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Palladium II

2765 Palladium Drive

Servicing and Stormwater Management Report

Prepared for: Broadstreet Properties Inc.

Engineering excellence.

Planning progress.

Liveable landscapes.

Palladium II
2765 Palladium Drive
City of Ottawa
Servicing and Stormwater Management Report

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
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June /10/ 2026

Novatech File: 125091
Ref: R-2026-024

June 10, 2026

City of Ottawa
Planning, Real Estate and Economic Development Department
Planning and Infrastructure Approvals Branch
110 Laurier Avenue West, 4th Floor
Ottawa ON, K1P 1J1

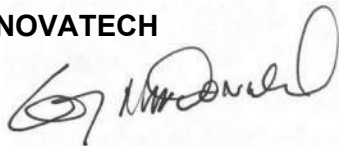
Attention: Colette Gorni, MCIP RPP, Planner II, Development Review West

**Reference: Palladium II – 2765 Palladium Drive
Servicing and Stormwater Management Report
Our File No.: 125091**

Please find enclosed the 'Servicing and Stormwater Management Report' for the above-noted development located in the City of Ottawa. This report is being submitted in support of the site plan application for the proposed development. Should you have any questions or require additional information, please contact the undersigned.

Yours truly,

NOVATECH



Greg MacDonald, P. Eng.
Director, Land Development and Public Sector Infrastructure

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1.0 INTRODUCTION

Novatech has been retained to prepare a Servicing and Stormwater Management Report for the proposed site plan located at 2765 Palladium Drive within the City of Ottawa. The proposed site is denoted as Part 3 of Block 242 and is presently named Palladium II. The purpose of this report is to support the site plan application for the subject development. **Figure 1 Key Plan** shows the site location.

1.1 Existing Conditions

The subject site is approximately 1.59 hectares (ha.) in size and is denoted as a part of Block 242, and a portion of Block 243 of the Subdivision located at 195 Huntmar Drive. It should be noted that the proposed development is only a portion Block 242 which had a total area of 2.27ha. The remainder of Block 242 is being developed as Palladium Phase I "670 Derreen Avenue" under City File Number D07-12-24-0140. The site is vacant and was cleared grubbed and pre-graded as part of the overall subdivision works. Historically, the south-west portion of Block 242 was an agricultural land site, while the remainder of the block consisted of unused land with predominant tree cover. A copy of the legal plan is included in **Appendix A** for reference.

The site is bound by Palladium Drive to the north-east, Derreen Avenue to the south-east, the proposed Palladium Phase I to the south-west, and a future commercial block to the north-west. The site is relatively flat and primarily drains from the north-east to the south-west with a +/- 1.0m grade differential across the site. **Figure 2** shows the existing site conditions.

The 195 Huntmar subdivision was designed by David Schafer Engineering Ltd. (DSEL) and design information is provided in the following report:

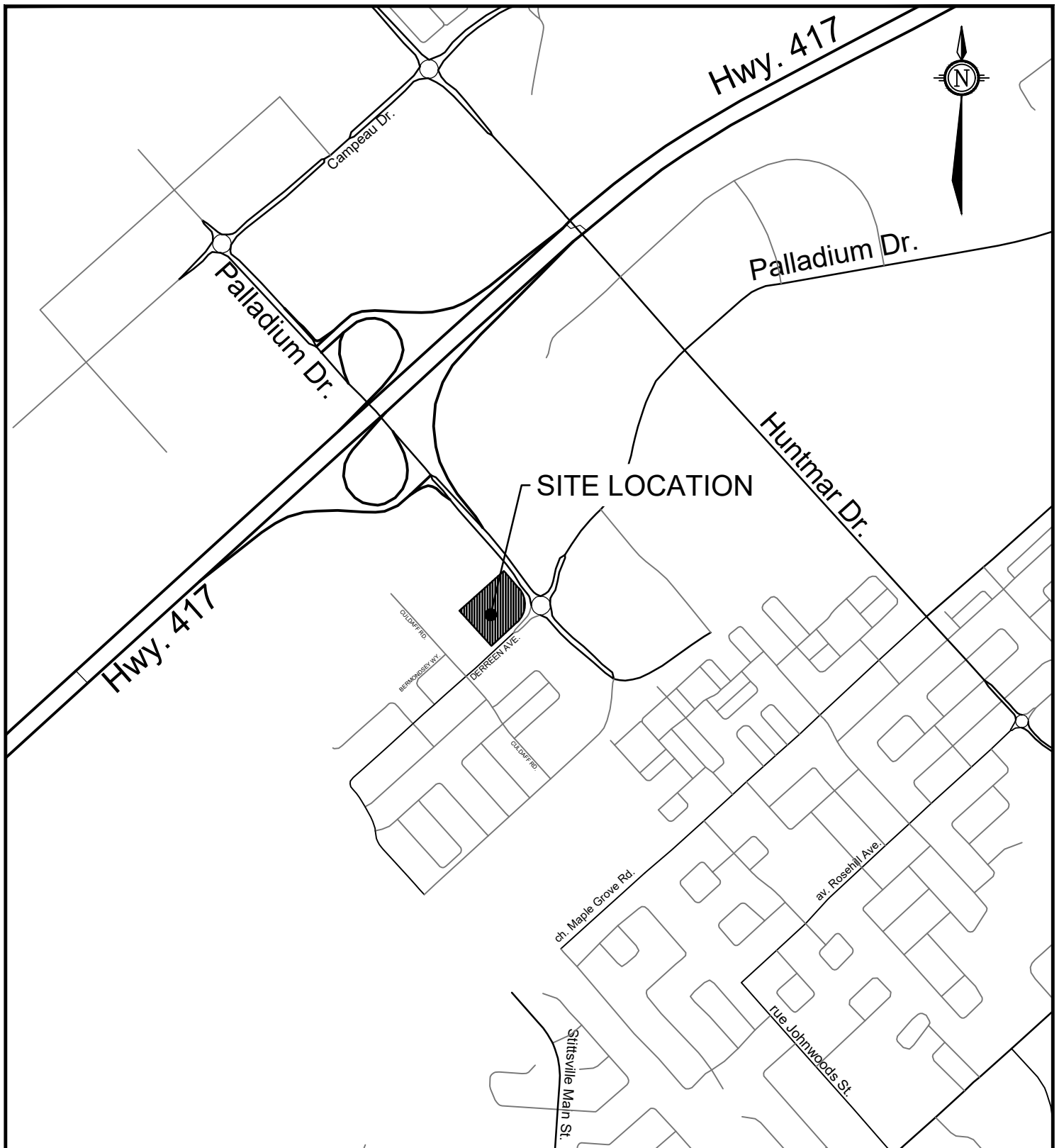
- 'Design Brief for 2325483 Ontario Ltd., 195 Huntmar Drive, City of Ottawa, Project No.: 12-624, prepared By DSEL dated July 2020, 2nd submission (Referenced as **DSEL Report**).

Additionally, the subdivision stormwater modelling was preformed by J.F. Sabourin and Associates Inc (JFSA), and design information is provided in the following report:

- 'Stormwater Management Report for the 195 Huntmar Drive Subdivision to Pond 7, City of Ottawa, Project No.: 12-624, prepared By JFSA dated July 2020, 2nd submission (Referenced as **JSFA Report**).

1.2 Proposed Development

It is proposed to develop the site with three (3) six (6) storey apartment buildings (denoted as Buildings A, B, and C) complete with a central above-ground parking area. The buildings will have one (1) level of underground parking beneath the proposed building footprints. The site will provide a total of 304 residential units. Vehicular and pedestrian access to the site will be provided from Palladium Phase I access off Derreen Avenue. **Figure 3** shows the site plan for the proposed development. Correspondence from the City pre-consultation meeting is also included in **Appendix A** for reference.



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CITY OF OTTAWA
2765 PALLADIUM DRIVE

