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Traditions II - Block 349 Medium Density

Servicing and Stormwater Management Report

Prepared for: Mattamy Homes

Traditions II - Block 349 Medium Density

Ottawa, ON

Servicing and Stormwater Management Report

Prepared By:

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Ottawa, Ontario
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October 29, 2024
Revised: January 23, 2025
Revised: April 15, 2025
Revised: July 2, 2025

Novatech File: 124097
Ref: R-2024-123

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July 2, 2025

City of Ottawa
Development Review West - Planning,
Development and Building Services Department
110 Laurier Avenue West
Ottawa, ON K1P 1J1

Attention: **Solé Soyak, Planner II**

Reference: **Traditions II - Block 349 Medium Density**
Servicing and Stormwater Management Report
Our File No.: 124097

Please find enclosed the 'Servicing and Stormwater Management Report' for the above noted project. This report has been prepared in support of a Site Plan Application and is submitted for your review and approval.

This report has been revised in response to City comments dated May 23, 2025. Refer to Appendix A of this report for responses to the applicable Engineering comments.

Should you have any questions or require additional information, please contact us.

Yours truly,

NOVATECH

Alex McAuley, P.Eng.
Senior Project Manager | Land Development Engineering

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1.0 INTRODUCTION

1.1 Background

This report addresses the approach to site servicing and stormwater management for the development at the Traditions II – Block 349 (Subject Site), which is being proposed by Mattamy Homes (Developer).

The Subject Site is located at the south-east corner of the Stittsville Main Street and Parade Drive intersection, as shown on **Figure 1.1** – Key Plan. The site is bound to the north by Parade Drive, to the south by Campolina Way, to the west by Stitsville Main Street, and to the east by Falabella Street.

The existing land usage consists of one single family home (1883 Stittsville Main Street), as shown on **Figure 1.2** – Existing Conditions Plan. An existing asphalt laneway which serves as an access to the single-family home is located at the west side of the property, off Stittsville Main Street, approximately 25m south of Parade Drive. The existing home has been demolished in late 2024, as per the demolition permit. A separate application for decommissioning of the septic system has been applied for to the Ottawa Septic System Office and has been granted (September 2023). Existing septic tank would be removed to approved location or filled with sand, gravel, or other soils by contractor. The existing well would be decommissioned as per MECP procedures.

The majority of the existing site drains overland from west to east towards Falabella Street. Stormwater runoff directed towards Falabella, Parade, and Campolina are conveyed to the existing storm sewer via roadside catchbasins. The small portion of stormwater runoff directed towards Stittsville Main Street is captured by the existing roadside ditch.

1.2 Development Intent

The Subject Site has an area of 1.04ha, and the proposed development will comprise of 7 townhome blocks, 3 storeys in height, containing 12 units each (84 units total), as shown in **Table 1.1** below. The development will contain a 6.0m wide private drive aisle through the site, connecting to Falabella Street at two locations. Parking spaces would be provided on-site adjacent to the 6.0m drive aisle. The proposed Site Plan (Drawing A – Block 349 Site Plan) is included in **Appendix F**.

Table 1.1: Land Use, Development Potential, and Yield

Unit Type[1]	Number of Townhome Blocks	Number of Units	Area
Stacked Townhomes	7	84	1.04 ha

[1]The development does not consist of singles, semis, or multi-unit residential / apartments.

The Subject Site is located within the serviced area in the City of Ottawa Official Plan; therefore, the site has been designed with municipal water, storm, and sanitary sewage collection.

All the private roads, sewers, watermain and stormwater collection system within the Subject Site shall remain private and operated through a Joint Use and Maintenance Agreement (JUMA).

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BLOCK 349

KEY PLAN

SCALE: NOT TO SCALE

DATE	JOB	FIGURE
JUL 2025	124097	1.1

SHT8X11.DWG - 216mmx279mm

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BLOCK 349
1883 STITTSVILLE MAIN ST

EXISTING CONDITIONS

SCALE		
NOT TO SCALE		
DATE: JUL 2025	JOB: 124097	FIGURE: 1.2

SHT8X11.DWG - 216mmx279mm

1.3 Report Objective

This report assesses the adequacy of existing and proposed services to support the proposed development. This report will be provided to the various agencies for approval and to obtain any applicable permits.

The City of Ottawa Servicing Study Guidelines for Development Applications checklist has been completed and is provided in **Appendix B**.

2.0 GEOTECHNICAL INVESTIGATION

Paterson Group Inc. (Paterson) conducted a geotechnical investigation in support of the proposed residential development: *Geotechnical Investigation – Proposed Residential Development 1883 Stittsville Main Street, Ottawa, Ontario; Report No. PG7178-1, Paterson Group Inc., July 2, 2024.* Based on the geotechnical study, it is not anticipated that there will be any significant geotechnical concerns with respect to servicing and developing the site. Refer to drawing PG7178-1 included in the report for the test hole location plan. A summary of the geotechnical report findings is provided in **Table 2.1** below.

Table 2.1: Summary of Geotechnical Servicing and Grading Considerations

Parameter	Summary
Sub-Soil Conditions	Glacial till, Dense brown silty sand with gravel, Cobbles and boulders
OHSA Soil Type	Type 2 and 3
Groundwater Considerations	Groundwater table within the bedrock
Bedrock	Weathered bedrock from 0.9m to 2.7m depth
Pipe Bedding / Backfill	Pipe Bedding 150 mm to 300 mm Granular A Pipe Cover 300 mm Granular A Backfill Native Material
Pavement Structure (Parking Areas)	50mm Wear Course (SuperPave 12.5) 150mm Base (Granular A) 300mm Subbase (Granular B Type II)
Pavement Structure (Drive Aisles)	40mm Wear Course (SuperPave 12.5) 50mm Binder Course (SuperPave 19.0) 150mm Base (Granular A) 450mm Subbase (Granular B Type I or II)

3.0 SERVICING AND GRADING

3.1 General Servicing

The Subject Site will be serviced using local storm and sanitary sewers, and watermain. The storm drainage / stormwater management, sanitary and water servicing strategy is discussed in further detail in the following sections.

Refer to **Figure 3.1** – Proposed Servicing Layout Plan.
For additional details refer to the General Plan of Services (Drawing 124097-GP) and Grading Plan (Drawing 124097-GR)

3.2 General Grading

The proposed grading within the Subject Site will direct overland flows to the Falabella Street right-of-way.

Portions of the Subject Site fronting onto the existing right-of-ways on Stittsville Main Street, Parade Drive, Falabella Street, and Campolina Way will direct overland flows to the corresponding right-of-ways.

Refer to the Grading Plan (Drawing 124097-GR) for details.

4.0 STORM SEWER SYSTEM AND STORMWATER MANAGEMENT

4.1 Stormwater Management Criteria

The following stormwater management criteria was followed for the stormwater management design of the proposed development:

- Control post-development flow from the site to the release rate of 249 L/s (240L/s/ha), allocated to the development site as part of the Detailed Servicing and Stormwater Management Report for the Stittsville South Development (Novatech, 2016). An excerpt from the Detailed Servicing and Stormwater Management Report for the Stittsville South Development (Novatech, 2016) is included in **Appendix C.**

- Minor System (Storm Sewers) designed per the City of Ottawa Design Guidelines.

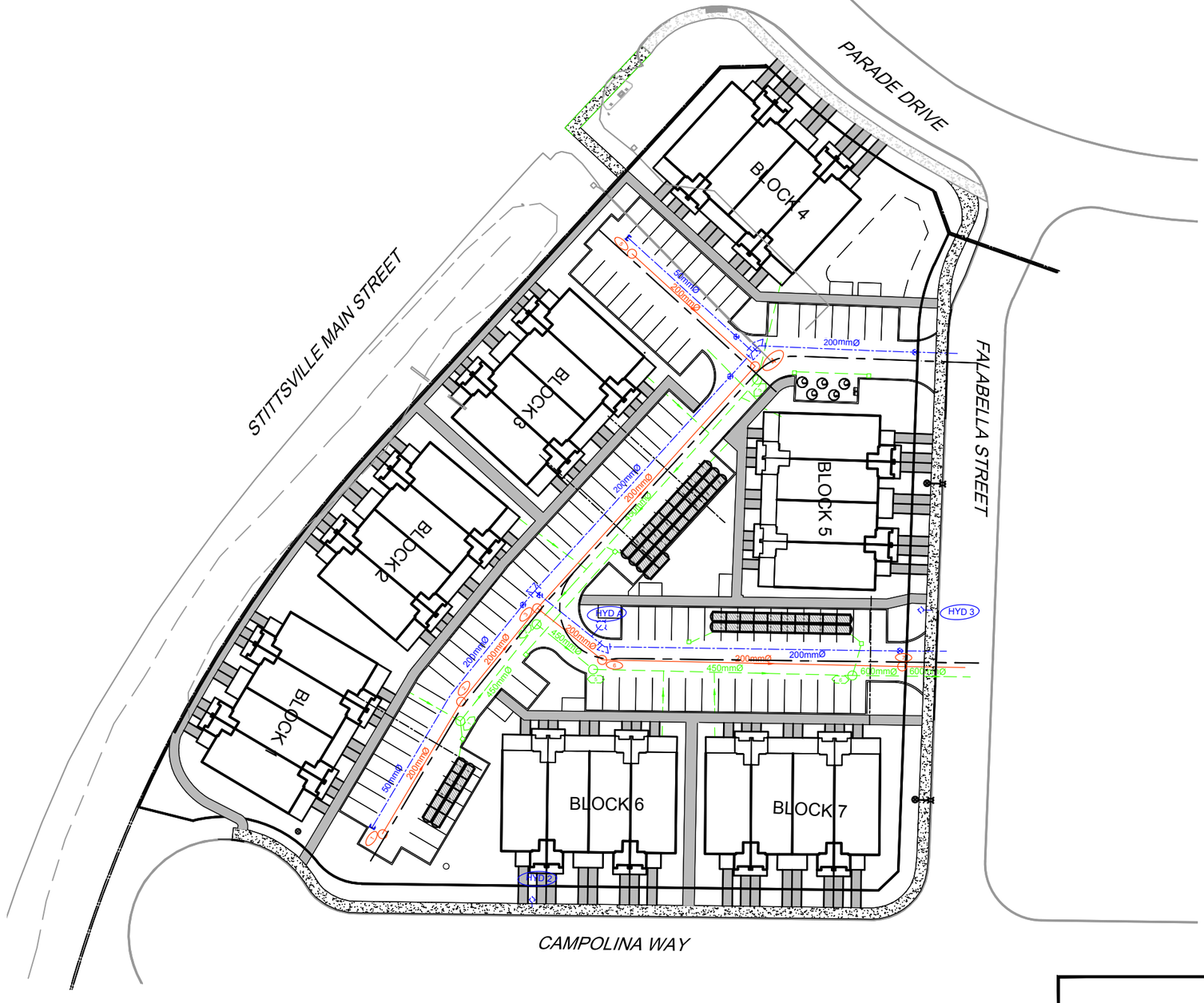
- Provide a major system (overland flow route) to the existing Falabella Street right-of-way for storms that exceed capacity of the minor system.

- Best Management Practices: implement lot level and conveyance Best Management Practices (BMPs) to promote infiltration and treatment of storm runoff.

4.2 Pre-Development Conditions

Refer to **Figure 4.1** – Pre-Development Storm Drainage Areas for an illustration of the pre-development drainage areas of the Subject Site.

Under existing conditions the majority of the site drains overland from west to east towards Falabella Street. Stormwater runoff directed towards Falabella, Parade, and Campolina would



LEGEND

- EXISTING WATERMAIN
- EXISTING HYDRANT
- PROPOSED WATERMAIN
- PROPOSED 50mmØ WATERMAIN
- PROPOSED HYDRANT
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING CULVERT
- PROPOSED STORM SEWER
- EXISTING GAS LINE
- EXISTING DITCH
- STORMTECH CHAMBERS

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TRADITIONS II - BLOCK 349

PROPOSED SERVICING LAYOUT PLAN

SCALE 1 : 750 (0, 10, 20, 30)
DATE JUL 2025
JOB 124097
FIGURE 3.1

SHT11X17.DWG - 279mmX432mm

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enter the existing storm sewer via roadside catchbasins. The small portion of stormwater runoff directed towards Stittsville Main Street would be captured by the existing roadside ditch.

4.3 Proposed Storm Drainage System

Stormwater servicing for the proposed development would be provided using an underground storm sewer system. Surface stormwater runoff would be captured and conveyed to the underground system via roadside catchbasins located throughout the site. The underground storm sewer system would include underground storage chambers to provide on-site quantity control. These underground chambers are discussed further in the section below. Storm services for the townhouse blocks are proposed to provide foundation drainage.

4.3.1 Storm Sewers (Minor System)

The proposed storm sewers have been designed using the Rational Method. The on-site storm sewers were sized to convey an uncontrolled peak flow corresponding to a 2-year return period. The criteria used to size the storm sewers are summarized in **Table 4.1**. The storm sewer design sheets are provided in **Appendix C**.

Table 4.1: Storm Sewer Design Parameters

Parameter	Design Criteria
Local Roads	2-year Return Period
Storm Sewer Design	Rational Method/Modeling
IDF Rainfall Data	OSDG
Initial Time of Concentration (T_c)	10 minutes
Minimum Velocity	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

The proposed storm drainage systems include the following:

- Approximately 131m of storm sewers within the drive aisle for collection and conveyance of stormwater runoff to the proposed underground storage system and collection of foundation drainage of the townhouse blocks, including a connection to the existing storm sewer stub on Falabella Street.

Hydraulic Grade Line (HGL)

The 100-year hydraulic grade line of the existing downstream storm sewer on Falabella Street was reviewed and is below the obvert of the pipe. Therefore, the 100-year hydraulic grade line of the storm sewers within the proposed development have not been reviewed as part of this report. Underside of footing (USF) elevations have been set to be at least 0.3m above the obvert of the nearest storm sewer pipe within the Subject Site.

4.3.2 Stormwater Quality Control

The Subject Site is within the catchment area of the existing stormwater management facility, located approximately 1.2km northwest of the Subject Site. The design of the existing stormwater management facility accounted for stormwater runoff from the Subject Site. The existing stormwater management facility provides quality control in accordance with MOE Level 1 – Enhance protection (80% TSS removal). Onsite quality control is not required and is not proposed.

4.3.3 Stormwater Quantity Control

The following provides an overview of the proposed stormwater management strategy for controlled and uncontrolled areas. Refer to **Figure 5.1** – Post-Development Drainage Areas for subcatchment locations:

- *Area STM-1, STM-2, STM-3 (Private Drive Aisle and Portions of Townhomes) – Controlled*

  These subcatchments represent areas draining towards the paved drive aisles. Storm runoff will be collected by catchbasins and conveyed to the StormTech chambers.

- *Areas STM-4, STM-5, STM-6 & STM-7 – Uncontrolled*

  These subcatchments represent portions of the Subject Site that will drain uncontrolled to the existing right-of-ways adjacent to the Subject Site. The overall site release rates have accounted for the uncontrolled release rates of these areas.

StormTech Chambers

Quantity control storage (to meet the allowable release rates) will be provided by StormTech chambers (model MC-3500 or approved equivalent). Inlet control devices (ICD's) will be installed in the outlet structures to control outflows from the StormTech chambers to the allowable release rate. The road and landscaped areas drainage system will connect to the StormTech chambers. The total storage provided by the StormTech chambers is approximately 188 m^3 based on the layout presented on the General Plan of Services (Drawing 124097-GP). Supporting documentation is provided in **Appendix C**.

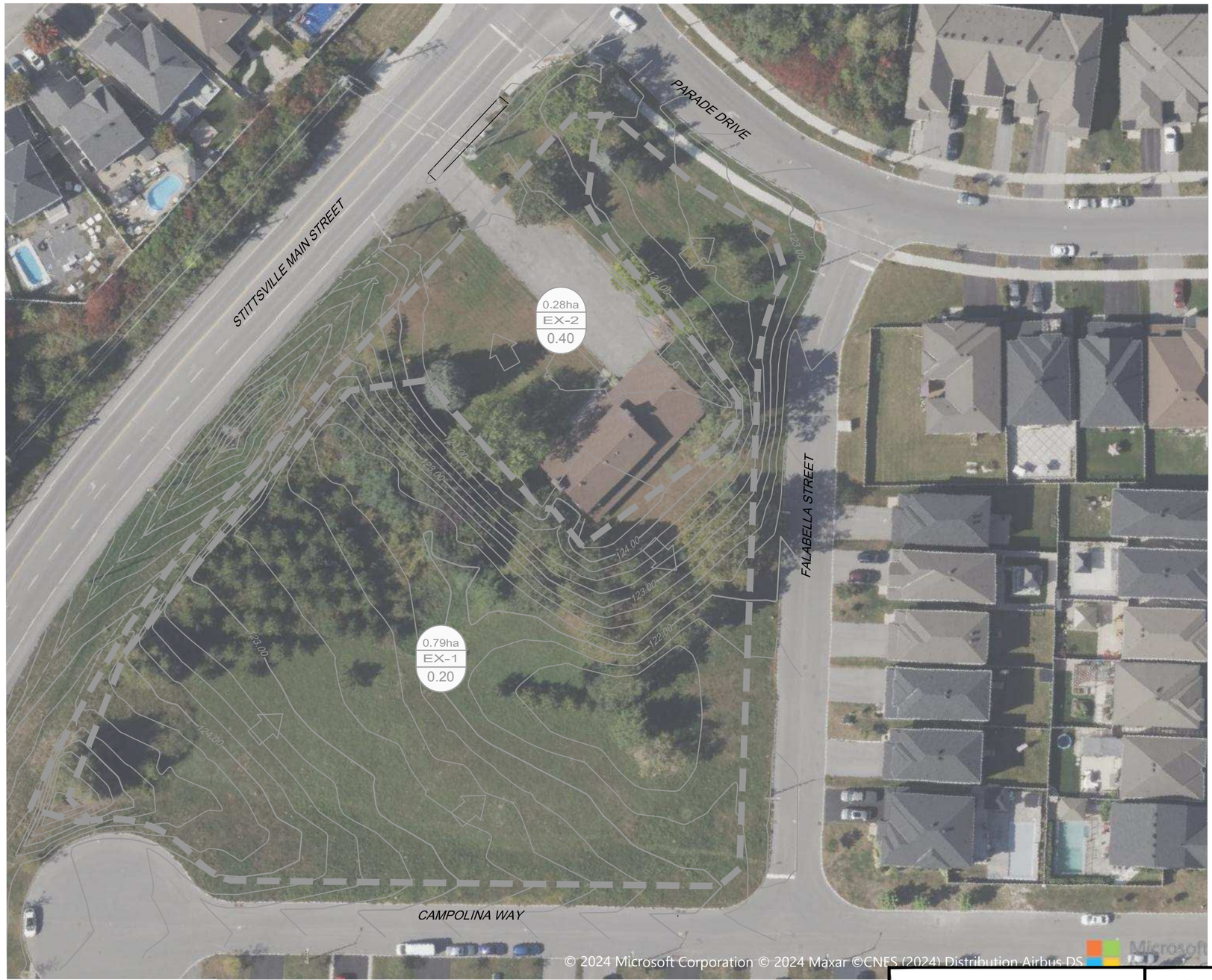
The StormTech chambers would provide sufficient storage volume to provide quantity control for the proposed development up to and including the 1:100 year storm event. As such, no surface ponding storage has been included in the stormwater quantity control calculations. Surface ponding is not expected to be present after a storm event, however during storm events, some localized dynamic flow depth would occur at catchbasins.

The StormTech chambers will be privately owned and maintained through a Joint Unit Maintenance Agreement (JUMA), that will be registered on title.

4.3.4 Grading & Overland Flow (Major System)

The site will be graded to provide an overland flow route (major system) for large infrequent storms or in the event that the storm sewer / stormwater management system becomes obstructed. Major system flows will be directed to Falabella Street.

Runoff from storms that exceed the minor system capacity are to be conveyed overland within the site drive aisles to Falabella Street.



0.500
STM-1
0.70

DRAINAGE AREA (hectares)

DRAINAGE AREA ID

RUNOFF COEFFICIENT (C)

DRAINAGE AREA BOUNDARY

MAJOR OVERLAND FLOW DIRECTION

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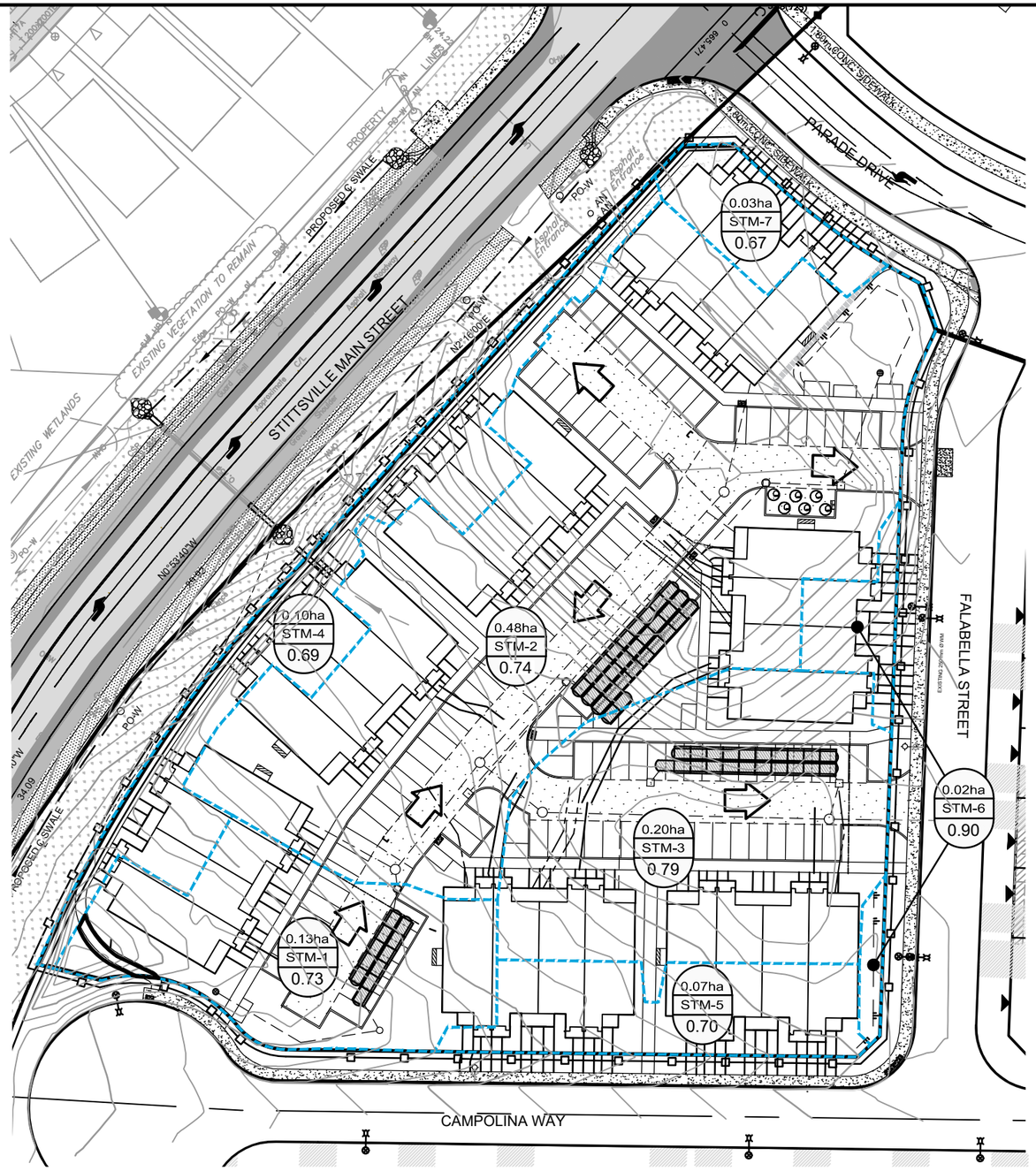
TRADITIONS II - BLOCK 349

PRE-DEVELOPMENT STORM DRAINAGE AREA PLAN

SCALE 1 : 750 (0, 10, 20, 30)

DATE JUL 2025 | JOB 124097 | FIGURE 4.1



0.500
STM-1
0.70

DRAINAGE AREA (hectares)

DRAINAGE AREA ID

RUNOFF COEFFICIENT (C)

DRAINAGE AREA BOUNDARY

MAJOR OVERLAND FLOW DIRECTION

REVISED JUN 18/25

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TRADITIONS II - BLOCK 349

POST-DEVELOPMENT STORM DRAINAGE AREA PLAN

SCALE 1 : 750 (0, 10, 20, 30)

DATE JUL 2025 | JOB 124097 | FIGURE 5.1

SHT11X17.DWG - 279mmX432mm

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4.3.5 Retention and Infiltration

There are no identified opportunities for re-use of retained storm runoff and the site is not suitable for infiltration due to the bedrock conditions identified in the Geotechnical Investigation (Patterson Group, 2024). The MOE SWM Manual recommends that infiltration systems for stormwater management be located a minimum of 1.0 m from the seasonally high groundwater table and bedrock.

The StormTech chambers have not been designed as infiltration systems as they will not meet the applicable MOE SWM Manual criteria due to the shallow depth to bedrock and groundwater. Design details of the StormTech Chambers would be included in the shop drawings, to be reviewed by the design engineer in order to meet the approved design intent.

5.0 SANITARY SEWER SYSTEM

5.1 Existing Sanitary Infrastructure

There is an existing 200mm diameter sanitary sewer (gravity) located on Falabella Street. A 9.0m – 200mm diameter stub was installed at the time of construction of the sanitary sewer on Falabella Street. The stub was capped at the Subject Site's property boundary. Refer to the General Plan of Services (Drawings 124097-GP) for the sanitary layout.

5.2 Proposed Sanitary Infrastructure

The proposed on-site works will require approximately 132 m of on-site sanitary sewer (gravity) to collect wastewater flows and to direct flows to the existing 200mm sanitary sewer stub connecting to the existing 200mm sanitary sewer on Falabella Street. The layout of the proposed sanitary sewer is shown on the General Plan of Services (Drawing 124097-GP).

5.3 Sanitary Demand and Design Parameters

The peak design flow parameters in **Table 5.1** have been used in the sewer capacity analysis. Unit and population densities and all other design parameters are specified in the OSDG.

Table 5.1: Sanitary Sewer Design Parameters

Design Component	Design Parameter
Unit Population: Row Townhomes	2.7 people/unit
Residential Flow Rate, Average Daily	280 L/cap/day
Residential Peaking Factor	Harmon Equation (min=2.0, max=4.0) Harmon Correction Factor = 0.8
Extraneous Flow Rate	0.33 L/s/ha
Minimum Pipe Size	200 mm (Res)
Minimum Velocity[1]	0.6 m/s
Maximum Velocity	3.0 m/s
Minimum Pipe Cover	2.5 m (Unless frost protection provided)

The sanitary sewer design sheet, located in **Appendix D**, confirms the peaked sanitary flows from the Subject Site to the receiving sewer will be 2.81 L/s.

The capacity of the existing downstream sanitary was reviewed to confirm sufficient capacity to service the development. The Detailed Servicing and Stormwater Management Report for the Stittsville South Development (Novatech, 2016), includes sanitary sewer design calculations for the existing sanitary sewer which the development would connect to on Falabella Street. The report indicates that the existing sanitary sewer on Falabella Street has a capacity of 24.2 L/s and is currently capturing 3.76 L/s from the existing houses on Falabella Street. Therefore, there is existing capacity in the existing downstream sewer on Falabella Street to service the proposed development. The sanitary sewer design table from the Detailed Servicing and Stormwater Management Report for the Stittsville South Development (Novatech, 2016) is included in **Appendix D.**

6.0 WATER SUPPLY SYSTEM

6.1 Existing Water Infrastructure

There is an existing 250mm diameter watermain adjacent to the Subject Site on Falabella Drive. It is proposed to connect to the existing 250mm diameter watermain at two locations to service the proposed development.

6.2 Proposed Water Infrastructure

The proposed on-site watermain would include approximately 165m of 200mm diameter watermain. 50mm watermains are proposed at the dead-end locations within the site to reduce stagnant water / water age.

Refer to the General Plan of Services **(124097-GP)** for the proposed watermain layout.

6.3 Watermain Design Parameters

Boundary conditions were provided by the City of Ottawa, based on the OWDG water demand criteria, for existing and proposed development. The boundary conditions are included in **Appendix E**.

The domestic demand design parameters, fire fighting demand design scenarios and system pressure criteria design parameters are outlined in **Table 6.1** below. The system pressure design criteria are used to determine the size of the watermains, required within the Subject Site, and are based on a conservative approach that considers three possible scenarios.

Table 6.1: Watermain Design Parameters and Criteria

Domestic Demand Design Parameters	**Design Parameters**
Population: Row Townhome	2.7 people/unit
Basic Day Residential Demand (BSDY)	280 L/c/d
Maximum Day Demand (MXDY)	2.5 x BSDY
Peak Hour Demand (PKHR)	2.2 x MXDY
Fire Demand Design	**Design Flows**
Fire Demand (FF)	217 L/s per FUS / OWDG TB-2014
System Pressure Criteria Design Parameters	**Criteria**
Maximum Pressure (BSDY) Condition	< 552 kPa (80 psi) occupied areas < 690 kPa (100 psi) unoccupied areas
Minimum Pressure (PKHR) Condition	> 276 kPa (40 psi) or 304 kPa (44psi) preferred (for 3-storey product)
Minimum Pressure (MXDY + FF) Condition	> 140 kPa (20 psi)

6.4 System Pressure Modelling and Results

System pressures for the Subject Site for both the existing and planned conditions were estimated using the EPANET modeling software.

The EPANET model layout is demonstrated in **Figure 6.1** – EPANET Model Schematic

Domestic Demand

The water demand summary for the build out of the Subject Site for the basic daily and peak hour demands has been provided in **Table 6.2** below. For detailed results refer to the tables provided in **Appendix E**.

Table 6.2: System Pressure (EPANET)

Condition	Demand (L/s)	Allowable Pressure (psi)	Max/Min Pressure (psi)
Planned Conditions (Summer 2025)			
Average Daily Demand	0.74	80 (Max)	53
Peak Hour Demand	4.04	44 (Min)	44

Based on a three-storey unit product, site-specific boundary conditions and previous experience in the subdivision (where roadway elevations are greater than 121.00 ASL), the peak hour system criteria threshold has been increased to 44 psi (from 40 psi). In order to mitigate marginally low expected pressures during the peak hour scenario (1 or 2 psi below the foregoing target), it is proposed that service laterals be increased from 19mm to 25mm for reduced head losses to

alleviate low pressure concerns. Given the site grading and modelling, all the units will have 25mm services from the private main.

Fire Demand

Furthermore, an analysis was carried out to determine the available fire flow under maximum day demand while maintaining a residual pressure of 20psi. This was completed using the EPANET modeling software.

To achieve the required fire flow and optimize watermain sizes, the OWDG and its subsequent revisions (specifically ISTB-2018-02) allow for multiple hydrants to be drawn from, as opposed to drawing from a single hydrant to meet the required demand. Upon review of the Subject Site and the proposed hydrant location, the required fire flows can be achieved for the proposed structures by utilizing multiple hydrants.

For the purpose of this analysis, and to ensure a residual pressure of 20 psi is maintained within the system, existing hydrants 1 and 2 were considered as hydrant class AA (5,700 L/min) given their relative location to the boundary conditions received from the city. Existing hydrant 3 was considered as hydrant class A (3,800 L/min) given it's location on a dead-end watermain. Proposed hydrant A would be hydrant class AA. With this approach, under the maximum required fire flow condition (Block 2) an available aggregate hydrant flow of 15,200 L/min can be achieved under maximum day and fire flow demands by drawing 5,700 L/min, 5,700 L/min, and 3,800 L/min from proposed hydrant A, and existing hydrants 2 and 3, respectively. For detailed results refer to the tables provided in **Appendix E.**

Please see **Table 6.3** below for a summary of the required fire flows for each townhouse block, and the available fire flows based on distances to the proposed and existing hydrants. The maximum required fire flow scenario is highlighted in blue. Refer to **Figure 7.1** for the Fire Hydrant coverage plan.

Table 6.3: Summary of Available Aggregate Hydrant Flow

Block #	Fire Hydrants providing 5,700L/min (1)	Fire Hydrants providing 3,800L/min (2)	Combined Hydrant Flow Rates (L/min)	Modeled Fire Flow - (L/min) (4)	Required Fire Flow per FUS Calculations (L/min)
1	1	2	13,300	13,000	12,000
2	2	1	15,200		13,000
3	2	1	15,200		12,000
4	3	0	17,100		12,000
5	3	0	17,100		12,000
6	2	1	15,200		12,000
7	2	1	15,200		11,000

Therefore, in the maximum fire flow demand scenario, (Block 2) the combined fire flow from the proposed on-site hydrant and existing hydrants of 15,200 L/min exceeds the required fire flow of 13,000 L/min.

Based on the boundary condition information provided by the City and the existing fire hydrants in the area, the existing watermain infrastructure can provide adequate flow and pressure for domestic demand and fire protection for the proposed development. Refer to **Appendix E** for water demands, fire flow calculations, boundary conditions, and hydraulic analysis calculations.

6.5 Water Age Analysis

The OWDG indicates that a total travel time of 5 days or less during basic day demands is reasonable, and a residence time of 8 days should not be exceeded.

The Subject Site is located within Zone 3W of the City of Ottawa 2013 Water Master Plan, where the average water age is 3 days during basic day demand conditions. Based on the modelling results provided in **Appendix E**, the maximum local water age is 1.09 hours. **Table 6.4** below demonstrates that the maximum water age will be 3 days and 1.09 hours (3.05 days), falling below a total travel time of 5 days and not exceeding the allowable residence time of 8 days. Alternately, when considering a travel time of 5 days maximum, the total water age is 5 days and 1.09 hours, remaining below the allowable 8-day residence time.

Table 6.4: Summary of Water Age Analysis

Condition	Allowable Residence Time	Zone	Max Water Age
Proposed Development	8 Days	3W	3 days +1.09 hours

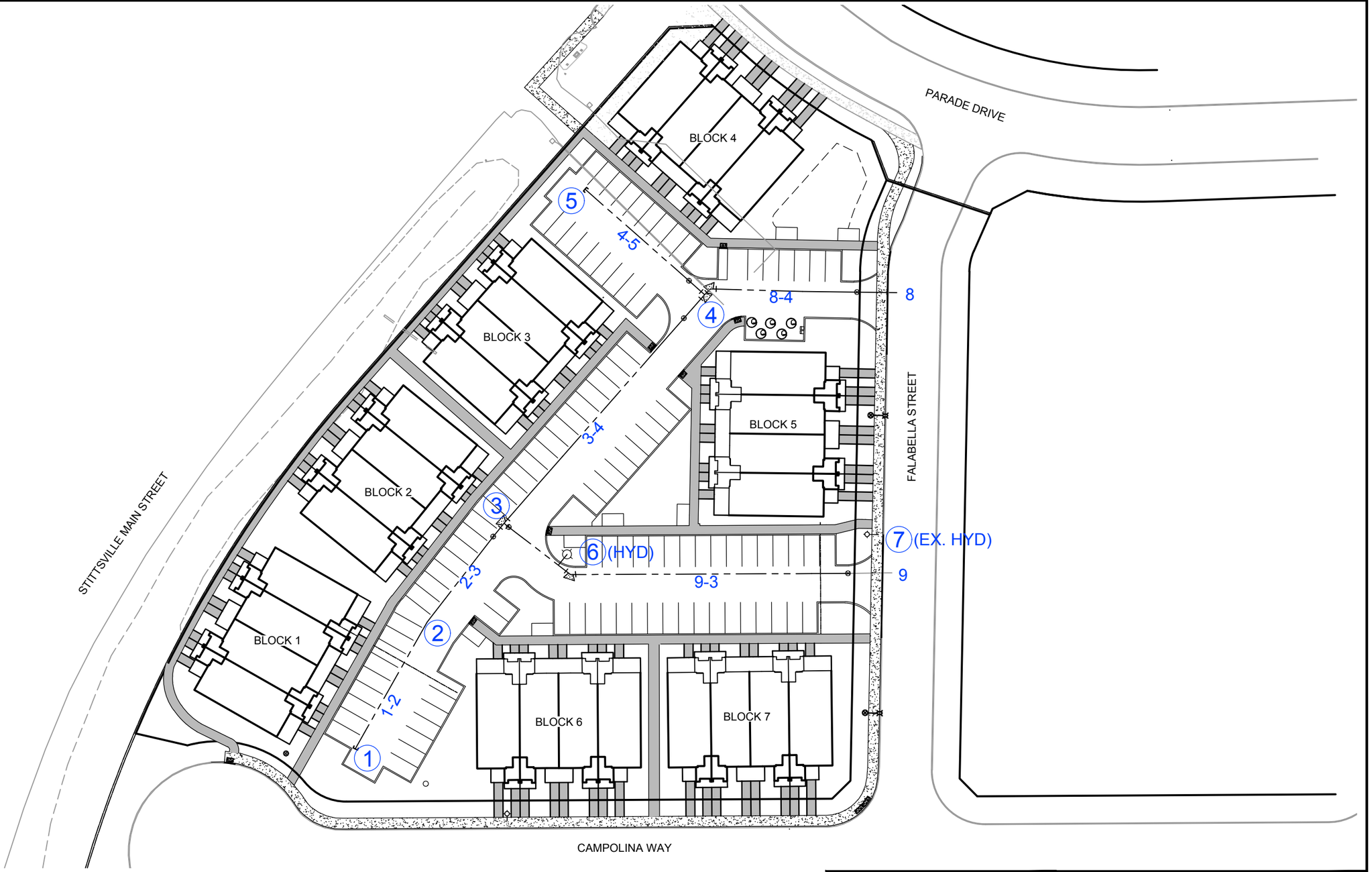
Based on the above, the water age analysis demonstrates that the OWDG requirements are being met.

