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DESIGN BRIEF

FOR

MINTO COMMUNITIES–ABBOTT'S RUN BLOCK 13

CITY OF OTTAWA

PROJECT NO.: 22-1295.1

JUNE 2025
SUBMISSION 1

DESIGN BRIEF
FOR ABBOTT'S RUN BLOCK 13
MINTO COMMUNITIES

TABLE OF CONTENTS

IN-TEXT FIGURES

TABLES

APPENDICES

Appendix A
Site Plan (SRN, June 10, 2025)

Appendix B
Average Day Demand Figure
Max Day + Fire Flow Demand Figure
Peak Hour Demand Figure
Average Day Demand Hydraulic Analysis
Max Day + Fire Flow Demand Hydraulic Analysis
Peak Hour Demand Hydraulic Analysis
Hydraulic Capacity and Modeling Analysis Abbott's Run Phases 2 & 3 Development (GeoAdvice, December 20, 2024)

Appendix C
Sanitary Design Sheet (DSEL, June 2025)
Sanitary Design Sheet - Adequacy of Public Servicing Report (DSEL, May 2025)

Appendix D
Storm Design Sheet (DSEL, June 2025)
Ponding Volume Table
USF Freeboard Results - 100yr Chicago 3 hr
USF Freeboard Results - 100yr+20% Chicago 3 hr
Ponding Depth - 100-year & 100-year+20% Chicago 3hr

DESIGN BRIEF
FOR
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1.0 INTRODUCTION & BACKGROUND

David Schaeffer Engineering Limited (DSEL) has prepared this Design Brief in support of the development of Abbott's Run Block 13 on behalf of Minto Communities.

The study area is located within 5618 Hazeldean Road in the City of Ottawa urban boundary, in the Stittsville ward. As illustrated in ***Figure 1.1***, the study area is bounded by Abbott's Run Stage 2 and Robert Grant Avenue. The site is a 1.39 ha parcel located within the Fernbank Community.

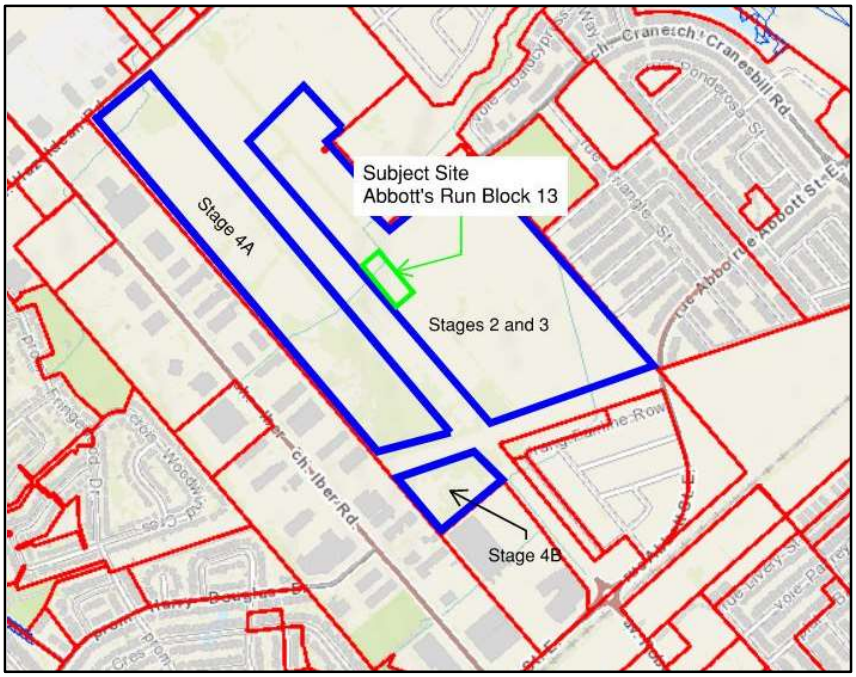


Figure 1.1: Site Location

The study area is part of the broader Fernbank community. The *Master Servicing Study* (MSS) (Novatech, June 2009) and the *Environmental Management Plan* (EMP)

(Novatech, June 2009) were prepared for the Fernbank Community, which includes Abbott's Run—encompassing the subject lands, Abbott's Run Block 13—and provide a roadmap for development. The *Adequacy of Public Servicing Report* (DSEL) and the *Abbott's Run Phase 2 and 3 Design Brief* (DSEL) have recently been submitted to the City of Ottawa for review. These reports of consistent both the MSS and EMP and provide both the overall and detailed servicing strategy for these lands.

1.1 Development Concept

The site plan for the proposed development is presented in ***Appendix A***. The proposed development consists of a total of 124 stacked townhouse units. ***Table 1.1*** presented below provides a projected population count for the site.

Table 1.1: Development Statistic Projections

Land Use	Total Area (ha)	Projected Residential Units	Residential Population per Unit	Projected Population
Stacked Townhouse Units	1.39	124	2.1	260

1.2 Existing Conditions

The existing elevations within the subject site generally range from 103 m to 102 m, falling from the south end of the site to the north end. The geotechnical report indicates that the maximum permissible grade raise for the subject site is between 2.0m to 2.3 m. Additional geotechnical details can be found within the Geotechnical Investigation – Proposed Residential Development, 5618 Hazeldean Road. Report: PG7460-1 (Paterson Group, May 28, 2025).

1.3 Required Permits / Approvals

Development of the study area is expected to be subject to the following permits and approvals presented in ***Table 1.2***.

Table 1.2: Anticipated Permit/Approval Requirements

Agency	Permit/Approval Required	Trigger	Remarks
MECP	Permit to Take Water (PTTW)	Construction of proposed land uses (e.g. basements for residential homes) and services.	Pumping of groundwater or surface water may be required during construction, given site conditions, proposed land uses, and on-site/off-site municipal infrastructure.
MECP/City of Ottawa	MECP Form 1 – Record of Watermains Authorized as a Future Alteration.	Construction of watermains.	The City of Ottawa is expected to review the watermains on behalf of the MECP through the Form 1 – Record of Watermains

			Authorized as a Future Alteration.
City of Ottawa	Commence Work Notification (CWN)	Construction of new sanitary and storm sewer throughout the site plan.	The City of Ottawa will issue a commence work notification for construction of the sanitary and storm sewers

Under Ontario Regulation 525/98, privately owned sanitary sewers located entirely on private property and not including treatment or pumping facilities are exempt from requiring an Environmental Compliance Approval (ECA). As such, the proposed system for this site does not require an ECA.

1.4 Pre-Consultation

Pre-application consultation was conducted on May 12, 2025, between the City of Ottawa and the developers as part of the Plan of Subdivision Application process. Various stakeholders provided written comments that were recorded and formalized in meeting minutes.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following key studies were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**, City of Ottawa, *SDG002,* October 2012 *(Sewer Design Guidelines)* and all applicable technical bulletins.
- **Ottawa Design Guidelines – Water Distribution,** City of Ottawa, July 2010. *(Water Supply Guidelines)* and all applicable technical bulletins.
- **Fire Underwriters Survey**, 1999. *(FUS)*
- **Design Guidelines for Drinking-Water Systems**, Ministry of the Environment, 2008. *(MECP Water Guidelines)*
- **Design Guidelines for Sewage Works**, Ministry of the Environment, 2008. *(MECP Design Guidelines)*
- **Stormwater Planning and Design Manual**, Ministry of the Environment, 2003. *(SWMP Design Manual)*
- **Fernbank Community Design Plan Master Servicing Study,** Novatech June 24, 2009. ***(MSS)***
- **Fernbank Community Design Plan Environmental Management Plan,** Novatech June 2009. ***(EMP)***
- **Adequacy of Public Servicing Report for Abbott's Run Phase 2, 3, 4a and 4b,** DSEL, May 2025. ***(Adequacy of Public Servicing Report)***
- **Design Brief for Abbott's Run Phase 2 and 3,** DSEL, May 2025. ***(Design Brief)***
- **Fernbank Community - Pond 1 Stormwater Management Report** Novatech July 19, 2023, ***(Pond 1 SWM Report)***

- **Geotechnical Investigation** – Proposed Residential Development – 5618 Hazeldean Road, Paterson Group, May 28, 2025.
  (Geotechnical Report)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the existing City of Ottawa 3W pressure zone in the West Urban Community (WUC). To the south of the subject property, a 200mm diameter watermain is proposed on Monorail Road and to the north a 300mm diameter watermain is proposed on Cranesbill Road. A 200mm stub extending from Cranesbill Road extends to subject lands.

3.2 Water Supply Servicing Design

The study area is proposed to be serviced by a network comprised of 50mm, 100mm and 200mm diameter watermains with connections to Cranesbill Road to the north and Monorail Road to the south. The proposed watermain network is shown in ***Drawing 3.*** The units will be equipped with individual water meters and have their own water service. The sizing of the proposed watermain network is based on the *Water Supply Guidelines* summarized in ***Table 3.1*** below. As Block 13 is imbedded within Abbott's Run Stage 2, which is also currently under review by the city, the hydraulic analysis for these lands have been included in **Appendix B**.

Potable water will be supplied to pressurized local watermains by connections to the 300mm diameter watermain on Cranesbill Road and the 200mm diameter watermain on Monorail Road. The proposed watermain network can be seen in the accompanying engineering drawings prepared by DSEL.

Table 3.1: Water Supply Design Criteria

Design Parameter	Value
Residential – Medium Density Condo	2.1 p/unit
Single Family Home Average Day Demand (ADD)	280 L/c/d
Institutional / Park Average Day Demand (ADD)	28,000 L/ha/d
Single Family Home Max. Daily Demand (MDD)	avg. day + OWD L/d
Multi Family Townhome Max. Daily Demand (MDD)	avg. day + OWD L/d
High Density Building Max. Day Demand (MDD)	avg. day
Institutional/ Park Max. Day Demand (MDD)	1.5 x avg. day L/ha/d
Single Family Home Peak Hour Demand (PHD)	2.1 x max. day L/d
Multi Family Townhome Peak Hour Demand (PHD)	2.1 x max. day L/d
High Density Building Peak Hour Demand (PHD)	1.6 x max. day L/d
Institutional/ Park Peak Hour Demand (PHD)	1.8 x max day L/ha/d
Minimum Watermain Size	200 mm diameter
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350 kPa and 480 kPa

During normal operating conditions pressure must not drop below	345 kPa (50 psi)
During normal operating conditions pressure must not exceed	552 kPa (80 psi)
During fire flow operating pressure must not drop below	140 kPa (20 psi)

Notes:

- *Extracted from Section 4: Ottawa Design Guidelines, Water Distribution (July 2010), Table 4.1 – Per Unit Populations and Table 4.2 – Consumption Rates for Subdivisions of 501 to 3,000 Persons.*
- *No Outdoor Water Demand considered for residential uses.*
- *Park water demands assumed based on classification and potential for community facilities, etc.*
- *Residential Average Daily Demand assumed to be 280 L/d/P in accordance with 2018 changes to Sanitary Design Guidelines, see Section 4.0.*

3.2.1 Watermain Modelling

A hydraulic analysis for the proposed watermain network was completed and can be found in **Appendix B**. The water demands for the site are shown in **Table 3.2.**

Table 3.2 Water Demands

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	261	73.1	50.8	263.1	182.7	394.6	274.1

The fire flows are calculated in accordance with the City of Ottawa's Technical Bulletins and the Fire Underwriters Survey's (FUS) Water Supply for Public Fire Protection Guideline (2020).

- Type of construction: Wood Frame Construction.
- Sprinkler protection: non-sprinklered
- Firewall provided for 24-unit blocks

The required fire flow demands for Block 13 are as follows:

- Block 1: 16,000 L/min
- Block 2 and 5: 14,000 L/min
- Block 4: 15,000 L/min
- Block 6: 12,000 L/min

The boundary conditions were generated for the site using the Hydraulic Capacity and Modeling Analysis Abbott's Run Phases 2 & 3 Development (GeoAdvice, December 2024). This analysis can be found in **Appendix B**. ***Table 3.3***. shows the boundary conditions that were extracted from the Stage 2 & 3 model for this site.

Table 3.3: Boundary Conditions

Condition	Connection 1 (Cranesbill Road)		Connection 2 (Monorail Road)	
	HGL (m)	Pressure (psi)	HGL (m)	Pressure (psi)
Max HGL	58.4	83.0	58.4	83.1
Peak Hour	51.0	72.5	51.0	72.5
Max Day + Fire 1 (267 L/s)	38.9	55.3	38.1	54.2

Water modelling was carried out for average day, peak hour and maximum day plus fire flow. Modelling results shown in ***Table 3.4*** indicate that the development can be adequately serviced for average day and peak hour criteria.

Table 3.4: Summary of Available Service Pressures

Average Day Demand Maximum Pressure	Peak Hour Demand Minimum Pressure
58.47 m (573.39 kPa)	50.25 m (492.78 kPa)

In accordance with the City of Ottawa Water Distribution Guidelines, it is best practice for the water distribution system to operate between 345 kPa (50 psi) and 552 kPa (80 psi). The maximum pressure of the average day demand was calculated at 573.39 kPa suggesting that pressure-reducing valves may be required.

Per ***Table 3.1,*** the minimum allowable pressure under max day and fire flow conditions is 140 kPa (20 psi). The minimum pressure in the system for the max day + fire flow is 211 kPa, therefore exceeding the minimum requirement. Further details and hydraulic analysis can be found in ***Appendix B***.

3.3 Water Supply Conclusion

The proposed watermain network conforms to all relevant City and MECP *Water Supply Guidelines*. The hydraulic analysis of the proposed watermain network, concludes that all required domestic and fire flows can be met throughout the study area upon full buildout of the development. Anticipated fire flow requirements can be met throughout the development lands according to City Guidelines and ISTB-2018-02.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

There is an existing 900mm diameter sanitary trunk on Robert Grant Avenue and ultimately to the Kanata West Pump Station located at 1590 Maple Grove Road.

4.2 Wastewater Design

The wastewater servicing strategy for Block 13 was considered within the *Adequacy of Public Servicing Report and* the *Abbott's Run Stage 2 and 3 Design Brief* which are currently under review by the city. The site's allocated flows are proposed to be directed towards a proposed sewer on Cranesbill Road and ultimately to the trunk sewer on Robert Grant Avenue.

The development is proposed to be serviced by a network of gravity sewers, 200mm in diameter, connecting to the proposed 250mm diameter municipal sewer on Cranesbill Road. The sanitary sewer network was designed in accordance with the wastewater design parameters from ISTB-2018-01 and the *Sewer Design Guidelines*, summarized in ***Table 4.1*** below. The detailed sanitary sewer network is included in the accompanying engineering drawings prepared by DSEL.

Table 4.1: Wastewater Design Criteria

Design Parameter	Value
Townhome/Stacked Townhome Unit Population	2.1 people/unit
Residential Flow Rate, Average Daily	280 L/cap/day
Residential Peaking Factor	Harmon's Peaking Factor, where K=0.8
Commercial & Institutional Flow Rate	50,000 L/day/ha
ICI Peaking Factor	1.5
Park Peaking Factor	1.0
Infiltration Rate	0.33 L/s/ha
Sanitary sewers are to be sized employing Manning's Equation	$Q = \frac{1}{n} AR^{\frac{2}{3}} S^{\frac{1}{2}}$
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Pipe Size	250 mm (ICI), 200mm (Res)
Minimum Velocity	0.6 m/s
Maximum Velocity	3.0 m/s

A peak wastewater flow of 3.40 L/s has been calculated for the proposed development, based on the design parameters outlined in **Table 4.1**.

The *Adequacy of Public Servicing Report*, currently under City review, considered 1.2L/s for Block 13. With the revised parameters, the design flow for Block 13 is 3.40 L/s. To ensure that the additional flows can be conveyed by downstream system, the design sheet from the *Adequacy of Public Servicing Report* was reviewed and has been included

in Appendix C. With the additional flows, the receiving Cranesbill sewer is at 56% and that the most restrictive leg on Robert Grant Avenue is at 45% capacity.

Table 4.2: Wastewater Peak Flow

Area (Ha.)		Number of Units	Population		Allocated Demand (L/c/d)	Avg Day (L/s)	I/I (L/s)	Peak Factor	Peak Flow (L/s)
			Persons per unit	Population					
Block 13	1.39	124	2.1	260	280 L/c/d	0.84	0.46	3.48	3.40

Based on the sanitary design sheets included in ***Appendix C,*** there is sufficient residual capacity in the receiving sewer system to accommodate the development.

4.3 Wastewater Servicing Conclusions

A network of local gravity sewers is proposed within the subject site to convey flow to existing offsite sanitary sewers. The site is in accordance with the *Adequacy of Public Servicing Report* and *Design Brief*. The downstream system has been reviewed for available capacity and based on available information; it has been confirmed that the system can accommodate Block 13 as proposed.

The sewers have been designed in conformance with all relevant City of Ottawa and MECP Guidelines and Policies. Per ISTB-2018-01, the City's current design parameters represent a flow reduction from the outdated standards used within the MSS and Concept Servicing Report.

5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Drainage

The subject site is located within the Carp River watershed - under the jurisdiction of the Mississippi Valley Conservation Authority (MVCA).

The site generally drains from the south to the north. There is currently an interim ditch which cuts across from the west of the site towards the east boundary. The ditch will be decommissioned as the flow from the ditch is now captured by the Robert Grant sewer. The existing interim site drainage is shown in **Figure 5.1.**

Figure 5.1 Existing Drainage Features

5.2 Stormwater Management Criteria

Stormwater management requirements for the subject site have been adopted from the *MSS,* the *Design Brief and Pond 1 Stormwater Management Report*.

The following criteria were considered as part of the stormwater management strategy within the subject site and conveyance to the stormwater management Pond 1 among other requirements:

- Storm sewers on local roads are designed to provide a minimum 2-year level of service per the City's latest Technical Bulletin PIEDTB-2016-01.
- For less frequent storms (i.e. larger than the minimum level of service), the minor system sewer capture will be restricted with the use of inlet control devices to prevent excessive hydraulic surcharges.
- Under full flow conditions, the allowable velocity in storm sewers is to be no less than 0.80 m/s and no greater than 6.0 m/s.
- The major system is designed with sufficient capacity to allow the excess runoff of a 100-year storm to be conveyed within the public ROW or adjacent to the right- of-way provided that the water level must not touch any part of the building envelope, must remain below all building openings during the stress test event (100-year + 20%), and must maintain 15 cm vertical clearance between spill elevation on the street and the ground elevation at the nearest building envelope.
- The product of the maximum flow depths on streets and maximum flow velocity must be less than 0.60 m^2/s on all roads.
- Freeboard clearance is to be calculated between the USF and the HGL or pipe obvert, whichever is higher.
- A minimum 15cm of freeboard is to be provided from the ponding spill elevation to the ground elevation at the envelope.

5.3 Stormwater Management Strategy

The overall stormwater management strategy for the subject site was developed as part of the *Adequacy of Public Servicing Report* and *Design Brief*, which are currently under review by the city. Both the minor and major systems of the residential portion are to be directed towards the existing stormwater management Pond 1.

5.3.1 Minor System

The site is to be serviced by a storm sewer system designed in accordance with the amendment to the storm sewer and stormwater management elements of *PIETB-2016-01*. **Table 5.1** summarizes the standards used for detailed design of the storm sewer network, consistent with the *Design Brief* and *Adequacy of Public Servicing Report* and meeting the criteria described in ***Section 5.2***. The storm sewer design uses ICDs to ensure that storm flows entering the minor system are limited to 2-year event.

Table 5.1 Stormwater Management Standards

Design Parameter	Value
Minor System Design Return Period	2-Year (Local Streets) – PIEDTB-2016-01
100-Year Hydraulic Grade Line	0.3m below underside of footing (USF)
Minimum CB Lead Size	200mm
Storm Sewer Velocity	0.8 m/s – 6.0 m/s
Inlet Control Device Min Flow	2-year storm
Maximum Ponding Depth	0.35 m

The proposed gravity storm sewer network are designed in accordance to the sewer design guidelines and relevant ISTBs. The storm sewer network is shown in the accompanying engineering drawings prepared by DSEL. The proposed sewers collect stormwater runoff from the Block 13, and ultimately direct minor flows towards SWM Pond 1 via the proposed storm sewers.

ICDs were sized for minimum 2 year capture and local surface depressions in the parking lot and travel lanes were used for on-site storage. ICDs are located within catch-basins only.