KEY PLAN

SCALE

N.T.S

DATE

MAR 2026

JOB

125091

FIGURE

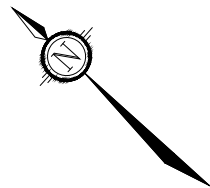
FIGURE 1

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LEGEND

— — — — — PROPOSED DEVELOPMENT BOUNDARY



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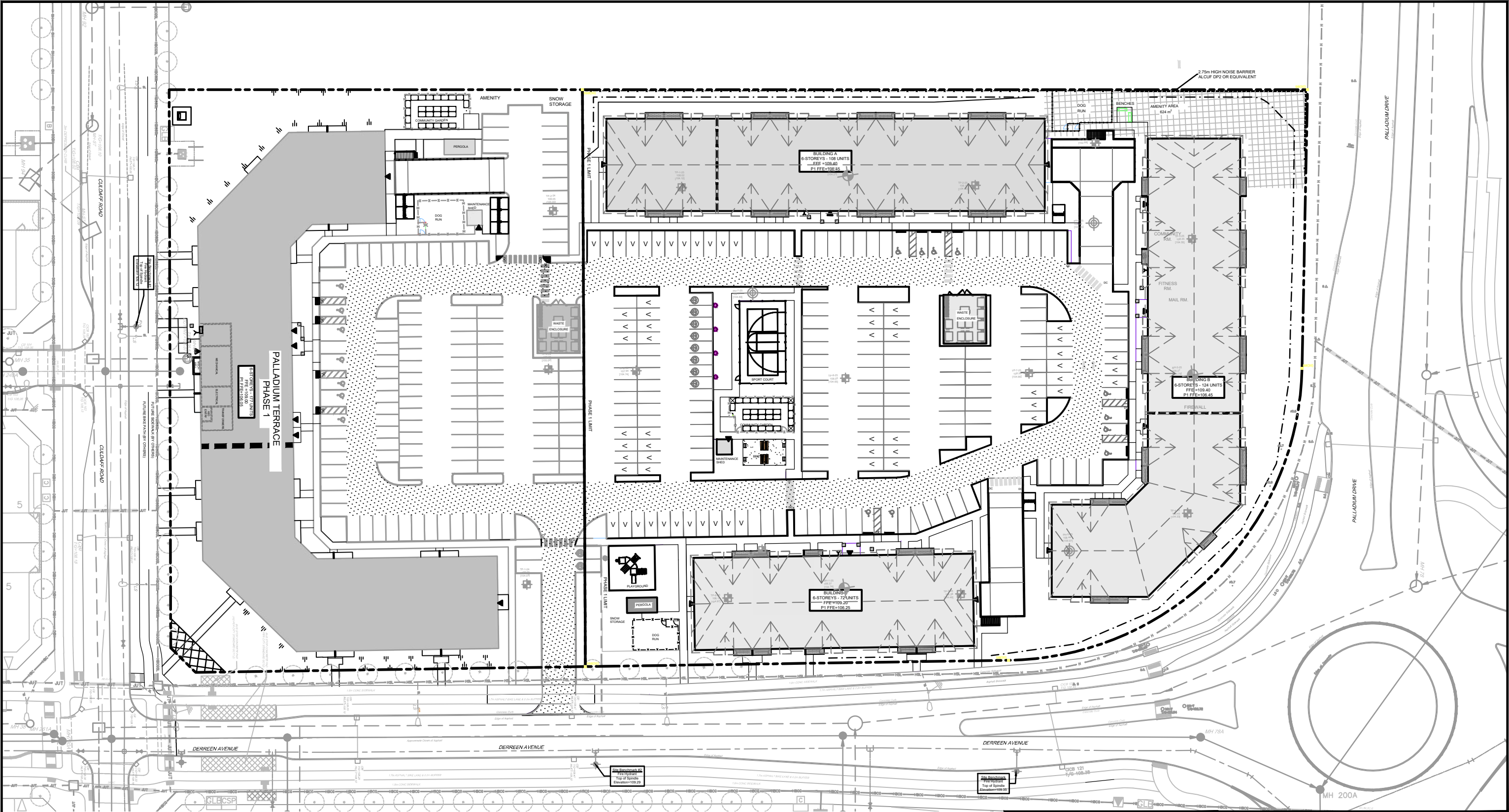
CITY OF OTTAWA
2765 PALLADIUM DRIVE

EXISTING CONDITIONS

SCALE 1 : 1000

DATE MAR 2026	JOB 125091	FIGURE FIGURE 2
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LEGEND

----- PROPOSED DEVELOPMENT BOUNDARY



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CITY OF OTTAWA
2765 PALLADIUM DRIVE

PROPOSED SITE PLAN

SCALE 1 : 750

DATE JUNE 2026 JOB 125091 FIGURE FIGURE 3

2.0 GEOTECHNICAL INVESTIGATION

A geotechnical investigation was completed for the proposed development, and a report prepared entitled 'Geotechnical Investigation', Proposed Residential Development, 2765 Palladium Drive, Ottawa, Ontario, prepared by Paterson Group Inc. dated June 30, 2025 (PG7573-1). The following is a summary of the findings of the reports:

- Practical refusal to augering and excavation was encountered at each test hole at depths ranging from 1.5 to 4.1 m below ground surface.
- Three groundwater monitoring wells were installed in Boreholes (BH1-25, BH2-25, and BH3-25); no groundwater was observed in the monitoring wells. It should also be noted that groundwater levels are subject to seasonal fluctuations. Therefore, the groundwater levels could vary at the time of construction.
- Excavation side slopes above the groundwater level extending to a maximum vertical height of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsurface soil is considered to be mainly a Type 2 and Type 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.
- In sound bedrock, almost vertical side slopes can be constructed, provided all weathered and loose rock is removed or stabilized with rock anchors or other means determined by Paterson at the time of construction.
- Perimeter footings of heated structures are required to be insulated against frost, a minimum of 1.5m thick soil cover (or insulated equivalent) should be provided.
- Exterior unheated footing should be provided with a minimum 2.1m thick soil cover (or insulated equivalent).
- 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.

3.0 WATER SERVICING

The proposed site is located within the City of Ottawa Pressure Zone 3W. Existing municipal watermain lines are located within the Derreen Avenue right-of-way fronting the proposed site, which were constructed as part of the 195 Huntmar Subdivision. A 300 mm diameter PVC watermain currently exists within the Derreen Avenue right-of-way and will serve as the connection point for the proposed development.

3.1 Watermain Design Parameters

Water Demands have been calculated using criteria from Section 4 of the City of Ottawa Water Distribution Guidelines as follows:

Table 3.1: Watermain Design Parameters and Criteria

Domestic Demand Design Parameters	Design Parameters
Unit Population: 1-Bed Apartments	1.4 people/unit
2-bed Apartments	2.1 people/unit
3 Bed Apartments	3.1 people/unit
Average Day Demand	280 L/c/d
Maximum Day Demand (MXDY)	Residential: 2.5 x Basic Day (> 500 Persons) MOE Table 3-3 (<500 Persons)
Peak Hour Demand (PKHR)	Residential: 2.2 x Max Day (> 500 Persons) MOE Table 3-3 (<500 Persons)
Fire Demand (FF) Design	Design Flows
Apartment Building	per FUS 2020
Hydrant spacing	Within 45m of the building Siamese
System Pressure Criteria Design Parameters	Criteria
Maximum Pressure (BSDY) Condition	<u>< 80 psi occupied areas</u>
Minimum Pressure (PKHR) Condition	> 40 psi
Minimum Pressure (MXDY+FF) Condition	> 20 psi

3.2 Fire Demand

The required fire demand was calculated using the Fire Underwriters Survey 2020 (FUS) Guidelines and City of Ottawa ITSB-2014-02. Through correspondence with the Architect, it is understood that the proposed buildings are residential occupancy (Limited Combustible) and are composed of wood frame construction. The building will have an adequately designed fire system as per NFPA 13, complete with a standard water supply, a fully supervised system and 100% sprinkler coverage. Due to the size and combustible nature of the proposed building A and B a firewall is provided to split the building to lower the required fire demand to achievable levels. Correspondence with the Architect is included in **Appendix B** for reference.

3.3 Water Demand

The water demand and fire flow calculations are provided in **Appendix B** for reference. A summary of the water demand and required fire flow is provided in **Table 3.2**.

Table 3.2: Domestic Water Demand Summary

Building	Population	Ave. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	Fire Flow (L/s)
A	221.30	0.72	1.79	3.94	283
B	265.20	0.86	2.15	4.73	250
C	145.70	0.47	1.18	2.60	200
Total	632.2	2.05	5.12	11.27	

The proposed development demand exceeds 50 residential units and thus, will need to be serviced with two (2) services separated by an isolation valve. The proposed development will be serviced by an on-site private watermain that will connect to the municipal watermain within the Derreen Avenue right-of-way at two (2) locations to provide redundancy.

Additionally, the required site fire flow will be provided by three (3) proposed on-site private fire hydrants. All proposed hydrants within proximity of the development are Class AA rating (blue top). As per Appendix I of the Ottawa Water Design Guidelines the fire flow allowance from the existing hydrants was assumed to be as outlined in **Table 3.3**.

Table 3.3: Maximum Flow to be Considered from a Given Hydrant.

Hydrant Class	Distance to building (m)	Contribution to Fire Flow	
		(L/min)	(L/s)
AA	≤75	5700	95
	>75 and ≥150	3800	63.33
A	≤75	3800	63.33
	>75 and ≥150	2850	47.50
B	≤75	1900	31.67
	>75 and ≥150	1500	25.00
C	≤75	800	13.33
	>75 and ≥150	800	13.33

3.4 Water Boundary Conditions

The above water demand information was submitted to the City for boundary conditions from the City's water model. These boundary conditions were used for analyzing the performance of the proposed and existing watermain systems for three theoretical conditions:

- 1) High Pressure check under Average Day conditions
- 2) Peak Hour demand
- 3) Maximum Day + Fire Flow demand.

Refer to **Table 3.4** for a summary of the proposed boundary conditions and hydraulic analysis.

Table 3.4: Water Boundary Conditions

Criteria	Head (m)	Pressure ¹ (psi)	Pressure Requirements (psi)
Connection 1 - Derreen Ave West			
Max HGL (Average Day)	160.6	72.80	< 80psi
Min HGL (Peak Hour)	155.4	65.41	> 40psi
Max Day + Fire Flow	145.8	51.76	> 20psi
Connection 2 - Derreen Ave East			
Max HGL (Average Day)	160.6	72.80	< 80psi
Min HGL (Peak Hour)	155.4	65.41	> 40psi
Max Day + Fire Flow	146.9	53.32	> 20psi

¹Pressure based on an elevation of 109.40m

3.5 System pressure Modeling and Results

The above boundary conditions were used to create a hydraulic model using EPANET for analyzing the performance of the proposed watermain system for three theoretical conditions: 1) High Pressure check under Average Day conditions, 2) Peak Hour Demand, 3) Maximum Day + Fire Flow Demand. The following **Table 3.5** provides a summary of the results from the hydraulic water model.

Table 3.5: Water Boundary Conditions and Hydraulic Analysis Summary

Condition	Demand (L/s)	Min/Max Allowable Operating Pressures (psi)	Limits of Design Operating Pressures (psi)
High Pressure (Average Day)	2.03 L/s	80psi (Max)	74 psi
Maximum Daily Demand and Fire Flow	288.41 L/s	20psi (Min)	33 psi
Peak Hour	11.18 L/s	40psi (Min)	66 psi

Based on the preceding analysis the existing watermain system will provide adequate system pressures and flows to service the proposed development. If required booster pumps will be utilized by the internal mechanical system to ensure adequate pressures to the upper floors. Refer to **Appendix B** for detailed model results.

4.0 SANITARY SERVICING

There is an existing 450mm diameter sanitary sewer within the Derreen Avenue right-of-way fronting the proposed site, constructed as part of the 195 Huntmar Subdivision. It is proposed to service the development with a private 200 mm sanitary sewer that will connect to the existing 450 mm sanitary sewer within the Derreen Avenue right-of-way.

