculations and specifications prepared by Novatech.

The reasons for the imposition of these terms and conditions are as follows:

REASONS:

1. Condition 1 is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted. This condition is also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included as regular inspection and necessary removal of sediment and excessive decaying vegetation from the Works are required to mitigate the impact of sediment, debris and/or decaying vegetation on the treatment capacity of the Works. The Condition also ensures that adequate storage is maintained in the Works at all times as required by the design. Furthermore, this Condition is included to ensure that the Works are operated and maintained to function as designed.

5. Condition 5 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction until they are no longer required.

6. Condition 6 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

7. Condition 7 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing

shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment,
Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 8th day of January, 2021

A. Ahmed

Aziz Ahmed, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

NM/
c: District Manager, MECP Ottawa
City Clerk, City of Ottawa (File No. D07-16-17-0001)
Jeff Shillington, P.Eng., Senior Project Manager, Development Review, City of Ottawa;
Marc St. Pierre, Novatech

Conservation Partners
Partenaires en conservation

Mississippi Valley Conservation Authority | Rideau Valley Conservation Authority | South Nation Conservation / Conservation de la Nation Sud

November 26, 2020

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Kanata, Ontario
K2M 1P6

Attention: James Ireland, Novatech

Subject: **Claridge Homes**
Plan of Subdivision D07-16-17-0001
3370 Greenbank Road, City of Ottawa

Dear Mr. Ireland:

In response to your request with regards to the MECP clearance letter request, the Rideau Valley Conservation Authority has reviewed and have accepted the following:

> Burnett Lands 3370 Greenbank Roadstormwater Management Report by Novatech dated October 9, 2020 (Second Revision)

The RVCA is satisfied that the design objectives are appropriate to support the characteristics and sensitivity of the receiving watercourse. Please contact me should you require anything else.

Respectfully,

Eric Lalande, MCIP, RPP
Planner, Planning and Regulations
Rideau Valley Conservation Authority
613-692-3571 ext. 1137
eric.lalande@rvca.ca

RVCA Letter of Permission —

Ont. Reg. 174/06, S. 28 *Conservation Authorities Act* 1990, As Amended.

Rideau Valley Conservation Authority

3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504
F 613-692-0831 | www.rvca.ca

Date: December 4, 2020
File: RV5-3720
Contact: Eric Lalande, Planner

Applicant: Claridge Homes (South Nepean) LP
210 Gladstone Ave, Suite 2001
Ottawa, ON K2P 0Y6

Permit for: Development Under Section 28 of the Conservation Authorities Act for a balance cut and fill, at 3370 Greenbank Road, Lot 13, Concession 3, former Township of Nepean, now in the City of Ottawa. Roll Number: 061412077004950

***NOTICE:* The permit holder, and agents thereof, are responsible to consider any active Provincial Emergency Orders under the Emergency Management and Civil Protection Act, R.S.O. 1990, c. E.9, when determining the safety and legality of undertaking construction work.**

Dear Mr. Malhotra,

The Rideau Valley Conservation Authority has reviewed the application and understands the proposal to be for the balanced cut and fill of land associated with the realignment of a portion of the Burnett Municipal Drain at 3700 Greenbank Road including:

- **The placement of approximately 571 m^3 of fill; and**
- **The removal of approximately 708 m^3 of fill**

  *Note: this application supersedes the previously approved and since expired permit issued in September 2018 (RV5-1918)

This proposal was reviewed under Ontario Regulation 174/06, the "*Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*" regulation and the RVCA Development Policies (approved by the Board of Directors, November 2010), specifically Section 2.0 – Polices Regarding the Placing of Fill. The proposal is not expected to impact the control of flooding, pollution, erosion or conservation of land providing conditions are followed.

PERMISSION AND CONDITIONS

By this letter the Rideau Valley Authority hereby grants you approval to undertake this project as outlined in your permit application but subject to the following conditions:

1. Approval is subject to the understanding of the project as described above and outlined in the application and submitted plans completed by Novatech, NO: 111117-FP, dated November 5, 2020, (Rev#3) Project #111117-01

2. All excavated material not utilized as backfill (if appropriate material) must be removed from the site to a suitable disposal site outside the 1:100 year floodplain and any regulated area.

3. A finished grading plan will be submitted as soon as the work is complete to confirm the balance cut and fill has been completed in accordance with submitted plans on the property. A refundable deposit of $3000 is required to be submitted prior to commencement of the work. Satisfactory review of the finished grading plan and compliance with other conditions of approval will result in the return of the deposit (less 10% administrative fee).