7.0 EROSION AND SEDIMENT CONTROL AND DEWATERING MEASURES

Temporary erosion and sediment control measures will be implemented during construction in accordance with the “Guidelines on Erosion and Sediment Control for Urban Construction Sites” (Government of Ontario, May 1987). Details are provided on the Grading Plan (Drawing 124097-GR). Erosion and sediment control measures may include:

- Placement of filter fabric under all catch basin and maintenance hatches;
- Tree protection fence around the trees to be maintained
- Silt fence around the area under construction placed as per OPSS 577 / OPSD 219.110
- Light duty straw bale check dam per OPSD 219.180

The erosion and sediment control measures will need to be installed to the satisfaction of the engineer, the City, and the Ontario Ministry of Environment Conservation and Parks (MECP), prior to construction and will remain in place during construction until vegetation is established. The erosion and sediment control measure will also be subject to regular inspection to ensure that measures are operational.



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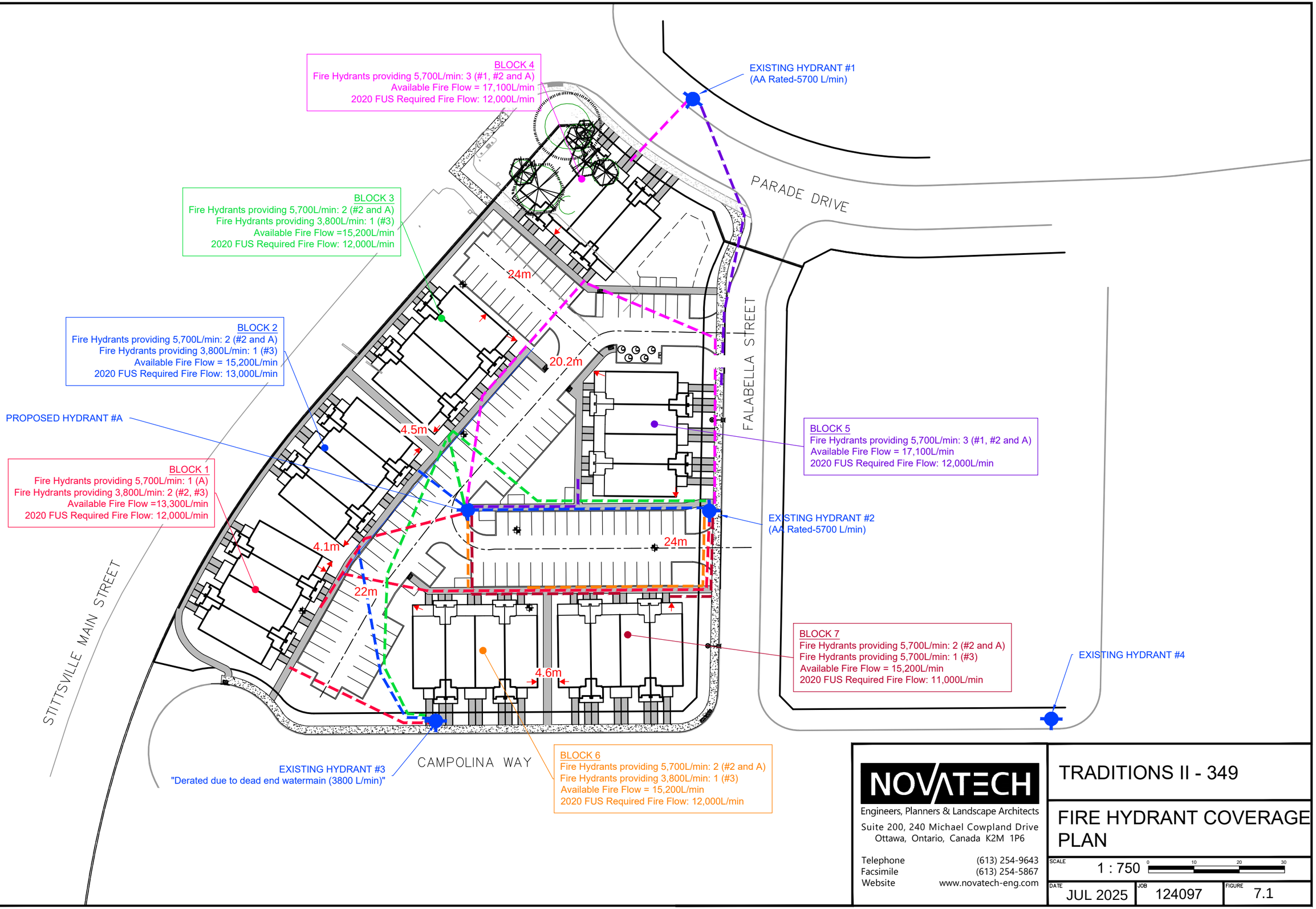
TRADITIONS II - BLOCK 349

EPA NET MODEL SCHEMATIC

SCALE: NTS
DATE: JUL 2025
JOB: 124097
FIGURE: 6.1

SHT11X17.DWG - 279mmX432mm



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Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

TRADITIONS II - 349

FIRE HYDRANT COVERAGE PLAN

SCALE 1 : 750 (0, 10, 20, 30)
DATE JUL 2025
JOB 124097
FIGURE 7.1

8.0 NEXT STEPS, COORDINATION, AND APPROVALS

The proposed private infrastructure may be subject, but not limited to the following approvals:

- MECP EASR. Submitted to: MECP. Proponent: Developer.
- Road Cut Permit. Submitted to City of Ottawa. Proponent: Developer, or its contractor/agent.

9.0 SUMMARY AND CONCLUSIONS

This report demonstrates that the proposed development can be adequately serviced with storm and sanitary sewers and watermain. The report is summarized below:

Stormwater Management

- The Subject Site will be serviced with approximately 131m of on-site storm sewers 450mm in diameter. The on-site storm sewers will outlet to the existing storm sewer on Falabella Street.
- Stormwater management will be provided to adhere to the allowable release rates.
- Underground storage will be provided by StormTech MC-3500 arch-type chambers (or approved equivalent). ICDs will be placed on the outlet structures to control flows from the Stormtech Chambers.

Sanitary and Wastewater Collection System

- The sanitary outlet would be the existing 200mm sanitary sewer on Falabella Street. The existing sanitary sewer has capacity to facilitate the proposed development.
- The proposed on-site works would require approximately 132m of on-site sanitary 200mm diameter sewers to collect wastewater flows and to direct flows to the sanitary outlet. The proposed sanitary sewers have been designed per the OSDG design parameters.

Water Supply System

- The watermain connection point for the Subject Site is two locations on the existing 250 mm watermain on Falabella Street.
- The proposed on-site watermain would include approximately:
    - 165m of 200mm diameter watermain
    - 50m of 50mm diameter watermain
- The townhouse units would be serviced with 25mm water services.
- One private hydrant location has been provided for fire protection purposes. The proposed hydrant would be a Class AA hydrant. To ensure a residual pressure of 20 psi is maintained within the system, existing hydrants 1 and 2 were considered as Class AA hydrants, and existing hydrant 3 was considered as Class A hydrant, given that it is located on a dead end watermain.
- A water age analysis was completed for the Subject Site to determine if the requirements outlined in the OWDG were being met. The Subject Site is located within Zone 3W, where the average water age is 3 days during basic day demand conditions. Based on the modelling results the maximum local water age is 3.59 hours, resulting in a total water age of 3 days and 3.59 hours (3.15 days).

Erosion and Sediment Control

- Temporary erosion and sediment control measures would be implemented both prior to commencement and during construction in accordance with the "Guidelines on Erosion and Sediment Control for Urban Construction Sites" (Government of Ontario, May 1987).

Next Steps, Coordination, and Approvals

- Road Cut Permit.
- MECP EASR. Submitted to: MECP

10.0 CLOSURE

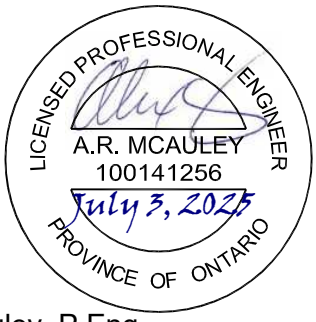
This report is respectfully submitted for review and subsequent approval. Please contact the undersigned should you have questions or require additional information.

NOVATECH

Prepared by:

Bradley Reed, P.Eng.
Project Engineer | Land Development

Reviewed by:



Alex McAuley, P.Eng.
Senior Project Manager | Land Development Engineering

Bassam Bahia, M.Eng., P.Eng.
Senior Project Manager | Land Development Engineering

Appendix A

NOVATECH
Engineers, Planners & Landscape Architects

July 3, 2025

City of Ottawa
Planning Infrastructure and Economic Development
110 Laurier Avenue West, 4th Floor
Ottawa, Ontario, K1P 1J1

Attention: **Amanda Davidson, Planner I**

Reference: **1883 Stittsville Main**
Response to First Formal Review Comments (D07-12-24-0142)
Our File No.: 124097

Please find below our response to the consolidated comments from the first formal review of the above noted application dated May 23, 2025.

Responses to the review comments are provided below in **bold** text. The responses should be read together with package which includes:

- Revised Site Plan, prepared by Korsiak dated June 27, 2025
- Revised Geotechnical Study, prepared by Paterson dated July 2, 2024
- Revised Detailed Design Report, prepared by Novatech dated July 2, 2025
- Revised Grading Plan and Erosion and Sediment Control Plan, prepared by Novatech dated June 24, 2025
- Revised Construction Management Plan, prepared by Novatech dated June 24, 2025
- General Plan of Services Plan by Novatech dated June 24, 2025
- Revised Landscape Plan by Novatech dated June 27, 2025

Planning

List of Studies and Plans Reviewed:

- **Landscape Plan**, 124097-L.1, prepared by Novatech, dated Oct 9/24, revision 5 dated Apr 11/25.
- **Landscape Details**, 124097-L.2, prepared by Novatech, dated Oct 9/24, revision 5 dated Apr 11/25.
- **Block 349 Site Plan**, Drawing No. A, prepared by Korsiak, dated 21/08/24
- **Urban Design Brief**, prepared by Korsiak, dated October 2024.

Comments:

Site Plan:

1. List the revision numbers on the site plan.

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Response: Site Plan revised.

2. It is understood that a minor variance application has been submitted for a reduced interior side yard setback along Stittsville Main Street. The minor variance should be approved and in-effect, prior to site plan approval.

Response: Acknowledged.

3. A Maintenance and Liability Agreement will be required for the proposed paver connections from the buildings and amenity area.

Response: Acknowledged.

4. The site plan will be required to be approved prior to approval of the associated plan of condominium, D07-04-25-0002.

Response: Acknowledged.

5. It is staff's understanding that the proposed waste collection is an underground system, specifically, Molok brand containers. Please include a detail of the inground refuse containers.

   a. As previously indicated, the City cannot service this type of waste system. As such, a condition will be included in the delegated authority report concerning private waste collection.

Response: Acknowledged.

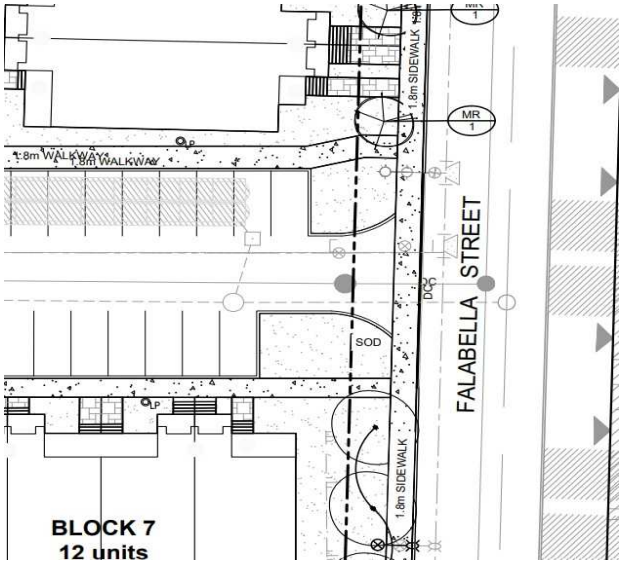
6. Please review opportunities to provide a pedestrian crossing connection and depressed curb connecting the east walkways to the west.

b. 

Response: Shown on the revised Site Plan.

Landscape Plan:

7. Can small trees or plantings be accommodated at the entrance of Falabella Street to improve screening of the parking area and utility infrastructure?

a. 

Response: Acknowledged. Trees have been accommodated in the planting beds on either side of the entrance.

b. Can additional tree planting be accommodated between block 3 and 4, particularly adjacent to the parking area, and south of Block 4?

Response: Acknowledged. Trees have been accommodated between block 3 and 4, and south of block 4.

c. Please confirm why a walkway between Block 3 and 4 has not been provided.

Response: Walkways are provided around the perimeter of the Subject Site, connecting to Parade Drive at the north and Campolina Way at the south. A mid-block connection between block Block 2 and Block 3 provides access to Stittsville Main Street from Falabella Street. A secondary walkway between Block 3 and Block 4 is not required.

8. Please consider additional landscaping/screening around the waste disposal area, such as small trees or large trees if feasible.

Response: A decorative privacy screen is proposed around the waste disposal area. We have added more planting on either ends of the disposal area to provide further screening being cognizant of the minimum required setbacks from hydro mini-sub towards east and hydro cabinet on the wall towards south.

9. Can any tree retention be accommodated in the amenity area on the northeast corner of the site, or in the northwest corner of the site?

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Response: Based on proposed grading changes and building placement, it is anticipated that existing trees will suffer significant damage to their critical root zones, resulting in further challenges to their survival and retention. It will not be possible to save the existing trees on the northeast and northwest corner of the site. By proposing a much greater canopy coverage at maturity (exceeding urban tree canopy cover targets), the intent is to offset this loss.

Elevations

10. Please clarify the meaning of the “UPG” acronym on plans A2.11 and A2.31.

Response: Legend included on the required plans.

Feel free to contact Amanda Davidson, Planner I, for follow up questions.

Urban Design Comments:

11. No comments.

Response: Acknowledged.

Engineering

List of Studies and Plans Reviewed:

- **General Plan of Services**, Dwg No. 124097-GP, prepared by Novatech, revision 6, dated April 11, 2025.
- **Grading Plan**, Dwg No. 124097-GR, prepared by Novatech, revision 8, dated April 11, 2025.
- **Traditions II – Block 349 Medium Density**, Servicing and Stormwater Management Report, prepared by Novatech, dated April 15, 2025.
- **Geotechnical Investigation,** Proposed Residential Development, 1883 Stittsville Main Street, prepared by Paterson Group, dated July 2, 2024.
- **Phase I – Environmental Site Assessment**, 1883 Stittsville Main Street, prepared by Paterson Group, dated December 19, 2024.

Comments:

Servicing and Stormwater Management Report

12. Section 4.3.3: The report does not list Area STM-7 Uncontrolled, when compared to Figure 5.1.

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Response: Report revised.

13. Section 6.0: As per technical bulletin ISDTB-2014-02, Section 4 – 3: For multiunit residential buildings which do not fall into the categories described above, options such as sprinkler systems, or two hour firewalls that compartmentalize the structure into separate fire areas are to be considered and applied as needed to limit the sizing of crescent, dead-end, and other distribution mains to a nominal size of no more than 200 mm. Please review the use of firewalls within the buildings to reduce the onsite watermains to a nominal size of no more than 200mm.

Response: The onsite watermain has been revised to be 200mm throughout and the EPANET model updated.

14. Section 6.1: The existing watermain on Falabella Drive is noted as 200mm when it should be noted as 250mm.

Response: Plan revised.

15. Section 8.0: This is a private development so a MECP ECA – Consolidated Linear Infrastructure (CLI) cannot be used. A MECP ECA for private sewage works will be required.

Response: The reference to the ECA-CLI has been removed from the report. The proposed development is a single parcel that will be completed as a plan of Condominium through a subsequent process. An ECA is not required. To be confirmed with MECP as required.

16. Appendix C: Please review the storm sewer design sheet. The Time of Concentration entries appear to be incorrect based on the storm sewer layout.

Response: Time of Concentrations have been revised accordingly.

17. Appendix C: Table 4, Table 5, Table 6 and Table 7, the runoff coefficients do not match the runoff coefficient listed on the Storm Drainage Plan.

Response: Plan revised.

18. Please provide supporting documentation for the Stormtech chambers to justify the number of chambers required to meet the storage volume demand.

Response: Supporting information on the Stormtech chambers has been added to Appendix C.

19. Appendix D: Peak extraneous flows were not included on the Sanitary Design Sheet. Please update the peak wastewater flows throughout the report to include the extraneous flow, in accordance with the Ottawa Sewer Design Guidelines.

Response: Flows have been added to design sheet.

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20. Appendix D: Please ensure all pipe lengths and slopes listed on the Sanitary Sewer Design sheet match those shown on the General Plan of Services.

Response: Checked.

21. Appendix E: Please re-check your exposure distances. Some of the building offsets and Description/Address noted in the Table 6 Worksheets appear to be incorrect. Exposure distance figure for Block 4 and Block 5 is missing.

Response: Exposure distances for all blocks have been added to Figure 7.1

22. Please provide the EPANET model results within Appendix E for Average Day Demand, Peak Hour Demand and Max Day plus Fire Flow Demand.

Response: EPANET model results are included in Appendix E.

23. Please provide the water age analysis modelling results in Appendix E.

Response: Water age analysis results during average day conditions are included Appendix E.

Grading Plan

24. If the Grading Plan will serve as the ESC Plan as well, please ensure the title of the drawing notes *Grading Plan and Erosion and Sediment Control Plan,* or similar. Please add ESC notes to the drawing.

Response: Plan revised

25. Please add additional grades/slopes between Block 3 and Block 4.

Response: Plan revised

26. The limit of grading along Stittsville Main Street should be contained within the property limits and not extend into the existing right-of-way ditch.

Response: Novatech completed works in 2018 as part of the Subdivision Registration. The Stittsville Main Street back of ditch grading was left low as part of a previous culvert crossing project to allow the existing property to drain. The proposed grading with 3:1 side slopes is consistent with the top of ditch grades created as part of the previous works.

General Plan of Services

27. Please label the existing watermain on Falabella Street.

Response: Plan revised

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28. Please note the ICD locations and sizes on the plan.

Response: Plan revised.

29. The existing watermain stub is 200mm diameter. Please update on the plan.

Response: Plan revised.

30. How will the service laterals for Block 5 cross over top of the stormtech chambers. For sanitary and storm service connections, the minimum cover shall be 2.0m from the finished grade.

Response: Services will be re-routed to the mainline. Refer to the GP for services lateral locations.

31. Can the sanitary sewer from SANMH5 to SANMH4 accommodate all sanitary service laterals for Block 1 or should it be extended?

Response: Dead end services have been extended 1.5m beyond the last service per the guidelines.

32. For the proposed City streetlight relocations, please send an email to Ryan Zaichkowsky, ryan.zaichkowsky@ottawa.ca, with the servicing drawings and CAD files, as well as any other pertinent information.

Response: Acknowledged. Preliminary CUP is included with the submission package.

Feel free to contact Julie Candow, Infrastructure Project Manager, for follow-up questions.

Transportation

List of Studies and Plans Reviewed:

- **Block 349 Site Plan**, dated March 21, 2025.

Comments:

33. Explore revising the Stittsville Main/Parade corner triangle to 9 x 3 m, instead of 5x5m.

Response: A 9 x 3 m corner triangle was not requested through the pre-consultation process with City staff and review agencies. A 5x5 m design has been used. No modifications are proposed.

Feel free to contact Mike Giampa, Transportation Project Manager, for follow-up questions.

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Noise

List of Studies and Plans Reviewed:

- **Noise** Impact Feasibility Report, prepared by Novatech, dated November 13, 2024.

Comments:

34. No comments.

Response: Acknowledged.

Feel free to contact Mike Giampa, TPM, for follow-up questions.

Ottawa Fire Services

Comments:

35. Please confirm the fire routes and that the fire routes meet all OBC requirements per 3.2.5.6.

Response: Confirmed.

Feel free to contact Allan Evans, Fire Protection Engineer, for follow-up questions.

Environment

Comments:

36. There are no triggers for an Environmental Impact Study, the nearest natural feature is over 30 m to the west which is beyond the adjacency distance for an urban area.

Response: Acknowledged.

37. Does not trigger bird-safe design comment since it is 4 storeys or less.

Response: Acknowledged.

38. Landscaping includes native species, so Environment has no concerns.

Response: Acknowledged.

Feel free to contact Matthew Hayley, Environmental Planner, for follow-up questions.

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Forestry

List of Studies and Plans Reviewed: Comments:

39. The TCR justifies the need to remove the privately-owned trees; a permit will be issued at site plan approval

Response: Acknowledged.

40. Please confirm if the relocation of the walkway is possible in order to retain city owned trees 2, 3 and 5.

    a. Compensation may be required if removal is justified.

Response: Acknowledged.

41. The information in the LP is well presented.

Response: Acknowledged.

Feel free to contact Mark Richardson, Planning Forester, for follow-up questions.

Parkland

These Parkland comments were included in previous submissions but have not been addressed thus far.

42. The amount of required parkland conveyance is to be calculated as per the City of Ottawa parkland Dedication By-law No. 2022-280 (or as amended). For cashin-lieu of conveyance of parkland (residential > 18 units/net ha). One hectare per 1,000 net residential units. For sites less than 5.0 hectares in size, the parkland dedication is capped at 10% of the development area

Response: Acknowledged.

43. PFP will be requesting cash-in-lieu of conveyance of parkland for parkland dedication. The amount of parkland owing is calculated as follows:

    1.0 hectares per 1000 units = .084 hectares per 84 units or 840 sq meters owing in CIL

    An appraisal will be required to determine the value of the parkland CIL required.

Response: Please refer to Comment 44 below.

44. In case Parkland has been conveyed previously under the subdivision application D07-16-13-0033: Please demonstrate how Parkland for Block 349, 4M1589 Plan, has been satisfied

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and provide evidence. It is the applicant responsibility to demonstrate that CIL or parkland for block 349 was taken previously and at what rate was the dedication calculated

Response: Block 349 has previously dedicated 0.24ha of parkland for 72 units at a rate of 1 Hectare per 300 units. The current requirement is (84 @ 1/1000) 0.084ha or 840 square metres. Parkland dedication requirements have been satisfied.

Further details are provided below and with the resubmission package:

- **At Draft approval in Aug 2015, the Area 6 West Lands were 650 Units (including 152 HD units within future Block 349 and 353). The remaining low-rise density were 295 Mattamy and 203 Valecraft.**
- **Post-draft approval Aug 2015 to Oct 2016 Early Service and prior to registration, Valecraft re-lotted and added 6 units, for a total Area 6 West of 656 Units. Refer to the Servicing Report in support of Registration.**
- **July 2017 Registration includes a clause for the dedication of Parkland at 1ha/300 units for the total 656 units (including this block). This parkland requirement was met between two park blocks – Howard A Maguire Park and Ray McCaffery Park. There was minor CIL paid at this time. Refer to Excerpt from Subdivision Agreement, Sched H, Section C, Clause 7a)**
- **The High density accounted for within the 656 units, was made up for 72 units at Block 349 and 80 units at Block 252. Refer to the Servicing Report in support of Registration.**

Feel free to contact, Diane Emmerson Parks Planner, for follow-up questions.

TELUS Communications

45. No conflict with TELUS

Response: Acknowledged.

Ottawa-Carleton District School Board

46. The OCDSB requires our standard clause to be included within the Subdivision Agreement and associated Purchase and Sale Agreement for Units. Our clause is as follows:

    a. The Owner shall include in all agreements of Purchase and Sale the following clause:

    b. *"Prospective purchasers are informed that school accommodation pressures exist in the Ottawa-Carleton District School Board schools designated to serve this development which are currently being addressed by the utilization of portable classrooms and/or by directing students to schools outside of their community".*

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Response: Acknowledged.

Contact: Julie.earle@ocdsb.ca

Hydro Ottawa

Hydro Ottawa has prepared a number of comments on the proposal.

47. The owner is advised that there is existing medium-voltage overhead on the north-west side of the property along Stittsville Main Street and Parade Drive.

    a. The Applicant is advised that permanent structures located within the "restricted zone" surrounding overhead lines are prohibited. This zone is defined by Hydro Ottawa's standard OLS0002 "Overhead High Voltage Clearances to Adjacent Building", which can be found at https://hydroottawa.com/accounts-services/accounts/contractorsdevelopers/clearances. This standard complies with the requirements of the Ministry of Labour's Occupational Health & Safety Act, the Ontario Building Code, and the Ontario Electrical Safety Code. Permanent structures include buildings, signs (even lit signs when open for maintenance), antennas, pools, and fences.

Response: Acknowledged.

    b. The Applicant shall ensure that any landscaping or surface finishing does not encroach into existing or proposed Hydro Ottawa overhead or underground assets or easement. When proposing to plant trees in proximity of existing power lines, the Owner shall refer to Hydro Ottawa's free publication "Tree Planting Advice" which can be found at https://hydroottawa.com/outages-safety/safety-home/outsidehome/planting-trees. The shrub or tree location and expected growth must be considered. If any Hydro Ottawa related activity requires the trimming, cutting or removal of vegetation, or removal of other landscaping or surface finishing, the activity and the re-instatement shall be at the owner's expense.

Response: Acknowledged.

    c. Should any activity, such as tree trimming or working on the sides of a building, be anticipated within three meters (3m) of Hydro Ottawa's overhead lines, contact Hydro Ottawa to discuss arrangements before any activity is undertaken. In line with the Ministry of Labour's Occupational Health & Safety Act, only a Hydro Ottawa employee or Hydro Ottawa approved contractor can work in proximity of these lines.

Response: Acknowledged.

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d. If the change in grade is more than three tenths of a meter (0.3m) in the vicinity of proposed or existing electric utility equipment. Hydro Ottawa requests to be consulted to prevent damages to its equipment.

Response: Acknowledged.

48. The Owner is to contact Hydro Ottawa if the electrical servicing of the site is to change in location or size. A load summary will be needed for the technical evaluation.

Response: Acknowledged.

49. The Applicant may be responsible for a Capital Contribution payment(s) towards a distribution system expansion if the proposed development requires electrical servicing greater than can be provided by the existing distribution system in the vicinity, either in capacity or in extension limit. This amount shall be in accordance with Hydro Ottawa's Contributed Capital Policy and Conditions of Service.

Response: Acknowledged.

50. The Owner shall enter an Installation and Service agreement with Hydro Ottawa.

Response: Acknowledged.

51. The Owner shall be responsible for servicing the buildings within the property. Only one service entrance per property shall be permitted.

Response: Acknowledged.

52. The Owner shall be responsible for all costs for feasible relocations, protection, or encasement of any existing Hydro Ottawa plant.

Response: Acknowledged.

53. The Owner shall convey, at their cost, all required easements as determined by Hydro Ottawa.

Response: Acknowledged.

54. The Applicant shall comply with Hydro Ottawa's Conditions of Service and thus should be consulted for the servicing terms. The document, including referenced standards, guidelines, and drawings, may be found at https://hydroottawa.com/about-us/policies/conditions-service. The Owner should consult Hydro Ottawa prior to commencing engineering designs to ensure compliance with these documents.

Response: Acknowledged.

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55. Hydro Ottawa reserves the right to raise conditions throughout the development of this proposal should the revisions contain non-conformances with, for example, Hydro Ottawa's Conditions of Service or Standards. To ensure the best outcome, Hydro Ottawa welcomes an early discussion on the proposal.

Response: Acknowledged.

For more information on electrical servicing, the following link outlines Hydro Ottawa's services for Commercial, Overhead Underground, and Residential projects, together with contact information for Hydro Ottawa representatives:

https://hydroottawa.com/accounts-services/accounts/contractorsdevelopers/distribution-system-design

Contact: **hoomanmohammadian@hydroottawa.com**

Bell Canada

56. Bell Canada Conditions of Approval are provided in a separate document.

Response: Acknowledged.

Rideau Valley Conservation Authority (RVCA)

57. RVCA comments are provided in a separate document.

Response: Acknowledged.

Canada Post

Comments:

58. Canada Post will provide mail delivery service to the development through centralized Community Mailboxes (CMBs).

59. The developer will consult Canada Post to determine suitable CMB locations

60. If the development includes plans for (a) multi-unit building(s) with a common indoor entrance, the developer must supply, install and maintain the mail delivery equipment within these buildings to Canada Post's specifications.

Additional Developer Requirements:

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61. The developer will consult with Canada Post to determine suitable permanent locations for the Community Mailboxes. The developer will then indicate these locations on the appropriate servicing plans.

62. The developer agrees, prior to offering any units for sale, to display a map on the wall of the sales office in a place readily accessible to potential homeowners that indicates the location of all Community Mailboxes within the development, as approved by Canada Post.

63. The developer agrees to include in all offers of purchase and sale a statement which advises the purchaser that mail will be delivered via Community Mailbox. The developer also agrees to note the locations of all Community Mailboxes within the development, and to notify affected homeowners of any established easements granted to Canada Post to permit access to the Community Mailbox.

64. The developer will provide a suitable and safe temporary site for a Community Mailbox until curbs, sidewalks and final grading are completed at the permanent Community Mailbox locations. Canada Post will provide mail delivery to new residents as soon as the homes are occupied.

65. The developer agrees to provide the following for each Community Mailbox site and to include these requirements on the appropriate servicing plans:

66. Any required walkway across the boulevard, per municipal standards

67. Any required curb depressions for wheelchair access, with an opening of at least two meters (consult Canada Post for detailed specifications)

Response: All Canada Post comments acknowledged.

Contact: Corey Craney-Twolan Corey.craney-twolan@canadapost.ca

Councillor and Community Comments

Councillor Gower:

68. Is it feasible to provide access via Parade and/or Campolina, instead of Falabella?

Response: Access to Parade is not desirable due to the left turn lane at Stittsville Main/Parade extending across the frontage to Falabella. Also a minimum spacing of 30m from the Stittsville Main right of way (ROW) would be required in accordance with the City's Private Approach By-Law. This would put the access very close to Falabella and could create driver confusion. Access to Campolina is feasible but not required.

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69. I request that prior to construction start, the applicant work with the Councillor's office to develop a Construction Information sheet for residents, to be posted on the Councillor's web site, that outlines expected impacts from construction, mitigation in place, timelines, and key contacts for the builder/developer.

Response: The applicant will work with the Councillor's office to outline the construction impacts. A construction traffic management plan was prepared as part of the complete development application.

Public Comments:

70. Theme 1: Transportation Motor Vehicle Traffic:

- Concerns regarding the additional 84 units increasing the amount of motor vehicles both on Stittsville Main Street as well as in the community, with potential for increased conflict on local roads.
- Concerns that the development will lead to increased traffic and congestion, and obstruction of service vehicles.
- Concerns about the vehicular access being to/from Falabella Street, and safety hazards, and a request that access be from Stittsville Main Street.
- Concerns regarding existing speeding issues along local streets, and the addition of speeding traffic resulting from the development. Comments suggested that more traffic calming interventions be installed along Parade Drive between Stittsville Main Street and Dalmatian Way
- Request for a transportation/traffic and safety assessment, and a scoped traffic brief.
- Safety concerns relating to construction traffic.

Response: The capacity of a local suburban street is 600 veh/hr per lane. The existing Falabella traffic is likely 10-15 veh/hr based on TRANS rates and 20 single family homes. The proposed Falabella traffic is likely 30-35 veh/hr based on TRANS rates and 84 stacked towns. The total traffic is expected to be much less than capacity.

Access to Stittsville Main is inappropriate since the primary function of arterials is traffic flow and the primary function of locals is access. The reserve from the Plan of Subdivision was intended to restrict access to Stittsville Main.

Existing neighbourhood traffic calming concerns are not a Site Plan matter.

The development application did not meet the requirements for a Transportation Impact Assessment (TIA).

Parking:

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- Comments that the development will lead to increased street parking and parking issues, with impacts on traffic and obstruction of service vehicles.
- Concerns regarding existing on-street parking issues due to insufficient parking in the neighbourhood, and concerns that the proposal will worsen existing on-street parking issues, due to the influx of traffic from the development.
- Concerns that overflow parking will reduce availability of on-street parking for visitors to nearby residents.
- Concern that insufficient parking is provided for the development, and requests that additional spaces be added.
- Suggestion that the number of units is reduced to provide 1.5 parking spaces per unit.

Response: The minimum parking requirements are met in accordance with the City's Zoning By-Law and spillover parking is not anticipated.

Pedestrian Safety:

- Concerns for pedestrian safety due to the increased traffic and on-street parking from this development.
- Concerns regarding the safety of children playing outside, due to increased traffic, the access on Falabella, and on-street parking reducing visibility.
- Concerns for pedestrian safety relating to construction traffic.
- Concerns regarding the lack of sidewalks in the neighbourhood, resulting in pedestrians, including children, walking on the roads.

Response: Traffic on the local roads is expected to be much less than capacity. Sidewalks are proposed on Falabella and Campolina.

71. Theme 2: Forestry and Greenspace:

a. Concerns surrounding the cutting down of existing trees on site, and the loss of green space in the neighbourhood.

b. Concerns regarding the potential over-crowding of recreation and park space, specifically in Howard A. Maguire Park, and difficulty using facilities during peak hours.

Response: All necessary City approvals will be obtained for required tree removals to facilitate the proposed development.

72. Theme 3: Built Form & Community Impact

Suite 200, 240 Michael Cowpland Drive, Ottawa ON-K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

a. Concerns that the proposal is too dense for the site and will create a significant shift away from the neighbourhood character, and is not in keeping with the character of the neighbourhood
b. Concerns regarding the loss of privacy due to the density of the development.
c. Request for a reduced number of units in the proposal.
d. Concerns regarding strain on local resources resulting from the development, including the capacity of schools and community/recreation centres to accommodate the new residents.
e. Concerns regarding increased noise and disruption both during construction and after occupancy.
f. Concerns regarding increased pollution from increased vehicle traffic and construction.
g. Comments that the development does not fit the aesthetic of the neighbourhood.

Response: The proposal can be developed as of right based on policies of the Official Plan and provisions of the zoning by-law. A minor variance application to reduce the required interior side yard setback along Stittsville Mainstreet was approved by the Committee of Adjustment.

All City construction requirements will be adhered to through the development process to mitigate temporary noise impacts on the surrounding community. A preliminary Construction Management Plan has been prepared complete with proposed temporary routes to alleviate heavy traffic on surrounding roads while site works take place.

73. Other

a. Concerns regarding decreased property values
b. Overall concern about the consultation process of this development, and a request for a public meeting to be held

Response: A public meeting was held on June 4th, 2025.

We trust this information is of use to you. Should you have any further questions or comments, please do not hesitate to contact the undersigned below

Yours truly,

NOVATECH

Jeffrey Kelly, MCIP RPP

Suite 200, 240 Michael Cowpland Drive, Ottawa ON-K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

Project Manager | Planning & Development

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Conservation Partners
Partenaires en conservation

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

May 8, 2025

SENT BY EMAIL (amanda.davidson@ottawa.ca)

Amanda Davidson
Planner I
Development Review West
City of Ottawa
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1

Re: **Plan of Condominium D07-04-25-0002**
Site Plan Control Application D07-12-24-0107
Part of Lot 22, Concession 9
1883 Stittsville Main Street
City of Ottawa
Mattamy Homes

This letter acknowledges receipt of the above-noted applications circulated by the City of Ottawa. The materials were received by the Rideau Valley Conservation Authority (RVCA) on May 1, 2025 and May 2, 2025.