4.1 Sanitary Design Parameters

Sanitary flows for the proposed development were calculated using criteria from Section 4 of the City of Ottawa Sewer Design Guidelines, and the Ontario Building Code as follows:

Table 4.1: Sanitary Sewer Design Parameters

Design Component	Design Parameter
Unit Population:	
1-Bed Apartments	1.4 people/unit
2-bed Apartments	2.1 people/unit
3 Bed Apartments	3.1 people/unit
Residential Flow Rate	Design = 280 L/cap/day
Residential Peaking Factor	Harmon Equation (min=2.0, max=4.0) Harmon Correction Factor = 0.8m (Design)
Extraneous Flow Rate	Design = 0.33 L/s/ha
Minimum Pipe Size	200mm (Res)
Minimum Velocity ¹	0.6 m/s
Maximum Velocity	3.0 m/s
Minimum Pipe Cover	2.0 m (Unless frost protection provided)

¹A minimum gradient of 0.65% is required for any initial sewer run with less than 10 residential connections.

4.2 Proposed Development Flows

The proposed development will have a combination of one (1) bed, two (2) bed and three (3) bed apartments for a total of 304 units and a population of 627 persons. The proposed residential flow for the site was determined to be **6.78 L/s**. The extraneous flows for the **1.59 ha** development was calculated to be **0.53 L/s**. Thus, the peak sanitary flow including infiltration for the development is **7.31 L/s**. Detailed sanitary flow calculations are provided in **Appendix C** for reference.

4.3 Anticipated Block 242 Flows

The detailed design of the 195 Huntmar subdivision was completed by DSEL with details provided within the **DSEL Report**. The subdivision design assumed that Block 242 and 243 were to be commercial developments with an anticipated flow rate of commercial demand of **28000 L/ha/day**, with a peaking factor of 1.5 and an extraneous flow of **0.33 L/s/ha**, with an anticipated discharge to the Culdaff sanitary sewer.

Therefore, the flow allotment for the Phase 1 (**0.97 ha**) development was **0.32 L/s** (commercial) and **0.32 l/s** extraneous for a total anticipated flow of **0.78 L/s**.

The remaining **1.59 ha** of Block 242, which is current development, will instead be directed downstream to the existing 450 mm diameter sanitary sewer within the Derreen Avenue right-of-way. The anticipated flow from this portion of the block was previously estimated at **1.30 L/s** during Phase 1 design; however, updated calculations indicate a flow of **7.31 L/s**.

4.4 Downstream Capacity

The capacity of the downstream system was reviewed to ensure that there is adequate capacity within the downstream sewers for the proposed development. The proposed development will result in an increase of **6.01 L/s**.

The pipe run (75A-77A) was previously calculated to be at **81.2%** capacity with a flow of **120.83 L/s** including the Phase 1 sanitary flow. Accounting for the new proposed flows directed to the Derreen Avenue sanitary sewer, the revised design flow to the pipe run downstream of the proposed sanitary manhole is approximately **126.16 L/s** corresponding to a capacity utilization of approximately **84.8%**.

Further downstream the pipes within Derreen Avenue ultimately connect to sanitary sewers within Huntmar Drive. A review of all pipes up to the Huntmar Drive connection was performed and the highest pipe capacity utilization was **88.1%**. Detailed sanitary flow calculations are provided in **Appendix C** for reference.

Based on the above analysis, the downstream sewer system has capacity to convey the flows for the proposed development.

5.0 STORM SERVICING

There is a 1050 mm diameter storm sewer located within the Derreen Avenue right-of-way fronting the proposed development. There is also a 450 mm diameter storm sewer within Palladium Drive.

As part of the neighboring development a 900 mm diameter service stub was provided from the Culdaff Road sewer to service Block 242. Due to the configuration of the proposed site, it is proposed to service the site with storm sewer connections from the existing sewers in Derreen Avenue. It is also proposed to provide storage during storm events utilizing StormTech chambers under the parking area. Refer to the General Plan of Services drawing (125091-GP) for more details.

The design criteria used in sizing the storm sewers are summarized below in **Table 5.1**.

Table 5.1: Storm Sewer Design Parameters

Parameter	Design Criteria
Local Roads	2 Year Return Period
Storm Sewer Design	Rational Method
IDF Rainfall Data	Ottawa Sewer Design Guidelines
Initial Time of Concentration (Tc)	10 min
Minimum Velocity	0.8 m/s
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

Refer to **Appendix D** for detailed storm drainage area plans and storm sewer design sheets.

5.1 Downstream System

As noted within the Comments to the Committee of Adjustment document that was prepared regarding the severance of Block 242, Plan 4M-1687, dated June 1, 2023:

“The existing plans show drainage from Part 3 (2765 Palladium Drive) towards Parts 1 and 2 (425 Culdaff Road). At the time of Site Plan and/or Building Permit, the applicant will be required to regrade Part 3 (2765 Palladium Drive) or provide adequate on-site storm structures to contain drainage within 2765 Palladium Drive and discharge overland flow towards the City’s right-of-way. Separate water and sewer connections to the municipal services along Derreen Avenue will also be required.”

The original subdivision design anticipated that the entirety of Block 242 would be directed to the provided storm sewer stub on Culdaff Road. Since the initial design, Block 242 has been severed into two (2) separate parcels: Phase 1 of the development at 425 Culdaff Road (0.97 ha), and the subject site located to the northwest (1.59 ha).

For the Phase 1 development at 425 Culdaff Road, stormwater runoff from approximately **0.62 ha** of the site will be conveyed to the storm sewer within Derreen Avenue, while runoff from the remaining **0.35 ha** will be conveyed to the Culdaff Road storm sewer. Stormwater runoff from the subject site (**1.59 ha**) will be directed to the storm sewer within Derreen Avenue.

The capacity of the existing system downstream of the proposed connections up to the existing SWM pond was reviewed to assess the impacts. The existing pipe runs (STMMH 81-83 and STMMH 83-84) adjacent to the site were previously utilizing **58%** and **60%** of the available pipe capacity. With the revised design, the pipes will flow at **83.7%** and **79.7%** capacity. The increase in utilization is still below the pipe capacity, and the system will continue to function as designed.

Please refer to **Appendix D** for report excerpts and storm sewer design sheets.

6.0 STORM DRAINAGE AND STORMWATER MANAGEMENT

The stormwater management strategy for the site is based on the established criteria from the City of Ottawa, the **DSEL Report** and the **JFSA Report**.

6.1 Design Criteria

The following stormwater management criteria for the proposed development were prepared in accordance with the City of Ottawa Sewer Design Guidelines (December 2025), Technical Bulletins, correspondence with the City of Ottawa, the **DSEL Report**, the **JFSA Report** and our knowledge of development requirements in the area.

Minor System (Storm Sewers)

- Control proposed development flows, up to and including the 100-year storm event, to an allowable release rate based on a 2-year storm with a $C=0.8$.
- Runoff from a 5mm rainfall shall be retained on site to meet retention requirements per the City of Ottawa's Feedmill Creek SWM Criteria Study.

Major System

- Provide on-site storage for storm runoff which exceeds the allowable minor system release rate from the site up to and including the 100-year design event;
- Ponding depths are not to exceed 0.35 m (static + dynamic) and are not to be within 0.30 m (vertical) to the nearest building opening;
- No surface ponding for storms up to and including the 2-year event.

Quality Control

- The downstream Pond 7 is designed to provide 80% TSS from the minor system. Additional stormwater quality treatment is not required.
- Provide guidelines to ensure that site preparation and construction is in accordance with the current Best Management Practices for Erosion and Sediment Control.

6.2 Allowable Release Rate

Based on the design parameters, the allowable release rate for the **1.59 ha** site is **272.2 L/s**. The design approach for stormwater quantity control is to calculate the flows from the uncontrolled areas and provide sufficient on-site storage in the controlled areas to attenuate the total post-development runoff (controlled and uncontrolled) to the allowable release rate prior to being discharged into the storm sewers within Derreen Avenue.

6.3 Stormwater Management Modeling

The City of Ottawa Sewer Design Guidelines (December 2025) requires hydrologic / hydraulic modeling for all dual drainage systems. The performance of the proposed storm drainage system was evaluated using the PCSWMM hydrologic / hydraulic model. The results of the analysis were used to:

- Determine the total runoff from the site (peak flow and runoff volume) for the design storm events.
- Size the required inlet control devices (ICDs) to ensure post development flow rates do not exceed the allowable release rates.

- Determine the required underground storage volumes.
- Calculate the storm sewer hydraulic grade line and ponding elevations for the 100-year storm event.

The post-development PCSWMM model schematic and output for the 100-year and stress-test events are provided in **Appendix E**.

Area A-04, A05, A06, A08, A09, A10

- Stormwater runoff from the above ground parking area will be conveyed to storm sewers within Derreen Avenue. These flows will be captured by catchbasins and conveyed by the proposed sewers to Derreen Avenue. Inflows to the minor system will be controlled by inlet control devices (ICD) within CB 3, CB 5, and CB 7. The required storage volume will be provided by the catch basin leads between structures and surface storage in the parking area. The surface storage will be limited to a maximum ponding depth of 0.30 m prior to spilling overland to Derreen Avenue.

Area A-12:

- Stormwater runoff from this community and snow storage area will be captured by proposed catch basin 10. Inflows to the minor system will be controlled by an inlet control device (ICD) and conveyed to the existing sewers in Derreen Avenue by the proposed private sewer system.

Area R-02, R-03, R-04, R-06, R-09, R-10

- Stormwater runoff from the building roofs facing the internal parking area will be captured by downspouts and conveyed directly to proposed storm sewers within the parking area. An ICD will restrict the flows, and an underground StormTech arch chamber system will provide the required storage volume and infiltration. The flows will ultimately be conveyed to the existing sewers in Derreen Avenue. If the system were to ever exceed capacity the flows would be conveyed overland through the proposed parking area to Derreen Avenue. For details on the roof downspouts refer to the mechanical plans.

Area A-02, A-03, A-13:

- Stormwater runoff from the underground parking garage accesses will be captured by trench drains located at the bottom of the ramps. The collected runoff will be conveyed through the internal mechanical systems to the private stormwater system, which will ultimately discharge to the municipal storm sewers within the Derreen Avenue right-of-way.