Both the major and minor system were modelled using the PCSWMM modelling software to confirm ponding extent and freeboards between the underside of footings and the hydraulic grade line during both the 1:100year and the 1:100year +20% storm events.

5.3.2 Hydraulic Grade Line

A detailed hydraulic grade line (HGL) analysis using the PCSWMM modeling software has been completed for the proposed storm sewer network as detailed Appendix D. The analysis concludes that there is at least 0.30 m of freeboard between the HGL or the pipe obvert, whichever is higher, and the underside of residential footings during the 1:100-year storm for all units. The results also confirm adequate freeboard during the 100 year +20% event for all units.

The analysis was conducted using the design storms listed below:

1. The 100-Year, 3-hour Chicago Storm;

2. The 100-Year, 3-hour Chicago Storm+20%.

Detailed results are presented in **Appendix D**.

5.3.3 Major System

As outlined in the Adequacy of Public Servicing Report and the Design Brief, major system drainage from the site will be conveyed to SWM Pond 1. Major system flows are

proposed to be conveyed along the site's internal road network, except for the outer units fronting Cranesbill Road, Robert Grant Avenue, and Monorail Road, which will drain uncontrolled to the adjacent streets. All major system flows from the site are proposed to be directed towards Pond 1. Major system flow paths are illustrated in the engineering drawings prepared by DSEL.

Based on the SWMM model, it was determined that the 100-year depth of water in the street ponding areas (both static and dynamic) will not exceed the maximum ponding depth of 35cm. The models during the 100 year + 20% event show that the maximum water surface elevation will not touch the building envelopes. The overland flow analysis results are saved in **Appendix D**.

5.3.4 Quality Control

Quality control for Block 13 will be provided by Pond 1, as outlined in the Pond 1 SWM Report. The report identifies a required permanent pool volume of 13,923 m³ to achieve 80% TSS removal for the contributing drainage area. Pond 1 provides a total permanent pool volume of 29,380 m³, which exceeds this requirement.

5.4 Stormwater Management Calculations

A detailed PCSWMM model was produced for the detailed design of stages 2 and 3 of the Abott's Run development. The detailed model included both minor and major system flow allocations for Block 13. The site plan was modelled, again using PCSWMM to ensure the allowable release rates, that were accounted for in stages 2 and 3 were respected. Allowable release rates are presented in **Table 5.2**.

Table 5.2 Allowable Release Rates (1:100 year)

	Allowable Release Rate (L/s)	Block 13 Model Flow Rate (L/s)
Minor System	237	221
Major System	264	251

Minor and major system peak flows are less than those accounted for in the Stage 2 and 3 detailed design model. On-site storage through surface ponding is used to store excess volumes and respect the allowable major system release rate. Detailed results on ponding extents are provided in **Appendix D** and within the engineering drawings. The packaged PCSWMM model is included with this submission.

5.5 Stormwater Servicing Conclusions

A network of local gravity storm sewers is proposed within Block 13 to collect and convey runoff to the existing storm infrastructure along Cranesbill Road, ultimately discharging to SWM Pond 1. The storm sewers have been sized using the Rational Method, with ICDs incorporated to regulate discharge to the allowable release rate for the minor system.

For events exceeding the 2-year return period, surface storage has been provided on-site to manage excess runoff and maintain quantity control. Quality control will be provided by SWM Pond 1, which is designed to achieve the required TSS removal.

HGL analysis confirms that sufficient freeboard is maintained throughout the site, ensuring the system operates safely under both minor and major storm conditions.

6.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate, and topography. The extent of erosion losses is exaggerated where vegetation has been removed during construction and the top layer of soil becomes agitated, and where increased stormwater runoff is directed to natural areas.

Prior to earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

The erosion and sediment controls will include (but are not limited to):

- Minimize the area to be cleared and grubbed.
- Plan construction at proper time to avoid flooding.
- Provide sediment traps and basins during dewatering.
- Silt fence to be installed around the perimeter of the site and to be cleaned and maintained throughout construction. Silt fence to remain in place until the working areas have been stabilized and re-vegetated. See ***Drawings 18 & 19.***
- A mud mat to be installed at the construction access in order to prevent mud tracking onto adjacent roads.
- Catch basins to have inserts installed under the grate during construction to protect from silt entering the storm sewer system.
- Extent of exposed soils to be limited at any given time, and exposed areas will be re-vegetated as soon as possible.
- Exposed slopes to be protected with plastic or synthetic mulches.
- Stockpiles of cleared materials as well as equipment fueling and maintenance areas to be located away from swales, watercourses, and other conveyance routes.
- Seepage barriers such as silt fencing, straw bale check dams and other sediment and erosion control measures to be installed in any temporary drainage stormwater conveyance channels and around disturbed areas during construction and stockpiles of fine material.
- Filter inserts to remain on open surface structures such as manholes and catch basins until these structures are commissioned and put into use, streets are asphalted and curbed, and the surrounding landscape is stabilized.

The contractor will, at every rainfall, complete inspections and guarantee proper performance. The inspection is to include:

- Verification that water is not flowing under silt barriers.
- Clean and change inserts at catch basins.

A qualified Inspector will give recommendations related to the mitigation measures that are being implemented and maintained. Bulkhead barriers, filter clothes on open surface structures, silt fencing, and other E&SC measures may require removal of sediment and repairs. The City of Ottawa's Protocol for Wildlife Protection is to be followed during construction.

After build-out of the development, applicable sewers will be inspected and cleaned. All sediment and construction fencing should be removed following construction, providing there is no exposed soil or other potential sources of sedimentation.

7.0 CONCLUSIONS AND RECOMMENDATIONS

This Design Brief has been prepared on behalf of Minto Communities - Canada.

This Design Brief is to be read in conjunction with detailed engineering drawing package from DSEL.

The key features of the detailed design of the proposed development are as follows:

- The site will connect to the proposed watermain on Cranesbill Road. The proposed watermain network conforms to all relevant City and MECP *Water Supply Guidelines*.

- Wastewater service will be provided through gravity sewers that have been designed in conformance with all relevant City of Ottawa and MECP Guidelines and Policies. A series of gravity sewers will direct wastewater to a proposed sanitary sewer on Cranesbill Road to be built prior to the construction of Block 13.
- Stormwater from the outer units along Cranesbill Road, Robert Grant Avenue, and Monorail Drive will drain uncontrolled to the surrounding streets. This uncontrolled runoff has been deducted from the site's allowable 2-year release rate. The remaining areas will drain to the minor storm system, with flows exceeding the 2-year capacity managed through on-site surface storage via road ponding. The site's quality control will be provided by Pond 1.

The infrastructure identified in this Design Brief is expected to require approval from the City of Ottawa, Ontario Ministry of the Environment, Conservation and Parks prior to construction.

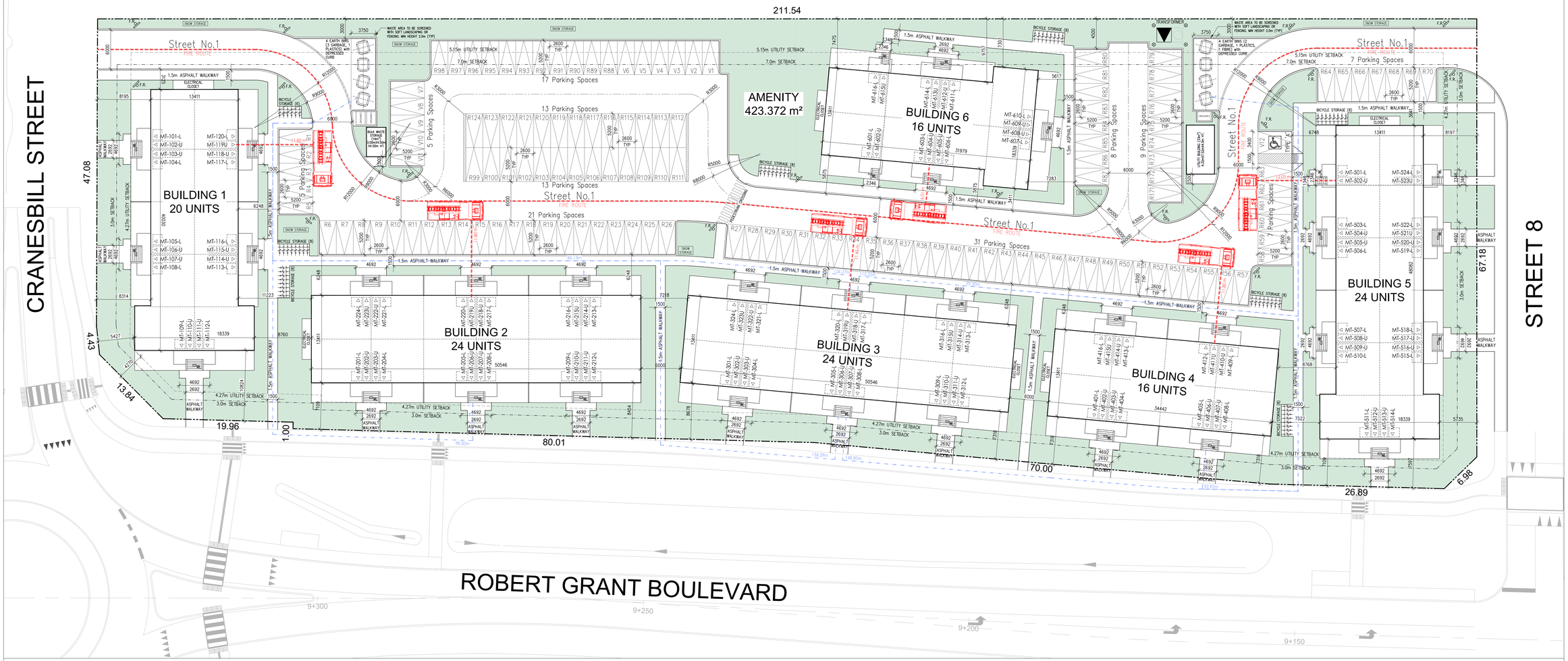
Prepared by,
David Schaeffer Engineering Ltd.

Per: Alexandra Marchese

Per: Alexandre Tourigny P.Eng.

Appendix A

Site Plan (SRN, June 10, 2025)



1 / A100 ARCHITECTURAL SITE PLAN

SCALE: 1:250

SITE STATISTICS

PROVISION	REQUIRED	PROPOSED		COMPLIANCE
NET LOT AREA (excludes dedication):	NO MINIMUM	13932.545 m²		**N/A**
DEDICATION AREA (easement):	NO MINIMUM	N/A		**N/A**
GROSS LOT AREA (includes dedication):	NO MINIMUM	13932.545 m²		**N/A**
BUILDING AREA	NO MINIMUM	3583.023 m²		**N/A**
LOT COVERAGE (building area/net lot area):	NO MINIMUM	3583.023 m²		**N/A**
GROSS FLOOR AREA	NO MINIMUM	10642.193 m²		**N/A**
NET F.S.I. (gross floor area/net lot area):	2.0 MAX	0.76		**YES**
GROSS F.S.I. (gross floor area/gross lot area):	N/A	0.76		**N/A**
BUILDING HEIGHTS (mid-point of roof):				
STACKED DWELLINGS:	11.00 m	11.62m (MID-POINT)		**NO**
SETBACKS :				
MIN. FRONT YARD (WEST):	3.00 m	5.43 m		**YES**
MIN INTERIOR SIDE YARD (NORTH):	7.00m	7.30 m		**YES**
MIN REAR YARD (EAST):	3.00m	5.74 m		**YES**
MIN CORNER SIDE YARD (SOUTH):	3.00m	4.27 m		**YES**
NUMBER OF STACKED TOWNHOUSE UNITS :		**124 SUITES**		
2 BED INTERIOR:	NO MINIMUM	**76 SUITES**		
3 BED END:	NO MINIMUM	**48 SUITES**		
TOTAL PARKING SPACES :		**136 PS**		
RESIDENT PARKING SPACES (STACKED-TOWNS):	**0.9 SPACES/UNIT = (124x0.9) MIN. 112 SP**	**124**	**1:1**	**YES**
VISITOR PARKING SPACES (STACKED-TOWNS) (INCLUDES BARRIER FREE PS)	**0.1 SPACES/UNIT = (124x0.1) MIN. 12 SP**	**12**	**0.1:1**	**YES**
BARRIER FREE PARKING SPACES DEDICATED FOR VISITORS :	**0**	**1**	**N/A**	**N/A**
BICYCLE SPACES (STACKED-TOWNS):				
BICYCLE SPACES :	**0.5 SPACES/UNIT = (124x0.5) MIN. 62**	**62**		**YES**
TOTAL LANDSCAPE :	**30%**	6182.615m² (44.38% OF NET LOT AREA)		**YES**
LANDSCAPED OPEN SPACE AREA :				
SOFT LANDSCAPE AREA :	**N/A**	3244.126m² (52.47% OF LANDSCAPING)		**N/A**
HARD LANDSCAPE AREA :	**N/A**	2938.489m² (47.53% OF LANDSCAPING)		**N/A**
LANDSCAPED PARKING AREA :				
TOTAL PARKING AREA :	**N/A**	5409.855m²		**N/A**
PAVED PARKING AREA :	**85% MAX**	3793.092m² (70.11 % OF PARKING AREA)		**YES**
LANDSCAPED PARKING AREA :	**15% MIN**	1616.762 m² (29.89 % OF PARKING AREA)		**YES**
AMENITY:				
TOTAL AMENITY AREA: (6 m² PER METRO UNIT INCULDES PRIVATE + COMMUNAL)	**124 UNITS X 6 m² =744 m²**	LOWER PATIO = 19.889 m² X 24 END UNITS LOWER PATIO = 16.483m² X 38 INT. UNITS UPPER BALCONY AREA 6.828m² X 62 UNITS = 1527.045m² TOTAL PRIVATE AREA +PRIVATE 1527.045m² + COMMUNAL 423.372m² =1950.417m² TOTAL AMENITY		**YES**
COMMUNAL AMENITY AREA: (50% OF REQUIRED)	**746 m^2 =372 m²**	AREA WEST OF BUILDING 6 = 423.372m² TOTAL COMMUNAL AREA		**YES**

LEGEND

- MAIN ENTRANCE
- BICYCLE PARKING, REFER TO LANDSCAPE DRAWINGS
- BARRIER FREE PARKING
- RESIDENT PARKING
- VISITOR PARKING
- H&V — FIRE HYDRANT, REFER TO CIVIL DRAWINGS
- LS — LIGHT POLE, REFER TO ELECTRICAL DRAWINGS
- LB — LIGHT BOLLARD, REFER TO ELECTRICAL DRAWINGS
- WL — WALL MOUNTED LIGHT FIXTURE, REFER TO ELECTRICAL DWGS
- F.R. — FIRE ROUTE SIGN AS PER CITY STANDARD
- H.S. — BARRIER FREE PARKING SIGN, AS PER CITY STANDARD
- S.S. — STOP SIGN
- I.S. — IDLE FREE ZONE SIGN
- P.S. — POPS SIGN
- TACTILE INDICATOR
- TRANSFORMER
- DC — DEPRESSED CURB
- G — GAS METER
- H — HYDRO METER
- NFHB — NON FREEZABLE HOSE BIB
- EVCS — ELECTRIC VEHICLE CHARGING STATION
- SIAMESE CONNECTION
- XXX — SUITE NUMBER
- FIRE BREAK BLOCK
- LLE — LOWER LEVEL ELEVATION
- FFE — FIRST FLOOR ELEVATION
- AREA DRAIN
- DENOTES FIRE ROUTE
- DENOTES AMENITY BOUNDARY
- DENOTES PARKING LOT LANDSCAPING BOUNDARY
- DENOTES SOFT LANDSCAPING AREA
- DENOTES DECORATIVE FENCING

SCALE=1:250

20 15 10 5 0 10 20

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NO:	DATE:	ISSUED FOR:
1	2024.04.30	COORDINATION

minto

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PLAN OF SURVEY OF
BLOCK 140
REGISTERED PLAN 4M-1544
CITY OF OTTAWA
SURVEYED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

APPLICANT:
MINTO CANADA
200-180 KENT STREET
OTTAWA ON K1P 0B6

CIVIL ENGINEER:
DAVID SCHAEFER ENGINEERING LTD.
120 IBER ROAD, UNIT 103
STITTVILLE, ON K4S 1E9

SURVEYOR:
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ON K2E 7S6

PRELIMINARY, NOT FOR CONSTRUCTION
ALL AREAS CALCULATIONS ARE PRELIMINARY

NO:	DATE:	REVISION COMMENT:

SRN ARCHITECTS
8395 JANE STREET, SUITE 203
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

CLIENT:
Minto Canada
200-180 Kent Street
Ottawa, Ontario K1P 0B6

PROJECT:
Abbott's Run
Block 13
Ottawa, Ontario

DRAWING TITLE:
SITE PLAN

DATE: 2025-04-28	SCALE: 1:250
DRAWN BY: AB	CHECKED BY: GF
PROJECT NUMBER: S25016	DRAWING NUMBER: A100

Project Number: 1295
Project: Abbott's Run Stage 2, 3 and 4- Adequacy of Public Servicng Report
Date: May-25

DSEL
David Schaeffer Engineering Limited
600 Alden Road, Suite 606
Markham, ON L3R 0E7

Average Site Population Density by Outlet

Development Statistics										
	Phase 2 (RG)		Phase 2 (AS)		Phase 3 (RG)		Phase 4A (RG)		Phase 4B (RG)	
Unit Type	Unit	Pop	Unit	Pop	Unit	Pop	Unit	Pop	Unit	Pop
Singles	49	167	81	275	69	235	150	510	0	0
Towns	87	235	0	0	166	448	205	554	71	192
Condo	124	223	0	0	111	199.8	246	443	0	0
Total	**260**	**625**	**81**	**275**	**346**	**883**	**601**	**1506**	**71**	**192**

	Abbott Street		**Robert Grant**	
	Pop	**Area**	**Pop**	**Area**
	275	4.74	3205	38.97
Pop/ha	58		80	