RVCA staff have reviewed these applications in accordance with the *Conservation Authorities Act*, which requires RVCA to provide programs and services related to the risk of natural hazards within its jurisdiction. With respect to *Planning Act* matters, conservation authorities have a role to ensure that decisions under the *Planning Act* are consistent with the natural hazard policies (Chapter 5) of the Provincial Policy Statement (PPS).

In addition, RVCA staff have also reviewed these applications in accordance with Section 28 of the *Conservation Authorities Act*. Where development activity is proposed within a regulated area, a permit is required to ensure that it conforms to the applicable tests for implementation of the Act.

Purpose of the Application

It is our understanding that the purpose of the above noted applications to provide design details to facilitate a Planned Unit Development consisting of seven 3-storey stacked townhouse dwellings and to establish a standard condominium for common ownership of shared services and site elements, including the surface parking lot and amenity areas.

Conservation Authorities Act - Section 28

The subject property is not located within RVCA's Regulated Area. As such, any development or site alteration would not be subject to a permit pursuant to 28.1 of the *Conservation Authorities Act*.

Application-Specific Comments

The subject lands are located within RVCA's jurisdiction, but they are not located within RVCA's regulated area. There are no regulated natural features (i.e., wetlands or watercourses) or natural hazards (i.e., flooding, erosion, unstable soil/bedrock associated with steep slopes) on, or directly adjacent to, the site based on RVCA mapping. Without the presence of regulated natural features and associated natural hazards, RVCA planning or regulatory policy interests are not impacted. As such, RVCA has no comments related to the current application.

Recommendation

Based on the above, RVCA has no objections to the approval of Plan of Condominium D07-04-25-0002 and Site Plan Control Application D07-12-24-0142.

We trust these comments are of assistance. Should you have any questions, please contact me at stephen.bohan@rvca.ca

Sincerely,

Stephen Bohan
Planner
Rideau Valley Conservation Authority
Stephen.bohan@rvca.ca
613-692-3571 ext. 1191

Appendix B

NOVATECH
Engineers, Planners & Landscape Architects

Development Servicing Study Checklist

Project Name: Traditions II - Block 349
Project Number: 124097
Date: July 2, 2025

4.1 General Content	**Addressed (Y/N/NA)**	**Section**	**Comments**
Executive Summary (for larger reports only).	**NA**		
Date and revision number of the report.	Y	Cover	
Location map and plan showing municipal address, boundary, and layout of proposed development.	Y	Fig 1.1, 1.2	
Plan showing the site and location of all existing services.	Y	GP	
Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	NA		
Summary of Pre-consultation Meetings with City and other approval agencies.	N		
Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Y	2	
Statement of objectives and servicing criteria.	Y	1	
Identification of existing and proposed infrastructure available in the immediate area.	Y	4,5,6	
Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	NA		
Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighboring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Y	GR	

4.1 General Content	**Addressed (Y/N/NA)**	**Section**	**Comments**
Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	NA		
Proposed phasing of the development, if applicable.	NA		
Reference to geotechnical studies and recommendations concerning servicing.	Y	2	
All preliminary and formal site plan submissions should have the following information:			
Metric scale	NA		
North arrow (including construction North)	NA		
Key plan	NA		
Name and contact information of applicant and property owner	NA		
Property limits including bearings and dimensions	NA		
Existing and proposed structures and parking areas	NA		
Easements, road widening and rights-of-way	NA		
Adjacent street names	NA		

4.2 Water	Addressed (Y/N/NA)	Section	Comments
Confirm consistency with Master Servicing Study, if available.	NA		
Availability of public infrastructure to service proposed development.	Y	6	
Identification of system constraints.	Y	6	
Identify boundary conditions.	Y	6	
Confirmation of adequate domestic supply and pressure.	Y	6	
Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Y	6	
Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	Y	6	
Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design.	NA		
Address reliability requirements such as appropriate location of shut-off valves.	Y	GP	
Check on the necessity of a pressure zone boundary modification.	NA		
Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	Y	6	
Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Y	6, GP	
Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	NA		
Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Y	6	
Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Y	App E	

4.3 Wastewater	**Addressed (Y/N/NA)**	**Section**	**Comments**
Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Y	5	
Confirm consistency with Master Servicing Study and/or justifications for deviations.	NA		
Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	NA		
Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Y	5	
Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Y	5	
Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	N		
Description of proposed sewer network including sewers, pumping stations, and forcemains.	Y	5	
Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	NA		
Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	NA		
Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	NA		
Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	NA		
Special considerations such as contamination, corrosive environment etc.	NA		

4.4 Stormwater	Addressed (Y/N/NA)	Section	Comments
Description of drainage outlets and downstream constraints including legality of outlet (i.e. municipal drain, right-of-way, watercourse, or private property).	Y	4	
Analysis of the available capacity in existing public infrastructure.	NA		
A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns and proposed drainage patterns.	Y	Fig 4.1, STM	
Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Y	4	
Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Y	4	
Description of stormwater management concept with facility locations and descriptions with references and supporting information.	Y	4	
Set-back from private sewage disposal systems.	NA		
Watercourse and hazard lands setbacks.	NA		
Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	NA		
Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	NA		
Storage requirements (complete with calcs) and conveyance capacity for 5 yr and 100 yr events.	Y	4	
Identification of watercourse within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	Y	4	
Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Y	4	
Any proposed diversion of drainage catchment areas from one outlet to another.	NA		
Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and SWM facilities.	Y	4	
If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	NA		

4.4 Stormwater	**Addressed (Y/N/NA)**	**Section**	**Comments**
Identification of municipal drains and related approval requirements.	NA		
Description of how the conveyance and storage capacity will be achieved for the development.	Y	4	
100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Y	4	
Inclusion of hydraulic analysis including HGL elevations.	Y	4	
Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Y	7	
Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	Y	4	
Identification of fill constrains related to floodplain and geotechnical investigation.	NA		

4.5 Approval and Permit Requirements	Addressed (Y/N/NA)	Section	Comments
Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Y	8	
Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	Y	8	
Changes to Municipal Drains.	NA		
Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	Y	8	

4.6 Conclusion	Addressed (Y/N/NA)	Section	Comments
Clearly stated conclusions and recommendations.	Y	9	
Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	NA		
All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario.	Y	10	

Appendix C

STORM SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Density
Date: 10/18/2024
Revised: 6/23/2025
Input By: MNP
Reviewed By: ARM
Drawing Reference: 124097-GP and 124097-STM

Storm Design Event = 2 Year

Legend:
- Design Input by User
- As-Built Input by User
- Cumulative Cell
- Calculated Design Cell Output
- Calculated Uncontrolled Peak Flow Cell Output
- Design Input Restricted Peak Flow Cell

Reference: City of Ottawa - Sewer Design Guidelines (2012 and TBs)
MOE - Design Guidelines for Sewage Works (2008)

Location				Flow							Design Capacity / Proposed Sewer Pipe Sizing / Design								
Street	Area ID	From MH	To MH	Area A (ha.)	Runoff Coefficient C	Indivi. 2.78 AC	Accum. 2.78 AC	Time of Conc. Tc (min.)	Rain Intensity I (mm/hr)	Total Uncontrolled Peak Flow Q (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Time of Flow (min.)	Q / Qfull
Drive Aisle A	STM-1	STMMH 1	STMMH 2	0.13	0.73	0.26	0.26	10.00	76.81	20.3	19.4	450 CONC	0.4572	0.013	2.24	445.2	2.71	0.12	4.6%
Drive Aisle A	STM-2	STMMH 3	STMMH 2	0.48	0.74	0.99	1.25	10.00	76.81	96.1	51.8	450 CONC	0.4572	0.013	0.43	195.0	1.19	0.73	49.3%
Drive Aisle B	--	STMMH 2	STMMH 4	0.00	0.00	0.00	1.52	10.73	74.12	112.3	11.4	450 CONC	0.4572	0.013	1.48	361.8	2.20	0.09	31.0%
Drive Aisle B	--	STMMH 4	STMMH 5	0.00	0.00	0.00	1.52	10.81	73.82	111.8	40.8	450 CONC	0.4572	0.013	1.49	363.1	2.21	0.31	30.8%
Drive Aisle B	STM-3	STMMH 5	Existing Stub	0.20	0.79	0.44	1.95	11.12	72.76	142.2	5.9	600 CONC	0.6096	0.013	0.43	420.0	1.44	0.07	33.9%
Totals				**0.81**							**129.3**								

Demand Equation / Parameters

1. Q = 2.78 ACI

Definitions

Q = Peak flow in litres per second (L/s)
A = Area in hectares (ha)
C = Weighted runoff coefficient (increased by 25% for 100-year)
I = Rainfall intensity in millimeters per hour (mm/hr)

Rainfall intensity is based on City of Ottawa IDF data presented in the City of Ottawa - Sewer Design Guidelines

Capacity Equation

Q full = $1000*(1/n)*A_p*R^{2/3}*So^{0.5}$

Definitions

Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A_p = Pipe flow area (m^2)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

Table 1: Area STM-1, Post-Development Controlled Flow (Underground Storage #1)

Runoff Coefficient "C"

			2/5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	*C_{avg}
Total	Hard	0.094	0.90	0.73	1.00	0.81
0.125	Soft	0.031	0.20		0.25	
	Pond	0.000	0.00		0.00	

2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - T-2

0.125 =Area (ha)
0.73 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	5	103.57	26.14	4.2	21.93	6.58
	30	**40.04**	**10.11**	**4.2**	**5.89**	**10.61**
	35	36.06	9.10	4.2	4.89	10.26
	40	32.86	8.30	4.2	4.08	9.79
	45	30.24	7.63	4.2	3.42	9.23

5 YEAR EVENT QUANTITY STORAGE REQUIREMENT

0.125 =Area (ha)
0.73 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	15	83.56	21.09	5.2	15.88	14.29
	20	70.25	17.73	5.2	12.52	15.02
	25	**60.90**	**15.37**	**5.2**	**10.16**	**15.23**
	30	53.93	13.61	5.2	8.40	15.11
	35	48.52	12.25	5.2	7.03	14.76

* Release rate for storage is based on 1/2 the allowable to account for falling head on the orifice control.

100 YEAR EVENT QUANTITY STORAGE REQUIREMENT

0.125 =Area (ha)
0.81 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	25	103.85	29.37	7.5	21.87	32.81
	30	91.87	25.99	7.5	18.49	33.28
	35	**82.58**	**23.36**	**7.5**	**15.86**	**33.30**
	40	75.15	21.26	7.5	13.76	33.01
	45	69.05	19.53	7.5	12.03	32.49

* Release rate for storage is based on 1/2 the allowable to account for falling head on the orifice control.

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

ORIFICE SIZING

Control Device		
Circular Plug Type ICD	72	mm

Design Event	Flow	Head	Elevation	Orifice Area (m^2)	Circ (mm)
1:2 Year	8.4	0.56	122.14	0.004099	72
1:5 Year	10.4	0.86	122.44	0.004099	72
1:100 Year	15.0	1.75	123.33	0.004124	72

Outlet Invert	121.54

Orifice Control Sizing

$Q = 0.62 \times A \times (2gh) \times 0.5$

Where:

Q is the release rate in m^3/s
A is the orifice area in m^2
g is the acceleration due to gravity, 9.81 m/s^2
h is the head of water above the orifice center in m
d is the diameter of the orifice in m

Table 2: Area STM-2, Post-Development Controlled Flow (Underground Storage #2)

Runoff Coefficient "C"

			2/5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	*C_{avg}
Total	Hard	0.376	0.90	0.74	1.00	0.83
0.484	Soft	0.108	0.20		0.25	
	Pond	0.000	0.00		0.00	

2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - T-2

0.484 =Area (ha)
0.74 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	0	167.22	167.36	32.6	134.72	0.00
	5	103.57	103.65	32.6	71.01	21.30
	10	**76.81**	**76.87**	**32.6**	**44.23**	**26.54**
	15	61.77	61.82	32.6	29.18	26.26
	20	52.03	52.07	32.6	19.43	23.32

5 YEAR EVENT QUANTITY STORAGE REQUIREMENT

0.484 =Area (ha)
0.74 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	5	141.18	141.29	41.1	100.23	30.07
	10	104.19	104.28	41.1	63.22	37.93
	15	**83.56**	**83.62**	**41.1**	**42.56**	**38.31**
	20	70.25	70.31	41.1	29.25	35.10
	25	60.90	60.94	41.1	19.89	29.83

* Release rate for storage is based on 1/2 the allowable to account for falling head on the orifice control.

100 YEAR EVENT QUANTITY STORAGE REQUIREMENT

0.484 =Area (ha)
0.83 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	5	242.70	271.91	60.0	211.91	63.57
	10	178.56	200.05	60.0	140.05	84.03
	15	**142.89**	**160.09**	**60.0**	**100.09**	**90.08**
	20	119.95	134.39	60.0	74.39	89.26
	25	103.85	116.34	60.0	56.34	84.52

* Release rate for storage is based on 1/2 the allowable to account for falling head on the orifice control.

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

ORIFICE SIZING

Control Device		
Circular Plug Type ICD	204	mm

Design Event	Flow	Head	Elevation	Orifice Area (m^2)	Circ (mm)
1:2 Year	65.3	0.52	121.38	0.032807	204
1:5 Year	82.1	0.84	121.69	0.032665	204
1:100 Year	120.0	1.78	122.63	0.032770	204

Outlet Invert	120.75

Orifice Control Sizing

$Q = 0.62 \times A \times (2gh) \times 0.5$

Where:

Q is the release rate in m^3/s
A is the orifice area in m^2
g is the acceleration due to gravity, 9.81 m/s^2
h is the head of water above the orifice center in m
d is the diameter of the orifice in m

Table 3: Area STM-3, Post-Development Controlled Flow (Underground Storage #3)

Runoff Coefficient "C"

			2/5 Year Event		100 Year Event	
Area	Surface	Ha	"C"	C_{avg}	"C" + 25%	*C_{avg}
Total	Hard	0.169	0.90	0.79	1.00	0.88
0.200	Soft	0.031	0.20		0.25	
	Pond	0.000	0.00		0.00	

2 YEAR EVENT QUANTITY STORAGE REQUIREMENT - T-2

0.200 =Area (ha)
0.79 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
2 YEAR	20	52.03	22.90	5.7	17.16	20.59
	25	45.17	19.88	5.7	14.14	21.21
	30	**40.04**	**17.62**	**5.7**	**11.89**	**21.40**
	35	36.06	15.87	5.7	10.13	21.28
	40	32.86	14.46	5.7	8.73	20.94

5 YEAR EVENT QUANTITY STORAGE REQUIREMENT

0.200 =Area (ha)
0.79 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
5 YEAR	20	70.25	30.92	7.0	23.89	28.67
	25	60.90	26.80	7.0	19.77	29.66
	30	**53.93**	**23.73**	**7.0**	**16.70**	**30.07**
	35	48.52	21.35	7.0	14.32	30.08
	40	44.18	19.44	7.0	12.42	29.80

* Release rate for storage is based on 1/2 the allowable to account for falling head on the orifice control.

100 YEAR EVENT QUANTITY STORAGE REQUIREMENT

0.200 =Area (ha)
0.88 = C

Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Allowable Runoff (L/s)*	Net Flow to be Stored (L/s)	Storage Req'd (m^3)
100 YEAR	30	91.87	45.14	10.0	35.14	63.25
	35	82.58	40.58	10.0	30.58	64.21
	40	**75.15**	**36.92**	**10.0**	**26.92**	**64.62**
	45	69.05	33.93	10.0	23.93	64.61
	50	63.95	31.42	10.0	21.42	64.27

* Release rate for storage is based on 1/2 the allowable to account for falling head on the orifice control.

Equations:

Flow Equation

$Q = 2.78 \times C \times I \times A$

Where:

C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

Runoff Coefficient Equation

$C_5 = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

$C_{100} = (A_{hard} \times 1.0 + A_{soft} \times 0.25)/A_{Tot}$

ORIFICE SIZING

Control Device		
Circular Plug Type ICD	84	mm

Design Event	Flow	Head	Elevation	Orifice Area (m^2)	Circ (mm)
1:2 Year	11.5	0.55	120.49	0.005607	84
1:5 Year	14.1	0.85	120.79	0.005541	84
1:100 Year	20.0	1.75	121.68	0.005508	84

Outlet Invert	119.89

Orifice Control Sizing

$Q = 0.62 \times A \times (2gh) \times 0.5$

Where:

Q is the release rate in m^3/s
A is the orifice area in m^2
g is the acceleration due to gravity, 9.81 m/s^2
h is the head of water above the orifice center in m
d is the diameter of the orifice in m

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Table 4: Area STM-4, Post-Development Uncontrolled Flows

Runoff Coefficient "C"

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.070	0.90	0.69	0.78
0.100	Soft	0.030	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

Uncontrolled Flow

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Stittsville Main Street	0.100	0.69	10	**14.7**	**20.0**	**38.5**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$

Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

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Table 5: Area STM-5, Post-Development Uncontrolled Flows

Runoff Coefficient "C"

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.050	0.90	0.70	0.79
0.070	Soft	0.020	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

Uncontrolled Flow

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Campolina Way	0.070	0.70	10	**10.5**	**14.2**	**27.3**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$

Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

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Table 6: Area STM-6, Post-Development Uncontrolled Flows

Runoff Coefficient "C"

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.020	0.90	0.90	1.00
0.020	Soft	0.000	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

Uncontrolled Flow

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Falabella Street	0.020	0.90	10	**3.8**	**5.2**	**9.9**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$

Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

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Table 7: Area STM-7, Post-Development Uncontrolled Flows

Runoff Coefficient "C"

Area	Surface	Ha	"C"	C_{avg}	*C_{100}
Total	Hard	0.020	0.90	0.67	0.75
0.030	Soft	0.010	0.20		

Runoff Coefficient Equation

$C = (A_{hard} \times 0.9 + A_{soft} \times 0.2)/A_{Tot}$

* Runoff Coefficient increases by 25% up to a maximum value of 1.00 for the 100-Year event

Uncontrolled Flow

Outlet Options	Area (ha)	C_{avg}	Tc (min)	$Q_{2\ Year}$ (L/s)	$Q_{5\ Year}$ (L/s)	$Q_{100\ Year}$ (L/s)
Parade Drive	0.030	0.67	10	**4.3**	**5.8**	**11.2**

Time of Concentration	Tc=	10	min
Intensity (2 Year Event)	I_2=	76.81	mm/hr
Intensity (5 Year Event)	I_5=	104.19	mm/hr
Intensity (100 Year Event)	I_{100}=	178.56	mm/hr

100 year Intensity = 1735.688 / (Time in min + 6.014) $^{0.820}$
5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$
2 year Intensity = 732.951 / (Time in min + 6.199) $^{0.810}$

Equations:
Flow Equation
$Q = 2.78 \times C \times I \times A$

Where:
C is the runoff coefficient
I is the rainfall intensity, City of Ottawa IDF
A is the total drainage area

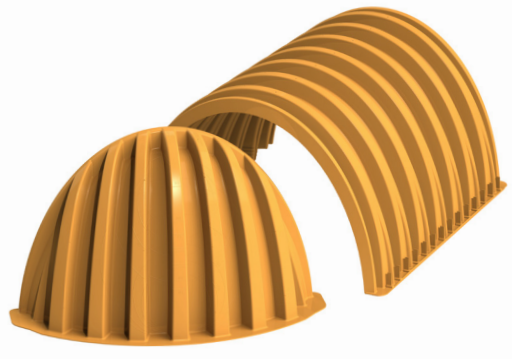
Table 8: Post-Development Stormwater Management Summary

Area ID	Area (ha)	1:2 & 1:5 Year Weighted Cw	1:100 Year Weighted Cw	5 Year Storm Event				100 Year Storm Event			
				Release (L/s)	Ponding Depth (m)	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.) [2]	Release (L/s)	Ponding Depth (m)	Req'd Vol (cu.m)	Max. Vol. Provided (cu.m.)
1	0.125	0.73	0.81	10.4	0.00	15.23	17.00	15.0	0.00	33.30	34.00
2	0.484	0.74	0.83	82.1	0.00	38.31	45.00	120.0	0.00	90.08	90.00
3	0.200	0.79	0.88	14.1	0.00	30.07	32.50	20.0	0.00	64.62	65.00
4	0.100	0.69	0.78	20.0	0.00	N/A	N/A	38.5	0.00	N/A	N/A
5	0.070	0.70	0.79	14.2	0.00	N/A	N/A	27.3	0.00	N/A	N/A
6	0.020	0.90	1.00	5.2	0.00	N/A	N/A	9.9	0.00	N/A	N/A
7	0.030	0.67	0.75	5.8	0.00	N/A	N/A	11.2	0.00	N/A	N/A
Total				**151.8**				**241.9**		**188.0**	
Allowable*				**197.0**				**249 (1)**			

(1) Allowable release rate based on allocated release rate of 240 L/s/ha, indicated in The Detailed Servicing and Stormwater Management Report for the Sittsville South Development (Novatech, 2016)

StormTech® MC-3500 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.



Nominal Chamber Specifications
(not to scale)

Size (L x W x H)
90” x 77” x 45”
2286 mm x 1956 mm x 1143 mm

Chamber Storage
109.9 ft³ (3.11 m³)

Min. Installed Storage*
175.0 ft³ (4.96 m³)

Weight
134 lbs (60.8 kg)

Shipping
15 chambers/pallet
7 end caps/pallet
7 pallets/truck

*Assumes a minimum of 12” (300 mm) of stone above, 9” (230 mm) of stone below chambers, 6” (150 mm) of stone between chambers/ end caps and 40% stone porosity.

Nominal End Cap Specifications
(not to scale)

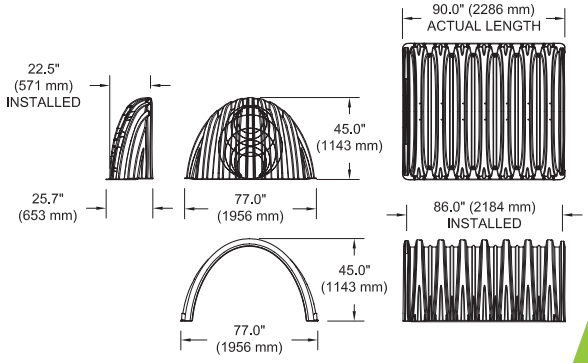
Size (L x W x H)
26.5” x 71” x 45.1”
673 mm x 1803 mm x 1145 mm

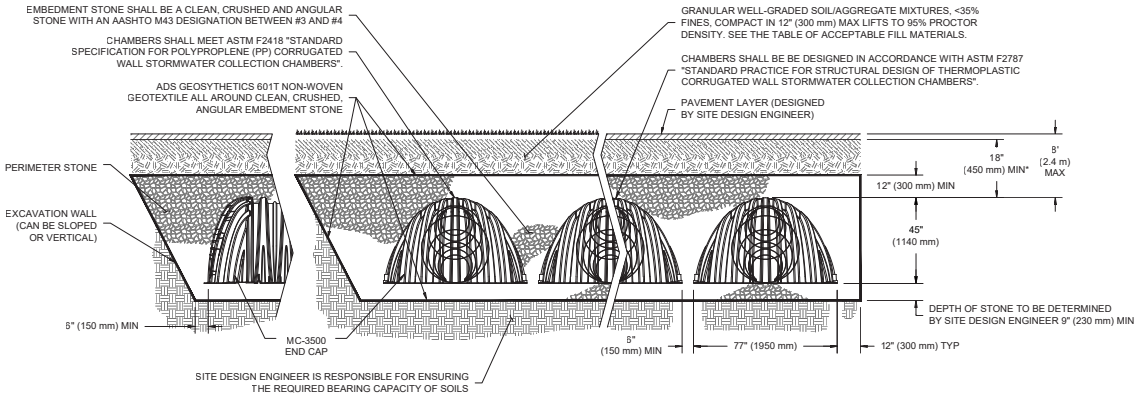
End Cap Storage
14.9 ft³ (0.42 m³)

Min. Installed Storage*
45.1 ft³ (1.28 m³)

Weight
49 lbs (22.2 kg)

*Assumes a minimum of 12” (300 mm) of stone above, 9” (230 mm) of stone below, 6” (150 mm) of stone perimeter, 6” (150 mm) of stone between chambers/ end caps and 40% stone porosity.





*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).

ADS StormTech™

StormTech MC-3500 Specifications

Storage Volume Per Chamber

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)			
		9 in (230 mm)	12 in (300 mm)	15 in (375 mm)	18 in (450 mm)
Chamber	109.9 (3.11)	175.0 (4.96)	179.9 (5.09)	184.9 (5.24)	189.9 (5.38)
End Cap	14.9 (0.42)	45.1 (1.28)	46.6 (1.32)	48.3 (1.37)	49.9 (1.41)

Note: Assumes 6" (150 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume.

Amount of Stone Per Chamber

English Tons (yds³)	Stone Foundation Depth			
	9 in	12 in	15 in	18 in
Chamber	8.5 (6.0)	9.1 (6.5)	9.7 (6.9)	10.4 (7.4)
End Cap	3.9 (2.8)	4.1 (2.9)	4.3 (3.1)	4.5 (3.2)
Metric Kilograms (m³)	**230 mm**	**300 mm**	**375 mm**	**450 mm**
Chamber	7711 (4.6)	8255 (5.0)	8800 (5.3)	9435 (5.7)
End Cap	3538 (2.1)	3719 (2.2)	3901 (2.4)	4082 (2.5)

Note: Assumes 12" (300 mm) of stone above and 6" (150 mm) row spacing and 6" (150 mm) of perimeter stone in front of end caps.

Volume Excavation Per Chamber yd³ (m³)

	Stone Foundation Depth			
	9 in (230 mm)	12 in (300 mm)	15 in (375mm)	18 in (450 mm)
Chamber	11.9 (9.1)	12.4 (9.5)	12.8 (9.8)	13.3 (10.2)
End Cap	4.0 (3.1)	4.1 (3.3)	4.3 (3.3)	4.4 (3.4)

Note: Assumes 6" (150 mm) of separation between chamber rows and 24" (600 mm) of cover. The volume of excavation will vary as depth of cover increases.

ADS StormTech products, manufactured in accordance with ASTM F2418 or ASTMF2922, comply with all requirements in the Build America, Buy America (BABA) Act.

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ADS StormTech™

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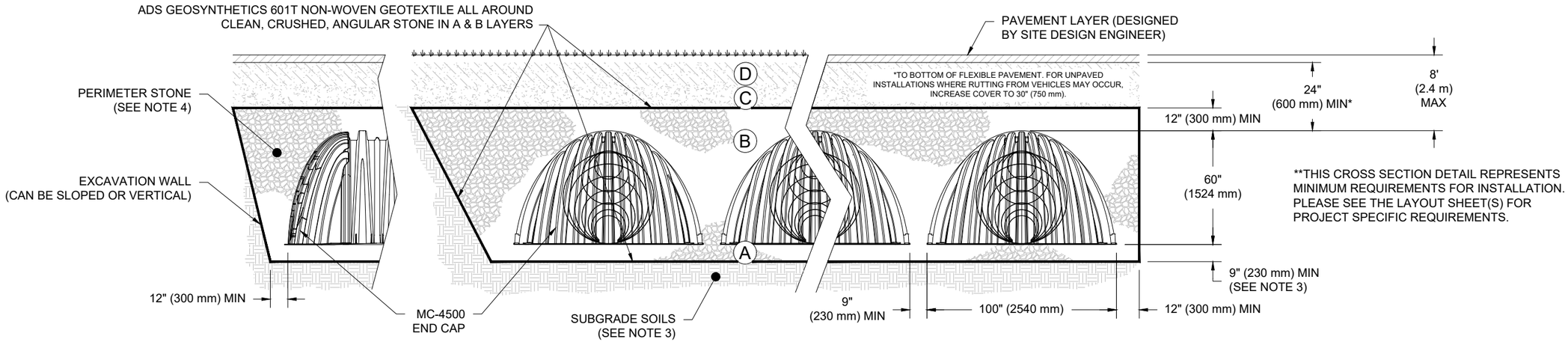
ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE[5]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.
5. WHERE RECYCLED CONCRETE AGGREGATE IS USED IN LAYERS 'A' OR 'B' THE MATERIAL SHOULD ALSO MEET THE ACCEPTABILITY CRITERIA OUTLINED IN TECHNICAL NOTE 6.20 "RECYCLED CONCRETE STRUCTURAL BACKFILL".



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

STANDARD CROSS SECTION
MC-4500 CHAMBER
STORMTECH

DATE: 02/17/2025 | DRAWN: SMW | CHECKED: JLM
DRAWING #: 724-420

DATE	DESCRIPTION	DRWN	CHKD

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StormTech® Chamber System
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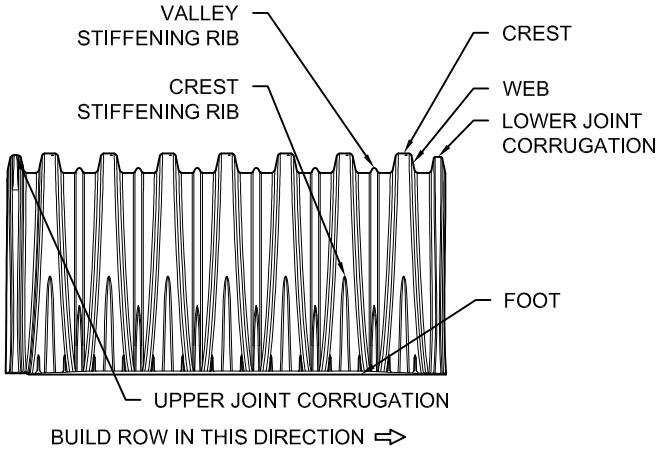
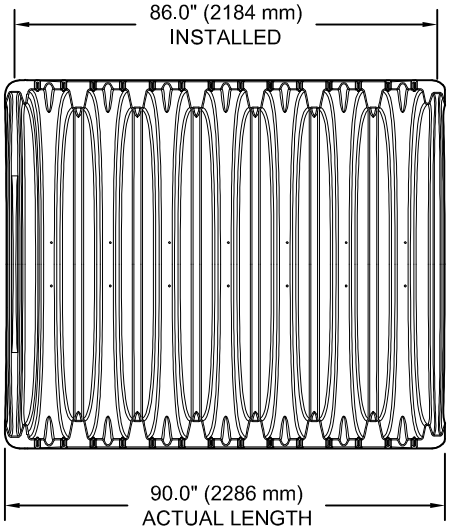
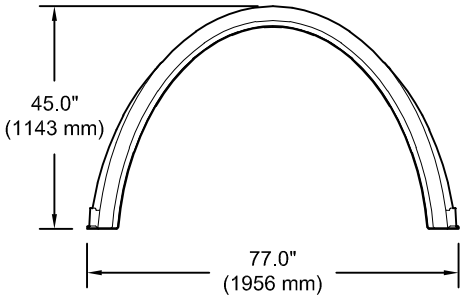
SHEET 1 OF 1

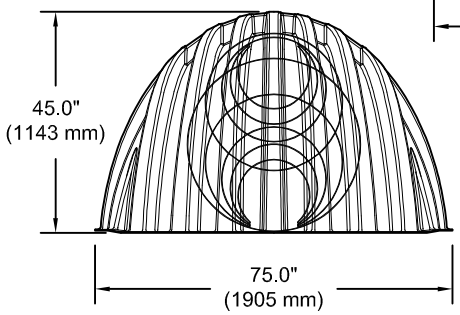
MC-3500 TECHNICAL SPECIFICATION

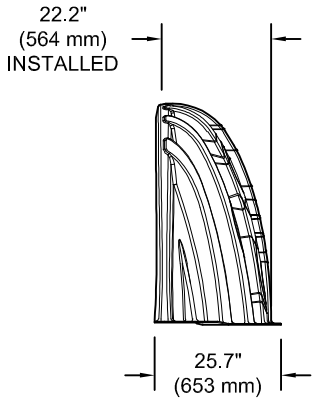
NTS











NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	175.0 CUBIC FEET	(4.96 m³)
WEIGHT	134 lbs.	(60.8 kg)

NOMINAL END CAP SPECIFICATIONS

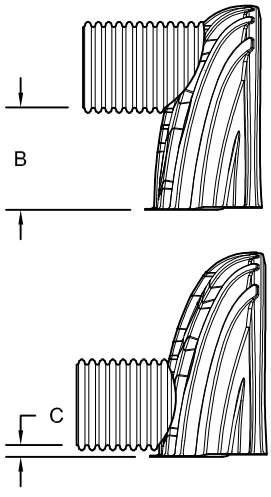
SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m³)
WEIGHT	49 lbs.	(22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" (152 mm) STONE BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

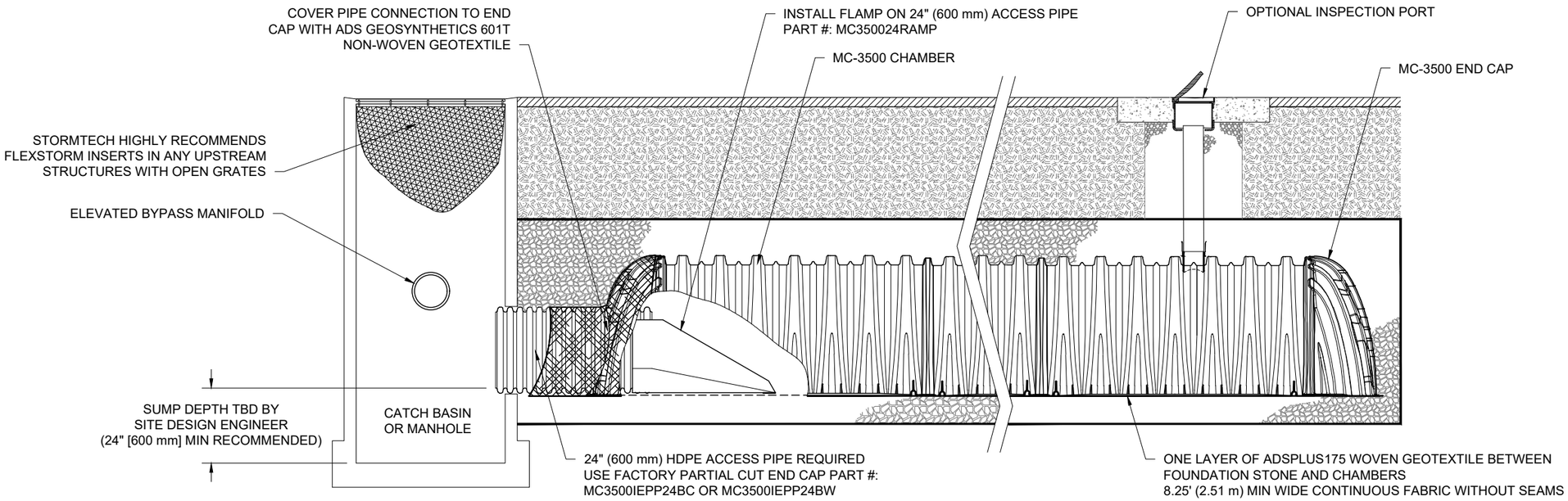
PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PARTIAL CUT INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.



MC-3500 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

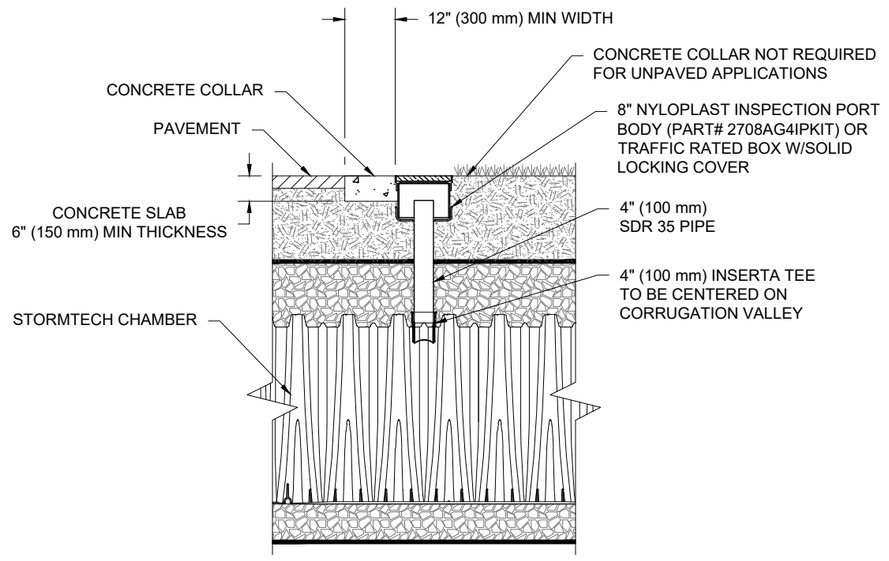
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.