Area R-05, R-07, R-08, R-11-R-14, A-14-A-17, A-7

- Stormwater runoff from the Building B roof facing the north-east and Building C roof facing the south-east will be captured by downspouts and conveyed directly to the infiltration trench within the landscaped area. The infiltration trench design includes catchbasin, catchbasin manhole and landscape drain inlets to capture surface water from the landscaped area. An ICD will restrict the flows and promote infiltration prior to discharging to Derreen Avenue. If the capacity of the infiltration system is exceeded, flows would be conveyed overland to Derreen Avenue. Refer to the mechanical plans for details on the roof downspouts.

Area R-01, A-01

- Stormwater runoff from the roof of Building A, facing the north-west, will be captured by downspouts and conveyed directly to the infiltration trench within the landscaped area. The infiltration trench will be complete with catchbasin and landscape drain inlets to capture surface water from the landscaped area. An ICD will restrict the flows from the trench and promote infiltration prior to discharging to proposed storm sewer in the parking area. If runoff directed through the system exceeds capacity, flows will be conveyed overland to Derreen Avenue. Refer to the mechanical plans for details on the roof downspouts.

Area D-01

- Stormwater runoff from a small portion of the parking area and boulevard will be captured by the existing catchbasin installed as part of the Phase 1 development. The catch basin will be uncontrolled thus the additional flow will not impact the SWM design.

6.3.1 PCSWMM Model Parameters**Design Storms**

The model uses the 6-hour Chicago Storm Distribution (10-minute time step) derived from the City of Ottawa IDF data presented in the City of Ottawa Sewer Design Guidelines (December 2025):

The 6-hour Chicago distribution generates the highest peak flows for both the minor and major systems and was determined to be the critical storm distribution for the design of the storm drainage system.

The proposed drainage system has also been stress tested using a 6-hour Chicago design storm that has a 20% higher intensity and total volume compared to the 100-year event.

Modelling Parameters

The hydrologic parameters for each subcatchment were developed based on the proposed land use and grading. Subcatchments were modeled using the standard SWMM5 runoff module with Horton's Equation for infiltration.

PCSWMM Model Schematic, Output Data and Modeling Files

The PCSWMM model schematic and output data for the 100-year and stress-test design events are provided in **Appendix E**. Digital versions of the PCSWMM modeling files have been provided with the submission package.

Impervious Values

Runoff coefficients for each subcatchment area were determined based on the proposed site plan. Refer to the Stormwater Management Plan (**Drawing 125091-SWM**) for details. Percent impervious values were calculated using the following formula:

$$\%imp = \frac{C - 0.2}{0.7}$$

Subcatchment Areas

For modeling purposes, the site has been divided into subcatchments based on the drainage areas tributary to each inlet of the existing and proposed storm sewer systems. The subcatchment areas are shown on the Stormwater Management Area Plan (**Drawing 125091-SWM**).

The site has been divided into thirty-one (31) drainage areas for the post-development condition. The hydrologic modeling parameters for each subcatchment were developed based on the Site Plan (**Figure 2**) and the Stormwater Management Plan specified above. Subcatchment parameters are provided in **Table 6.1**. The building roof is sloped and has no storage.

Table 6.1: Subcatchment Parameters

Area ID	Catchment Area (ha)	Runoff Coefficient (C)	Percent Impervious (%)	Zero-Imperv. (%)	Flow Length (m)	Average Slope (%)
A-01	0.061	0.24	6%	0%	4	2.50
A-02	0.021	0.90	100%	0%	8	2.00
A-03	0.025	0.86	94%	0%	9	2.00
A-04	0.148	0.81	87%	0%	18	2.50
A-05	0.119	0.83	90%	0%	17	2.50
A-06	0.099	0.84	91%	0%	16	2.50
A-07	0.116	0.23	4%	0%	9	6.00
A-08	0.147	0.82	89%	0%	21	2.00
A-09	0.130	0.83	90%	0%	17	2.00
A-10	0.082	0.80	86%	0%	14	2.50
A-12	0.032	0.36	23%	0%	9	2.50
A-13	0.036	0.83	90%	0%	13	2.00
A-14	0.035	0.25	7%	0%	12	11.00
A-15	0.019	0.22	3%	0%	3	20.00
A-16	0.006	0.38	26%	0%	1	9.00
A-17	0.007	0.32	17%	0%	1	3.50
D-01	0.006	0.47	39%	0%	4	3.50
R-01	0.090	0.90	100%	100%	10	3.00
R-02	0.050	0.90	100%	100%	9	3.00
R-03	0.039	0.90	100%	100%	10	3.00
R-04	0.031	0.90	100%	100%	10	3.00
R-05	0.070	0.90	100%	100%	10	3.00
R-06	0.057	0.90	100%	100%	10	3.00
R-07	0.031	0.90	100%	100%	9	3.00
R-08	0.019	0.90	100%	100%	9	3.00
R-09	0.041	0.90	100%	100%	9	3.00
R-10	0.017	0.90	100%	100%	10	3.00
R-11	0.017	0.90	100%	100%	9	3.00
R-12	0.010	0.90	100%	100%	9	3.00
R-13	0.023	0.90	100%	100%	9	3.00
R-14	0.008	0.90	100%	100%	9	3.00

Infiltration

Infiltration losses for all catchment areas were modeled using Horton's infiltration equation, which defines the infiltration capacity of soil over the duration of a precipitation event using a decay function that ranges from an initial maximum infiltration rate to a minimum rate as the storm progresses. The default values as specified in the Sewer Design Guidelines were used for all catchments.

Horton's Equation:
 $f(t) = f_c + (f_o - f_c)e^{-k(t)}$

Initial infiltration rate: $f_o = 76.2$ mm/hr
Final infiltration rate: $f_c = 13.2$ mm/hr
Decay Coefficient: $k = 4.14$ /hr

Depression Storage

The default values for depression storage provided in the Ottawa Sewer Design Guidelines were used for all catchments. Rooftops were assumed to provide no depression storage (zero-impervious parameter).

Depression Storage (pervious areas): 4.67 mm
Depression Storage (impervious areas): 1.57 mm

Subarea Routing

Subarea routing for all subcatchments is set to "outlet" for all catchment areas.

Equivalent Width

The equivalent width parameter for all subcatchments is based on the measured flow length. Flow lengths were digitized in PCSWMM as described in Section 5.4.5.6 of the City of Ottawa Sewer Design Guidelines (December 2025).

Inlet Control Devices

Proposed inlet control devices (ICDs) are represented in the model as circular orifices. ICD information is indicated on the General Plan of Services (**Drawing 125091-GP**).

Storage Rating Curves (Surface Ponding)

The storage curves for ponding in the parking lot were calculated based on the Grading Plan (**Drawing 125091-GR**).

Infiltration Trench Conduits

Storage below the perforated pipes was not accounted for in the model to provide a more conservative approach as blockages beneath the trenches may occur resulting in no infiltration below the system. Infiltration trench storage beside and above the perforated pipes has been accounted for in the modeling using an equivalent width and assuming 30% porosity in the clearstone layer.

Minor System Conduits (Bend / Exit Losses)

The minor system network was created in Civil3D and imported into PCSWMM. The following exit losses have been inputted into the model. They represent the loss coefficient based on the bend angle, as per the Appendix 6-B in the City of Ottawa Sewer Design Guidelines (December 2025).

Bend Angle	Loss Coefficient
0	0.00
15	0.09
30	0.21
45	0.39
60	0.64
75	0.96
90	1.32

Downstream Boundary Conditions (Outfalls)

The 100-year Hydraulic Grade Line (HGL) elevations for the existing off-site storm sewer systems are indicated within the **JSFA Report** (refer to profiles provided in **Appendix D**). The 100-year HGL at the proposed storm sewer outlet connecting to Derreen Avenue is **106.032 m**. This elevation has been used for both the 100-year and stress-test events. A 'normal' boundary condition is used for the 2-year and 5-year events.

6.3.2 Stormwater Quantity Control

Quantity control storage will be required to meet the allowable release rates for the site. The proposed building will have a pitched roof and will not provide any storage. As such, the required quantity control storage will be provided using a combination of surface and underground storage consisting of:

- StormTech chambers below the parking area in front of the proposed building
- Clearstone infiltration trenches along the rear perimeter of the building.
- Surface storage in the parking lot.

These storage elements have been represented in the PCSWMM model and summarized in the following sections.

Groundwater Elevations

The geotechnical investigation revealed no groundwater present at the time of testing in any of the installed boreholes. Therefore, it is anticipated that the elevations of the proposed underground storage systems will be above the groundwater table so this will not affect the available storage capacity.

StormTech Chambers

Underground storage will be provided in three different locations below the parking area using StormTech SC-800 arch-type chambers. They will be installed upstream of the ICDs on MH207, MH214, and MH220. The StormTech chambers will provide a total of **91.7 m³** of underground storage as summarized in **Table 6.2**. Refer to **Drawing 125091-GP** for the proposed layout.

Table 6.2: Underground Storage (StormTech Chambers)

Location	Chamber Model	No. of Chambers	Available Storage (m ³)*
MH207	SC-800	9	34.0
MH214		9	34.0
MH220		6	23.7

*Includes 152 mm of stone above and 600 mm below the chambers assuming a void ratio of 40%

Infiltration Trenches

Infiltration trenches will be used to store runoff and promote infiltration from the rear yards and rear building rooftops. The infiltration system will consist of two separate trenches, one along the northern perimeter behind building A and the other along the perimeters of building B and C. Inlet control devices (ICDs) will be installed at the downstream end of each trench to promote storage in the infiltration trenches and control flows to the Derreen Avenue storm sewer.

The infiltration trenches will consist of 250 mm perforated pipes surrounded by clearstone wrapped in geotextile. The rainwater leaders from the rear of the building will connect directly to the 250 mm perforated pipe. A series of catchbasins and CBMH structures will collect surface runoff from the rearyard areas and direct it into the infiltration trenches. The layout of the infiltration trenches is shown on the General Plan of Services (**125091-GP**). The cross-section is shown on the Notes and Details (**125091-ND**).

