120 Iber Road, Suite 103
Ottawa, Ontario K2S 1E9
Tel. (613)836-0856
Fax (613) 836-7183
www.DSEL.ca

# DESIGN BRIEF

## FOR

# MINTO COMMUNITIES–ABBOTT'S RUN BLOCK 13

CITY OF OTTAWA

PROJECT NO.: 22-1295.1

JUNE 2025
SUBMISSION 1

# DESIGN BRIEF
# FOR ABBOTT'S RUN BLOCK 13
# MINTO COMMUNITIES

## TABLE OF CONTENTS

## IN-TEXT FIGURES



## TABLES

# APPENDICES

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

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

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

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

# DESIGN BRIEF
# FOR
# ABBOTT'S RUN BLOCK 13
# 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.

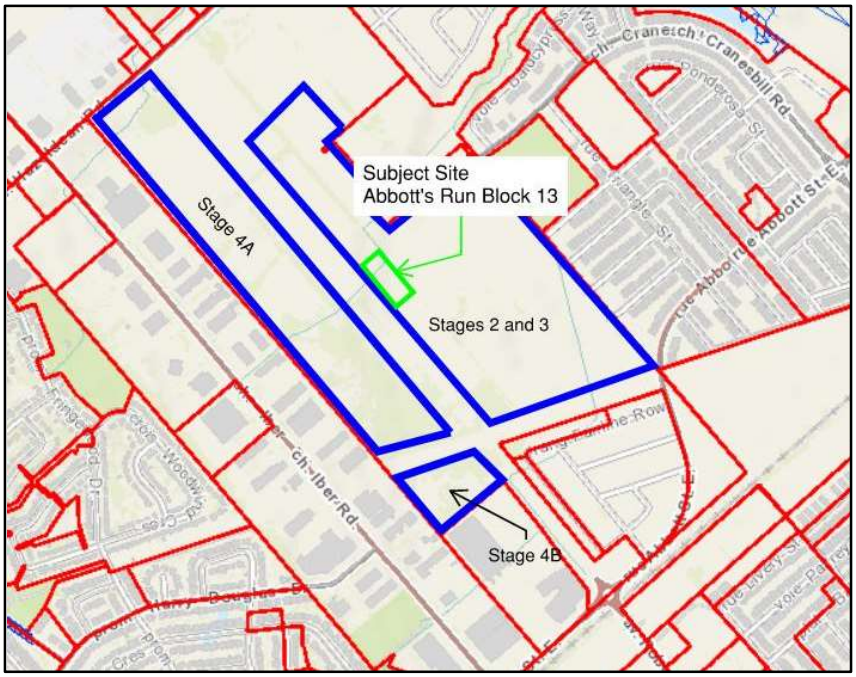



**Figure 1.1: Site Location**

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

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

## 1.1 Development Concept

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

**Table 1.1: Development Statistic Projections**

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

## 1.2 Existing Conditions

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

## 1.3 Required Permits / Approvals

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

**Table 1.2: Anticipated Permit/Approval Requirements**

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

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

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

## 1.4 Pre-Consultation

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

# 2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

## 2.1 Existing Studies, Guidelines, and Reports

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

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

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

# 3.0 WATER SUPPLY SERVICING

## 3.1 Existing Water Supply Services

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

## 3.2 Water Supply Servicing Design

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

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

**Table 3.1: Water Supply Design Criteria**

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

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

*Notes:*

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

### 3.2.1 Watermain Modelling

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

**Table 3.2 Water Demands**

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

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

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

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

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

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

**Table 3.3: Boundary Conditions**

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

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

**Table 3.4: Summary of Available Service Pressures**

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

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

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

## 3.3 Water Supply Conclusion

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

# 4.0 WASTEWATER SERVICING

## 4.1 Existing Wastewater Services

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

## 4.2 Wastewater Design

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

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

**Table 4.1: Wastewater Design Criteria**

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

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

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

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

**Table 4.2: Wastewater Peak Flow**

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

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

## 4.3 Wastewater Servicing Conclusions

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

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

# 5.0 STORMWATER MANAGEMENT

## 5.1 Existing Stormwater Drainage

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

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


**Figure 5.1 Existing Drainage Features**

## 5.2 Stormwater Management Criteria

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

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

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

## 5.3 Stormwater Management Strategy

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

### 5.3.1 Minor System

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

**Table 5.1 Stormwater Management Standards**

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

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

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

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

### 5.3.2 Hydraulic Grade Line

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

The analysis was conducted using the design storms listed below:

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

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

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

### 5.3.3 Major System

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

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

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

### 5.3.4 Quality Control

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

## 5.4 Stormwater Management Calculations

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

**Table 5.2 Allowable Release Rates (1:100 year)**

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

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

## 5.5 Stormwater Servicing Conclusions

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

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

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

## 6.0 EROSION AND SEDIMENT CONTROL

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

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

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

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

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

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

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

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

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

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

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

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

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

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

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

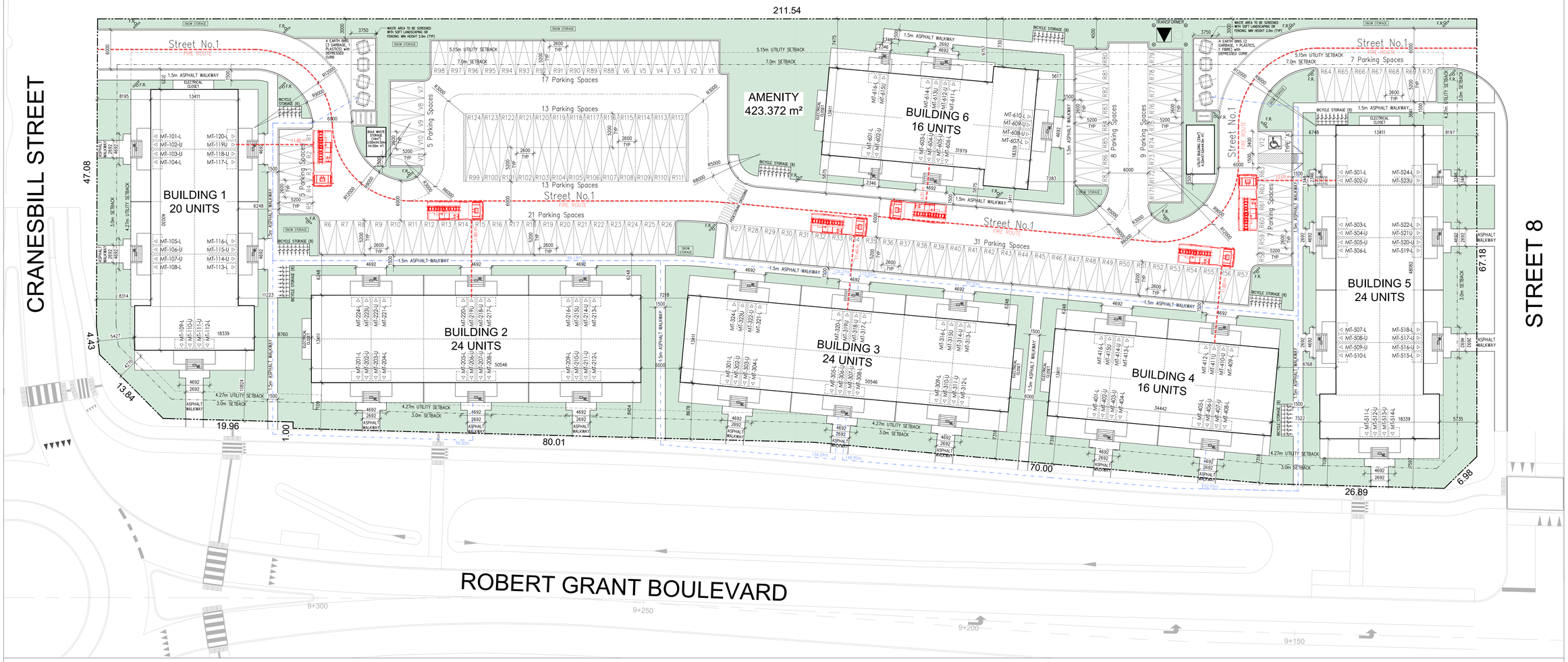
Prepared by,
**David Schaeffer Engineering Ltd.**

