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DESIGN BRIEF

FOR

MINTO COMMUNITIES–ABBOTT'S RUN BLOCK 13

CITY OF OTTAWA

PROJECT NO.: 22-1295.1

OCTOBER 2025
SUBMISSION 2
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DESIGN BRIEF
FOR ABBOTT'S RUN BLOCK 13
MINTO COMMUNITIES

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DESIGN BRIEF
FOR
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MINTO COMMUNITIES

JUNE 2025
CITY OF OTTAWA
PROJECT NO.: 22-1295.1

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.

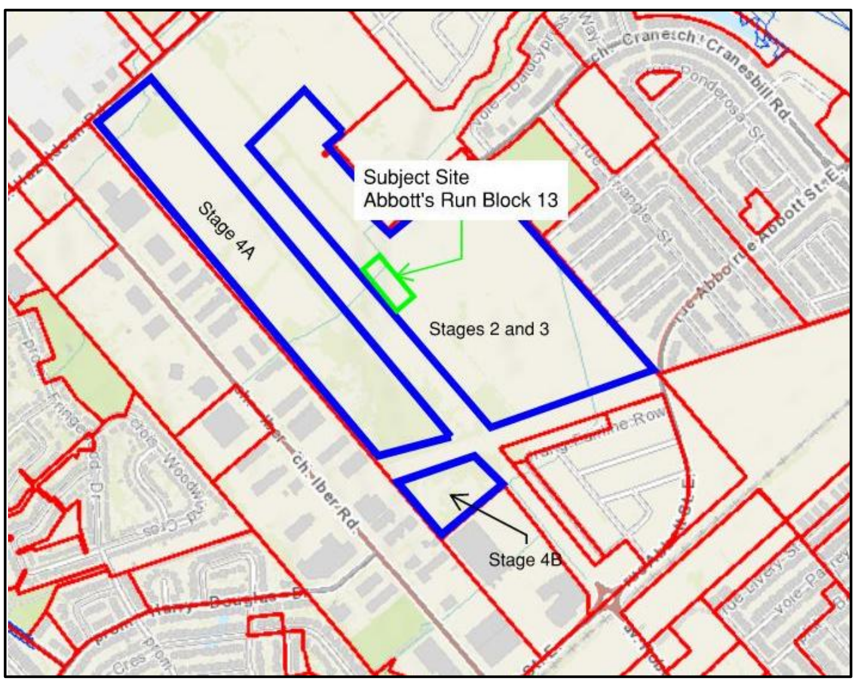

Figure 1.1: Site Location

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

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(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
2 Bedroom Units	1.39	76	2.1	160
3 Bedroom Units		48	3.1	149
			Total Project Population:	309

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 – Block 143. Report: PG7460-1 Revision 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	Construction of watermains.	The City of Ottawa is expected to review the

	Authorized as a Future Alteration.		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.

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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, October 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 – Block 143, Paterson Group, PG7460-1 Revision 1 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 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 surrounded by 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 – 2 Bedroom Unit	2.1 p/unit
Residential – 3 Bedroom Unit	3.1 p/unit
Single Family Home Average Day Demand (ADD)	280 L/c/d
High Density Building Max. Day Demand (MDD) (Per MOE – 300 pop. Equivalent)	avg. day x 3.6
High Density Building Peak Hour Demand (PHD) (Per MOE – 300 pop. Equivalent)	Avg. day x 5.4
Minimum Watermain Size	150 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 (50 psi) and 480 kPa (70 psi)
During normal operating conditions pressure must not drop below	275 kPa (40 psi)

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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

To support the design of the on-site water distribution system, a hydraulic analysis was completed for the proposed watermain network. A summary of the results is provided in this section, with the full analysis available in Appendix B.

The domestic water demands used for the hydraulic analysis were determined based on the anticipated site population and applicable design criteria from Table 3.1. Table 3.2 summarizes the average day, maximum day, and peak hour demands applied in the analysis.

Table 3.2 Water Demands

Total Domestic Demand	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Design Brief Phase 2/3, Per GeoAdvice Report (Octpber 2025)	187	40.99	28.2	40.99	28.2	86.09	60
Block 13 Site Plan (October, 2025)	309	86.52	60.1	311.5	216.3	467.2	324.5

For reference, the domestic demand assumptions from the Design Brief have been included for comparison with those used for Block 13. The difference between the two demand scenarios is that the GeoAdvice values are based on the larger Phase 2 & 3 subdivision population, while the Block 13 figures reflect only the localized site population. In accordance with the City of Ottawa Water Distribution Design Guidelines, when the serviced population is fewer than 500 people, peaking factors must be determined using Table 3-3 of the MOE Design Guidelines.

Accordingly, the hydraulic modelling applies the more conservative Block 13 Site Plan population and demand values to ensure the proposed network is adequately sized under peak conditions. This approach provides a higher level of confidence that the system will maintain acceptable service pressures during maximum day and peak hour demands.

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In addition to the domestic demand analysis, fire flow requirements were also evaluated to confirm that the proposed watermain network can meet firefighting needs under emergency conditions. The fire flow calculations were completed in accordance with the City of Ottawa's Technical Bulletins and the Fire Underwriters Survey's Water Supply for Public Fire Protection Guideline (2020). The full fire flow analysis is provided in Appendix B.

The following parameters were applied in determining the required fire flows for Block 13:

- Type of construction: Wood frame
- Sprinkler protection: Non-sprinklered
- Firewalls: Provided for 24-unit blocks

Based on these parameters, the required fire flow demands for each block are summarized below:

- Block 1: 16,000 L/min
- Blocks 2 and 5: 14,000 L/min
- Blocks 3 and 4: 15,000 L/min
- Block 6: 12,000 L/min

These values were used in the hydraulic model to assess available pressures and confirm that the proposed water distribution system can deliver adequate flow rates for fire protection while maintaining pressures above the minimum criteria established by the City of Ottawa.

The boundary conditions were derived from the Hydraulic Capacity and Modeling Analysis Abbott's Run Phases 2 & 3 Development (GeoAdvice, October 2025). The full analysis is provided in Appendix B.

Table 3.3 summarizes the boundary conditions extracted from the Stage 2 & 3 model for the Block 13 site.

Table 3.3: Boundary Conditions

Condition	Connection 1 (Cranesbill Road)		Connection 2 (Monorail Road)	
	HGL (m)	Pressure (psi)	HGL (m)	Pressure (psi)
Average Day	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

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Using the established boundary conditions, hydraulic modelling was performed for the average day, peak hour, and maximum day plus fire flow scenarios to evaluate system performance under a range of operating conditions. Several Max Day plus Fire Flow scenarios were analyzed; however, only the worst case scenario, which results in the lowest system pressure, is presented to demonstrate compliance with the design criteria. The results of this analysis are summarized in Table 3.4.

Table 3.4: Service Pressures Analysis

	Service Pressures Analysis	Design Criteria
Max Average Day Demand Pressure	58.47 m (573.59 kPa) [Node 11]	During normal operating conditions pressure must not exceed 552 kPa (80 psi)
Min Peak Hour Demand Pressure	50.27 m (493.15 kPa) [Node 12]	During peak hour conditions pressure must not drop below 275 kPa (40 psi)
Min Max Day + Fire Flow Pressure	21.56 m (211.50 kPa) [Node 3]	During fire flow operating pressure must not drop below 140 kPa (20 psi)

As demonstrated in Table 3.4, modelling was completed for the Average Day Demand (ADD), Peak Hour Demand (PHD), and Maximum Day Demand plus Fire Flow (MDD+FF) scenarios, as documented in Appendix B. Both the PHD and MDD+FF scenarios meet the minimum required pressure under their respective operating conditions.

The Average Day Demand pressure is 573.59 kPa, which exceeds the 552 kPa threshold; therefore, pressure-reducing valves (PRVs) have been incorporated into the proposed design. A pressure check will be performed during construction, and PRVs will be installed as required based on actual field pressures.

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.

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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 developed with consideration of the Adequacy of Public Servicing Report and the Abbott's Run Stage 2 and 3 Design Brief, both of which are currently under review by the City. The site's allocated sanitary flows are proposed to discharge to a new sanitary sewer on Cranesbill Road, which will ultimately convey flows to the trunk sewer on Robert Grant Avenue.

The development will be serviced by a network of 200 mm diameter gravity sewers, which connect to the proposed 250 mm diameter municipal sewer on Cranesbill Road. The sanitary sewer network has been designed in accordance with the wastewater design parameters outlined in ISTB-2018-01 and the City of Ottawa Sewer Design Guidelines, summarized in Table 4.1. The detailed sanitary layout and design information are provided on the 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	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
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

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The proposed sanitary design for Block 13 has been evaluated to confirm that the downstream system has sufficient capacity to accommodate the projected flows. The analysis incorporates updated design parameters and compares them with the values previously established in supporting reports. The resulting values are summarized in Table 4.2 below.

Table 4.2: Block 13 Wastewater Peak Flow

	Area (ha)	Population	Peak Factor	Peak Flow (L/s)	I/I (L/s)	Total Peak Flow (L/s)
Adequacy Of Public Servicing Report (May 2025)	1.39	111	3.6	1.29	0.46	1.75
Design Brief Ph.2&3 (Oct 2025)	1.39	158	3.5	1.82	0.46	2.27
Current Block 13 Submission (Oct 2025)	1.39	309	3.5	3.46	0.46	3.93

As presented above, the proposed development is expected to generate a total peak wastewater flow of 3.93 L/s. In comparison, the Adequacy of Public Servicing Report and the Stage 2 and 3 Design Brief (both currently under City review) estimated lower peak flows of 1.75 L/s and 2.27 L/s, respectively. The increase is primarily due to an underestimation of the block's population in earlier reports, as the Block 13 Site Plan had not been fully developed at the time those documents were prepared. This results in a net increase of 2.18 L/s compared to the Adequacy of Public Servicing Report.

To verify that the downstream system can accommodate the additional flow, the design sheets from both the Adequacy of Public Servicing Report and the Abbott's Run Stage 2 and 3 Design Brief were reviewed and are provided in Appendix C. Based on the updated analysis, the Cranesbill sewer downstream of Block 13 will operate at approximately 52% full, leaving 15.7 L/s of available capacity. According to the Adequacy of Public Servicing Report, the most restrictive leg along Robert Grant Avenue operates at 45% capacity, with 651.3 L/s of remaining capacity.

The additional 2.18 L/s of flow is therefore not expected to have any impact on the performance of the downstream sanitary system. Detailed design sheets are provided in Appendix C, with key information highlighted for ease of review.

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4.3 Wastewater Servicing Conclusions

A network of local gravity sewers is proposed within the subject site to convey wastewater to existing off-site sanitary sewers. The proposed system design is consistent with the Adequacy of Public Servicing Report and the Abbott's Run Stage 2 and 3 Design Brief. The downstream sanitary system has been reviewed for available capacity, and based on the information available, it has been confirmed that the existing network can accommodate the Block 13 flows as proposed.

The sanitary sewers have been designed in accordance with all applicable City of Ottawa and MECP design guidelines and policies. In accordance with ISTB-2018-01, the City's current wastewater design parameters represent a refinement of previous standards used within the Master Servicing Study (MSS) and Concept Servicing Report, resulting in more representative flow estimates for the proposed development.

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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 m^3 to achieve 80% TSS removal for the contributing drainage area. Pond 1 provides a total permanent pool volume of 29,380 m^3, which exceeds this requirement.

5.4 Stormwater Management

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	231
Major System	333	278

Minor and major system peak flows are less than the allowable flows established in the Stage 2 and 3 detailed design model.

- During the 100-year storm, a total of 97 m^3 of on-site surface ponding is provided to store excess runoff and maintain compliance with the allowable major and minor system release rates.

Detailed results on ponding extents are provided in Appendix D and within the engineering drawings. The packaged PCSWMM model is included with this submission.

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5.4.1 Uncontrolled Flows

To assess the potential impacts of uncontrolled overland flow from the proposed development, the portions of Cranesbill Road, Robert Grant Avenue, and Monorail Road rights-of-way (ROWs) impacted by the site were extracted from the stormwater model for detailed review. A comprehensive overland flow and ponding depth analysis was completed to evaluate system performance under both minor and major storm events.

The results of this analysis are presented in the tables provided in Appendix D:

- "Adjacent ROW – Ponding Depths over Catch Basins Scenario" confirms that, under the respective design storm events (5-year for Cranesbill Road, 10-year for Robert Grant Avenue, and 2-year for Monorail Road), no surface ponding occurs, and the level of service criteria are maintained.

- "Adjacent ROW – Overland Flow Analysis" demonstrates that ponding depths during the 100-year, 3-hour Chicago storm remain below allowable ponding criteria, with no overspillage beyond the right-of-way limits.

Based on this analysis, uncontrolled overland flow from the outer units will not adversely affect the level of service of Cranesbill Road, Robert Grant Avenue, or Monorail Road. The existing stormwater infrastructure and right-of-way grading are sufficient to safely convey uncontrolled surface runoff under both minor and major storm conditions.

5.5 Infiltration Targets

Infiltration targets were established by the EMP and MSS in support of the Community Design Plan (CDP). The targets were based on Best Management Practices being implemented on low and medium density residential developments. The following is an excerpt from the MSS:

> *Infiltration BMPs*
>
> *The majority of the Fernbank Community will be low and medium density residential development. The most suitable practices for groundwater infiltration include:*
>
> • *Infiltration of runoff captured by rearyard catchbasins.*
> • *Direct roof leaders to rearyard areas.*
> • *Infiltration trenches underlying drainage swales in park and open space areas.*
> • *The use of fine sandy loam topsoil in parks and on residential lawns.*

The infiltration targets set by the EMP/MSS were set by assuming that 35% of runoff from low density, medium density and parks would be routed towards rear yard swales with perforated pipe system. These targets were achieved for the low and medium density land-uses for Abott's Run Stages 1-3. The EMP/MSS assumed runoff from the remaining land-uses would be directed towards conventional sewers. An excerpt of the EMP calculations is provided in **Appendix D**.

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5.6 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.

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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.
- 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.

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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.

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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.

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Prepared by,

David Schaeffer Engineering Ltd.

Per: Martin Fréchette P.Eng.

Per: Alexandre Tourigny P.Eng.

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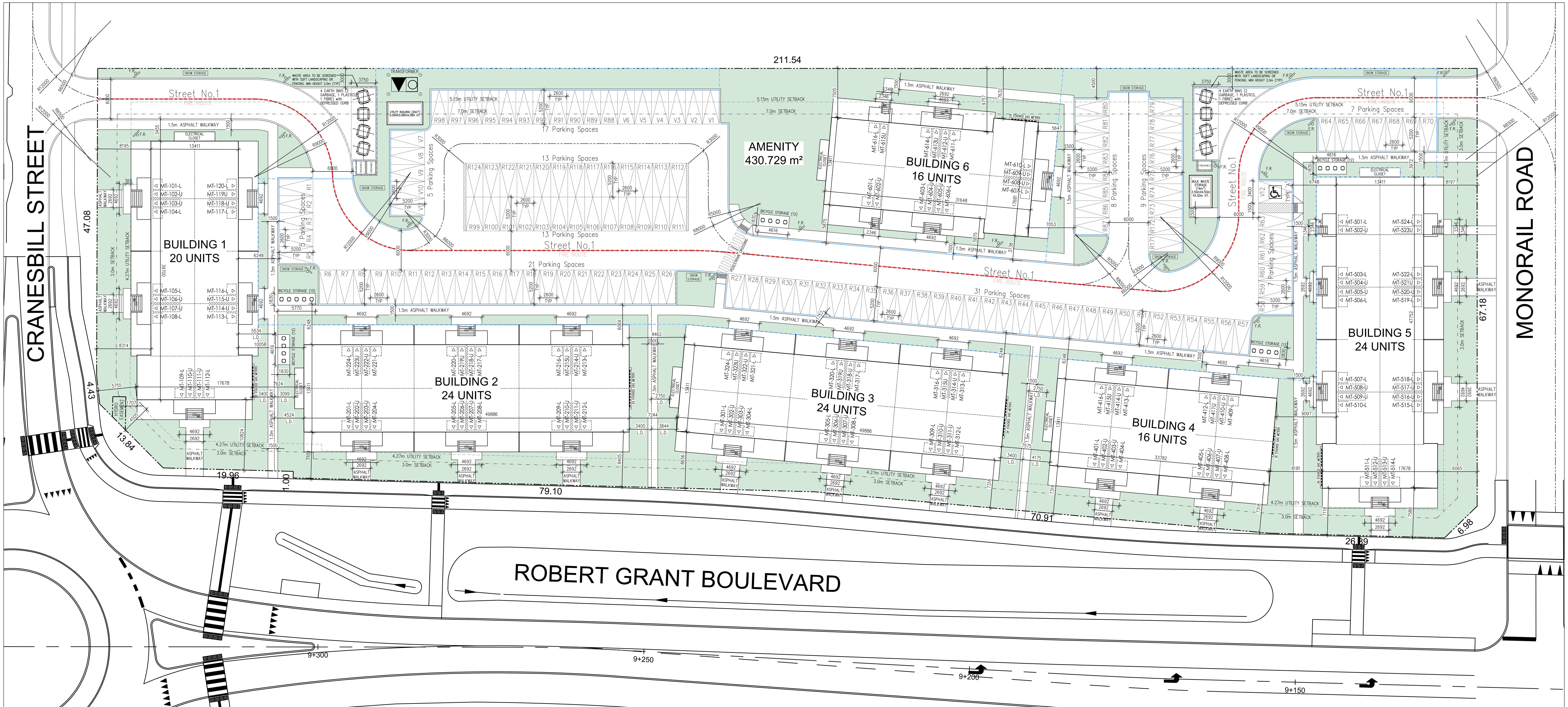
APPENDIX A

Site Plans

- Abbott’s Run Block 13 Site Plan – S25016-A100 (SRN Architects, 2025-10-20)



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	3529.640 m²		**N/A**
LOT COVERAGE (building area/net lot area):	NO MINIMUM	3529.640 m²		**N/A**
GROSS FLOOR AREA	NO MINIMUM	############		**N/A**
NET F.S.I. (gross floor area/net lot area):	2.0 MAX	####		**YES**
GROSS F.S.I. (gross floor area/gross lot area):	N/A	####		**N/A**
BUILDING HEIGHTS (mid-point of roof):				
STACKED DWELLINGS:	12.00 m	11.62m (MID-POINT)		**YES**
SETBACKS :				
MIN. FRONT YARD (WEST):	3.00 m	5.75 m		**YES**
MIN INTERIOR SIDE YARD (NORTH):	7.00m	7.50 m		**YES**
MIN REAR YARD (EAST):	3.00m	6.06 m		**YES**
MIN CORNER SIDE YARD (SOUTH):	3.00m	4.50 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**	**63**		**YES**
TOTAL LANDSCAPE :	**30%**	6235.998m² (44.76% OF NET LOT AREA)		**YES**
LANDSCAPED OPEN SPACE AREA :				
SOFT LANDSCAPE AREA :	**N/A**	3333.738m² (53.46% OF LANDSCAPING)		**N/A**
HARD LANDSCAPE AREA :	**N/A**	2902.260m² (46.54% OF LANDSCAPING)		**N/A**
LANDSCAPED PARKING AREA :				
TOTAL PARKING AREA :	**N/A**	5413.200m²		**N/A**
PAVED PARKING AREA :	**85% MAX**	3793.092m² (70.07 % OF PARKING AREA)		**YES**
LANDSCAPED PARKING AREA :	**15% MIN**	1620.108 m² (29.93 % 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 430.729m² =1957.773m² TOTAL AMENITY		**YES**
COMMUNAL AMENITY AREA: (50% OF REQUIRED)	**744 m²/2 =372 m²**	AREA WEST OF BUILDING 6 = 430.729m² TOTAL COMMUNAL AREA		**YES**

File:H:\Acad SRN Projects\2025\S25016-MintoAbbott'sRun-StacksStittsville\1-Drawings\1-DESIGN\1-ACAD\S25016-A100 [CURRENT].dwg Plotted: Oct 20, 2025 By:AndrewB

LEGEND

	MAIN ENTRANCE
1500, SEE PLAN	BARRIER FREE PARKING
R10, 2600	RESIDENT PARKING
V10, 2600, 5200	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
F B	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

THESE DRAWINGS ARE NOT TO BE SCALED:
ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES MUST BE REPORTED DIRECTLY TO SRN ARCHITECTS INC.

NO:	DATE:	ISSUED FOR:
1	2024.04.30	COORDINATION
2	2025.06.25	SPA SUBMISSION #1
3	2025.10.20	SPA SUBMISSION #2

ADDITIONAL NOTES:

THE DRAWING, AS AN INSTRUMENT OF SERVICE, IS PROVIDED BY AND IS THE PROPERTY OF SRN ARCHITECTS INC. THE CONTRACTOR MUST VERIFY AND ACCEPT RESPONSIBILITY FOR ALL DIMENSIONS AND CONDITIONS ON SITE AND MUST NOTIFY SRN ARCHITECTS INC. OF ANY VARIATIONS FROM THE SUPPLIED INFORMATION. SRN ARCHITECTS INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF SURVEY, STRUCTURAL, MECHANICAL, ELECTRICAL. ETC. ENGINEERING INFORMATION SHOWN ON THIS DRAWING REFER TO APPROPRIATE ENGINEERS DRAWINGS BEFORE PROCEEDING WITH ANY WORK. CONSTRUCTION MUST CONFORM TO ALL APPLICABLE CODES AND REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION (UNDERTAKEN OTHERWISE NOTED). NO INVESTIGATION HAS BEEN OR REPORTED ON BY THIS OFFICE IN REGARDS TO THE ENVIRONMENTAL CONDITION OF THIS SITE.