The clearstone trenches will have dimensions of 1.25 m wide x 0.85 m deep. The clearstone will have a porosity of approximately 30%. To promote infiltration, the 250mm perforated pipes will be installed 0.30 m above the bottom of the clearstone. The infiltration storage below the bottom of the pipes is not accounted for in the model, so the active depth of the trenches is 0.55 m. The infiltration trench sections are represented in the model using an equivalent width of 0.35 m (1.25 m width x 30% porosity minus the cross-sectional area of the perforated pipe) to accurately reflect the storage volume provided. The model does not account for storage below the perforated pipe and does not simulate infiltration from the trenches.

The proposed infiltration trenches will provide a total active storage volume of 59.5 m³ above the invert of the 250 mm perforated pipe as summarized in **Table 6.3**.

Table 6.3: Underground Storage (Infiltration Trenches)

MH to MH (U/S to D/S)	Trench Dimensions					Storage Volumes (m³)		
	Pipe Dia. (mm)	Length (m)	Height (m)	Width (m)	Porosity	Perf. Pipe	Stone*	TOTAL
North Trench								
LD1001 - CB1	250	68.295	0.55	1.25	0.3	1.1	13.8	14.9
Total Length (North) =		69.1	Total Storage (North) =				14.9	
South Trench								
LD1001-CB 8	250	49.745	0.55	1.25	0.3	1.1	9.9	11.0
CB 8-CB 9	250	31.59	0.55	1.25	0.3	1.1	6.2	7.3
CB 9 -CBMH 225	250	39.945	0.55	1.25	0.3	1.1	7.9	9.0
CBMH 225-CBMH 224	250	15.7	0.55	1.25	0.3	1.1	2.9	4.0
CBMH 224-CBMH 223	251	30.8	0.55	1.25	0.3	1.1	6.0	7.1
CBMH223 - CBMH222	250	26.3	0.55	1.25	0.3	1.1	5.1	6.2
Total Length (South) =		194.08	Total Storage (South) =				44.6	
Total Length (North + South) =		263.18	Total Active Storage (North & South) =				59.5	

* Based on 30% porosity in the clear stone

Surface Storage

Storage nodes in PCSWMM are used to simulate the available surface storage volume in the parking lot. The stage-storage curves are generated using Civil3D and then imported into PCSWMM. Storm events up to 2-year will be stored underground, ensuring there is no surface ponding within the parking area. Refer to **Section 6.4.2** for additional details.

6.3.3 Inlet Control Devices

All the catchbasins in the parking areas and roadway are located at low points. Inflows to the storm sewer are based on the ICD specified for the inlet and the maximum depth of ponding. ICDs have been sized to limit the ultimate outlet peak flows to the allowable release rate of **272.2 L/s**.

ICDs have been installed in the downstream catchbasin maintenance hole to limit peak flows from the upstream series of inlets, as well as take advantage of the storage provided by the upstream storm sewers.

The ICDs have been sized to ensure that surface ponding under 100-year and stress test storm events are lower than 0.35 m. Standard City of Ottawa ICD sizes and Tempest LMF ICDs have been used. ICD sizes and design flows are provided in **Table 6.4**.

Table 6.4: Inlet Control Devices

Structure ID	ICD Data			2-year Event ⁽¹⁾			100-year Event ⁽¹⁾		
	Diameter (mm)	Invert	C/L Elevation	Max HGL (m)	Head (m)	ICD Flow Rate (L/s)	Max HGL (m)	Head (m)	ICD Flow Rate (L/s)
<i>Parking Lot Area (Pipes & Stormtech Chambers)</i>									
CB10	83	107.40	107.44	107.46	0.02	1.9	108.17	0.73	12.5
CB3	152	107.00	107.08	108.31	1.23	54.7	108.63	1.55	59.3
CB5	152	107.13	107.21	108.16	0.95	47.9	108.62	1.41	58.2
CB7	127	107.19	107.25	108.26	1.01	34.3	108.72	1.47	41.4
MH207	LMF105	106.48	106.53	106.85	0.32	5.6	107.39	0.86	9.3
MH214	LMF105	106.62	106.67	106.99	0.32	5.7	107.50	0.83	9.1
MH220	LMF100	106.18	106.23	106.49	0.26	4.6	106.95	0.72	7.7
<i>Rearyard Area (Infiltration Trenches)</i>									
CB1	83	106.66	106.70	107.14	0.45	9.8	108.15	1.46	17.7
CBMH222	108	106.01	106.06	109.92	3.86	22.2	107.94	1.88	32.0
Total Controlled Flow from ICDs =									221.0

(1) ICD head is calculated as the difference between the maximum HGL and the centreline elevation of the orifice.

6.4 PCSWMM Model Results

The results of the post-development PCSWMM model demonstrate that the overall stormwater management strategy for the subject site will conform to the stormwater management criteria outlined in this report.

6.4.1 Summary of Peak Flows

The PCSWMM model was used to evaluate the performance of the proposed storm servicing and stormwater management strategy and ensure that peak flows are controlled to the 100-year allowable release rate of **272.2 L/s**.

The proposed ICDs have a combined 100-year peak flow rate of **221.0 L/s** (see **Table 6.4**). However, there are three catchment areas representing underground parking entrances that are uncontrolled through internal building services to the proposed minor system. The PCSWMM model calculates the total peak flow (controlled and uncontrolled) at the Derreen Avenue outlet.

Table 6.5 compares the minor system release rates to the allowable release rate of the downstream storm sewer systems and demonstrates that the total minor system release rate is less than the allowable release rate for all storms up to and including the 100-year event. During the 100-year event, there will be less than a liter per second of direct runoff to Phase 1 from D-01. The allowable minor system release rate will be slightly exceeded during the stress test event due to the increased ponding depths which increases the head on the ICDs.

Table 6.5: Peak Flow Comparison

Outlet	Peak Flow ⁽¹⁾ (L/s)				Allowable Release Rate (L/s)
	2-year	5-year	100-year	Stress Test	
Derreen Avenue	192.3	217.1	270.2	289.5	272.2

¹⁾ PCSWMM model results for a 6-hour Chicago storm distribution

6.4.2 Major System Summary

A summary of the modelled ponding depths during the 100-year storm and stress-test design events is provided below in **Table 6.6**. There is no surface ponding for the 2-year event. The model results indicate that ponding depths will not exceed 0.3 m during either the 100-year or stress test events.

The proposed SWM design provides sufficient storage to contain all runoff for storms up to and including the 100-year event. During the stress-test event, ponding will be contained within the parking lot areas, the infiltration trench does not exceed capacity, and the only overland flow will be from the small portion of direct runoff back towards Phase 1.

Table 6.6: Major System Ponding Depths

Structure	T/G (m)	Max. Static Ponding (Spill Depth)		100yr Event		Stress-Test Event	
		Elev. (m)	Depth (m)	Elev. (m)	Depth (m)	Elev. (m)	Depth (m)
Parking Lot							
CB2	108.35	108.70	0.35	108.57	0	108.60	0.25
CB3	108.35	108.65	0.30	108.54	0	108.57	0.22
CB4	108.45	108.75	0.30	108.65	0.20	108.68	0.23
CB5	108.45	108.73	0.28	108.62	0.17	108.65	0.20
CB6	108.50	108.78	0.28	108.73	0.23	108.76	0.26
CB7	108.60	108.75	0.15	108.72	0.12	108.75	0.15
CB10	108.60	108.75	0.15	108.17	0	108.60	0
South Infiltration Trench							
LD1001	108.71	108.71	0.00	107.97	0	108.30	0
CB8	108.42	108.61	0.19	107.96	0	108.30	0
CB9	108.57	108.96	0.39	107.96	0	108.29	0
CBMH225	108.40	108.62	0.22	107.96	0	108.29	0
CBMH224	108.49	108.62	0.13	107.95	0	108.28	0
LD1002	108.60	108.69	0.09	107.95	0	108.28	0
CBMH223	108.59	108.68	0.09	107.95	0	108.28	0
LD1003	108.65	109.00	0.35	107.94	0	108.27	0
CBMH222	108.57	108.90	0.33	107.94	0	108.27	0
North Infiltration Trench							
LD1000	108.83	108.83	0.00	108.16	0	108.55	0
CB1	108.70	109.00	0.30	108.16	0	108.55	0

6.5 Feedmill Creek SWM Study Requirements (5mm Rainfall Retention)

As per the Feedmill Creek Stormwater Management Study the proposed site has a 5 mm retention requirement. Based on the total site area of 1.594 ha, the required retention volume is **79.7 m³**.

The required retention volume will be provided by a combination of depression storage in the parking lot and landscaped areas, as well as subsurface infiltration storage using clearstone below the outlets of the StormTech chambers and the infiltration trench. The proposed design provides a total of **80.8 m³** of retention storage. Refer to **Table 6.7** for details.

Table 6.7: 5mm Retention (as per Feedmill Creek SWM Study)

Site Infiltration Requirement				
Total Site Area	1.594	ha		
Retention Requirement	5	mm		
Total Retention Volume Required	79.7	m³		
Depression Storage				
Depression storage on paved and landscaped areas as per City guidelines.				
Assume no depression storage on pitched roof or entrance ramp to parking				
Land Use		Paved	Landscaped	
Area (ha)		0.520	0.350	
Depression Storage (mm)		1.57	4.67	
Depression Storage Vol (m³)		8.2	16.3	
Total Depression Storage Vol (m³)		24.5		
Infiltration Storage				
Storage in clearstone layer below Stormtech chambers and infiltration trenches.				
Storage Location	R-02 & R-03 Chambers	R-04 & R-06 Chambers	R-09 & R-10 Chambers	Trenches
Length (m)	8.9	8.9	8.9	263.18
Width (m)	4.7	4.7	3.3	1.25
Depth (m)	0.6	0.6	0.6	0.3
Porosity	0.4	0.4	0.4	0.3
Infiltration Rate (mm/hr)	15	15	15	15
Drawdown Time (hrs)	40	40	40	20
Volume (m³)	9.9	9.9	7.0	29.6
Total Infiltration Vol (m³)	57.1			
Total Retention Volume (m³)	80.8			
Depression + Infiltration Storage				

Drawdown Times for Infiltration

Infiltration rates were not provided in the geotechnical report. However, in Phase 1 infiltration rates were determined to be varying between 15 and 97 mm/hr. For design purposes, an infiltration rate of 15 mm/hr was applied to drawdown calculations for the infiltration trenches. The drawdown time for the infiltration trenches is approximately **20 hrs**. The drawdown time for the clearstone below the StormTech chambers is approximately **40 hrs**.