4" PVC INSPECTION PORT DETAIL (MC SERIES CHAMBER)
NTS

MC-3500
ISOLATOR ROW PLUS DETAILS
DATE: 8/03/22 | DRAWN: KLJ | CHECKED: KLJ | PROJECT #:

DATE	DRWN	CHKD	DESCRIPTION

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

StormTech® Chamber System
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4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS

Isolator® Row Plus
O&M Manual

ADS StormTech™

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS), Total Phosphorus (TP), Total Petroluem Hydrocarbons (TPH) and Total Nitrogen (TN) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, SC-800, MC-3500, MC-4500 or MC-7200 models, are lined with filter fabric and connected to a closely located manhole for easy access. The fabric lined chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers allow stormwater to flow vertically out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS Isolator Row and Plus fabric are placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting.

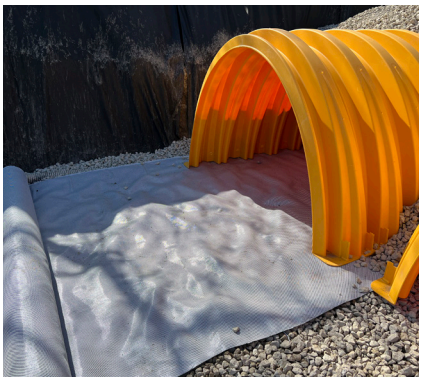
The Isolator Row Plus is designed to capture the “first flush” runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

The Isolator Row Plus Flamp™ is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end, or more difficult to remove and require confined space entry into the chamber area. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

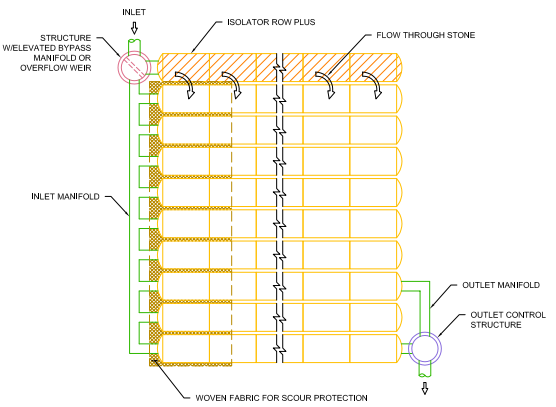
The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*

Looking down the Isolator Row Plus from the manhole opening, ADS Plus Fabric is shown between the chamber and stone base.



StormTech Isolator Row Plus with Overflow Structure (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

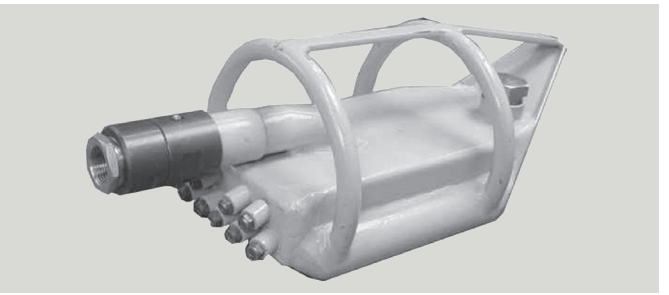
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3" (75 mm) throughout the length of the Isolator Row Plus, clean-out should be performed.

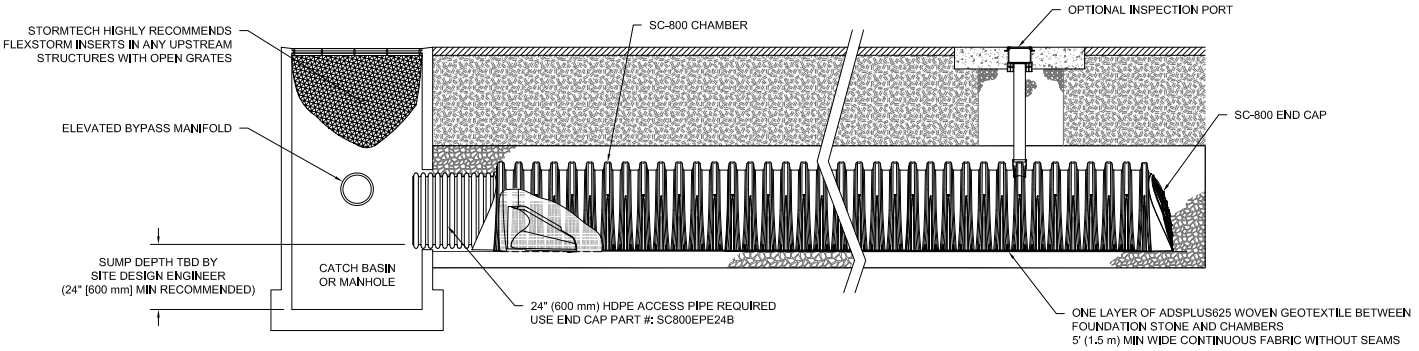
Maintenance

The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entry.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45” are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**



StormTech Isolator Row Plus (*not to scale*)



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

A) Inspection ports (if present)
   i. Remove lid from floor box frame
   ii. Remove cap from inspection riser
   iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
   iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Row Plus
   i. Remove cover from manhole at upstream end of Isolator Row Plus
   ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
      1. Mirrors on poles or cameras may be used to avoid a confined space entry
      2. Follow OSHA regulations for confined space entry if entering manhole
   iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
   If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.

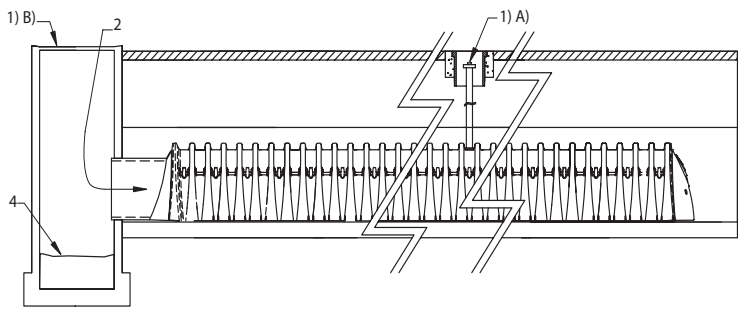
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



Sample Maintenance Log

Date	Stadia Rod Readings		Sedi-ment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row Plus, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

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StormTech® Installation Guide
MC-3500 & MC-4500 Chamber

StormTech
Installation Video

Required Materials and Equipment List

- Acceptable fill materials per Table 1
- ADS Plus and non-woven geotextile fabrics
- StormTech solid end caps, pre-cored and pre-fabricated end caps
- StormTech chambers, manifolds and fittings

Note: MC-3500 chamber pallets are 77" x 90" (2.0 m x 2.3 m) and weigh about 2010 lbs. (912 kg) and MC-4500 pallets are 100" x 52" (2.5 m x 1.3 m) and weigh about 840 lbs. (381 kg). Unloading chambers requires 72" (1.8 m) (min.) forks and/or tie downs (straps, chains, etc).

Important Notes:

A. This installation guide provides the minimum requirements for proper installation of chambers. Nonadherence to this guide may result in damage to chambers during installation. Replacement of damaged chambers during or after backfilling is costly and very time consuming. It is recommended that all installers are familiar with this guide, and that the contractor inspects the chambers for distortion, damage and joint integrity as work progresses.

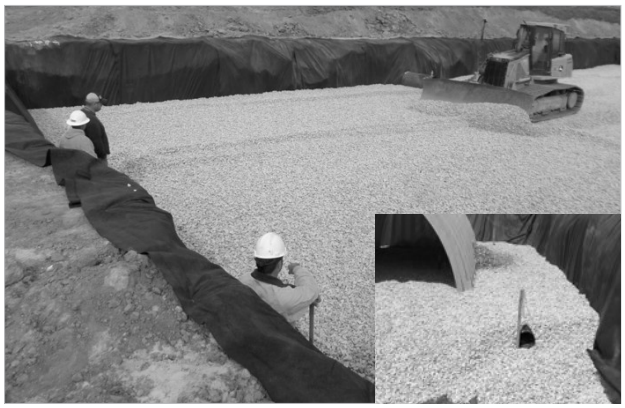
B. Use of a dozer to push embedment stone between the rows of chambers may cause damage to chambers and is not an acceptable backfill method. Any chambers damaged by using the "dump and push" method are not covered under the StormTech standard warranty.

C. Care should be taken in the handling of chambers and end caps. End caps must be stored standing upright. Avoid dropping, prying or excessive force on chambers during removal from pallet and initial placement.

Requirements for System Installation

Excavate bed and prepare subgrade per engineer's plans. Plans and specifications should include Best Management Practices (BMPs) to deter contamination of open pits during construction.

Place non-woven geotextile over prepared soils and up excavation walls.



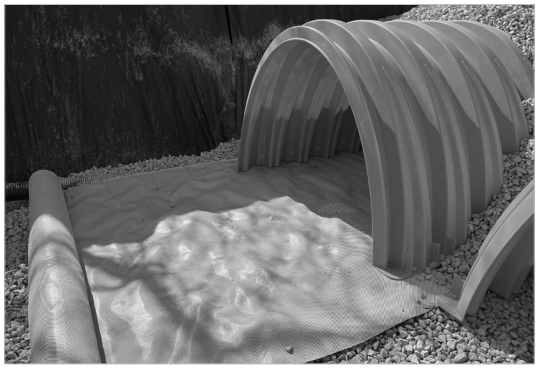
Place clean, crushed, angular stone foundation 9" (230 mm) min. Install underdrains if required. Compact to achieve a flat surface.

Manifold, Scour Fabric and Chamber Assembly

Install manifolds and lay out ADS PLUS fabric at inlet rows [min. 17.5 ft (5.33 m)] at each inlet end cap. Place a continuous piece (no seams) along entire length of Isolator® PLUS Row(s).

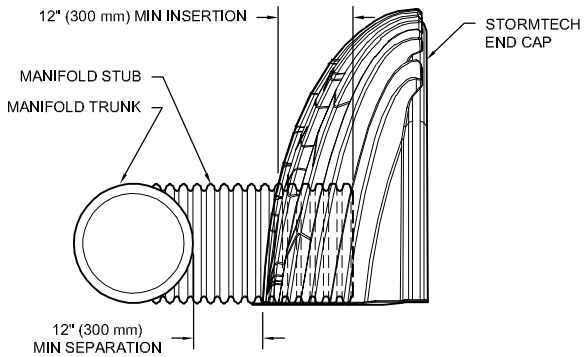
Align the first chamber and end cap of each row with inlet pipes. Contractor may choose to postpone stone placement around end chambers and leave ends of rows open for easy inspection of chambers during the backfill process.

Continue installing chambers by overlapping chamber end corrugations. Chamber joints are labeled “Lower Joint – Overlap Here” and “Build this direction – Upper Joint” Be sure that the chamber placement does not exceed the reach of the construction equipment used to place the stone. Maintain minimum 6” (150 mm) spacing between MC-3500 rows and 9” (230 mm) spacing between MC-4500 rows.



Place a continuous layer of ADS PLUS fabric between the foundation stone and the Isolator Row PLUS chambers, making sure the fabric lays flat and extends the entire width of the chamber feet.
When used on an Isolator Row PLUS, a 24” FLAMP (flared end ramp) is attached to the inside of the inlet pipe with a provided threaded rod and bolt. The FLAMP then lays on top of the ADS PLUS fabric.

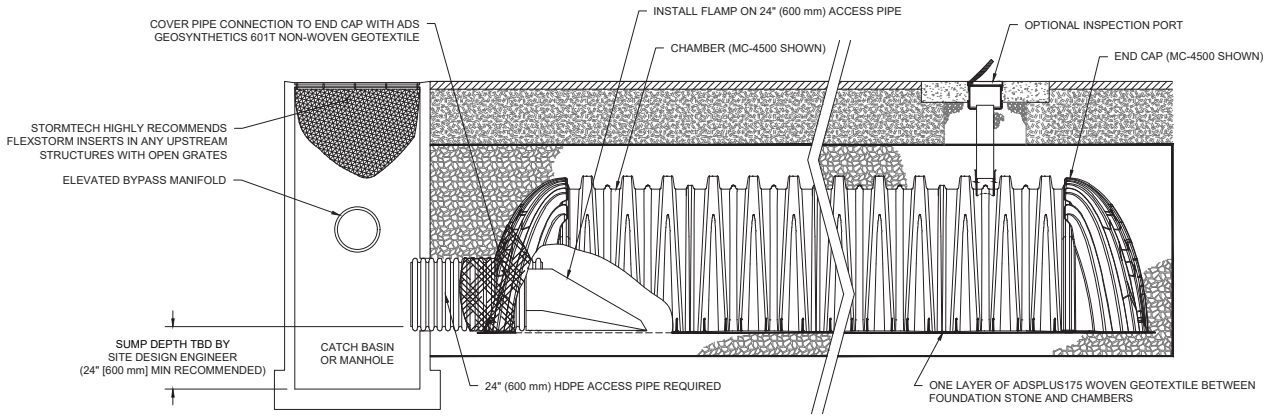
Manifold Insertion



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

Insert inlet and outlet manifolds a minimum 12” (300 mm) into chamber end caps. Manifold header should be a minimum 12” (300 mm) from base of end cap.

StormTech Isolator Row Plus Detail

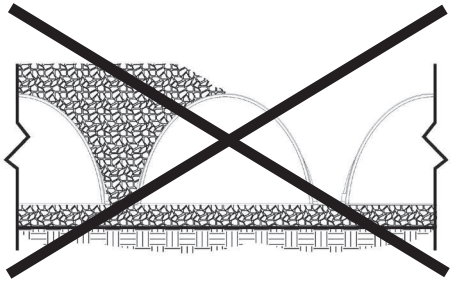


Initial Anchoring of Chambers – Embedment Stone

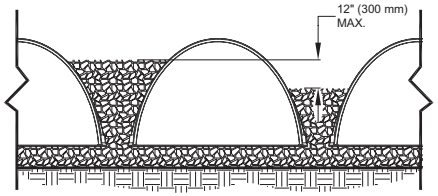
Initial embedment shall be spotted along the centerline of the chamber evenly anchoring the lower portion of the chamber. This is best accomplished with a stone conveyor or excavator reaching along the row.

No equipment shall be operated on the bed at this stage of the installation. Excavators must be located off the bed. Dump trucks shall not dump stone directly on to the bed. Dozers or loaders are not allowed on the bed at this time.

Backfill of Chambers – Embedment Stone

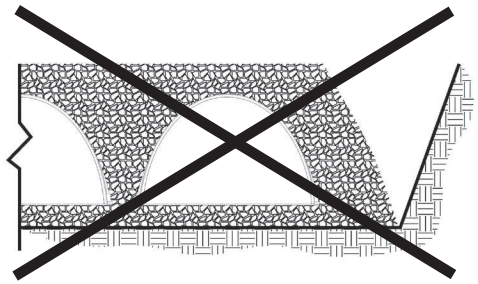


Uneven Backfill

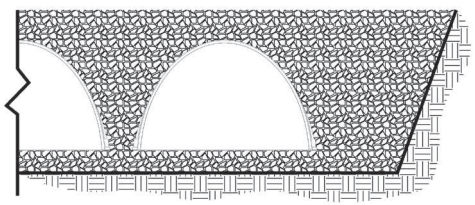


Even Backfill

Backfill chambers evenly. Stone column height should never differ by more than 12” (300 mm) between adjacent chamber rows or between chamber rows and perimeter.



Perimeter Not Backfilled

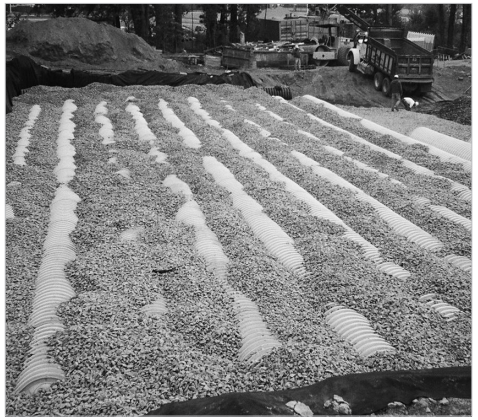


Perimeter Fully Backfilled

Perimeter stone must be brought up evenly with chamber rows. Perimeter must be fully backfilled, with stone extended horizontally to the excavation wall.

Backfill of Chambers – Embedment Stone and Cover Stone

Continue evenly backfilling between rows and around perimeter until embedment stone reaches tops of chambers and a minimum 12” (300 mm) of cover stone is in place. Perimeter stone must extend horizontally to the excavation wall for both straight or sloped sidewalls. The recommended backfill methods are with a stone conveyor outside of the bed or build as you go with an excavator inside the bed reaching along the rows. Backfilling while assembling chambers rows as shown in the picture will help to ensure that equipment reach is not exceeded.

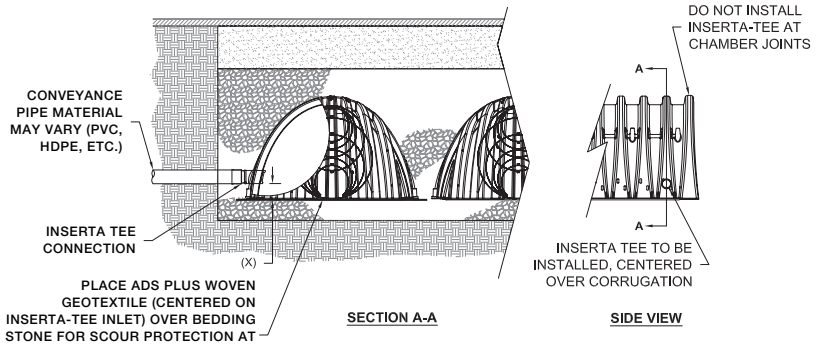


Only after chambers have been backfilled to top of chamber and with a minimum 12” (300 mm) of cover stone on top of chambers can skid loaders and small LGP dozers be used to final grade cover stone and backfill material in accordance with ground pressure limits in Table 2. Equipment must push material parallel to rows only. Never push perpendicular to rows. StormTech recommends the contractor inspect chamber rows before placing final backfill. Any chambers damaged by construction equipment shall be removed and replaced.

Final Backfill of Chambers – Fill Material

Install non-woven geotextile over stone. Geotextile must overlap 24” (600 mm) where edges meet. Compact at 18” (450 mm) of fill for MC-3500 and 24” (600 mm) of fill for MC-4500. Roller travel parallel with rows.

Inserta Tee Detail



CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
MC-3500	12” (250 mm)	6” (150 mm)
MC-4500	12” (250 mm)	8” (200 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

NOTE:
PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.

Table 1- Acceptable Fill Materials

Material Location	Description	AASHTO M43 Designation[1]	Compaction/Density Requirement
(D) **Final Fill:** Fill Material for layer 'D' starts from the top of the 'C' layer to the bottom of flexible pavement or unpaved finished grade above. Note that the pavement subbase may be part of the 'D' layer.	Any soil/rock materials, native soils or per engineer's plans. Check plans for pavement subgrade requirements.	N/A	Prepare per site design engineer's plans. Paved installations may have stringent material and preparation requirements.
(C) **Initial Fill:** Fill Material for layer 'C' starts from the top of the embedment stone ('B' layer) to 18" (450 mm) for MC-3500 and 24" (600 mm) for MC-4500 above the top of the chamber. Note that pavement subbase may be part of the 'C' layer.	Granular well-graded soil/aggregate mixtures, <35% fines or processed aggregate. Most pavement subbase materials can be used in lieu of this layer.	AASHTO M145[1] A-1, A-2-4, A-3 or AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	Begin compaction after min. 18" (450 mm) for MC-3500 and 24" (600 mm) for MC-4500 of material over the chambers is reached. Compact additional layers in 12" (300 mm) max. lifts to a min. 95% Proctor density for well-graded material and 95% relative density for processed aggregate materials.
(B) **Embedment Stone:** Embedment Stone surrounding chambers from the foundation stone to the 'C' layer above.	Clean, crushed, angular stone or Recycled Concrete[4]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	No compaction required.
(A) **Foundation Stone:** Foundation Stone below the chambers from the subgrade up to the foot (bottom) of the chamber.	Clean, crushed, angular stone or Recycled Concrete[4]	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	Place and compact in 9" (225 mm) lifts using two full coverages with a vibratory compactor.[2, 3]

Please Note:

1. The listed AASHTO designations are for gradations only. The stone must also be clean, crushed, angular. For example, a specification for #4 stone would state: "clean, crushed, angular no. 4 (AASHTO M43) stone".
2. StormTech compaction requirements are met for 'A' location materials when placed and compacted in 9" (230 mm) (max) lifts using two full coverages with a vibratory compactor.
3. Where infiltration surfaces may be comprised by compaction, for standard installations and standard design load conditions, a flat surface may be achieved by raking or dragging without compaction equipment. For special load designs, contact StormTech for compaction requirements.
4. Where recycled concrete aggregate is used in layers 'A' or 'B' the material should also meet the acceptable criteria outlined in ADS Technical Note 6.20 "Recycled Concrete Structural Backfill".

Figure 1- Inspection Port Detail

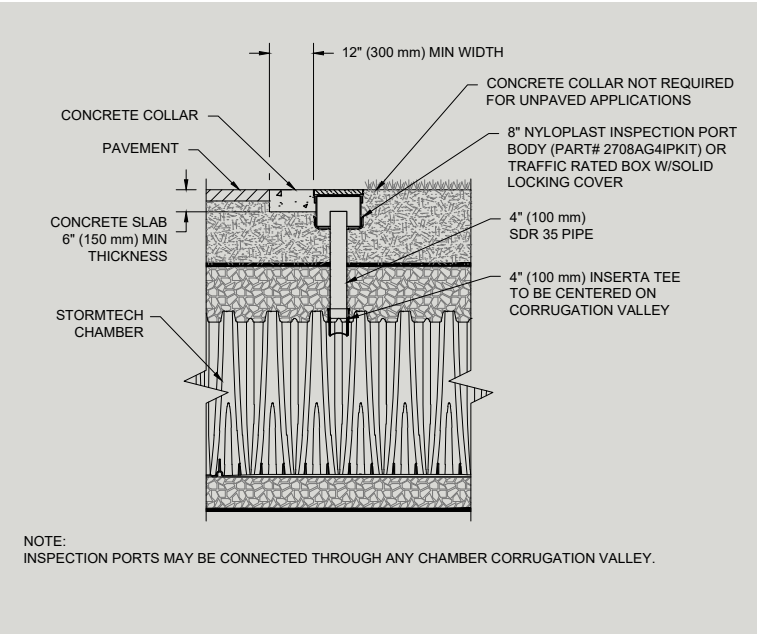
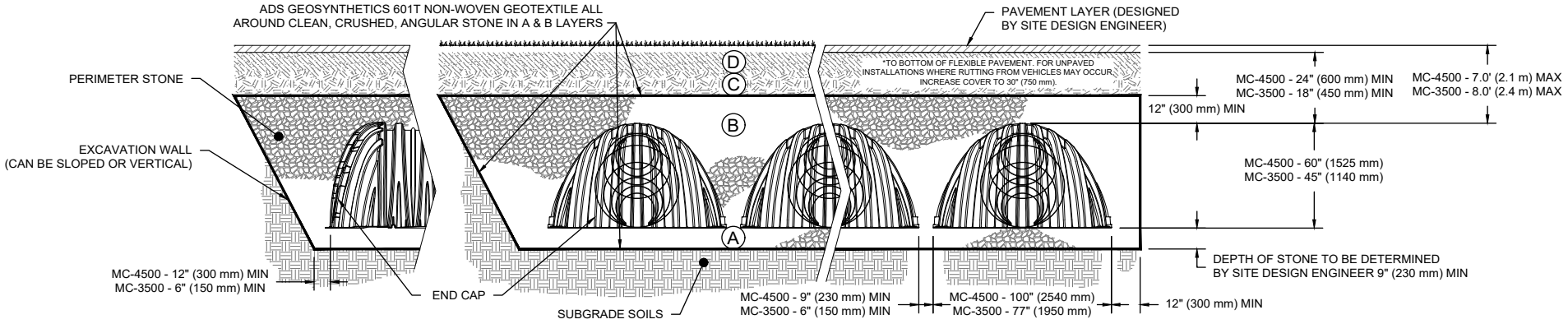


Figure 2 - Fill Material Locations



Notes:

1. 36” (900 mm) of stabilized cover materials over the chambers is recommended during the construction phase if general construction activities, such as full dump truck travel and dumping, are to occur over the bed.
2. During paving operations, dump truck axle loads on 18” (450mm) of cover for MC-3500s may be necessary. Precautions should be taken to avoid rutting of the road base layer, to ensure that compaction requirements have been met, and that a minimum of 18” (450mm) of cover for MC-3500s exists over the chambers. Contact StormTech for additional guidance on allowable axle loads during paving.
3. Ground pressure for track dozers is the vehicle operating weight divided by total ground contact area for both tracks. Excavators will exert higher ground pressures based on loaded bucket weight and boom extension.
4. Mini-excavators (<8,000lbs/3,628 kg) can be used with at least 12” (300 mm) of stone over the chambers and are limited by the maximum ground pressures in Table 2 based on a full bucket at maximum boom extension.
5. StormTech does not require compaction of initial fill at 18” (450 mm) of cover. However, requirements by others for 6” (150 mm) lifts may necessitate the use of small compactors at 18” (450 mm) of cover.
6. Storage of materials such as construction materials, equipment, spoils, etc. should not be located over the StormTech system. The use of equipment over the StormTech system not covered in Table 2 (ex. soil mixing equipment, cranes, etc) is limited. Please contact StormTech for more information.
7. Allowable track loads based on vehicle travel only. Excavators shall not operate on chamber beds until the total backfill reaches 3 feet (900 mm) over the entire bed.

Call StormTech at **888.892.2694** for technical and product information or visit www.stormtech.com

Table 2 - Maximum Allowable Construction Vehicle Loads[6]

Material Location	Fill Depth over Chambers in. (mm)	Maximum Allowable Wheel Loads		Maximum Allowable Track Loads[6]		Maximum Allowable Roller Loads
		Max Axle Load for Trucks lbs (kN)	Max Wheel Load for Loaders lbs (kN)	Track Width in. (mm)	Max Ground Pressure psf (kPa)	Max Drum Weight or Dynamic Force lbs (kN)
Ⓓ Final Fill Material	36” (900) Compacted	32,000 (142)	16,000 (71)	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	4050 (194) 2760 (132) 2130 (102) 1770 (84) 1530 (73)	38,000 (169)
Ⓒ Initial Fill Material	24” (600) Compacted	32,000 (142)	16,000 (71)	12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	2750 (131) 1920 (92) 1520 (73) 1310 (63) 1180 (56)	20,000 (89)
	24” (600) Loose/Dumped	MC-3500		12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	2430 (116) 1730 (82) 1390 (66) 1210 (58) 1100 (52)	16,000 (71)
		32,000 (142)	16,000 (71)			
		MC-4500				
		24,000 (107)	12,000 (53)			
	18” (450)	MC-3500		12” (305) 18” (457) 24” (610) 30” (762) 36” (914)	2140 (102) 1530 (73) 1260 (60) 1120 (53) 1030 (49)	5,000 (22) (static loads only)[5]
		32,000 (142)	16,000 (71)			
		MC-4500				
		24,000 (107)	12,000 (53)			
Ⓑ Embedment Stone	12” (300)	Not Allowed	Not Allowed	12” (305) 18” (457) 24” (610) 30” (762)	1100 (53) 710 (34) 660 (32) 580 (28)	Not Allowed
	6” (150)	Not Allowed	Not Allowed	Not Allowed	Not Allowed	Not Allowed

Table 3 - Placement Methods and Descriptions

Material Location	Placement Methods/ Restrictions	Wheel Load Restrictions	Track Load Restrictions	Roller Load Restrictions
		See Table 2 for Maximum Construction Loads		
Ⓓ Final Fill Material	A variety of placement methods may be used. All construction loads must not exceed the maximum limits in Table 2.	36” (900 mm) minimum cover required for dump trucks to dump over chambers.	Dozers to push parallel to rows.[4]	Roller travel parallel to rows only until 36” (900 mm) compacted cover is reached.
Ⓒ Initial Fill Material	Excavator positioned off bed recommended. Small excavator allowed over chambers. Small dozer allowed.	Asphalt can be dumped into paver when compacted pavement subbase reaches 18” (450 mm) for MC-3500 and 24” (600 mm) for MC-4500 above top of chambers.	Small LGP track dozers & skid loaders allowed to grade cover stone with at least 12” (300 mm) stone under tracks at all times. Equipment must push parallel to rows at all times.	Use dynamic force of roller only after compacted fill depth reaches 18” (450 mm) for MC-3500 and 24” (600 mm) for MC-4500 over chambers. Roller travel parallel to chamber rows only.
Ⓑ Embedment Stone	No equipment allowed on bare chambers. Use excavator or stone conveyor positioned off bed or on foundation stone to evenly fill around all chambers to at least the top of chambers.	No wheel loads allowed. Material must be placed outside the limits of the chamber bed.	No tracked equipment is allowed on chambers until a min. 12” (300 mm) cover stone is in place.	No rollers allowed.
Ⓐ Foundation Stone	No StormTech restrictions. Contractor responsible for any conditions or requirements by others relative to subgrade bearing capacity, dewatering or protection of subgrade.			

StormTech® Standard Limited Warranty

STANDARD LIMITED WARRANTY OF STORMTECH LLC ("STORMTECH"): PRODUCTS

(A) This Limited Warranty applies solely to the StormTech chambers and end plates manufactured by StormTech and sold to the original purchaser (the "Purchaser"). The chambers and end plates are collectively referred to as the "Products."

(B) The structural integrity of the Products, when installed strictly in accordance with StormTech's written installation instructions at the time of installation, are warranted to the Purchaser against defective materials and workmanship for one (1) year from the date of purchase. Should a defect appear in the Limited Warranty period, the Purchaser shall provide StormTech with written notice of the alleged defect at StormTech's corporate headquarters within ten (10) days of the discovery of the defect. The notice shall describe the alleged defect in reasonable detail. StormTech agrees to supply replacements for those Products determined by StormTech to be defective and covered by this Limited Warranty. The supply of replacement products is the sole remedy of the Purchaser for breaches of this Limited Warranty. StormTech's liability specifically excludes the cost of removal and/or installation of the Products.

(C) THIS LIMITED WARRANTY IS EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE PRODUCTS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

(D) This Limited Warranty only applies to the Products when the Products are installed in a single layer. UNDER NO CIRCUMSTANCES, SHALL THE PRODUCTS BE INSTALLED IN A MULTI-LAYER CONFIGURATION.

(E) No representative of StormTech has the authority to change this Limited Warranty in any manner or to extend this Limited Warranty. This Limited Warranty does not apply to any person other than to the Purchaser.

(F) Under no circumstances shall StormTech be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the Products, or the cost of other goods or services related to the purchase and installation of the Products. For this Limited Warranty to apply, the Products must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and StormTech's written installation instructions.

(G) THE LIMITED WARRANTY DOES NOT EXTEND TO INCIDENTAL, CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES. STORMTECH SHALL NOT BE LIABLE FOR PENALTIES OR LIQUIDATED DAMAGES, INCLUDING LOSS OF PRODUCTION AND PROFITS; LABOR AND MATERIALS; OVERHEAD COSTS; OR OTHER LOSS OR EXPENSE INCURRED BY THE PURCHASER OR ANY THIRD PARTY. SPECIFICALLY EXCLUDED FROM LIMITED WARRANTY COVERAGE ARE DAMAGE TO THE PRODUCTS ARISING FROM ORDINARY WEAR AND TEAR; ALTERATION, ACCIDENT, MISUSE, ABUSE OR NEGLECT; THE PRODUCTS BEING SUBJECTED TO VEHICLE TRAFFIC OR OTHER CONDITIONS WHICH ARE NOT PERMITTED BY STORMTECH'S WRITTEN SPECIFICATIONS OR INSTALLATION INSTRUCTIONS; FAILURE TO MAINTAIN THE MINIMUM GROUND COVERS SET FORTH IN THE INSTALLATION INSTRUCTIONS; THE PLACEMENT OF IMPROPER MATERIALS INTO THE PRODUCTS; FAILURE OF THE PRODUCTS DUE TO IMPROPER SITING OR IMPROPER SIZING; OR ANY OTHER EVENT NOT CAUSED BY STORMTECH. A PRODUCT ALSO IS EXCLUDED FROM LIMITED WARRANTY COVERAGE IF SUCH PRODUCT IS USED IN A PROJECT OR SYSTEM IN WHICH ANY GEOTEXTILE PRODUCTS OTHER THAN THOSE PROVIDED BY ADVANCED DRAINAGE SYSTEMS ARE USED. THIS LIMITED WARRANTY REPRESENTS STORMTECH'S SOLE LIABILITY TO THE PURCHASER FOR CLAIMS RELATED TO THE PRODUCTS, WHETHER THE CLAIM IS BASED UPON CONTRACT, TORT, OR OTHER LEGAL THEORY.

ADS StormTech™

adspipe.com
800-821-6710

ADS 0601T/O NONWOVEN GEOTEXTILE SPECIFICATION

Scope

This specification describes ADS 0601T/O nonwoven geotextile.

Filter Fabric Requirements

ADS 0601T/O is an orange nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. ADS 0601T/O is inert to biological degradation and resists naturally encountered chemicals, alkali and acids. ADS 0601T/O conforms to the physical property values listed below:

Filter Fabric Properties

Property	Test Method	Unit	Typical Value[1] MD	Typical Value[1] CD
Grab Tensile Strength	ASTM D4632	lbs (N)	175 (779)	175 (779)
Grab Tensile Elongation	ASTM D4632	%	75	75
Trapezoid Tear Strength	ASTM D4533	lbs (N)	85 (378)	85 (378)
CBR Puncture Strength	ASTM D6241	lbs (N)	480 (2136)	480 (2136)
Permittivity	ASTM D4491	sec^{-1}	1.5	1.5
Flow Rate	ASTM D4491	gal/min/ft^2 (l/min/m^2)	105 (4278)	105 (4278)
UV Resistance (at 500 hours)[1]	ASTM D4355	% strength retained	80	80

Physical Properties

Property	Test Method	Unit	Typical Value[2]
Weight	ASTM D5161	oz/yd^2 (g/m^2)	6.5 (220)
Thickness	ASTM D5199	mils (mm)	65 (1.7)
Roll Dimensions (W x L)	-	ft (m)	15 x 300 (4.5 x 91)
Roll Area	-	yd^2 (m^2)	500 (418)
Estimated Roll Weight	-	lb (kg)	220 (100)

1 Modified, Minimum Test Value
2 ASTM D4439 Standard Terminology for Geosynthetics: typical value, n-*for geosynthetics*, the mean value calculated from documented manufacturing quality control test results for a defined population obtained from one test method associated with on specific property.

ADS PLUS WOVEN GEOTEXTILE SPECIFICATION

For use with StormTech® Isolator® Row Plus

Scope

This specification describes ADS Plus woven geotextile.

ADS Plus woven geotextile fabrics are woven polypropylene materials offering optimum performance when used in stabilization applications. Produced from first quality raw materials, they provide the perfect balance of strength and separation in styles capable of functioning exceptionally well in a wide range of performance requirements.

Filter Fabric Properties

Property[1]	Test Method	Unit	M.A.R.V. (Minimum Average Roll Value)[2]
Weight	ASTM D5261	oz/yd^2 (g/m^2)	8.0 (271.25)
Grab Tensile Strength	ASTM D4632	lbs (kN)	325 (1.45)
Grab Elongation	ASTM D4632	%	15
Trapezoidal Tear Strength	ASTM D4533	lbs (kN)	125 (0.89)
CBR Puncture Resistance	ASTM D6241	lbs (kN)	1,124 (5.0)

1. The property values listed above are subject to change without notice.
2. Minimum Average Roll Values (MARV) is calculated as the average minus two standard deviations. Statistically, it yields approximately 97.5% degree of confidence that any samples taken from quality assurance testing will meet or exceed the values described above.

Dimensions

ADS Plus shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 12.5’ (3.8 m) width x 360’ (110 m) length for Plus125 and 6.25’ (1.9 m) width x 360’ (110 m) length for Plus625.