Per: Alexandra Marchese


Per: Alexandre Tourigny P.Eng.

# Appendix A

Site Plan (SRN, June 10, 2025)




1 / A100 ARCHITECTURAL SITE PLAN

SCALE: 1:250

## SITE STATISTICS

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

## LEGEND

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

SCALE=1:250

20 15 10 5 0 10 20

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 |

minto

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


**PRELIMINARY, NOT FOR CONSTRUCTION**
**ALL AREAS CALCULATIONS ARE PRELIMINARY**

| NO: | DATE: | REVISION COMMENT: |
|---|---|---|


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




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

PROJECT:
Abbott's Run
Block 13
Ottawa, Ontario

DRAWING TITLE:
SITE PLAN

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

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

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

## Average Site Population Density by Outlet

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

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

# Appendix B

Average Day Demand Figure

Max Day + Fire Flow Demand Figure

Peak Hour Demand Figure

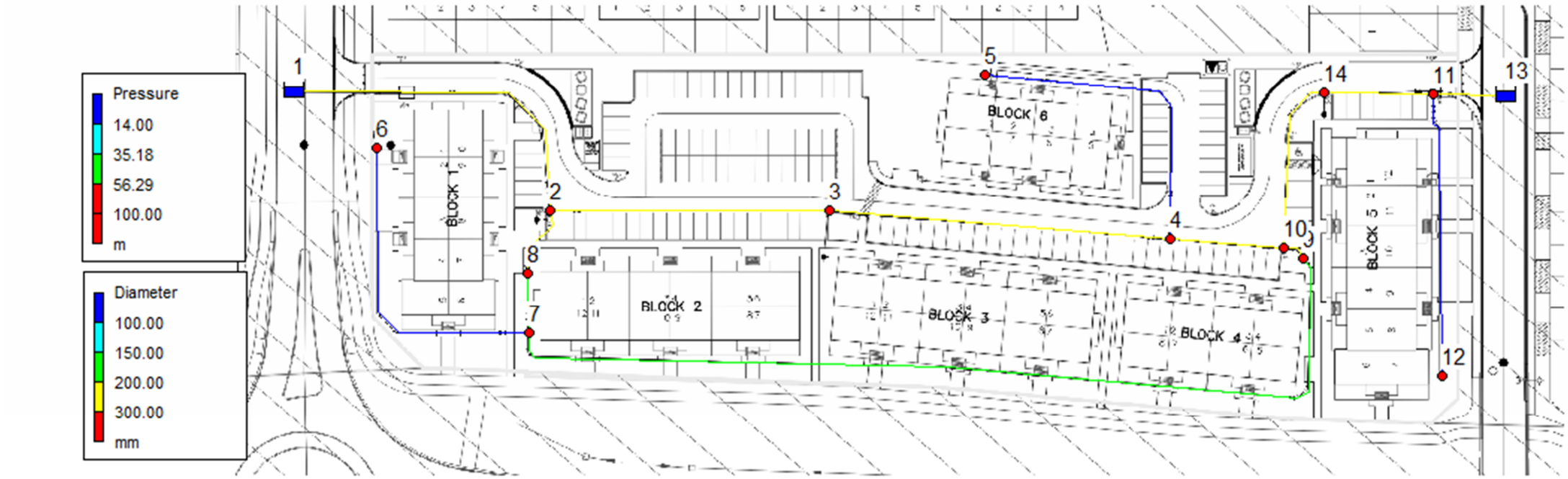
Average Day Demand Hydraulic Analysis

Max Day + Fire Flow Demand Hydraulic Analysis

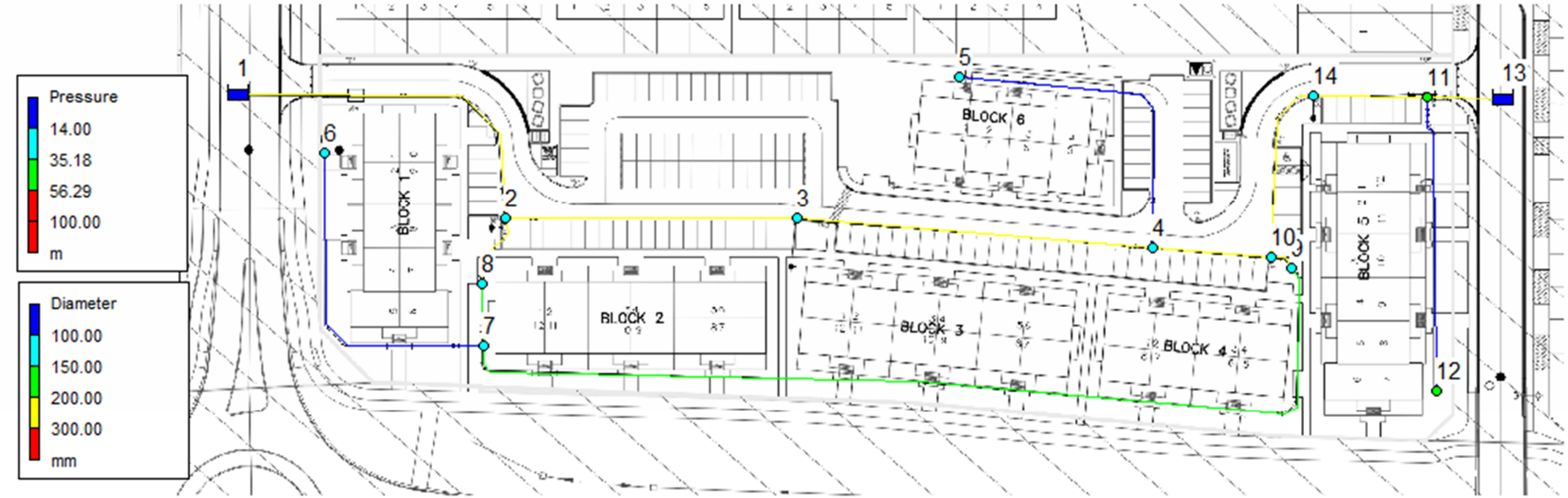
Peak Hour Demand Hydraulic Analysis

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

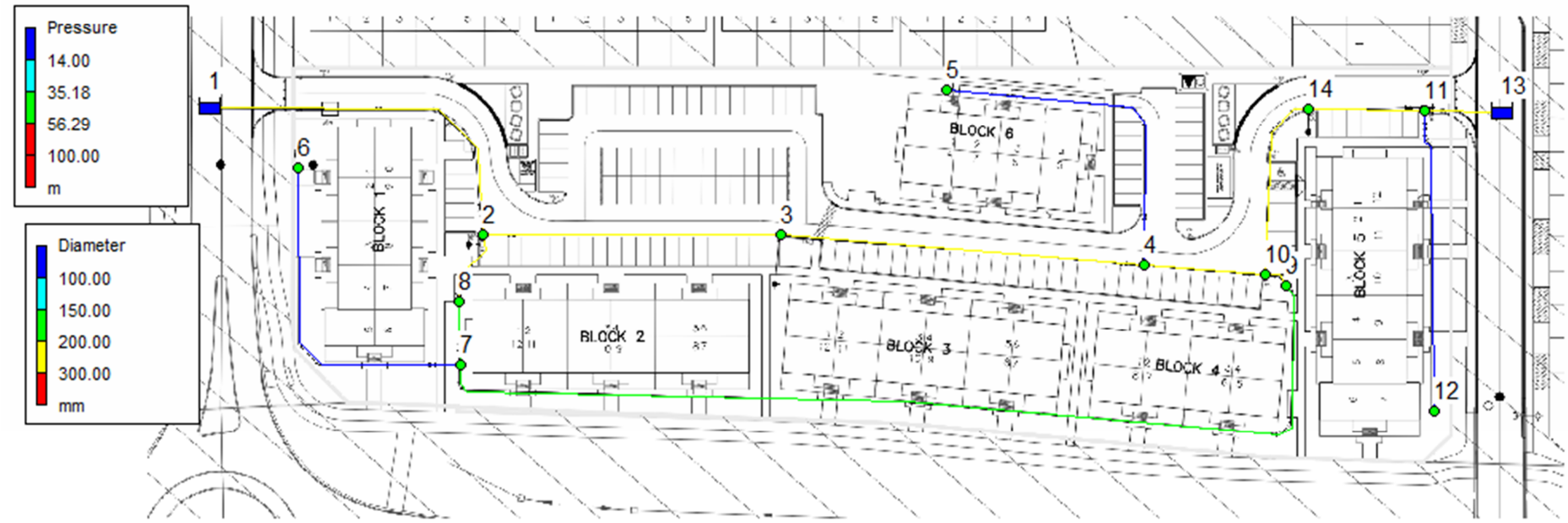
AVERAGE DAY SCENARIO



MAX DAY + FIRE FLOW SCENARIO



PEAK HOUR SCENARIO



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

Input File: 1295_Block13_AverageDay.net

Link - Node Table:

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

Node Results:

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

| | | | | | |
|---|---|---|---|---|---|
| 13 | -1191.24 | 161.70 | 0.00 | 0.00 | Reservoir |



Link Results:

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

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

Input File: 1295_Block13_MaxDayFF.net

Link - Node Table:

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

Node Results:

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

| | | | | | |
|---|---|---|---|---|---|
| 13 | -7054.57 | 141.40 | 0.00 | 0.00 | Reservoir |



Link Results:

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

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

Input File: 1295_Block13_PeakHour.net
```

Link - Node Table:

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

Node Results:

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

| | | | | | |
|---|---|---|---|---|---|
| 13 | -1306.27 | 154.30 | 0.00 | 0.00 | Reservoir |



Link Results:

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

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

# Technical Memorandum

## FINAL

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

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

**Submission Date:** December 20, 2024

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

# Document History and Version Control

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



## Statement of Qualifications and Limitations

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

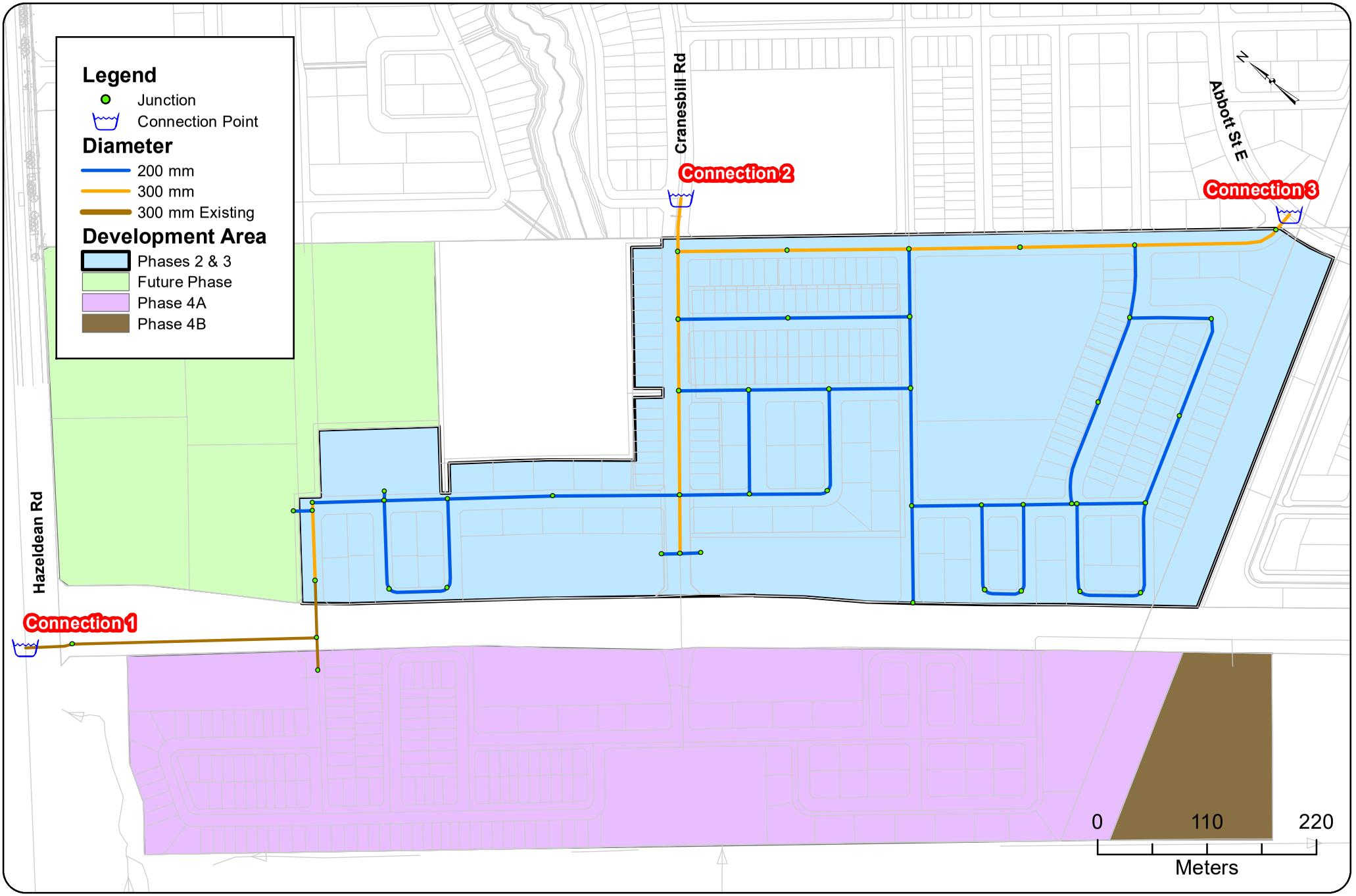
# 1 Introduction

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

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

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

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




GeoAdvice Engineering Inc.

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



# Site Layout and Connection Points

**Figure 1.1**

# 2 Modeling Considerations

## 2.1 Water Main Configuration

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

## 2.2 Elevations

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

## 2.3 Consumer Demands

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

**Table 2.1: City of Ottawa Demand Factors***

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

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

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

**Table 2.2: Residential Water Demand Calculations**

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

**Table 2.3: Non-residential Water Demand Calculations**

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

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

## 2.4 Fire Flow Demand

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

The calculations yielded the following required fire flows:

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

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

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

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

## 2.5 Boundary Conditions

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

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

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

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

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

**Table 2.3: Boundary Conditions**

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

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

# 3 Hydraulic Capacity Design Criteria

## 3.1 Pipe Characteristics

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

**Table 3.1: Model Pipe Characteristics**

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

## 3.2 Pressure Requirements

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

**Table 3.2: Pressure Requirements**

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