6.6 Water Quality Treatment

The downstream Pond 7 has been designed to provide an Enhanced level of stormwater quality treatment (80% TSS removal) for the subject site. Additional stormwater quality treatment measures are not required.

7.0 EROSION AND SEDIMENT CONTROL

Temporary erosion and sediment control measures will be implemented on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter socks (catchbasin inserts) will be placed in existing and proposed catchbasins and catchbasin manholes, and will remain in place until vegetation has been established and construction is completed;
- Silt fencing will be placed along the surrounding construction limits;
- Mud mats will be installed at the site entrances;
- The contractor will be required to perform regular street sweeping and cleaning as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site;

Erosion and sediment control measures should be inspected daily and after every rain event to determine maintenance, repair or replacement requirements. Sediments or granulars that enter site sewers shall be removed immediately by the contractor. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established. Refer to the Erosion and Sediment Control Plan (drawing 125091-ESC) for additional information.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Watermain

The analysis of the existing and proposed watermain network confirms the following:

- The site will be serviced by two (2) 200mm diameter PVC water services from the existing 300mm diameter watermain within Derreen Avenue.
- There are adequate pressures in the existing watermain infrastructure to meet the required domestic demands for the development.
- There are adequate flows and pressures to service the proposed site fire demand as calculated per the Fire Underwriters Survey (FUS).

Sanitary Servicing

The analysis of the existing and proposed sanitary system confirms the following:

- It is proposed to service the development with a 200mm diameter sanitary service from the existing mains within Derreen Avenue.
- It is anticipated there is adequate capacity within the existing sanitary infrastructure to service.

Stormwater Management

The following provides a summary of the storm sewer and stormwater management system:

- The proposed storm sewer system is to connect to the existing 1050mm diameter sewer within Derreen Avenue.
- Stormwater quantity control will be provided using a combination of underground and surface storage:
 - Underground storage will be provided using StormTech chambers below the parking area and infiltration trenches along the rear perimeter of the proposed buildings. The design provides sufficient underground storage to ensure no surface ponding for storms up to and including the 2-year event.
 - Surface storage is provided in ponding areas above catchbasins in the parking lot and swales. The site provides sufficient storage to ensure no overland flow leaves the site for storms up to and including the 100-year event.
- Minor system flows will be controlled using inlet control devices (ICDs) installed downstream of the underground storage systems.
- The site has been designed to retain the first 5mm of rainfall using a combination of depression storage and infiltration storage.
- Existing Pond 7 will provide an enhanced level of water quality treatment for the site and no additional water quality treatment is required.

Erosion and Sediment control

- Erosion and sediment control measures (i.e. filter fabric, catchbasin inserts, silt fences, etc.) will be implemented prior to construction and are to remain in place until vegetation is established.

9.0 CLOSURE

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

NOVATECH

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Appendix A
Pre - Consultation Meeting Minutes



File No.: PC2025-0222

September 2, 2025

Brad McGregor
Broadstreet Properties
Via email: brad.mcgregor@broadstreet.ca

**Subject: Pre-Consultation: Meeting Feedback
Proposed Site Plan Control Application – 2765 Palladium Drive**

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on August 21, 2025.

Pre-Consultation Preliminary Assessment

1 ☐	2 ☒	3 ☐	4 ☐	5 ☐
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One (1) indicates that considerable major revisions are required while five (5) suggests that the proposal appears to meet the City's key land use policies and guidelines. This assessment is purely advisory and does not consider technical aspects of the proposal or in any way guarantee application approval.

Next Steps

1. A review of the proposal and materials submitted for the above-noted pre-consultation has been undertaken. For your next submission, please submit the required Application Form, together with the necessary studies and/or plans to planningcirculations@ottawa.ca, copy (cc:) to the file lead and planning support.
2. In your subsequent pre-consultation or application submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed is requested with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.
3. Please note, if your development proposal changes significantly in scope, design, or density it is recommended that a subsequent pre-consultation application be submitted.

Supporting Information and Material Requirements

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified, during this phase of pre-consultation, as either required (R) or advised (A) as part of a future complete application submission.

- a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.

Consultation with Technical Agencies

1. You are encouraged to consult with technical agencies early in the development process and throughout the development of your project concept. A list of technical agencies and their contact information is enclosed.

Planning

Comments:

1. Refer to the comments provided as part of previous pre-con for the site (File No. PC2025-0163) for general comments related to applicable policy and zoning.
2. Coordination with 425 Culdaff Road development
 - a. The applicant has an active site plan control application (File No. D07-12-24-0140) on the property directly abutting the subject site to the west, which has been deemed complete and circulated. The applicant was encouraged to coordinate the two developments to create efficiencies between the two developments and allow for the consolidation of accesses, more varied amenity spaces, etc. It is staff's understanding that the applicant intends to proceed with the approval of 425 Culdaff, with the plans as currently shown (does not show changes resulting from coordination with the subject site) as the application is nearing approval, with the intention of updating the plans in the future through either a site plan revision/permission to proceed to align with the comprehensive plan for the site.
 - b. Please note that with the approach noted above, the phase 1 site will need to be completely zoning compliant. It will not be considered a phased development at the time of approval, as there is no active development application on the subject site.
3. Site Access
 - a. Please remove the secondary access to the site/consolidate it with the access being proposed on phase 1 site. If the two sites are being coordinated and treated as one development, there is no need for two separate accesses along Derreen Avenue.
 - b. Only other viable location for a secondary access into site may be on Culdaff may be through the phase 1 development due to traffic medians/proximity to the traffic circle. Applicant is encouraged to consider

site access further before proceeding with the approval of phase 1 if a secondary access into the site is desired.

- c. Given the number of users of the proposed site access, consider removing/relocation parking spaces leading up to the driveway to reduce friction /queuing in this area.



4. Parking

- a. It is understood that the minor variance is being sought for resident parking on the site. More information on the minor variance process can be found [here](#).
- b. Staff have concerns with the amount of surface parking being proposed on the site. Is there an opportunity to increase the size of the underground parking garage to accommodate more of the required spaces?

5. Parkland dedication

- a. Refer to the parkland dedication comments in this letter.
- b. Staff have concerns about the visibility of the large surface parking lot from the public realm along Derreen Ave as a result of the introduction of a park along the street frontage. Seek opportunities to align the location of outdoor amenity space with the park to create a pleasant sight line from the street and reduce impacts to the public realm.

6. Section 37 requirements / Community Benefits Charge

- a. The former Section 37 regime has been replaced with a “Community Benefits Charge”, [By-law No. 2022-307](#), of 4% of the land value. This charge will be required for ALL buildings that are 5 or more storeys and 10 or more units and will be required at the time of building permit unless the development is subject to an existing registered Section 37 agreement. Questions regarding this change can be directed to Ranbir.Singh@ottawa.ca.

Required Applications:

- 7. A Site Plan Control (Complex) application – more information on process, timelines, fees, etc. can be found [here](#).

Urban Design

Comments:

- 8. An Urban Design Brief is required. Please see attached customized Terms of Reference to guide the preparation.
 - a. The Urban Design Brief should be structured by generally following the headings highlighted under Section 3 – Contents of these Terms of Reference.
- 9. Additional drawings and studies are required as shown on the SPIL. Please follow the terms of references ([Planning application submission information and materials | City of Ottawa](#)) to prepare these drawings and studies. These include:
 - a. Site Plan.
 - b. Landscape Plan
 - c. Building Elevations
 - d. Conceptual Floorplans

Preliminary Design Comments:

- 10. Efforts should be made to consolidate the vehicular access proposed on Derreen Avenue with the Phase 1 development.
- 11. There is an opportunity to enhance the amenity offerings by consolidating or sharing facilities between the Phase 1 and 2 developments.
- 12. Like the Phase 1 development, staff are keen to see active entrances along public frontages with walkways and enhanced landscaping.

13. Efforts should be made to green the parking lot to reduce the urban heat island effect. Staff would be willing to support a further parking reduction for the inclusion of trees.
14. Staff are looking to see pedestrian connections between the Phase 1 and 2 developments enhanced.
15. Recognizing that the City is looking for parkland dedication on Phase 2 lands, please endeavor to provide alignment and strong connections between the proposed park and the outdoor amenity area.
16. Parking should be entirely screened from the public realm.
17. Staff look forward to reviewing Building Elevations and a detailed landscape strategy.

Feel free to contact Nader Kadri, Planner III, for follow-up questions.

Engineering

Comments:

18. The stormwater management criteria for the subject site are to be based on the following reports:
 - a. Design Brief for 2325483 Ontario Ltd., 195 Huntmar Drive, City of Ottawa, Project No.: 12-624, prepared By DSEL dated July 2020, 2nd submission.
 - b. Stormwater Management Report for the 195 Huntmar Drive Subdivision to Pond 7, City of Ottawa, Project No.: 12-624, prepared By JFSA dated July 2020, 2nd submission.
19. Flows to the storm sewer in excess of the 2-year storm release rate, up to and including the 100-year storm event, must be detained on site. For events greater than the 100-year storm event, spillage must be directed to the public ROW. Overland flow cannot discharge to neighbouring private property.
20. When underground storage is used, the release rate fluctuates from a maximum peak flow based on maximum head down to a release rate of zero. This difference is large and has a significant impact on storage requirements. We therefore require that an average release rate equal to 50% of the peak allowable rate shall be applied to estimate the required volume. Alternatively, the consultant may choose to use a dynamic computer model.
21. Quality Control: The downstream Pond 7 is designed to treat 80% TSS from the minor system. Additional stormwater quality treatment is not required.