Appendix B

Average Day Demand Figure

Max Day + Fire Flow Demand Figure

Peak Hour Demand Figure

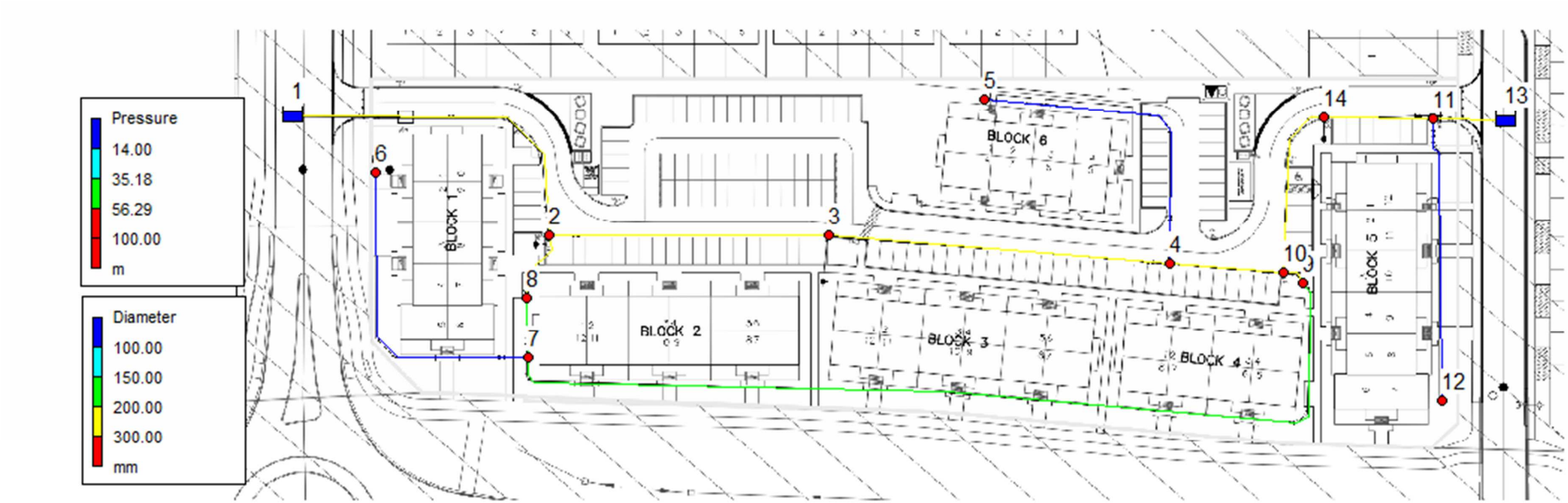
Average Day Demand Hydraulic Analysis

Max Day + Fire Flow Demand Hydraulic Analysis

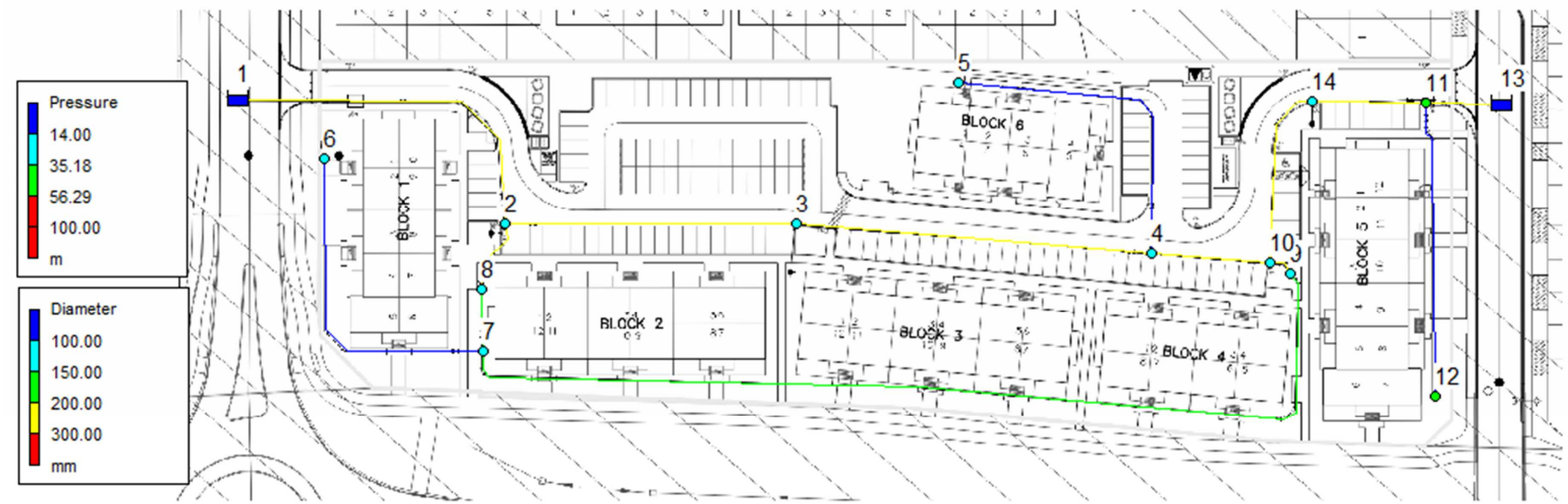
Peak Hour Demand Hydraulic Analysis

Hydraulic Capacity and Modeling Analysis Abbott□s Run P□ases 2 □ 3 Development (GeoAdvice, December 20, 2024)

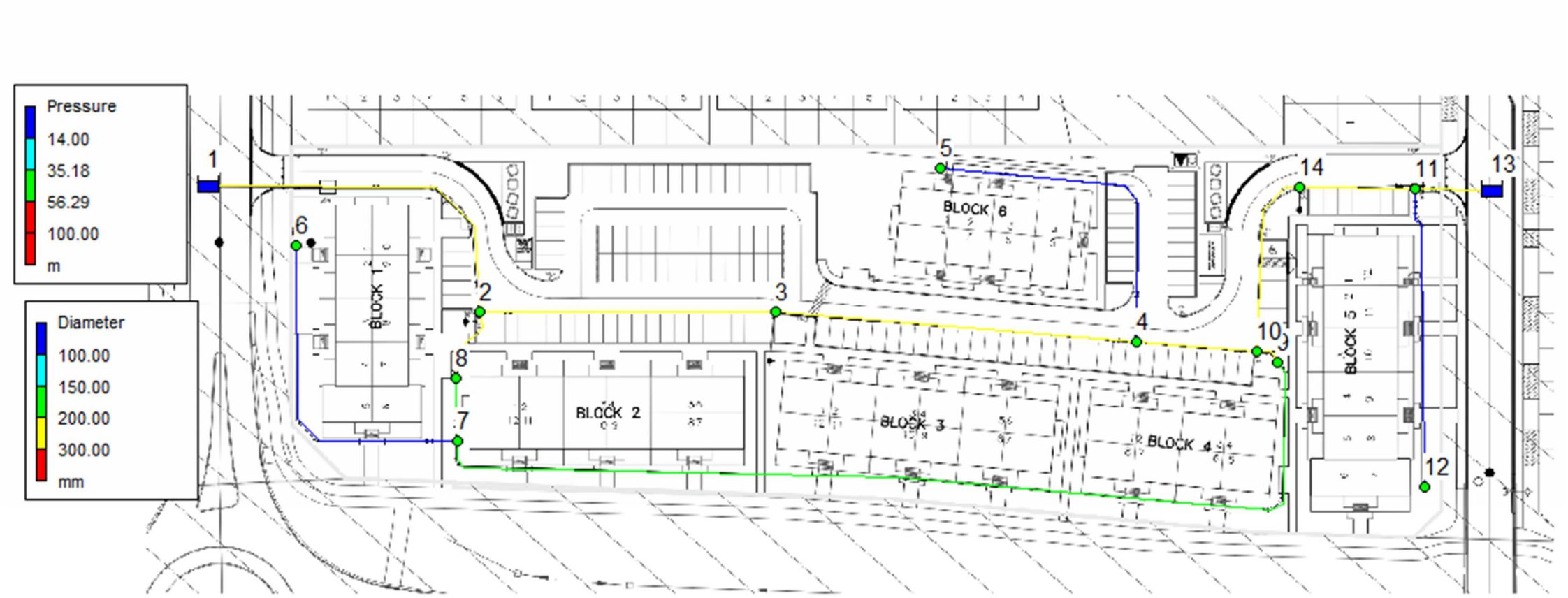
AVERAGE DAY SCENARIO



MAX DAY + FIRE FLOW SCENARIO



PEAK HOUR SCENARIO



```
*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************
```

Input File: 1295_Block13_AverageDay.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
2	2	3	50	200
4	4	5	65	50
5	13	11	15	200
6	11	12	55	50
7	11	14	20	200
8	14	10	35	200
9	10	9	5	200
10	9	7	185	150
11	7	8	15	150
12	8	2	15	200
13	7	6	65	50
14	3	4	70	200
15	4	10	25	200
16	1	2	65	200

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality	
2	4.23	161.14	58.25	0.00	
3	4.23	161.24	58.09	0.00	
4	4.23	161.37	57.87	0.00	
5	4.23	161.36	58.13	0.00	
6	4.23	161.16	58.40	0.00	
7	4.23	161.16	58.00	0.00	
8	4.23	161.14	57.80	0.00	
9	4.23	161.43	58.07	0.00	
10	4.23	161.43	58.24	0.00	
11	4.23	161.65	58.47	0.00	
12	4.23	161.64	57.79	0.00	
14	4.23	161.57	58.28	0.00	
1	1140.48	160.92	0.00	0.00	Reservoir

13	-1191.24	161.70	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	Velocity m/s	Unit Headloss m/km	Status
2	-834.98	0.44	2.04	Open
4	4.23	0.04	0.10	Open
5	1191.24	0.63	3.43	Open
6	4.23	0.04	0.10	Open
7	1182.78	0.63	3.92	Open
8	1178.55	0.63	4.01	Open
9	326.65	0.17	0.65	Open
10	322.42	0.30	1.43	Open
11	313.96	0.30	1.35	Open
12	309.73	0.16	0.44	Open
13	4.23	0.04	0.10	Open
14	-839.21	0.45	1.85	Open
15	-847.67	0.45	2.51	Open
16	-1140.48	0.61	3.32	Open

```
*********************************************************************
*                            E P A N E T                            *
*                     Hydraulic and Water Quality                   *
*                     Analysis for Pipe Networks                    *
*                          Version 2.2                              *
*********************************************************************
```

Input File: 1295_Block13_MaxDayFF.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
2	2	3	50	200
4	4	5	65	50
5	13	11	15	200
6	11	12	55	50
7	11	14	20	200
8	14	10	35	200
9	10	9	5	200
10	9	7	185	150
11	7	8	15	150
12	8	2	15	200
13	7	6	65	50
14	3	4	70	200
15	4	10	25	200
16	1	2	65	200

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality	
2	12.69	132.94	30.05	0.00	
3	15012.69	124.74	21.59	0.00	
4	12.69	130.62	27.12	0.00	
5	12.69	130.57	27.34	0.00	
6	12.69	132.95	30.19	0.00	
7	12.69	133.00	29.84	0.00	
8	12.69	132.95	29.61	0.00	
9	12.69	133.63	30.27	0.00	
10	12.69	133.64	30.45	0.00	
11	12.69	139.98	36.80	0.00	
12	12.69	139.94	36.09	0.00	
14	12.69	137.72	34.43	0.00	
1	-8097.71	141.40	0.00	0.00	Reservoir

13	-7054.57	141.40	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	Velocity m/s	Unit Headloss m/km	Status
2	8563.18	4.54	164.00	Open
4	12.69	0.11	0.74	Open
5	7054.57	3.74	94.69	Open
6	12.69	0.11	0.75	Open
7	7029.19	3.73	112.94	Open
8	7016.50	3.72	116.59	Open
9	528.92	0.28	1.67	Open
10	516.23	0.49	3.42	Open
11	490.85	0.46	3.11	Open
12	478.16	0.25	1.02	Open
13	12.69	0.11	0.73	Open
14	-6449.51	3.42	84.07	Open
15	-6474.90	3.44	120.75	Open
16	8097.71	4.30	130.20	Open

```
******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
******************************************************************
```

Input File: 1295_Block13_PeakHour.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
2	2	3	50	200
4	4	5	65	50
5	13	11	15	200
6	11	12	55	50
7	11	14	20	200
8	14	10	35	200
9	10	9	5	200
10	9	7	185	150
11	7	8	15	150
12	8	2	15	200
13	7	6	65	50
14	3	4	70	200
15	4	10	25	200
16	1	2	65	200

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality	
2	19.03	153.69	50.80	0.00	
3	19.03	153.79	50.64	0.00	
4	19.03	153.93	50.43	0.00	
5	19.03	153.82	50.59	0.00	
6	19.03	153.62	50.86	0.00	
7	19.03	153.72	50.56	0.00	
8	19.03	153.70	50.36	0.00	
9	19.03	153.99	50.63	0.00	
10	19.03	153.99	50.80	0.00	
11	19.03	154.24	51.06	0.00	
12	19.03	154.15	50.30	0.00	
14	19.03	154.15	50.86	0.00	
1	1077.85	153.50	0.00	0.00	Reservoir

13	-1306.27	154.30	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	Velocity m/s	Unit Headloss m/km	Status
2	-825.97	0.44	2.00	Open
4	19.03	0.16	1.58	Open
5	1306.27	0.69	4.07	Open
6	19.03	0.16	1.59	Open
7	1268.20	0.67	4.47	Open
8	1249.17	0.66	4.47	Open
9	347.05	0.18	0.73	Open
10	328.02	0.31	1.47	Open
11	289.95	0.27	1.17	Open
12	270.91	0.14	0.34	Open
13	19.03	0.16	1.56	Open
14	-845.01	0.45	1.88	Open
15	-883.08	0.47	2.71	Open
16	-1077.85	0.57	2.98	Open

Hydraulic Capacity and Modeling Analysis Abbott's Run Phases 2 & 3 Development

Technical Memorandum

FINAL

Prepared for:
David Schaeffer Engineering Ltd.
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

Prepared by:
GeoAdvice Engineering Inc.
Unit 203, 2502 St. John's Street
Port Moody, BC V3H 2B4

Submission Date: December 20, 2024

Contact: Mr. Werner de Schaetzen, Ph.D., P.Eng.
Project: 2024-123-DSE

Document History and Version Control

Revision No.	Date	Document Description	Revised By	Reviewed By
R0	December 19, 2024	Draft	Jim Lee	Werner de Schaetzen
R1	December 20, 2024	Final	Jim Lee	Werner de Schaetzen

Statement of Qualifications and Limitations

This document represents GeoAdvice Engineering Inc. best professional judgment based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by a member of the engineering profession currently practicing under similar conditions. No warranty, express or implied is made.

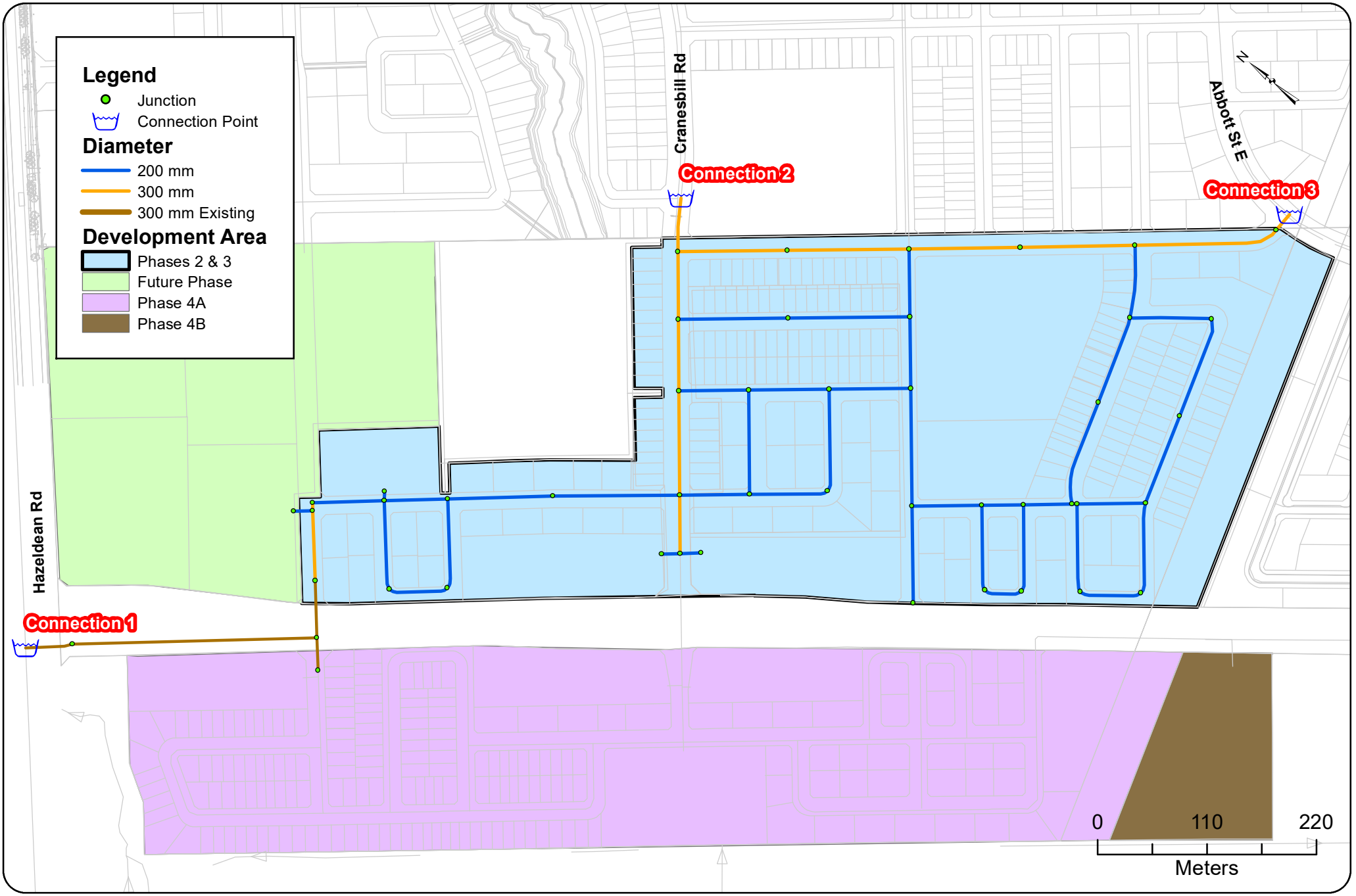
1 Introduction

GeoAdvice Engineering Inc. ("GeoAdvice") was retained by David Schaeffer Engineering Ltd. ("DSEL") to size the proposed water main network for Abbott's Run Phases 2 and 3 development ("Development") in the City of Ottawa, ON ("City").

The development will have multiple connections to the City's water distribution system along Abbott Street East, Cranesbill Road and Hazeldean Road. The development site is shown in **Figure 1.1** on the following page, with the final recommended pipe diameters.

This memo describes the assumptions and results of the hydraulic modeling and capacity analysis using InfoWater (Autodesk/Innovyze), a GIS water distribution system modeling and management software application.

The results presented in this memo are based on the analysis of steady state simulations. The predicted available fire flows, as calculated by the hydraulic model, represent the flow available in the water main while maintaining a residual pressure of 20 psi. No extended period simulations were completed in this analysis to assess the water quality or to assess the hydraulic impact on storage and pumping.



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Abbott's Run Phases 2 & 3
Client: **David Schaeffer Engineering Ltd.**
Date: **December 2024**
Created by: **JL**
Reviewed by: **WdS**

Site Layout and Connection Points

Figure 1.1

2 Modeling Considerations

2.1 Water Main Configuration

The water main network was modeled based on a water network plan prepared by DSEL (1295_wtr-coord.dwg) and provided to GeoAdvice on November 21th, 2024.

2.2 Elevations

Elevations of the modeled junctions were assigned according to a site base plan prepared by DSEL (1295_grad-coord.dwg) and provided to GeoAdvice on November 21th, 2024.

2.3 Consumer Demands

The demand factors were based on the City of Ottawa's internally developed parameters (DraftFinal_SystemLevelDemandParameters_24May2024(JB).xls) for populations exceeding 3,000. A summary of the rates relevant for this development is presented in **Table 2.1**.

Table 2.1: City of Ottawa Demand Factors*

Demand Type	Amount	Units	Outdoor Water Demand (OWD)	Units
Average Day Demand (ADD)				
Single Family Home	180	L/c/d	700	L/unit/d
Multi Family Townhome	198	L/c/d	350	L/unit/d
High Density Building	219	L/c/d	0	L/unit/d
Institutional/Park**	28,000	L/ha/d		
Maximum Daily Demand (MDD)				
Single Family Home	avg. day + OWD	L/d		
Multi Family Townhome	avg. day + OWD	L/d		
High Density Building	avg. day	L/d		
Institutional/Park	1.5 x avg. day	L/ha/d		
Peak Hour Demand (PHD)				
Single Family Home	2.1 x max. day	L/d		
Multi Family Townhome	2.1 x max. day	L/d		
High Density Building	1.6 x max. day	L/d		
Institutional/Park	1.8 x max. day	L/ha/d		

***For ADD, a connection loss of 80 L/unit/day was applied to each unit, except for high density buildings**
****City of Ottawa Design Guidelines – Water Distribution (2010)**

Table 2.2 and **Table 2.3** summarize the water demand calculations for the Abbott's Run Phases 2 and 3 developments.

Table 2.2: Residential Water Demand Calculations

Development	Population (Cap)	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Phase 2	864	2.14	3.54	7.21
Phase 3	883	2.24	3.47	7.05
Phase 4A	1,506	3.78	5.83	11.88
Future Phase	770	1.96	1.96	4.10

Table 2.3: Non-residential Water Demand Calculations

Development	Land Use	Area (Ha)	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Phase 2	School	2.83	0.92	1.38	2.48
	Park	0.99	0.32	0.48	0.87
Phase 3	Park	0.82	0.27	0.40	0.72
Phase 4A	Park	2.55	0.83	1.24	2.23

Demands from two additional adjacent development areas (Phase 4A and future phase) were incorporated into the analysis due to their downstream location relative to the City's boundary conditions. Phase 4B was excluded as it is expected to be serviced by a separate connection. Detailed demand calculations are provided in **Appendix A**.

2.4 Fire Flow Demand

Fire flow calculations were completed as per the City of Ottawa's Technical Bulletins and the Fire Underwriters Survey's (FUS) Water Supply for Public Fire Protection Guideline (2020). DSEL confirmed that there will be 10 m of backing for single family homes and multi family townhomes. These dwelling types meet Technical Bulletin ISTB-2018-02, and the required fire flows were capped at 10,000 L/min (167 L/s).