# 4 Hydraulic Capacity Analysis

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

## 4.1 Development Pressure Analysis

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

**Table 4.1: Summary Available Service Pressures**

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

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

## 4.2 Development Fire Flow Analysis

**Table 4.2: Summary of Minimum Available Fire Flows**

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

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

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

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

## Submission

**Prepared by:**

Jim Lee, E.I.T.
Hydraulic Modeler / Project Engineer

**Approved by:**

LICENSED PROFESSIONAL ENGINEER
W. B. F. de Schaetzen
100116349
PROVINCE OF ONTARIO

Dec 20, 2024

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

# Appendix A Domestic Water Demand Calculations

# Consumer Water Demands

**Residential Demands - Phase 2***

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

**Non Residential Demands - Phase 2**

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

**Residential Demands - Phase 3***

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

**Non Residential Demands - Phase 3**

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

**Residential Demands - Phase 4A***

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

**Non Residential Demands - Phase 4A**

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

**Residential Demands - Phase 4B***

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

**Residential Demands - Future Phase***

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

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

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

**Units based on estimate provided by DSEL

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

# Appendix B FUS Calculations and Required Fire Flows

# FUS Required Fire Flow Calculation

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

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

**A. Type of Construction:** Wood Frame Construction

**B. Ground Floor Area:** 4763 **m²**

**C. Number of Storeys:** 2

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

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

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

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

The total floor area in m² in the building being considered

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

**E. Occupancy**

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

**F. Sprinkler Protection**

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

**G. Exposures**

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

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

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

For wood shingle or shake roofs

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

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

*Rounded to the nearest 1,000 L/min

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

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

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