22. Water Balance: Runoff from a 5mm rainfall shall be retained on site through infiltration. All soil assumptions made in the servicing report should be supported by the geotechnical report.
23. The sanitary sewer release rate, for the subject site, is to be in accordance with the following reports:
 - a. Design Brief for 2325483 Ontario Ltd., 195 Huntmar Drive, City of Ottawa, Project No.: 12-624, prepared By DSEL dated July 2020, 2nd submission.
24. Any capacity/allotment allocated to the 2765 Palladium Drive property through previously developed and approved reports and/or plans should be appropriately partitioned due to the property being severed.
25. Given that this parcel was anticipated for commercial use in the 195 Huntmar subdivision approval, it is anticipated that the sanitary capacity allocated to this parcel will be exceeded given that a residential use is proposed. The servicing report should identify the proposed sanitary demand and confirm if capacity is available in the downstream sanitary sewer system.
26. New services must be grouped in a common trench to minimize the number of road cuts.
27. A monitoring maintenance hole for storm and sanitary sewers shall be required for all connections from a private sewer to a public sewer. Monitoring maintenance holes should be located in an accessible location on private property near the property line (i.e., not in a parking area).
28. As per Section 4.4.7.2 of the Ottawa Design Guidelines – Water Distribution, a DMA (District Metering Area) chamber will be required for private site developments serviced by:
 - a. a connection of 150mm or larger or;
 - b. when there are two or more private connections to the public watermain
29. The installation of a DMA chamber gives the City the ability to monitor and detect water loss at a subject site. The DMA chamber shall be installed at, or as close to the property line as possible, and shall be as per Standard Detail Drawing W3.3.
30. Residential areas serving 50 or more dwellings shall be connected with a minimum of two watermains, separated by an isolation valve, to avoid the creation of a vulnerable service area.
31. Water Boundary condition requests must include the location of the service (map or plan with connection location(s) indicated) and the expected loads required by the proposed development, including calculations. Please provide the following information:

- a. Location of service
 - b. Type of development
 - c. The amount of fire flow required (per OBC or FUS).
 - d. Average daily demand: _l/s.
 - e. Maximum daily demand: _l/s.
 - f. Maximum hourly daily demand: _l/s.
32. Grading and Drainage: The proposed development shall follow the approved grading plan as per the 195 Huntmar Drive subdivision approval.
33. An MECP Environmental Compliance Approval will be required for this application unless the proposed development meets the following exemption criteria:
- a. Is designed to service one lot or parcel of land;
 - b. Discharges into a storm sewer that is not a combined sewer;
 - c. Does not service industrial land or a structure located on industrial land; and
 - d. Is not located on industrial land. O.Reg. 525/98, s. 3; O.Reg. 40/15, s. 4.
34. Phase 1 ESAs and Phase 2 ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

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

Transportation

Comments:

35. The two private approaches should be consolidated. If this is not feasible, explore increasing the spacing or restricting the types of movements.
36. Ensure that the development proposal complies with the Right-of-Way protection requirements - See [Schedule C16 of the Official Plan](#).
37. Corner triangles as per OP Annex 1 - Road Classification and Rights-of-Way on the final plan will be required (measure on the property line/ROW protected line; no structure above or below this triangle). The development proponent should protect the corner triangles to accommodate protected intersections per policies 2.1.1 (e) & (f). The City requires the following corner triangles at these locations:

- a. Arterial/Arterial, Arterial/Collector, or Collector/Collector: two overlapping 5 metre x 15 metre triangles
- b. Arterial/Local, or Collector/Local: a 3 metre x 9 metre triangle, with the longer portion on the higher road segment
- c. Local/Local, or Public Lane/Local: a 3 metre x 3 metre triangle
- d. ROW and corner triangles must be unincumbered and conveyed at no cost to the City. Note that conveyance of the ROW/corner triangle will be required prior to registration of the SP agreement. Additional information on the conveyance process can be provided upon request.
- e. Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management.

38. A TIA is warranted, please proceed to **Step 2: TIA Scoping report**. The application will not be deemed complete without Step 2 being submitted at least 14 calendar days prior to a Phase 3 pre-consultation or formal application. A **TIA Strategy report (Step 3)** with the Synchro files will be required at or prior to the formal application. Refer to the City of Ottawa website for the updated TIA process: [Transportation Impact Assessment Guidelines | City of Ottawa](#).

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

Environment

Comments:

- 39. There are no triggers for an Environmental Impact Study. An EIS was completed for the subdivision and does not need to be updated; it provides some guidance regarding planting and encourages the use of locally appropriate native species of trees.
- 40. Bird-Safe Design Guidelines - Please review and incorporate bird safe design elements, where feasible. Some of the risk factors include glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, landscaping, light pollution. More guidance and solutions are available in the guidelines which can be found here: https://documents.ottawa.ca/sites/documents/files/birdsafedesign_guidelines_en.pdf
- 41. Please consider if there are features that can be added reduce the urban heat island effect (see OP 10.3). The site has a lot of parking surrounded by buildings which can generate and trap heat. Look for ways to manage this for example, this impact can be reduced by adding large canopy trees on parking islands,

using permeable paving to increase tree rooting areas, using green roofs or vegetation walls, or incorporating building with low heat absorbing materials like white colour roofing material.

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

Forestry

Comments:

42. Tree preservation / Tree Removal

- a. There are no existing trees – a TCR is not required

43. Tree planting requirements for the Landscape Plan

- a. Please ensure all retained trees are shown on the LP
- b. Minimum Setbacks
 - i. Maintain 1.5m from sidewalk, MUP/cycle track, water service laterals.
 - ii. Maintain 2.5m from curb.
 - iii. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.
- b. Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas.
- c. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.
- d. Tree specifications
 - i. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
 - ii. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.
- e. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; if possible, include watering and warranty as described in the specification.
- f. No root barriers, dead-man anchor systems, or planters are permitted.
- g. No tree stakes unless necessary
- h. Hard surface planting
 - i. If there are hard surface plantings, a planting detail must be provided.

- ii. Curb style planter is highly recommended.
- iii. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- iv. Trees are to be planted at grade.
- i. Soil Volume - Please demonstrate as per the **Landscape Plan Terms of Reference** that the available soil volumes for new plantings will meet or exceed the following:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

- j. Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.
- k. The city requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.
- l. Efforts shall be made to provide as much future canopy cover as possible at a site level, through tree planting and tree retention. The Landscape Plan shall show/document that the proposed tree planting and retention will contribute to the City's overall canopy cover over time. Please provide a projection of the future canopy cover for the site to 40 years.
- m. Page 7 of the Landscape Plan Terms of Reference requires applicants to submit a digital, georeferenced CAD or GIS file of the final approved LP. Please follow this link to review the submission requirements: https://documents.ottawa.ca/sites/documents/files/landscape_tor_en.pdf . The file can be sent to the Planning Forester or Planning File Lead.

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

Parkland

Comments:

- 44. A parkland dedication will be required for this site. This is based on the Parkland Dedication [By-law No. 2022-280](#).

45. The amount of Parkland owing is calculated in the table below. Given that this is a change of use from a commercial to residential use, the previously anticipated 2% parkland dedication calculated at the time of the subdivision of 195 Huntmar Road 4M-1675, has been subtracted from the parkland owing at this time.

2765 Palladium Drive Parkland Calculation table					
Proposed Use	Units	Gross land area (sq meters)	Parkland Dedication Rate	Parkland Dedication (sq meters)	Parkland Dedication based on 10% cap
Residential Apartments : 3 six story buildings	306 units	15,940 sq meters	1ha per 600 units for land dedication	306/600 = 0.51 hectares 5100 sq meters	Parkland owing is 1594 sq meters
		15,940 sq meters			Minus 2% previous dedication based on commercial use – 318 sq meters
					Final parkland owing 1276 meters sq

46. The parkland owing is 1276 square meters. This park land must be located to have road frontage on Derreen Avenue. The land must be rectangular in shape to allow ease of development. If possible, coordinating the location of the amenity space and the park would be advantageous to maximize the area of open green space on the site. Please refer to the Park and Pathway Manual 2nd edition for further information regarding Design Criteria for a Parkette.
47. The applicant will be required to prepare the park block to a clean and green state in anticipation of further development by the City once included in the city



capital budget. The applicant must provide services to the park block which will include:

- a. A 300mm diameter storm sewer and Catch Basin/Manhole at 2m inside the park property line;
 - b. A 50mm diameter water line complete with water vault chamber at 2m inside the park property line as per city standard details for unit price contracts. Costs for the water vault chamber and water meter, if ultimately required, shall be paid for by the City or be included as part of the maximum park construction budget for the park;
 - c. 150mm diameter sanitary sewer and Manhole at 2m inside the park property line;
 - d. A 120/240 volt, 200 ampere single phase hydro service at 2m inside the park property line complete with electrical kiosk for park services as per city standard details for unit price contracts. The Owner is responsible for making all arrangements and coordinating the connection of the new hydro service, including costs and inspections, with the respective electrical agencies.
48. Electrical and water connections (minimum 50mm) are to be connected directly to the street line, including back flow preventors, shutoff valves, water and hydro meters and chambers.
49. A record of site conditions will be required for the park block and remediation of the site if required, will be at the expense of the applicant/owner.

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

Other

50. The High-Performance Development Standard (HPDS) is a collection of voluntary and required standards that raise the performance of new building projects to achieve sustainable and resilient design and will be applicable to Site Plan Control and Plan of Subdivision applications.
- a. The HPDS was passed by Council on April 13, 2022, but is not in effect at this time, as Council has referred the 2023 HPDS Update Report back to staff with the direction to bring forward an updated report to Committee at a later date. The timing of an updated report to Committee is unknown at this time, and updates will be shared when they are available.
 - b. Please refer to the HPDS information at ottawa.ca/HPDS for more information.

51. Under the Affordable Housing Community Improvement Plan, a Tax Increment Equivalent Grant (TIEG) program was created to incentivize the development of affordable rental units. It provides a yearly fixed grant for 20 years. The grant helps offset the revenue loss housing providers experience when incorporating affordable units in their developments.