The calculations yielded the following required fire flows:

- Single-Family: 10,000 L/min (167 L/s)
- 6-unit Townhome: 10,000 L/min (167 L/s)
- Back-to-Back Townhome: 13,000 L/min (217 L/s)

Please note that the required fire flows for medium density condo blocks and school blocks have been assumed as 267 L/s, as agreed with DSEL.

Fire flow simulations were completed at each model node. The locations of nodes do not necessarily represent hydrant locations.

Detailed FUS fire flow calculations as well as the illustrated spatial allocation of the required fire flows are shown in **Appendix B**.

2.5 Boundary Conditions

The boundary conditions were provided by the City of Ottawa in the form of Hydraulic Grade Line (HGL) at the following location:

- Connection 1: Hazeldean Road
- Connection 2: Cranesbill Road
- Connection 3: Abbott Street East

The above connection points are illustrated in **Figure 1.1**.

Boundary conditions were provided for Peak Hour demand (PHD), Maximum Day demand plus Fire (MDD+FF) and Average Day demand (ADD) conditions. The City boundary conditions were provided to GeoAdvice on November 29, 2024, and can be found in **Appendix C**.

Table 2.3 outlines the boundary conditions used for sizing and analyzing the water network.

Table 2.3: Boundary Conditions

Condition	Connection 1 HGL (m)	Connection 2 HGL (m)	Connection 3 HGL (m)
ADD (max. pressure)	161.1	161.1	161.1
PHD (min. pressure)	154.9	154.2	154.2
Max Day + Fire Flow (167 L/s)*	156.7	150.4	154.2
Max Day + Fire Flow (217 L/s)*	156.2	145.9	152.0
Max Day + Fire Flow (267 L/s)	155.6	141.4	149.9

*Interpolated from the boundary conditions provided by the City of Ottawa.

3 Hydraulic Capacity Design Criteria

3.1 Pipe Characteristics

Pipe characteristics of internal diameter (ID) and Hazen-Williams C factors were assigned in the model according to the City of Ottawa Design Guidelines for PVC water main material. Pipe characteristics used for the development are outlined in **Table 3.1** below.

Table 3.1: Model Pipe Characteristics

Nominal Diameter (mm)	ID PVC (mm)	Hazen Williams C-Factor (/)
200	204	110
300	297	120

3.2 Pressure Requirements

As outlined in the City of Ottawa Design Guidelines, the generally accepted best practice is to design new water distribution systems to operate between 350 kPa (50 psi) and 480 kPa (70 psi). The maximum pressure at any point in the distribution system in occupied areas outside of the public right-of-way shall not exceed 552 kPa (80 psi). Pressure requirements are outlined in **Table 3.2.**

Table 3.2: Pressure Requirements

Demand Condition	Minimum Pressure		Maximum Pressure	
	(kPa)	(psi)	(kPa)	(psi)
Normal Operating Pressure (maximum daily flow)	350	50	480	70
Peak Hour Demand (minimum allowable pressure)	276	40	-	-
Maximum Fixture Pressure (Ontario Building Code)	-	-	552	80
Maximum Distribution Pressure (minimum hour check)	-	-	552	80
Maximum Day Plus Fire	140	20	-	-

4 Hydraulic Capacity Analysis

The proposed water mains within the development were sized to the minimum diameter which would satisfy the greater of maximum day plus fire and peak hour demand. Modeling was carried out for average day demand, peak hour demand and maximum day demand plus fire flow using InfoWater.

4.1 Development Pressure Analysis

Modeled service pressures for the development are summarized in **Table 4.1**. Figures showing the pressures under ADD and PHD scenarios are provided in **Appendix D**.

Table 4.1: Summary Available Service Pressures

Average Day Demand Maximum Pressure	Peak Hour Demand Minimum Pressure
85 psi (585 kPa)	72 psi (496 kPa)

As outlined in the City of Ottawa Design Guidelines, the generally accepted best practice is to design new water distribution systems to operate between 350 kPa (50 psi) and 480 kPa (70 psi). The maximum pressure at any point in the distribution system in occupied areas outside of the public right-of-way shall not exceed 552 kPa (80 psi). **The maximum service pressure is 85 psi, exceeding the 80 psi threshold. As such, pressure reducing valves may be required for the proposed development. The minimum service pressure is 72 psi under PHD, meeting the required 40 psi threshold.**

4.2 Development Fire Flow Analysis

Table 4.2: Summary of Minimum Available Fire Flows

Required Fire Flow	Minimum Available Flow*
167 L/s	207 L/s
217 L/s	258 L/s
267 L/s	359 L/s

*The predicted available fire flows, as calculated by the hydraulic model, represent the flow available in the water main while maintaining a residual pressure of 20 psi. High available fire flows (>500 L/s) are theoretical values. Actual available fire flow is limited by the hydraulic losses through the hydrant lateral and hydrant port sizes.

As summarized in Table 4.2 the fire flow requirements can be met at all junctions within the development.

The figure showing the available fire flows at 20 psi under MDD + FF scenario can be found in **Appendix E.**

Submission

Prepared by:

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Approved by:

LICENSED PROFESSIONAL ENGINEER
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PROVINCE OF ONTARIO

Dec 20, 2024

Werner de Schaetzen, Ph.D., P.Eng.
Senior Modeling Review / Project Manager

Appendix A Domestic Water Demand Calculations

Consumer Water Demands

Residential Demands - Phase 2*

Dwelling Type	Number of Units	Population		OWD Outdoor Water Demand (L/unit/day)	Water Loss per Connection (L/unit/day)	Average Day Demand			Max Day ADD + OWD	Peak Hour 2.1 x Max. Day
		Persons per Unit	Population Per Dwelling Type			(L/c/d)	(L/d)	(L/s)		
Singles	130	3.4	442	700	-	180	79,560	0.92	1.97	4.15
Executive Towns	45	2.7	122	350	-	198	24,057	0.28	0.46	0.97
Avenue Towns	42	2.7	113	350	-	198	22,453	0.26	0.43	0.90
Medium Density Condos	104	1.8	187	-	-	219	40,997	0.47	0.47	1.00
Connection Loss‡	218	-	-	-	80		17,440	0.20	0.20	0.20
Subtotal	**321**		**864**				**184,507**	**2.14**	**3.5**	**7.2**

Non Residential Demands - Phase 2

Property Type	Area (ha)				Average Day Demand			Max Day 1.5 x Avg. Day	Peak Hour 1.8 x Max Day
					(L/ha/d)	(L/d)	(L/s)		
School	2.83				28,000	79,240	0.92	1.38	2.48
Park	0.99				28,000	27,720	0.32	0.48	0.87
Subtotal	**3.82**					**106,960**	**1.24**	**1.86**	**3.34**

Residential Demands - Phase 3*

Dwelling Type	Number of Units	Population		(OWD)Outdoor Water Demand (L/unit/day)	Water Loss per Connection (L/unit/day)	Average Day Demand			Max Day ADD + OWD	Peak Hour 2.1 x Max. Day
		Persons per Unit	Population Per Dwelling Type			(L/c/d)	(L/d)	(L/s)		
Singles	69	3.4	235	700	-	180	42,228	0.49	1.05	2.20
Executive Towns	166	2.7	448	350	-	198	88,744	1.03	1.70	3.57
Medium Density Condos	111	1.8	200	-	-	219	43,756	0.51	0.51	1.06
Connection Loss‡	236	-	-	-	80		18,880	0.22	0.22	0.22
Subtotal	**346**		**883**				**193,608**	**2.24**	**3.5**	**7.1**

Non Residential Demands - Phase 3

Property Type	Area (ha)				Average Day Demand			Max Day 1.5 x Avg. Day	Peak Hour 1.8 x Max Day
					(L/ha/d)	(L/d)	(L/s)		
Park	0.82				28,000	22,960	0.27	0.40	0.72
Subtotal	**0.82**					**22,960**	**0.27**	**0.40**	**0.72**

Residential Demands - Phase 4A*

Dwelling Type	Number of Units	Population		(OWD)Outdoor Water Demand (L/unit/day)	Water Loss per Connection (L/unit/day)	Average Day Demand			Max Day ADD + OWD	Peak Hour 2.1 x Max. Day
		Persons per Unit	Population Per Dwelling Type			(L/c/d)	(L/d)	(L/s)		
Singles	150	3.4	510	700	-	180	91,800	1.06	2.28	4.78
Executive Towns	175	2.7	473	350	-	198	93,555	1.08	1.79	3.76
Avenue Towns	30	2.7	81	350	-	198	16,038	0.19	0.31	0.65
Medium Density Condos	246	1.8	443	-	-	219	96,973	1.12	1.12	2.36
Connection Loss‡	357	-	-	-	80		28,560	0.33	0.33	0.33
Subtotal	**601**		**1,506**				**326,926**	**3.78**	**5.8**	**11.9**

Non Residential Demands - Phase 4A

Property Type	Area (ha)				Average Day Demand			Max Day 1.5 x Avg. Day	Peak Hour 1.8 x Max Day
					(L/ha/d)	(L/d)	(L/s)		
Park	2.55				28,000	71,400	0.83	1.24	2.23
Subtotal	**2.55**					**71,400**	**0.83**	**1.24**	**2.23**

Residential Demands - Phase 4B*

Dwelling Type	Number of Units	Population		(OWD)Outdoor Water Demand (L/unit/day)	Water Loss per Connection (L/unit/day)	Average Day Demand			Max Day ADD + OWD	Peak Hour 2.1 x Max. Day
		Persons per Unit	Population Per Dwelling Type			(L/c/d)	(L/d)	(L/s)		
Executive Towns	49	2.7	132	350	-	198	26,195	0.30	0.50	1.05
Avenue Towns	62	2.7	167	350	-		33,145	0.38	0.63	1.33
Connection Loss‡	111	-	-	-	80		8,880	0.10	0.10	0.10
Subtotal	**111**		**300**				**68,221**	**0.79**	**1.2**	**2.5**

Residential Demands - Future Phase*

Dwelling Type	Number of Units**	Population		(OWD)Outdoor Water Demand (L/unit/day)	Water Loss per Connection (L/unit/day)	Average Day Demand			Max Day ADD + OWD	Peak Hour 2.1 x Max. Day
		Persons per Unit	Population Per Dwelling Type			(L/c/d)	(L/d)	(L/s)		
High Density Residential	264	1.8	475	-	-	219	104,069	1.20	1.20	2.53
Mixed Use Residential	164	1.8	295	-	-		64,649	0.75	0.75	1.57
Connection Loss‡	4	-	-	-	80		320	0.00	0.00	0.00
Subtotal	**428**		**770**				**169,038**	**1.96**	**1.96**	**4.1**

	Avg. Day	Max Day	Peak Hour
Total (Connection Points 1, 2 and 3)	**13.24**	**19.53**	**39.03**

*Peaking factors based on the City of Ottawa's DraftFinal_SystemLevelDemandParameters_24May2024(JB).xls spreadsheet

**Units based on estimate provided by DSEL

‡Condo connections assumed to be 1 per 100 units. ADD, MDD and PHD are the same for conection loss

Appendix B FUS Calculations and Required Fire Flows

FUS Required Fire Flow Calculation

Client: David Schaeffer Engineering Ltd.
Project: 2024-123-DSE
Development: Abbott's Run SF Block 23
Zoning: Single Family Residential
Date: December 12, 2024

Calculations Based on "Water Supply for Public Fire Protection", Fire Underwriters Survey, 2020.

A. Type of Construction: Wood Frame Construction

B. Ground Floor Area: 4763 **m²**

C. Number of Storeys: 2

Note: Single family detached dwellings are separated by less than 3 m; therefore, they must be considered as one fire area. The combined area of 18 units is considered in this calculations

D. Required Fire Flow*: $F = 220C\sqrt{A}$

C: Coefficient related to the type of construction — **C =** 1.5

A: Effective area — **A =** 9526 **m²**

The total floor area in m² in the building being considered

F = 32,208 L/min **D = 32,000 L/min***

E. Occupancy

Occupancy content hazard: Limited Combustible — -15 % of **D** **-4,800 L/min** **E = 27,200 L/min**

F. Sprinkler Protection

Automatic sprinkler protection: None — 0 % of **E** **0 L/min** **F = 27,200 L/min**

G. Exposures

Side	Separation Distance	Length-Height Factor - Adjacent Structure	Construction Type - Adjacent Structure	Exposure
North	0.0 to 3 m	41-60 m-storeys	Wood Frame	22%
East	10.1 to 20 m	21-40 m-storeys	Wood Frame	11%
South	3.1 to 10 m	41-60 m-storeys	Wood Frame	17%
West	0.0 to 3 m	21-40 m-storeys	Wood Frame	21%
			Total	**71%**

% of **E** **+ 19,312 L/min** **G = 46,512 L/min**

H. Wood Shake Charge — No — **0 L/min** **H = 46,512 L/min**

For wood shingle or shake roofs

The required fire flow exceeds the cap in the City of Ottawa Technical Bulletin ISDTB-2014-02 4.1. The single detached dwellings do comply with the provisions of the Bulletin; therefore, the required fire flow is:

Total Fire Flow Required	**10,000**	**L/min****
	167	**L/s**
Required Duration of Fire Flow	**2**	**Hrs**
Required Volume of Fire Flow	**1,200**	**m³**

*Rounded to the nearest 1,000 L/min

The Total Required Fire Flow for the Abbott's Run development should be reviewed when drawings and site plans have been finalized. The Total Required Fire Flow may be reduced or increased depending on area, construction, occupancy, exposures, and level of sprinkler protection. If any of these items change, the Total Required Fire Flow should be reviewed to determine the impact.

Consideration should be given for fire prevention during construction phases as the required fire flows during construction of buildings is substantially higher than after the buildings are occupied. This is due to exposed framing and inactive sprinkler systems. Fires starting in unprotected portion of buildings quickly become too strong for sprinkler systems in protected portion of buildings. As such, special precautions should be taken any time construction is occurring.

* The amount and rate of water application required in firefighting to confine and control the fires possible in a building or group of buildings which comprise essentially the same fire area by virtue of immediate exposure.

** Rounded to the nearest 1,000 L/min

FUS Required Fire Flow Calculation

Client: David Schaeffer Engineering Ltd.
Project: 2024-123-DSE
Development: Abbott's Run — Townhouse Block 50
Zoning: Multi Family Residential — 6-unit Townhome
Date: December 12, 2024

Calculations Based on "Water Supply for Public Fire Protection", Fire Underwriters Survey, 2020.

A. Type of Construction: Wood Frame Construction

B. Ground Floor Area: 570 m^2

C. Number of Storeys: 2

D. Required Fire Flow*: $F = 220C\sqrt{A}$

C: Coefficient related to the type of construction — **C =** 1.5

A: Effective area — **A =** 1141 m^2

The total floor area in m^2 in the building being considered

F = 11,146 L/min — **D = 11,000 L/min***

E. Occupancy

Occupancy content hazard	Limited Combustible	-15	% of **D**	**-1,650**	**L/min**

E = 9,350 L/min

F. Sprinkler Protection

Automatic sprinkler protection	None	0	% of **E**	**0**	**L/min**

F = 9,350 L/min

G. Exposures

Side	Separation Distance	Length-Height Factor - Adjacent Structure	Construction Type - Adjacent Structure	Exposure
North	3.1 to 10 m	21-40 m-storeys	Wood Frame	16%
East	10.1 to 20 m	61-80 m-storeys	Wood Frame	13%
South	3.1 to 10 m	21-40 m-storeys	Wood Frame	16%
West	3.1 to 10 m	61-80 m-storeys	Wood Frame	18%
			Total	**63%**

% of **E** **+ 5,891 L/min** — **G = 15,241 L/min**

H. Wood Shake Charge — No — **0 L/min** — **H = 15,241 L/min**

For wood shingle or shake roofs

The required fire flow exceeds the cap in the City of Ottawa Technical Bulletin ISDTB-2014-02 4.1. The townhome dwellings do comply with the provisions of the Bulletin; therefore, the required fire flow is:

Total Fire Flow Required	**10,000**	**L/min****
	167	**L/s**
Required Duration of Fire Flow	**2**	**Hrs**
Required Volume of Fire Flow	**1,200**	**m^3**

*Rounded to the nearest 1,000 L/min

The Total Required Fire Flow for the Abbott's Run development should be reviewed when drawings and site plans have been finalized. The Total Required Fire Flow may be reduced or increased depending on area, construction, occupancy, exposures, and level of sprinkler protection. If any of these items change, the Total Required Fire Flow should be reviewed to determine the impact.

Consideration should be given for fire prevention during construction phases as the required fire flows during construction of buildings is substantially higher than after the buildings are occupied. This is due to exposed framing and inactive sprinkler systems. Fires starting in unprotected portion of buildings quickly become too strong for sprinkler systems in protected portion of buildings. As such, special precautions should be taken any time construction is occurring.

* The amount and rate of water application required in firefighting to confine and control the fires possible in a building or group of buildings which comprise essentially the same fire area by virtue of immediate exposure.

** Rounded to the nearest 1,000 L/min

FUS Required Fire Flow Calculation

Client: David Schaeffer Engineering Ltd.
Project: 2024-123-DSE
Development: Abbott's Run — B2B Block 73
Zoning: Single Family Residential — 12-unit B2B Townhome
Date: December 12, 2024 — Firewall considered

Calculations Based on "Water Supply for Public Fire Protection", Fire Underwriters Survey, 2020.

A. Type of Construction: Wood Frame Construction

B. Ground Floor Area: 450 m^2

C. Number of Storeys: 2

D. Required Fire Flow*: $F = 220C\sqrt{A}$

C: Coefficient related to the type of construction — **C =** 1.5

A: Effective area — **A =** 900 m^2

The total floor area in m^2 in the building being considered

F = 9,900 L/min — **D =** 10,000 L/min*

E. Occupancy

Occupancy content hazard: Limited Combustible — -15 % of **D** = **-1,500 L/min** — **E =** 8,500 L/min

F. Sprinkler Protection

Automatic sprinkler protection: None — 0 % of **E** = **0 L/min** — **F =** 8,500 L/min

G. Exposures

Side	Separation Distance	Length-Height Factor - Adjacent Structure	Construction Type - Adjacent Structure	Exposure
North	10.1 to 20 m	41-60 m-storeys	Wood Frame	12%
East	Firewall	21-40 m-storeys	Wood Frame	10%
South	10.1 to 20 m	41-60 m-storeys	Wood Frame	12%
West	0.0 to 3 m	21-40 m-storeys	Wood Frame	21%
			Total	**55%**

% of **E** = **+ 4,675 L/min** — **G =** 13,175 L/min

H. Wood Shake Charge: No — **0 L/min** — **H =** 13,175 L/min

For wood shingle or shake roofs

Total Fire Flow Required	**13,000**	**L/min****
	217	**L/s**
Required Duration of Fire Flow	**2.75**	**Hrs**
Required Volume of Fire Flow	**2,145**	**m^3**

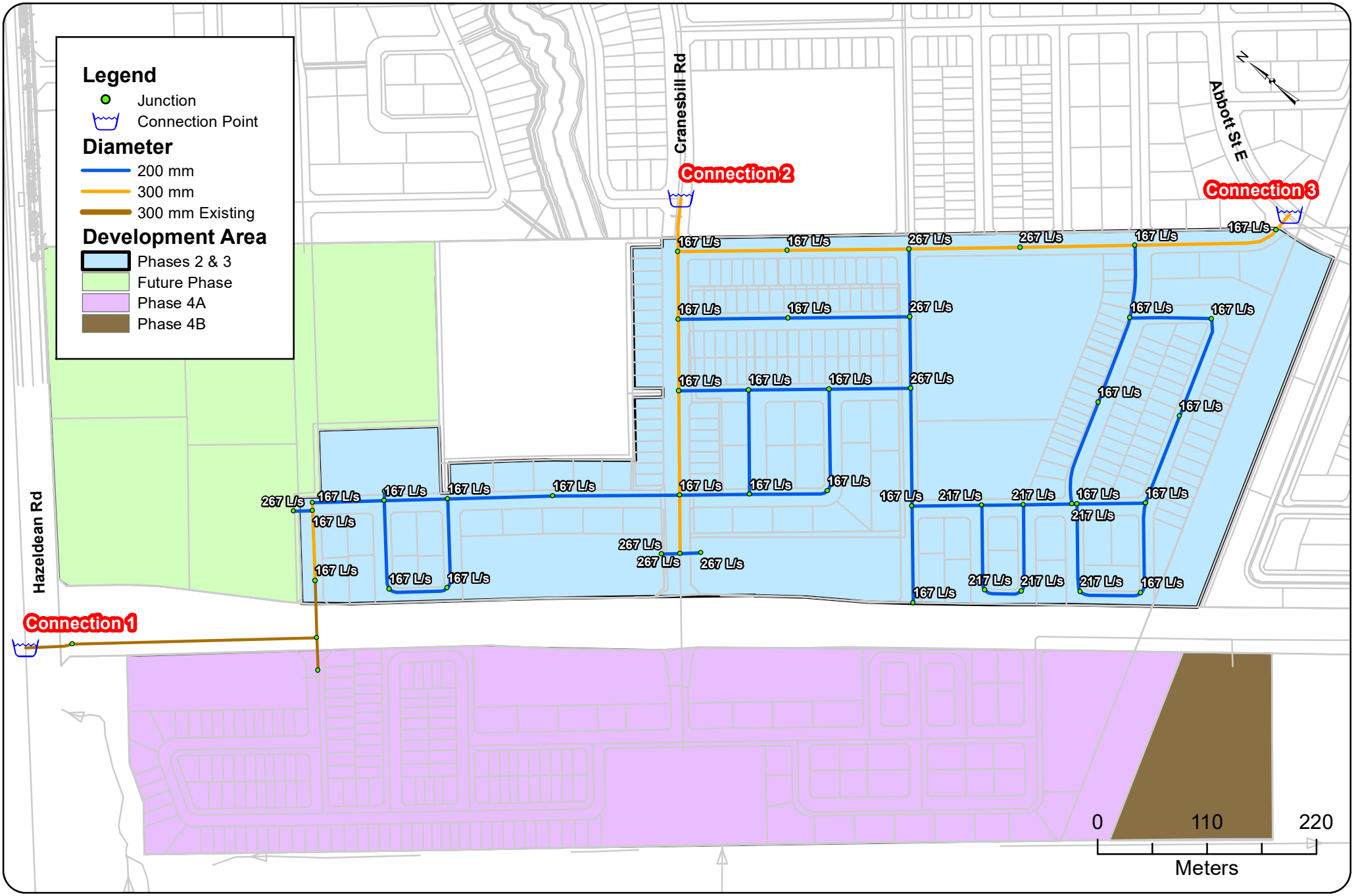
*Rounded to the nearest 1,000 L/min

The Total Required Fire Flow for the Abbott's Run development should be reviewed when drawings and site plans have been finalized. The Total Required Fire Flow may be reduced or increased depending on area, construction, occupancy, exposures, and level of sprinkler protection. If any of these items change, the Total Required Fire Flow should be reviewed to determine the impact.