Appendix D

SANITARY SEWER DESIGN SHEET

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Density
Date: 6/19/2025
Input By: MNP
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend:
- Design Input by User
- As-Built Input by User
- Cumulative Cell
- Calculated Design Cell Output
- Calculated Annual Cell Output
- Calculated Rare Cell Output

Reference: City of Ottawa - Sewer Design Guidelines (2012 and TBs)
MOE - Design Guidelines for Sewage Works (2008)

Location				Demand												Design Capacity							
				Residential Flow										Extraneous Flow Area Method		Total Design Flow	Proposed Sewer Pipe Sizing / Design						
Street	Blocks	From MH	To MH	Singles	Semis / Towns	Apts	Park Area	Population (in 1000's)	Cumulative Population (in 1000's)	Average Pop. Flow Q(q) (L/s)	Design Peaking Factor M	Peak Design Pop. Flow Q(p) (L/s)	Res. Drainage Area (ha.)	Cumulative Res. Drainage Area (ha.)	Cumulative Extraneous Drainage Area (ha.)	Design Extraneous Flow Q(e) (L/s)	Total Peak Design Flow Q(D) (L/s)	Pipe Length (m)	Pipe Size (mm) and Material	Pipe ID Actual (m)	Roughness n	Design Grade So (%)	Capacity Qfull (L/s)	Full Flow Velocity (m/s)	Q(D) / Qfull
Drive Aisle C	A1	SANMH 5	SANMH 4		12			0.032	0.032	0.11	3.68	0.39	0.165	0.165	0.165	0.05	0.44	27.9	200 PVC	0.203	0.013	2.50	54.1	1.67	0.8%
Drive Aisle A	A5	SANMH 4	SANMH 3		24			0.065	0.097	0.32	3.60	1.13	0.159	0.159	0.159	0.05	1.19	51.2	200 PVC	0.203	0.013	0.44	22.7	0.70	5.2%
Drive Aisle A	A6	SANMH 1	SANMH 2		12			0.032	0.032	0.11	3.68	0.39	0.115	0.274	0.274	0.09	0.48	24.2	200 PVC	0.203	0.013	0.50	24.2	0.75	2.0%
Drive Aisle A	A7	SANMH 2	SANMH 3		12			0.032	0.065	0.21	3.63	0.76	0.088	0.362	0.362	0.12	0.88	19.0	200 PVC	0.203	0.013	2.24	51.2	1.58	1.7%
Drive Aisle B	A8	SANMH 3	SANMH 6		6			0.016	0.178	0.58	3.53	2.04	0.019	0.381	0.381	0.13	2.17	13.0	200 PVC	0.203	0.013	1.48	41.6	1.28	5.2%
Drive Aisle B	A9	SANMH 6	SANMH 7		18			0.049	0.227	0.74	3.50	2.57	0.171	0.717	0.717	0.24	2.81	47.2	200 PVC	0.203	0.013	1.49	41.8	1.29	6.7%
Totals				**0**	**84**	**0**	**0.000**	**0.227**	**0.227**	**0.74**	**3.50**	**2.57**	**0.717**	**0.717**	**0.717**	**0.24**	**2.81**	**182.5**							

Demand Equation / Parameters

1. **Q(D), Q(A), Q(R) =** Q(p) + Q(fd) + Q(ici) + Q(e)
2. **Q(p) =** (P x q x M x K / 86,400)
3. **q =** 280 L/per person/day (design)
   200 L/per person/day (annual and rare)
4. **M = Harmon Formula (maximum of 4.0)**
5. **K =** 0.8 (design)
   0.6 (annual and rare)
6. **Park flow is considered equivalent to a single unit / ha**
   Park Demand = 4 single unit equivalent / park ha (~ 3,600 L/ha/day)
7. **Q(fd) =** 0.45 L/s/unit
8. **Q(ici) =** ICI Area x ICI Flow x ICI Peak
9. **Q(e) =** 0.33 L/s/ha (design)
   0.30 L/s/ha (annual)
   0.55 L/s/ha (rare)

Definitions

Q(D) = Peak Design Flow (L/s)
Q(A) = Peak Annual Flow (L/s)
Q(R) = Peak Rare Flow (L/s)
Q(p) = Peak Design Population Flow (L/s)
Q(q) = Average Population Flow (L/s)

	Singles	Semis / Towns	Apts
P = Residential Population =	3.4	2.7	2.1

q = Average Capita Flow
M = Harmon Formula
K = Harmon Correction Factor

Typ. Service Diameter (mm) =	135	
Typ. Service Length (m) =	15	15
I/I Pipe Rate (L/mm dia/m/hr) =	0.007	

Q(fd) = Foundation Flow (L/s)
Q(ici) = Industrial / Commercial / Institutional Flow (L/s)
Q(e) = Extraneous Flow (L/s)

Institutional / Commercial / Industrial	Industrial	Commercial / Institutional	
Design =	35000	28000	L/gross ha/day
Annual / Rare =	10000	17000	L/gross ha/day
ICI Peak *			
Design =	1.0	1.5	* ICI Peak = 1.0 Default, 1.5 if ICI in contributing area is >20% (design only)
Annual / Rare =		1.0	

Capacity Equation

Q full = $1000*(1/n)*A_p*R^{2/3}*So^{0.5}$

Definitions

Q full = Capacity (L/s)
n = Manning coefficient of roughness (0.013)
A_p = Pipe flow area (m^2)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

STITTSVILLE SOUTH - AREA 6
SANITARY SEWER DESIGN SHEET

JOB# 113004

NOVATECH
Engineers, Planners & Landscape Architects

LOCATION			FLOW																	PROPOSED SEWER						
FROM MH	TO MH	STREET	RESIDENTIAL UNITS				PARK	COMMERCIAL	INDIVIDUAL		CUMULATIVE				PEAK FACTOR (M)	POPUL. FLOW	PEAK PARK FLOW	PEAK COMMERCIAL FLOW	PEAK EXTRAN. FLOW	PEAK DESIGN FLOW	LENGTH (m)	PIPE SIZE (mm)	TYPE	SLOPE %	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	RATIO (Q/Qfull)
			SINGLES	SEMIS/ TOWNS	STACKS	APT.	PARK AREA (ha.)	COMMERCIAL AREA (ha.)	POPUL. (1000's)	AREA (ha.)	POPUL. (1000's)	PARK AREA (ha)	COMMERCIAL AREA (ha)	RESIDENTIAL AREA (ha.)		Q(p) L/s	Q(pk) L/s	Q(c) L/s	Q(e) (L/s)	Q(d) (L/s)							
221	219	PARADE			70				0.161	1.023	0.161	0.00	0.00	1.023	4.000	2.609	0.00	0.00	0.287	2.895	35.3	200	PVC	1.15	36.693	1.13	8%
219	217	PARADE	4	9					0.038	0.596	0.199	0.00	0.00	1.620	4.000	3.223	0.00	0.00	0.454	3.676	75.7	200	PVC	1.85	46.540	1.44	8%
217	215	PARADE		5					0.014	0.293	0.212	0.00	0.00	1.913	4.000	3.442	0.00	0.00	0.536	3.977	83.3	200	PVC	2.20	50.751	1.56	8%
267	215	HARSTMERE		12		100			0.242	1.027	0.242	0.00	0.00	1.027	4.000	3.928	0.00	0.00	0.288	4.215	84.3	200	PVC	0.40	21.640	0.67	19%
215	213	PARADE	2						0.007	0.190	0.462	0.00	0.00	3.131	3.992	7.464	0.00	0.00	0.877	8.341	54.0	200	PVC	1.85	46.540	1.44	18%
213	211	PARADE	7						0.024	0.412	0.485	0.00	0.00	3.543	3.981	7.828	0.00	0.00	0.992	8.820	69.0	200	PVC	1.85	46.540	1.44	19%
211	209	PARADE	6				1.33		0.020	1.694	0.506	1.33	0.00	5.238	3.972	8.138	0.06	0.00	1.467	9.665	75.0	200	PVC	1.55	42.599	1.31	23%
257	255	CAPMOLINA	9						0.031	0.893	0.031	0.00	0.00	0.893	4.000	0.496	0.00	0.00	0.250	0.746	120.0	200	PVC	1.50	41.907	1.29	2%
265	255	FALABELLA	5		82				0.206	1.531	0.206	0.00	0.00	1.531	4.000	3.331	0.00	0.00	0.429	3.760	77.4	200	PVC	0.50	24.195	0.75	16%
255	253	CAPMOLINA	7						0.024	0.557	0.260	0.00	0.00	2.982	4.000	4.213	0.00	0.00	0.835	5.048	84.0	200	PVC	0.55	25.376	0.78	20%
263	253	QUARTER HORSE	13						0.044	0.761	0.044	0.00	0.00	0.761	4.000	0.716	0.00	0.00	0.213	0.929	119.4	200	PVC	0.40	21.640	0.67	4%
253	251	CAPMOLINA	5						0.017	0.425	0.321	0.00	0.00	4.169	4.000	5.205	0.00	0.00	1.167	6.372	81.9	200	PVC	1.60	43.281	1.33	15%
261	251	LIPIZZANER		31					0.084	0.940	0.084	0.00	0.00	0.940	4.000	1.356	0.00	0.00	0.263	1.620	117.2	200	PVC	0.60	26.504	0.82	6%
251	249	CAPMOLINA	7						0.024	0.573	0.429	0.00	0.00	5.683	4.000	6.947	0.00	0.00	1.591	8.538	90.3	200	PVC	1.35	39.756	1.23	21%
249	247	CAPMOLINA	7						0.024	0.616	0.453	0.00	0.00	6.299	3.996	7.325	0.00	0.00	1.764	9.089	98.3	200	PVC	1.35	39.756	1.23	23%
247	245	CAPMOLINA	1						0.003	0.148	0.456	0.00	0.00	6.448	3.995	7.377	0.00	0.00	1.805	9.182	10.9	200	PVC	1.35	39.756	1.23	23%
245	243	CAPMOLINA	11						0.037	0.632	0.493	0.00	0.00	7.080	3.977	7.948	0.00	0.00	1.982	9.930	71.4	200	PVC	0.60	26.504	0.82	37%
243	209	CAPMOLINA	8						0.027	0.432	0.521	0.00	0.00	7.512	3.965	8.361	0.00	0.00	2.103	10.464	55.9	200	PVC	0.60	26.504	0.82	39%
209	207	PARADE	7						0.024	0.411	1.050	1.33	0.00	13.162	3.786	16.106	0.06	0.00	3.685	19.850	82.0	250	PVC	0.85	57.197	1.13	35%
207	205	PARADE	7	9					0.048	0.622	1.098	1.33	0.00	13.784	3.773	16.787	0.06	0.00	3.860	20.704	82.0	250	PVC	0.85	57.197	1.13	36%
241	205	PEDIGREE	14						0.048	0.776	0.048	0.00	0.00	0.776	4.000	0.771	0.00	0.00	0.217	0.989	119.0	200	PVC	0.35	20.243	0.62	5%
205	203	PARADE	7	9					0.048	0.609	1.194	1.33	0.00	15.170	3.749	18.132	0.06	0.00	4.248	22.437	82.0	250	PVC	0.60	48.055	0.95	47%
239A	239B	MANEGE	16						0.054	0.865	0.054	0.00	0.00	0.865	4.000	0.881	0.00	0.00	0.242	1.124	107.7	200	PVC	0.40	21.640	0.67	5%
239B	203	MANEGE							0.000	0.000	0.054	0.00	0.00	0.865	4.000	0.881	0.00	0.00	0.242	1.124	11.1	200	PVC	0.40	21.640	0.67	5%
203	201	PARADE	7						0.024	0.417	1.272	1.33	0.00	16.453	3.730	19.222	0.06	0.00	4.607	23.886	82.0	250	PVC	0.60	48.055	0.95	50%
237	235	STALLION	1	28					0.079	0.893	0.079	0.00	0.00	0.893	4.000	1.280	0.00	0.00	0.250	1.530	112.8	200	PVC	0.50	24.195	0.75	6%
235	233	STALLION	2						0.007	0.256	0.086	0.00	0.00	1.150	4.000	1.390	0.00	0.00	0.322	1.712	11.0	200	PVC	0.50	24.195	0.75	7%
233	231	STALLION	5						0.017	0.431	0.103	0.00	0.00	1.581	4.000	1.666	0.00	0.00	0.443	2.108	74.2	200	PVC	0.50	24.195	0.75	9%
231	229	STALLION	4						0.014	0.499	0.116	0.00	0.00	2.081	4.000	1.886	0.00	0.00	0.583	2.469	82.0	200	PVC	0.50	24.195	0.75	10%
229	227	STALLION	4						0.014	0.483	0.130	0.00	0.00	2.564	4.000	2.106	0.00	0.00	0.718	2.824	74.7	200	PVC	0.50	24.195	0.75	12%
227	225	STALLION	2						0.007	0.230	0.137	0.00	0.00	2.794	4.000	2.217	0.00	0.00	0.782	2.999	10.9	200	PVC	0.50	24.195	0.75	12%
225	223	STALLION	11						0.037	0.541	0.174	0.00	0.00	3.336	4.000	2.823	0.00	0.00	0.934	3.757	113.2	200	PVC	0.50	24.195	0.75	16%
223	201	STALLION	8						0.027	0.418	0.201	0.00	0.00	3.754	4.000	3.263	0.00	0.00	1.051	4.315	11.1	200	PVC	0.50	24.195	0.75	18%
201	159	PARADE	6						0.020	0.410	1.494	1.33	0.00	20.62	3.681	22.275	0.06	0.00	5.773	28.105	82.0	300	PVC	0.50	71.334	0.98	39%
157	155	BECKETT	11						0.037	0.530	0.037	0.00	0.00	0.530	4.000	0.606	0.00	0.00	0.148	0.754	112.7	200	PVC	0.40	21.640	0.67	3%
155	159	BECKETT	6						0.020	0.330	0.058	0.00	0.00	0.860	4.000	0.937	0.00	0.00	0.241	1.177	12.0	200	PVC	0.70	28.628	0.88	4%
159	145	PARADE	13						0.044	0.631	1.596	1.33	0.00	22.108	3.660	23.661	0.06	0.00	6.190	29.908	82.0	300	PVC	0.50	71.334	0.98	42%
157	153	BECKETT	2						0.007	0.244	0.007	0.00	0.00	0.244	4.000	0.110	0.00	0.00	0.068	0.179	10.9	200	PVC	0.30	18.741	0.58	1%
153	151	BECKETT	6						0.020	0.561	0.027	0.00	0.00	0.805	4.000	0.441	0.00	0.00	0.226	0.666	66.8	200	PVC	0.30	18.741	0.58	4%
151	149	BECKETT	1						0.003	0.114	0.031	0.00	0.00	0.920	4.000	0.496	0.00	0.00	0.258	0.753	11.1	200	PVC	0.50	24.195	0.75	3%
149	147	BECKETT		14					0.038	0.445	0.068	0.00	0.00	1.365	4.000	1.108	0.00	0.00	0.382	1.491	112.3	200	PVC	0.50	24.195	0.75	6%
147	145	BECKETT		9					0.024	0.393	0.093	0.00	0.00	1.759	4.000	1.502	0.00	0.00	0.492	1.994	11.9	200	PVC	0.85	31.546	0.97	6%
145	143	PARADE	9						0.031	0.589	1.719	1.33	0.00	24.456	3.636	25.322	0.06	0.00	6.848	32.226	74.3	300	PVC	0.50	71.334	0.98	45%
143	141	PARADE	3						0.010	0.262	1.729	1.33	0.00	24.719	3.634	25.459	0.06	0.00	6.921	32.436	13.9	300	PVC	0.50	71.334	0.98	45%
141	139	PARADE	6						0.020	0.359	1.750	1.33	0.00	25.078	3.630	25.732	0.06	0.00	7.022	32.810	61.2	300	PVC	0.50	71.334	0.98	46%
139	137	PARADE	12						0.041	0.569	1.791	1.33	0.00	25.647	3.623	26.277	0.06	0.00	7.181	33.514	60.8	300	PVC	0.50	71.334	0.98	47%
137	135	PARADE	2						0.007	0.222	1.797	1.33	0.00	25.870	3.621	26.368	0.06	0.00	7.244	33.667	12.3	300	PVC	0.50	71.334	0.98	47%
135	133	PARADE	5						0.017	0.404	1.814	1.33	0.00	26.274	3.618	26.594	0.06	0.00	7.357	34.007	74.3	300	PVC	0.50	71.334	0.98	48%

Appendix E

Boundary Conditions
1883 Stittsville Main Street

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	44	0.74
Maximum Daily Demand	110	1.84
Peak Hour	242	4.04
Fire Flow Demand #1	5,700	95.00
Fire Flow Demand #2	10,002	166.70
Fire Flow Demand #3	12,000	200.00
Fire Flow Demand #4	14,000	233.33

Location

Results

Connection 1 – Falabella St. (North)

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.7	53.8
Peak Hour	155.0	45.7
Max Day plus Fire Flow #1	152.6	42.3
Max Day plus Fire Flow #2	145.7	32.4
Max Day plus Fire Flow #3	141.6	26.6
Max Day plus Fire Flow #4	136.9	20.0 (19.97)

[1] Ground Elevation = 122.9 m

Connection 2 – Falabella St. (South)

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.7	56.9
Peak Hour	155.0	48.8
Max Day plus Fire Flow #1	152.5	45.2
Max Day plus Fire Flow #2	145.3	35.0
Max Day plus Fire Flow #3	141.0	28.9
Max Day plus Fire Flow #4	136.2	22.1

[1] Ground Elevation = 120.7 m

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.

1. Background

On behalf of the City of Ottawa, the National Research Council of Canada (NRC) evaluated the City's hydrant spacing guidelines in relation to Required Fire Flow (RFF) as calculated using the Fire Underwriters Survey (FUS) methodology. This work lead to the development of a procedure to be used to establish the appropriate sizing of, and hydrant spacing on, dead-end watermains. This procedure may also be used as an optional watermain network design method to optimize watermain sizing based on RFF and standard hydrant spacing.

The procedure is partially based on the NFPA 1: Fire Code (NFPA1) and the City of Ottawa existing hydrant classification practice (refer to **Attachment A** at the end of this appendix for relevant excerpts of the Fire Code).

2. Rationale for Guideline

Given a Required Fire Flow (RFF) for a certain asset/structure/building, proper planning must ensure that there is a sufficient number of hydrants at sufficient proximities to actually provide the RFF. Both the capacity of the hydrants and their proximity to the asset/structure/building must be considered. Pressure losses (due to friction) in firehoses are proportional to the firehose length. Therefore, the actual fire flow delivered by the nozzle at the end of a very long firehose will be less compared to a short firehose connected to the same hydrant. Table 1 provides conservative values for hydrant fire flow capacity adjusted for firehose length.

3. Hydrant Capacity Requirement

For the purposes of this guidelines, the aggregate fire flow capacity of all contributing fire hydrants within 150 m of a building/asset/structure[1], measured in accordance with Table 1, shall be not less than the RFF.

4. Standard Practice

For the vast majority of developments, hydrant spacing as indicated in Section 4.5, Table 4.9, Ottawa Design Guidelines – Water Distribution, are sufficient to meet the RFF. This has been verified by evaluating approved development plans representing a

[1] Although NFPA 1 considers hydrant contribution at distances of up to 1000ft (305 m), Ottawa Fire Services (OFS) would need two pumpers to deliver flow from such a distance (one pumper midway – acting as a booster). Moreover, OFS cautioned that some redundancy is advisable to account for accessibility limitations in emergency situations, wind effects, etc. Therefore 150 m was considered as the maximum contributing distance

range of land uses and configurations. However, in some instances involving dead-end watermains, standard spacing requirements may not be sufficient to meet RFF.

Standard design practice involves systematic checking of design fire flows at every node in hydraulic models of proposed water distribution systems. Normally the entire design fire flow is applied to each node in succession. Nodes are typically at water main junctions rather than actual hydrant locations. This significantly simplifies the design process and the current software packages that are normally used for this purpose have been developed based on this practice. The "point load assumption" produces a conservative design.

Table 1. Maximum flow to be considered from a given hydrant

Hydrant Class	Distance to asset/structure/building (m)[a]	Contribution to required fire flow (L/min)[b]
AA	≤ 75	5,700
	> 75 and ≤ 150	3,800
A	≤ 75	3,800
	> 75 and ≤ 150	2,850
B	≤ 75	1,900
	> 75 and ≤ 150	1,500
C	≤ 75	800
	> 75 and ≤ 150	800

[a] Distance of contributing hydrant from the structure, measured in accordance with NFPA 1 (Appendix A).

[b] Maximum flow contribution to be considered for a given asset/structure/building, at a residual pressure of 20 psi, measured at the location of the main, at ground level.

4. Intended Application of Guideline

The intent of this procedure is to:

- Determine the appropriate sizing of dead end watermains and associated hydrant requirements.
- Provide an optional approach to local watermain network sizing that will assist the designer in determining the minimum pipe sizing needed to meet RFF.

The procedure permits the designer to: (a) reconcile available hydrant flow with computed RFFs, and (b) allow the distribution of RFFs along multiple hydrants, rather

than consider RFF to be a point flow. The application of this protocol may result in reduced watermain diameters compared to those determined based on a traditional design approach. Caution is required in the application of the procedure to ensure that the transmission function of any watermains identified in a Master Servicing Study is not compromised. Normally, watermains 300mm in diameter and larger that are identified in such studies would not be considered for resizing.

5. Application Procedure

5.1 Rated hydrants

The procedure described here would apply to an existing watermain network with existing hydrants (i.e., re-development or infill in existing neighborhoods):

- Identify critical zones within the (re)development area, e.g., high RFF, dead ends, small diameter watermains, low C factor, and/or high geographic elevation zones.
- For the critical zones use Table 1 to examine if there are sufficient hydrants to deliver the RFF (following procedure described in 5.3).
- If hydrant capacity is insufficient, then consider either:
    - adding hydrants as appropriate;
    - determine if the existing hydrants can be upgraded to higher rating; or
    - upgrade existing watermains.

5.2 Un-rated hydrants

There are currently about 24,800 hydrants in the City of Ottawa, of which about 78% are rated. Of the rated hydrants, 96% are AA (Blue), 3% are A (Green). Many of the un-rated hydrants are located in old parts of the City, often installed on water mains with minimum diameter of 6" (150 mm), and would be likely to have a low rating.

Based on a review of hydrants that have been installed as part of recent urban development, approximately 99% of those which were rated are rated AA, and only 1% are rated A.

5.2.1 Un-rated Existing Hydrants

In cases where fire flow is to be evaluated in areas with an established water distribution network and with existing fire hydrants (i.e., re-development or infill in existing neighborhoods), all un-rated hydrants should be tested and rated in accordance with NFPA standard 291. The procedure described in Section 5.1 can then be followed to complete the design.

5.2.2 Planned hydrants

Planned hydrants cannot be tested for rating because they have not been installed yet. Moreover, the rating of a hydrant is an intrinsic property of the hydrant and can therefore not be directly evaluated by simulation. Based on the statistics cited previously, it can be assumed for design purposes that all planned hydrants are AA. However, there could be a situation where the proposed network might not have sufficient capacity to supply 5,700 L/min to a AA-rated hydrant in a specific area. Hydraulic analysis is required to confirm that the distribution network is capable of providing the hydrants with the fire flows in Table 1.

5.3 Hydrant Placement and Watermain Size Optimization

Ottawa design guidelines for watermain sizing and hydrant placement (Section 4) stipulate that the RFF be added to the average hourly rate of a peak day demand. This fire flow is added to hydraulic nodes in the vicinity of the planned development, while ensuring that the residual pressure is at least 140 kPa (measured at the location of the main, at ground level).[2] The following procedure is used to optimize watermain sizing and hydrant placement based on the RFF.

- Place hydrants throughout the development area according to the current Ottawa design guidelines.
- Size water mains and locate hydrants according to standard design procedures. Assume all hydrants are AA-rated.
- Identify the most critical zones in the development area, e.g. highest required fire flows, dead ends, longest distances between junctions, and/or highest elevation. Within these critical zones identify critical structures, i.e. those with highest RFF or greatest distance from proposed hydrant locations. Identify the closest hydrants to these buildings.
- For each critical structure, distribute the RFF according to Table 1 (i.e., assign a flow of 5,700 L/min to all hydrants with a distance of less or equal to 75 m from the test property and 3,800 L/min to all hydrants with a distance of more than 75 m but less or equal to 150 m from the test property) These hydrants are to be represented as hydrant-nodes in the network model, where the hydrant lateral would connect to the proposed water main.

---

[2] At the time when this protocol was proposed, the City of Ottawa had in effect Technical Bulletin ISDTB 2014-02, whereby RFF may be capped at 10,000 L/min for single detached dwellings (with a minimum 10 m separation between the backs of adjacent units and for side-by-side town and row houses that comply with the OBC Div. B, subsection 3.1.10 requirement (compartments of no more than 600 m^2 area).

- For each critical structure, run a single fire flow simulation ensuring that the RFF is provided by hydrants within 150 m distance from the test property, with a minimum residual pressure of 140 kPa.
- If the required residual pressure cannot be achieved, consider either re-sizing of pipes, and/or re-spacing of hydrants.

The above procedure is optional except for dead-end watermains servicing cul-de-sacs because (a) based on standard spacing requirements, there would often be insufficient fire flow provided and (b) the watermain would otherwise could be sized larger than necessary and lead to excessive water age and on-going flushing requirements.

Irrespective of the above, if the RFF is equal to or less than 10,000 L/min, then:

- where the distance between two adjacent hydraulic nodes is greater than the inter-hydrant spacing allowed in the guideline, a hydraulic node should be added halfway between the two nodes, and proceed with fire flow simulations to verify watermain sizing, ensuring that the simulation considers RFF at the new hydraulic node.

Attachment A—Excerpts from NFPA 1 Fire Code (2015 Edition)

18.5 Fire Hydrants.

18.5.1 Fire Hydrant Locations and Distribution. Fire hydrants shall be provided in accordance with Section 18.5 for all new buildings, or buildings relocated into the jurisdiction unless otherwise permitted by 18.5.1.1 or 18.5.1.2.

18.5.1.4* The distances specified in Section 18.5 shall be measured along fire department access roads in accordance with 18.2.3.

18.5.1.5 Where fire department access roads are provided with median dividers incapable of being crossed by fire apparatus, or where fire department access roads have traffic counts of more than 30,000 vehicles per day, hydrants shall be placed on both sides of the fire department access road on an alternating basis, and the distances specified by Section 18.5 shall be measured independently of the hydrants on the opposite side of the fire department access road.

18.5.1.6 Fire hydrants shall be located not more than 12 ft (3.7 m) from the fire department access road.

18.5.2 Detached One- and Two-Family Dwellings. Fire hydrants shall be provided for detached one- and two-family dwellings in accordance with both of the following:

(1) The maximum distance to a fire hydrant from the closest point on the building shall not exceed 600 ft (183 m).

(2) The maximum distance between fire hydrants shall not exceed 800 ft (244 m).

18.5.3 Buildings Other than Detached One- and Two-Family Dwellings. Fire hydrants shall be provided for buildings other than detached one- and two-family dwellings in accordance with both of the following:

(1) The maximum distance to a fire hydrant from the closest point on the building shall not exceed 400 ft (122 m).

(2) The maximum distance between fire hydrants shall not exceed 500 ft (152 m).

18.5.4 Minimum Number of Fire Hydrants for Fire Flow.

18.5.4.1 The minimum number of fire hydrants needed to deliver the required fire flow for new buildings in accordance with Section 18.4 shall be determined in accordance with Section 18.5.4.

18.5.4.2 The aggregate fire flow capacity of all fire hydrants within 1000 ft (305 m) of the building, measured in accordance with 18.5.1.4 and 18.5.1.5, shall be not less than the required fire flow determined in accordance with Section 18.4.

18.5.4.3* The maximum fire flow capacity for which a fire hydrant shall be credited shall be as specified by Table 18.5.4.3. Capacities exceeding the values specified in Table 18.5.4.3 shall be permitted when local fire department operations have the ability to accommodate such values as determined by the fire department.

Table 18.5.4.3 Maximum fire flow hydrant capacity

Distance to buildings[a]		Maximum capacity[b]	
(ft)	(m)	(gpm)	(L/min)
≤ 250	≤ 76	1500	5678
> 250 and ≤ 500	> 76 and ≤ 152	1000	3785
> 500 and ≤ 1000	> 152 and ≤ 305	750	2839

[a] Measured in accordance with 18.5.1.4 and 18.5.1.5.

[b] Minimum 20 psi (139.9 kPa) residual pressure.

18.5.4.4 Fire hydrants required by **18.5.2** and **18.5.3** shall be included in the minimum number of fire hydrants for fire flow required by **18.5.4**.

The City of Ottawa design guidelines on hydrant classification conform to the NFPA Standard #291, which recommends the following:

5.1 Classification of Hydrants. Hydrants should be classified in accordance with their rated capacities [at 20 psi (1.4 bar) residual pressure or other designated value as follows:

(1) Class AA — Rated capacity of 1500 gpm (5700L/min) or greater

(2) Class A — Rated capacity of 1000–1499 gpm (3800– 5699 L/min)

(3) Class B — Rated capacity of 500–999 gpm (1900–3799 L/min)

(4) Class C — Rated capacity of less than 500 gpm (1900 L/min)

City of Ottawa 2013 Water Master Plan

Update to the 2009 IMP
Recommendations
Final Report

September 20, 2013

City of Ottawa - Water Distribution System Facilities & Feedermains

CARP
WELLS/RESERVOIRS/P.S

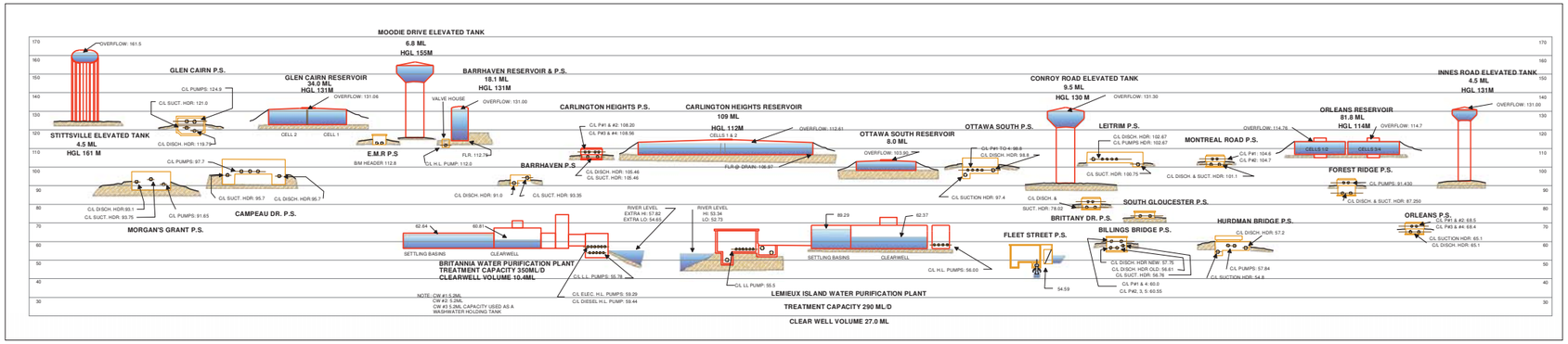
RICHMOND
WELLS

MUNSTER
WELLS/RESERVOIRS/P.S

VARS
WELLS/RESERVOIRS/TREATMENT PLANT & P.S

ORLEANS P.S.
FOREST RIDGE P.S
Ogilvie Rd. Backup P.S.
ORLEANS RES.
MONTREAL ROAD P.S.
BRITTANY DRIVE P.S.
FLEET STREET P.S.
LEMIEUX ISLAND PURIFICATION PLANT & P.S. & RES.
BRITANNIA PURIFICATION PLANT & P.S. & RES.
MORGAN'S GRANT P.S.
CAMPEAU DR. P.S.
ENERGY MINES & RESOURCES P.S.
GLEN CAIRN P.S. & RES
STITTSVILLE ELEVATED TANK
Abbott/Iber St. Backup P.S.
MOODIE ELEVATED TANK
BARRHAVEN P.S.
BARRHAVEN RES. & P.S.
Merivale Rd. Backup P.S.
OTTAWA SOUTH P.S & RES.
HURDMAN P.S.
Innes Rd Backup P.S.
Innes Rd/BearBrook Rd Backup P.S.
INNES RD ELEVATED TANK
BILLINGS BRIDGE P.S.
CONROY RD ELEVATED TANK
CARLINGTON HEIGHTS P.S. & RES.
SOUTH GLOUCESTER P.S. (INACTIVE)
LEITRIM P.S.
SHADOW RIDGE P.S. & WELLS
SHADOW RIDGE WELL

1E 1W 2C 2E 2W 3C 3W 4C BARR EMR ME MG MONT SHAD



Legend

Water System Structure

- Pump Station
- Backup Pump Station
- Water Treatment Plant
- Well
- Elevated Tank
- Reservoir

WATERMAINS

Priority, Internal Diameter

- Backbone 1524mm - 1981mm
- Backbone 1067mm - 1372mm
- Backbone 610mm - 914mm
- Backbone 406mm - 508mm
- Backbone 152mm - 305mm
- Distribution 1676mm - 1981mm
- Distribution 1067mm - 1372mm
- Distribution 610mm - 914mm
- Distribution 406mm - 508mm
- Distribution 305mm - 381mm

PRESSURE ZONES

1E, 1W, 2C, 2E, 2W, 3C, 3W, 4C, BARR, EMR, ME, MG, MONT, SHAD

N W E S

Ottawa

Infrastructure Services & Community Sustainability
Infrastructure Services

0 1,000 2,000 4,000 6,000
Meters

FIGURE 1-1

DRAWN BY: D. HESS DATE: 31 July 2013

5.3.3 Water Age Assessment

A water quality assessment was carried out by determining the resulting water age throughout the entire under winter demands conditions for each 2012, 2031 and 2060 respectively. A selected number of nodes in each zone were monitored over a 20-day (480 hour) simulation using the hydraulic model. Nodes were selected to provide a good geographic representation across each pressure zone. In addition, nodes were selected along looped pipes with demands to ensure a good representation of zonal water age. **Appendix G** provides the results of the water age analysis for both storage facilities and the selected nodes in each pressure zone.

Table 5-10 presents the average water age in each zone for existing and future water demands. Results of the analysis show an overall general decrease in water age as water demands increase. In areas where water age does not decrease, this may be attributed to factors such as new storage capacities added to the system and slight modifications to controls such that storage is used more effectively for increased balancing. New large diameter transmission line can also have an impact by increasing water age thereby offsetting the decrease in water age due to demands. In areas without significant new development, it is also expected that water age increases are the result of decreasing unit water demands.

Table 5-10: Hydraulic Modelling Results – Water Age by Pressure Zone

Zone	AVG (days)		
	2012	2031	2060
1W	1	<1	<1
1E	2	1	1
2E	6	4	3
MONT	3	1	1
2C	3	1	1
3C	3	1	1
4C	4	3	2
2W	1	1	1
3W	4	3	2
MG	4	2	1
BARR	6	4	4
ME	5	5	3

5.3.4 Transient Analysis

Fluid transients are rapidly moving waves of compressed fluid generated by sudden changes in a piping system's status quo. This surging effect, often termed "water hammer", can exert pressures significantly lower and higher than the normal operating line pressures. It is desirable to implement measures to mitigate transient causing events in distribution systems in order to prevent the potential negative impacts of such events including but not limited to: pipe failure and the potential inflow of contaminants due to negative pressures/vacuum conditions, over pressurization beyond design limits, rupture due to cyclical loading of high pressures, cavitation at pumps resulting in impeller damage, and, overall pump failure.