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

# FUS Required Fire Flow Calculation

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

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

**A. Type of Construction:** Wood Frame Construction

**B. Ground Floor Area:** 570 $m^2$

**C. Number of Storeys:** 2

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

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

A: Effective area — **A =** 1141 $m^2$

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

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

**E. Occupancy**

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

**E = 9,350 L/min**

**F. Sprinkler Protection**

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

**F = 9,350 L/min**

**G. Exposures**

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

% of **E** **+ 5,891 L/min**

**G = 15,241 L/min**

**H. Wood Shake Charge** — No — **0 L/min**

For wood shingle or shake roofs

**H = 15,241 L/min**

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

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

*Rounded to the nearest 1,000 L/min

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

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

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

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

# FUS Required Fire Flow Calculation

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

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

**A. Type of Construction:** Wood Frame Construction

**B. Ground Floor Area:** 450 $m^2$

**C. Number of Storeys:** 2

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

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

A: Effective area — **A =** 900 $m^2$

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

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

**E. Occupancy**

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

**F. Sprinkler Protection**

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

**G. Exposures**

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

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

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

For wood shingle or shake roofs

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

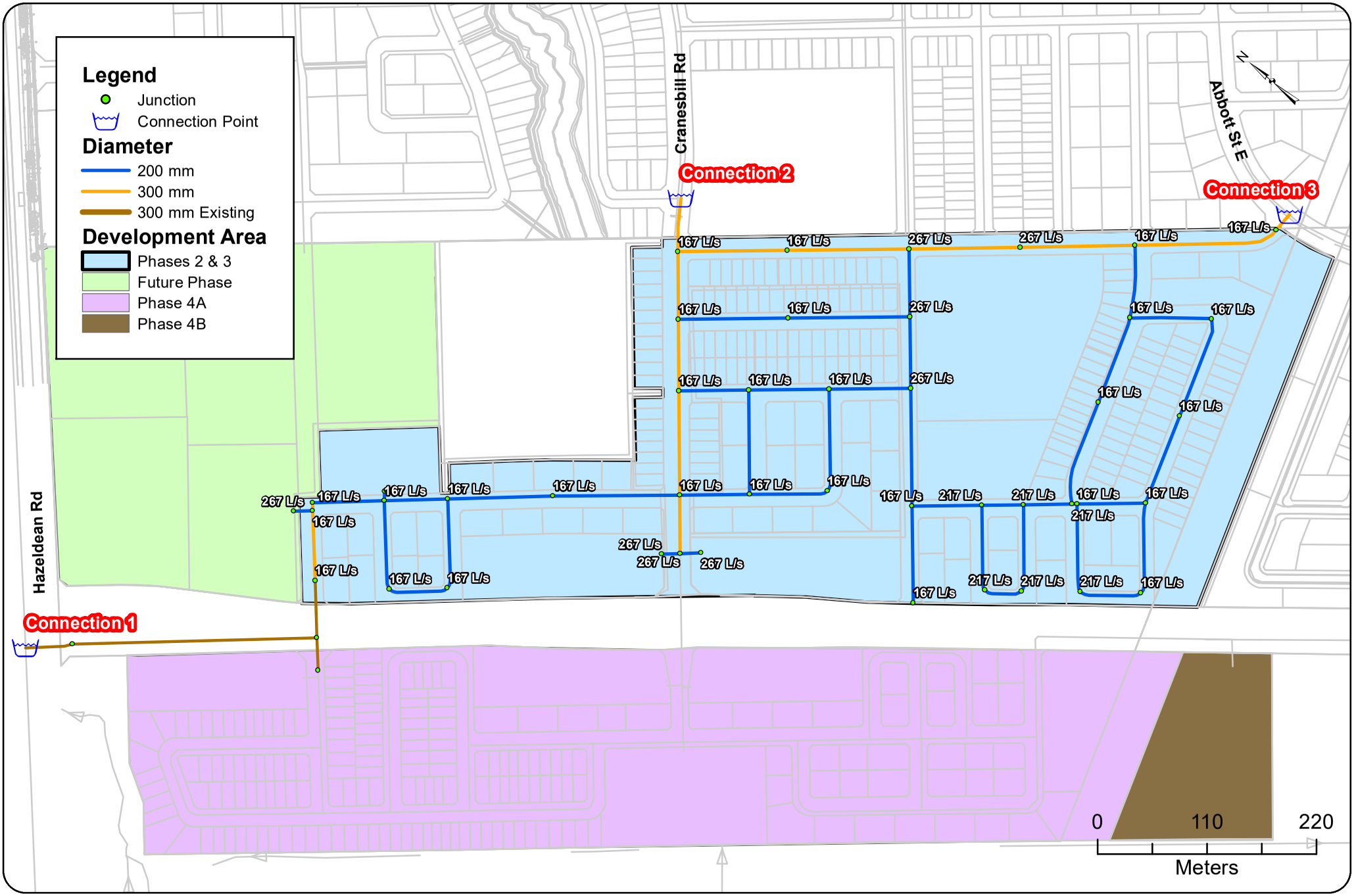
*Rounded to the nearest 1,000 L/min

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

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

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

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




GeoAdvice Engineering Inc.

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



# Required Fire Flows

**Figure B.1**

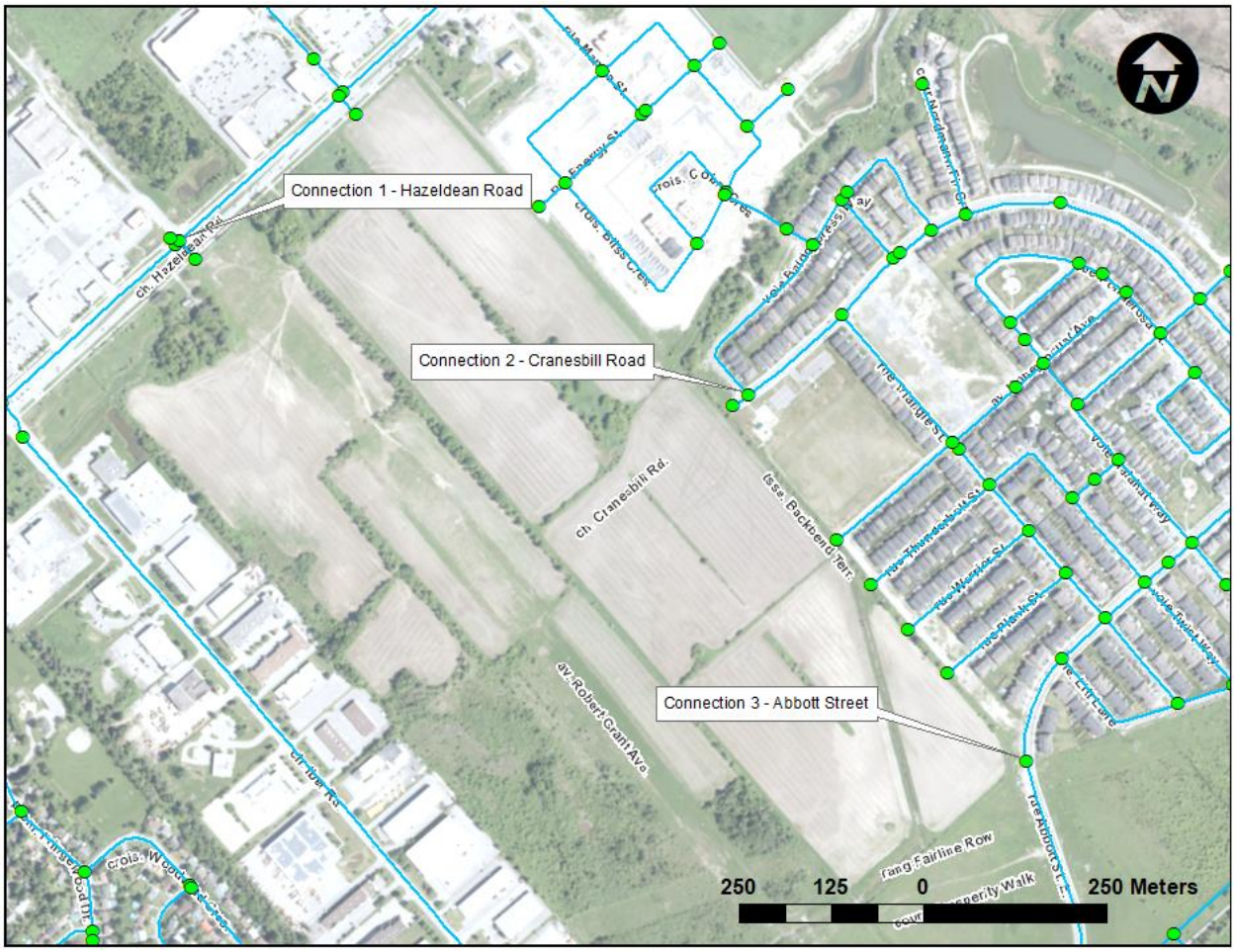
# Appendix C Boundary Conditions

# Boundary Conditions
# Minto – Abbott's Phases 2 & 3

## Provided Information

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

## Location



## Results

### Connection 1 - Hazeldean Road

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

[1] Ground Elevation = 101.6 m

### Connection 2 - Cranesbill Road

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

[1] Ground Elevation = 99.6 m

### Connection 3 - Abbott Street

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

[1] Ground Elevation = 101.3 m