4. The Rideau Valley Conservation Authority is to receive 48 hours' notice prior to the start of the project.

5. The applicant agrees that Authority staff may visit the subject property before, during and after project completion to ensure compliance with the conditions as set out in this letter of permission.

6. Sediment control will be established to ensure no sediment migration from the site. All grubbing and equipment storage and operation will be limited to the development envelope. All areas located outside the development envelope will be left untouched. No fill including topsoil, sand, etc. will be placed outside the development envelope for any reason purpose. No equipment will be permitted to disturb area outside the development envelope.

7. A new application must be submitted should any work as specified in this letter be ongoing or planned for or after December 4, 2022.

By this letter the Rideau Valley Conservation Authority assumes no responsibility or liability for any flood, erosion, or slope failure damage which may occur either to your property or the structures on it or if any activity undertaken by you adversely affects the property or interests of adjacent landowners. This letter does not relieve you of the necessity or responsibility for obtaining any other federal, provincial or municipal permits. This permit is not transferable to subsequent property owners.
The permit holder, and agents thereof, are responsible to consider any active Provincial Emergency Orders when determining the safety and legality of undertaking construction work.

Should you have any questions regarding this letter, please contact Eric Lalande, Planner at 613-692-3571 x1137.

Terry K. Davidson P.Eng
Conservation Authority S. 28 Signing delegate
O. Reg. 174/06

- Pursuant to the provisions of S. 28(12) of the *Conservation Authorities Act* (R.S.O.1990, as amended.) any or all of the conditions set out above may be appealed to the Executive Committee of the Conservation Authority in the event that they are not satisfactory or cannot be complied with.
- Failure to comply with the conditions of approval or the scope of the project may result in the cancelling of the permission and/or initiation of legal action under S. 28(16) of the Act.
- Commencement of the work and/or a signed and dated copy of this letter indicates acknowledgement and acceptance of the conditions of the RVCA's approval letter concerning the application and the undertaking and scope of the project.

Name: _____(print)

Signed: _____ Date: _____

RVCA Letter of Permission —

Ont. Reg. 174/06, S. 28 *Conservation Authorities Act* 1990, As Amended.

Rideau Valley Conservation Authority

3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504
F 613-692-0831 | www.rvca.ca

Date: December 4, 2020
File: RV5-3820
Contact: Eric Lalande, Planner

Applicant: Claridge Homes (South Nepean) LP
210 Gladstone, Suite 2001
Ottawa, ON K2P 0Y6

Permit for: Alteration to a Watercourse Under Section 28 of the Conservation Authorities Act for the filling in of watercourse formerly known as the Burnett Municipal Drain , at 3370 Greenbank Road, Lot 13, Concession 3, former Township of Nepean, now in the City of Ottawa.
Roll Number: 601412077004950

***NOTICE:** The permit holder, and agents thereof, are responsible to consider any active Provincial Emergency Orders under the Emergency Management and Civil Protection Act, R.S.O. 1990, c. E.9, when determining the safety and legality of undertaking construction work.*

Dear Mr. Malhotra,

The Rideau Valley Conservation Authority has reviewed the application and understands the proposal to be for:

a) **The infill and abandonment of approximately 210m of a watercourse formerly known as the Burnett Municipal Drain that has been abandoned through City Bylaw..**

This proposal was reviewed under Ontario Regulation 174/06, the "*Development, Interference with Wetlands, and Alteration to Watercourse and Shorelines"* regulation and the RVCA Development Policies (approved by the RVCA, Board of Directors), specifically Section 3. Alteration to Waterways. The proposal is not expected to impact the control of flooding, pollution, erosion or conservation of land providing conditions are followed.

PERMISSION AND CONDITIONS

By this letter the Rideau Valley Authority hereby grants you approval to undertake this project as outlined in your permit application but subject to the following conditions:

1. Approval is subject to the understanding of the project as described above and outlined in the application and submitted drawings including
    a. Existing Conditions completed by Novatech, dated Nov 2020, Project 111117, Figure 1;
    b. Existing Ditch Plan, completed by Novatech, dated Nov 2020, Project 111117, Plan 1, Plan 2 and XS 2
    c. Sediment and Erosion Control Plan, completed by Novatech, dated Nov 5, 2020, Project 111117-ESC Rev#5

2. Any changes to the proposed work must be submitted in writing to the Conservation Authority for review and approval prior to implementation. No conditions are subject to change/revision by the on-site contractor(s).

3. The work must ensure adequate drainage outlet for any upstream properties is maintained at all times in order to ensure no upstream flooding shall occur.