Water Demand Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Density
Date: 6/24/2025
Input By: MNP
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User | No Input Required | Calculated Cells →

Reference: Ottawa Design Guidelines - Water Distribution (2010 and TBs)
MOE Design Guidelines for Drinking-Water Systems (2008)
Fire Underwriter's Survey Guideline (2020)
Ontario Building Code, Part 3 (2012)

Small System = NO

Location	Total Water Demand															
Node	Residential Input & Average Demand							Maximum Day & Peak Hour Demand						Design Fire Demand		
								Maximum Day Demand			Peak Hour Demand			Required Fire Flow (RFF)		
	Singles	Semis / Towns	Apts (2-BR)	Apts (1-BR)	Apts (Avg)	Pop. Equiv.	Res. Average Day Flow Demand (L/s)	Res. Peaking Factor	ICI Peaking Factor	Max Day Flow Demand (L/s)	Res. Peaking Factor	ICI Peaking Factor	Peak Hour Flow Demand (L/s)	FUS (L/min)		Max Day + RFF (L/s)
J1		12				32.40	0.11	2.50	1.50	0.26	5.50	2.70	0.58			0.26
J2		12				32.40	0.11	2.50	1.50	0.26	5.50	2.70	0.58			0.26
J3		24				64.80	0.21	2.50	1.50	0.53	5.50	2.70	1.16			0.53
J4		24				64.80	0.21	2.50	1.50	0.53	5.50	2.70	1.16			0.53
J5		12				32.40	0.11	2.50	1.50	0.26	5.50	2.70	0.58			0.26
J6 (Existing Hydrant - Falabella Street)						0.00	0.00	2.50	1.50	0.00	5.50	2.70	0.00	5,700		95.00
J7 (Proposed Hydrant)						0.00	0.00	2.50	1.50	0.00	5.50	2.70	0.00	7,300		121.67
Totals	**0**	**84**	**0**	**0**	**0**	**226.80**	**0.74**	**2.50**	**1.50**	**1.84**	**5.50**	**2.70**	**4.04**			

Demand Parameters

Residential					
Unit Type Population Equiv.	**Singles**	**Semis/ Towns**	**Apts (2-BR)**	**Apts (1-BR)**	**Apts (Avg)**
	3.4	2.7	2.1	1.4	1.8
Dailly Demand	L/per person/day				
Average Demand	280				
Basic Demand	200				

Residential Peaking Factors		Max Day (x Avg Day)	Peak Hour (x Avg Day)
	Pop.		
Small System (If Applicable)	0	9.50	14.30
	30	9.50	14.30
	150	4.90	7.40
Modified	300	3.60	*5.50*
	450	3.00	*5.50*
	500	2.90	*5.50*
Large System (Default)	> 500	2.50	5.50

Quick Fire Flow Reference Guide			
FUS (L/min)	**Comments**	**OBC (L/min)**	**Comments**
> 2,000	**Min FUS**	**< 9,000**	**Unsprinklered Non- Combustible**
	Low Density - Singles/Towns		
10,000	Complies w/ TB2014-01 Cap. (10m rear spacing, 6 units max, <600 m²)		
13,000	Non-complying w/TB2014-01. Calculate.		
15,000	**Medium Density** Back-to-back Towns.		
	High Density		
20,000	Wood Frame 4-Storey		
5,000	Fire-Resisitve Podium/Multi-Storey		
30,000	**High Contiguous / Hazard Areas**		
< 45,000	**Max FUS**		

Water Demand Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

Maximum Pressure During Average Day (AVDY) Conditions

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Densi
Date: 6/24/2025
Input By: TGS
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User | No Input Required
Acceptable (40psi - 80psi)
Acceptable w/ PRV (81psi - 100psi)
Unacceptable (< 40psi or > 100psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)	Age (hrs)
J1	124.10	0.26	160.67	36.57	52	1.09
J2	123.60	0.32	160.70	37.10	53	1.04
J3	123.20	0.53	160.70	37.50	53	0.65
J4	123.10	0.53	160.70	37.60	53	0.47
J5	123.90	0.26	160.67	36.77	52	0.37

Water Demand Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

Minimum Pressure During Peak Hour (PKHR) Conditions

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Densi
Date: 6/24/2025
Input By: TGS
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User | No Input Required
Acceptable (=> 40psi)
Unacceptable (< 40psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
J1	124.10	0.26	154.97	30.87	44
J2	123.60	0.58	155.00	31.40	45
J3	123.20	1.16	155.00	31.80	45
J4	123.10	1.16	155.00	31.90	45
J5	123.90	0.58	154.87	30.97	44

Water Demand Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

Minimum Pressure During Max Day Plus Fire Flow (MXDY+FF) Condition (13,000L/min)

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Densi
Date: 6/24/2025
Input By: TGS
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User | No Input Required
Acceptable (=> 20psi)
Unacceptable (< 20psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
J1	124.10	0.26	138.50	14.40	20
J2	123.60	0.32	138.53	14.93	21
J3	123.20	0.53	138.53	15.33	22
J4	123.10	0.53	138.85	15.75	22
J5	123.90	0.26	138.93	15.03	21
J7 (Existing Hydrant)*	121.70	122.00	139.11	17.41	25
J8 (Proposed Hydrant)**	122.85	95.00	138.46	15.61	22

* 95 L/s represents 5,700 L/min of flow from proposed hydrant
** 122 L/s represents 7,300 L/min of flow from existing City hydrants. Refer to Figure 7.1 for flow distribution

Water Demand Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

Minimum Pressure During Max Day Plus Fire Flow (MXDY+FF) Condition (12,000L/min)

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Densi
Date: 6/24/2025
Input By: TGS
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User | No Input Required
Acceptable (=> 20psi)
Unacceptable (< 20psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
J1	124.10	0.26	140.51	16.41	23
J2	123.60	0.32	140.54	16.94	24
J3	123.20	0.53	140.54	17.34	25
J4	123.10	0.53	141.02	17.92	25
J5	123.90	0.26	141.14	17.24	25
J7 (Existing Hydrant)*	121.70	105.00	140.99	19.29	27
J8 (Proposed Hydrant)**	122.85	95.00	140.43	17.58	25

* 95 L/s represents 5,700 L/min of flow from proposed hydrant
** 105 L/s represents 6,300 L/min of flow from existing City hydrants. Refer to Figure 7.1 for flow distribution

FUS - Fire Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Density
Date: 6/24/2025
Input By: MNP
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User / No Input Required
Reference: Fire Underwriter's Survey Guideline (2020) Formula Method

Building Description: Block 1 - 3 storey
Type V - Wood frame

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	478			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**1,434**	
	F	**Base fire flow without reductions**				**12,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible	Yes	-25%	-25%	**9,000**
		Limited combustible		-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	3.1 - 10 m		20%	**2,700**
		East Side	20.1 - 30 m		10%	
		South Side	>30m		0%	
		West Side	>30m		0%	
				Cumulative Total	**30%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**12,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**200**
				or	USGPM	3,170

FUS - Fire Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Density
Date: 6/24/2025
Input By: MNP
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User / No Input Required
Reference: Fire Underwriter's Survey Guideline (2020) Formula Method

Building Description: Block 2 - 3 storey
Type V - Wood frame

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	478			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**1,434**	
	F	**Base fire flow without reductions**				**12,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible	Yes	-25%	-25%	**9,000**
		Limited combustible		-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 6**		**Surcharge**	
	(3)	North Side	3.1 - 10 m		17%	**4,230**
		East Side	10.1 - 20 m		13%	
		South Side	3.1 - 10 m		17%	
		West Side	>30m		0%	
				Cumulative Total	**47%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**13,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**217**
				or	USGPM	3,435

FUS - Fire Flow Calculations
Block 2

Engineers, Planners & Landscape Architects

Table 6 Worksheet

To be used only if adjacent *Exposed Building* construction is known

Source of Information: 124097-GP

Legend: Input by User / No Input Required

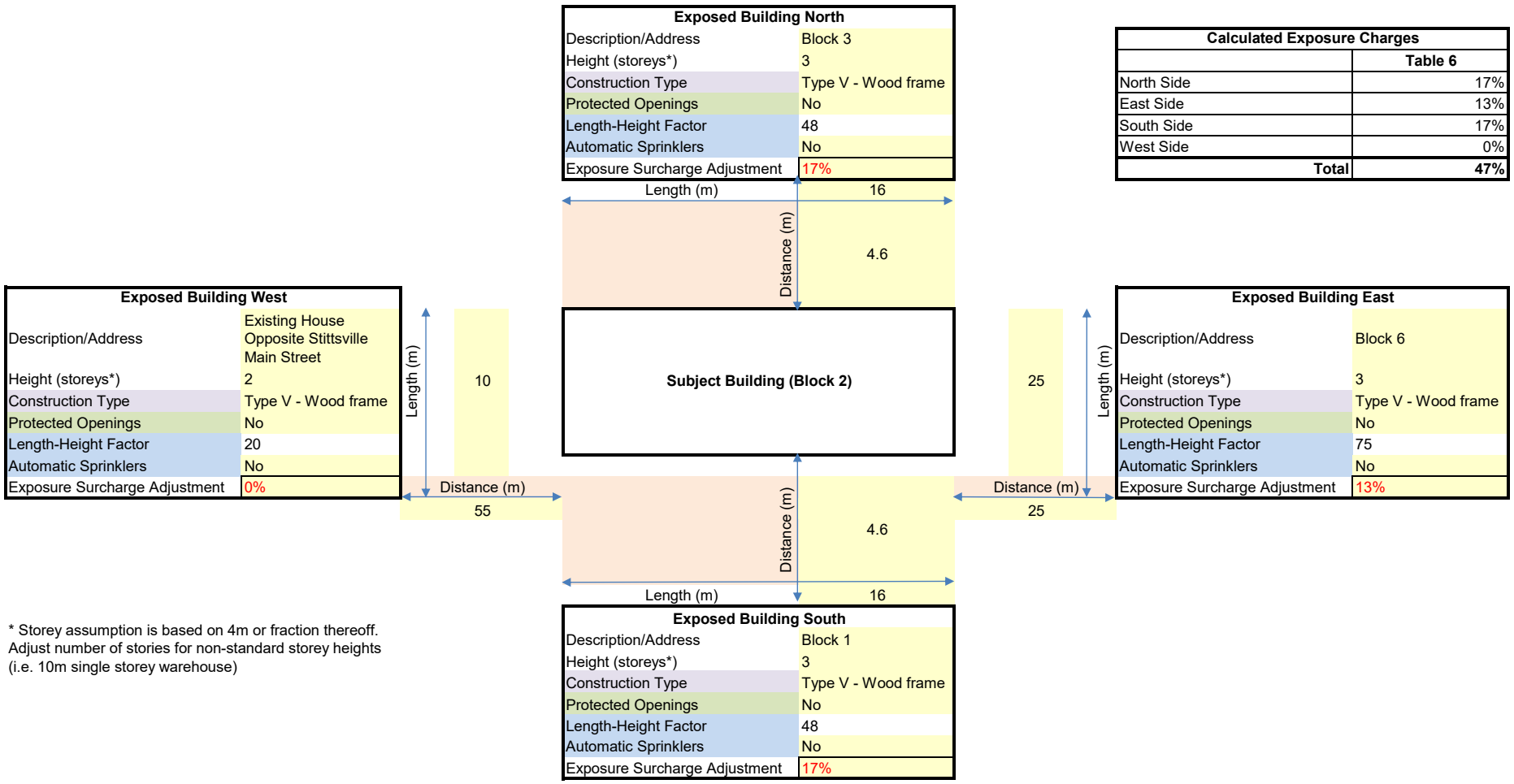
Exposed Building North	
Description/Address	Block 3
Height (storeys*)	3
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	48
Automatic Sprinklers	No
Exposure Surcharge Adjustment	17%

Calculated Exposure Charges	
	Table 6
North Side	17%
East Side	13%
South Side	17%
West Side	0%
Total	**47%**

Exposed Building West	
Description/Address	Existing House Opposite Stittsville Main Street
Height (storeys*)	2
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	20
Automatic Sprinklers	No
Exposure Surcharge Adjustment	0%

Exposed Building East	
Description/Address	Block 6
Height (storeys*)	3
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	75
Automatic Sprinklers	No
Exposure Surcharge Adjustment	13%

Exposed Building South	
Description/Address	Block 1
Height (storeys*)	3
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	48
Automatic Sprinklers	No
Exposure Surcharge Adjustment	17%



* Storey assumption is based on 4m or fraction thereoff.
Adjust number of stories for non-standard storey heights
(i.e. 10m single storey warehouse)

FUS - Fire Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Density
Date: 6/24/2025
Input By: MNP
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User
No Input Required
Reference: Fire Underwriter's Survey Guideline (2020)
Formula Method

Building Description: Block 3 - 3 storey
Type V - Wood frame

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	478			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**1,434**	
	F	**Base fire flow without reductions**				**12,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible	Yes	-25%	-25%	**9,000**
		Limited combustible		-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 6**		**Surcharge**	
	(3)	North Side	20.1 - 30 m		8%	**2,970**
		East Side	20.1 - 30 m		8%	
		South Side	3.1 - 10 m		17%	
		West Side	>30m		0%	
				Cumulative Total	**33%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**12,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**200**
				or	USGPM	3,170

FUS - Fire Flow Calculations
Block 3

Engineers, Planners & Landscape Architects

Table 6 Worksheet

To be used only if adjacent *Exposed Building* construction is known

Source of Information: 124097-GP

Legend: Input by User / No Input Required

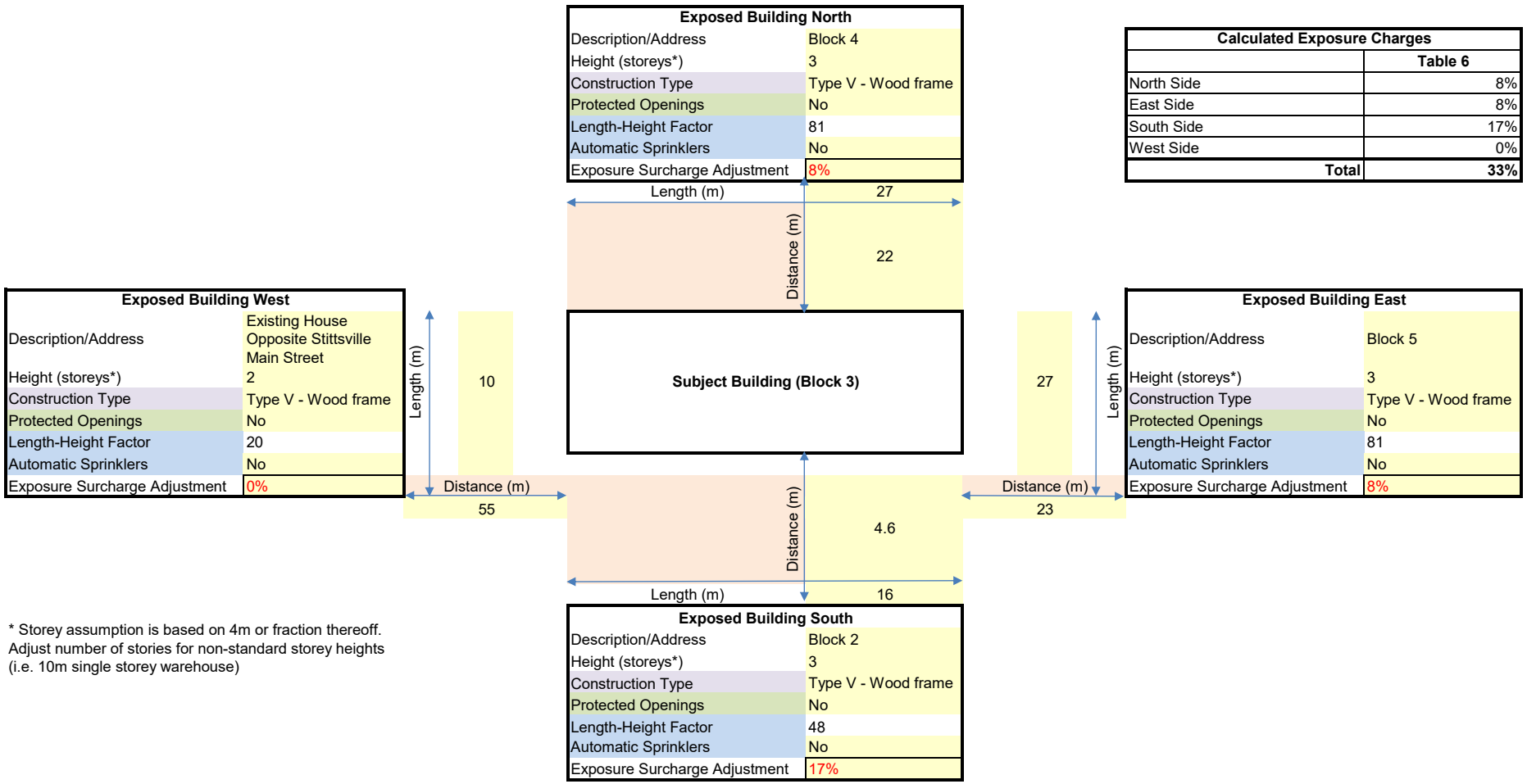
Exposed Building North	
Description/Address	Block 4
Height (storeys*)	3
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	81
Automatic Sprinklers	No
Exposure Surcharge Adjustment	8%

Calculated Exposure Charges	
	Table 6
North Side	8%
East Side	8%
South Side	17%
West Side	0%
Total	**33%**

Exposed Building West	
Description/Address	Existing House Opposite Stittsville Main Street
Height (storeys*)	2
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	20
Automatic Sprinklers	No
Exposure Surcharge Adjustment	0%

Exposed Building East	
Description/Address	Block 5
Height (storeys*)	3
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	81
Automatic Sprinklers	No
Exposure Surcharge Adjustment	8%

Exposed Building South	
Description/Address	Block 2
Height (storeys*)	3
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	48
Automatic Sprinklers	No
Exposure Surcharge Adjustment	17%



* Storey assumption is based on 4m or fraction thereoff.
Adjust number of stories for non-standard storey heights
(i.e. 10m single storey warehouse)

FUS - Fire Flow Calculations

Engineers, Planners & Landscape Architects

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Density
Date: 6/24/2025
Input By: MNP
Reviewed By: ARM
Drawing Reference: 124097-GP

Building Description: Block 4 - 3 storey
Type V - Wood frame

Legend: Input by User
No Input Required
Reference: Fire Underwriter's Survey Guideline (2020)
Formula Method

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	478			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**1,434**	
	F	**Base fire flow without reductions**				**12,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible	Yes	-25%	-25%	**9,000**
		Limited combustible		-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	>30m		0%	**2,700**
		East Side	20.1 - 30 m		10%	
		South Side	3.1 - 10 m		20%	
		West Side	>30m		0%	
				Cumulative Total	**30%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**12,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**200**
				or	USGPM	3,170

FUS - Fire Flow Calculations

Engineers, Planners & Landscape Architects

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Density
Date: 6/24/2025
Input By: MNP
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User / No Input Required
Reference: Fire Underwriter's Survey Guideline (2020) Formula Method

Building Description: Block 5 - 3 storey
Type V - Wood frame

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	478			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**1,434**	
	F	**Base fire flow without reductions**				**12,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible	Yes	-25%	-25%	**9,000**
		Limited combustible		-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	>30m		0%	**2,700**
		East Side	20.1 - 30 m		10%	
		South Side	20.1 - 30 m		10%	
		West Side	20.1 - 30 m		10%	
				Cumulative Total	**30%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**12,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**200**
				or	USGPM	3,170

FUS - Fire Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Density
Date: 6/24/2025
Input By: MNP
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User / No Input Required
Reference: Fire Underwriter's Survey Guideline (2020) Formula Method

Building Description: Block 6 - 3 storey
Type V - Wood frame

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	478			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**1,434**	
	F	**Base fire flow without reductions**				**12,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible	Yes	-25%	-25%	**9,000**
		Limited combustible		-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 6**		**Surcharge**	
	(3)	North Side	20.1 - 30 m		8%	**2,790**
		East Side	3.1 - 10 m		17%	
		South Side	20.1 - 30 m		2%	
		West Side	20.1 - 30 m		4%	
				Cumulative Total	**31%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**12,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**200**
				or	USGPM	3,170

FUS - Fire Flow Calculations
Block 6

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Table 6 Worksheet

To be used only if adjacent *Exposed Building* construction is known

Source of Information: 12097-GP

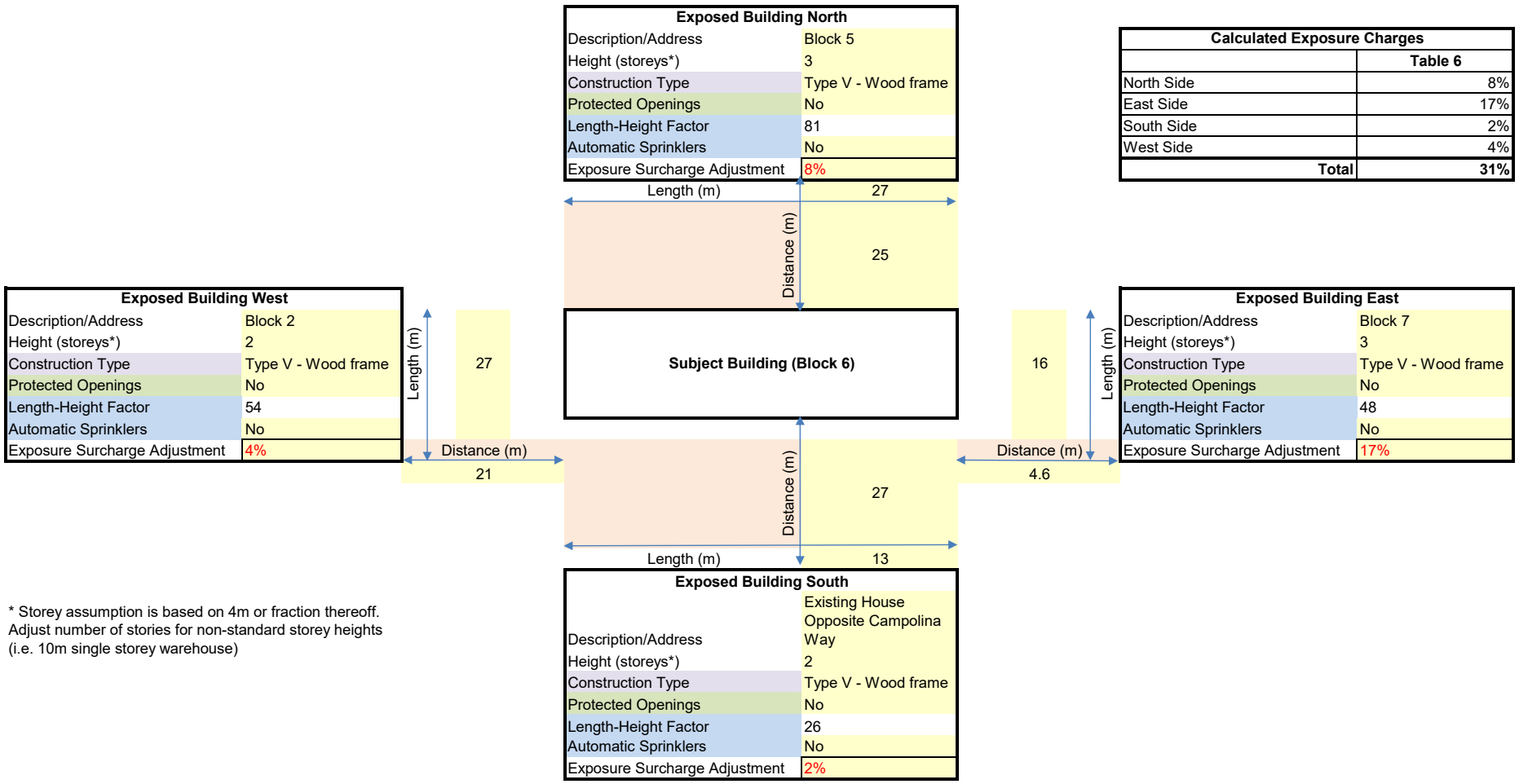
Legend: Input by User / No Input Required

Exposed Building North	
Description/Address	Block 5
Height (storeys*)	3
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	81
Automatic Sprinklers	No
Exposure Surcharge Adjustment	8%

Exposed Building West	
Description/Address	Block 2
Height (storeys*)	2
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	54
Automatic Sprinklers	No
Exposure Surcharge Adjustment	4%

Exposed Building East	
Description/Address	Block 7
Height (storeys*)	3
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	48
Automatic Sprinklers	No
Exposure Surcharge Adjustment	17%

Exposed Building South	
Description/Address	Existing House Opposite Campolina Way
Height (storeys*)	2
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	26
Automatic Sprinklers	No
Exposure Surcharge Adjustment	2%



Calculated Exposure Charges	
	Table 6
North Side	8%
East Side	17%
South Side	2%
West Side	4%
Total	**31%**

* Storey assumption is based on 4m or fraction thereoff.
Adjust number of stories for non-standard storey heights
(i.e. 10m single storey warehouse)

FUS - Fire Flow Calculations

Engineers, Planners & Landscape Architects

Novatech Project #: 124097
Project Name: Traditions II - Block 349 Medium Density
Date: 6/24/2025
Input By: MNP
Reviewed By: ARM
Drawing Reference: 124097-GP

Legend: Input by User / No Input Required
Reference: Fire Underwriter's Survey Guideline (2020) Formula Method

Building Description: Block 7 - 3 storey
Type V - Wood frame

Step			Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow						
1	**Construction Material**			**Multiplier**		
	Coefficient related to type of construction **C**	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	Building Footprint (m^2)	478			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m^2)			**1,434**	
	F	**Base fire flow without reductions**				**12,000**
		F = 220 **C** (**A**)$^{0.5}$				
Reductions or Surcharges						
3	**Occupancy hazard reduction or surcharge**		**FUS Table 3**	**Reduction/Surcharge**		
	(1)	Non-combustible	Yes	-25%	-25%	**9,000**
		Limited combustible		-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	**Sprinkler Reduction**		**FUS Table 4**	**Reduction**		
	(2)	Adequately Designed System (NFPA 13)	No	-30%		**0**
		Standard Water Supply	No	-10%		
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**0%**	
		Area of Sprinklered Coverage (m^2)	0	0%		
				Cumulative Total	**0%**	
5	**Exposure Surcharge**		**FUS Table 6**		**Surcharge**	
	(3)	North Side	20.1 - 30 m		4%	**2,160**
		East Side	20.1 - 30 m		2%	
		South Side	20.1 - 30 m		2%	
		West Side	3.1 - 10 m		16%	
				Cumulative Total	**24%**	
Results						
6	**(1) + (2) + (3)**	**Total Required Fire Flow, rounded to nearest 1000L/min**			**L/min**	**11,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**183**
				or	USGPM	2,906

FUS - Fire Flow Calculations
Block 7

Engineers, Planners & Landscape Architects

Table 6 Worksheet

To be used only if adjacent *Exposed Building* construction is known

Source of Information: 124097-GP

Legend: Input by User / No Input Required

Exposed Building North	
Description/Address	Block 5
Height (storeys*)	3
Construction Type	Type V - Wood frame
Protected Openings	No
Length-Height Factor	48
Automatic Sprinklers	No
Exposure Surcharge Adjustment	4%

Calculated Exposure Charges	
	Table 6
North Side	4%
East Side	2%
South Side	2%
West Side	16%
Total	**24%**

* Storey assumption is based on 4m or fraction thereoff.
Adjust number of stories for non-standard storey heights
(i.e. 10m single storey warehouse)

FUS - Fire Flow Calculations
Table 6 Adjustments

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FUS Table 6 Exposure Charges Adjustment						
Separation	Length-Height Ratio	Type V	Unprotected		Protected Openings	
	Unitless		Type III-IV	Type I-II	Type III-IV	Type I-II
0 - 3 m	0-20	20%	15%	10%	5%	0%
	21-40	21%	16%	11%	6%	1%
	41-60	22%	17%	12%	7%	2%
	61-80	23%	18%	13%	8%	3%
	81-100	24%	19%	14%	9%	4%
	>100	25%	20%	15%	10%	5%
3.1 - 10 m	0-20	15%	10%	6%	3%	0%
	21-40	16%	11%	7%	4%	0%
	41-60	17%	12%	8%	5%	1%
	61-80	18%	13%	9%	6%	2%
	81-100	19%	14%	10%	7%	3%
	>100	20%	15%	11%	8%	4%
10.1 - 20 m	0-20	10%	5%	3%	0%	0%
	21-40	11%	6%	4%	1%	0%
	41-60	12%	7%	5%	2%	0%
	61-80	13%	8%	6%	3%	1%
	81-100	14%	9%	7%	4%	2%
	>100	15%	10%	8%	5%	3%
20.1 - 30 m	0-20	0%	0%	0%	0%	0%
	21-40	2%	1%	0%	0%	0%
	41-60	4%	2%	1%	0%	0%
	61-80	6%	3%	2%	1%	0%
	81-100	8%	4%	3%	2%	0%
	>100	10%	5%	4%	3%	0%
>30m	all sizes	0%	0%	0%	0%	0%

Appendix F

PATERSON GROUP

Geotechnical Investigation

Proposed Residential Development

1883 Stittsville Main Street
Ottawa, Ontario

Prepared for Mattamy Homes

Report PG7178-1 dated July 2, 2024

Table of Contents

Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Mattamy Homes to conduct a geotechnical investigation for the proposed residential development to be located at 1883 Stittsville Main Street in the City of Ottawa, Ontario (refer to Figure 1 - Key Plan in Appendix 2 for the general site location).

The objectives of the geotechnical investigation were to:

- Determine the subsoil and groundwater conditions at this site by means of test pits.
- Provide geotechnical recommendations pertaining to the design of the proposed development including construction considerations which may affect the design.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes geotechnical recommendations pertaining to the design and construction of the subject development as they are understood at the time of writing this report.

Investigating for the presence or potential presence of contamination on the subject property was not part of the scope of the present investigation. Therefore, the present report does not address environmental issues.

2.0 Proposed Development

Based on the available conceptual drawings, it is understood that the proposed development will consist of back-to-back style townhouses which may include up to 1 basement level.

At finished grades, the proposed buildings will generally be surrounded by asphalt-paved access lanes, parking areas, and walkways with landscaped margins. It is also understood that the proposed development is to be municipally serviced.

It is expected that the existing residential dwelling will need to be demolished to accommodate the construction of the proposed buildings.

3.0 Method of Investigation

3.1 Field Investigation

Field Program

The field program for the current geotechnical investigation was carried out on June 18, 2024, and consisted of advancing a total of 6 test pits to a maximum depth of 3.0 m below the existing ground surface. The test pit locations were distributed in a manner to provide general coverage of the proposed development, taking into consideration existing site features and underground services. The approximate locations of the test pits are shown on Drawing PG7178-1 - Test Hole Location Plan included in Appendix 2.

The test pits were excavated using a backhoe and backfilled with the excavated soil upon completion. All fieldwork was conducted under the full-time supervision of Paterson personnel under the direction of a senior engineer. The test pitting procedure consisted of excavating to the required depth at the selected locations, and sampling and testing the overburden.

Sampling and In-Situ Testing

Soil samples were recovered from the sidewalls of the test pits. All soil samples were visually inspected and classified on site. The soil samples were placed in sealed plastic bags and transported to our laboratory for further examination and classification. The depths at which the soil samples were recovered from the test pits are shown as G on the Soil Profile and Test Data sheets presented in Appendix 1.

The subsurface conditions observed in the test pits were recorded in detail in the field. The soil profiles are logged on the Soil Profile and Test Data Sheets in Appendix 1 of this report.

Groundwater

Where present, groundwater infiltration levels and soil color changes were recorded in all test pits prior to backfilling at the time of excavation of the test pits. The groundwater observations are further discussed in Section 4.3 and are presented in the Soil Profile and Test Data Sheets in Appendix 1.

3.2 Field Survey

The test pit locations, and the ground surface elevations at each test pit location, were surveyed by Paterson using a handheld GPS unit, and referenced to a geodetic datum. The test pit locations are presented on Drawing PG7178-1 - Test Hole Location Plan in Appendix 2.

3.3 Laboratory Review

Soil samples were collected during the excavation of the test pits, and visually examined in our laboratory to review the results of the field logging. All samples will be stored in the laboratory for a period of one (1) month after issuance of this report. They will then be discarded unless we are otherwise directed.

4.0 Observations

4.1 Surface Conditions

The northern portion of the subject site is currently occupied by an existing residential dwelling and asphalt-paved driveway. The southern portion of the site generally consists of landscaped areas with mature trees.

The subject site is bordered to the west by Stittsville Main Street, to the north by Parade Drive, to the east by Falabella Street, and to the south by Campolina Way. The site generally slopes downward from west to east, from approximate geodetic elevation 122 to 119 m.

4.2 Subsurface Profile

Overburden

Generally, the subsurface profile at the subject site consists of topsoil underlain by a glacial till deposit. At test pits TP 1-24 and TP 3-24, a fill layer was observed underlying the topsoil material and extended to approximate depths of 0.3 and 0.1 m, respectively. The fill was observed to consist of loose, brown silty sand with topsoil and organics as well as trace gravel and cobbles.

A deposit of glacial till was observed underlying the topsoil and/or fill layer at all test pit locations. The glacial till deposit consisted of compact to dense brown silty sand to sandy silt with gravel, cobbles and boulders and extended to the bedrock surface.

Reference should be made to the Soil Profile and Test Data sheets presented in Appendix 1 for details of the soil profiles encountered at each test pit location.

Bedrock

Weathered bedrock was encountered at depths ranging from 0.9 to 2.7 m, generally increasing in depth from west to east across the site. The weathered bedrock was observed to consist of black shale. Practical refusal to excavation on competent bedrock was encountered in all test pits at approximate depths ranging from 1.4 to 3.0 m below the existing ground surface.

4.3 Groundwater

Groundwater infiltration into the open test pits was not observed at the time of the field program. However, long-term groundwater levels can also be estimated based on the observed colour, moisture content and consistency of the recovered soil samples. Based on these observations, it is anticipated that the groundwater table is located within the bedrock.

It should be noted that groundwater levels are subject to seasonal fluctuations, therefore, the groundwater levels could vary at the time of construction.

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is suitable for the proposed development. It is recommended that the proposed residential buildings be founded on conventional spread footings bearing either on the compact to dense glacial till, undisturbed weathered bedrock, and/or clean surface sounded bedrock.

Expansive shale bedrock may present at this site. Precautions should be provided during construction to reduce the risks associated with the potentially heaving shale bedrock, which are discussed further in Section 6.7.

Due to relatively shallow bedrock depth across the site, it is anticipated that bedrock removal will be required for building construction and site servicing. All contractors should be prepared for bedrock removal within the subject site.

The above and other considerations are further discussed in the following sections.

5.2 Site Grading and Preparation

Stripping Depth

Topsoil and any fill containing significant amounts of deleterious or organic materials, should be stripped from under any buildings and other settlement sensitive structures. Care should be taken not to disturb adequate bearing soils below the founding level during site preparation activities.

Existing foundation walls and other construction debris should be entirely removed from within the building perimeter. Under paved areas, existing construction remnants, such as foundation walls should be excavated to a minimum of 1 m below final grade.

Bedrock Removal

In areas where shallow bedrock is encountered, and where the bedrock is weathered and only a small quantity of bedrock is to be removed, bedrock removal may be possible by hoe-ramming. However, dependent on the quantity and condition of the bedrock, line-drilling in conjunction with hoe-ramming may be required to remove the bedrock. Sound bedrock may be removed by line drilling in conjunction with controlled blasting and/or hoe ramming.

Prior to considering blasting operations, the blasting effects on the existing services, buildings, and other structures should be addressed. A pre-blast or pre-construction survey of the existing structures located in the proximity of the blasting operations should be carried out prior to commencing site activities.

The extent of the survey should be determined by the blasting consultant and should be sufficient to respond to any inquiries or claims related to the blasting operations.

The blasting operations must be planned and conducted under the supervision of a licensed professional engineer who is also an experienced blasting consultant.

Vibration Considerations

Construction operations are also the cause of vibrations, and possibly, sources of nuisance to the community. Therefore, means to reduce the vibration levels should be incorporated in the construction operations to maintain, as much as possible, a cooperative environment with the residents.

The following construction equipment could be a source of vibrations: piling rig, hoe ram, compactor, dozer, crane, truck traffic, etc. Vibrations, whether caused by blasting operations or by construction operations, could be the cause of the source of detrimental vibrations on the nearby buildings and structures. Therefore, it is recommended that all vibrations be limited.

Two parameters are used to determine the permissible vibrations, namely, the maximum peak particle velocity and the frequency. For low frequency vibrations, the maximum allowable peak particle velocity is less than that for high frequency vibrations. As a guideline, the peak particle velocity should be less than 15 mm/s between frequencies of 4 to 12 Hz, and 50 mm/s above a frequency of 40 Hz (interpolate between 12 and 40 Hz).

It should be noted that these guidelines are for today's construction standards. Considering that these guidelines are above perceptible human level and, in some cases, could be very disturbing to some people, it is recommended that a pre-construction survey be completed to minimize the risks of claims during or following the construction of the proposed buildings.

Fill Placement

Engineered fill used for grading beneath the proposed building should consist of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II. This material should be tested and

approved prior to delivery. The fill should be placed in maximum 300 mm thick loose lifts and compacted by suitable compaction equipment. Fill placed beneath the propose building should be compacted to a minimum 98% of the Standard Proctor Maximum Dry Density (SPMDD).

Non-specified existing fill, along with site-excavated soil, can be used as general landscaping fill where settlement of the ground surface is of minor concern. These materials should be spread in thin lifts and at least compacted by the tracks of the spreading equipment to minimize voids. If this material is to be used to build up the subgrade level for areas to be paved, it should be compacted in thin lifts to at least 95% of the material's SPMDD.

If excavated rock is to be used as fill, it should be suitably fragmented to produce a well-graded material with a maximum particle size of 300 mm. Where this fill material is open-graded, a woven geotextile may be required to prevent adjacent finer materials from migrating into the voids, with associated loss of ground and settlements. Site-generated blast rock fill should be compacted using a suitably sized smooth drum vibratory roller when considered for placement. This can be assessed at the time of construction.

Under winter conditions, if snow and ice is present within the blast rock fill below future basement slabs, then settlement of the fill should be expected and support of a future basement slab and/or temporary supports for slab pours will be negatively impacted and could undergo settlement during spring and summer time conditions. The geotechnical consultant should complete periodic inspections during fill placement to ensure that snow and ice quantities are minimized.

Lean Concrete Filled Trenches

As discussed above, where the clean, surface sounded bedrock is encountered below the underside of footing (USF) elevation, zero-entry vertical trenches should be excavated and backfilled with lean concrete (minimum **17 MPa** 28-day compressive strength). Typically, the excavation side walls will be used as the form to support the concrete. The lean concrete placement should be at least 150 mm wider than all sides of the footing (strip and pad footings) at the base of the excavation. The additional width of the concrete poured will suffice in providing a direct transfer of the footing load to the underlying clean, surface sounded bedrock. Once the trench excavation is approved by Paterson, lean concrete can be poured up to the proposed founding elevation.