CONDITIONS FOR ELECTRONIC INFORMATION TRANSFER:

ELECTRONIC INFORMATION IS SUPPLIED TO THE OTHER ASSOCIATED FIRMS TO ASSIST THEM IN THE ERECTION OF THEIR WORK/REVIEW. THE RECIPIENT FIRMS MUST DETERMINE THE COMPLETENESS/APPROPRIATENESS/ RELEVANCE OF THE INFORMATION IN RESPECT TO THEIR PARTICULAR RESPONSIBILITY.

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

NO:	DATE:	REVISION COMMENT:

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

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

PROJECT:
Abbott's Run
Block 13
Ottawa, Ontario

DRAWING TITLE:
SITE PLAN

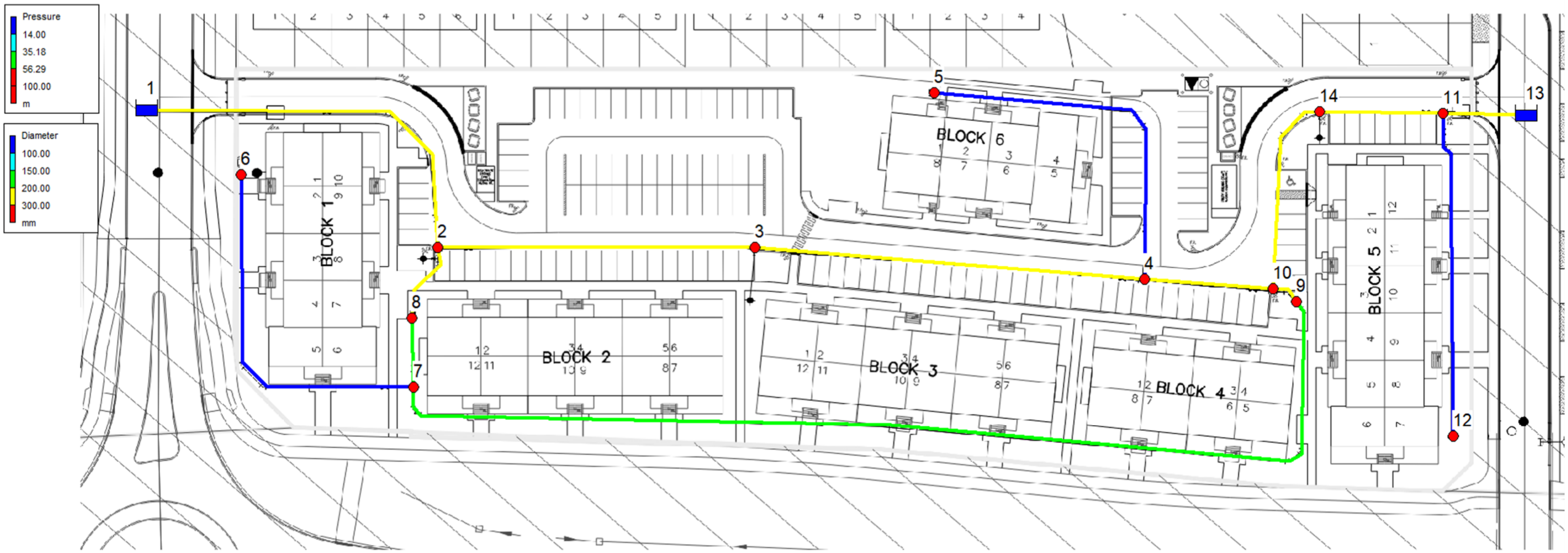
DATE: 2025-10-20 SCALE: 1:250
DRAWN BY: AB CHECKED BY: GF
PROJECT NUMBER: S25016 DRAWING NUMBER: A100

APPENDIX B

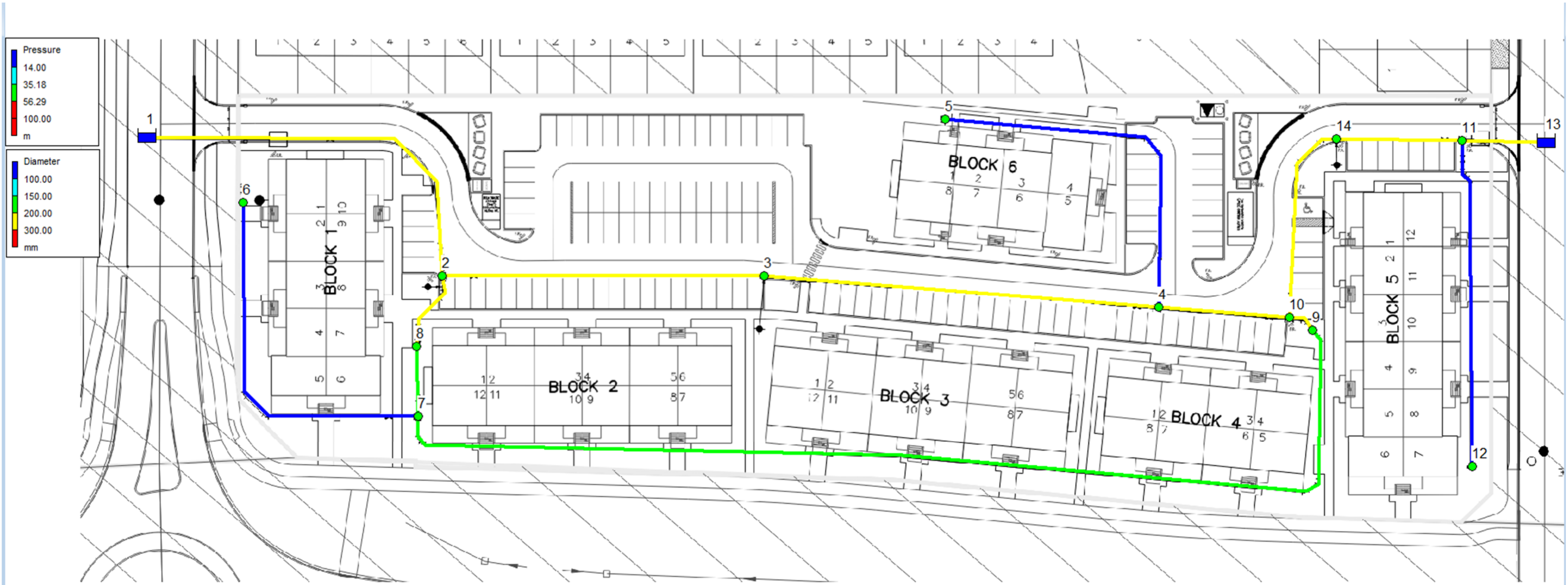
Water Servicing

- Average Day Demand (ADD) Scenario Figure (DSEL, 2025-10-16)
- Peak Hour Demand (PHD) Scenario Figure (DSEL, 2025-10-17)
- Max Day Fire Flow Demand (MDD) Scenario Figure (DSEL, 2025-10-16)
- EPANET Hydraulic & Water Quality Analysis – ADD Report (DSEL, 2025-10-16)
- EPANET Hydraulic & Water Quality Analysis – PHD Report (DSEL, 2025-10-16)
- EPANET Hydraulic & Water Quality Analysis – MDD Report (DSEL, 2025-10-16)
- Abbott’s Run Block 13 Concept Plan 42 – Option C – Fire Wall Locations (SRN Architects, 2025-04-01)
- FUS Fire Flow Demand (FFD) Calculations (DSEL, 2025-05-14)
- Hydraulic Capacity and Modelling Analysis (GeoAdvice, 2025-10-16)

AVERAGE DAY SCENARIO



PEAK HOUR SCENARIO



MAX DAY FIRE FLOW SCENARIO

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

Input File: 1295_Block13_AverageDay.net

1295_Block13_AverageDay

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	5.01	161.13	58.24	0.00	
3	5.01	161.24	58.09	0.00	
4	5.01	161.37	57.87	0.00	
5	5.01	161.36	58.13	0.00	
6	5.01	161.15	58.39	0.00	
7	5.01	161.16	58.00	0.00	
8	5.01	161.14	57.80	0.00	
9	5.01	161.42	58.06	0.00	
10	5.01	161.43	58.24	0.00	
11	5.01	161.65	58.47	0.00	
12	5.01	161.64	57.79	0.00	
14	5.01	161.57	58.28	0.00	
1	1136.42	160.92	0.00	0.00	Reservoir
13	-1196.54	161.70	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
2	-833.95	0.44	2.03	Open
4	5.01	0.04	0.13	Open
5	1196.54	0.63	3.46	Open
6	5.01	0.04	0.13	Open
7	1186.52	0.63	3.94	Open
8	1181.51	0.63	4.03	Open
9	327.52	0.17	0.66	Open
10	322.51	0.30	1.43	Open
11	312.49	0.29	1.34	Open
12	307.48	0.16	0.44	Open
13	5.01	0.04	0.13	Open
14	-838.96	0.45	1.85	Open
15	-848.98	0.45	2.51	Open
16	-1136.42	0.60	3.29	Open

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

Input File: 1295_Block13_MaxDayFF.net

1295_Block13_MaxDayFF

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	15.03	132.91	30.02	0.00	
3	15015.03	124.71	21.56	0.00	
4	15.03	130.59	27.09	0.00	
5	15.03	130.53	27.30	0.00	
6	15.03	132.91	30.15	0.00	
7	15.03	132.97	29.81	0.00	
8	15.03	132.93	29.59	0.00	
9	15.03	133.61	30.25	0.00	
10	15.03	133.62	30.43	0.00	
11	15.03	139.97	36.79	0.00	
12	15.03	139.92	36.07	0.00	
14	15.03	137.71	34.42	0.00	
1	-8109.38	141.40	0.00	0.00	Reservoir
13	-7070.98	141.40	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
2	8565.67	4.54	164.09	Open
4	15.03	0.13	1.02	Open
5	7070.98	3.75	95.10	Open
6	15.03	0.13	1.02	Open
7	7040.92	3.74	113.30	Open
8	7025.88	3.73	116.88	Open
9	531.43	0.28	1.68	Open
10	516.40	0.49	3.43	Open
11	486.34	0.46	3.06	Open
12	471.31	0.25	0.99	Open
13	15.03	0.13	1.00	Open
14	-6449.36	3.42	84.06	Open
15	-6479.42	3.44	120.91	Open
16	8109.38	4.30	130.56	Open

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

Input File: 1295_Block13_PeakHour.net

1295_Block13_PeakHour

Link - Node Table:

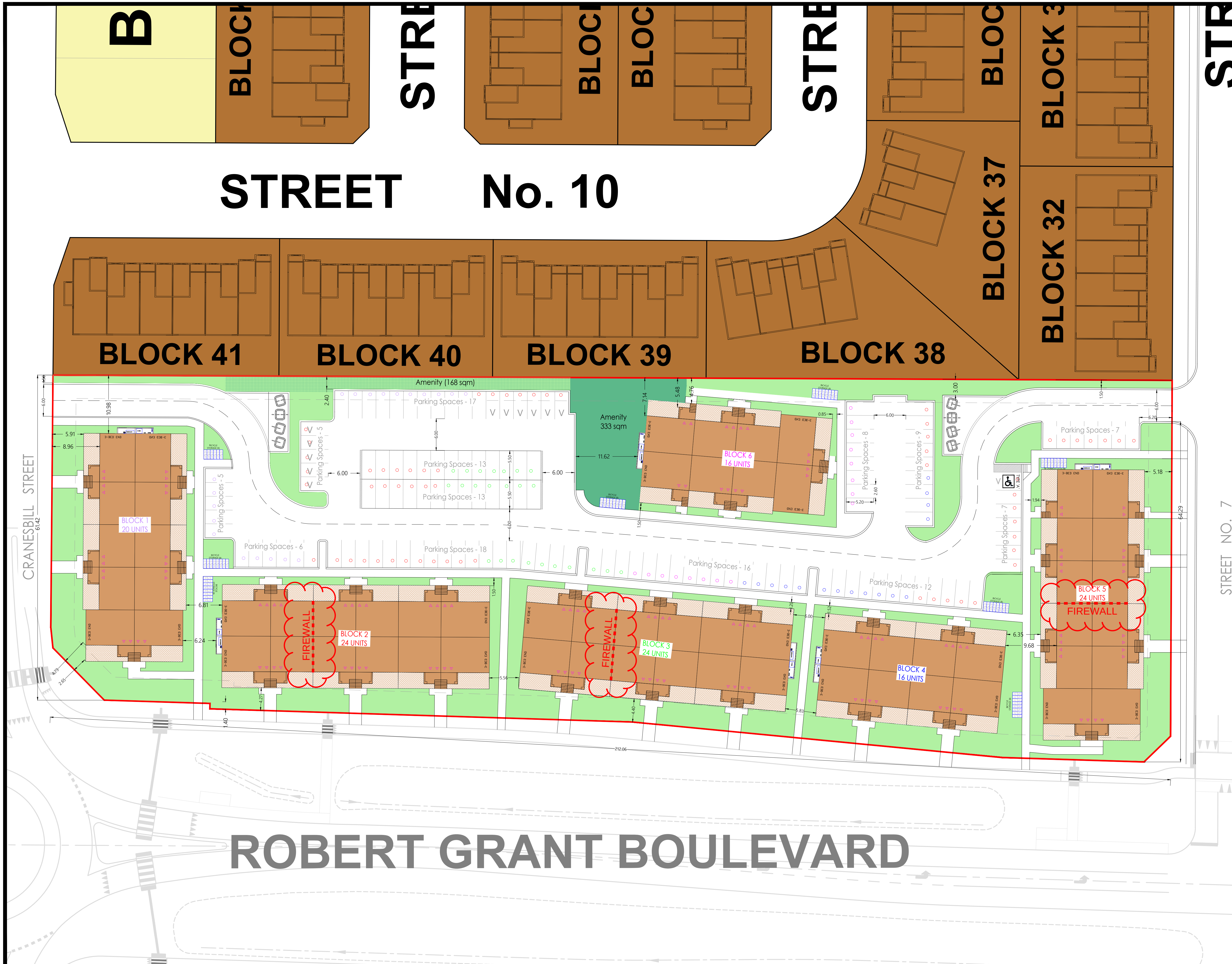
Link ID	Start Node	End Node	Length m	Diameter mm
2	2	3	50	200
4	4	5	65	50
5	13	11	15	200
6	11	12	55	50
7	11	14	20	200
8	14	10	35	200
9	10	9	5	200
10	9	7	185	150
11	7	8	15	150
12	8	2	15	200
13	7	6	65	50
14	3	4	70	200
15	4	10	25	200
16	1	2	65	200

Node Results:

Node ID	Demand LPM	Head m	Pressure m	Quality	
2	22.55	153.69	50.80	0.00	
3	22.55	153.79	50.64	0.00	
4	22.55	153.92	50.42	0.00	
5	22.55	153.78	50.55	0.00	
6	22.55	153.57	50.81	0.00	
7	22.55	153.71	50.55	0.00	
8	22.55	153.69	50.35	0.00	
9	22.55	153.98	50.62	0.00	
10	22.55	153.99	50.80	0.00	
11	22.55	154.24	51.06	0.00	
12	22.55	154.12	50.27	0.00	
14	22.55	154.15	50.86	0.00	
1	1058.86	153.50	0.00	0.00	Reservoir
13	-1329.40	154.30	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPM	VelocityUnit m/s	Headloss m/km	Status
2	-820.87	0.44	1.97	Open
4	22.55	0.19	2.16	Open
5	1329.40	0.71	4.21	Open
6	22.55	0.19	2.18	Open
7	1284.31	0.68	4.58	Open
8	1261.76	0.67	4.56	Open
9	350.71	0.19	0.75	Open
10	328.17	0.31	1.47	Open
11	283.08	0.27	1.12	Open
12	260.53	0.14	0.32	Open
13	22.55	0.19	2.13	Open
14	-843.41	0.45	1.87	Open
15	-888.50	0.47	2.74	Open
16	-1058.86	0.56	2.89	Open



Title:
Concept Plan 42 - Option C

Project:
Abbotts Run - Block 13

Legend

- Site Outline
- Metro Towns - Surface Parked
- Open Space
- Amenity Area
- 12 m Turning Radius for Garbage and Fire

Site Statistics

Gross Site Area	1.39 ha	
Gross Site Density	89.21 u/ ha	
Unit Type	**Unit Count**	
Total Metro Towns	**124**	
3 Bed End Unit	48	
2 Bed Interior Unit	76	
	Required	**Provided**
Total Amenity Space (6 sqm./unit)	744 Sq m.	1,865 Sq m.
Communal Amenity Space (50% of total amenity per unit = min. 3 Sq m./Unit)	372 Sq m.	501 Sq m.
Landscape Requirement	2,085 Sq m.	2,283 Sq m.
Bicycle Parking (0.5 per unit)	62	62
Parking – Resident Parking (1.0 per unit)	124	124
Parking – Visitor Parking (0.1 per unit)	12	12
Parking – Extra Parking	-	-
Parking – **Total Parking Spaces (Units x 1.1)**	**136**	**136**

NOTES:
1. All pathways are 1.5m unless otherwise noted.
2. Each stacked town has an lower unit with a patio (16 sq. m.) and an upper unit with a balcony (6 sq.m.) which are included as private amenity area.
3. Parking requirement for stacked towns is 1.0 per unit for the residents + 0.1 per unit for visitor = total 1.1 per unit.
4. All End units are 1.0m wider to accommodate 3-Bedroom Units. They have been denoted on the plan with text "3-BED END".

No.	Description	Date	By
1	Pathways and Bike parking adjusted	2025-03-28	G.T
0	Drafted For Internal Review	2025-03-18	G.T

Revisions

Drawn By: G.T.
Checked By: C.T.
Minto Communities Inc
180 Kent Street,
Ottawa, ON
K1P 0B6

North

Scale: **NTS**

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 2020

Fire Flow Required

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Wood Frame

C 1.5 *Type of Construction Coefficient per FUS Part II, Section 1*

A 1710.0 m^2 *Total floor area based on FUS Part II section 1*

Fire Flow	13646.2 L/min
	14000.0 L/min *rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible -15%

Fire Flow	**11900.0 L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered 0%

Reduction	**0 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Type V	10.1m-20m	13.5	2	27	11%
S	Type V	Over 30m	18.5	0	0	0%
E	Type V	3.1m-10m	40	3	120	20%
W	Type V	Over 30m	40	0	0	0%
		% Increase				**31%** *value not to exceed 75%*

Increase	**3689.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	15589.0 L/min
	16000.0 L/min *rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by _________________.
-Calculations based on 2020 FUS

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 2020

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Wood Frame

C 1.5 *Type of Construction Coefficient per FUS Part II, Section 1*

A 1341.0 m^2 *Total floor area based on FUS Part II section 1*

Fire Flow	12084.5 L/min
	12000.0 L/min *rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible -15%

Fire Flow	**10200.0 L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered 0%

Reduction	**0 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Type V	Over 30m	33.5	2	67	0%
S	Type V	Over 30m	33.5	0	0	0%
E	Type V	3.1m-10m	13.5	3	41	17%
W	Type V	0m-3m	13.5	3	41	22%
		% Increase				**39%** *value not to exceed 75%*

Increase	**3978.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	14178.0 L/min
	14000.0 L/min *rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by ________________.
-Calculations based on 2020 FUS

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 2020

Fire Flow Required

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Wood Frame

C 1.5 *Type of Construction Coefficient per FUS Part II, Section 1*
A 1341.0 m^2 *Total floor area based on FUS Part II section 1*

Fire Flow	12084.5 L/min	
	12000.0 L/min	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible -15%

Fire Flow	**10200.0 L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered 0%

Reduction	**0 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Type V	20.1m-30m	33.5	3	101	10%
S	Type V	Over 30m	33.5	0	0	0%
E	Type V	3.1m-10m	13.5	3	41	17%
W	Type V	0m-3m	13.5	3	41	22%
		% Increase				**49%** *value not to exceed 75%*

Increase	**4998.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	15198.0 L/min	
	15000.0 L/min	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by ________________.
-Calculations based on 2020 FUS

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 2020

Fire Flow Required

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Wood Frame

C 1.5 *Type of Construction Coefficient per FUS Part II, Section 1*
A 1386.0 m^2 *Total floor area based on FUS Part II section 1*

Fire Flow	12285.6 L/min
	12000.0 L/min *rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible -15%

Fire Flow	**10200.0 L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered 0%

Reduction	**0 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Type V	20.1m-30m	34.5	3	104	10%
S	Type V	Over 30m	33.5	0	0	0%
E	Type V	3.1m-10m	13.5	3	41	17%
W	Type V	3.1m-10m	13.5	3	41	17%
		% Increase				**44%** *value not to exceed 75%*

Increase	**4488.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	14688.0 L/min
	15000.0 L/min *rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by ________________.
-Calculations based on 2020 FUS

Fire Flow Estimation per Fire Underwriters Survey
Water Supply For Public Fire Protection - 2020

Fire Flow Required

1. Base Requirement

$F = 220C\sqrt{A}$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Wood Frame

C 1.5 *Type of Construction Coefficient per FUS Part II, Section 1*
A 1017.0 m^2 *Total floor area based on FUS Part II section 1*

Fire Flow 10523.8 L/min
11000.0 L/min *rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible -15%

Fire Flow **9350.0 L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered 0%

Reduction **0 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Type V	10.1m-20m	13.5	2	27	11%
S	Type V	0m-3m	13.5	3	41	22%
E	Type V	Over 30m	25.5	3	77	0%
W	Type V	3.1m-10m	25.5	3	77	18%
		% Increase				**51%** *value not to exceed 75%*

Increase **4768.5 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow 14118.5 L/min
14000.0 L/min *rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by ________________.
-Calculations based on 2020 FUS

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 2020

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Wood Frame

C 1.5 *Type of Construction Coefficient per FUS Part II, Section 1*
A 1386.0 m^2 *Total floor area based on FUS Part II section 1*

Fire Flow	12285.6 L/min
	12000.0 L/min *rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible -15%