Consideration should be given for fire prevention during construction phases as the required fire flows during construction of buildings is substantially higher than after the buildings are occupied. This is due to exposed framing and inactive sprinkler systems. Fires starting in unprotected portion of buildings quickly become too strong for sprinkler systems in protected portion of buildings. As such, special precautions should be taken any time construction is occurring.

* The amount and rate of water application required in firefighting to confine and control the fires possible in a building or group of buildings which comprise essentially the same fire area by virtue of immediate exposure.

** Rounded to the nearest 1,000 L/min



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Abbott's Run Phases 2 & 3
Client: **David Schaeffer Engineering Ltd.**
Date: **December 2024**
Created by: **JL**
Reviewed by: **WdS**

Required Fire Flows

Figure B.1

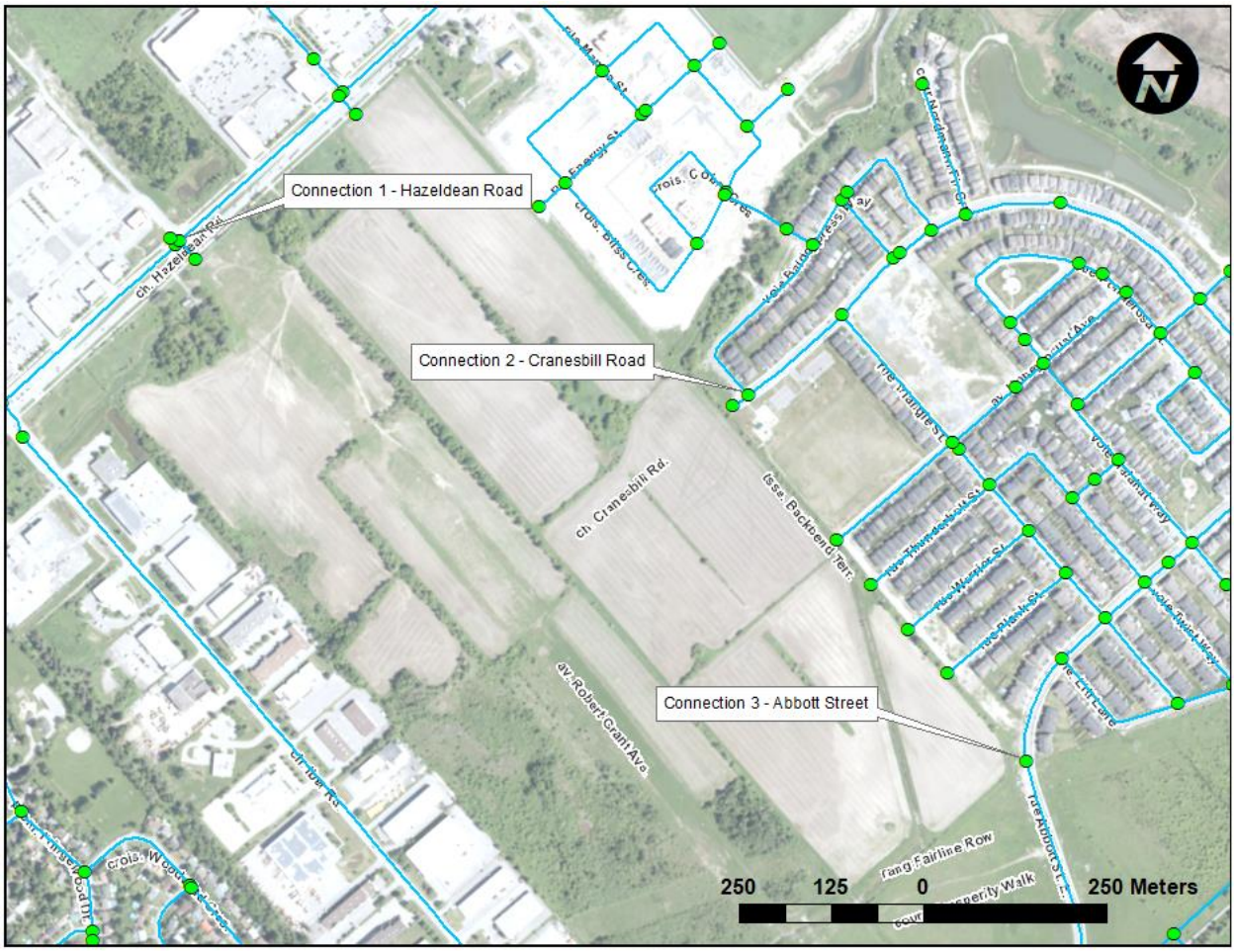
Appendix C Boundary Conditions

Boundary Conditions
Minto – Abbott's Phases 2 & 3

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	794	13.24
Maximum Daily Demand	1,172	19.53
Peak Hour	2,342	39.03
Fire Flow Demand #1	9,000	150.00
Fire Flow Demand #2	16,000	266.67

Location



Results

Connection 1 - Hazeldean Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.1	84.5
Peak Hour	154.9	75.8
Max Day plus Fire Flow #1	157.0	78.8
Max Day plus Fire Flow #2	155.6	76.8

[1] Ground Elevation = 101.6 m

Connection 2 - Cranesbill Road

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.1	87.5
Peak Hour	154.2	77.7
Max Day plus Fire Flow #1	151.9	74.4
Max Day plus Fire Flow #2	141.4	59.5

[1] Ground Elevation = 99.6 m

Connection 3 - Abbott Street

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.1	85.0
Peak Hour	154.2	75.1
Max Day plus Fire Flow #1	154.9	76.1
Max Day plus Fire Flow #2	149.9	69.1

[1] Ground Elevation = 101.3 m

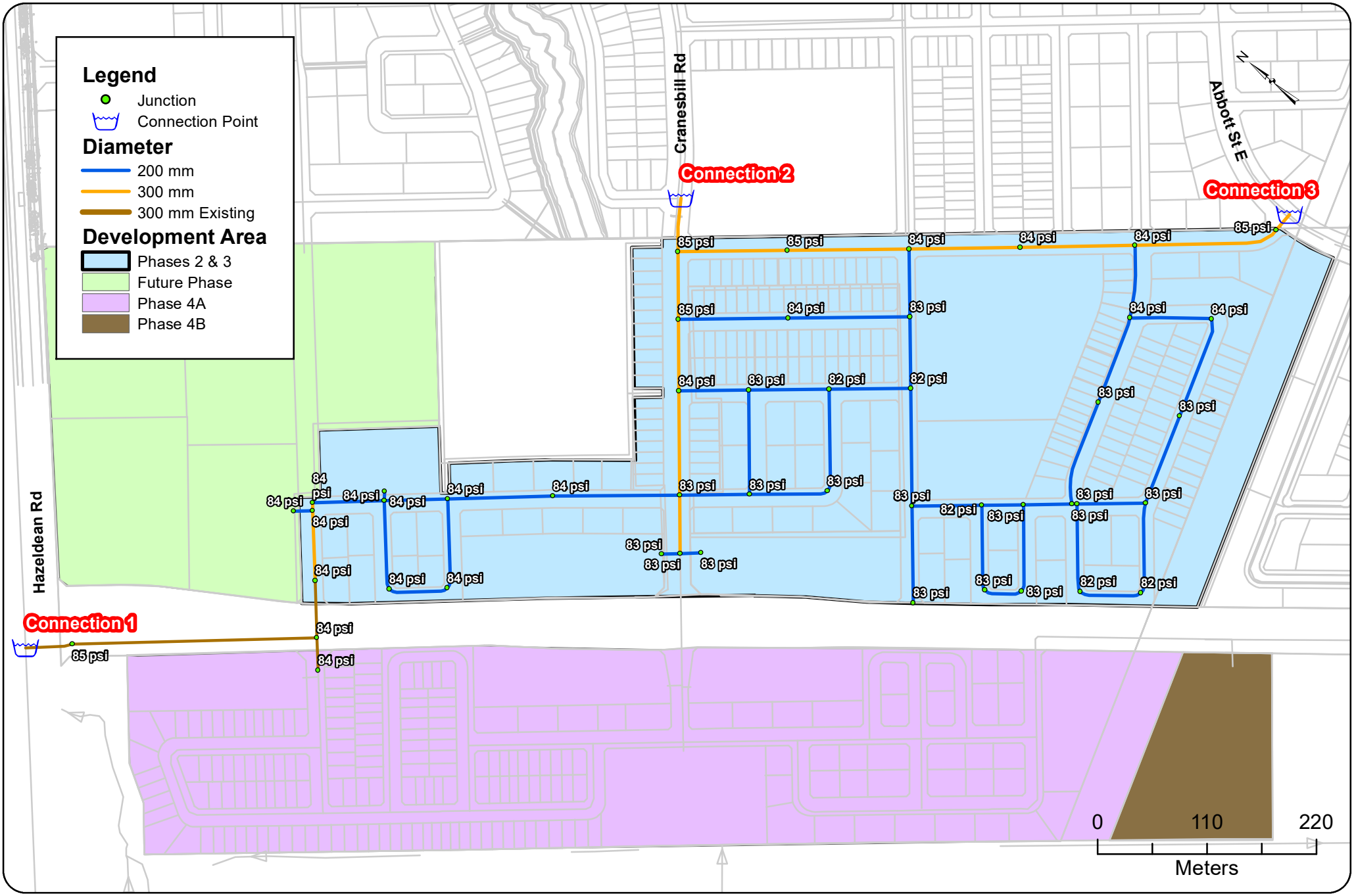
Notes

1. Demands for proposed Connection 1 at existing stub off Hazeldean Road were assigned to upstream junction of the existing stub and Hazeldean Road off the public looped watermains. The engineer must calculate headloss off the dead-end main.
2. Demands for proposed Connection 2 at existing stub off Cranesbill Road were assigned to upstream junction of the existing stub and Cranesbill Road off the public looped watermains. The engineer must calculate headloss off the dead-end main.
3. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
    a. If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
    b. Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

Disclaimer

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

Appendix D Pressure Results



GeoAdvice Engineering Inc.

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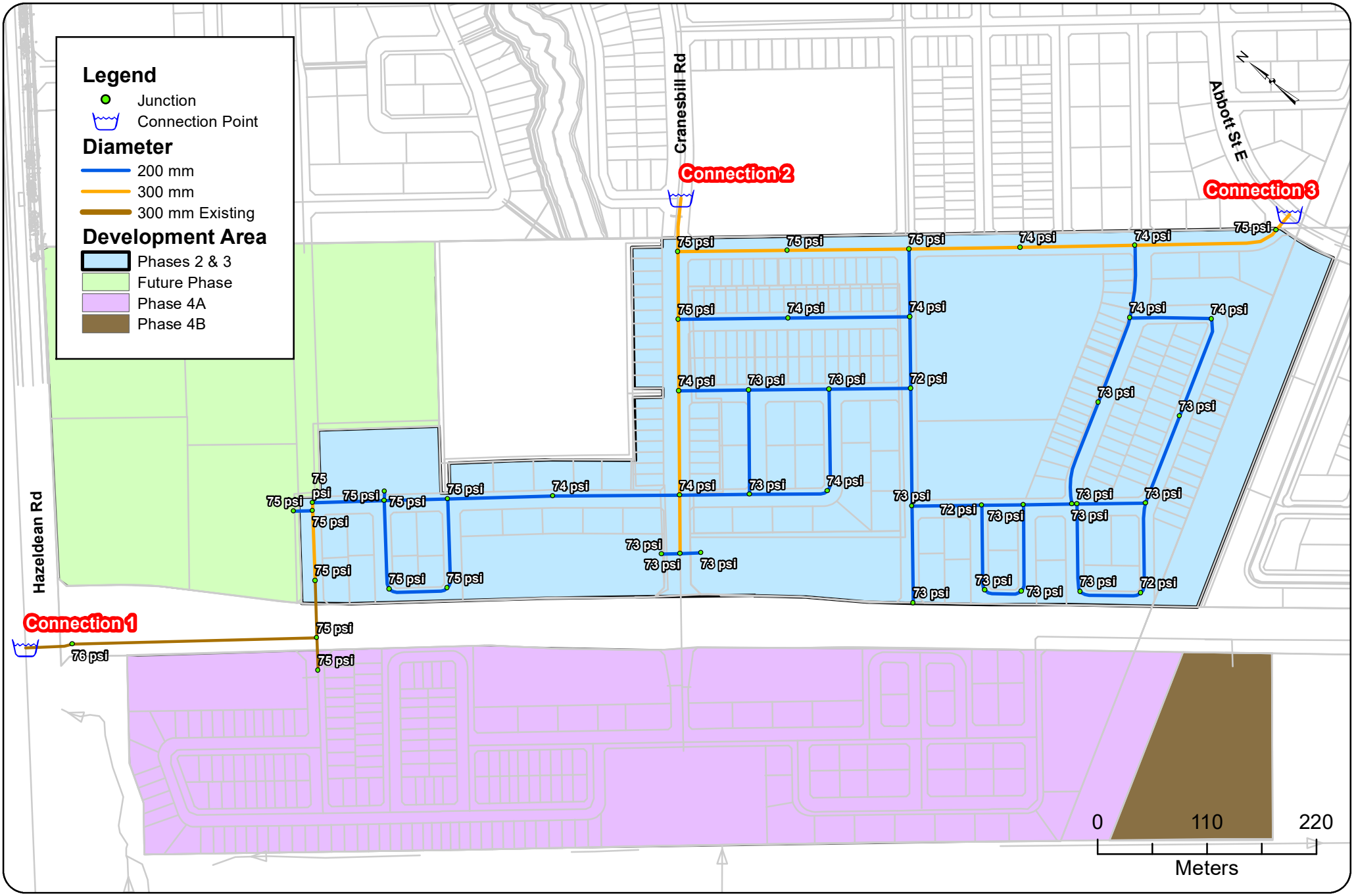
Abbott's Run Phases 2 & 3
Client: **David Schaeffer Engineering Ltd.**
Date: **December 2024**
Created by: **JL**
Reviewed by: **WdS**

ADD Pressure Modeling Results

Figure D.1



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Abbott's Run Phases 2 & 3
Client: **David Schaeffer Engineering Ltd.**
Date: **December 2024**
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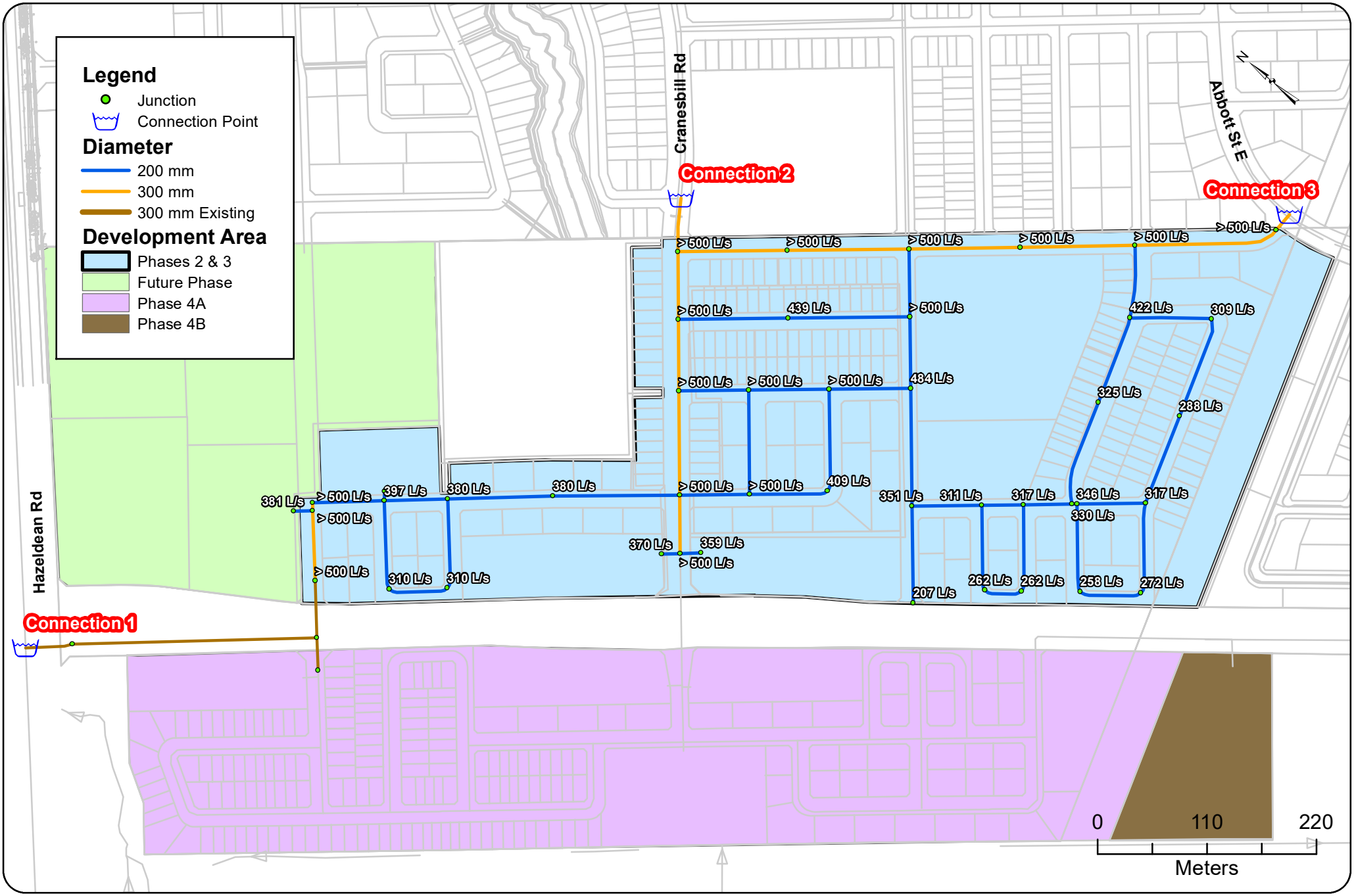
Reviewed by: **WdS**