5.3 Foundation Design

Bearing Resistance Values

Footings placed on an undisturbed, weathered bedrock, or compact to dense glacial till can be designed using a bearing resistance value at serviceability limit states (SLS) of **200 kPa** and a factored bearing resistance value at ultimate limit states (ULS) of **300 kPa.** A geotechnical resistance factor of 0.5 was applied to the above noted bearing resistance value at ULS.

An undisturbed soil or weathered bedrock bearing surface consists of one from which all topsoil and deleterious materials, such as loose, frozen or disturbed soil, have been removed prior to the placement of concrete for footings.

Footings designed using the bearing resistance value at SLS given above will be subjected to potential post construction total and differential settlements of 25 and 20 mm, respectively.

Footings supported directly on clean, surface-sounded bedrock, or on lean concrete which is placed directly over the clean surface-sounded bedrock, can be designed using a factored bearing resistance value at ultimate limit states (ULS) of **1,000 kPa**. A geotechnical resistance factor of 0.5 was applied to the bearing resistance value at ULS.

A clean, surface-sounded bedrock bearing surface should be free of loose materials, and have no near surface seams, voids, fissures or open joints which can be detected from surface sounding with a rock hammer.

Footings supported directly on clean, surface sounded bedrock and design for the bearing resistance values provided above will be subject to negligible post-construction total and differential settlements.

Lateral Support

The bearing medium under footing-supported structures is required to be provided with adequate lateral support with respect to excavations and different foundation levels. Above the groundwater level, adequate lateral support is provided to the in-situ bearing medium soils when a plane extending down and out from the bottom edge of the footing at a minimum of 1.5H:1V passes only through in situ soil.

Adequate lateral support is provided to a sound bedrock bearing medium when a plane extending down and out from the bottom edge of the footing at a minimum of 1H:6V (or flatter) passes only through sound bedrock or a material of the same

or higher capacity as the bedrock, such as concrete. A heavily fractured, weathered bedrock bearing medium will require a lateral support zone of 1H:1V (or flatter).

Bedrock/Soil Transition

Where a footing is founded partly on bedrock and partly on soil, it is recommended to decrease the soil bearing resistance value by 25% for the portion placed on a soil bearing medium to reduce the potential long-term total and differential settlements.

Also, at the soil/bedrock transitions, it is recommended that a minimum depth of 500 mm of bedrock be removed from below the founding elevation for a minimum length of 2 m on the bedrock side. This area should be subsequently reinstated with an engineered fill, such as OPSS Granular A or Granular B Type II and compacted to a minimum of 98% of the material SPMDD.

The width of the sub-excavation should be a minimum of 500 mm greater than the width of the footing. Steel reinforcement, extending a minimum of 3 m on both sides of the 2 m long transition, should be placed in the top portions of the footing and foundation walls.

5.4 Design for Earthquakes

The site class for seismic site response can be taken as **Class C**. If a higher seismic site class is required (Class A or B) for the proposed residential buildings, and the proposed footings are to be located within 3 m of the bedrock surface, a site-specific shear wave velocity test may be completed to accurately determine the applicable seismic site classification for foundation design of the proposed building, as defined in Table 4.1.8.4.A of the Ontario Building Code (OBC) 2012.

Soils underlying the subject site are not susceptible to liquefaction. Reference should be made to the latest version of the OBC 2012 for a full discussion of the earthquake design requirements.

5.5 Floor Slab Construction

With the removal of all topsoil and deleterious fill from within the footprint of the proposed building, the glacial till or bedrock medium will be considered acceptable subgrades on which to commence backfilling for floor slab construction.

For structures with slab-on-grade construction, it is recommended that the upper 200 mm of sub-slab fill consist of OPSS Granular A crushed stone. All backfill material within the footprint of the proposed structures should be placed in maximum 300 mm thick loose layers and compacted to a minimum of 98% of the material's SPMDD.

If a basement level is considered for the proposed building, it is recommended that the upper 300 mm of sub-floor fill consists of 19 mm clear crush stone. All backfill material within the footprint of the proposed buildings should be placed in maximum 300 mm thick loose layers and compacted to a minimum of 98% of the material's SPMDD.

5.6 Pavement Design

Car only parking areas, access lanes and heavy truck parking/loading areas are anticipated at this site. For the proposed surface parking areas, the pavement structures provided in Tables 1 and 2 are recommended.

Table 1 - Recommended Asphalt Pavement Structure - Car Only Parking Areas

Thickness (mm)	Material Description
50	**Wear Course** - HL-3 or Superpave 12.5 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
300	**SUBBASE** - OPSS Granular B Type II
SUBGRADE – Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil or fill.	

Table 2 - Recommended Asphalt Pavement Structure - Access Lanes and Heavy Loading Parking Areas

Thickness (mm)	Material Description
40	**Wear Course** – Superpave 12.5 Asphaltic Concrete
50	**Binder Course** – Superpave 19.0 Asphaltic Concrete
150	**BASE** – OPSS Granular A Crushed Stone
300	**SUBBASE** – OPSS Granular B Type II
SUBGRADE – Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil or fill.	

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for this project. If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type II material. The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 99% of the material's SPMDD using suitable compaction equipment.

6.0 Design and Construction Precautions

6.1 Foundation Drainage & Waterproofing

Foundation Drainage

Should the proposed buildings include below-grade space, a perimeter foundation drainage system is recommended to be provided for the proposed structures. The system should consist of a 150 mm diameter perforated and corrugated plastic pipe, surrounded on all sides by 150 mm of 19 mm clear crushed stone, which is placed at the footing level around the exterior perimeter of the structure. The pipe should have positive outlet, such as a gravity connection to the storm sewer.

Backfill against the exterior sides of the foundation walls should consist of free draining non frost susceptible granular materials. The greater part of the site excavated materials will be frost susceptible and, as such, are not recommended for re-use as backfill against the foundation walls, unless used in conjunction with a drainage geocomposite, such as Delta Drain 6000, connected to the perimeter foundation drainage system. Imported granular materials, such as clean sand or OPSS Granular B Type I granular material, should otherwise be used for this purpose.

6.2 Protection of Footings Against Frost Action

Perimeter foundations of heated structures are required to be insulated against the deleterious effects of frost action. A minimum 1.5 m thick soil cover, or an equivalent thickness of soil cover and foundation insulation, should be provided in this regard.

Exterior unheated foundations, such as isolated piers, are more prone to deleterious movement associated with frost action than the exterior walls of the structure, and require additional protection, such as soil cover of 2.1 m, or an equivalent combination of soil cover and foundation insulation.

However, foundations which are founded directly on clean, surface-sounded bedrock with no cracks or fissures, and which is approved by Paterson at the time of construction, is not considered frost susceptible and does not require soil cover.

6.3 Excavation Side Slopes

The side slopes of excavations in the overburden and weathered bedrock should either be cut back at acceptable slopes or should be retained by shoring systems from the start of the excavation until the structure is backfilled. For the proposed development, it is anticipated that sufficient room will be available for the greater part of the excavations to be undertaken by open-cut methods (i.e. unsupported excavations).

The excavation side slopes in the overburden soils and weathered bedrock, above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. Excavations below the groundwater level should be cut back at a maximum slope of 1.5H:1V. The subsoil at this site is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.

Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides.

Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.

It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides. It is expected that services will be installed by “cut and cover” methods and excavations will not be left open for extended periods of time.

Excavation side slopes in sound bedrock can be carried out using almost vertical side walls. A minimum 1 m horizontal ledge should be left between the bottom of the overburden excavation and the top of the bedrock surface to provide an area to allow for potential sloughing or to provide a stable base for the overburden shoring system. Where sufficient space for the horizontal ledge is not available, it is recommended that concrete blocks be used to retain the overburden soils.

6.4 Pipe Bedding and Backfill

Bedding and backfill materials should be in accordance with the most recent Material Specifications & Standard Detail Drawings from the Department of Public Works and Services, Infrastructure Services Branch of the City of Ottawa.

A minimum of 150 mm of OPSS Granular A should be placed for bedding for sewer or water pipes when placed on a soil or weathered bedrock subgrade. If the bedding is placed on clean, surface sounded bedrock, the thickness of the bedding should be increased to 300 mm for sewer pipes. The bedding should extend to the spring line of the pipe. Cover material, from the spring line to a minimum of 300 mm above the obvert of the pipe, should consist of OPSS Granular A (concrete or PSM PVC pipes) or sand (concrete pipe). The bedding and cover materials should be placed in maximum 225 mm thick lifts and compacted to 95% of the SPMDD.

It should generally be possible to re-use the site generated fill materials (moist, not wet) above the cover material if excavation and filling operations are carried out in dry and non-freezing weather conditions. All cobbles larger than 200 mm in their longest direction should be segregated from re-use as trench backfill.

Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.8 m below finished grade) and above the cover material should match the soils exposed at the trench walls to minimize differential frost heaving. The trench backfill should be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 95% of the material's SPMDD.

6.5 Groundwater Control

It is anticipated that groundwater infiltration into the excavation should be controllable using open sumps. The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

Permit to Take Water

A temporary Ministry of Environment, Conservation and Parks (MECP) permit to take water (PTTW) may be required if more than 400,000 L/day of ground and/or surface water are to be pumped during the construction phase. At least 4 to 5 months should be allowed for completion of the application and issuance of the permit by the MECP.

For typical ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Persons as stipulated under O.Reg. 63/16.

If a project qualifies for a PTTW based upon anticipated conditions, an EASR will not be allowed as a temporary dewatering measure while awaiting the MECP review of the PTTW application.

6.6 Winter Construction

Precautions must be taken if winter construction is considered for this project. The subsoil conditions at this site consist of frost susceptible materials. In the presence of water and freezing conditions, ice could form within the soil mass. Heaving and settlement upon thawing could occur.

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures using straw, propane heaters and tarpaulins or other suitable means. In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

Trench excavations and pavement construction are also difficult activities to complete during freezing conditions without introducing frost into the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions. Additional information could be provided, if required.

6.7 Protection of Potentially Expansive Shale Bedrock

Upon being exposed to air and moisture, shale may decompose into thin flakes along the bedding planes. Previous studies have concluded shales containing pyrite are subject to volume changes upon exposure to air. As a result, the formation of jarosite crystals by aerobic bacteria occurs under certain ambient conditions.

It has been determined that the expansion process does not occur or can be retarded when air (i.e. oxygen) is prevented from contact with the shale and/or the ambient temperature is maintained below 20^{o}C, and/or the shale is confined by pressures in excess of 70 kPa. The latter restriction on the heaving process is probably the major reason why damage to structures has, for the greater part, been confined to slabs-on-grade rather than footings.

Based on the test pit logs, expansive shale may be encountered at the subject site. To reduce the long term deterioration of the shale, exposure of the bedrock surface to oxygen should be kept as low as possible.

The weathered bedrock surface within the proposed building footprint should be protected from excessive dewatering and exposure to ambient air. A 50 mm thick concrete mud slab, consisting of minimum 17 MPa lean concrete, should be placed on the exposed bedrock surface within a 48 hour period of being exposed. The excavated sides of the exposed bedrock should be sprayed with shotcrete to seal bedrock from exposure to air and dewatering.

7.0 Recommendations

It is a requirement for the foundation design data provided herein to be applicable that the following material testing and observation program be performed by the geotechnical consultant.

- ❑ Observation of all bearing surfaces prior to the placement of concrete.
- ❑ Sampling and testing of the concrete and fill materials.
- ❑ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- ❑ Observation of all subgrades prior to backfilling.
- ❑ Field density tests to determine the level of compaction achieved.
- ❑ Sampling and testing of the bituminous concrete including mix design reviews.

A report confirming that these works have been conducted in general accordance with our recommendations could be issued upon the completion of a satisfactory inspection program by the geotechnical consultant.

All excess soil must be handled as per ***Ontario Regulation 406/19: On-Site and Excess Soil Management.***

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8.0 Statement of Limitations

The recommendations provided are in accordance with the present understanding of the project. Paterson requests permission to review the recommendations when the drawings and specifications are completed.

A soils investigation is a limited sampling of a site. Should any conditions at the site be encountered which differ from those at the test locations, Paterson requests immediate notification to permit reassessment of our recommendations.

The recommendations provided herein should only be used by the design professionals associated with this project. They are not intended for contractors bidding on or undertaking the work. The latter should evaluate the factual information provided in this report and determine the suitability and completeness for their intended construction schedule and methods. Additional testing may be required for their purposes.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Mattamy Homes, or their agents, is not authorized without review by Paterson for the applicability of our recommendations to the alternative use of the report.

Paterson Group Inc.

Mrunmayi Anvekar, M.Eng.

Kevin Pickard, P.Eng.

Report Distribution:

- ❑ Mattamy Homes (email copy)
- ❑ Paterson Group (1 copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
1883 Stittsville Main Street
Ottawa, Ontario

EASTING: 350930.109 **NORTHING:** 5011425.879 **ELEVATION:** 124.43
DATUM: Geodetic
REMARKS:
BORINGS BY: Backhoe **DATE:** June 18, 2024

FILE NO. PG7178
HOLE NO. TP 1-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	124.43	20 40 60 80	
TOPSOIL and organics 0.05									
FILL: Loose brown silty sand, trace gravel and cobbles		G	1						
0.30									
GLACIAL TILL: Compact brown silty sand, trace gravel, cobbles		G	2						
0.90						1	123.43		
BEDROCK: Weathered black shale bedrock									
2.00						2	122.43		
End of Test Pit Practical refusal to excavation at 2.0 m								20 40 60 80 100 **Shear Strength (kPa)** ▲ Undisturbed △ Remoulded	

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
1883 Stittsville Main Street
Ottawa, Ontario

EASTING: 350952.898 **NORTHING:** 5011402.061 **ELEVATION:** 122.62
DATUM: Geodetic
REMARKS:
BORINGS BY: Backhoe **DATE:** June 18, 2024

FILE NO. PG7178
HOLE NO. TP 2-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface									
TOPSOIL and organics						0	122.62		
0.10									
GLACIAL TILL: Compact to dense brown silty sand with gravel and cobbles									
- Dense and with boulders by 0.8 m		G	1						
1.00						1	121.62		
BEDROCK: Weathered black shale bedrock									
		G	2						
1.40									
End of Test Pit									
Practical refusal to excavation at 1.4 m									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
1883 Stittsville Main Street
Ottawa, Ontario

EASTING: 350953.945 **NORTHING:** 5011349.338 **ELEVATION:** 124.02
DATUM: Geodetic
REMARKS:
BORINGS BY: Backhoe **DATE:** June 18, 2024

FILE NO. PG7178
HOLE NO. TP 3-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	124.02	20 40 60 80	
FILL: Loose brown silty sand with topsoil and organics									
0.10									
GLACIAL TILL: Dense brown silty sand with gravel, cobbles and boulders		G	1						
		G	2			1	123.02		
		G	3						
		G	4			2	122.02		
		G	5						
2.70									
BEDROCK: Weathered black shale bedrock									
3.00						3	121.02		
End of Test Pit Practical refusal to excavation at 3.0 m								20 40 60 80 100 **Shear Strength (kPa)** ▲ Undisturbed △ Remoulded	

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9 Auriga Drive, Ottawa, Ontario K2E 7T9

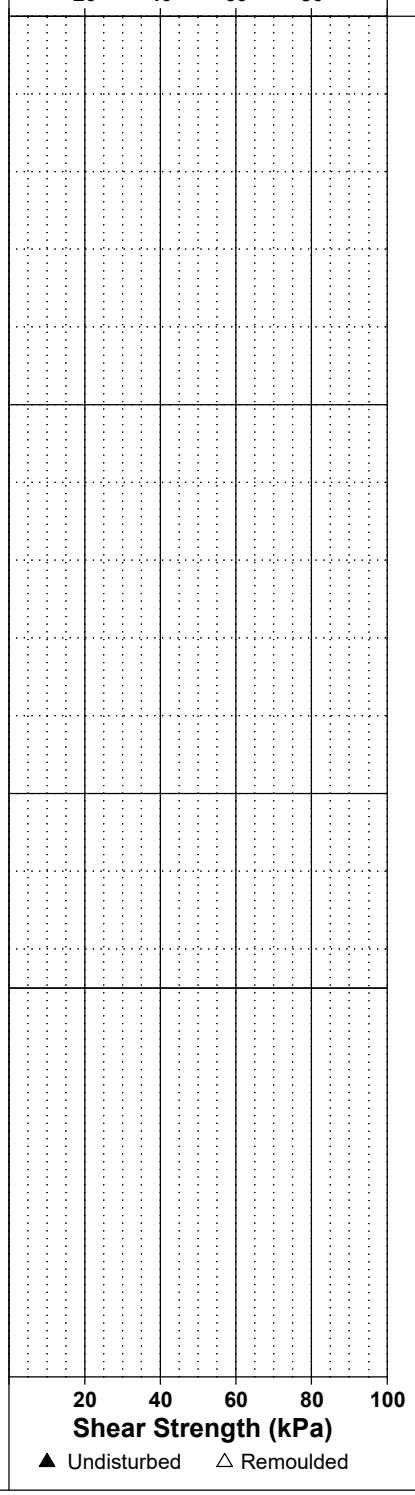
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
1883 Stittsville Main Street
Ottawa, Ontario

EASTING: 350990.031 **NORTHING:** 5011384.755 **ELEVATION:** 121.75
DATUM: Geodetic
REMARKS:
BORINGS BY: Backhoe **DATE:** June 18, 2024

FILE NO. PG7178
HOLE NO. TP 4-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface						0	121.75
TOPSOIL and organics							
0.20							
GLACIAL TILL: Compact brown silty sand with gravel and cobbles		G	1				
		G	2			1	120.75
1.25							
GLACIAL TILL: Compact brown silty sand to sandy silt, with gravel, cobbles and boulders		G	3				
2.00						2	119.75
BEDROCK: Weathered bedrock							
2.50							
End of Test Pit Practical refusal to excavation at 2.5 m							



PIEZOMETER CONSTRUCTION

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

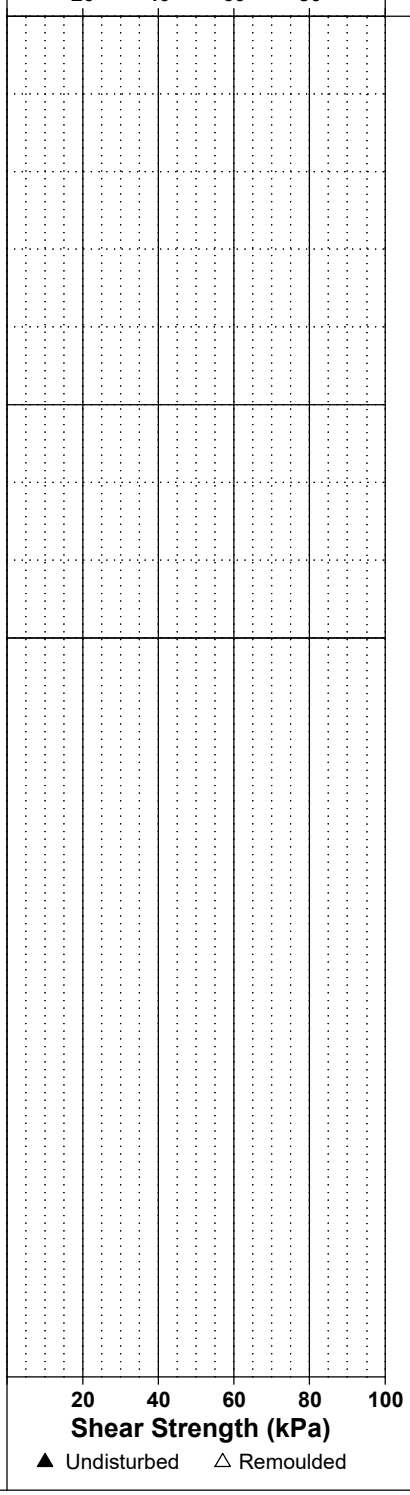
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
1883 Stittsville Main Street
Ottawa, Ontario

EASTING: 351000.559 **NORTHING:** 5011412.837 **ELEVATION:** 121.30
DATUM: Geodetic
REMARKS:
BORINGS BY: Backhoe **DATE:** June 18, 2024

FILE NO. PG7178
HOLE NO. TP 5-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface						0	121.30
TOPSOIL and organics with brown silty sand, trace gravel							
0.30							
GLACIAL TILL: Compact brown silty sand with gravel and cobbles, trace boulders		G	1				
		G	2			1	120.30
1.10							
GLACIAL TILL: Compact brown silty sand to sandy silt with gravel, cobbles and boulders		G	3				
1.60							
End of Test Pit Practical refusal to excavation at 1.6 m							



PIEZOMETER CONSTRUCTION

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

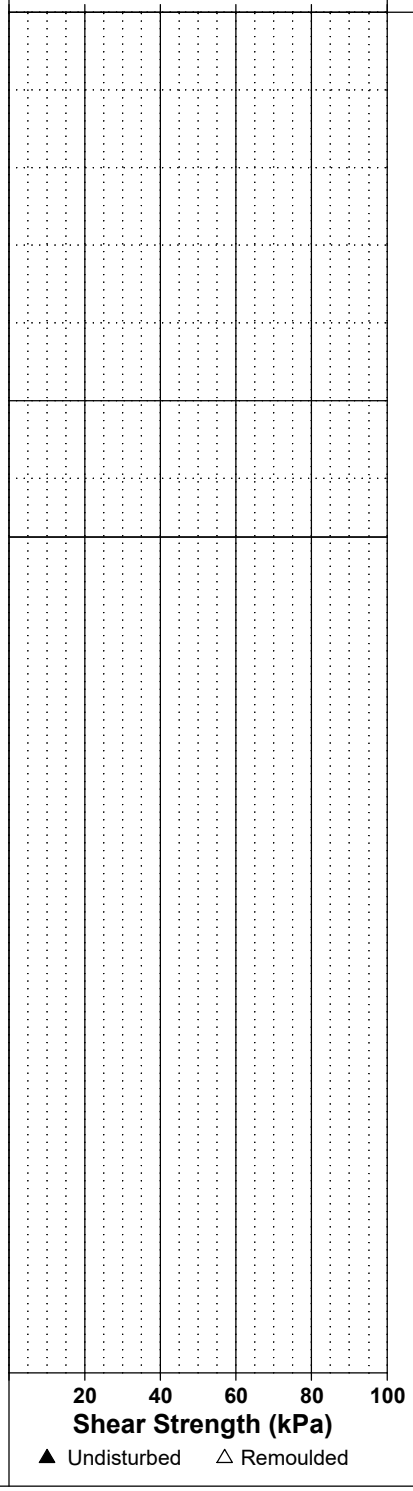
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
1883 Stittsville Main Street
Ottawa, Ontario

EASTING: 350975.905 **NORTHING:** 5011394.776 **ELEVATION:** 121.76
DATUM: Geodetic
REMARKS:
BORINGS BY: Backhoe **DATE:** June 18, 2024

FILE NO. PG7178
HOLE NO. TP 6-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface									
TOPSOIL and organics						0	121.76		
0.20									
GLACIAL TILL: Compact silty sand with gravel, cobbles and shale fragments		G	1						
		G	2						
1.05						1	120.76		
BEDROCK: Weathered black shale bedrock									
1.35									
End of Test Pit Practical refusal to excavation at 1.35 m									



SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

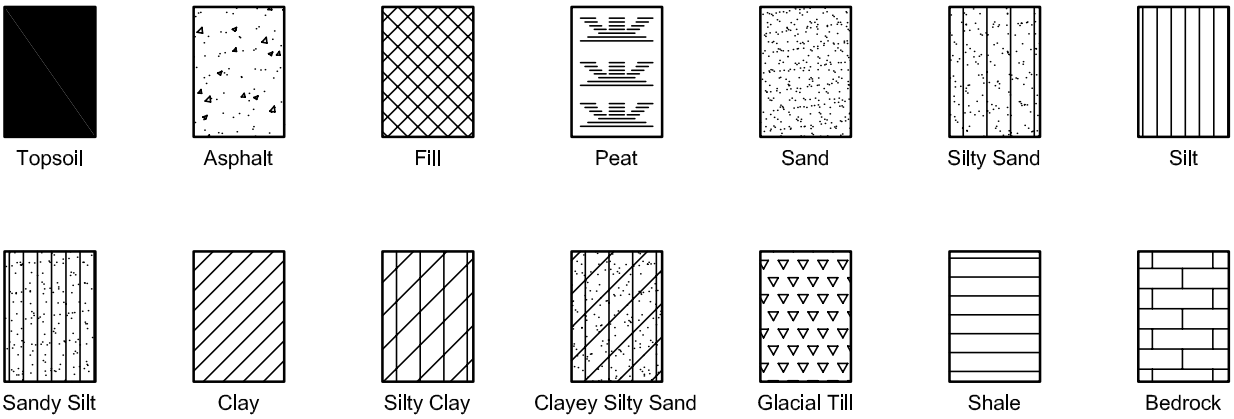
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

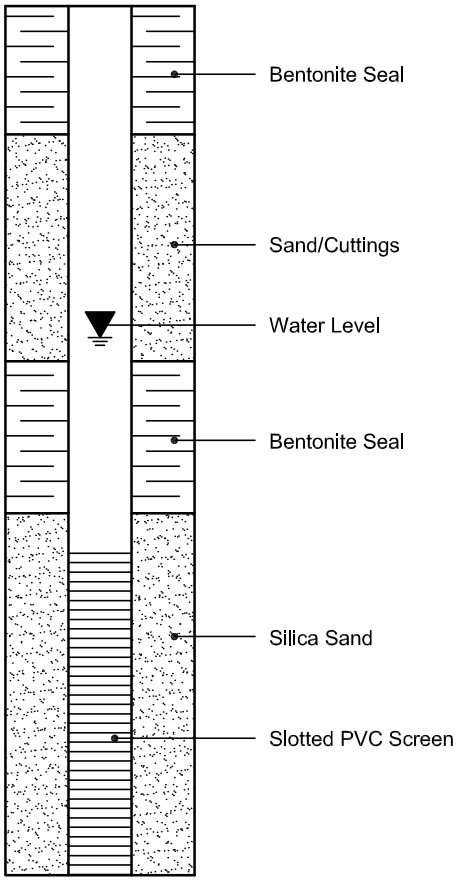
SYMBOLS AND TERMS (continued)

STRATA PLOT

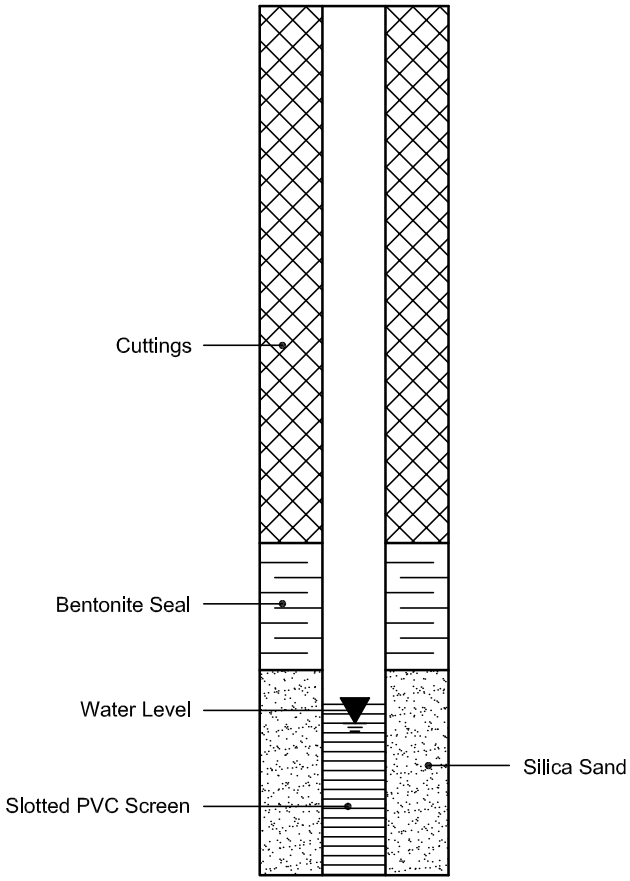


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



APPENDIX 2

FIGURE 1 - KEY PLAN

DRAWING PG7178-1 - TEST HOLE LOCATION PLAN

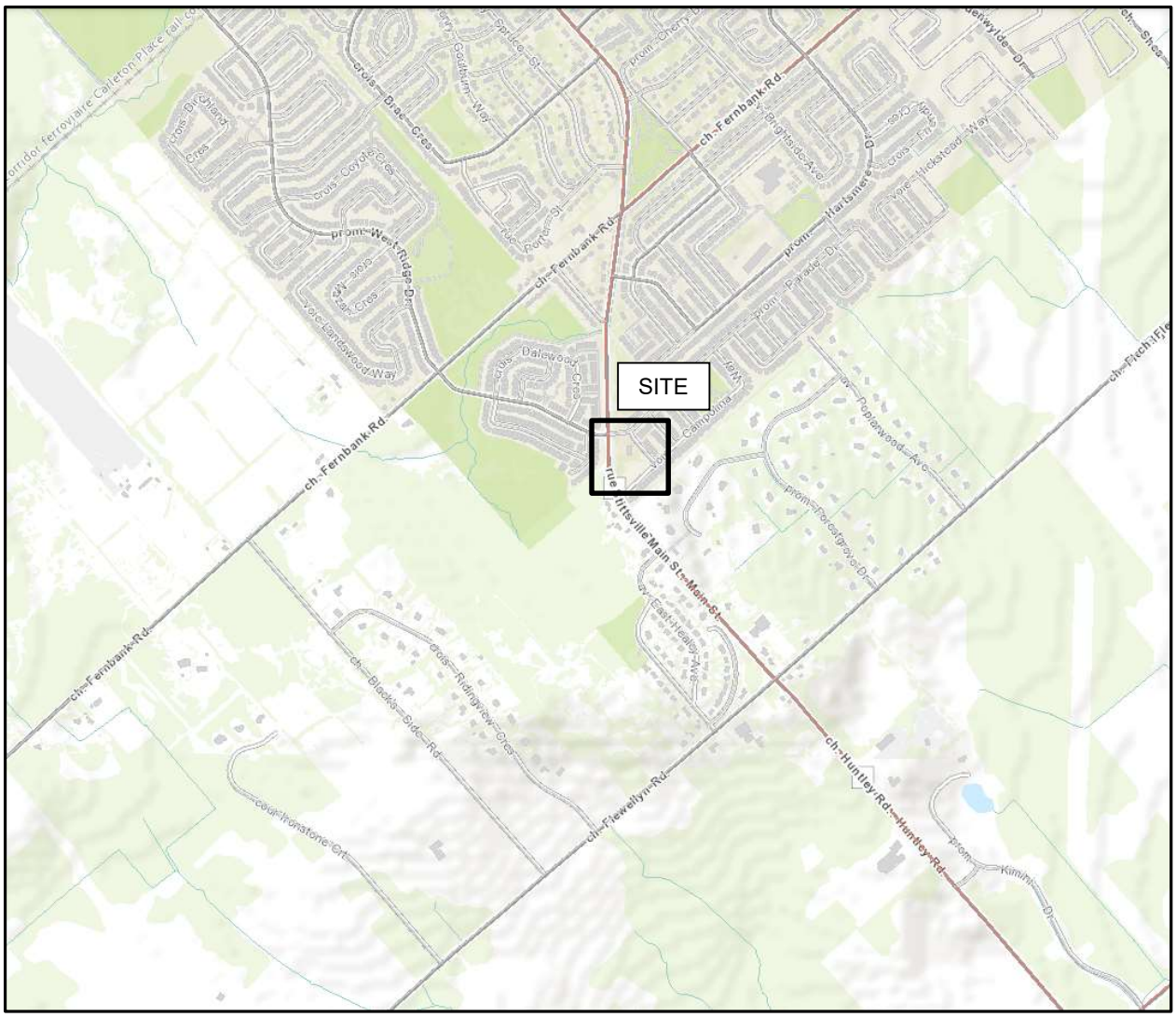
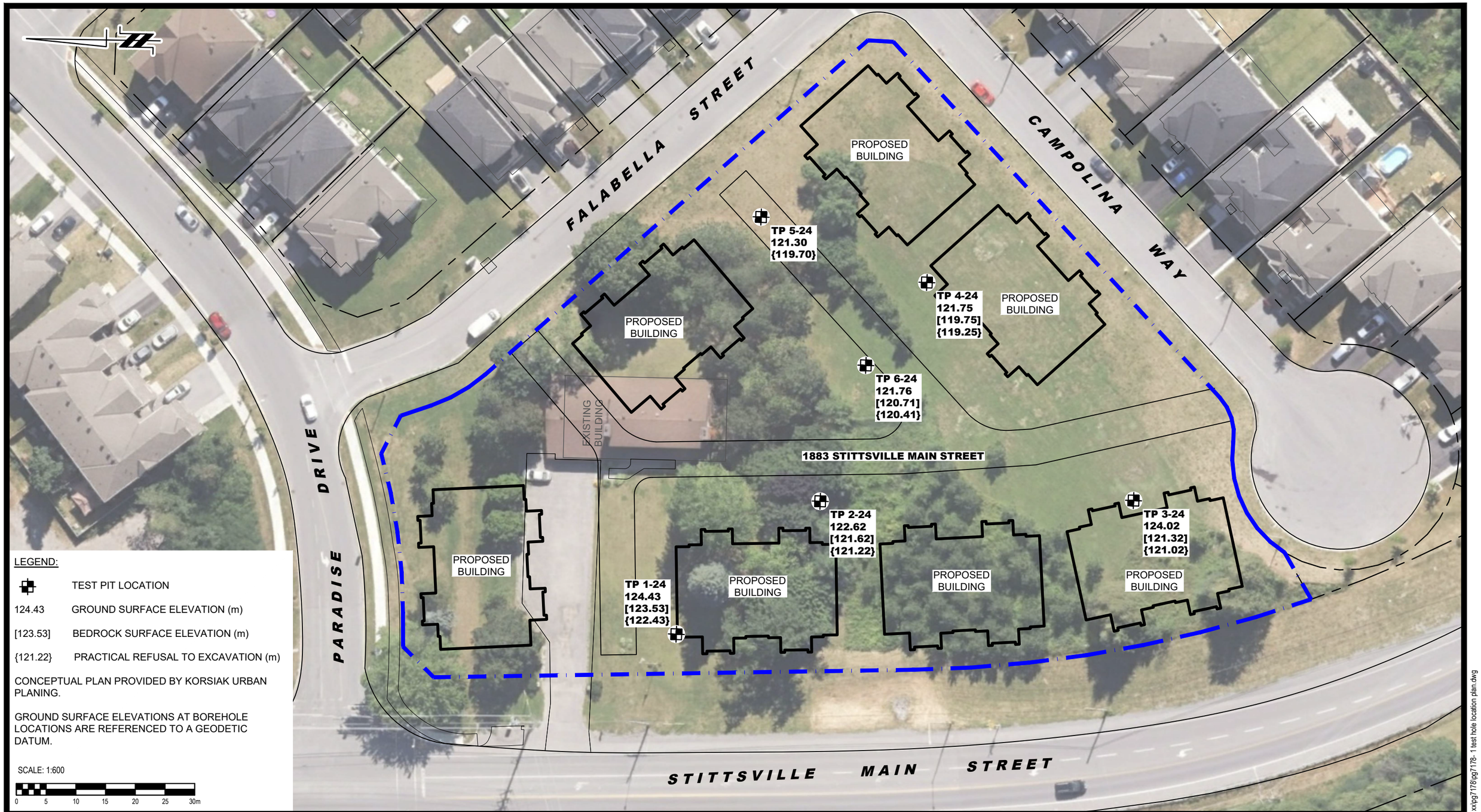


FIGURE 1

KEY PLAN

PATERSON GROUP



LEGEND:

⌖	TEST PIT LOCATION
124.43	GROUND SURFACE ELEVATION (m)
[123.53]	BEDROCK SURFACE ELEVATION (m)
{121.22}	PRACTICAL REFUSAL TO EXCAVATION (m)

CONCEPTUAL PLAN PROVIDED BY KORSIAK URBAN PLANING.