Fire Flow	**10200.0 L/min**

3. Reduction for Sprinkler Protection

Non-Sprinklered 0%

Reduction	**0 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Type V	10.1m-20m	32	2	64	13%
S	Type V	20.1m-30m	32	3	96	8%
E	Type V	Over 30m	18.5	3	56	0%
W	Type V	Over 30m	13.5	3	41	0%
		% Increase				**21%** *value not to exceed 75%*

Increase	**2142.0 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	12342.0 L/min
	12000.0 L/min *rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by ________________.
-Calculations based on 2020 FUS

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

Technical Memorandum

FINAL

Prepared for:
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Submission Date: October 16, 2025

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Project: 2024-123-DSE

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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
R2	October 15, 2025	Updated Draft	Jim Lee	Werner de Schaetzen
R3	October 16, 2025	Final	Jim Lee	Werner de Schaetzen

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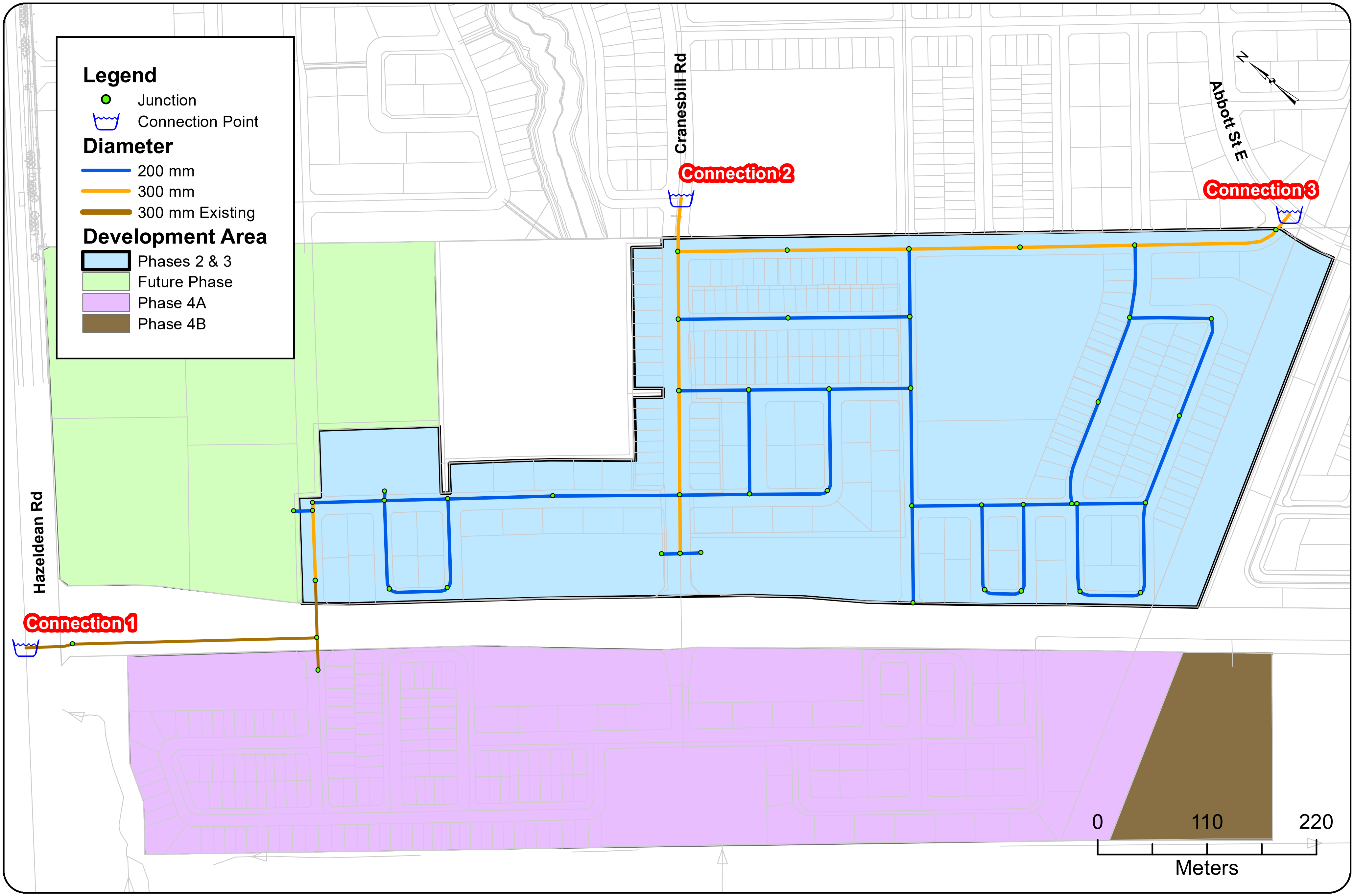
1 Introduction

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 Pro (Autodesk Software), 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**

DISCLAIMER: GeoAdvice does not warrant in any way the accuracy and completeness of the information shown on this map. Field verification of the accuracy and completeness of the information shown on this map is the sole responsibility of the user.

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).

The FUS calculations yielded the following required fire flows:

- Single-Family: 8,000 L/min (133 L/s)
- 6-unit Townhome: 10,000 L/min (167 L/s)
- Back-to-Back Townhome with Firewall: 10,000 L/min (167 L/s)
- 7-unit Townhome with Firewall: 10,000 L/min (167 L/s)
- 8-unit Townhome with Firewall: 11,000 L/min (183 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 (133 L/s)*	157.2	153.4	155.6
Max Day + Fire Flow (167 L/s)**	156.8	150.4	154.2
Max Day + Fire Flow (183 L/s)**	156.6	148.9	153.5
Max Day + Fire Flow (267 L/s)	155.6	141.4	149.9

***Extrapolated from the boundary conditions provided by the City of Ottawa.**
****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*
133 L/s	299 L/s
167 L/s	207 L/s
183 L/s	267 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

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Approved by:

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PROVINCE OF ONTARIO

Oct 16, 2025

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: Persons per Unit	Population: Population Per Dwelling Type	OWD Outdoor Water Demand (L/unit/day)	Water Loss per Connection (L/unit/day)	Average Day Demand: (L/c/d)	Average Day Demand: (L/d)	Average Day Demand: (L/s)	Max Day ADD + OWD	Peak Hour 2.1 x Max. Day
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: (L/ha/d)	Average Day Demand: (L/d)	Average Day Demand: (L/s)	Max Day 1.5 x Avg. Day	Peak Hour 1.8 x Max Day
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: Persons per Unit	Population: Population Per Dwelling Type	(OWD)Outdoor Water Demand (L/unit/day)	Water Loss per Connection (L/unit/day)	Average Day Demand: (L/c/d)	Average Day Demand: (L/d)	Average Day Demand: (L/s)	Max Day ADD + OWD	Peak Hour 2.1 x Max. Day
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: (L/ha/d)	Average Day Demand: (L/d)	Average Day Demand: (L/s)	Max Day 1.5 x Avg. Day	Peak Hour 1.8 x Max Day
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: Persons per Unit	Population: Population Per Dwelling Type	(OWD)Outdoor Water Demand (L/unit/day)	Water Loss per Connection (L/unit/day)	Average Day Demand: (L/c/d)	Average Day Demand: (L/d)	Average Day Demand: (L/s)	Max Day ADD + OWD	Peak Hour 2.1 x Max. Day
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 — Single Family Block 28
Zoning: Single Family Residential
Date: October 9, 2025

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

A. Type of Construction: Wood Frame Construction

B. Ground Floor Area: 192 **m²**

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 =** 384 **m²**

The total floor area in m² in the building being considered

F = 6,468 L/min — **D = 6,000 L/min***

E. Occupancy

Occupancy content hazard — Limited Combustible — -15 % of **D** — **-900 L/min** — **E = 5,100 L/min**

F. Sprinkler Protection

Automatic sprinkler protection — None — 0 % of **E** — **0 L/min** — **F = 5,100 L/min**

G. Exposures

Side	Separation Distance	Length-Height Factor - Adjacent Structure	Construction Type - Adjacent Structure	Exposure
North	20.1 to 30 m	0-20 m-storeys	Wood Frame	0%
East	0.0 to 3 m	21-40 m-storeys	Wood Frame	21%
South	10.1 to 20 m	0-20 m-storeys	Wood Frame	10%
West	0.0 to 3 m	21-40 m-storeys	Wood Frame	21%
			Total	**52%**

% of **E** — **+ 2,652 L/min** — **G = 7,752 L/min**

H. Wood Shake Charge — No — **0 L/min** — **H = 7,752 L/min**

For wood shingle or shake roofs

Total Fire Flow Required	**8,000**	**L/min****
	133	**L/s**
Required Duration of Fire Flow	**2**	**Hrs**
Required Volume of Fire Flow	**960**	**m³**

*Rounded to the nearest 1,000 L/min

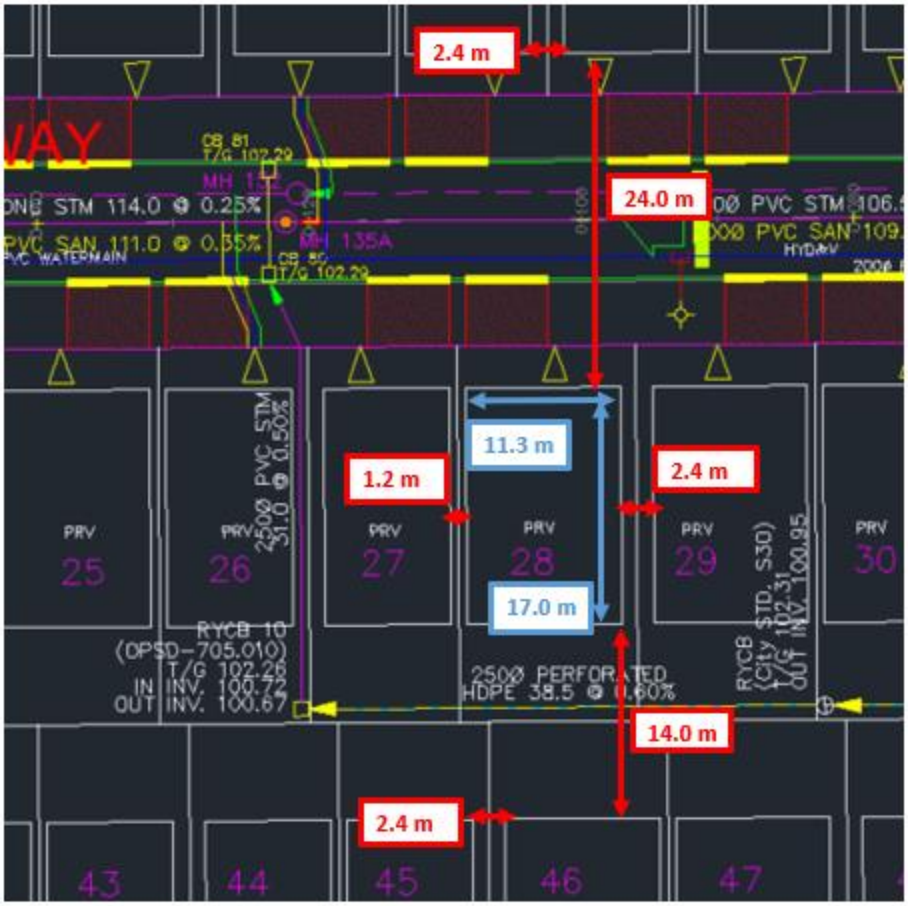
The Total Required Fire Flow for the Abbott's Run development should be reviewed when drawings and site plans have been finalized. The Total Required Fire Flow may be reduced or increased depending on area, construction, occupancy, exposures, and level of sprinkler protection. If any of these items change,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

Exposure Distances – Single Family Block 28



FUS Required Fire Flow Calculation

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

Client: David Schaeffer Engineering Ltd.
Project: 2024-123-DSE
Development: Abbott's Run — Townhouse Block 88
Zoning: Multi Family Residential — 6-unit Townhome
Date: October 9, 2025

A. Type of Construction: Wood Frame Construction

B. Ground Floor Area: 567 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 = 1134 m^2

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

F = 11,112 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	20.1 to 30 m	61-80 m-storeys	Wood Frame	6%
East	3.1 to 10 m	21-40 m-storeys	Wood Frame	16%
South	3.1 to 10 m	61-80 m-storeys	Wood Frame	18%
West	3.1 to 10 m	21-40 m-storeys	Wood Frame	16%
			Total	**56%**

% of E **+ 5,236 L/min** — **G = 14,586 L/min**

H. Wood Shake Charge — No — **0 L/min** — **H = 14,586 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

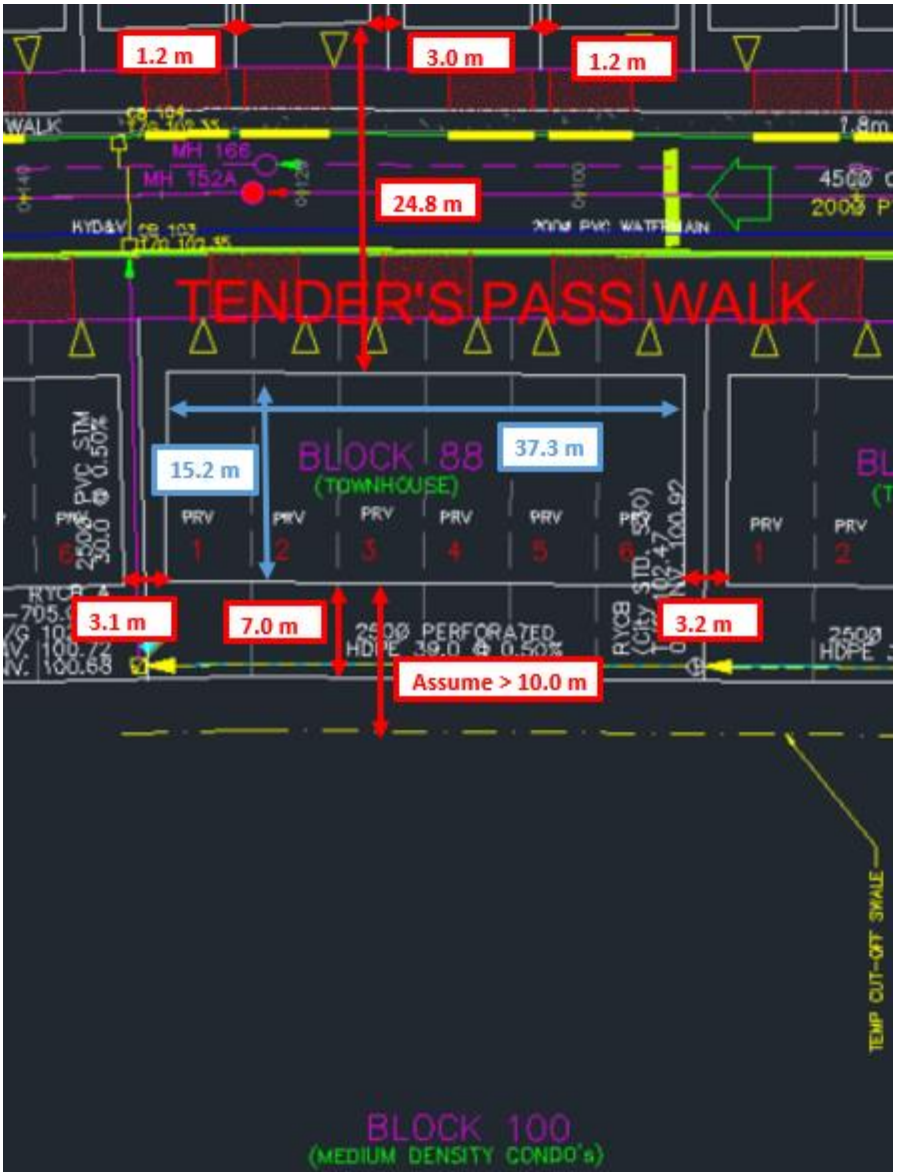
The Total Required Fire Flow for the Abbott's Run development should be reviewed when drawings and site plans have been finalized. The Total Required Fire Flow may be reduced or increased depending on area, construction, occupancy, exposures, and level of sprinkler protection. If any of these items change,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

Exposure Distances – 6-unit Townhome Block 88



FUS Required Fire Flow Calculation

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

Client: David Schaeffer Engineering Ltd.
Project: 2024-123-DSE
Development: Abbott's Run — B2B Block 135
Zoning: Single Family Residential — 12-unit B2B Townhome Split with Firewall
Date: October 9, 2025

A. Type of Construction: Wood Frame Construction

B. Ground Floor Area: 414 **m²**

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 =** 828 **m²**

The total floor area in m² in the building being considered

F = **9,496** **L/min** — **D =** **9,000** **L/min***

E. Occupancy

Occupancy content hazard — Limited Combustible — -15 % of **D** — **-1,350** **L/min** — **E =** **7,650** **L/min**

F. Sprinkler Protection

Automatic sprinkler protection — None — 0 % of **E** — **0** **L/min** — **F =** **7,650** **L/min**

G. Exposures

Side	Separation Distance	Length-Height Factor - Adjacent Structure	Construction Type - Adjacent Structure	Exposure
North	Firewall	41-60 m-storeys	Wood Frame	10%
East	20.1 to 30 m	21-40 m-storeys	Wood Frame	2%
South	3.1 to 10 m	41-60 m-storeys	Wood Frame	17%
West	20.1 to 30 m	21-40 m-storeys	Wood Frame	2%
			Total	**31%**

% of **E** — **+ 2,372** **L/min** — **G =** **10,022** **L/min**

H. Wood Shake Charge — No — **0** **L/min** — **H =** **10,022** **L/min**

For wood shingle or shake roofs

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

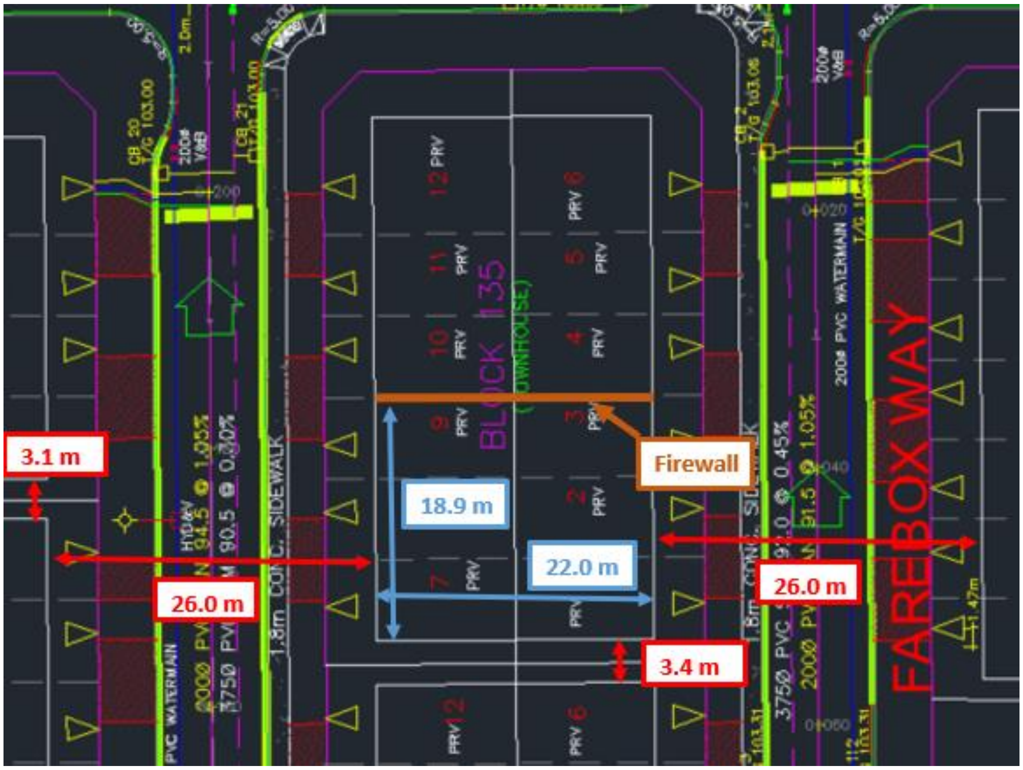
The Total Required Fire Flow for the Abbott's Run development should be reviewed when drawings and site plans have been finalized. The Total Required Fire Flow may be reduced or increased depending on area, construction, occupancy, exposures, and level of sprinkler protection. If any of these items change,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

Exposure Distances – 12-Unit B2B Townhome Block 135 with Firewall



FUS Required Fire Flow Calculation

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

Client: David Schaeffer Engineering Ltd.
Project: 2024-123-DSE
Development: Abbott's Run — Townhouse Block 81
Zoning: Multi Family Residential — 7-unit Townhome Split with Firewall
Date: October 15, 2025

A. Type of Construction: Wood Frame Construction

B. Ground Floor Area: 429 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 =** 857 m^2

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

F = **9,661** **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	Firewall	21-40 m-storeys	Wood Frame	10%
East	10.1 to 20 m	41-60 m-storeys	Wood Frame	12%
South	3.1 to 10 m	21-40 m-storeys	Wood Frame	10%
West	20.1 to 30 m	41-60 m-storeys	Wood Frame	4%
			Total	**36%**