4. Any excess excavated material, as a result of the work, must be disposed of in a suitable location outside any regulatory floodplain and fill regulated area.

5. It is recommended that you retain the services of an engineer to conduct on-site inspections to ensure adequacy of the work, verify stability of the final grades, and confirm all imported fill is of a suitable type and has been adequately placed and compacted.

6. **There will be no in-water works between March 15 and June 30, of any given year to protect local aquatic species populations during their spawning and nursery time periods.**

7. Sediment barriers should be used on site in an appropriate method according to the Ontario Provincial Standard Specifications (OPSS) for silt barriers as a minimum. In-water work may require the use of a properly secured silt curtain. Soil type, slope of land, drainage area, weather, predicted sediment load and deposition should be considered when selecting the type of sediment/erosion control.

8. Sediment and erosion control measures shall be in place before any excavation or construction works commence. All sediment/erosion control measures are to be monitored regularly by experienced personnel and maintained as necessary to ensure good working order. If the erosion and sedimentation control measures are deemed not to be performing adequately, the contractor shall undertake immediate additional measures as appropriate to the situation to the satisfaction of the Conservation Authority.

9. Activities such as equipment refueling and maintenance must be conducted away from the water to prevent entry of petroleum products, debris, or other deleterious substances into the water. Operate machinery from outside the water, or on the water in a manner that minimizes disturbance to the banks or bed of the watercourse. Equipment shall not be cleaned in the watercourse or where wash-water can enter any watercourse. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.

10. Any aquatic species (fish, turtles) trapped within an enclosed work area are to be safely relocated outside of the enclosed area to the main watercourse downstream of the work zone.

11. All disturbed soil areas must be appropriately stabilized to prevent erosion.

12. It is recommended that you ensure your contractor(s) are provided with a copy of this letter to ensure compliance with the conditions listed herein.

13. The applicant agrees that Authority staff may visit the subject property, before, during and after project completion, to ensure compliance with the conditions as set out in this letter of permission.A new application must be submitted should any work as specified in this letter be ongoing or planned for or after December 4, 2022

By this letter the Rideau Valley Conservation Authority assumes no responsibility or liability for any flood, erosion, or slope failure damage which may occur either to your property or the structures on it or if any activity undertaken by you adversely affects the property or interests of adjacent landowners. This letter does not relieve you of the necessity or responsibility for obtaining any other federal, provincial or municipal permits. This permit is not transferable to subsequent property owners.
The permit holder, and agents thereof, are responsible to consider any active Provincial Emergency Orders when determining the safety and legality of undertaking construction work.

Should you have any questions regarding this letter, please contact Eric Lalande, Planner at 613-692-3571 x1137

Terry K. Davidson P.Eng
Conservation Authority S. 28 Signing delegate
O. Reg. 174/06