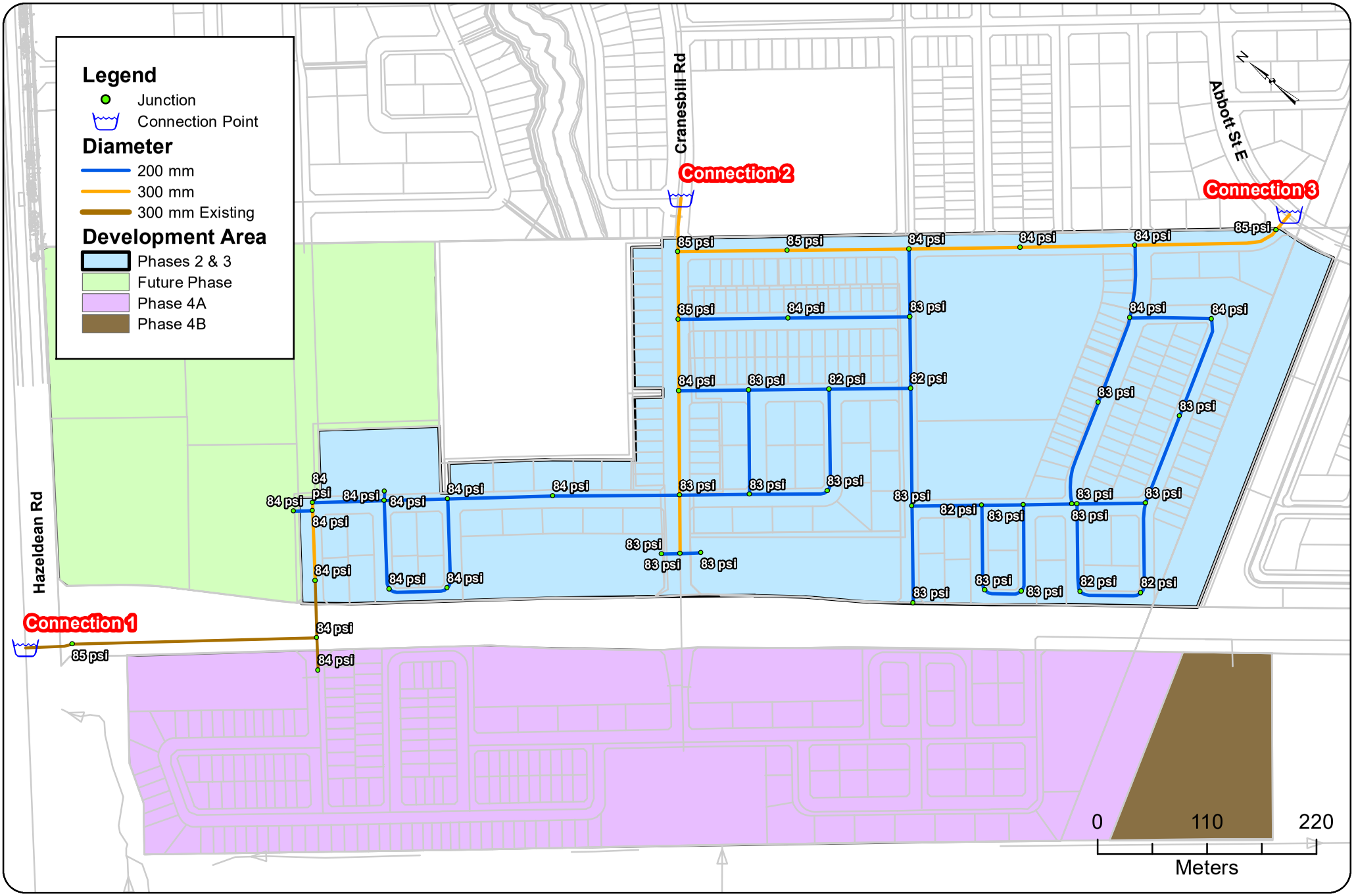
**Notes**

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

**Disclaimer**

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

# Appendix D Pressure Results



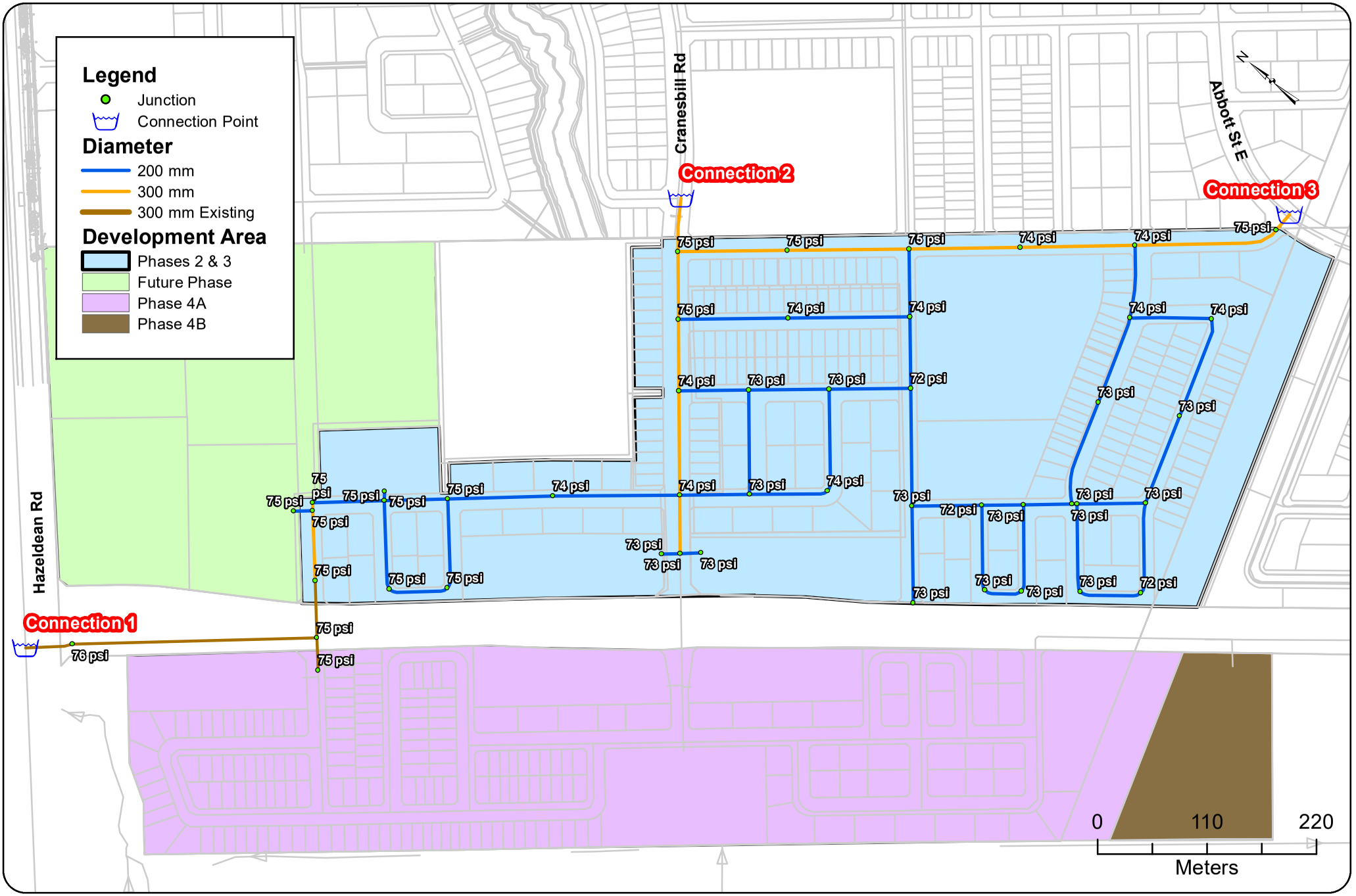

GeoAdvice Engineering Inc.

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**



# ADD Pressure Modeling Results

**Figure D.1**




GeoAdvice Engineering Inc.

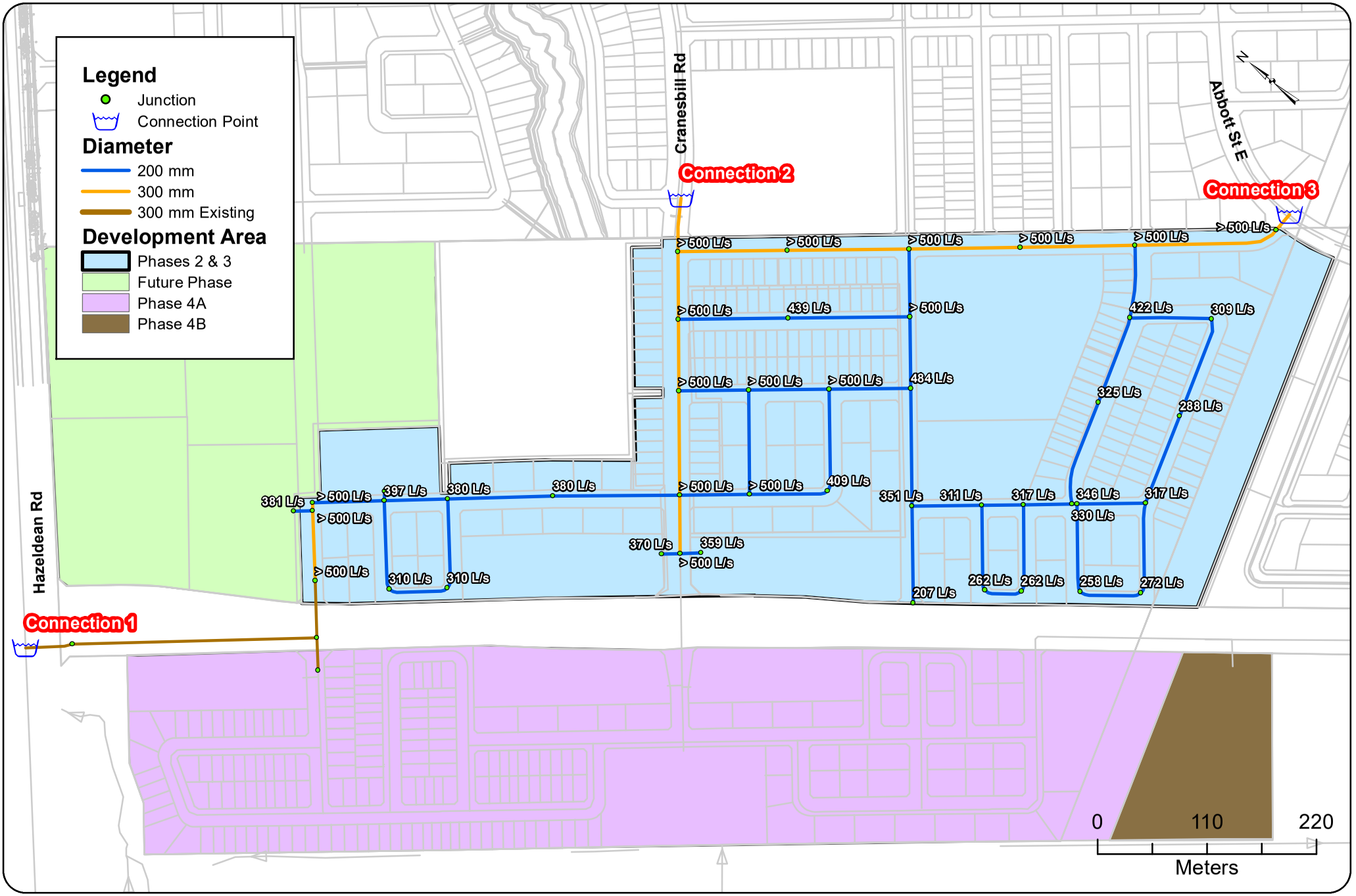
Project: **Hydraulic Capacity and Modeling Analysis**
**Abbott's Run Phases 2 & 3**
Client: **David Schaeffer Engineering Ltd.**
Date: **December 2024**
Created by: **JL**
Reviewed by: **WdS**



# PHD Pressure Modeling Results

**Figure D.1**

# Appendix E MDD+FF Model Results




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**



**Available Fire Flow Modeling Results**

**Figure E.1**

# Appendix C

Sanitary Design Sheet  (DSEL, June 2025)

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

# SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

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

DESIGN PARAMETERS

| | | | | |
|---|---|---|---|---|
| Park Flow = | 9300 | L/ha/da | 0.10764 | l/s/Ha |
| Average Daily Flow = | 280 | l/p/day | | |
| 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 = 0.33 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: E.D.
Checked: S.M.

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

LOCATION: **City of Ottawa**

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

File Ref:

Date: **20 Jun 2025**

Sheet No. 1 of 1

PROFESSIONAL ENGINEER S. L. MERRICK 100186523 PROVINCE OF ONTARIO 2025-06-20

JOB# 22-1295-[illegible]

1295_SAN.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) |
| **BLOCK 143** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 146A | 148A | 2.29 | | 243 | 2.29 | 243 | 3.5 | 2.75 | | 0.00 | | 0.00 | | 0.00 | 0.00 | 2.29 | 2.29 | 0.76 | 3.51 | 20.0 | 200 | 0.65 | 26.44 | 0.13 | 0.84 | 0.58 |
| To IRON RANGE ROAD, Pipe 148A - 149A | | | | | | 2.29 | 243 | | | | 0.00 | | 0.00 | | 0.00 | | | 2.29 | | | | | | | | | |
| | | | 2.21 | | 234 | 2.21 | 234 | | | 2.39 | 2.39 | | 0.00 | | 0.00 | | 4.60 | 4.60 | | | | | | | | | |
| | 147A | 148A | 2.39 | | 110 | 4.60 | 344 | 3.4 | 3.84 | | 2.39 | | 0.00 | | 0.00 | 1.16 | 2.39 | 6.99 | 2.31 | 7.31 | 18.0 | 200 | 0.70 | 27.44 | 0.27 | 0.87 | 0.74 |
| To IRON RANGE ROAD, Pipe 148A - 149A | | | | | | 4.60 | 344 | | | | 2.39 | | 0.00 | | 0.00 | | | 6.99 | | | | | | | | | |
| **BLOCK 147** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 128A | 74253 | 2.27 | | 109 | 2.27 | 109 | 3.6 | 1.27 | | 0.00 | | 0.00 | | 0.00 | 0.00 | 2.27 | 2.27 | 0.75 | 2.02 | 51.0 | 200 | 0.65 | 26.44 | 0.08 | 0.84 | 0.49 |
| To ROBERT GRANT, Pipe 74253 - 74254 | | | | | | 2.27 | 109 | | | | 0.00 | | 0.00 | | 0.00 | | | 2.27 | | | | | | | | | |
| **BLOCK 142** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 117A | 118A | | | | 0.00 | | | | | 0.00 | | 0.00 | 0.82 | 0.82 | 0.13 | 0.82 | 0.82 | 0.27 | 0.40 | 17.5 | 200 | 5.10 | 74.07 | 0.01 | 2.36 | 0.61 |
| To TENDER'S PASS & KETTLE VALLEY, Pipe 118A - 120A | | | | | | 0.00 | 0 | | | | 0.00 | | 0.00 | | 0.82 | | | 0.82 | | | | | | | | | |
| **CIRCUIT CRESCENT** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 0.07 | | 6 | 0.07 | 6 | | | | 0.00 | | 0.00 | | 0.00 | | 0.07 | 0.07 | | | | | | | | | |