% of E **+ 3,060** **L/min** — **G = 11,560 L/min**

H. Wood Shake Charge — No — **0** **L/min** — **H = 11,560 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

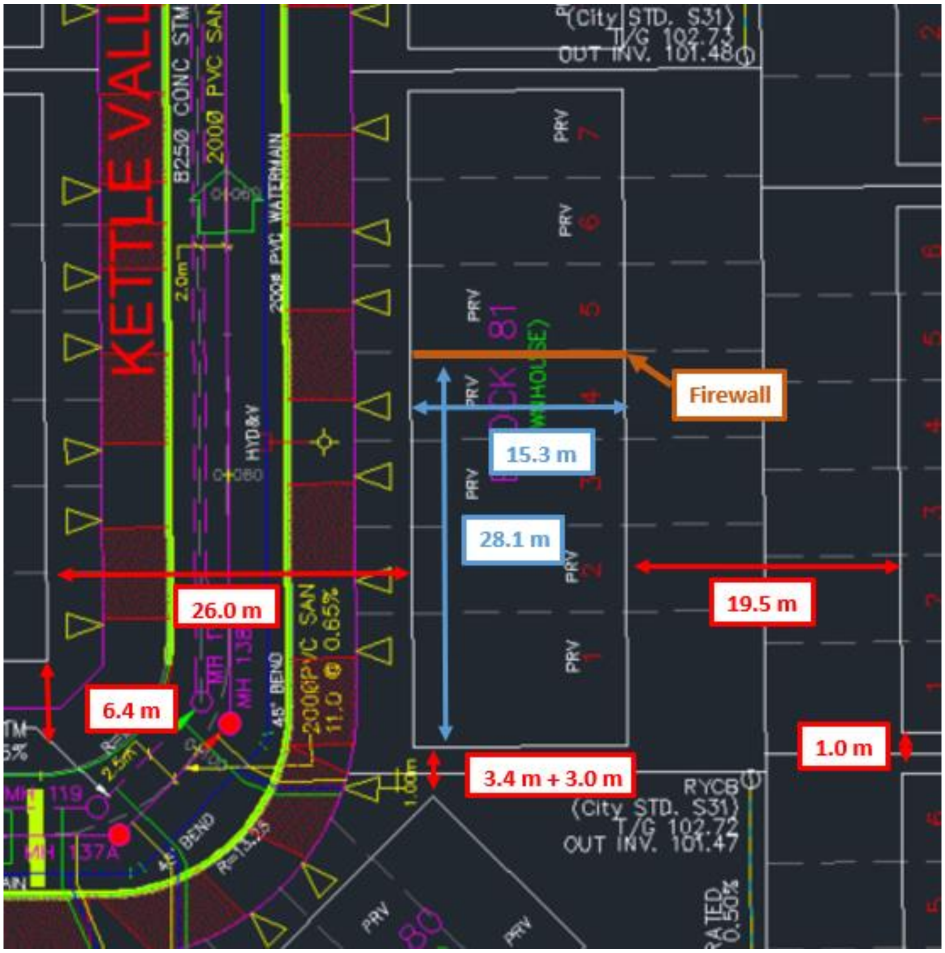
The Total Required Fire Flow for the Abbott's Run development should be reviewed when drawings and site plans have been finalized. The Total Required Fire Flow may be reduced or increased depending on area, construction, occupancy, exposures, and level of sprinkler protection. If any of these items change,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

Exposure Distances – 7-Unit Townhome Block 81 with Firewall



FUS Required Fire Flow Calculation

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

Client: David Schaeffer Engineering Ltd.
Project: 2024-123-DSE
Development: Abbott's Run — Townhouse Block 133
Zoning: Multi Family Residential — 8-unit Townhome Split with Firewall
Date: October 9, 2025

A. Type of Construction: Wood Frame Construction

B. Ground Floor Area: 486 **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 =** 973 **m^2**

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

F = 10,293 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	3.1 to 10 m	21-40 m-storeys	Wood Frame	16%
East	Firewall	21-40 m-storeys	Wood Frame	10%
South	Beyond 30 m	61-80 m-storeys	Wood Frame	0%
West	20.1 to 30 m	21-40 m-storeys	Wood Frame	2%
			Total	**28%**

% of E **+ 2,380 L/min** — **G = 10,880 L/min**

H. Wood Shake Charge — No — **0 L/min** — **H = 10,880 L/min**

For wood shingle or shake roofs

Total Fire Flow Required	**11,000**	**L/min****
	183	**L/s**
Required Duration of Fire Flow	**2.25**	**Hrs**
Required Volume of Fire Flow	**1,485**	**m^3**

*Rounded to the nearest 1,000 L/min

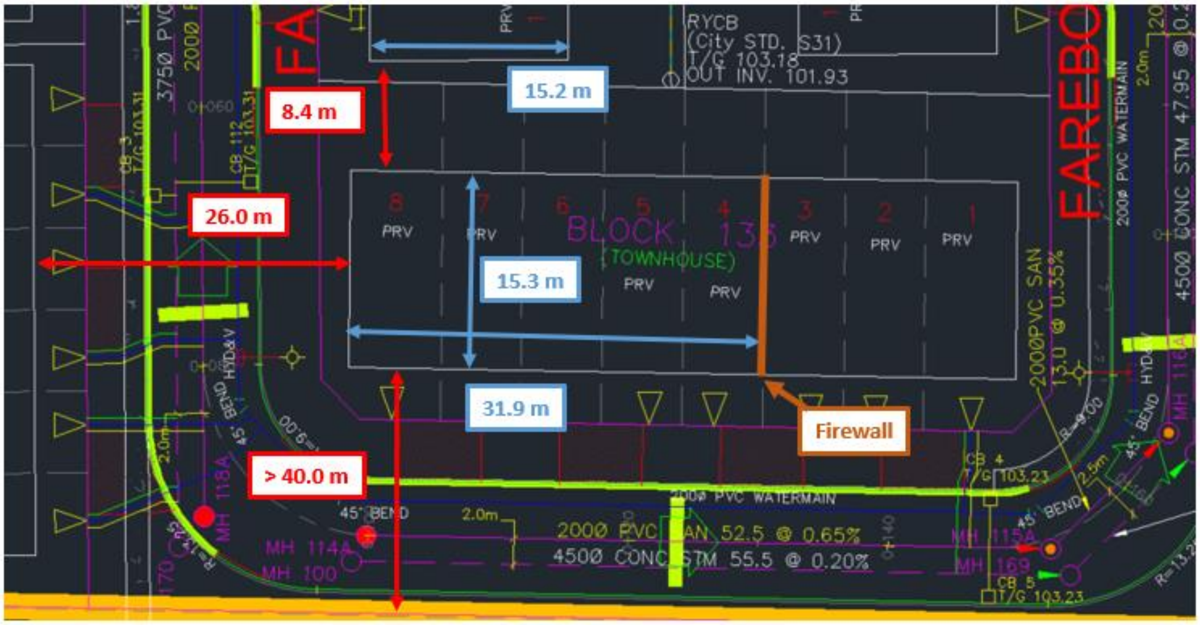
The Total Required Fire Flow for the Abbott's Run development should be reviewed when drawings and site plans have been finalized. The Total Required Fire Flow may be reduced or increased depending on area, construction, occupancy, exposures, and level of sprinkler protection. If any of these items change,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

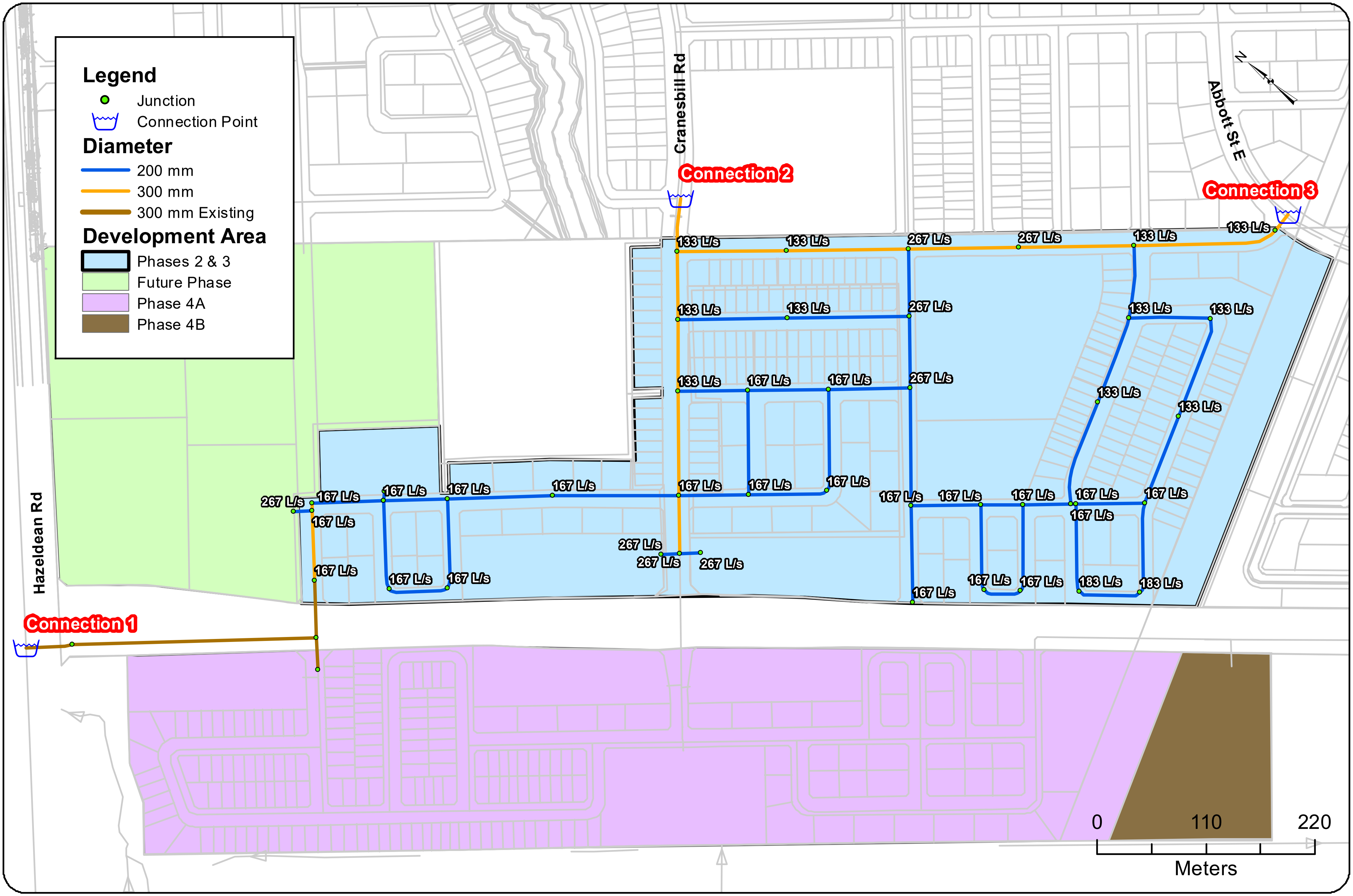
Consideration should be given for fire prevention during construction phases as the required fire flows during construction of buildings is substantially higher than after the buildings are occupied. This is due to exposed framing and inactive sprinkler systems. Fires starting in unprotected portion 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

Exposure Distances – 8-Unit Townhome Block 133 with Firewall





Project: **Hydraulic Capacity and Modeling Analysis**
Abbott's Run Phases 2 & 3
Client: **David Schaeffer Engineering Ltd.**
Date: **October 2025**
Created by: **JL**
Reviewed by: **WdS**

GeoAdvice Engineering Inc.

DISCLAIMER: GeoAdvice does not warrant in any way the accuracy and completeness of the information shown on this map. Field verification of the accuracy and completeness of the information shown on this map is the sole responsibility of the user.

Required Fire Flows

Figure B.1

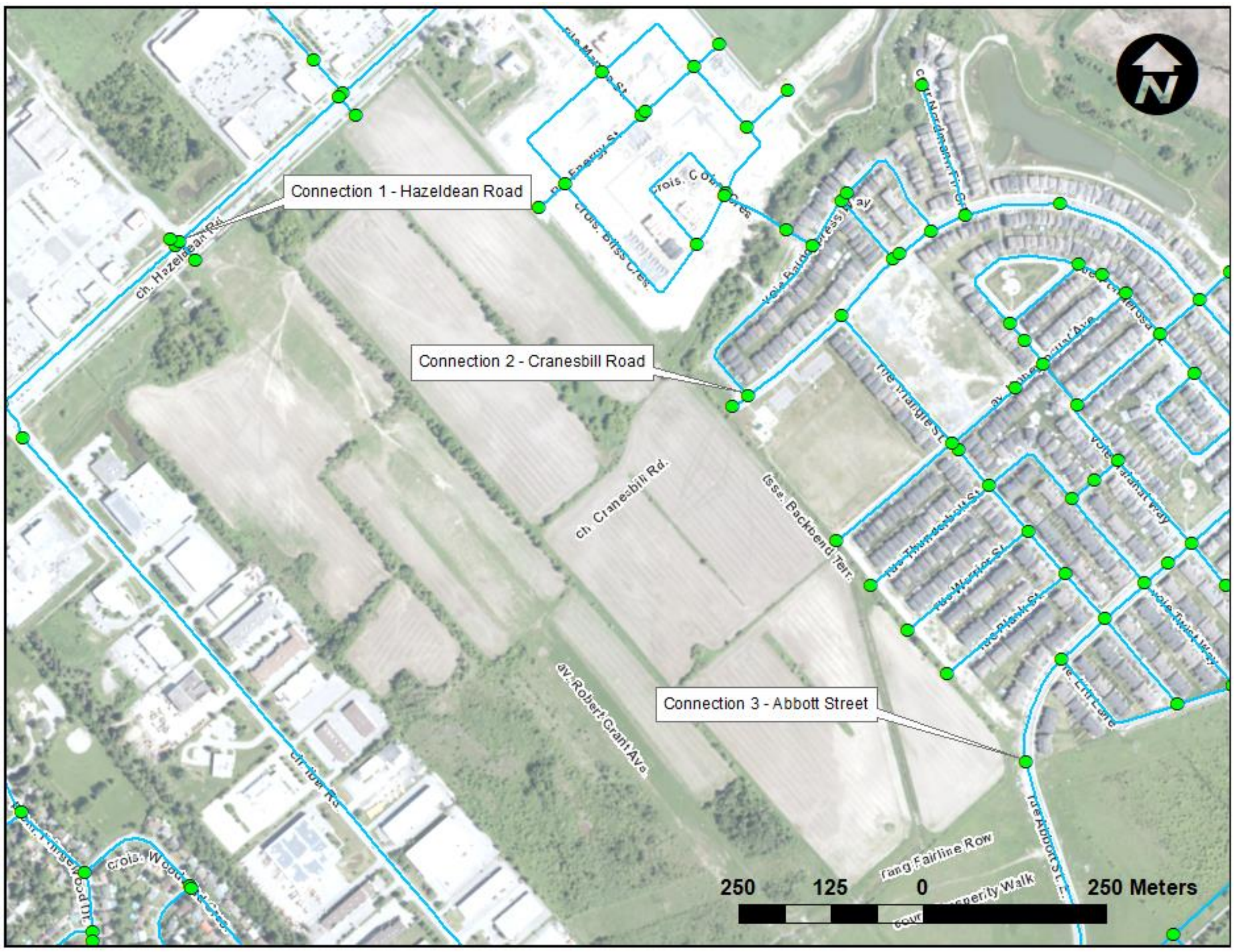
Appendix C Boundary Conditions

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

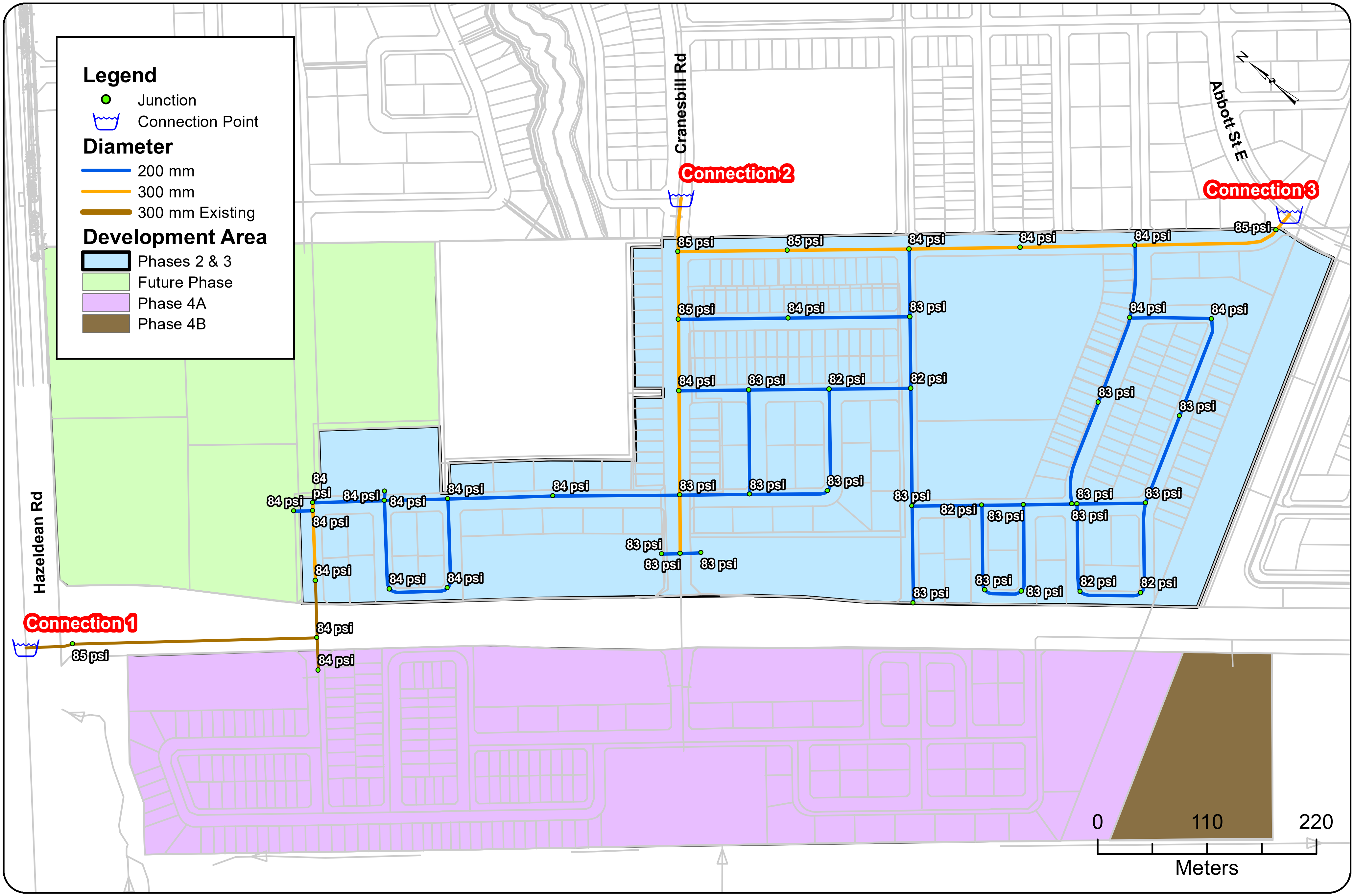
Notes

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



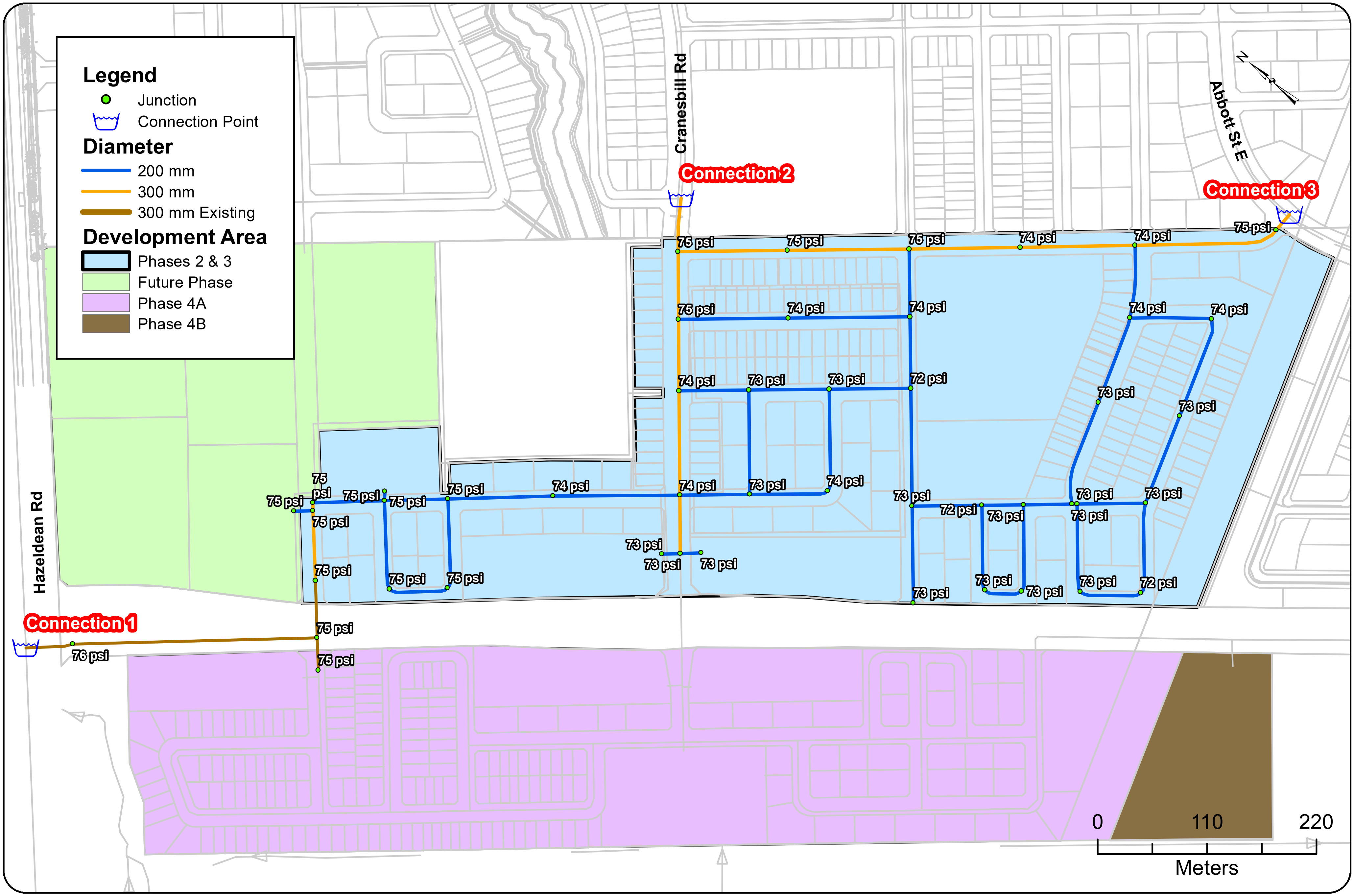
Project: **Hydraulic Capacity and Modeling Analysis**
Abbott's Run Phases 2 & 3
Client: **David Schaeffer Engineering Ltd.**
Date: **December 2024**
Created by: **JL**
Reviewed by: **WdS**

GeoAdvice Engineering Inc.