PHD Pressure Modeling Results

Figure D.1

Appendix E MDD+FF Model Results



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Abbott's Run Phases 2 & 3
Client: **David Schaeffer Engineering Ltd.**
Date: **December 2024**
Created by: **JL**
Reviewed by: **WdS**

Available Fire Flow Modeling Results

Figure E.1

Appendix C

Sanitary Design Sheet (DSEL, June 2025)

Sanitary Design Sheet - Adequacy of Public Servicing Report (DSEL, May 2025)

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
SERVICING BLOCK 3																											
	4A	5A				0.00					0.00		0.00		0.00	0.00	0.00	0.00	0.00	0.00	24.5	200	0.65	26.44	0.00	0.84	0.05
To SERVICING BLOCK 1, Pipe 5A - 6A						0.00	0				0.00		0.00		0.00			0.00									
SERVICING BLOCK 1																											
	1A	2A	0.11	12	25	0.11	25	3.7	0.30		0.00		0.00		0.00	0.00	0.11	0.11	0.04	0.34	42.0	200	0.65	26.44	0.01	0.84	0.28
	2A	3A				0.11	25	3.7	0.30		0.00		0.00		0.00	0.00	0.00	0.11	0.04	0.34	9.5	200	0.35	19.40	0.02	0.62	0.23
	3A	5A	0.05	6	13	0.16	38	3.7	0.45		0.00		0.00		0.00	0.00	0.05	0.16	0.05	0.50	18.5	200	0.35	19.40	0.03	0.62	0.26
Contribution From SERVICING BLOCK 3, Pipe 4A - 5A						0.00	0				0.00		0.00		0.00		0.00	0.16									
	5A	6A	0.10	16	34	0.26	72	3.6	0.85		0.00		0.00		0.00	0.00	0.10	0.26	0.09	0.93	75.0	200	0.35	19.40	0.05	0.62	0.31
	6A	8A				0.26	72	3.6	0.85		0.00		0.00		0.00	0.00	0.00	0.26	0.09	0.93	77.5	200	0.35	19.40	0.05	0.62	0.31
	8A	9A	0.11	16	34	0.37	106	3.6	1.23		0.00		0.00		0.00	0.00	0.11	0.37	0.12	1.36	6.0	200	0.35	19.40	0.07	0.62	0.35
	9A	10A	0.06	6	13	0.43	119	3.6	1.38		0.00		0.00		0.00	0.00	0.06	0.43	0.14	1.52	30.5	200	0.35	19.40	0.08	0.62	0.36
	10A	17A	0.04	4	8	0.47	127	3.6	1.47		0.00		0.00		0.00	0.00	0.04	0.47	0.16	1.62	10.5	200	0.35	19.40	0.08	0.62	0.37
To PRIVATE STREET 1, Pipe 17A - 18A						0.47	127				0.00		0.00		0.00			0.47									
PRIVATE STREET 3																											
	11A	12A	0.09	6	13	0.09	13	3.7	0.16		0.00		0.00		0.00	0.00	0.09	0.09	0.03	0.19	40.5	200	0.65	26.44	0.01	0.84	0.23
	12A	15A	0.07	4	8	0.16	21	3.7	0.25		0.00		0.00		0.00	0.00	0.07	0.16	0.05	0.30	29.0	200	1.20	35.93	0.01	1.14	0.35
To PRIVATE STREET 1, Pipe 15A - 16A						0.16	21				0.00		0.00		0.00			0.16									
PRIVATE STREET 1																											
	13A	14A	0.12	6	13	0.12	13	3.7	0.16		0.00		0.00		0.00	0.00	0.12	0.12	0.04	0.20	16.0	200	1.75	43.39	0.00	1.38	0.33
	14A	15A	0.06	6	13	0.18	26	3.7	0.31		0.00		0.00		0.00	0.00	0.06	0.18	0.06	0.37	17.0	200	0.35	19.40	0.02	0.62	0.24
Contribution From PRIVATE STREET 3, Pipe 12A - 15A						0.16	21				0.00		0.00		0.00		0.16	0.34									
	15A	16A	0.24	20	42	0.58	89	3.6	1.04		0.00		0.00		0.00	0.00	0.24	0.58	0.19	1.23	66.5	200	0.35	19.40	0.06	0.62	0.34
	16A	17A	0.23	12	25	0.81	114	3.6	1.32		0.00		0.00		0.00	0.00	0.23	0.81	0.27	1.59	55.0	200	0.35	19.40	0.08	0.62	0.37
Contribution From SERVICING BLOCK 1, Pipe 10A - 17A						0.47	127				0.00		0.00		0.00		0.47	1.28									
	17A	18A				1.28	241	3.5	2.73		0.00		0.00		0.00	0.00	0.00	1.28	0.42	3.15	15.0	200	0.35	19.40	0.16	0.62	0.45
	18A	19A				1.28	241	3.5	2.73		0.00		0.00		0.00	0.00	0.00	1.28	0.42	3.15	12.0	200	0.35	19.40	0.16	0.62	0.45
	19A	20A				1.28	241	3.5	2.73		0.00		0.00		0.00	0.00	0.00	1.28	0.42	3.15	23.5	200	0.35	19.40	0.16	0.62	0.45
To SERVICING BLOCK 2, Pipe 20A - 147A(B.O.)						1.28	241				0.00		0.00		0.00			1.28									
SERVICING BLOCK 2																											
	21A	147A(B.O.)	0.06	8	17	0.06	17	3.7	0.20		0.00		0.00		0.00	0.00	0.06	0.06	0.02	0.22	31.5	200	1.20	35.93	0.01	1.14	0.31
To EXISTING SERVICING NORTH, Pipe 147A(B.O.) - 31(B.O.)						0.06	17				0.00		0.00		0.00			0.06									
Contribution From PRIVATE STREET 1, Pipe 19A - 20A						1.28	241				0.00		0.00		0.00		1.28	1.28									
	20A	147A(B.O.)	0.06	2	5	1.34	246	3.5	2.78		0.00		0.00		0.00	0.00	0.06	1.34	0.44	3.23	13.0	200	0.35	19.40	0.17	0.62	0.46
To EXISTING SERVICING NORTH, Pipe 147A(B.O.) - 31(B.O.)						1.34	246				0.00		0.00		0.00			1.34									
EXISTING SERVICING NORTH																											
Contribution From SERVICING BLOCK 2, Pipe 20A - 147A(B.O.)						1.34	246				0.00		0.00		0.00		1.34	1.34									
Contribution From SERVICING BLOCK 2, Pipe 21A - 147A(B.O.)						0.06	17				0.00		0.00		0.00		0.06	1.40									
	147A(B.O.)	31(B.O.)				1.40	263	3.5	2.97		0.00		0.00		0.00	0.00	0.00	1.40	0.46	3.43	17.0	250	6.00	145.67	0.02	2.97	1.23

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha				
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph			
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha	
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s	
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013	(Pvc)	0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7		
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4		

Designed: E.D.

Checked: S.M.

Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 16

PROJECT: **ABBOTT'S RUN BLOCK 13**

LOCATION: **City of Ottawa**

File Ref:

Date: **20 Jun 2025**

Sheet No. 1 of 1

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE					VEL.	
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	(FULL) (m/s)	(ACT.) (m/s)
BLOCK 143																											
	146A	148A	2.29		243	2.29	243	3.5	2.75		0.00		0.00		0.00	0.00	2.29	2.29	0.76	3.51	20.0	200	0.65	26.44	0.13	0.84	0.58
To IRON RANGE ROAD, Pipe 148A - 149A						2.29	243				0.00		0.00		0.00			2.29									
			2.21		234	2.21	234			2.39	2.39		0.00		0.00		4.60	4.60									
	147A	148A	2.39		110	4.60	344	3.4	3.84		2.39		0.00		0.00	1.16	2.39	6.99	2.31	7.31	18.0	200	0.70	27.44	0.27	0.87	0.74
To IRON RANGE ROAD, Pipe 148A - 149A						4.60	344				2.39		0.00		0.00			6.99									
BLOCK 147																											
	128A	74253	2.27		109	2.27	109	3.6	1.27		0.00		0.00		0.00	0.00	2.27	2.27	0.75	2.02	51.0	200	0.65	26.44	0.08	0.84	0.49
To ROBERT GRANT, Pipe 74253 - 74254						2.27	109				0.00		0.00		0.00			2.27									
BLOCK 142																											
	117A	118A				0.00					0.00		0.00	0.82	0.82	0.13	0.82	0.82	0.27	0.40	17.5	200	5.10	74.07	0.01	2.36	0.61
To TENDER'S PASS & KETTLE VALLEY, Pipe 118A - 120A						0.00	0				0.00		0.00		0.82			0.82									
CIRCUIT CRESCENT																											
			0.07		6	0.07	6				0.00		0.00		0.00		0.07	0.07									
	119A	120A	0.54		44	0.61	50	3.7	0.59		0.00		0.00		0.00	0.00	0.54	0.61	0.20	0.79	84.5	200	0.65	26.44	0.03	0.84	0.37
To TENDER'S PASS & KETTLE VALLEY, Pipe 120A - SA25						0.61	50				0.00		0.00		0.00			0.61									
	113A	114A	0.08		7	0.08	7	3.7	0.08		0.00		0.00		0.00	0.00	0.08	0.08	0.03	0.11	54.0	200	0.65	26.44	0.00	0.84	0.20
	114A	115A	0.03		3	0.11	10	3.7	0.12		0.00		0.00		0.00	0.00	0.03	0.11	0.04	0.16	11.0	200	0.35	19.40	0.01	0.62	0.18
	115A	116A	0.34		28	0.45	38	3.7	0.45		0.00		0.00		0.00	0.00	0.34	0.45	0.15	0.60	84.5	200	0.35	19.40	0.03	0.62	0.28
To TENDER'S PASS & KETTLE VALLEY, Pipe 116A - 118A						0.45	38				0.00		0.00		0.00			0.45									
IRON RANGE ROAD																											
	145A	148A				0.00					0.00		0.00		0.00	0.00	0.00	0.00	0.00	0.00	65.0	200	1.70	42.76	0.00	1.36	#######
Contribution From BLOCK 143, Pipe 146A - 148A						2.29	243				0.00		0.00		0.00		2.29	2.29									
Contribution From BLOCK 143, Pipe 147A - 148A						4.60	344				2.39		0.00		0.00		6.99	9.28									
	148A	149A	0.54		0	7.43	587	3.3	6.37		2.39		0.00		0.00	1.16	0.54	9.82	3.24	10.77	56.0	200	0.80	29.34	0.37	0.93	0.86
Contribution From TENDER'S PASS & KETTLE VALLEY, Pipe 120A - SA25						2.85	232				0.00		0.00		0.82		3.67	3.67									
Contribution From TENDER'S PASS & KETTLE VALLEY, Pipe 122A - SA25						1.71	83				1.71		0.00		0.00		3.42	7.09									
	SA25	SA29	0.21		17	4.77	332	3.4	3.71		1.71		0.00		0.82	0.96	0.21	7.30	2.41	7.08	45.0	250	0.25	29.73	0.24	0.61	0.50
	SA29	74251	0.25		20	5.02	352	3.4	3.92		1.71		0.00		0.82	0.96	0.25	7.55	2.49	7.38	63.5	250	0.25	29.73	0.25	0.61	0.50
To ROBERT GRANT, Pipe 74251 - 74252						5.02	352				1.71		0.00		0.82			7.55									
STREET No. 21																											
Contribution From STREET No.20- 22, Pipe 101A - 102A						0.87	70				0.00		0.00		0.00		0.87	0.87									
Contribution From STREET No.20- 22, Pipe 98A - 102A						2.03	165				0.00		0.00		0.00		2.03	2.90									
	102A	107A	0.23		19	3.13	254	3.5	2.87		0.00		0.00		0.00	0.00	0.23	3.13	1.03	3.90	72.0	200	0.35	19.40	0.20	0.62	0.48
Contribution From STREET No.20- 22, Pipe 106A - 107A						1.69	136				0.00		0.00		0.00		1.69	4.82									
	107A	SA39	0.31		25	5.13	415	3.4	4.59		0.00		0.00		0.00	0.00	0.31	5.13	1.69	6.28	83.0	250	0.35	35.18	0.18	0.72	0.54
			0.20		16	5.33	431				0.00		0.00		0.00		0.20	5.33									
	SA39	74251	1.04		83	6.37	514	3.4	5.62		0.00		0.00		0.00	0.00	1.04	6.37	2.10	7.72	48.5	250	0.35	35.18	0.22	0.72	0.57
To ROBERT GRANT, Pipe 74251 - 74252						6.37	514				0.00		0.00		0.00			6.37									

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha				
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph			
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha	
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s	
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013	(Pvc)	0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7		
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4		

Designed:

Checked:

Dwg. Reference:

Sanitary Drainage Plan, Dwgs. No.

PROJECT:

LOCATION: **City of Ottawa**

File Ref:

Date: **09 May 2025**

Sheet No. 1 of 7

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
BLOCK 13																											
	67A	SA31	1.31		105	1.31	105	3.6	1.22		0.00		0.00		0.00	0.00	1.31	1.31	0.43	1.65	19.5	200	6.00	80.34	0.02	2.56	0.99
To CRAINSBILL, Pipe SA31 - 74247						1.31	105				0.00		0.00		0.00			1.31									
	68A	SA31	1.39		111	1.39	111	3.6	1.29		0.00		0.00		0.00	0.00	1.39	1.39	0.46	1.75	19.5	200	0.65	26.44	0.07	0.84	0.47
To CRAINSBILL, Pipe SA31 - 74247						1.39	111				0.00		0.00		0.00			1.39									
DOWLING SPOKE ROW																											
	61A	62A	0.68		54	0.68	54	3.6	0.64		0.00		0.00		0.00	0.00	0.68	0.68	0.22	0.86	90.5	200	0.65	26.44	0.03	0.84	0.38
To SPERRY CAR TERRACE, Pipe 62A - SA19						0.68	54				0.00		0.00		0.00			0.68									
TENDER'S PASS & KETTLE VALLEY																											
	122A	SA25	1.71		83	1.71	83	3.6	0.97	1.71	1.71		0.00		0.00	0.83	3.42	3.42	1.13	2.93	17.0	250	0.34	34.68	0.08	0.71	0.43
To IRON RANGE ROAD, Pipe SA25 - SA29						1.71	83				1.71		0.00		0.00			3.42									
	58A	60A	0.78		62	0.78	62	3.6	0.73		0.00		0.00		0.00	0.00	0.78	0.78	0.26	0.99	97.5	200	0.65	26.44	0.04	0.84	0.40
To SPERRY CAR TERRACE, Pipe 60A - 62A						0.78	62				0.00		0.00		0.00			0.78									
	64A	65A	0.39		32	0.39	32	3.7	0.38		0.00		0.00		0.00	0.00	0.39	0.39	0.13	0.51	68.0	200	0.65	26.44	0.02	0.84	0.33
	65A	SA17	0.31		25	0.70	57	3.6	0.67		0.00		0.00		0.00	0.00	0.31	0.70	0.23	0.90	81.5	200	0.35	19.40	0.05	0.62	0.31
To CRAINSBILL, Pipe SA17 - SA31						0.70	57				0.00		0.00		0.00			0.70									
	111A	112A	0.86		69	0.86	69	3.6	0.81		0.00		0.00		0.00	0.00	0.86	0.86	0.28	1.09	107.0	200	0.65	26.44	0.04	0.84	0.41
	112A	116A	0.66		53	1.52	122	3.6	1.41		0.00		0.00		0.00	0.00	0.66	1.52	0.50	1.92	92.0	200	0.35	19.40	0.10	0.62	0.39
Contribution From CIRCUIT CRESCENT, Pipe 115A - 116A						0.45	38				0.00		0.00		0.00		0.45	1.97									
	116A	118A	0.11		9	2.08	169	3.5	1.94		0.00		0.00		0.00	0.00	0.11	2.08	0.69	2.62	62.5	200	0.35	19.40	0.14	0.62	0.43
Contribution From BLOCK 142, Pipe 117A - 118A						0.00	0				0.00		0.00		0.82		0.82	2.90									
	118A	120A				2.08	169	3.5	1.94		0.00		0.00		0.82	0.13	0.00	2.90	0.96	3.03	7.5	200	0.35	19.40	0.16	0.62	0.45
Contribution From CIRCUIT CRESCENT, Pipe 119A - 120A						0.61	50				0.00		0.00		0.00		0.61	3.51									
	120A	SA25	0.16		13	2.85	232	3.5	2.63		0.00		0.00		0.82	0.13	0.16	3.67	1.21	3.97	72.0	200	0.35	19.40	0.20	0.62	0.48
To IRON RANGE ROAD, Pipe SA25 - SA29						2.85	232				0.00		0.00		0.82			3.67									
SPERRY CAR TERRACE																											
	59A	60A	0.35		28	0.35	28	3.7	0.33		0.00		0.00		0.00	0.00	0.35	0.35	0.12	0.45	64.0	200	0.65	26.44	0.02	0.84	0.32
Contribution From TENDER'S PASS & KETTLE VALLEY, Pipe 58A - 60A						0.78	62				0.00		0.00		0.00		0.78	1.13									
	60A	62A	0.35		28	1.48	118	3.6	1.37		0.00		0.00		0.00	0.00	0.35	1.48	0.49	1.86	76.0	200	0.35	19.40	0.10	0.62	0.39
Contribution From DOWLING SPOKE ROW, Pipe 61A - 62A						0.68	54				0.00		0.00		0.00		0.68	2.16									
	62A	SA19	0.32		26	2.48	198	3.5	2.26		0.00		0.00		0.00	0.00	0.32	2.48	0.82	3.08	81.0	200	0.35	19.40	0.16	0.62	0.45
To CRAINSBILL, Pipe SA19 - SA17						2.48	198				0.00		0.00		0.00			2.48									
CARGO CROSS WAY																											
	55A	56A	0.93		74	0.93	74	3.6	0.87		0.00	2.83	2.83		0.00	1.38	3.76	3.76	1.24	3.49	118.0	200	0.65	26.44	0.13	0.84	0.58
	56A	343A	0.73		58	1.66	132	3.6	1.53		0.00		2.83		0.00	1.38	0.73	4.49	1.48	4.38	115.0	200	0.35	19.40	0.23	0.62	0.50
To CRAINSBILL, Pipe 343A - SA19						1.66	132				0.00		2.83		0.00			4.49									
CRAINSBILL																											
Contribution From FREIGHTLINE TERRACE, Pipe 50A - 52A						1.36	109				0.00		0.00		0.00		1.36	1.36									
	52A	343A	0.45		36	1.81	145	3.6	1.67		0.00		0.00		0.00	0.00	0.45	1.81	0.60	2.27	74.0	200	0.35	19.40	0.12	0.62	0.41

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha			
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013 (Pvc)	0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7	
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4	

Designed:	PROJECT:		
Checked:	LOCATION: **City of Ottawa**		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.	File Ref:	Date: **09 May 2025**	Sheet No. 2 of 7