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:600

0 5 10 15 20 25 30m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

MATTAMY HOMES
GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL DEVELOPMENT
1883 STITTSVILLE MAIN STREET
OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:600	Date: 06/2024
Drawn by: GK	Report No.: PG7178-1
Checked by: MA	Dwg. No.: PG7178-1
Approved by: KP	Revision No.:

11x17

p:\autocad drawings\geotechnical\pg7\xx\pg7178\pg7178- 1 test hole location plan.dwg

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL REPORT (No. PG7178-1, DATED JULY 2, 2024), PREPARED BY PATERSON GROUP FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
10. REFER TO STORMWATER MANAGEMENT REPORT(R-2024-123) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

SEWER NOTES:

1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
STORM / SANITARY MANHOLE (1200Ø)	701.010	OPSD
CB, FRAME & COVER	400.020	OPSD
STORM / SANITARY MH FRAME & COVER	401.010	OPSD
SEWER TRENCH - BEDDING (GRANULAR A) COVER (GRANULAR A OR GRANULAR B TYPE I, WITH MAXIMUM PARTICLE SIZE=25mm)		
STORM SEWER	PVC DR 35	
SANITARY SEWER	PVC DR 35	
CATCHBASIN LEAD	PVC DR 35	

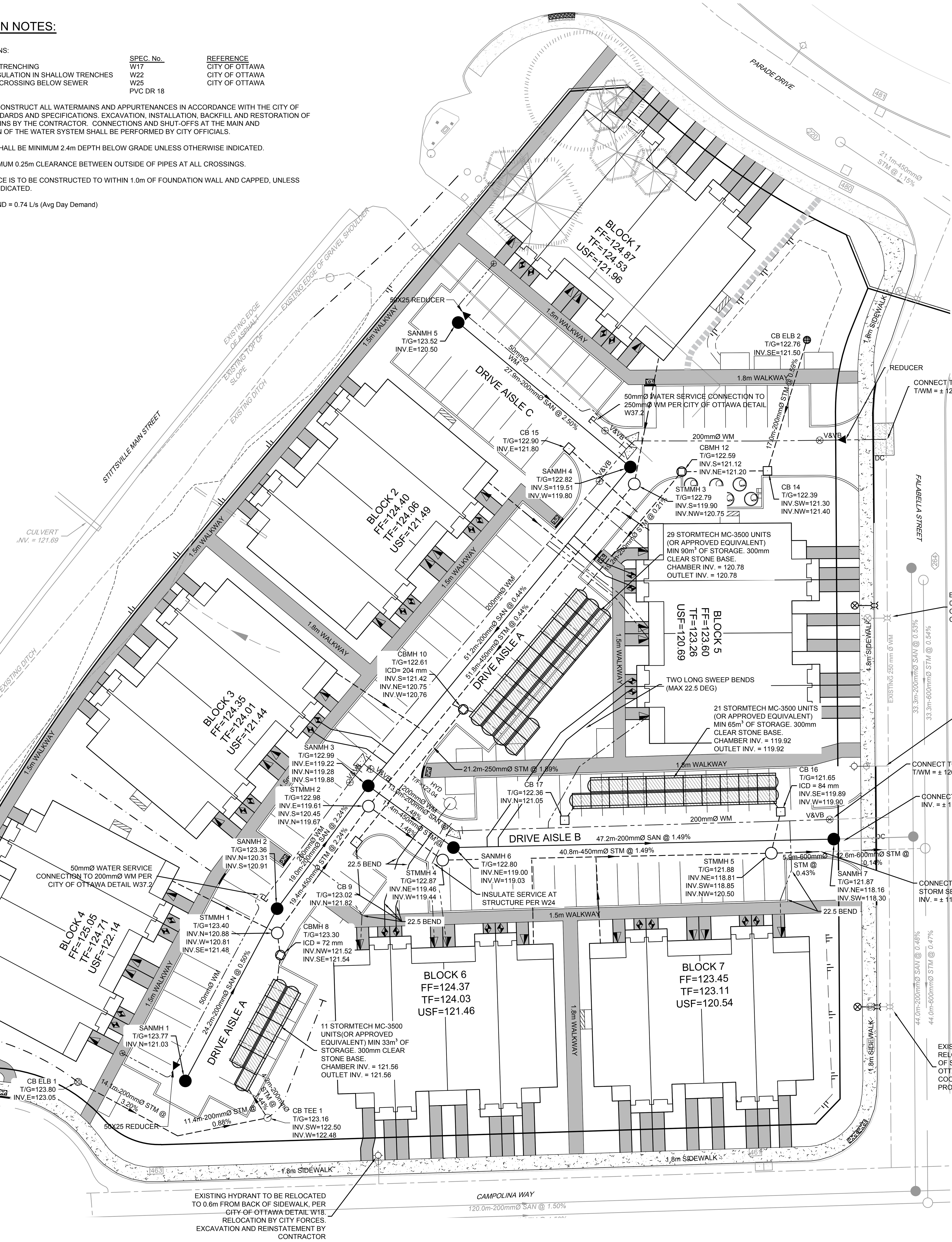
2. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 1.5m COVER WITH 50mmX1200mm HI-40 INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.
3. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0% WITH A MAX OF TWO 22.5 DEG BENDS.
4. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
5. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTING PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). THE CONCRETE CRADLE FOR THE PIPE CAN BE ELIMINATED.
6. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.
7. STORM MANHOLES AND CBMHS ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
8. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES.

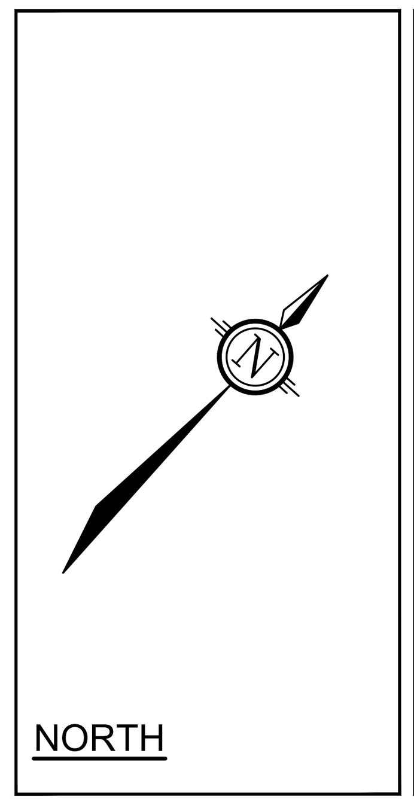
WATERMAIN NOTES:

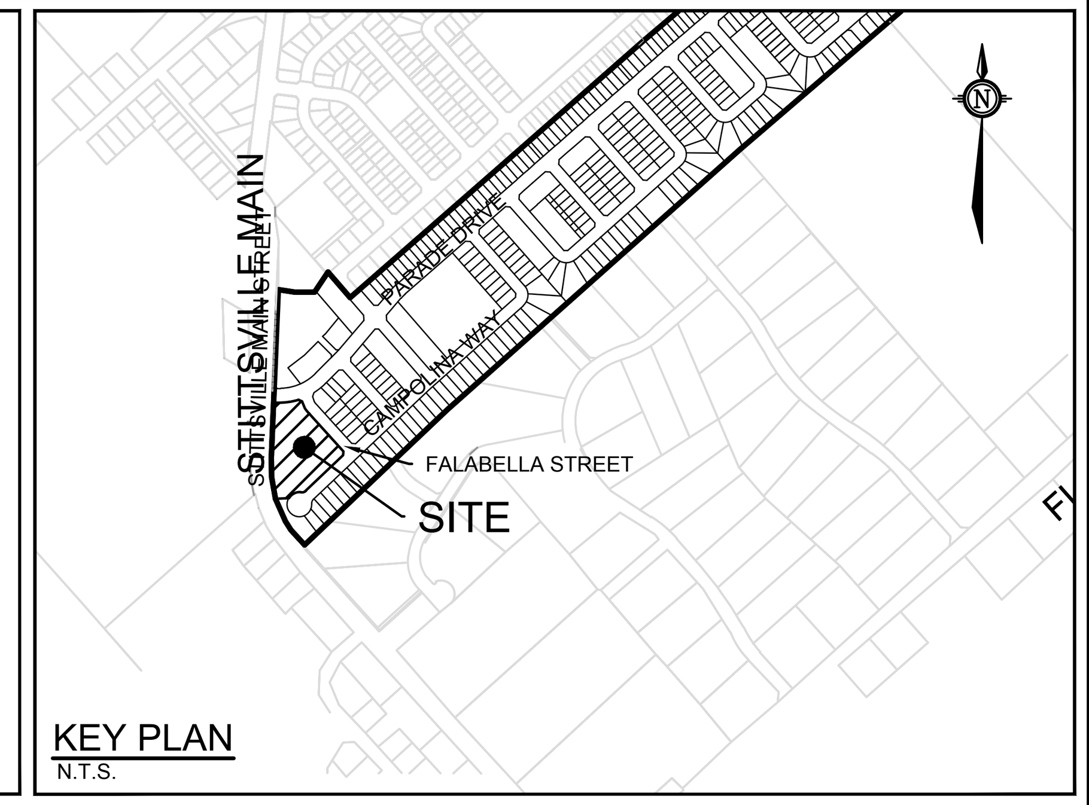
1. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
WATERMAIN TRENCHING	W17	CITY OF OTTAWA
THERMAL INSULATION IN SHALLOW TRENCHES	W22	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN	PVC DR 18	

2. SUPPLY AND CONSTRUCT ALL WATERMAINS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS. EXCAVATION, INSTALLATION, BACKFILL AND RESTORATION OF ALL WATERMAINS BY THE CONTRACTOR. CONNECTIONS AND SHUT-OFFS AT THE MAIN AND CHLORINATION OF THE WATER SYSTEM SHALL BE PERFORMED BY CITY OFFICIALS.
3. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED.
4. PROVIDE MINIMUM 0.25m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS.
5. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.
6. WATER DEMAND = 0.74 L/s (Avg Day Demand)







LEGEND

Symbol	Description
200mmØ WM	PROPOSED WATERMAIN
	PROPOSED VALVE LOCATION
V&VB	VALVE & VALVE BOX
HYD	PROPOSED HYDRANT C/W VALVE & LEAD
T/F=98.45	PROPOSED TOP OF BOTTOM FLANGE
BEND	PROPOSED BEND AND THRUSTBLOCK 11.25°, 22.5°, 45° or TEE
	PROPOSED SANITARY MH & SEWER
	PROPOSED STORM MH & SEWER
CBMH	PROPOSED CATCHBASIN MANHOLE
CB	PROPOSED ROAD CATCHBASIN
CB ELB	PROPOSED LANDSCAPE ELBOW CATCHBASIN
CB TEE	PROPOSED LANDSCAPE TEE CATCHBASIN
	PROPOSED WATER SERVICE (3 x 25mm SERVICES)
	PROPOSED SANITARY SERVICE (1 x 125mm SERVICE)
	EXISTING SANITARY MH & SEWER
	EXISTING STORM MH & SEWER

200mmØ WATERMAIN TABLE (DRIVE AISLE A)

STATION	ELEVATION	TOP OF WATERMAIN	DESCRIPTION
0+000	123.75	121.35	50mmØ X 25mmØ REDUCER
0+023.0	123.32	120.92	200mmØ WATERMAIN CAP
0+023.5	123.30	120.90	50mmØ WATERMAIN CONNECTION
0+042	122.99	120.59	VALVE AND VALVE BOX
0+044.5	122.95	120.55	TEE CONNECTION / 250mmØ WATERMAIN CONNECTION
0+054.60	122.67	120.27	VERTICAL BEND
0+075	122.69	120.29	TOP OF WATERMAIN
0+078.90	122.98	120.58	VERTICAL BEND
0+085.50	122.88	120.48	VALVE AND VALVE BOX
0+090.00	122.80	120.40	TEE CONNECTION
0+100.00	122.72	120.32	TOP OF WATERMAIN
0+105.20	122.53	120.13	VERTICAL BEND
0+112.90	122.56	120.16	VALVE AND VALVE BOX
0+115.10	122.56	120.16	REDUCER
0+121.1	122.42	120.22	CONNECT TO EXISTING 250mmØ WATERMAIN

200mmØ WATERMAIN TABLE (DRIVE AISLE C)

STATION	ELEVATION	TOP OF WATERMAIN	DESCRIPTION
0+000	123.50	121.10	50mmØ X 25mmØ REDUCER
0+020.91	120.90	120.42	200mmØ WATERMAIN CAP
0+021.41	120.90	120.42	50mmØ WATERMAIN CONNECTION
0+023.26	122.92	120.52	VALVE AND VALVE BOX
0+026.70	120.90	120.42	TEE CONNECTION

200mmØ WATERMAIN TABLE (DRIVE AISLE C)

STATION	ELEVATION	TOP OF WATERMAIN	DESCRIPTION
0+000	123.50	121.10	50mmØ X 25mmØ REDUCER
0+020.91	120.90	120.42	200mmØ WATERMAIN CAP
0+021.41	120.90	120.42	50mmØ WATERMAIN CONNECTION
0+023.26	122.92	120.52	VALVE AND VALVE BOX
0+026.70	120.90	120.42	TEE CONNECTION

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

No.	REVISION	DATE	BY
8.	REVISED AND RE-ISSUED FOR REVIEW	JUN 24/25	BHB
7.	ISSUED FOR COORDINATION	MAY 28/25	ARM
6.	RE-ISSUED FOR SITE PLAN APPLICATION	APR 11/25	DJC
5.	REVISED PER CITY COMMENTS	JAN 23/25	ARM
4.	ISSUED FOR COORDINATION	NOV 21/24	ARM
3.	ISSUED WITH SERVICING & SWM REPORT	OCT 22/24	ARM
2.	ISSUED FOR COORDINATION	OCT 9/24	ARM
1.	ISSUED FOR COORDINATION	SEP 11/24	ARM

SCALE 1:300

1:300 — 0 3 6 9 12

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED ARM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
A.R. MCAULEY
100141256
June 24, 2025
PROVINCE OF ONTARIO

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

LOCATION
CITY OF OTTAWA
BLOCK 349

DRAWING NAME
GENERAL PLAN

PROJECT No. 124097
REV REV # 8
DRAWING No. 124097-GP

PLANA1.DWG - 841mmx594mm

M:\2024\124097\CAD\Civil\124097-GP.dwg, GP, Jun 24, 2025 - 4:23pm, breed

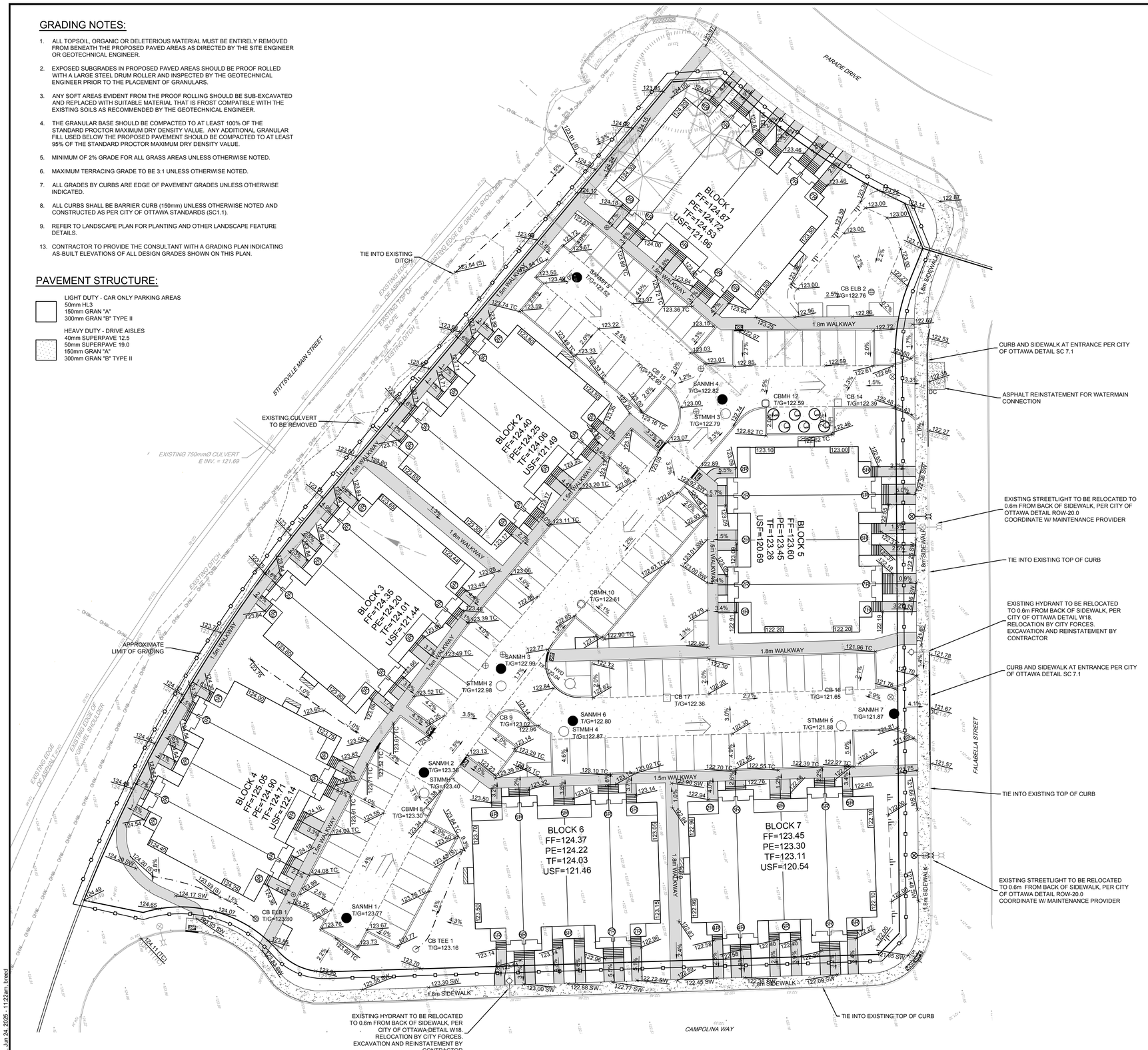
GRADING NOTES:

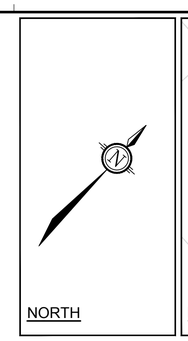
1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
7. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARDS (SC1.1).
9. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

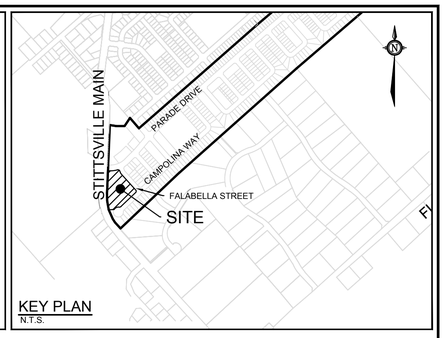
PAVEMENT STRUCTURE:

LIGHT DUTY - CAR ONLY PARKING AREAS
50mm HL3
150mm GRAN "A"
300mm GRAN "B" TYPE II

HEAVY DUTY - DRIVE AISLES
40mm SUPERPAVE 12.5
50mm SUPERPAVE 19.0
150mm GRAN "A"
300mm GRAN "B" TYPE II







LEGEND

- PROPOSED ELEVATION / EXISTING ELEVATION
- PROPOSED SWALE ELEVATION
- PROPOSED TOP OF GRATE ELEVATION
- GRADE AND DIRECTION
- PROPOSED TERRACE ELEVATION
- NUMBER OF RISERS (RAILINGS AS REQUIRED BY OBC)
- FF= FINISHED FLOOR ELEVATION
- PE= PORCH ELEVATION
- TF= TOP OF FOUNDATION ELEVATION
- USF= UNDERSIDE OF FOOTING ELEVATION
- PROPOSED TERRACING
- PROPOSED SWALE
- PROPOSED SANITARY MH
- PROPOSED STORM MH
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED ROAD CATCHBASIN
- PROPOSED LANDSCAPE ELBOW CATCHBASIN
- PROPOSED LANDSCAPE TEE CATCHBASIN
- PROPOSED 1.5m CONCRETE WALKWAY
- PROPOSED 1.8m SIDEWALK
- EXISTING 1.8m SIDEWALK
- PROPOSED EROSION CONTROL SILT FENCE
- MAJOR OVERLAND FLOW ROUTE
- PROPOSED HYDRO NICHE LOCATION

EROSION AND SEDIMENT CONTROL NOTES:

1. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE TOWN OF CARLETON PLACE AND MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS (MOECP), APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL SUCH AS BUT NOT LIMITED TO INSTALLING SILTSACKS ACROSS MANHOLE/CATCHBASIN LIDS TO PREVENT SEDIMENTS FROM ENTERING STRUCTURES AND INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.
2. TO PREVENT SURFACE EROSION FROM ENTERING THE STORM SYSTEM DURING CONSTRUCTION, SILTSACKS WILL BE PLACED UNDER ALL PROPOSED AND SURROUNDING CATCHBASINS AND MANHOLES. THE SILTSACKS WILL REMAIN IN PLACE UNTIL VEGETATION HAS BEEN ESTABLISHED AND CONSTRUCTION COMPLETE.
3. CONTRACTOR IS TO INSTALL LIGHT DUTY SILT FENCE AS PER OPSD 219.110 NEAR EXISTING CULVERTS AROUND SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AS SHOWN ON DRAWING 119221-ESC. CONTRACTOR SHALL MAINTAIN SILT FENCE FOR THE DURATION OF THE CONTRACT.
4. CONTRACTOR IS TO INSTALL STRAW BALES AS PER OPSD 219.180 AS INDICATED AND DIRECTED BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
5. ALL AREAS DISTURBED BY CONSTRUCTION ARE TO BE TREATED WITH IMPORTED TOPSOIL, SEED AND MULCH.
6. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
7. ALL STREETS ARE TO BE SWEPT ONCE ROADWAYS ARE PAVED AND TO CONTINUE FOR THE DURATION OF CONSTRUCTION ACTIVITY. STREETS ARE TO SWEPT REGULARLY AS INDICATED BY THE ENGINEER.
8. THE CONTRACTOR SHALL KEEP MATERIAL FOR ADDITIONAL EROSION AND SEDIMENT CONTROLS ONSITE AT ALL TIMES. THESE MATERIALS INCLUDE BUT ARE NOT LIMITED TO: SILT FENCES, STRAW BALES, SEDIMENT BAGS AND CLEAR STONE. A CONTINGENCY PLAN TO INCLUDE THE PROVISION OF ADDITIONAL LABOUR, EQUIPMENT OR MATERIALS TO INSTALL ADDITIONAL CONTROL MEASURES, AS WELL AS PROVIDE AN EMERGENCY RESPONSE PLAN IN CASE OF AN ACCIDENTAL EVENT. AS SUCH, THE CONTRACTORS SHALL HAVE ADDITIONAL CONTROL MEASURES ON SITE ALL TIMES WHICH ARE EASILY ACCESSIBLE AND MAY BE IMPLEMENTED AT A MOMENT'S NOTICE.
9. MUD MATS ARE TO BE INSTALLED AND MAINTAINED AT CONSTRUCTION ACCESS POINTS TO MINIMIZE SEDIMENT TRANSFER TO EXISTING ROADWAYS (SEE MUD MAT DETAIL).
10. COORDINATE ALL WORK WITH THE OWNER AND CONTRACT ADMINISTRATOR

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

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9.	ISSUED FOR COORDINATION	MAY 28/25	BHB

No.	REVISION	DATE	BY
8.	RE-ISSUED FOR SITE PLAN APPLICATION	APR 11/25	DJC
7.	ISSUED FOR COORDINATION	JAN 23/25	ARM
6.	ISSUED FOR COORDINATION	JAN 7/25	ARM
5.	ISSUED FOR COORDINATION	DEC 3/24	ARM
4.	ISSUED FOR COORDINATION	NOV 21/24	ARM
3.	ISSUED FOR COORDINATION	OCT 22/24	ARM
2.	ISSUED FOR COORDINATION	OCT 9/24	ARM
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SCALE
1:300
1:300
0 3 6 9 12

DESIGN MNP
CHECKED ARM
DRAWN MNP
CHECKED ARM
APPROVED ARM

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER
A.R. MCAULEY
100141256
June 24, 2025
PROVINCE OF ONTARIO

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

LOCATION
CITY OF OTTAWA
BLOCK 349

DRAWING NAME
GRADING PLAN AND EROSION AND SEDIMENT CONTROL PLAN

PROJECT No. 124097
REV REV # 10
DRAWING No. 124097-GR

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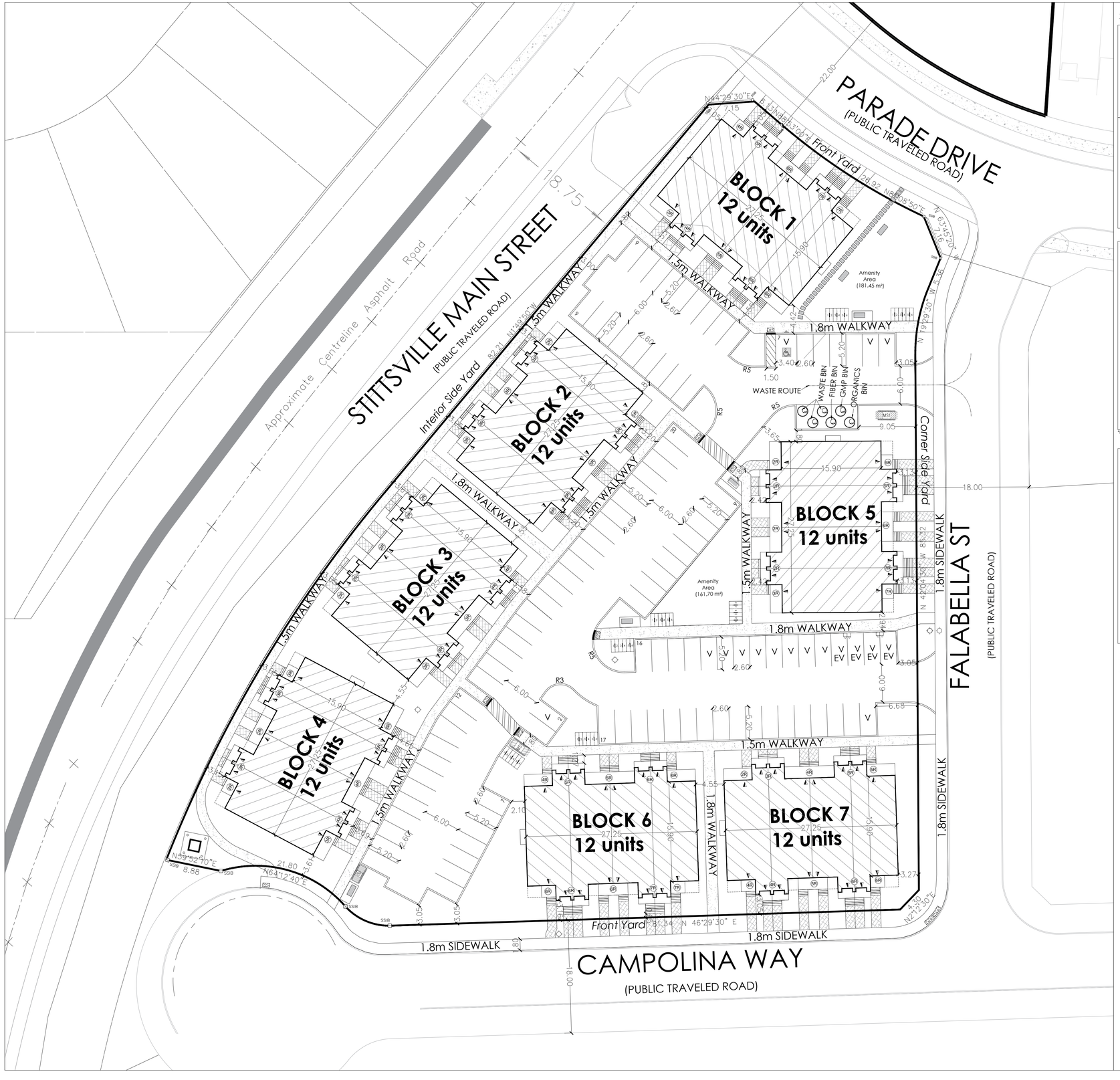


SITE STATISTICS AND DEVELOPMENT DATA

SITE AREA	10,476m² (1.05 ha)
PAVED AREA	2,924.58m² (28%)
LANDSCAPED AREA	3,550.80m² (34%)
TOTAL BUILDING COVERAGE	4,000.84m² (38%)
TOTAL APPROXIMATE GROSS FLOOR AREA	9,751.49m² (0.97 ha)
TOTAL UNITS	84
DENSITY (UPH)	80 UPH
ZONE CATEGORY	R4(Z) (RESIDENTIAL FOURTH DENSITY)

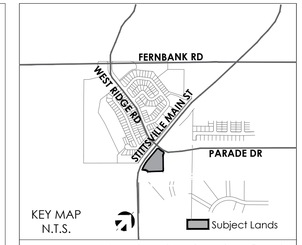
DWELLING BLOCK	DWELLING TYPE	GROSS FLOOR AREA (m2)	UNITS
BLOCK 1	STACKED TOWNHOUSE	1,393.07	12
BLOCK 2	STACKED TOWNHOUSE	1,393.07	12
BLOCK 3	STACKED TOWNHOUSE	1,393.07	12
BLOCK 4	STACKED TOWNHOUSE	1,393.07	12
BLOCK 5	STACKED TOWNHOUSE	1,393.07	12
BLOCK 6	STACKED TOWNHOUSE	1,393.07	12
BLOCK 7	STACKED TOWNHOUSE	1,393.07	12
	TOTAL	**9,751.49m²**	**84**

SECTION	ZONE PROVISION - PLANNED UNIT DEVELOPMENT	REQUIRED	PROPOSED
162A(Table)(2)	MIN. LOT AREA (m²)	1,400m²	10,476m²
162A(Table)(2)	MIN. LOT WIDTH (m)	18m	44.86m
162A(Table)(2)	MIN. FRONT YARD SETBACK (m)	3.0m	3.05m
162A(Table)(2)	MIN. CORNER SIDE YARD SETBACK (m)	3.0m	3.05m
162A(Table)(2)	MIN. INTERIOR SIDE YARD SETBACK (m)*	1.5m	3.05m
162A(Table)(2)	MAX. BUILDING HEIGHT (m)	15m	12.0m (3 storeys)
101 (Table)	RESIDENT PARKING -84 Units @ 1.0 spaces/unit	84	91
102(Table)	VISITOR PARKING -84 Units @ 0.2 spaces/unit	17	17
111A(Table)	MIN. BICYCLE PARKING -84 Units @ 0.5 spaces/unit	42	42
131(Table)(1)	MIN. WIDTH OF PRIVATE WAY/ PARKING AISLE (m)	6.0m	6.0m
131(Table)(2)	MIN. SETBACK FOR ANY WALL OF A RESIDENTIAL USE BUILDING TO A PRIVATE WAY (m)	1.8m	3.4m
131(Table)(4)	MIN. SEPARATION DISTANCE BETWEEN BUILDINGS WITHIN A PLANNED UNIT DEVELOPMENT (m)	1.2m	4.5m
137(Table)	AMENITY AREA:		
	TOTAL MIN. AMENITY AREA (6m² per unit)	504m²	749m²*
	MIN. COMMUNAL AMENITY AREA (min. 50% area)	252m²	345m²

*individual amenity areas are provided on the balconies

SECTION	ADDITIONAL PROVISIONS	REQUIRED	PROPOSED
65(Table)	PERMITTED PROJECTIONS INTO REQUIRED YARDS:		
65(Table)(5)	FIRE ESCAPES, OPEN STAIRWAYS, STOOP (m)	>0.6m to lot line	0.6m
65(Table)(6)	COVERED OR UNCOVERED BALCONY, PORCH, DECK	>1m to lot line	1.7m
106(1)(a)	MIN. PERPENDICULAR PARKING SPACE SIZE (m)	2.6m x 5.2m	2.6m x 5.2m
106(2)	MIN. BARRIER FREE PARKING**		
	TYPE A PARKING SPACE SIZE (m)	3.4m wide	3.4m wide
	TYPE B PARKING SPACE SIZE (m)	2.4m wide	2.4m wide
	ACCESS AISLE (m)	1.5m	1.5m
111B(Table)	MIN. BICYCLE PARKING SPACE DIMENSION, HORIZONTAL (m)	Width: 0.6m Length: 1.8m	Width: 0.6m Length: 1.8m
111(9)	MIN. BICYCLE PARKING SPACE ACCESS AISLE WIDTH (m)	1.5m	1.5m
109(3)(b)	MAX. WALKWAY WIDTH PERMITTED IN YARD (m)	1.8m	1.8m
110(1)	MIN. % OF PARKING LOT LANDSCAPED	15%	25%
110(Table)(IV)	LANDSCAPED AREA SURROUNDING PARKING LOT ABUTTING A STREET (m)	3.0m	3.05m
110(3)	REFUSE COLLECTION AREAS:		
110(3)(b)	MIN. WASTE COLLECTION SETBACK FROM A LOT LINE ABUTTING A PUBLIC STREET (m)	9.0m	9.05m
110(3)(c)	OPAQUE SCREEN MIN. HEIGHT (m)	2.0m***	See Note***

**Per the 2014 Guide to the Integrated Accessibility Standards Regulation - Design of Public Spaces Standard, 4% of parking spaces provided for public use must be accessible. 1 of the provided 17 visitor spaces have been designed to be barrier-free, Type A.
***Section 110(3)(d) where an in-ground refuse container is provide, the screening requirement of Section (3)(c) above may be achieved with soft landscaping (Bylaw 2020-299)



SCALE 1:300 0 3 6 9 12 15 18

LEGEND

- STACKED TOWNS
- CROSSWALK
- WALKWAY TO ENTRY (PAVERS)
- CONCRETE
- TWSI (TACTILE WALKING SURFACE INDICATOR)
- CURB (0.2m)
- DEPRESSED CURB
- MOUNTABLE CURB
- BALCONY
- PORCH
- L/A LANDSCAPED AREA
- EV CHARGER
- ENTRANCE
- V VISITOR PARKING
- BARRIER FREE SIGNAGE
- BARRIER FREE PARKING
- MOLOK BIN
- ORGANICS CARTS
- PAD MOUNT TRANSFORMER
- HYDRO CABINET
- MINI SUBS (HYDRO)
- EV CHARGERS
- HYDRANT
- SECONDARY PEDESTRIAN ACCESS
- BENCH

DATE (D.M.Y)	REVISION	BY
27/06/25	Site Plan Revisions	AS
21/03/25	Site Plan Revisions	CR
25/02/25	Site Plan Revisions	WS
01/09/25	Site Plan Revisions	WS
11/09/24	Draft site plan	JH
21/08/24	Draft site plan	WS

GENERAL NOTES

1. DO NOT SCALE DRAWINGS FOR PRINT.
2. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF KORSIAK URBAN PLANNING. COPYRIGHT RESERVED.
3. WALKWAYS AND CURBS TO BE TIED INTO PUBLIC ROW WHERE APPLICABLE.
4. REFERENCES CITY OF OTTAWA T.W.S.I. DETAIL SC7.3
5. SURVEY BOUNDARY BY J.D. BARNES LIMITED.
   2430 DON REID DRIVE, SUITE 204, OTTAWA, ON
   TEL: (613) 731-7244 FAX: (613) 731-8955
6. SNOW WILL BE REMOVED FROM THE SITE IMMEDIATELY.

PROJECT TEAM

SITE PLAN DESIGN:
39A-277 LAKESHORE ROAD EAST
OAKVILLE, ON L6J 1HP

LANDSCAPE ARCHITECTURE:
240 MICHAEL COWPLAND DRIVE, SUITE 101,
KANATA, ON K2M 1P6

PLANNING:
240 MICHAEL COWPLAND DRIVE, SUITE 101,
KANATA, ON K2M 1P6

ARCHITECTURE:
NAK DESIGN STRATEGIES
438 KING STREET WEST,
3RD FLOOR, TORONTO,
ON M5V 1M4

TRANSPORTATION:
240 MICHAEL COWPLAND DRIVE, SUITE 101,
KANATA, ON K2M 1P6

CIVIL ENGINEER:
240 MICHAEL COWPLAND DRIVE, SUITE 101,
KANATA, ON K2M 1P6

ELECTRICAL:
NEXT ENGINEERING
3680 CANOTEK ROAD, OTTAWA, ON
K1J 9G2

mattamyHOMES
50 Hines Road, Suite 100, Ottawa, ON Canada K2K 2M5

BLOCK 349 STITTSVILLE OTTAWA

GEOGRAPHIC TOWNSHIP OF GOULBOURN
CITY OF OTTAWA

TITLE: BLOCK 349 SITE PLAN

DATE: March 21, 2025 | DRAWN BY: JH | CHECKED BY: CR | DRAWING NO. A

FILE NO.: D07-12-24-0142

JOB NO.:

S:\Korsiak & Company\MATTAMY\Investigation\Ottawa\Stittsville\Site Plan\2025-06\Stittsville Investigation - Site Plan - Jun-27-25 - a & d.dwg