DISCLAIMER: GeoAdvice does not warrant in any way the accuracy and completeness of the information shown on this map. Field verification of the accuracy and completeness of the information shown on this map is the sole responsibility of the user.

ADD Pressure Modeling Results

Figure D.1



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**

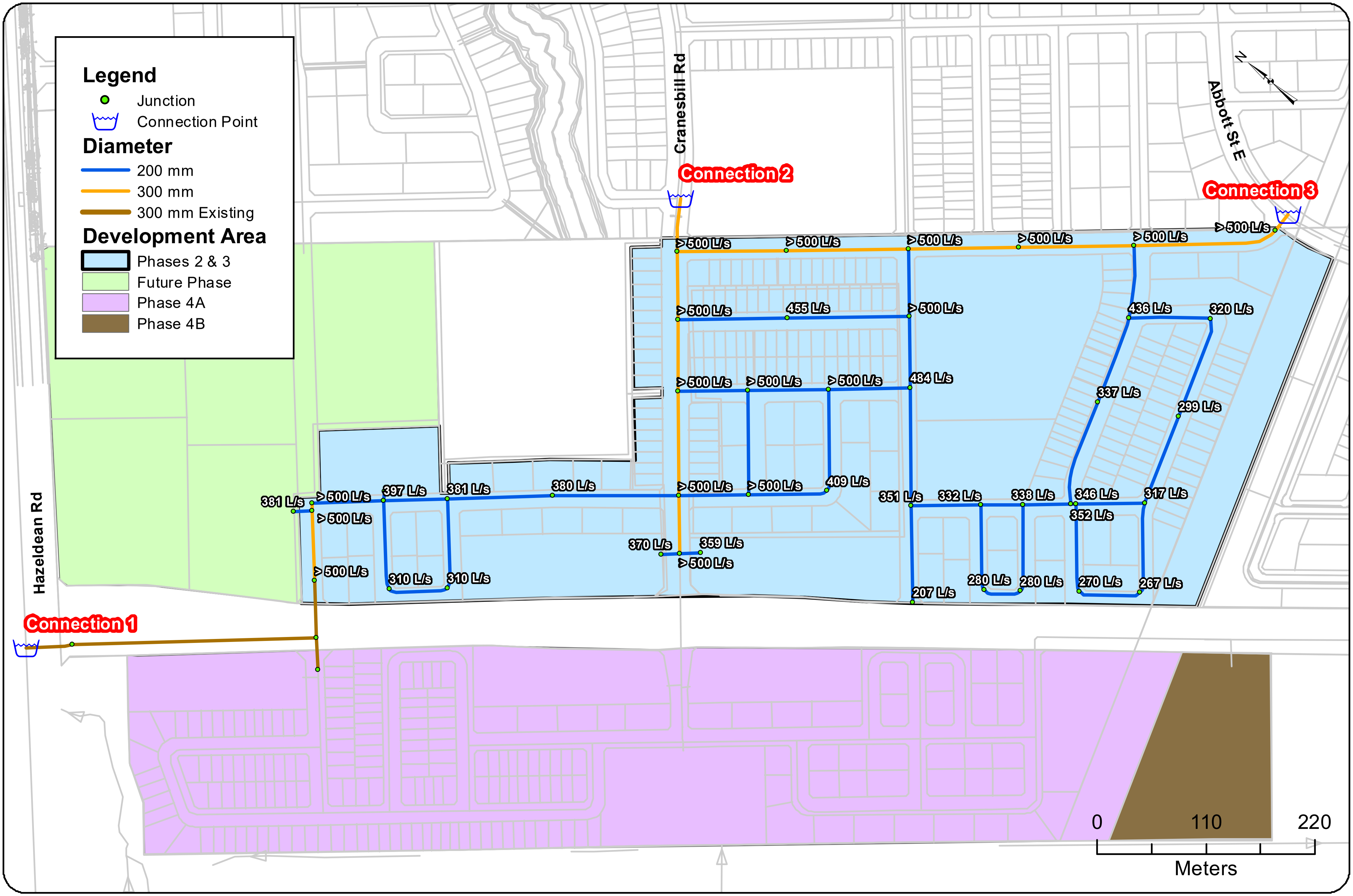
GeoAdvice Engineering Inc.

DISCLAIMER: GeoAdvice does not warrant in any way the accuracy and completeness of the information shown on this map. Field verification of the accuracy and completeness of the information shown on this map is the sole responsibility of the user.

PHD Pressure Modeling Results

Figure D.1

Appendix E MDD+FF Model Results



Project: **Hydraulic Capacity and Modeling Analysis**
Abbott's Run Phases 2 & 3
Client: **David Schaeffer Engineering Ltd.**
Date: **October 2025**
Created by: **JL**
Reviewed by: **WdS**

GeoAdvice Engineering Inc.

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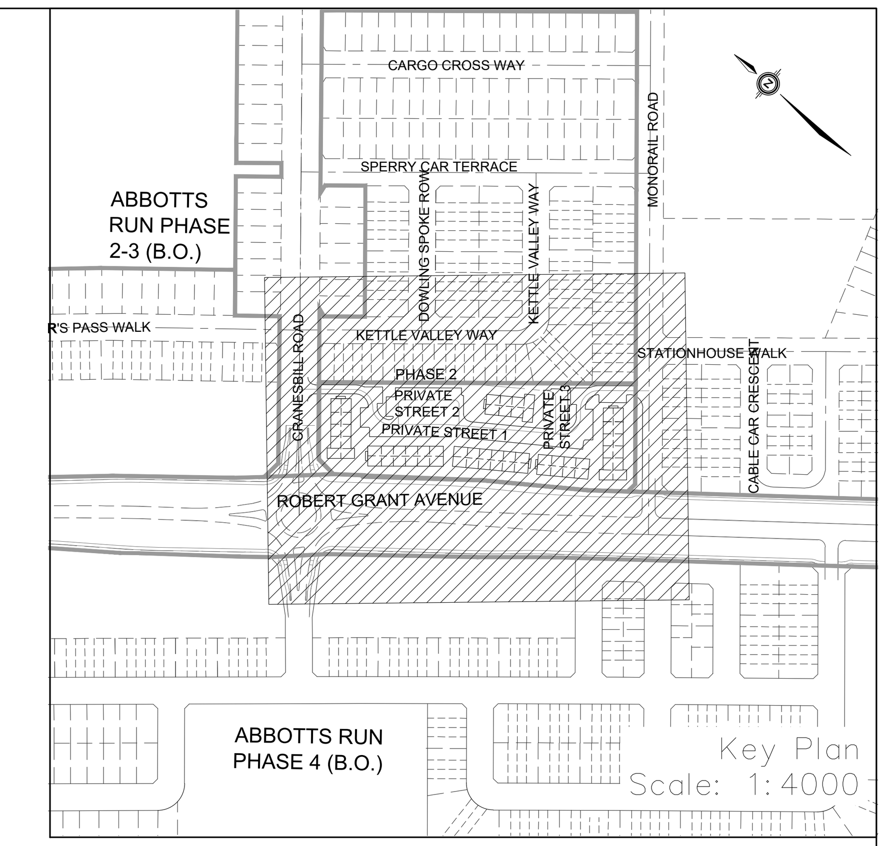
Available Fire Flow Modeling Results

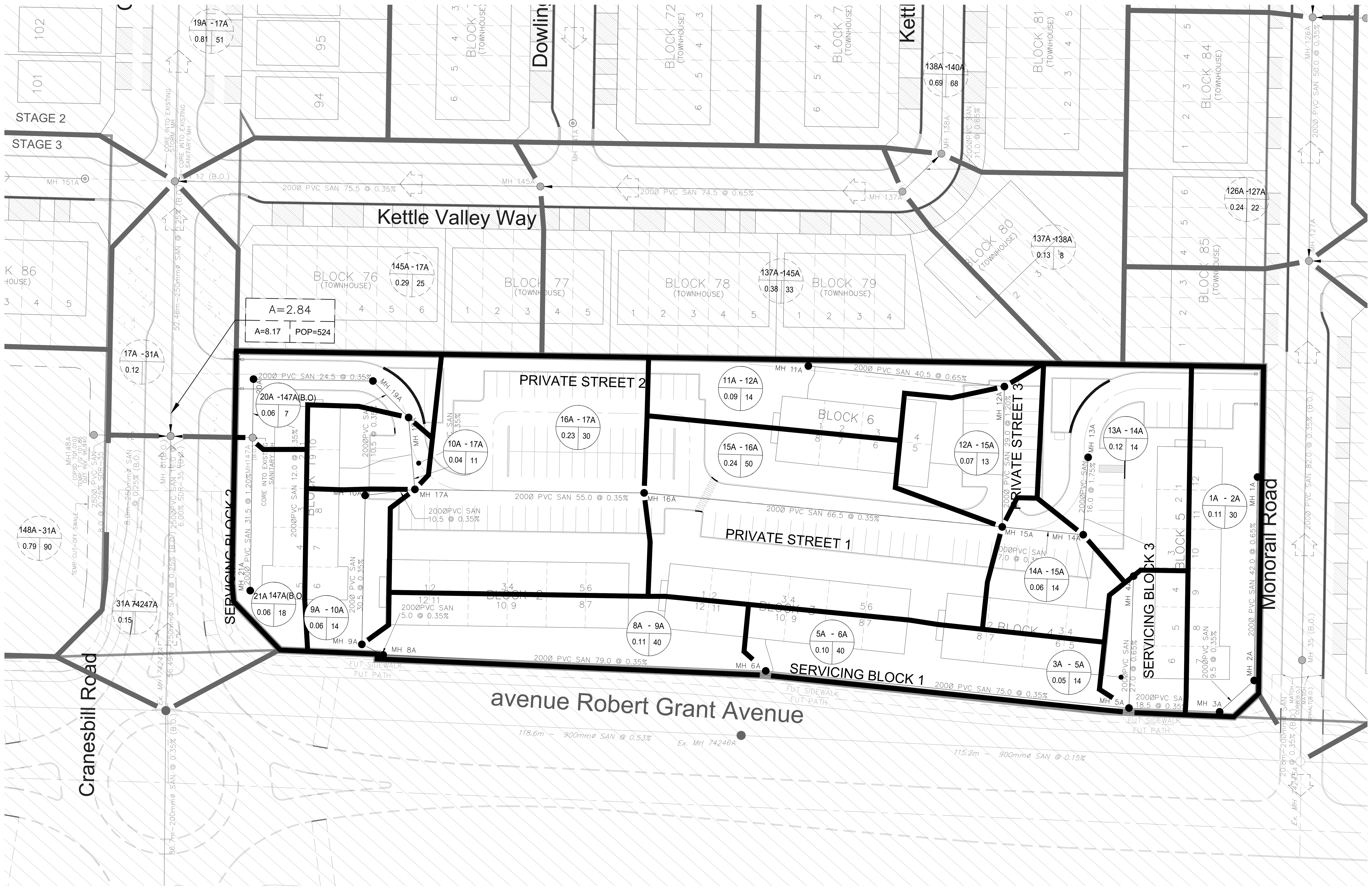
Figure E.1

APPENDIX C

Sanitary Servicing

- Abbott's Run Block 13 - Sanitary Drainage Plan (DSEL, 2025-10-17)
- Sanitary Sewer Design Sheets (DSEL, 2025-10-20)
- Abbot's Run Stage 2/3 – Overall Sanitary Drainage Plan (DSEL, 2025-10-10)
- Sanitary Sewer Design Sheets from Abbott's Run Stage 2/3 Design Brief (DSEL, 2025-08-14)
- Adequacy of Public Servicing Report Sanitary Sewer Design Sheet (DSEL, 2025-05-09)





LEGEND

SANITARY DRAINAGE BOUNDARY
SANITARY EXISTING DRAINAGE BOUNDARY
SANITARY SUB-DRAINAGE BOUNDARY

UPSTREAM MH TO DOWNSTREAM MH — 43A - 44A
AREA IN HECTARES — 0.78
POPULATION — 61

UPSTREAM MH TO DOWNSTREAM MH — 43A-44A
AREA IN OTHER PHASES IN HECTARES — 0.78
POPULATION — 61

EXTERNAL INSTITUTIONAL/ COMMERCIAL AREA (Ha) — A=53.63
EXTERNAL POPULATION — POP=5739
EXTERNAL RESIDENTIAL AREA (Ha) — A=107

SANITARY MAINTENANCE HOLE (WATERTIGHT LID PER OPSD 401.030)
SANITARY MAINTENANCE HOLE — MH202A
CAP
EXISTING SANITARY MAINTENANCE HOLE

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. PROJECT NO. 21942-22 DATED SEPTEMBER 1, 2022

SITE PLAN INFORMATION

SITE PLAN PROVIDED BY SRN ARCHITECTS, DATED ON OCTOBER 20, 2025.

ELEVATION NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM VERTICAL CONTROL MONUMENT NO. BM8BU502.

ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION
2	S.L.M	2025-10-24	2nd SUBMISSION
1	S.L.M	2025-06-20	1st SUBMISSION

Ottawa

CITY OF OTTAWA

PROJECT No. 1295_Block13

LICENSED PROFESSIONAL ENGINEER
S.L. MERRICK
100186523
2025-10-24
PROVINCE OF ONTARIO

Minto Group

ABBOTT'S RUN

BLOCK 13

DSEL

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

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SANITARY DRAINAGE PLAN

DRAWN BY: E.D.	CHECKED BY: S.L.M.	SHEET NO.
DESIGNED BY: E.D.	CHECKED BY: S.L.M.	15 OF 19
SCALE: 1:500	DATE: JUNE 2025	

CITY FILE No. D07-12-25-0089 CITY PLAN No.19356

SANITARY SEWER CALCULATION SHEET

Ottawa

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	30	0.11	30	3.7	0.36		0.00		0.00		0.00	0.00	0.11	0.11	0.04	0.39	42.0	200	0.65	26.44	0.01	0.84	0.30
	2A	3A				0.11	30	3.7	0.36		0.00		0.00		0.00	0.00	0.00	0.11	0.04	0.39	9.5	200	0.35	19.40	0.02	0.62	0.24
	3A	5A	0.05	6	14	0.16	44	3.7	0.52		0.00		0.00		0.00	0.00	0.05	0.16	0.05	0.57	18.5	200	0.35	19.40	0.03	0.62	0.27
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	40	0.26	84	3.6	0.98		0.00		0.00		0.00	0.00	0.10	0.26	0.09	1.07	75.0	200	0.35	19.40	0.06	0.62	0.33
	6A	8A				0.26	84	3.6	0.98		0.00		0.00		0.00	0.00	0.00	0.26	0.09	1.07	79.0	200	0.35	19.40	0.06	0.62	0.33
	8A	9A	0.11	16	40	0.37	124	3.6	1.44		0.00		0.00		0.00	0.00	0.11	0.37	0.12	1.56	5.0	200	0.35	19.40	0.08	0.62	0.37
	9A	10A	0.06	6	14	0.43	138	3.6	1.59		0.00		0.00		0.00	0.00	0.06	0.43	0.14	1.73	30.5	200	0.35	19.40	0.09	0.62	0.38
	10A	17A	0.04	4	11	0.47	149	3.6	1.72		0.00		0.00		0.00	0.00	0.04	0.47	0.16	1.87	10.5	200	0.35	19.40	0.10	0.62	0.39
To PRIVATE STREET 1, Pipe 17A - 18A						0.47	149				0.00		0.00		0.00			0.47									
PRIVATE STREET 3																											
	11A	12A	0.09	6	14	0.09	14	3.7	0.17		0.00		0.00		0.00	0.00	0.09	0.09	0.03	0.20	40.5	200	0.65	26.44	0.01	0.84	0.24
	12A	15A	0.07	4	13	0.16	27	3.7	0.32		0.00		0.00		0.00	0.00	0.07	0.16	0.05	0.38	29.0	200	1.20	35.93	0.01	1.14	0.37
To PRIVATE STREET 1, Pipe 15A - 16A						0.16	27				0.00		0.00		0.00			0.16									
PRIVATE STREET 1																											
	13A	14A	0.12	6	14	0.12	14	3.7	0.17		0.00		0.00		0.00	0.00	0.12	0.12	0.04	0.21	16.0	200	1.75	43.39	0.00	1.38	0.35
	14A	15A	0.06	6	14	0.18	28	3.7	0.33		0.00		0.00		0.00	0.00	0.06	0.18	0.06	0.39	17.0	200	0.35	19.40	0.02	0.62	0.24
Contribution From PRIVATE STREET 3, Pipe 12A - 15A						0.16	27				0.00		0.00		0.00		0.16	0.34									
	15A	16A	0.24	20	50	0.58	105	3.6	1.22		0.00		0.00		0.00	0.00	0.24	0.58	0.19	1.41	66.5	200	0.35	19.40	0.07	0.62	0.36
	16A	17A	0.23	12	30	0.81	135	3.6	1.56		0.00		0.00		0.00	0.00	0.23	0.81	0.27	1.83	55.0	200	0.35	19.40	0.09	0.62	0.39
Contribution From SERVICING BLOCK 1, Pipe 10A - 17A						0.47	149				0.00		0.00		0.00		0.47	1.28									
	17A	18A				1.28	284	3.5	3.19		0.00		0.00		0.00	0.00	0.00	1.28	0.42	3.62	15.0	200	0.35	19.40	0.19	0.62	0.47
	18A	19A				1.28	284	3.5	3.19		0.00		0.00		0.00	0.00	0.00	1.28	0.42	3.62	10.5	200	0.35	19.40	0.19	0.62	0.47
	19A	20A				1.28	284	3.5	3.19		0.00		0.00		0.00	0.00	0.00	1.28	0.42	3.62	24.5	200	0.35	19.40	0.19	0.62	0.47
To SERVICING BLOCK 2, Pipe 20A - 147A(B.O.)						1.28	284				0.00		0.00		0.00			1.28									
SERVICING BLOCK 2																											
	21A	147A(B.O.)	0.06	8	18	0.06	18	3.7	0.22		0.00		0.00		0.00	0.00	0.06	0.06	0.02	0.24	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	18				0.00		0.00		0.00			0.06									
Contribution From PRIVATE STREET 1, Pipe 19A - 20A						1.28	284				0.00		0.00		0.00		1.28	1.28									
	20A	147A(B.O.)	0.06	2	7	1.34	291	3.5	3.27		0.00		0.00		0.00	0.00	0.06	1.34	0.44	3.71	12.0	200	0.35	19.40	0.19	0.62	0.47
To EXISTING SERVICING NORTH, Pipe 147A(B.O.) - 31(B.O.)						1.34	291				0.00		0.00		0.00			1.34									
EXISTING SERVICING NORTH																											
Contribution From SERVICING BLOCK 2, Pipe 20A - 147A(B.O.)						1.34	291				0.00		0.00		0.00		1.34	1.34									
Contribution From SERVICING BLOCK 2, Pipe 21A - 147A(B.O.)						0.06	18				0.00		0.00		0.00		0.06	1.40									
	147A(B.O.)	31(B.O.)				1.40	309	3.5	3.46		0.00		0.00		0.00	0.00	0.00	1.40	0.46	3.93	17.0	250	6.00	145.67	0.03	2.97	1.26
To CRANESBILL ROAD, Pipe 31A(B.O.) - 74247(B.O.)						1.40	309				0.00		0.00		0.00			1.40									
EXISTING CRANESBILL ROAD																											
Contribution From CRANESBILL ROAD, Pipe 17A(B.O.) - 31A(B.O.)						8.17	524				0.00		2.84		0.00		11.01	11.01									
Contribution From BLOCK 143, Pipe 148A(B.O.) - 31A(B.O.)						0.79	90				0.00		0.00		0.00		0.16	11.17									
Contribution From EXSISTING SERVICING NORTH, Pipe 147A(B.O.) - 31A(B.O.)						1.40	309				0.00		0.00		0.00		1.40	12.57									
	31A(B.O.)	74247A	0.15		0	10.36	923	3.3	9.74		0.00		2.84		0.00	1.38	0.15	12.72	4.20	15.32	56.5	250	0.25	29.73	0.52	0.61	0.61

Block 13 Total Peak Flow

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.	PROJECT:	ABBOTT'S RUN BLOCK 13		
Checked: S.M.	LOCATION:	City of Ottawa		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 16	File Ref:	Date: 24 Oct 2025	Sheet No. 1	of 1

LICENSED PROFESSIONAL ENGINEER
S.L. MERRICK
100186523
2025-10-24
PROVINCE OF ONTARIO

DRB# 22-1295

Updated Peak Flow Discharge to Robert Grand & Cranesbill Road Intersection

1295_Block-13_SAN.xlsx

LEGEND

MAINTENANCE HOLE — 200mmø SAN — MH202A

CAP

EXISTING SANITARY MAINTENANCE HOLE

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. PROJECT NO. 21942-22 DATED SEPTEMBER 1, 2022

LEGAL INFORMATION

M-PLAN PROVIDED BY ANNIS, O'SULLIVAN,VOLLEBEKK LTD, PROJECT NUMBER 25486-24 STAGE 2 DATED JULY 18, 2025. STAGE 3 DATED JULY 12, 2025. TOWNHOUSE LOTLINES PER MINTO CONCEPT PLAN DATED AUGUST 6, 2025

ELEVATION NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM VERTICAL CONTROL MONUMENT NO. BM88U502 HAVING AN ELEVATION OF 106.039 METERS.