SANITARY SEWER CALCULATION SHEET

BLOCK 13 ALLOCATION

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Contribution From CARGO CROSS WAY, Pipe 56A - 343A						1.66	132				0.00		2.83		0.00		4.49	6.30									
	343A	SA19	0.40		32	3.87	309	3.5	3.46		0.00		2.83		0.00	1.38	0.40	6.70	2.21	7.05	72.0	250	0.25	29.73	0.24	0.61	0.50
Contribution From SPERRY CAR TERRACE, Pipe 62A - SA19						2.48	198				0.00		0.00		0.00		2.48	9.18									
	SA19	SA17	0.80		64	7.15	571	3.4	6.21		0.00		2.83		0.00	1.38	0.80	9.98	3.29	10.88	106.0	250	0.25	29.73	0.37	0.61	0.56
Contribution From TENDER'S PASS & KETTLE VALLEY, Pipe 65A - SA17						0.70	57				0.00		0.00		0.00		0.70	10.68									
	SA17	SA31	0.12		10	7.97	638	3.3	6.89		0.00		2.83		0.00	1.38	0.12	10.80	3.56	11.83	52.5	250	0.25	29.73	0.40	0.61	0.57
Contribution From BLOCK 13, Pipe 67A - SA31						1.31	105				0.00		0.00		0.00		1.31	12.11									
Contribution From BLOCK 13, Pipe 68A - SA31						1.39	111				0.00		0.00		0.00		1.39	13.50									
	SA31	74247	0.15		12	10.82	866	3.3	9.18		0.00		2.83		0.00	1.38	0.15	13.65	4.50	15.06	56.5	250	0.25	29.73	0.51	0.61	0.61
To ROBERT GRANT, Pipe 74247 - 74248						10.82	866				0.00		2.83		0.00			13.65									
BLOCK 5																											
	87A	SA-37	1.12		90	1.12	90	3.6	1.05		0.00		0.00		0.00	0.00	1.12	1.12	0.37	1.42	16.0	200	6.00	80.34	0.02	2.56	0.96
To STREET No. 17, Pipe SA-37 - 74247						1.12	90				0.00		0.00		0.00			1.12									
	88A	SA-37	0.95		76	0.95	76	3.6	0.89		0.00		0.00		0.00	0.00	0.95	0.95	0.31	1.20	13.0	200	0.65	26.44	0.05	0.84	0.43
To STREET No. 17, Pipe SA-37 - 74247						0.95	76				0.00		0.00		0.00			0.95									
STREET No.20- 22																											
	101A	102A	0.87		70	0.87	70	3.6	0.82		0.00		0.00		0.00	0.00	0.87	0.87	0.29	1.11	126.5	200	0.65	26.44	0.04	0.84	0.41
To STREET No. 21, Pipe 102A - 107A						0.87	70				0.00		0.00		0.00			0.87									
	101A	104A	0.21		17	0.21	17	3.7	0.20		0.00		0.00		0.00	0.00	0.21	0.21	0.07	0.27	12.0	200	0.65	26.44	0.01	0.84	0.27
	104A	105A	0.26		21	0.47	38	3.7	0.45		0.00		0.00		0.00	0.00	0.26	0.47	0.16	0.61	55.0	200	0.35	19.40	0.03	0.62	0.28
	105A	106A	0.26		21	0.73	59	3.6	0.70		0.00		0.00		0.00	0.00	0.26	0.73	0.24	0.94	14.0	200	0.35	19.40	0.05	0.62	0.31
	106A	107A	0.96		77	1.69	136	3.6	1.57		0.00		0.00		0.00	0.00	0.96	1.69	0.56	2.13	143.0	200	0.35	19.40	0.11	0.62	0.40
To STREET No. 21, Pipe 107A - SA39						1.69	136				0.00		0.00		0.00			1.69									
	97A	98A	0.51		41	0.51	41	3.7	0.49		0.00		0.00		0.00	0.00	0.51	0.51	0.17	0.66	45.0	200	0.65	26.44	0.02	0.84	0.35
Contribution From STREET No. 19, Pipe 96A - 98A						1.04	85				0.00		0.00		0.00		1.04	1.55									
	98A	102A	0.48		39	2.03	165	3.5	1.89		0.00		0.00		0.00	0.00	0.48	2.03	0.67	2.56	73.5	200	0.35	19.40	0.13	0.62	0.43
To STREET No. 21, Pipe 102A - 107A						2.03	165				0.00		0.00		0.00			2.03									
Contribution From STREET No. 19, Pipe 73A - 75A						0.06	5				0.00		0.00		0.00		0.06	0.06									
	75A	76A	0.22		18	0.28	23	3.7	0.28		0.00		0.00		0.00	0.00	0.22	0.28	0.09	0.37	33.5	200	0.35	19.40	0.02	0.62	0.24
	76A	77A	0.63		50	0.91	73	3.6	0.86		0.00		0.00		0.00	0.00	0.63	0.91	0.30	1.16	89.5	200	0.35	19.40	0.06	0.62	0.34
	77A	78A	0.06		5	0.97	78	3.6	0.91		0.00		0.00		0.00	0.00	0.06	0.97	0.32	1.23	11.0	200	0.35	19.40	0.06	0.62	0.34
	78A	79A	0.10		8	1.07	86	3.6	1.01		0.00		0.00		0.00	0.00	0.10	1.07	0.35	1.36	63.0	200	0.35	19.40	0.07	0.62	0.35
To STREET No. 16-18, Pipe 79A - 86A						1.07	86				0.00		0.00		0.00			1.07									
STREET No. 19																											
	73A	74A	0.16		13	0.16	13	3.7	0.16		0.00		0.00		0.00	0.00	0.16	0.16	0.05	0.21	36.0	200	0.95	31.97	0.01	1.02	0.28
To STREET No. 16-18, Pipe 74A - 151A						0.16	13				0.00		0.00		0.00			0.16									
	73A	75A	0.06		5	0.06	5	3.8	0.06		0.00		0.00		0.00	0.00	0.06	0.06	0.02	0.08	35.0	200	0.65	26.44	0.00	0.84	0.19
To STREET No.20- 22, Pipe 75A - 76A						0.06	5				0.00		0.00		0.00			0.06									
	70A	71A	0.10		8	0.10	8	3.7	0.10		0.00		0.00		0.00	0.00	0.10	0.10	0.03	0.13	26.5	200	0.65	26.44	0.00	0.84	0.22
	71A	72A	0.03		3	0.13	11	3.7	0.13		0.00		0.00		0.00	0.00	0.03	0.13	0.04	0.18	11.5	200	0.35	19.40	0.01	0.62	0.19

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha
Average Daily Flow =	280	l/p/day		
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha
Max Res. Peak Factor =	4.00			
Commercial/Inst./Park Peak Factor =	1.50			
Institutional =	0.32	l/s/Ha		

Industrial Peak Factor = as per MOE Graph

Extraneous Flow = 0.330 L/s/ha

Minimum Velocity = 0.600 m/s

Manning's n = (Conc) 0.013 (Pvc) 0.013

Townhouse coeff= 2.7

Single house coeff= 3.4

Designed:

Checked:

Dwg. Reference:

Sanitary Drainage Plan, Dwgs. No.

PROJECT:

LOCATION:

City of Ottawa

File Ref:

Date: **09 May 2025**

Sheet No. 3 of 7

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
	72A	74A	0.29		24	0.42	35	3.7	0.42		0.00		0.00		0.00	0.00	0.29	0.42	0.14	0.56	81.5	200	0.35	19.40	0.03	0.62	0.27
To STREET No. 16-18, Pipe 74A - 151A						0.42	35				0.00		0.00		0.00			0.42									
	70A	94A	0.13		11	0.13	11	3.7	0.13		0.00		0.00		0.00	0.00	0.13	0.13	0.04	0.18	32.0	200	0.65	26.44	0.01	0.84	0.23
	94A	95A	0.07		6	0.20	17	3.7	0.20		0.00		0.00		0.00	0.00	0.07	0.20	0.07	0.27	11.0	200	0.35	19.40	0.01	0.62	0.21
	95A	96A	0.48		39	0.68	56	3.6	0.66		0.00		0.00		0.00	0.00	0.48	0.68	0.22	0.89	75.5	200	0.35	19.40	0.05	0.62	0.31
	96A	98A	0.36		29	1.04	85	3.6	0.99		0.00		0.00		0.00	0.00	0.36	1.04	0.34	1.34	77.0	200	0.35	19.40	0.07	0.62	0.35
To STREET No.20- 22, Pipe 98A - 102A						1.04	85				0.00		0.00		0.00			1.04									
STREET No. 17																											
Contribution From STREET No. 16-18, Pipe 79A - 86A						2.83	229				0.00		0.00		1.62		4.45	4.45									
Contribution From STREET No. 16-18, Pipe 85A - 86A						1.96	159				0.00		0.00		0.00		1.96	6.41									
	86A	SA-37	0.07		6	4.86	394	3.4	4.37		0.00		0.00		1.62	0.26	0.07	6.48	2.14	6.77	45.0	200	0.35	19.40	0.35	0.62	0.56
Contribution From BLOCK 5, Pipe 87A - SA-37						1.12	90				0.00		0.00		0.00		1.12	7.60									
Contribution From BLOCK 5, Pipe 88A - SA-37						0.95	76				0.00		0.00		0.00		0.95	8.55									
	SA-37	74247	0.19		16	7.12	576	3.4	6.26		0.00		0.00		1.62	0.26	0.19	8.74	2.88	9.41	86.5	200	0.35	19.40	0.48	0.62	0.61
To ROBERT GRANT, Pipe 74247 - 74248						7.12	576				0.00		0.00		1.62			8.74									
CABLE CAR CRESCENT																											
			0.05		4	0.05	4				0.00		0.00		0.00		0.05	0.05									
	38A	39A	0.36		29	0.41	33	3.7	0.39		0.00		0.00		0.00	0.00	0.36	0.41	0.14	0.53	82.0	200	0.65	26.44	0.02	0.84	0.33
To STATIONHOUSE WALK, Pipe 39A - 43A						0.41	33				0.00		0.00		0.00			0.41									
	40A	41A	0.04		4	0.04	4	3.8	0.05		0.00		0.00		0.00	0.00	0.04	0.04	0.01	0.06	32.0	200	0.65	26.44	0.00	0.84	0.17
	41A	42A	0.07		6	0.11	10	3.7	0.12		0.00		0.00		0.00	0.00	0.07	0.11	0.04	0.16	11.0	200	0.35	19.40	0.01	0.62	0.18
	42A	43A	0.43		35	0.54	45	3.7	0.53		0.00		0.00		0.00	0.00	0.43	0.54	0.18	0.71	81.5	200	0.35	19.40	0.04	0.62	0.29
To STATIONHOUSE WALK, Pipe 43A - 45A						0.54	45				0.00		0.00		0.00			0.54									
STATIONHOUSE WALK																											
Contribution From FAREBOX WAY & WHISTLE POST, Pipe 150A - 29A						0.20	17				0.00		0.00		0.00		0.20	0.20									
Contribution From FAREBOX WAY & WHISTLE POST, Pipe 28A - 29A						0.42	35				0.00		0.00		0.00		0.42	0.62									
	29A	36A	0.12		11	0.74	63	3.6	0.74		0.00		0.00		0.00	0.00	0.12	0.74	0.24	0.99	72.5	200	0.35	19.40	0.05	0.62	0.32
Contribution From FAREBOX WAY & WHISTLE POST, Pipe 34A - 36A						0.69	59				0.00		0.00		0.00		0.69	1.43									
	36A	39A	0.08		7	1.51	129	3.6	1.49		0.00		0.00		0.00	0.00	0.08	1.51	0.50	1.99	48.0	200	0.35	19.40	0.10	0.62	0.40
Contribution From CABLE CAR CRESCENT, Pipe 38A - 39A						0.41	33				0.00		0.00		0.00		0.41	1.92									
	39A	43A	0.08		7	2.00	169	3.5	1.94		0.00		0.00	0.99	0.99	0.16	1.07	2.99	0.99	3.08	48.0	200	0.35	19.40	0.16	0.62	0.45
Contribution From CABLE CAR CRESCENT, Pipe 42A - 43A						0.54	45				0.00		0.00		0.00		0.54	3.53									
	43A	45A	0.11		9	2.65	223	3.5	2.53		0.00		0.00		0.99	0.16	0.11	3.64	1.20	3.89	70.0	200	0.35	19.40	0.20	0.62	0.48
To MONORAIL ROAD, Pipe 45A - SA35						2.65	223				0.00		0.00		0.99			3.64									
MONORAIL ROAD																											
	44A	45A	0.53		43	0.53	43	3.7	0.51		0.00		0.00		0.00	0.00	0.53	0.53	0.17	0.69	118.5	200	0.65	26.44	0.03	0.84	0.36
Contribution From STATIONHOUSE WALK, Pipe 43A - 45A						2.65	223				0.00		0.00		0.99		3.64	4.17									
	45A	SA35	0.45		36	3.63	302	3.5	3.39		0.00		0.00		0.99	0.16	0.45	4.62	1.52	5.07	73.5	200	0.34	19.12	0.27	0.61	0.51
	SA35	74245				3.63	302	3.5	3.39		0.00		0.00		0.99	0.16	0.00	4.62	1.52	5.07	29.5	200	0.25	16.40	0.31	0.52	0.46
To ROBERT GRANT, Pipe 74245 - 74246						3.63	302				0.00		0.00		0.99			4.62									

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha				
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph			
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha	
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s	
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013	(Pvc)	0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7		
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4		

Designed:	PROJECT:		
Checked:	LOCATION: **City of Ottawa**		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.	File Ref:	Date: **09 May 2025**	Sheet No. 4 of 7

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
STREET No. 13																											
	8A	9A	0.21		17	0.21	17	3.7	0.20		0.00		0.00		0.00	0.00	0.21	0.21	0.07	0.27	49.5	200	0.65	26.44	0.01	0.84	0.27
	9A	10A	0.03		3	0.24	20	3.7	0.24		0.00		0.00		0.00	0.00	0.03	0.24	0.08	0.32	11.5	200	0.35	19.40	0.02	0.62	0.22
	10A	12A	0.05		4	0.29	24	3.7	0.29		0.00		0.00		0.00	0.00	0.05	0.29	0.10	0.38	38.0	200	0.35	19.40	0.02	0.62	0.24
Contribution From STREET No.14, Pipe 11A - 12A						0.30	24				0.00		0.00		0.00		0.30	0.59									
	12A	13A	0.05		4	0.64	52	3.6	0.61		0.00		0.00		0.00	0.00	0.05	0.64	0.21	0.83	39.0	200	0.35	19.40	0.04	0.62	0.31
	13A	14A	0.06		5	0.70	57	3.6	0.67		0.00		0.00		0.00	0.00	0.06	0.70	0.23	0.90	10.5	200	0.35	19.40	0.05	0.62	0.31
	14A	20A	0.37		30	1.07	87	3.6	1.02		0.00		0.00		0.00	0.00	0.37	1.07	0.35	1.37	71.5	200	0.35	19.40	0.07	0.62	0.35
To STREET No. 16-18, Pipe 20A - 25A						1.07	87				0.00		0.00		0.00			1.07									
STREET No.14																											
	11A	12A	0.30		24	0.30	24	3.7	0.29		0.00		0.00		0.00	0.00	0.30	0.30	0.10	0.39	57.0	200	0.65	26.44	0.01	0.84	0.29
To STREET No. 13, Pipe 12A - 13A						0.30	24				0.00		0.00		0.00			0.30									
	18A	19A	0.11		9	0.11	9	3.7	0.11		0.00		0.00		0.00	0.00	0.11	0.11	0.04	0.15	56.0	200	1.90	45.21	0.00	1.44	0.32
To STREET No. 16-18, Pipe 19A - 20A						0.11	9				0.00		0.00		0.00			0.11									
STREET No. 16-18																											
	83A	84A	0.40		32	0.40	32	3.7	0.38		0.00		0.00		0.00	0.00	0.40	0.40	0.13	0.51	55.5	200	1.10	34.40	0.01	1.09	0.40
Contribution From STREET No. 12, Pipe 82A - 84A						1.03	84				0.00		0.00		0.00		1.03	1.43									
	84A	85A	0.16		13	1.59	129	3.6	1.49		0.00		0.00		0.00	0.00	0.16	1.59	0.52	2.02	35.5	200	0.35	19.40	0.10	0.62	0.40
	85A	86A	0.37		30	1.96	159	3.5	1.83		0.00		0.00		0.00	0.00	0.37	1.96	0.65	2.47	85.5	200	0.35	19.40	0.13	0.62	0.42
To STREET No. 17, Pipe 86A - SA-37						1.96	159				0.00		0.00		0.00			1.96									
Contribution From STREET No. 19, Pipe 72A - 74A						0.42	35				0.00		0.00		0.00		0.42	0.42									
Contribution From STREET No. 19, Pipe 73A - 74A						0.16	13				0.00		0.00		0.00		0.16	0.58									
	74A	151A	0.84		67	1.42	115	3.6	1.33		0.00		0.00		0.00	0.00	0.84	1.42	0.47	1.80	65.5	200	0.35	19.40	0.09	0.62	0.39
	151A	79A				1.42	115	3.6	1.33		0.00		0.00		0.00	0.00	0.00	1.42	0.47	1.80	65.5	200	0.35	19.40	0.09	0.62	0.39
Contribution From STREET No.20- 22, Pipe 78A - 79A						1.07	86				0.00		0.00		0.00		1.07	2.49									
	79A	86A	0.34		28	2.83	229	3.5	2.60		0.00		0.00	1.62	1.62	0.26	1.96	4.45	1.47	4.33	85.5	200	0.35	19.40	0.22	0.62	0.50
To STREET No. 17, Pipe 86A - SA-37						2.83	229				0.00		0.00		1.62			4.45									
	17A	19A	0.18		15	0.18	15	3.7	0.18		0.00		0.00		0.00	0.00	0.18	0.18	0.06	0.24	46.0	200	0.65	26.44	0.01	0.84	0.26
Contribution From STREET No.14, Pipe 18A - 19A						0.11	9				0.00		0.00		0.00		0.11	0.29									
	19A	20A	0.17		14	0.46	38	3.7	0.45		0.00		0.00		0.00	0.00	0.17	0.46	0.15	0.60	46.0	200	0.40	20.74	0.03	0.66	0.29
Contribution From STREET No. 13, Pipe 14A - 20A						1.07	87				0.00		0.00		0.00		1.07	1.53									
	20A	25A	0.27		22	1.80	147	3.6	1.69		0.00		0.00		0.00	0.00	0.27	1.80	0.59	2.29	70.0	200	0.35	19.40	0.12	0.62	0.41
To STREET No. 12, Pipe 25A - SA33						1.80	147				0.00		0.00		0.00			1.80									
STREET No. 12																											
	80A	81A	0.58		47	0.58	47	3.7	0.56		0.00		0.00		0.00	0.00	0.58	0.58	0.19	0.75	72.5	200	0.80	29.34	0.03	0.93	0.40
	81A	82A	0.19		16	0.77	63	3.6	0.74		0.00		0.00		0.00	0.00	0.19	0.77	0.25	1.00	11.0	200	1.65	42.13	0.02	1.34	0.55
	82A	84A	0.26		21	1.03	84	3.6	0.98		0.00		0.00		0.00	0.00	0.26	1.03	0.34	1.32	63.0	200	2.20	48.65	0.03	1.55	0.66
To STREET No. 16-18, Pipe 84A - 85A						1.03	84				0.00		0.00		0.00			1.03									
	21A	22A	0.18		15	0.18	15	3.7	0.18		0.00		0.00		0.00	0.00	0.18	0.18	0.06	0.24	23.0	200	0.80	29.34	0.01	0.93	0.27
	22A	23A	0.82		66	1.00	81	3.6	0.95		0.00		0.00		0.00	0.00	0.82	1.00	0.33	1.28	108.5	200	0.80	29.34	0.04	0.93	0.46
	23A	24A	0.15		12	1.15	93	3.6	1.09		0.00		0.00		0.00	0.00	0.15	1.15	0.38	1.46	11.0	200	0.40	20.74	0.07	0.66	0.37
	24A	25A	0.33		27	1.48	120	3.6	1.39		0.00		0.00		0.00	0.00	0.33	1.48	0.49	1.88	63.0	200	1.75	43.39	0.04	1.38	0.68

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha			
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013 (Pvc)	0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7	
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4	

Designed:	PROJECT:		
Checked:	LOCATION: **City of Ottawa**		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.	File Ref:	Date: **09 May 2025**	Sheet No. 5 of 7