| | 119A | 120A | 0.54 | | 44 | 0.61 | 50 | 3.7 | 0.59 | | 0.00 | | 0.00 | | 0.00 | 0.00 | 0.54 | 0.61 | 0.20 | 0.79 | 84.5 | 200 | 0.65 | 26.44 | 0.03 | 0.84 | 0.37 |
| To TENDER'S PASS & KETTLE VALLEY, Pipe 120A - SA25 | | | | | | 0.61 | 50 | | | | 0.00 | | 0.00 | | 0.00 | | | 0.61 | | | | | | | | | |
| | 113A | 114A | 0.08 | | 7 | 0.08 | 7 | 3.7 | 0.08 | | 0.00 | | 0.00 | | 0.00 | 0.00 | 0.08 | 0.08 | 0.03 | 0.11 | 54.0 | 200 | 0.65 | 26.44 | 0.00 | 0.84 | 0.20 |
| | 114A | 115A | 0.03 | | 3 | 0.11 | 10 | 3.7 | 0.12 | | 0.00 | | 0.00 | | 0.00 | 0.00 | 0.03 | 0.11 | 0.04 | 0.16 | 11.0 | 200 | 0.35 | 19.40 | 0.01 | 0.62 | 0.18 |
| | 115A | 116A | 0.34 | | 28 | 0.45 | 38 | 3.7 | 0.45 | | 0.00 | | 0.00 | | 0.00 | 0.00 | 0.34 | 0.45 | 0.15 | 0.60 | 84.5 | 200 | 0.35 | 19.40 | 0.03 | 0.62 | 0.28 |
| To TENDER'S PASS & KETTLE VALLEY, Pipe 116A - 118A | | | | | | 0.45 | 38 | | | | 0.00 | | 0.00 | | 0.00 | | | 0.45 | | | | | | | | | |
| **IRON RANGE ROAD** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 145A | 148A | | | | 0.00 | | | | | 0.00 | | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 65.0 | 200 | 1.70 | 42.76 | 0.00 | 1.36 | ####### |
| Contribution From BLOCK 143, Pipe 146A - 148A | | | | | | 2.29 | 243 | | | | 0.00 | | 0.00 | | 0.00 | | 2.29 | 2.29 | | | | | | | | | |
| Contribution From BLOCK 143, Pipe 147A - 148A | | | | | | 4.60 | 344 | | | | 2.39 | | 0.00 | | 0.00 | | 6.99 | 9.28 | | | | | | | | | |
| | 148A | 149A | 0.54 | | 0 | 7.43 | 587 | 3.3 | 6.37 | | 2.39 | | 0.00 | | 0.00 | 1.16 | 0.54 | 9.82 | 3.24 | 10.77 | 56.0 | 200 | 0.80 | 29.34 | 0.37 | 0.93 | 0.86 |
| Contribution From TENDER'S PASS & KETTLE VALLEY, Pipe 120A - SA25 | | | | | | 2.85 | 232 | | | | 0.00 | | 0.00 | | 0.82 | | 3.67 | 3.67 | | | | | | | | | |
| Contribution From TENDER'S PASS & KETTLE VALLEY, Pipe 122A - SA25 | | | | | | 1.71 | 83 | | | | 1.71 | | 0.00 | | 0.00 | | 3.42 | 7.09 | | | | | | | | | |
| | SA25 | SA29 | 0.21 | | 17 | 4.77 | 332 | 3.4 | 3.71 | | 1.71 | | 0.00 | | 0.82 | 0.96 | 0.21 | 7.30 | 2.41 | 7.08 | 45.0 | 250 | 0.25 | 29.73 | 0.24 | 0.61 | 0.50 |
| | SA29 | 74251 | 0.25 | | 20 | 5.02 | 352 | 3.4 | 3.92 | | 1.71 | | 0.00 | | 0.82 | 0.96 | 0.25 | 7.55 | 2.49 | 7.38 | 63.5 | 250 | 0.25 | 29.73 | 0.25 | 0.61 | 0.50 |
| To ROBERT GRANT, Pipe 74251 - 74252 | | | | | | 5.02 | 352 | | | | 1.71 | | 0.00 | | 0.82 | | | 7.55 | | | | | | | | | |
| **STREET No. 21** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contribution From STREET No.20- 22, Pipe 101A - 102A | | | | | | 0.87 | 70 | | | | 0.00 | | 0.00 | | 0.00 | | 0.87 | 0.87 | | | | | | | | | |
| Contribution From STREET No.20- 22, Pipe 98A - 102A | | | | | | 2.03 | 165 | | | | 0.00 | | 0.00 | | 0.00 | | 2.03 | 2.90 | | | | | | | | | |
| | 102A | 107A | 0.23 | | 19 | 3.13 | 254 | 3.5 | 2.87 | | 0.00 | | 0.00 | | 0.00 | 0.00 | 0.23 | 3.13 | 1.03 | 3.90 | 72.0 | 200 | 0.35 | 19.40 | 0.20 | 0.62 | 0.48 |
| Contribution From STREET No.20- 22, Pipe 106A - 107A | | | | | | 1.69 | 136 | | | | 0.00 | | 0.00 | | 0.00 | | 1.69 | 4.82 | | | | | | | | | |
| | 107A | SA39 | 0.31 | | 25 | 5.13 | 415 | 3.4 | 4.59 | | 0.00 | | 0.00 | | 0.00 | 0.00 | 0.31 | 5.13 | 1.69 | 6.28 | 83.0 | 250 | 0.35 | 35.18 | 0.18 | 0.72 | 0.54 |