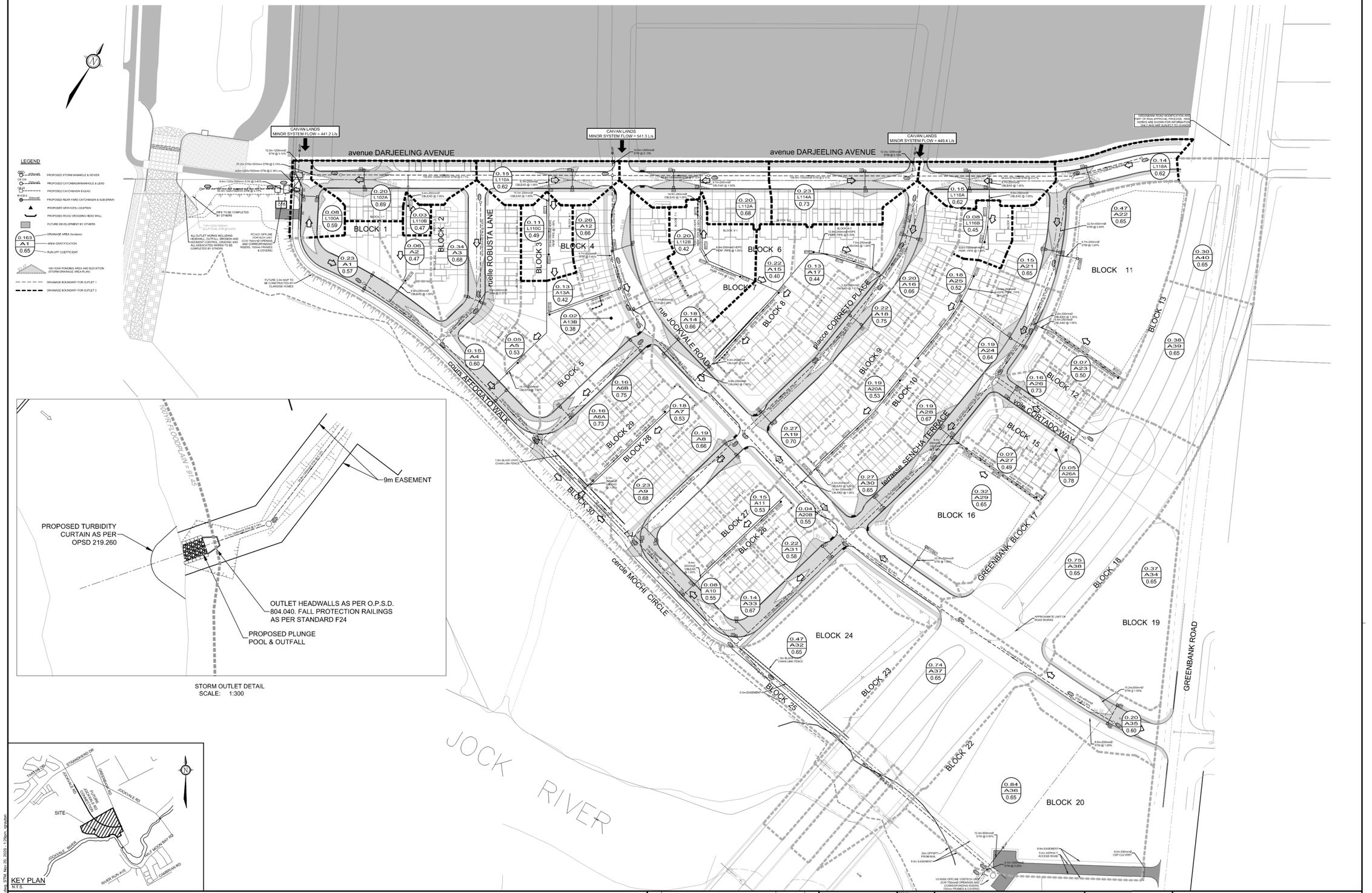
- Pursuant to the provisions of S. 28(12) of the *Conservation Authorities Act* (R.S.O.1990, as amended.) any or all of the conditions set out above may be appealed to the Executive Committee of the Conservation Authority in the event that they are not satisfactory or cannot be complied with.
- Failure to comply with the conditions of approval or the scope of the project may result in the cancelling of the permission and/or initiation of legal action under S. 28(16) of the Act.
- Commencement of the work and/or a signed and dated copy of this letter indicates acknowledgement and acceptance of the conditions of the RVCA's approval letter concerning the application and the undertaking and scope of the project.

Name: _____(print)

Signed: _____ Date: _____

Appendix E

Storm Report Excerpts



NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

NOTE:
CONTRACTOR TO CONFIRM ELEVATIONS OF INFRASTRUCTURE IN THE STREET PRIOR TO EXTENDING SERVICES INTO THE SITE AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES IMMEDIATELY.

No.	REVISION	DATE	BY
8.	ISSUED FOR ECA APPROVAL	NOV 19/20	SAZ
7.	REVISED AS PER CITY OF OTTAWA COMMENTS	OCT 9/20	SAZ
6	REVISED AS PER CITY OF OTTAWA COMMENTS	AUG 24/20	MSP
5	ISSUED CITY OF OTTAWA REVIEW	JUNE 22/20	MSP
4	REISSUED WITH DRAFT PLAN OF SUBDIVISION	MAY 29/19	MSP
3	REISSUED WITH DRAFT PLAN OF SUBDIVISION	MAY 23/18	MSP
2	REISSUED WITH DRAFT PLAN OF SUBDIVISION	JAN 26/18	MSP
1	ISSUED WITH DRAFT PLAN OF SUBDIVISION	DEC 6/16	GJM

SCALE
1:750
1:750
0 15 30

DESIGN SAZ
CHECKED DDB
DRAWN RBG
CHECKED DDB
APPROVED MSP

LICENSED PROFESSIONAL ENGINEER
S.A.N. ZORGEL
100191487
PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
BURNETT LANDS
3370 GREENBANK ROAD

DRAWING NAME
STORM DRAINAGE AREA PLAN

PROJECT No. 111117
REV REV # 8
DRAWING No. 111117-STM

D07-16-17-0001

#18179

C:\2021\111117\CAD\Design\111117 - STM.dwg, STM, Nov 26, 2020 - 1:29pm, rgrayson
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