ELEVATION = 106.039m

No.	BY	DATE	DESCRIPTION
4	S.L.M.	25-10-10	4th SUBMISSION
3	S.L.M.	25-08-15	3rd SUBMISSION
2	S.L.M.	25-04-09	2nd SUBMISSION
1	S.L.M.	24-12-20	1st SUBMISSION

Ottawa CITY OF OTTAWA

PROJECT No. 22-1295-PH2

LICENSED PROFESSIONAL ENGINEER S. L. MERRICK 100186523 2025.10.10 PROVINCE OF ONTARIO

MINTO COMMUNITIES

ABBOTT'S RUN

STAGE 2 / STAGE 3

DSEL

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

© DSEL

OVERALL SANITARY DRAINAGE PLAN

DRAWN BY: M.B.		DESIGNED BY: C.B.	
SCALE: 1:500		CHECKED BY: S.M.	
PROJECT NO. 22-1295-PH2		SHEET 03 OF 04	

CITY PLAN No. 17320

CITY FILE No. D07-16-16-0020

DESIEF BREIF PH.2&3 - DSEL (OCT 2025):

SANITARY SEWER CALCULATION SHEET

Ottawa

Manning's n=0.013

Block 13 Population and Peak Flow Estimate

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 143																											
	147A	31A	1.39		158	1.39	158	3.5	1.82		0.00		0.00		0.00	0.00	1.39	1.39	0.46	2.27	16.0	250	6.00	145.67	0.02	2.97	1.07
To CRANESBILL ROAD, Pipe 31A - 74247A						1.39	158				0.00		0.00		0.00			1.39									
	148A	31A	0.79		90	0.79	90	3.6	1.05		0.00		0.00		0.00	0.00	0.79	0.79	0.26	1.31	16.0	250	0.25	29.73	0.04	0.61	0.30
To CRANESBILL ROAD, Pipe 31A - 74247A						0.79	90				0.00		0.00		0.00			0.79									
DOWLING SPOKE ROW																											
	141A	142A	0.68	24	65	0.68	65	3.6	0.77		0.00		0.00		0.00	0.00	0.68	0.68	0.22	0.99	92.5	200	0.65	26.44	0.04	0.84	0.40
To SPERRY CAR TERRACE, Pipe 142A - 143A						0.68	65				0.00		0.00		0.00			0.68									
KETTLE VALLEY WAY																											
	137A	138A	0.17	4	11	0.17	11	3.7	0.13		0.00		0.00		0.00	0.00	0.17	0.17	0.06	0.19	11.0	200	0.65	26.44	0.01	0.84	0.24
	138A	140A	0.69	25	68	0.86	79	3.6	0.93		0.00		0.00		0.00	0.00	0.69	0.86	0.28	1.21	97.5	200	0.35	19.40	0.06	0.62	0.34
To SPERRY CAR TERRACE, Pipe 140A - 142A						0.86	79				0.00		0.00		0.00			0.86									
	137A	145A	0.34	11	30	0.34	30	3.7	0.36		0.00		0.00		0.00	0.00	0.34	0.34	0.11	0.47	74.5	200	0.65	26.44	0.02	0.84	0.32
	145A	17A	0.29	9	24	0.63	54	3.6	0.64		0.00		0.00		0.00	0.00	0.29	0.63	0.21	0.85	75.5	200	0.35	19.40	0.04	0.62	0.31
To CRANESBILL ROAD, Pipe 17A - 31A						0.63	54				0.00		0.00		0.00			0.63									
SPERRY CAR TERRACE																											
	129A	139A				0.00					0.00	2.84	2.84		0.00	1.38	2.84	2.84	0.94	2.32	11.5	200	0.35	19.40	0.12	0.62	0.41
	139A	140A	0.38	6	20	0.38	20	3.7	0.24		0.00		2.84		0.00	1.38	0.38	3.22	1.06	2.68	76.0	200	0.35	19.40	0.14	0.62	0.43
Contribution From KETTLE VALLEY WAY, Pipe 138A - 140A						0.86	79				0.00		0.00		0.00		0.86	4.08									
	140A	142A	0.31	6	20	1.55	119	3.6	1.38		0.00		2.84		0.00	1.38	0.31	4.39	1.45	4.21	76.0	200	0.35	19.40	0.22	0.62	0.49
Contribution From DOWLING SPOKE ROW, Pipe 141A - 142A						0.68	65				0.00		0.00		0.00		0.68	5.07									
	142A	143A				2.23	184	3.5	2.10		0.00		2.84		0.00	1.38	0.00	5.07	1.67	5.16	67.0	200	0.35	19.40	0.27	0.62	0.52
	143A	19A	0.32	6	20	2.55	204	3.5	2.32		0.00		2.84		0.00	1.38	0.32	5.39	1.78	5.48	14.0	200	0.35	19.40	0.28	0.62	0.53
To CRANESBILL ROAD, Pipe 19A - 17A						2.55	204				0.00		2.84		0.00			5.39									
CARGO CROSS WAY																											
	134A	135A	0.91	18	62	0.91	62	3.6	0.73		0.00		0.00		0.00	0.00	0.91	0.91	0.30	1.03	109.0	200	0.85	30.24	0.03	0.96	0.44
	135A	136A	0.76	17	58	1.67	120	3.6	1.39		0.00		0.00		0.00	0.00	0.76	1.67	0.55	1.94	111.0	200	0.35	19.40	0.10	0.62	0.39
To CRANESBILL ROAD, Pipe 136A - 19A						1.67	120				0.00		0.00		0.00			1.67									
CRANESBILL ROAD																											
Contribution From FREIGHTLINE TERRACE, Pipe 132A - 133A						1.58	58				0.00		0.00		0.00		1.58	1.58									
	133A	136A	0.41	6	20	1.99	78	3.6	0.91		0.00		0.00		0.00	0.00	0.41	1.99	0.66	1.57	74.0	200	0.35	19.40	0.08	0.62	0.37
Contribution From CARGO CROSS WAY, Pipe 135A - 136A						1.67	120				0.00		0.00		0.00		1.67	3.66									
	136A	19A	0.40	5	17	4.06	215	3.5	2.45		0.00		0.00		0.00	0.00	0.40	4.06	1.34	3.78	72.5	250	0.35	35.18	0.11	0.72	0.47
Contribution From SPERRY CAR TERRACE, Pipe 143A - 19A						2.55	204				0.00		2.84		0.00		5.39	9.45									
	19A	17A	0.81	15	51	7.42	470	3.4	5.16		0.00		2.84		0.00	1.38	0.81	10.26	3.39	9.93	105.2	250	0.25	29.73	0.33	0.61	0.54
Contribution From KETTLE VALLEY WAY, Pipe 145A - 17A						0.63	54				0.00		0.00		0.00		0.63	10.89									
	17A	31A	0.12		0	8.17	524	3.4	5.72		0.00		2.84		0.00	1.38	0.12	11.01	3.63	10.74	52.5	250	0.25	29.73	0.36	0.61	0.56
Contribution From BLOCK 143, Pipe 147A - 31A						1.39	158				0.00		0.00		0.00		1.39	12.40									
Contribution From BLOCK 143, Pipe 148A - 31A						0.79	90				0.00		0.00		0.00		0.79	13.19									
	31A	74247A	0.15		0	10.50	772	3.3	8.25		0.00		2.84		0.00	1.38	0.15	13.34	4.40	14.03	56.5	250	0.25	29.73	0.47	0.61	0.60

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.

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-08-15
PROVINCE OF ONTARIO

JOB# 22-1295

PROJECT:

LOCATION:

City of Ottawa

File Ref:

Date: 14 Aug 2025

Sheet No. 1 of 4

Calcualted Peak Flow to Robert Grand & Cranesbill Road Intersection

1295-Ph2_SAN.xlsx

DESIEF BREIF PH.2&3 - DSEL (OCT 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)
CABLE CAR CRESCENT																											
	120A	121A	0.44	21	57	0.44	57	3.6	0.67		0.00		0.00		0.00	0.00	0.44	0.44	0.15	0.82	94.5	200	1.05	33.61	0.02	1.07	0.44
To STATIONHOUSE WALK, Pipe 121A - 123A						0.44	57				0.00		0.00		0.00			0.44									
	122A	123A	0.52	21	57	0.52	57	3.6	0.67		0.00		0.00		0.00	0.00	0.52	0.52	0.17	0.84	89.5	200	0.85	30.24	0.03	0.96	0.41
To STATIONHOUSE WALK, Pipe 123A - 127A						0.52	57				0.00		0.00		0.00			0.52									
FAREBOX WAY																											
	118A	119A	0.43	19	51	0.43	51	3.7	0.60		0.00		0.00		0.00	0.00	0.43	0.43	0.14	0.75	91.5	200	1.05	33.61	0.02	1.07	0.43
To STATIONHOUSE WALK, Pipe 119A - 121A						0.43	51				0.00		0.00		0.00			0.43									
	114A	115A	0.27	8	22	0.27	22	3.7	0.26		0.00		0.00		0.00	0.00	0.27	0.27	0.09	0.35	52.5	200	0.65	26.44	0.01	0.84	0.29
	115A	116A				0.27	22	3.7	0.26		0.00		0.00		0.00	0.00	0.00	0.27	0.09	0.35	13.0	200	0.35	19.40	0.02	0.62	0.23
	116A	117A	0.30	9	25	0.57	47	3.7	0.56		0.00		0.00	0.07	0.07	0.01	0.37	0.64	0.21	0.78	85.5	200	0.35	19.40	0.04	0.62	0.30
To STATIONHOUSE WALK, Pipe 117A - 119A						0.57	47				0.00		0.00		0.07			0.64									
STATIONHOUSE WALK																											
Contribution From FAREBOX WAY, Pipe 116A - 117A						0.57	47				0.00		0.00		0.07		0.64	0.64									
	117A	119A	0.11		0	0.68	47	3.7	0.56		0.00		0.00		0.07	0.01	0.11	0.75	0.25	0.82	74.5	200	0.35	19.40	0.04	0.62	0.30
Contribution From WHISTLE POST WAY, Pipe 105A - 119A						0.15	7				0.00		0.00		0.00		0.15	0.90									
Contribution From FAREBOX WAY, Pipe 118A - 119A						0.43	51				0.00		0.00		0.00		0.43	1.33									
	119A	121A	0.07		0	1.33	105	3.6	1.22		0.00		0.00		0.07	0.01	0.07	1.40	0.46	1.69	48.0	200	0.35	19.40	0.09	0.62	0.37
Contribution From CABLE CAR CRESCENT, Pipe 120A - 121A						0.44	57				0.00		0.00		0.00		0.44	1.84									
	121A	123A	0.08		0	1.85	162	3.5	1.86		0.00		0.00		0.07	0.01	0.08	1.92	0.63	2.51	48.0	200	0.35	19.40	0.13	0.62	0.42
Contribution From CABLE CAR CRESCENT, Pipe 122A - 123A						0.52	57				0.00		0.00		0.00		0.52	2.44									
	123A	127A	0.11		0	2.48	219	3.5	2.49		0.00		0.00		0.07	0.01	0.11	2.55	0.84	3.34	70.0	200	0.35	19.40	0.17	0.62	0.46
To MONORAIL ROAD, Pipe 127A - 35A						2.48	219				0.00		0.00		0.07			2.55									
BLOCK 145 (PARK 1)																											
	125A	126A				0.00					0.00		0.00	0.99	0.99	0.16	0.99	0.99	0.33	0.49	11.0	200	0.65	26.44	0.02	0.84	0.32
To MONORAIL ROAD, Pipe 126A - 127A						0.00	0				0.00		0.00		0.99			0.99									
MONORAIL ROAD																											
	124A	126A	0.29	8	22	0.29	22	3.7	0.26		0.00		0.00		0.00	0.00	0.29	0.29	0.10	0.36	68.0	200	0.65	26.44	0.01	0.84	0.29
Contribution From BLOCK 145 (PARK 1), Pipe 125A - 126A						0.00	0				0.00		0.00		0.99		0.99	1.28									
	126A	127A	0.24	8	22	0.53	44	3.7	0.52		0.00		0.00		0.99	0.16	0.24	1.52	0.50	1.18	50.0	200	0.35	19.40	0.06	0.62	0.34
Contribution From STATIONHOUSE WALK, Pipe 123A - 127A						2.48	219				0.00		0.00		0.07		2.55	4.07									
	127A	35A	0.46	14	38	3.47	301	3.5	3.38		0.00		0.00		1.06	0.17	0.46	4.53	1.49	5.04	82.0	200	0.35	19.40	0.26	0.62	0.52
	35A	74245A				3.47	301	3.5	3.38		0.00		0.00		1.06	0.17	0.00	4.53	1.49	5.04	20.8	200	0.35	19.40	0.26	0.62	0.52
FAREBOX WAY																											
	100A	101A	0.78	16	54	0.78	54	3.6	0.64		0.00		0.00		0.00	0.00	0.78	0.78	0.26	0.90	94.0	200	0.65	26.44	0.03	0.84	0.39
	101A	102A	0.84	16	54	1.62	108	3.6	1.26		0.00		0.00		0.00	0.00	0.84	1.62	0.53	1.79	94.0	200	0.35	19.40	0.09	0.62	0.39
	102A	103A	0.18	2	7	1.80	115	3.6	1.33		0.00		0.00		0.00	0.00	0.18	1.80	0.59	1.93	14.5	200	0.35	19.40	0.10	0.62	0.39
	103A	104A	0.29	5	17	2.09	132	3.6	1.53		0.00		0.00		0.00	0.00	0.29	2.09	0.69	2.22	63.0	200	0.35	19.40	0.11	0.62	0.41
	104A	108A				2.09	132	3.6	1.53		0.00		0.00		0.00	0.00	0.00	2.09	0.69	2.22	9.0	200	0.35	19.40	0.11	0.62	0.41
To WHISTLE POST WAY, Pipe 108A - 109A						2.09	132				0.00		0.00		0.00			2.09									

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: **14 Aug 2025**

Sheet No: 2 of 4

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-08-15
PROVINCE OF ONTARIO

JOB# 22-1295

DESIEF BREIF PH.2&3 - DSEL (OCT 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)
WHISTLE POST WAY																											
	105A	119A	0.15	2	7	0.15	7	3.7	0.08		0.00		0.00		0.00	0.00	0.15	0.15	0.05	0.13	25.0	200	0.65	26.44	0.01	0.84	0.22
To STATIONHOUSE WALK, Pipe 119A - 121A						0.15	7				0.00		0.00		0.00			0.15									
	105A	106A	0.57	12	41	0.57	41	3.7	0.49		0.00		0.00		0.00	0.00	0.57	0.57	0.19	0.68	74.0	200	0.85	30.24	0.02	0.96	0.39
	106A	107A	0.60	13	44	1.17	85	3.6	0.99		0.00		0.00		0.00	0.00	0.60	1.17	0.39	1.38	74.0	200	0.45	22.00	0.06	0.70	0.38
	107A	108A	0.22	4	14	1.39	99	3.6	1.15		0.00		0.00		0.00	0.00	0.22	1.39	0.46	1.61	34.5	200	0.35	19.40	0.08	0.62	0.37
Contribution From FAREBOX WAY, Pipe 104A - 108A						2.09	132				0.00		0.00		0.00		2.09	3.48									
	108A	109A	0.12	2	7	3.60	238	3.5	2.70		0.00		0.00		0.00	0.00	0.12	3.60	1.19	3.88	25.5	200	0.35	19.40	0.20	0.62	0.48
	109A	110A	0.24	2	7	3.84	245	3.5	2.77		0.00		0.00		0.00	0.00	0.24	3.84	1.27	4.04	46.0	200	0.35	19.40	0.21	0.62	0.48
To FREIGHTLINE TERRACE, Pipe 110A - 111A						3.84	245				0.00		0.00		0.00			3.84									
FREIGHTLINE TERRACE																											
	130A	131A	0.77	4	14	0.77	14	3.7	0.17		0.00		0.00		0.00	0.00	0.77	0.77	0.25	0.42	55.5	200	0.65	26.44	0.02	0.84	0.30
	131A	132A	0.42	7	24	1.19	38	3.7	0.45		0.00		0.00		0.00	0.00	0.42	1.19	0.39	0.84	84.5	200	0.35	19.40	0.04	0.62	0.31
	132A	133A	0.39	6	20	1.58	58	3.6	0.68		0.00		0.00		0.00	0.00	0.39	1.58	0.52	1.21	84.5	200	0.35	19.40	0.06	0.62	0.34
To CRANESBILL ROAD, Pipe 133A - 136A						1.58	58				0.00		0.00		0.00			1.58									
Contribution From WHISTLE POST WAY, Pipe 109A - 110A						3.84	245				0.00		0.00		0.00		3.84	3.84									
			0.30	14	38	4.14	283				0.00		0.00		0.00		0.30	4.14									
	110A	111A	0.59	10	34	4.73	317	3.5	3.55		0.00		0.00		0.00	0.00	0.59	4.73	1.56	5.11	113.0	200	0.35	19.40	0.26	0.62	0.52
			0.05	1	3	4.78	320				0.00		0.00		0.00		0.05	4.78									
	111A	112A	0.16	1	3	4.94	323	3.5	3.61		0.00		0.00		0.00	0.00	0.16	4.94	1.63	5.24	16.5	200	0.35	19.40	0.27	0.62	0.52
	112A	20A				4.94	323	3.5	3.61		0.00		0.00		0.00	0.00	0.00	4.94	1.63	5.24	24.0	200	0.50	23.19	0.23	0.74	0.59
BLOCK 100																											
	159A	153A	0.52		59	0.52	59	3.6	0.70		0.00		0.00		0.00	0.00	0.52	0.52	0.17	0.87	13.5	200	0.65	26.44	0.03	0.84	0.38
To CIRCUIT CRESCENT, Pipe 153A - 154A						0.52	59				0.00		0.00		0.00			0.52									
CIRCUIT CRESCENT																											
	156A	157A				0.00					0.00		0.00	1.05	1.05	0.17	1.05	1.05	0.35	0.52	11.5	200	0.65	26.44	0.02	0.84	0.33
To TENDER'S PASS WALK, Pipe 157A - 25A						0.00	0				0.00		0.00		1.05			1.05									
Contribution From BLOCK 100, Pipe 159A - 153A						0.52	59				0.00		0.00		0.00		0.52	0.52									
	153A	154A	0.28	7	19	0.80	78	3.6	0.91		0.00		0.00		0.00	0.00	0.28	0.80	0.26	1.18	79.0	200	0.75	28.40	0.04	0.90	0.44
To TENDER'S PASS WALK, Pipe 154A - 157A						0.80	78				0.00		0.00		0.00			0.80									
	3001A	3002A	0.23	7	19	0.23	19	3.7	0.23		0.00		0.00		0.00	0.00	0.23	0.23	0.08	0.30	50.0	200	0.70	27.44	0.01	0.87	0.28
	3002A	155A	0.03	1	3	0.26	22	3.7	0.26		0.00		0.00		0.00	0.00	0.03	0.26	0.09	0.35	11.0	200	0.60	25.41	0.01	0.81	0.28
	155A	157A	0.50	18	49	0.76	71	3.6	0.83		0.00		0.00		0.00	0.00	0.50	0.76	0.25	1.08	85.5	200	0.95	31.97	0.03	1.02	0.47
To TENDER'S PASS WALK, Pipe 157A - 25A						0.76	71				0.00		0.00		0.00			0.76									
TENDER'S PASS WALK																											
	158A	25A	1.71		79	1.71	79	3.6	0.93	1.71	1.71		0.00		0.00	0.83	3.42	3.42	1.13	2.89	14.0	250	0.29	31.75	0.09	0.65	0.40
To IRON RANGE ROAD, Pipe 25A - 29A						1.71	79				1.71		0.00		0.00			3.42									
			0.35	7	24	0.35	24				0.00		0.00		0.00		0.35	0.35									
	151A	152A	0.39	16	44	0.74	68	3.6	0.80		0.00		0.00		0.00	0.00	0.39	0.74	0.24	1.04	104.5	200	0.65	26.44	0.04	0.84	0.41
			0.33	13	36	1.07	104				0.00		0.00		0.00		0.33	1.07									
	152A	154A	0.41	9	31	1.48	135	3.6	1.56		0.00		0.00		0.00	0.00	0.41	1.48	0.49	2.05	104.0	200	0.35	19.40	0.11	0.62	0.40

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

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025 08-15
PROVINCE OF ONTARIO

JOB# 22-1295

Designed:

Checked:

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

PROJECT:

LOCATION:
City of Ottawa

File Ref:

Date: 14 Aug 2025

Sheet No. 3 of 4

1295-Ph2_SAN.xlsx

DESIEF BREIF PH.2&3 - DSEL (OCT 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)
Contribution From CIRCUIT CRESCENT, Pipe 153A - 154A						0.80	78				0.00		0.00		0.00		0.80	2.28									
	154A	157A				2.28	213	3.5	2.42		0.00		0.00		0.00	0.00	0.00	2.28	0.75	3.18	70.0	200	0.35	19.40	0.16	0.62	0.45
Contribution From CIRCUIT CRESCENT, Pipe 155A - 157A						0.76	71				0.00		0.00		0.00		0.76	3.04									
Contribution From CIRCUIT CRESCENT, Pipe 156A - 157A						0.00	0				0.00		0.00		1.05		1.05	4.09									
	157A	25A				3.04	284	3.5	3.19		0.00		0.00		1.05	0.17	0.00	4.09	1.35	4.71	72.0	200	0.55	24.32	0.19	0.77	0.60
To IRON RANGE ROAD, Pipe 25A - 29A						3.04	284				0.00		0.00		1.05			4.09									
IRON RANGE ROAD																											
Contribution From TENDER'S PASS WALK, Pipe 157A - 25A						3.04	284				0.00		0.00		1.05		4.09	4.09									
Contribution From TENDER'S PASS WALK, Pipe 158A - 25A						1.71	79				1.71		0.00		0.00		3.42	7.51									
	25A	29A	0.20	5	14	4.95	377	3.4	4.19		1.71		0.00		1.05	1.00	0.20	7.71	2.54	7.73	46.4	250	0.25	29.73	0.26	0.61	0.51
	29A	74251A	0.27	7	19	5.22	396	3.4	4.39		1.71		0.00		1.05	1.00	0.27	7.98	2.63	8.02	62.2	250	0.25	29.73	0.27	0.61	0.51