| | | | 0.20 | | 16 | 5.33 | 431 | | | | 0.00 | | 0.00 | | 0.00 | | 0.20 | 5.33 | | | | | | | | | |
| | SA39 | 74251 | 1.04 | | 83 | 6.37 | 514 | 3.4 | 5.62 | | 0.00 | | 0.00 | | 0.00 | 0.00 | 1.04 | 6.37 | 2.10 | 7.72 | 48.5 | 250 | 0.35 | 35.18 | 0.22 | 0.72 | 0.57 |
| To ROBERT GRANT, Pipe 74251 - 74252 | | | | | | 6.37 | 514 | | | | 0.00 | | 0.00 | | 0.00 | | | 6.37 | | | | | | | | | |

DESIGN PARAMETERS

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

Designed:

Checked:

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

PROJECT:

LOCATION:
**City of Ottawa**

File Ref:

Date:
**09 May 2025**

Sheet No. 1
of 7

# SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

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

DESIGN PARAMETERS

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

Designed:

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

BLOCK 13 ALLOCATION

Manning's n=0.013

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

DESIGN PARAMETERS

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

Industrial Peak Factor = as per MOE Graph

Extraneous Flow = 0.330 L/s/ha

Minimum Velocity = 0.600 m/s

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

Townhouse coeff= 2.7

Single house coeff= 3.4

Designed:

Checked:

Dwg. Reference:

Sanitary Drainage Plan, Dwgs. No.

PROJECT:

LOCATION:

**City of Ottawa**

File Ref:

Date: **09 May 2025**

Sheet No. 3 of 7

# SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

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

DESIGN PARAMETERS

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

Designed:

Checked:

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

PROJECT:

LOCATION:
**City of Ottawa**

File Ref:

Date:
**09 May 2025**

Sheet No. 4 of 7

# SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

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

DESIGN PARAMETERS

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

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

# SANITARY SEWER CALCULATION SHEET

CAPACITY IN ROBERT GRANT SEWER

Manning's n=0.013

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

DESIGN PARAMETERS

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

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

# SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

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

DESIGN PARAMETERS

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

Designed:

Checked:

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

PROJECT:

LOCATION:
**City of Ottawa**

File Ref:

Date:
**09 May 2025**

Sheet No. 7
of 7

# Appendix D

Storm Design Sheet (DSEL, June 2025)

Ponding Volume Table

USF Freeboard Results - 100yr Chicago 3 hr

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

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

# STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

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

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

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

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

LICENSED PROFESSIONAL ENGINEER
S. L. MERRICK
100186523
2025-06-20
PROVINCE OF ONTARIO
JOB# 22-1295 - BLK13

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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