SANITARY SEWER CALCULATION SHEET

CAPACITY IN ROBERT GRANT SEWER

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
Contribution From STREET No. 16-18, Pipe 20A - 25A						1.80	147				0.00		0.00		0.00		1.80	3.28									
	25A	SA33	0.35		28	3.63	295	3.5	3.31		0.00		0.00	0.71	0.71	0.11	1.06	4.34	1.43	4.86	72.0	200	0.35	19.40	0.25	0.62	0.51
	SA33	SA07				3.63	295	3.5	3.31		0.00		0.00		0.71	0.11	0.00	4.34	1.43	4.86	29.0	200	0.30	17.96	0.27	0.57	0.49
	SA07	74244				3.63	295	3.5	3.31		0.00		0.00		0.71	0.11	0.00	4.34	1.43	4.86	21.0	200	0.50	23.19	0.21	0.74	0.58
To ROBERT GRANT, Pipe 74244 - 74245						3.63	295				0.00		0.00		0.71			4.34									
BLOCK 9																											
	4A	SA01	2.38		191	2.38	191	3.5	2.18		0.00		0.00		0.00	0.00	2.38	2.38	0.79	2.97	49.0	250	0.35	35.18	0.08	0.72	0.43
To ROBERT GRANT, Pipe SA01 - 74242						2.38	191				0.00		0.00		0.00			2.38									
ROBERT GRANT																											
			0.00		0	0.00	0				0.00		0.00		0.00		0.00	0.00		493.40							
	74231	74232				0.00	0				0.00		0.00		0.00	0.00	0.00	0.00	0.00	493.40	136.5	900	0.65	1952.92	0.25	3.07	2.55
	74232	74241				0.00	0				0.00		0.00		0.00	0.00	0.00	0.00	0.00	493.40	119.5	900	0.15	1194.53	0.41	1.88	1.78
	74241	SA01				0.00	0				0.00		0.00		0.00	0.00	0.00	0.00	0.00	493.40	88.5	900	0.15	1194.53	0.41	1.88	1.78
Contribution From BLOCK 9, Pipe 4A - SA01						2.38	191				0.00		0.00		0.00		2.38	2.38									
	SA01	74242				2.38	191	3.5	2.18		0.00		0.00		0.00	0.00	0.00	2.38	0.79	496.37	31.5	900	0.20	1303.00	0.38	2.05	1.90
	74242	74243				2.38	191	3.5	2.18		0.00		0.00		0.00	0.00	0.00	2.38	0.79	496.37	120.0	900	0.15	1194.53	0.42	1.88	1.78
	74243	74244				2.38	191	3.5	2.18		0.00		0.00		0.00	0.00	0.00	2.38	0.79	496.37	47.5	900	0.25	1398.56	0.35	2.20	2.01
Contribution From STREET No. 12, Pipe SA07 - 74244						3.63	295				0.00		0.00		0.71		4.34	6.72									
	74244	74245				6.01	486	3.4	5.33		0.00		0.00		0.71	0.11	0.00	6.72	2.22	501.06	126.5	900	0.10	1065.87	0.47	1.68	1.65
Contribution From MONORAIL ROAD, Pipe SA35 - 74245						3.63	302				0.00		0.00		0.99		4.62	11.34									
	74245	74246				9.64	788	3.3	8.41		0.00		0.00		1.70	0.27	0.00	11.34	3.74	505.82	115.0	900	0.10	1065.87	0.47	1.68	1.65
	74246	74247				9.64	788	3.3	8.41		0.00		0.00		1.70	0.27	0.00	11.34	3.74	505.82	118.5	900	0.10	1065.87	0.47	1.68	1.65
Contribution From CRAINSBILL, Pipe SA31 - 74247						10.82	866				0.00		2.83		0.00		13.65	24.99									
Contribution From STREET No. 17, Pipe SA-37 - 74247						7.12	576				0.00		0.00		1.62		8.74	33.73									
	74247	74248				27.58	2230	3.0	21.96		0.00		2.83		3.32	1.91	0.00	33.73	11.13	528.40	121.5	900	0.15	1194.53	0.44	1.88	1.82
	74248	74249				27.58	2230	3.0	21.96		0.00		2.83		3.32	1.91	0.00	33.73	11.13	528.40	78.5	900	0.29	1303.00	0.41	2.05	1.93
	74249	74250				27.58	2230	3.0	21.96		0.00		2.83		3.32	1.91	0.00	33.73	11.13	528.40	87.5	900	0.15	1194.53	0.44	1.88	1.82
	74250	74251				27.58	2230	3.0	21.96		0.00		2.83		3.32	1.91	0.00	33.73	11.13	528.40	79.0	900	0.15	1194.53	0.44	1.88	1.82
Contribution From IRON RANGE ROAD, Pipe SA29 - 74251						5.02	352				1.71		0.00		0.82		7.55	41.28									
Contribution From STREET No. 21, Pipe SA39 - 74251						6.37	514				0.00		0.00		0.00		6.37	47.65									
	74251	74252				38.97	3096	2.9	29.54		1.71		2.83		4.14	2.88	0.00	47.65	15.72	541.54	120.5	900	0.15	1194.53	0.45	1.88	1.83
	74252	74253				38.97	3096	2.9	29.54		1.71		2.83		4.14	2.88	0.00	47.65	15.72	541.54	120.5	900	0.15	1194.53	0.45	1.88	1.83
Contribution From BLOCK 147, Pipe 128A - 74253						2.27	109				0.00		0.00		0.00		2.27	49.92									
	74253	74254				41.24	3205	2.9	30.48		1.71		2.83		4.14	2.88	0.00	49.92	16.47	543.23	93.0	900	1.40	2635.39	0.21	4.14	3.24
FAREBOX WAY & WHISTLE POST																											
	150A	29A	0.20		17	0.20	17	3.7	0.20		0.00		0.00		0.00	0.00	0.20	0.20	0.07	0.27	22.0	200	0.65	26.44	0.01	0.84	0.27
To STATIONHOUSE WALK, Pipe 29A - 36A						0.20	17				0.00		0.00		0.00			0.20									
	28A	29A	0.42		35	0.42	35	3.7	0.42		0.00		0.00		0.00	0.00	0.42	0.42	0.14	0.56	85.0	200	0.65	26.44	0.02	0.84	0.34
To STATIONHOUSE WALK, Pipe 29A - 36A						0.42	35				0.00		0.00		0.00			0.42									
	136A	137A	0.88		50	0.88	50	3.7	0.59		0.00		0.00		0.00	0.00	0.88	0.88	0.29	0.88	88.5	200	0.65	26.44	0.03	0.84	0.39
	137A	139A	0.67		39	1.55	89	3.6	1.04		0.00		0.00		0.00	0.00	0.67	1.55	0.51	1.55	86.0	200	0.35	19.40	0.08	0.62	0.37
	32A	33A	0.25		21	0.25	21	3.7	0.25		0.00		0.00		0.00	0.00	0.25	0.25	0.08	0.33	56.5	200	0.65	26.44	0.01	0.84	0.28

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha			
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013 (Pvc)	0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7	
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4	

Designed:	PROJECT:		
Checked:	LOCATION: City of Ottawa		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.	File Ref:	Date: 09 May 2025	Sheet No. 6 of 7

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION				RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET		FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
		33A	34A	0.05		5	0.30	26	3.7	0.31		0.00		0.00		0.00	0.00	0.05	0.30	0.10	0.41	11.0	200	0.35	19.40	0.02	0.62	0.25
		34A	36A	0.39		33	0.69	59	3.6	0.70		0.00		0.00		0.00	0.00	0.39	0.69	0.23	0.92	84.0	200	0.35	19.40	0.05	0.62	0.31
To STATIONHOUSE WALK, Pipe 36A - 39A							0.69	59				0.00		0.00		0.00			0.69									
		132A	133A	0.89		52	0.89	52	3.6	0.61		0.00		0.00		0.00	0.00	0.89	0.89	0.29	0.91	104.0	200	0.65	26.44	0.03	0.84	0.39
		133A	134A	0.39		23	1.28	75	3.6	0.88		0.00		0.00		0.00	0.00	0.39	1.28	0.42	1.30	55.0	200	0.35	19.40	0.07	0.62	0.35
		134A	135A	0.34		20	1.62	95	3.6	1.11		0.00		0.00		0.00	0.00	0.34	1.62	0.53	1.64	14.5	200	0.35	19.40	0.08	0.62	0.37
		135A	139A	0.28		16	1.90	111	3.6	1.29		0.00		0.00		0.00	0.00	0.28	1.90	0.63	1.92	72.5	200	0.35	19.40	0.10	0.62	0.39
		139A	140A	0.57		33	4.02	233	3.5	2.64		0.00		0.00		0.00	0.00	0.57	4.02	1.33	3.97	13.5	200	0.35	19.40	0.20	0.62	0.48
		140A	141A				4.02	233	3.5	2.64		0.00		0.00		0.00	0.00	0.00	4.02	1.33	3.97	60.5	200	0.35	19.40	0.20	0.62	0.48
To FREIGHTLINE TERRACE, Pipe 141A - 142A							4.02	233				0.00		0.00		0.00			4.02									
FREIGHTLINE TERRACE																												
		49A	50A	0.83		66	0.83	66	3.6	0.78		0.00		0.00		0.00	0.00	0.83	0.83	0.27	1.05	116.0	200	0.65	26.44	0.04	0.84	0.41
		50A	52A	0.53		43	1.36	109	3.6	1.27		0.00		0.00		0.00	0.00	0.53	1.36	0.45	1.72	116.0	200	0.35	19.40	0.09	0.62	0.38
To CRAINSBILL, Pipe 52A - 343A							1.36	109				0.00		0.00		0.00			1.36									
Contribution From FAREBOX WAY & WHISTLE POST, Pipe 140A - 141A							4.02	233				0.00		0.00		0.00		4.02	4.02									
		141A	142A	0.48		28	4.50	261	3.5	2.95		0.00		0.00		0.00	0.00	0.48	4.50	1.49	4.43	114.0	200	0.35	19.40	0.23	0.62	0.50
		142A	143A	0.23		13	4.73	274	3.5	3.09		0.00		0.00		0.00	0.00	0.23	4.73	1.56	4.65	17.0	200	0.70	27.44	0.17	0.87	0.65
		143A	144A	0.01		1	4.74	275	3.5	3.10		0.00		0.00		0.00	0.00	0.01	4.74	1.56	4.66	23.5	200	0.35	19.40	0.24	0.62	0.50

DESIGN PARAMETERS

Park Flow =	9300	L/ha/da	0.10764	l/s/Ha			
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013 (Pvc)	0.013
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7	
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4	

Designed:		PROJECT:	
Checked:		LOCATION:	**City of Ottawa**
Dwg. Reference:		File Ref:	Date: **09 May 2025**
Sanitary Drainage Plan, Dwgs. No.			Sheet No. 7 of 7

Appendix D

Storm Design Sheet (DSEL, June 2025)

Ponding Volume Table

USF Freeboard Results - 100yr Chicago 3 hr

USF Freeboard Results - 100yr+20% Chicago 3 hr

Ponding Depth - 100-year & 100-year+20% Chicago 3hr

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha)														FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
PRIVATE STREET 2																																
			0.01	0.22	0.01	0.01			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
			0.12	0.69	0.23	0.24			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
	13	5			0.00	0.24			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	18	300	300	PVC	0.35	16.5	57.2089	0.8093	0.3398	0.317
To PRIVATE STREET 1, Pipe 5 - 6						0.24				0.00				0.00				0.00	10.34													
			0.01	0.24	0.01	0.01			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
			0.06	0.86	0.14	0.15			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
	14	6			0.00	0.15			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	12	300	300	PVC	0.35	15.5	57.2089	0.8093	0.3192	0.202
To PRIVATE STREET 1, Pipe 6 - 7						0.15				0.00				0.00				0.00	10.32													
PRIVATE STREET 1																																
			0.06	0.78	0.13	0.13			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
	1	2			0.00	0.13			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	10	300	300	PVC	0.35	10.0	57.2089	0.8093	0.2059	0.175
			0.05	0.53	0.07	0.20			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
	2	3			0.00	0.20			0.00	0.00			0.00	0.00			0.00	0.00	10.21	76.02	103.12	120.87	176.70	15	300	300	PVC	0.35	10.5	57.2089	0.8093	0.2162	0.271
			0.01	0.75	0.02	0.22			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
	3	4			0.00	0.22			0.00	0.00			0.00	0.00			0.00	0.00	10.42	75.22	102.01	119.58	174.79	17	300	300	PVC	0.35	21.0	57.2089	0.8093	0.4325	0.295
			0.07	0.83	0.16	0.39			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
			0.11	0.83	0.25	0.64			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
			0.12	0.81	0.27	0.91			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
	4	5			0.00	0.91			0.00	0.00			0.00	0.00			0.00	0.00	10.85	73.67	99.89	117.07	171.11	67	450	450	CONC	0.20	79.0	127.5033	0.8017	1.6424	0.526
Contribution From PRIVATE STREET 2, Pipe 13 - 5						0.24				0.00				0.00				0.00	10.34													
			0.15	0.83	0.35	1.49			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
	5	6			0.00	1.49			0.00	0.00			0.00	0.00			0.00	0.00	12.50	68.38	92.63	108.52	158.55	102	450	450	CONC	0.30	39.5	156.1591	0.9819	0.6705	0.654
Contribution From PRIVATE STREET 2, Pipe 14 - 6						0.15				0.00				0.00				0.00	10.32													
	6	7			0.00	1.64			0.00	0.00			0.00	0.00			0.00	0.00	13.17	66.46	89.99	105.42	154.00	109	450	450	CONC	0.30	15.5	156.1591	0.9819	0.2631	0.699
			0.09	0.82	0.21	1.85			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
	7	8			0.00	1.85			0.00	0.00			0.00	0.00			0.00	0.00	13.43	65.74	89.00	104.25	152.28	121	525	525	CONC	0.20	16.0	192.3297	0.8885	0.3001	0.632
	8	9			0.00	1.85			0.00	0.00			0.00	0.00			0.00	0.00	13.73	64.94	87.90	102.96	150.38	120	525	525	CONC	0.30	12.0	235.5548	1.0881	0.1838	0.509
			0.09	0.78	0.20	2.04			0.00	0.00			0.00	0.00			0.00	0.00	10.00													
	9	10			0.00	2.04			0.00	0.00			0.00	0.00			0.00	0.00	13.91	64.45	87.24	102.18	149.25	132	525	525	CONC	0.20	27.5	192.3297	0.8885	0.5159	0.685
To SERVICING BLOCK 2, Pipe 10 - 127(B.O)						2.04				0.00				0.00				0.00	14.43													
SERVICING BLOCK 2																																
Contribution From PRIVATE STREET 1, Pipe 9 - 10						2.04				0.00				0.00				0.00	14.43													
	10	127(B.O)			0.00	2.04			0.00	0.00			0.00	0.00			0.00	0.00	14.43	63.15	85.44	100.07	146.15	129	525	525	CONC	0.20	13.5	192.3297	0.8885	0.2532	0.671
To EXISTING SERVICING NORTH, Pipe 127(B.O) - 58(B.O)						2.04				0.00				0.00				0.00	14.68													
EXISTING SERVICING NORTH																																
Contribution From SERVICING BLOCK 2, Pipe 10 - 127(B.O)						2.04				0.00				0.00				0.00	14.68													
	127(B.O)	58(B.O)			0.00	2.04			0.00	0.00			0.00	0.00			0.00	0.00	14.68	62.52	84.59	99.07	144.68	128	525	525	CONC	0.20	17.0	192.3297	0.8885	0.3189	0.664

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

Designed: E.D.	PROJECT:	ABBOTT'S RUN	
		BLOCK 13	
Checked: S.M.	LOCATION:	City of Ottawa	
Dwg. Reference: 17	File Ref:	Date: 20 Jun 2025	Sheet No. SHEET 1 OF 1

Project Name: Abbott's Run Block 13
Project Number: 1295.1
Date: 2025-06-20

DSEL
David Schaeffer Engineering Limited
600 Alden Road, Suite 606
Markham, ON L3R 0E7

Ponding Volume					
Area ID	**Spill Elev**	**Gutter Elev**	**Ponding Depth**	**Ponding Area m2**	**Ponding Vol m3**
PA_1	102.43	102.27	0.16	116.92	7
PA_2	103.11	102.9	0.21	397.06	34
PA_3	103.13	102.88	0.25	339.1	30
PA_4	103.13	103	0.13	181.68	9
PA_5	103.39	103.19	0.2	248.36	18
PA_6	103.39	103.22	0.17	303.35	25
PA_7	103.45	103.38	0.07	14.86	0
PA_8	103.47	103.19	0.28	191.27	15
PA_9	103.21	103.16	0.05	34.49	0
PA_10	102.94	102.89	0.05	12.71	0
				Total Ponding Volume	**138**

Project Name:	Abbot's Run- Block 13
Project Number:	1295
Designed By:	AL
Checked By:	VM
Date:	6/13/2025

DSEL
David Schaeffer Engineering Limited
600 Alden Road, Suite 606
Markham, ON L3R 0E7

SWM Appendix D: USF Freeboard Results - 100yr Chicago 3 hr

Name	Inlet Node	Outlet Node	Lot #	USF (m)	Dist from DS MH (m)	U/S MH HGL (m)	D/S MH HGL (m)	Pipe Length (m)	INT. HGL (m)	Freeboard (m)
STM-10-11	MH-10	MH-11				100.41	100.31	13.62		
STM-11-58	MH-11	MH-58				100.31	100.26	17.15		
STM-1-2	MH-1	MH-2				101.12	101.10	10.2		
STM-13-5	MH-13	MH-5				100.93	100.92	16.33		
STM-14-6	MH-14	MH-6				100.81	100.80	15.51		
STM-2-3	MH-2	MH-3				101.10	101.08	10.55		
STM-3-4	MH-3	MH-4	5-1	102.01	14.00	101.08	101.03	20.96	101.06	0.95
STM-4-5	MH-4	MH-5	3-6	101.80	41.10	101.03	100.92	78.78	100.98	0.82
STM-4-5	MH-4	MH-5	4-4	102.02	80.40	101.03	100.92	78.78	101.03	0.99
STM-5-6	MH-5	MH-6	2-6	101.64	23.50	100.92	100.80	39.39	100.87	0.77
STM-6-7	MH-6	MH-7				100.80	100.65	15.45		
STM-7-8	MH-7	MH-8	1-10	101.51	12.60	100.65	100.60	15.84	100.64	0.87
STM-8-9	MH-8	MH-9				100.60	100.56	11.97		
STM-9-10	MH-9	MH-10				100.56	100.41	27.42		

Project Name:	Abbot's Run- Block 13
Project Number:	1295
Designed By:	AL
Checked By:	VM
Date:	6/13/2025

DSEL
David Schaeffer Engineering Limited
600 Alden Road, Suite 606
Markham, ON L3R 0E7

SWM Appendix D: USF Freeboard Results - 100yr+20% Chicago 3 hr

Name	Inlet Node	Outlet Node	Lot #	USF (m)	Dist from DS MH (m)	U/S MH HGL (m)	D/S MH HGL (m)	Pipe Length (m)	INT. HGL (m)	Freeboard (m)
STM-10-11	MH-10	MH-11				100.45	100.32	13.62		
STM-11-58	MH-11	MH-58				100.32	100.26	17.15		
STM-1-2	MH-1	MH-2				101.31	101.30	10.2		
STM-13-5	MH-13	MH-5				101.09	101.08	16.33		
STM-14-6	MH-14	MH-6				100.94	100.92	15.51		
STM-2-3	MH-2	MH-3				101.30	101.28	10.55		
STM-3-4	MH-3	MH-4	5-1	102.01	14.00	101.28	101.23	20.96	101.26	0.75
STM-4-5	MH-4	MH-5	3-6	101.80	41.10	101.23	101.08	78.78	101.16	0.64
STM-4-5	MH-4	MH-5	4-4	102.02	80.40	101.23	101.08	78.78	101.23	0.79
STM-5-6	MH-5	MH-6	2-6	101.64	23.50	101.08	100.92	39.39	101.02	0.62
STM-6-7	MH-6	MH-7				100.92	100.74	15.45		
STM-7-8	MH-7	MH-8	1-10	101.51	12.60	100.74	100.67	15.84	100.73	0.78
STM-8-9	MH-8	MH-9				100.67	100.62	11.97		
STM-9-10	MH-9	MH-10				100.62	100.45	27.42		

Project Name:	Abbott's Run - Block 13
Project Number:	1295
Designed By:	LH
Checked By:	AL
Date:	12-Jun-25

David Schaeffer Engineering Limited
600 Alden Road, Suite 606
Markham, ON L3R 0E7

Ponding Depth - 100-year & 100-year+20% Chicago 3hr

Storage	Catchbasin		Ponding Depth (m)			ICD Size (m)
			2yr	100yr	100yr+20%	
PA-1	CB_1	CB_2	0	0.32	0.35	0.083
PA-10	CB_20		0	0.16	0.18	0.094
PA-2	CB_3	CB_4	0	0.13	0.18	0.083
PA-3	CB_7	CB_8	0	0.22	0.43	0.083
PA-4	CB_5	CB_6	0	0.22	0.30	0.108
PA-5	CB_9	CB_10	0	0.18	0.26	0.094
PA-6	CB_11	CB_12	0	0.10	0.14	0.083
PA-7	CB_13		0	0.00	0.18	0.083
PA-8	CB_14		0	0.29	0.44	0.094
PA-9	CB_15	CB_16	0	0.10	0.12	0.083