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: 14 Aug 2025

Sheet No. 4 of 4

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-08-15
PROVINCE OF ONTARIO

1295-Ph2_SAN.xlsx

JOB# 22-1295

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 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:	PROJECT:		
Checked:	LOCATION: City of Ottawa		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.	File Ref:	Date: 09 May 2025	Sheet No. 1 of 7

1295_SAN-2025-05-09.xlsx

SANITARY SEWER CALCULATION SHEET

Block 13 Original Population & Peak Flow Estimate

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:

Checked:

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

PROJECT:

LOCATION:
City of Ottawa

File Ref:

Date: 09 May 2025

Sheet No. 2 of 7

SANITARY SEWER CALCULATION SHEET

Allocated Peak Flow to Robert Grand & Cranesbill Road Intersection

Manning's n=0.013

LOCATION: STREET	LOCATION: FROM M.H.	LOCATION: TO M.H.	RESIDENTIAL: AREA (ha)	RESIDENTIAL: UNITS	RESIDENTIAL: POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	COMM AREA (ha)	COMM ACCU. AREA (ha)	INSTIT AREA (ha)	INSTIT ACCU. AREA (ha)	PARK AREA (ha)	PARK ACCU. AREA (ha)	C+I+I PEAK FLOW (l/s)	INFILTRATION TOTAL AREA (ha)	INFILTRATION ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	PIPE DIST (m)	PIPE DIA (mm)	PIPE SLOPE (%)	PIPE 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			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. 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:

Checked:

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

PROJECT:

LOCATION: **City of Ottawa**

File Ref:

Date: **09 May 2025**

Sheet No. 4 of 7

1295_SAN-2025-05-09.xlsx

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

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	0.20	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

Robert Grant Capacity Downstream of Block 13

Peak Flow Discharge to Hazeldean

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

1295_SAN-2025-05-09.xlsx

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

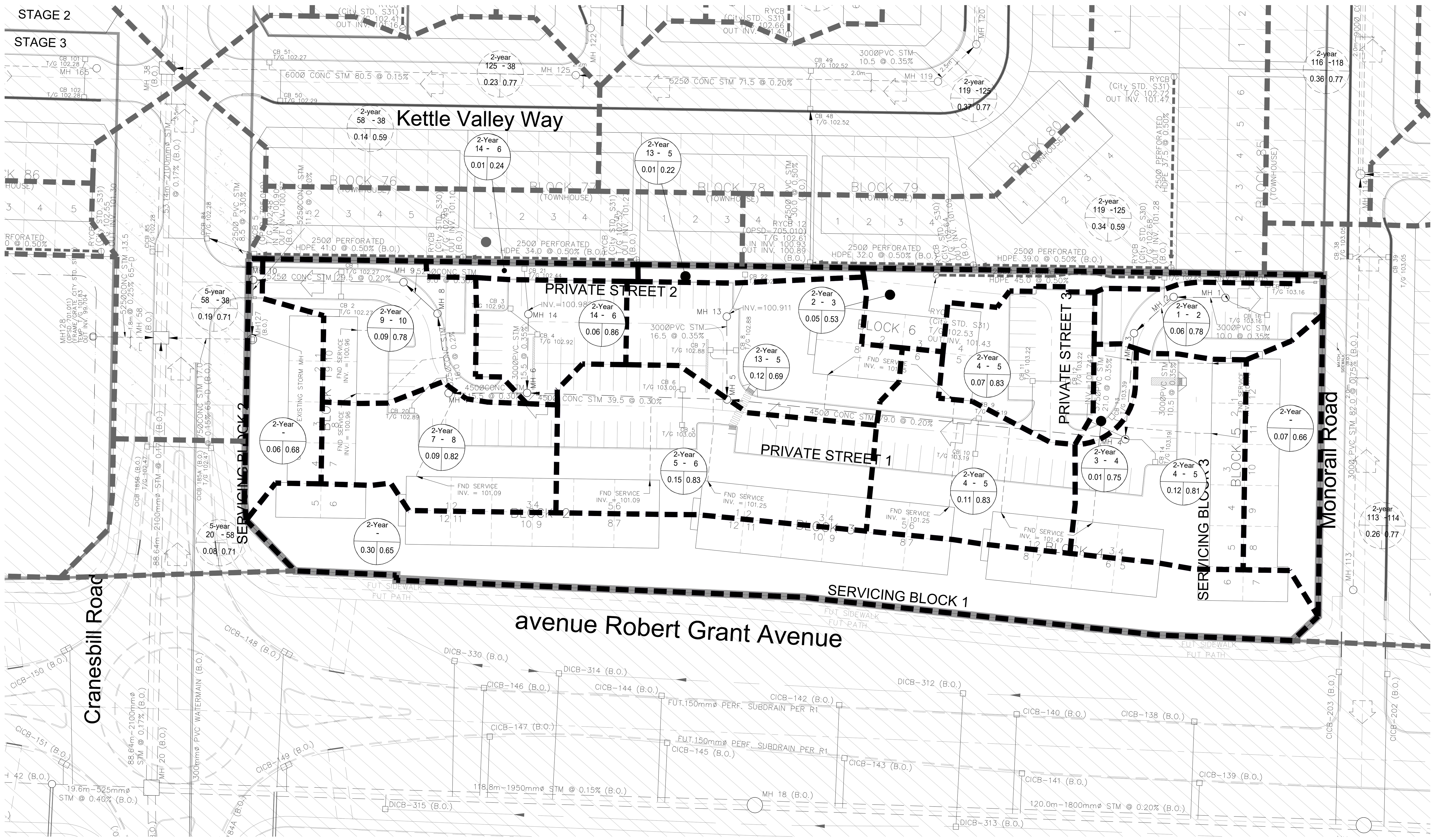
Park Flow =	9300	L/ha/da	0.10764	l/s/Ha			
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s
Max Res. Peak Factor =	4.00				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	

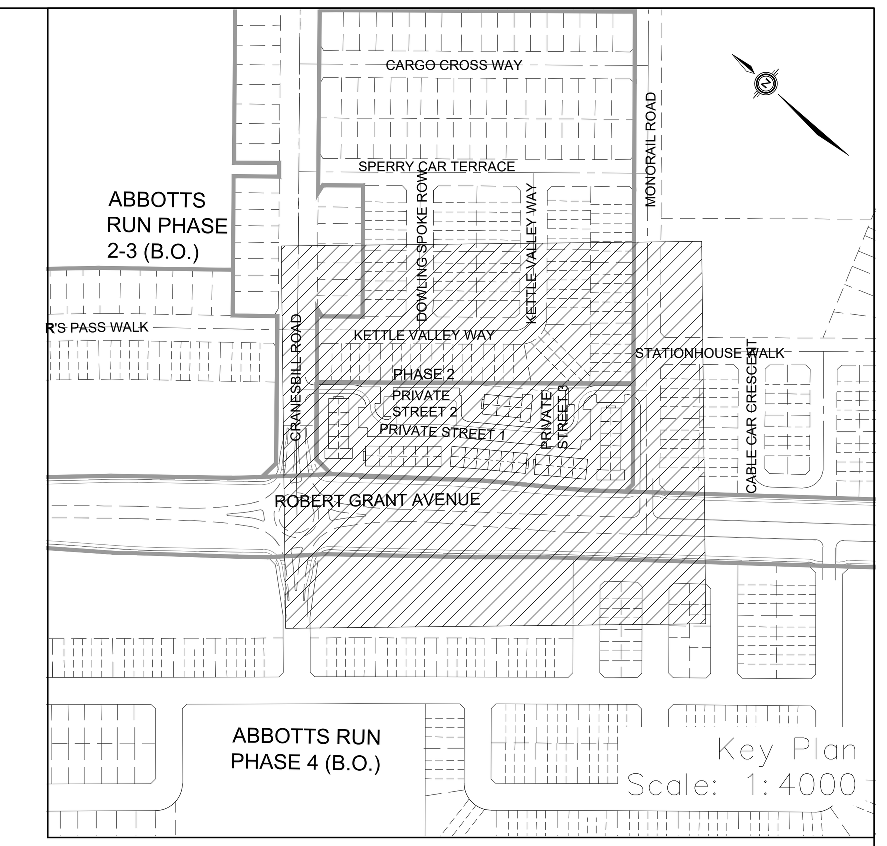
Designed:	PROJECT:		
Checked:	LOCATION: **City of Ottawa**		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No.	File Ref:	Date: **09 May 2025**	Sheet No. 7 of 7

APPENDIX D

Storm Servicing

- Storm Drainage Plan (DSEL, 2025-10-10)
- Storm Sewer Design Sheet (DSEL, 2025-10-17)
- Subdivision Markup Model (DSEL, 2025-10-06)
- Ponding Volume Table (DSEL, 2025-06-20)
- 100 Year Chicago 3HR HGL vs USF (DSEL, 2025-06-13)
- 100 Year + 20% Chicago 3 HR HGL vs USF (DSEL, 2025-06-13)
- 100 Year & 100 Year + 20% Chicago 3 HR Ponding Depth (DSEL, 2025-06-12)
- Adjacent Row Overland Flow Analysis – 100 Year Chicago 3 HR Block 13 & Subdivision Model (DSEL, 2025-10-07)
- Abbotts Run – Adjacent Row Ponding Depths Over Catchbasins (DSEL, 2025-10-07)
- EMP Excerpt for Water Balance Calculations (Novatech)





LEGEND

- STORM DRAINAGE BOUNDARY
- SUB-DRAINAGE BOUNDARY
- STORM DRAINAGE BOUNDARY (OTHER PHASES)
- STORM FREQUENCY — 2Yr
- UPSTREAM MH TO DOWNSTREAM MH — 43 - 44
- AREA IN HECTARES — 0.37
- RUNOFF COEFFICIENT — 0.51
- EXTERNAL 2.78AC = — 2.78AC=14.40
- EXTERNAL TIME OF CONCENTRATION — TC=14.5 MIN
- EXTERNAL BLENDED RUNOFF COEFFICIENT — C= 0.70
- EXTERNAL STORM FREQUENCY — 2YR
- STORM FREQUENCY — 2-year
- UPSTREAM MH TO DOWNSTREAM MH — 125 - 38
- AREA IN OTHER PHASES IN HECTARES — 0.23
- RUNOFF COEFFICIENT — 0.77
- STREET CATCHBASIN & LEAD
- STREET CATCHBASIN WITH CLOSED LID & LEAD
- MAINTENANCE HOLE — MH202
- CURB INLET CATCHBASIN & LEAD
- CATCHBASIN/ MAINTENANCE HOLE — CBMH201
- INTERCONNECTED CATCH BASIN & LEADS
- CAP
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EXISTING STORM MAINTENANCE HOLE

375mmø ST

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD. PROJECT NO. 21942-22 DATED SEPTEMBER 1, 2022

SITE PLAN INFORMATION

SITE PLAN PROVIDED BY SRN ARCHITECTS, DATED ON OCTOBER 20, 2025.

ELEVATION NOTE

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CGVD28 GEODETIC DATUM, DERIVED FROM VERTICAL CONTROL MONUMENT NO. BM88U502.

ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION
2	S.L.M	2025-10-24	2nd SUBMISSION
1	S.L.M	2025-06-20	1st SUBMISSION

CITY OF OTTAWA

PROJECT No. 1295_Block13

LICENSED PROFESSIONAL ENGINEER
S.L. MERRICK
100186523
2025-10-24
PROVINCE OF ONTARIO
JOB# 22-1295

Minto Group

ABBOTT'S RUN

BLOCK 13

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

© DSEL

STORM DRAINAGE PLAN

DRAWN BY: E.D.	CHECKED BY: S.L.M.	SHEET NO.
DESIGNED BY: E.D.	CHECKED BY: S.L.M.	16 OF 19
SCALE: 1:500	DATE: JUNE 2025	

CITY FILE No. D07-12-25-0089 CITY PLAN No.19356

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

Ottawa

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	9.0	235.5548	1.0881	0.1379	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	13.87	64.57	87.40	102.37	149.53	132	525	525	CONC	0.20	29.5	192.3297	0.8885	0.5534	0.686
To SERVICING BLOCK 2, Pipe 10 - 127(B.O)						2.04				0.00				0.00				0.00	14.42														
SERVICING BLOCK 2																																	
Contribution From PRIVATE STREET 1, Pipe 9 - 10						2.04				0.00				0.00				0.00	14.42														
	10	127(B.O)			0.00	2.04			0.00	0.00			0.00	0.00			0.00	0.00	14.42	63.17	85.47	100.10	146.20	129	525	525	CONC	0.20	11.5	192.3297	0.8885	0.2157	0.671
To EXISTING SERVICING NORTH, Pipe 127(B.O) - 58(B.O)						2.04				0.00				0.00				0.00	14.64														
EXISTING SERVICING NORTH																																	
Contribution From SERVICING BLOCK 2, Pipe 10 - 127(B.O)						2.04				0.00				0.00				0.00	14.64														
	127(B.O)	58(B.O)			0.00	2.04			0.00	0.00			0.00	0.00			0.00	0.00	14.64	62.64	84.75	99.25	144.95	128	525	525	CONC	0.20	17.0	192.3297	0.8885	0.3189	0.665

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

LICENSED PROFESSIONAL ENGINEER
S.L. MERRICK
100186523
2025-10-24
PROVINCE OF ONTARIO

Designed: E.D.	PROJECT:	ABBOTT'S RUN BLOCK 13		
Checked: S.M.	LOCATION:	City of Ottawa		
Dwg. Reference: 17	File Ref:	Date: 24 Oct 2025	Sheet No. SHEET 1 OF 1	

1295_STM.xlsx

JOB# 22-1295

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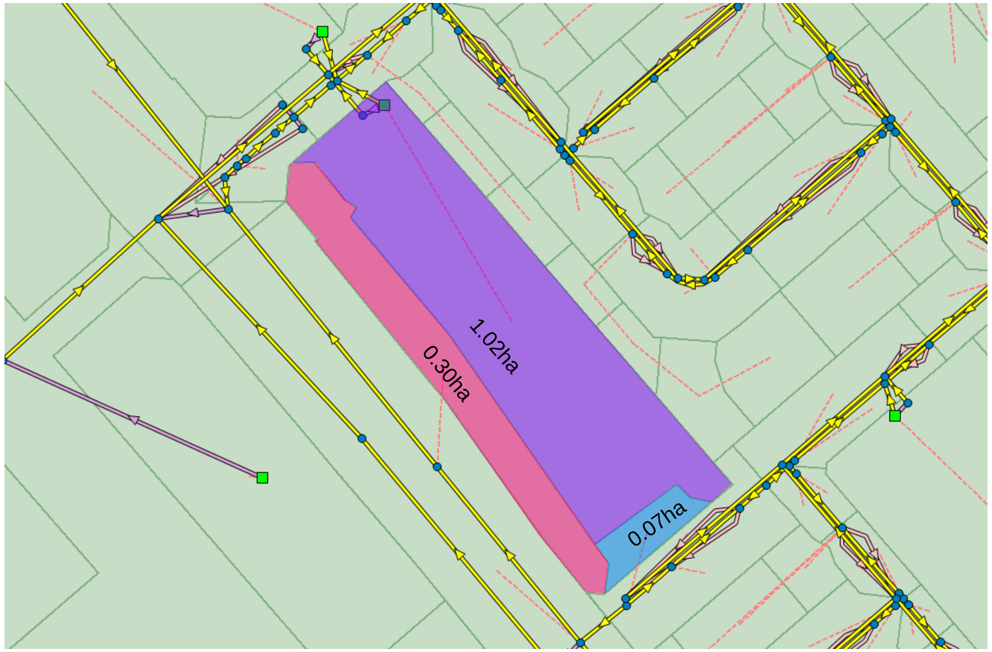
Markham, ON L3R 0E7

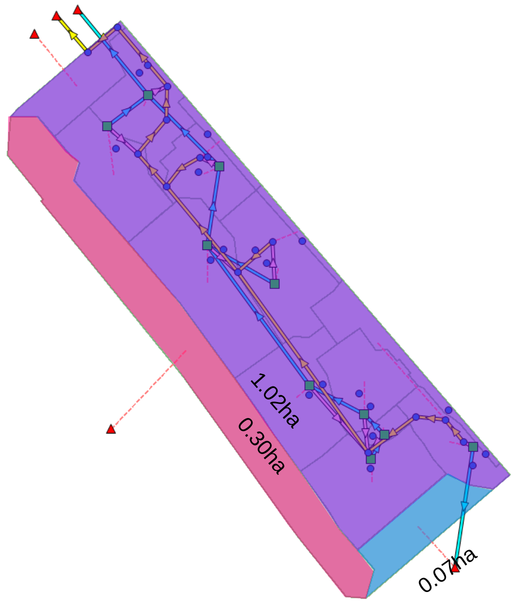
LEGEND

To Cranesbill
To Robert Grant
To Monorail

Subdivision model - scenario to address City Comment



Block 13 model



Project Name:	Abbot's Run- Block 13
Project Number:	1295
Designed By:	VM
Checked By:	-
Date:	2025-10-23

DSEL
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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-10-127	MH-10	MH-127				100.42	100.37	11.5		
STM-127-58	MH-127	MH-58				100.37	100.26	17		
STM-1-2	MH-1	MH-2				101.35	101.26	10.2		
STM-13-5	MH-13	MH-5				100.98	100.97	16.33		
STM-14-6	MH-14	MH-6				100.85	100.84	15.51		
STM-2-3	MH-2	MH-3				101.26	101.22	10.55		
STM-3-4	MH-3	MH-4	5-1	102.01	14.00	101.22	101.12	20.96	101.19	0.82
STM-4-5	MH-4	MH-5	3-6	101.80	41.10	101.12	100.97	78.78	101.05	0.75
STM-4-5	MH-4	MH-5	4-4	102.02	80.40	101.12	100.97	78.78	101.12	0.90
STM-5-6	MH-5	MH-6	2-6	101.64	23.50	100.97	100.84	39.39	100.92	0.72
STM-6-7	MH-6	MH-7				100.84	100.68	15.45		
STM-7-8	MH-7	MH-8	1-10	101.51	12.60	100.68	100.63	15.84	100.67	0.84
STM-8-9	MH-8	MH-9				100.63	100.59	9		
STM-9-10	MH-9	MH-10				100.59	100.42	29.5		

Project Name:	Abbot's Run- Block 13
Project Number:	1295
Designed By:	VM
Checked By:	-
Date:	2025-10-23

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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-10-127	MH-10	MH-127				100.46	100.37	11.5		
STM-127-58	MH-127	MH-58				100.37	100.26	17		
STM-1-2	MH-1	MH-2				101.47	101.46	10.2		
STM-13-5	MH-13	MH-5				101.18	101.17	16.33		
STM-14-6	MH-14	MH-6				101.01	100.99	15.51		
STM-2-3	MH-2	MH-3				101.46	101.43	10.55		
STM-3-4	MH-3	MH-4	5-1	102.01	14.00	101.43	101.35	20.96	101.40	0.61
STM-4-5	MH-4	MH-5	3-6	101.80	41.10	101.35	101.17	78.78	101.26	0.54
STM-4-5	MH-4	MH-5	4-4	102.02	80.40	101.35	101.17	78.78	101.35	0.67
STM-5-6	MH-5	MH-6	2-6	101.64	23.50	101.17	100.99	39.39	101.10	0.54
STM-6-7	MH-6	MH-7				100.99	100.78	15.45		
STM-7-8	MH-7	MH-8	1-10	101.51	12.60	100.78	100.71	15.84	100.77	0.74
STM-8-9	MH-8	MH-9				100.71	100.66	9		
STM-9-10	MH-9	MH-10				100.66	100.46	29.5		

Project Name:	Abbott’s Run - Block 13
Project Number:	1295
Designed By:	VM
Checked By:	-
Date:	23-Oct-25

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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	0.00	0.32	0.35	0.083
PA-10	CB_20		0.00	0.16	0.18	0.094
PA-2	CB_3	CB_4	0.00	0.13	0.18	0.083
PA-3	CB_7	CB_8	0.00	0.22	0.43	0.083
PA-4	CB_5	CB_6	0.00	0.22	0.30	0.108
PA-5	CB_9	CB_10	0.00	0.18	0.26	0.094
PA-6	CB_11	CB_12	0.00	0.10	0.14	0.083
PA-7	CB_13		0.00	0.00	0.16	0.094
PA-8	CB_14		0.00	0.29	0.43	0.094
PA-9	CB_15	CB_16	0.00	0.01	0.09	0.102

PH 2 & 3 Subdivision Model Check

Project Name:	Abbott's Run
Project Number:	1295
Designed By:	JC
Checked By:	VM
Date	Oct 7 2025

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ADJACENT ROW OVERLAND FLOW ANALYSIS - 100yr Chicago 3hr

Conduit Name	Inlet Junction	Outlet Junction	Transect	Max/Full Depth *	Max Depth (m)	Max. Velocity (m/s)	Depth x Velocity (m^2/s)
Subdivision Model - Scenario to Address City Comment (Block 13 divided into 3 subcatchments)							
C14	HP003	J018	22mROW_CranesbillRd	0.05	0.03	0.00	0.00
C15	J018	J019	22mROW_CranesbillRd	0.10	0.06	0.52	0.03
C16	J019	J020	22mROW_CranesbillRd	0.10	0.06	0.52	0.03
C17	J020	J014	22mROW_CranesbillRd	0.09	0.05	0.74	0.04
C12	J014	J015	22mROW_CranesbillRd	0.11	0.07	0.39	0.03
C186	J015	J016	22mROW_CranesbillRd	0.16	0.10	0.41	0.04
C187	J016	LP003	22mROW_CranesbillRd	0.17	0.10	0.72	0.07
26	P1-07S	P1-09S	27mROW_RobertGrantAve	0.23	0.14	0.63	0.08
C243	J164	LP010	18mROW	0.16	0.10	0.61	0.06
C244	HP009	J164	18mROW	0.10	0.06	0.54	0.03
16	HP009	P1-07S	18mROW	0.13	0.08	0.87	0.07

* Major system depth is 0.60m for the entire study area

PH 2 & 3 Subdivision Model Check

Project Name:	Abbott's Run
Project Number:	1295
Designed By:	JC
Checked By:	VM
Date:	07-Oct-25

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Markham, ON L3R 0E7

Adjacent ROW

Ponding Depths Over Catchbasins: Scenario to Address City Comment

ICD ID	Junction ID	Applied ICD (mm)	2yr Depth Over CB (m)	5yr Depth Over CB (m)	10yr Depth Over CB (m)	100yr Depth Over CB (m)	100yr + 20% Depth Over CB (m)
10-year Catchbasins: Robert Grant Avenue							
OP1-07	P1-07S	N/A	0.00	0.00	0.00	0.00	0.00
OP1-09	P1-09S	N/A	0.00	0.00	0.00	0.00	0.00
5-Year On-Grade Catchbasins: Cranesbill Road							
ICD-CB_185A	CB_185A	83	0.02	0.03	0.03	0.04	0.05
ICD-CB_185B	CB_185B	83	0.02	0.03	0.03	0.04	0.05
5-year In-Sag Catchbasins: Cranesbill Road							
ICD-CB_84	LP003	250	0.00	0.00	0.00	0.05	0.22
ICD-CB_85	LP003	250	0.00	0.00	0.00	0.05	0.22
2-year In-Sag Catchbasins: Monorail Road							
ICD-CB_38	LP010	83	0.00	0.07	0.09	0.13	0.14
ICD-CB_39	LP010	108	0.00	0.07	0.09	0.13	0.14

APPENDIX G

BEST MANAGEMENT PRACTICES MODELING / WATER BALANCE CALCULATIONS

BMP Modeling Sample Calculation - Carp River Subwatershed
Figure G-1: Distribution of Runoff for Low Density Residential Lots
Figure G-2: Distribution of Runoff for Medium Density Residential Lots

Water Balance Parameters
Water Balance Results - Carp River
Water Balance Results - Faulkner Drain
Water Balance Results - Flewellyn Drain
Water Balance Results - Monahan Drain

Carp River Subwatershed: Methodology used to model perforated pipes
Example Calculations - Post-Development Drainage Areas to Pond1

SWMHYMO METHODOLOGY:
(MOE Stormwater Management Planning and Design Manual, March 2003 - section 4.9)

<u>Method used to determine the portion of runoff infiltrated using perforated pipes:</u>

Step 1: **Calculate proportion of 5yr and 100yr peak flows for each land use within catchment P1 (using the Rational Method)**

$Q = 2.78\ CIA$ $\qquad I_5 = 85.60$ mm/hr (15 min tc)

$I_{100} = 146.80$ mm/hr (15 min tc)

Pond 1	Mixed Use	Commercial	Major Road	Schools	High Density	Medium Density*	Low Density*	Parks*	Open Space	Total
Area (ha)	11.06	0.61	8.3	9.13	0.00	20.49	22.36	2.42	2.76	74.39
C value	0.80	0.80	0.70	0.60	0.70	0.60	0.50	0.40	0.20	0.61
2.78 AC	24.60	1.36	16.15	15.23	0.00	34.18	31.08	2.69	1.53	126.82
Q_5 (L/s)	2,055	113	1,350	1,273	0	**2,856**	**2,597**	**225**	128	10,597
Q_{100} (L/s)	3,515	194	2,308	2,176	0	**4,884**	**4,441**	**385**	219	18,121

Areas and Runoff Coefficients from storm sewer design sheets (refer to Master Drainage Plan)
** A portion of flow from these areas is directed to perforated pipe system*

Step 2: **Split runoff from P1 into flows going to the perforated pipes (parks/rearyards) and flows to the conventional storm system.**

35% of runoff from low/medium density residential areas directed to rearyard swales /perforated pipe system (refer to Figures G-1 and G-2)
36% of runoff from parks directed to swales / perforated pipe system.
All runoff from remaining areas (roads, commercial, mixed use, schools, etc.) to conventional sewer system.

$$Q_{5\text{ (perf pipes)}} = 0.35(Q_{\text{medium density}} + Q_{\text{low density}}) + 0.36(Q_{\text{parks}})$$
$$= 0.35 \times (2856\text{ L/s} + 2597\text{ L/s}) + 0.36 \times (225\text{ L/s})$$
$$= 1989\text{ L/s}$$

Overall percentage of flow from catchment P1 to perforated pipe system:

$$\%\text{ Perf Pipes} = Q_{5\text{ (perf pipes)}} / Q_{5\text{ (total)}}$$
$$= 1{,}989\text{ Lps} / 10{,}597\text{ Lps}$$
$$= 0.1877$$
$$= 18.8\%$$

Therefore, 18.8% of the total runoff from catchment P1 will be directed to the perforated pipe systems.
Use the DIVERT HYD command to split flows between the perforated pipe system (18.8%) and the conventional sewer system (81.2%).

Step 3: **Use MOE equation 4.18 to split flows that are conveyed through the pervious pipes and flows that are exfiltrated into the storage/infiltration media.**

$$Q_{exfl} = Q_{in}\,(15A - 0.06S + 0.33)$$
$$= Q_{in}\,[15(0.0032) - 0.06(0.5) + 0.33]$$
$$= 0.348Q_{in}$$

where A = area of perforations per metre of pipe
= 0.0032 m^2/m (HDPE perforated pipes 300mm - Hancor (TN 1.02, April 2007))
S = Slope of perforated pipe
= 0.5% (assumed)

Therefore, 34.8% of flow through perforated pipes is exfiltrated to storage/infiltration media, and 65.2% is conveyed through to conventional sewers.
Use the DIVERT HYD to model the conveyance/exfiltration ratio in SWMHYMO.

Carp River Subwatershed: Methodology used to model perforated pipes
Example Calculations - Post-Development Drainage Areas to Pond1

Step 4: **Use MOE equation 4.17 to calculate infiltration rate from storage media.**

Flow out of storage media (infiltration trench) represents infiltration into the native soil
Overflows will occur when the infiltration trench storage is full and runoff continues through the perforated pipes to the minor system

$Q = f \times (P/3\,600\,000) \times (2LD + 2\,WD + LW) \times n$
$V = L\,W\,D \times n \times f$

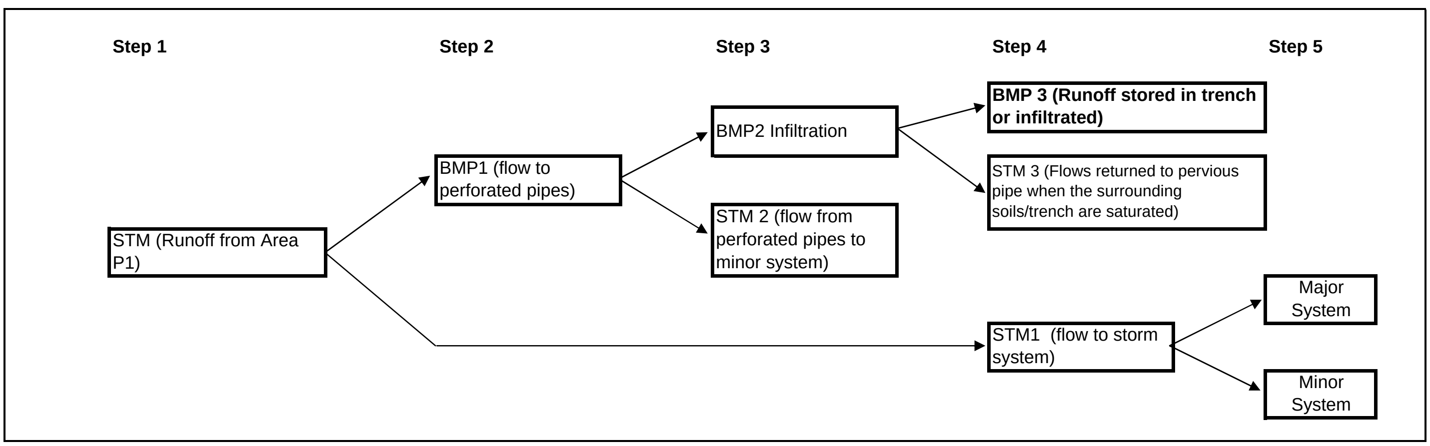
Q = flow rate (m^3/s) for a given storage volume
f = longevity factor - 0.5 (table 4.12 MOE Stormwater Management Planning and Design Manual, March 2003)
P = native soil percolation rate (assume 15mm/h based on soil type)
L = approximate length of pervious pipe in catchment (m)
W = width of pipe trench in (m)
D = depth of water in pipe trench (m)
V = volume of water in pipe trench (m)
n = void space in the trench storage layer

Use the ROUTE RESERVOIR command in SWMHYMO to model infiltration / overflow to conventional sewers.

Step 5: **Split flows in the conventional storm system into minor and major systems.**

Minor System Flow:	6.84	m^3/s	(85 L/s/ha)
Major System Storage:	4,021	m^3	(50 m^3/ha)

Use the COMPUTE DUALHYD command in SWMHYMO to split flows to conventional storm system into minor and major systems



BMP 3 represents the total reduction in runoff volume to the storm sewer system from infiltration through perforated pipes,
all other flows are added together and directed to SWM Facility 1.

Carp River Subwatershed: Methodology used to model perforated pipes
Example Calculations - Post-Development Drainage Areas to Pond1

EXAMPLE CALCULATIONS:

Step 1 - Split flows based on direction of runoff

18.8% of flow to perforated pipes
81.2% of flow to stormwater system

Q_{total} = Total runoff form drainage area

Q_{BMP1} = Flow to perforated pipes
= 0.196 x Q_{total}

Q_{STM1} = Flow to storm sewers
= 0.804 x Q_{total}

DIVERT HYD

Q total m^3/s	Q BMP1 m^3/s	Q STM1 m^3/s
0.000	0.000	0.000
0.250	0.048	0.203
0.500	0.095	0.405
0.750	0.143	0.608
1.000	0.190	0.810
1.500	0.285	1.215
2.000	0.380	1.620
2.500	0.475	2.025
3.000	0.570	2.430
4.000	0.760	3.240
5.000	0.950	4.050
6.000	1.140	4.860
7.000	1.330	5.670

	QIDi	+	QIDii	=	QTOTAL	
[	0.000	+	0.000	=	0.00	]
[	0.048	+	0.203	=	0.25	]
[	0.095	+	0.405	=	0.50	]
[	0.143	+	0.608	=	0.75	]
[	0.190	+	0.810	=	1.00	]
[	0.285	+	1.215	=	1.50	]
[	0.380	+	1.620	=	2.00	]
[	0.475	+	2.025	=	2.50	]
[	0.570	+	2.430	=	3.00	]
[	0.760	+	3.240	=	4.00	]
[	0.950	+	4.050	=	5.00	]
[	1.140	+	4.860	=	6.00	]
[	1.330	+	5.670	=	7.00	]

Step 2 - Exfiltration Discharge

$Q_{BMP2} = Q_{BMP1}\,(15A - 0.06S + 0.33)$
A = 0.0021 m^2/m
S = 0.5 %

Q_{BMP1} = Flow to perforated pipes
Q_{BMP2} = Flow exfiltrated from perforated pipes
Q_{STM2} = Flow which is not exfiltrated through perforations and is conveyed to the minor system

DIVERT HYD

Q BMP1 m^3/s	Q BMP2 m^3/s	Q STM2 m^3/s
0.000	0.000	0.000
0.048	0.016	0.032
0.095	0.031	0.064
0.143	0.047	0.095
0.190	0.063	0.127
0.285	0.094	0.191
0.380	0.126	0.254
0.475	0.157	0.318
0.570	0.189	0.381
0.760	0.252	0.508
0.950	0.315	0.635
1.140	0.378	0.762
1.330	0.441	0.889

	QIDi	+	QIDii	=	QTOTAL	
[	0.000	+	0.000	=	0.00	]
[	0.016	+	0.032	=	0.05	]
[	0.031	+	0.064	=	0.10	]
[	0.047	+	0.095	=	0.14	]
[	0.063	+	0.127	=	0.19	]
[	0.094	+	0.191	=	0.29	]
[	0.126	+	0.254	=	0.38	]
[	0.157	+	0.318	=	0.48	]
[	0.189	+	0.381	=	0.57	]
[	0.252	+	0.508	=	0.76	]
[	0.315	+	0.635	=	0.95	]
[	0.378	+	0.762	=	1.14	]
[	0.441	+	0.889	=	1.33	]

Equation 4.18 - MOE Stormwater Management Planning and Design Manual, March 2003

Step 3 - Rating Curve for Exfiltrated Water

V = LWD x n x f
V_{max} = 0.0430
Qexfil = f x (P/360 0000) x (2LD + 2WD + LW) x n

L	8608	m
W	0.5	m
D	0.5	m
n	0.4	
f	0.5	
P	15	mm/ha

ROUTE RESERVOIR

Depth (m)	Storage (ha)	Exfil (m^3/s)
0.1	0.0086	0.0050
0.2	0.0172	0.0065
0.3	0.0258	0.0079
0.4	0.0344	0.0093
0.5	0.0430	0.0108

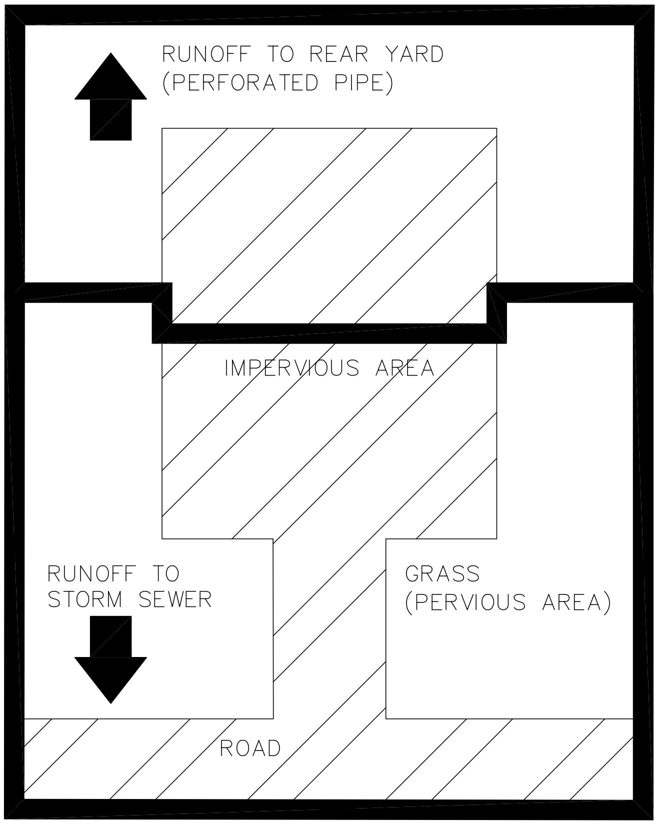
	(cms)	-	(ha-m)	
[	0	,	0	]
[	0.0050	,	0.0086	]
[	0.0065	,	0.0172	]
[	0.0079	,	0.0258	]
[	0.0093	,	0.0344	]
[		,	0.0430	]
[	-1	,	-1	]

IDovf=[8], NHYDovf=["P1STM3"]

Equation 4.17 - MOE Stormwater Management Planning and Design Manual, March 2003

Storage = Flow stored in the trench and surrounding soil
Exfil = Flow which exfiltrates from the perforated pipes into the surrounding soil
Overflow = Once the trench and surrounding soil are saturated water will not exfiltrate through the perforations, this water will be conveyed to the minor system

TYPICAL LOW DENSITY RESIDENTIAL LOT



LOW DENSITY RESIDENTIAL LOT

SPLIT LOT WITH
- 35% OF LOT AREA TO REAR YARD
- HALF OF ROOF AREA TO REAR YARD

(PER CITY OF OTTAWA SEWER DESIGN GUIDELINES, NOV 2004)

Area (m^2)	C	Proposed land use
1186	0.50	Lot
447.3	0.46	Rear yard
738.7	0.53	Front Yard
	0.50	Weighted Average C

Distribution of runoff

I = 83.56 mm/hr
Q = 2.78 CiA

Q (Total) = 2.78 x 0.50 x 83.56 x 0.1186
= 13.77 L/s

Q (Rear yards) = 2.78 x 0.46 x 83.56 x 0.0447
= 4.73 L/s
= 34.3% of total runoff

Q (Front yards) = 2.78 x 0.53 x 83.56 x 0.0739
= 9.04 L/s
= 65.7% of total runoff

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FERNBANK - EMP

DISTRIBUTION OF RUNOFF FOR LOW DENSITY RESIDENTIAL LOTS

MARCH 25 2009 | 101108 | FIGURE G-1

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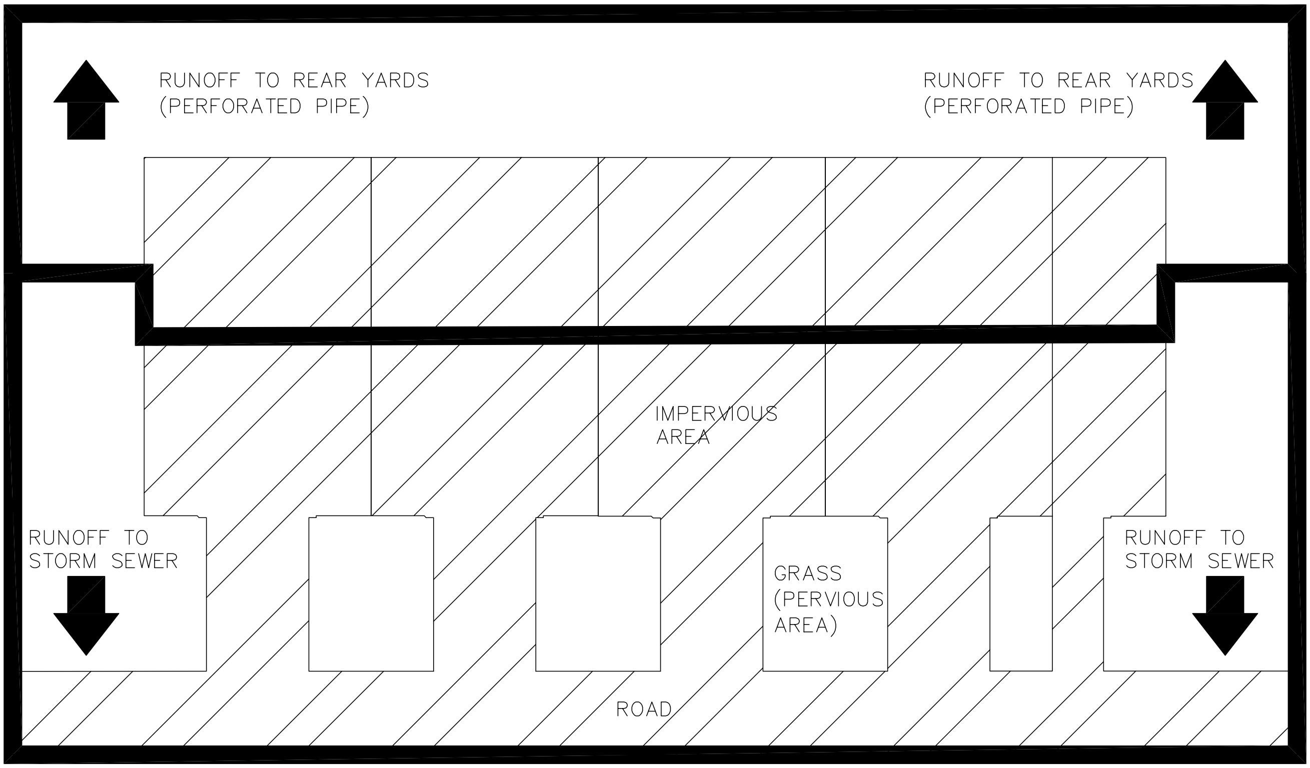
SHT8X11.DWG - 216mmX278mm

TYPICAL MEDIUM DENSITY RESIDENTIAL LOT



MEDIUM DENSITY RESIDENTIAL LOT

SPLIT LOT WITH
- 35% OF LOT AREA TO REAR YARD
- HALF OF ROOF AREA TO REAR YARD

(PER CITY OF OTTAWA SEWER DESIGN GUIDELINES, NOV 2004)

Area (m^2)	C	Proposed land use
2749	0.60	Lot
1145.7	0.52	Rear yard
1603.3	0.66	Front Yard
	0.60	Weighted Average C

Distribution of runoff

I = 83.56 mm/hr
Q = 2.78 CiA

Q (Total) = 2.78 x 0.60 x 83.56 x 0.2749
= 38.4 L/s

Q (Reare yards) = 2.78 x 0.52 x 83.56 x 0.1146
= 13.9 L/s
= 36.3% of total runoff

Q (Front yards) = 2.78 x 0.66 x 83.56 x 0.1603
= 24.5 L/s
= 63.7% of total runoff

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DISTRIBUTION OF RUNOFF FOR MEDIUM DENSITY RESIDENTIAL LOTS

MARCH 25 2009 | 101108 | FIGURE G-2

SHT8X11.DWG - 216mmX278mm