- a. To be eligible for the TIEG program you must meet the following criteria:
 - i. the greater of five units OR 15 per cent of the total number of units within the development must be made affordable
 - ii. provide a minimum of 15 per cent of each unit type in the development as affordable
 - iii. enter into an agreement with the city to ensure the units maintain affordable for a minimum period of 20 years at or below the city-wide average market rent for the entire housing stock based on building form and unit type, as defined by the Canada Mortgage and Housing Corporation
 - iv. must apply after a formal Site Plan Control submission, or Building Permit submission for projects not requiring Site Plan Control, and prior to Occupancy Permit issuance
- b. Please refer to the TIEG information at [Affordable housing community improvement plan](#) / [Plan d'améliorations communautaires pour le logement abordable](#) for more details or contact the TIEG coordinator via email at affordablehousingcip@ottawa.ca.

Submission Requirements and Fees

1. The attached **Study and Plan Identification List** outlines the information and material that has been identified as either required (R) or advised (A) as part of a future complete application submission.
 - a. The required plans and studies must meet the City's Terms of Reference (ToR) and/or Guidelines, as available on Ottawa.ca. These ToR and Guidelines outline the specific requirements that must be met for each plan or study to be deemed adequate.
2. All of the above comments or issues should be addressed to ensure the effectiveness of the application submission review.

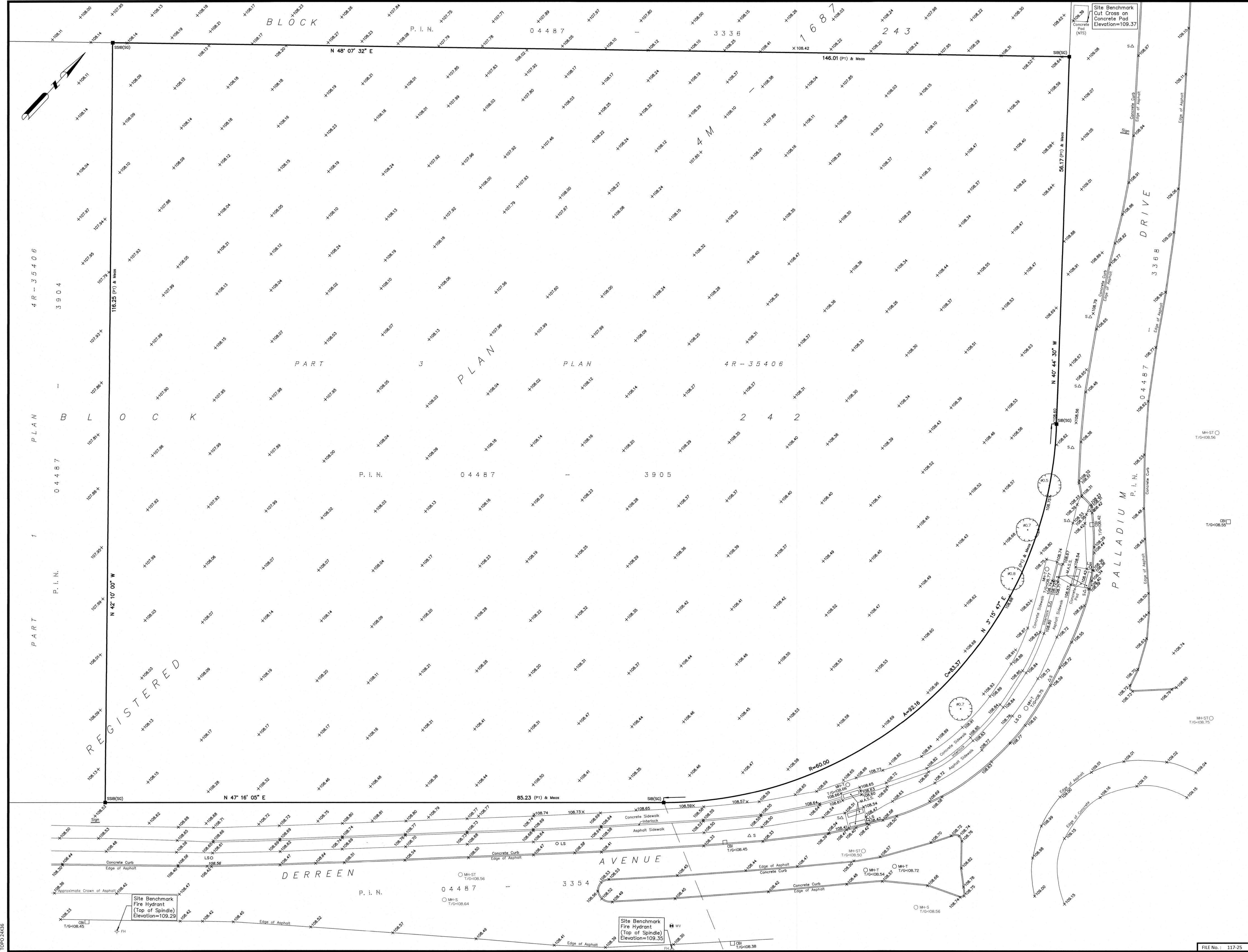
Should there be any questions, please do not hesitate to contact myself or the contact identified for the above areas / disciplines.

Yours Truly,
Colette Gorni

c.c. Emily Charby, Planner I



Nader Kadri, Planner III, Urban Design
Julie Candow, Infrastructure Project Manager
Alex Polyak, Senior Engineer
Mike Giampa, Transportation Project Manager
Matthew Hayley, Environmental Planner
Mark Richardson, Forester
Diane Emmerson, Parks Planner



TOPOGRAPHIC PLAN OF SURVEY OF

PART OF BLOCK 242
REGISTERED PLAN 4M-1687
CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2025

Scale 1: 250
0 2.5 5 7.5 10 12.5 15 20 25 metres

Metric Note
Distances and/or coordinates on this plan are in metres and can be converted to feet by dividing by 0.3048.

Distance Note
Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.999935.

Bearing Note
Bearings hereon are grid bearings derived from the Can-Net Real Time Network and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) Nad-83 (Original).

Elevation Notes
1. Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 -1978. (Monument No. 19770882)
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that its relative elevation and description agrees with the information shown on this drawing.

Utility Notes
1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

Notes & Legend

□

Denotes

Survey Monument Planted

■

Survey Monument Found

SSIB

Standard Iron Bar

SSIB

Short Standard Iron Bar

Meas

Measured

(P1)

Plan 4R-35406

SG

Stantec Geomatics LTD

○ MH-ST

Maintenance Hole (Storm)

○ MH-S

Maintenance Hole (Sanitary)

○ MH-T

Maintenance Hole (Traffic)

○ VC

Valve Chamber (Watermain)

□ CBI

Catch Basin Inlet

○ WV

Water Valve

○ FH

Fire Hydrant

Invt.

Invert

T/G

Top of Grate

C/L

Centreline

NTS

Not to Scale

M.A.S.S.

Metal Anti Slip Strip

+65.00

Location of Elevations

+65.00

Top of Concrete Curb

Property Line

Deciduous Tree - The Symbol shown denotes location and trunk diameter only. Size of its' root system/overhead canopy may be smaller/larger than the symbol size depicted on this plan.

WARNING NO PERSON MAY COPY, REPRODUCE, DISTRIBUTE OR ALTER THIS PLAN IN WHOLE OR IN PART WITHOUT THE WRITTEN PERMISSION OF FARLEY, SMITH & DENIS SURVEYING LTD.
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Surveyor's Certificate
I certify that:
1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Regulations made under them.
2. The survey was completed on the 25th day of April, 2025.

May 21/25

Date

Daniel Robinson

Ontario Land Surveyor

This plan of survey relates to AOLS Plan Submission Form Number V-98794

FARLEY, SMITH & DENIS SURVEYING LTD.
ONTARIO LAND SURVEYORS
CANADA LAND SURVEYORS
Unit 275, 30 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J6
TEL (613) 727-8226 E-mail: info@fstdsurveys.ca

TOPO 24X36

J:\2025\117-25_2765 Palladium Dr_Derreen ave_topo\Final\117-25 2765 Palladium Dr_BL242 RP4M-1687_Topo_F.dwg

Appendix B

Water Servicing

SITE INFORMATION			
PROJECT DESCRIPTION	3-MULTIFAMILY RESIDENTIAL APARTMENT (6 STOREY)		
TOTAL UNITS	304 UNITS		
ROOF TYPE	GABLE ROOF		
CIVIC ADDRESS	2765 PALLADIUM DRIVE		
MUNICIPALITY	CITY OF OTTAWA		
ZONING	CM2: MINOR CORRIDOR ZONE 2		
LEGAL DESCRIPTION	Part Block 242, Plan 4M1687, Part 3 on 4R35406		
LOT AREA	15,940 m ²	3.94 ACRES	1.59 HECTARES
DENSITY	77.2 DU/ACRE		
FLOOR SPACE INDEX (FSI)	1.74 (2.0 MAX)		

ZONING SUMMARY				
	REQUIRED		PROPOSED	
MAX. BUILDING HEIGHT	18 m		18 m	
MIN. FRONT YARD S.B.	3.0	m	3.0	m
MIN. REAR YARD S.B.	7.5	m	7.5	m
MIN. INTERIOR SIDE YARD S.B.	3.0	m	3.0	m
MIN. CORNER SIDE YARD S.B.	3.0	m	3.0	m
MIN. LOT AREA	No minimum	m ²	15,940	m ²
MIN. LOT WIDTH	No minimum	m	144.63	m

VEHICULAR PARKING				
	REQUIRED	UNITS/AREA	REQUIRED	PROPOSED
APARTMENT - REGULAR	1.2 / UNIT	304	365	274
VISITORS	0.2 / UNIT	304	61	61
TOTAL PARKING STALLS			426	*326
OTHER PARKING PROVISIONS				
SMALL CAR	MAX 50%		MAX 158	77
ACCESSIBLE TYPE A			5	5
ACCESSIBLE TYPE B			5	5
EV INSTALLED			-	-
EV CAPABLE	25%	304	64	64

* PARKING VARIANCE REQUIRED 269/304 = 0.9

BICYCLE PARKING				
	RATE	UNITS/AREA	REQUIRED	PROPOSED
APARTMENT BUILDING	.75	304	228	230
TOTAL BICYCLE			256	258
OTHER BICYCLE PROVISIONS				
INCLUSIVE	5% ALL SPACES	-	12	12
SHORT TERM	1 PER 20 DU	304	16	16

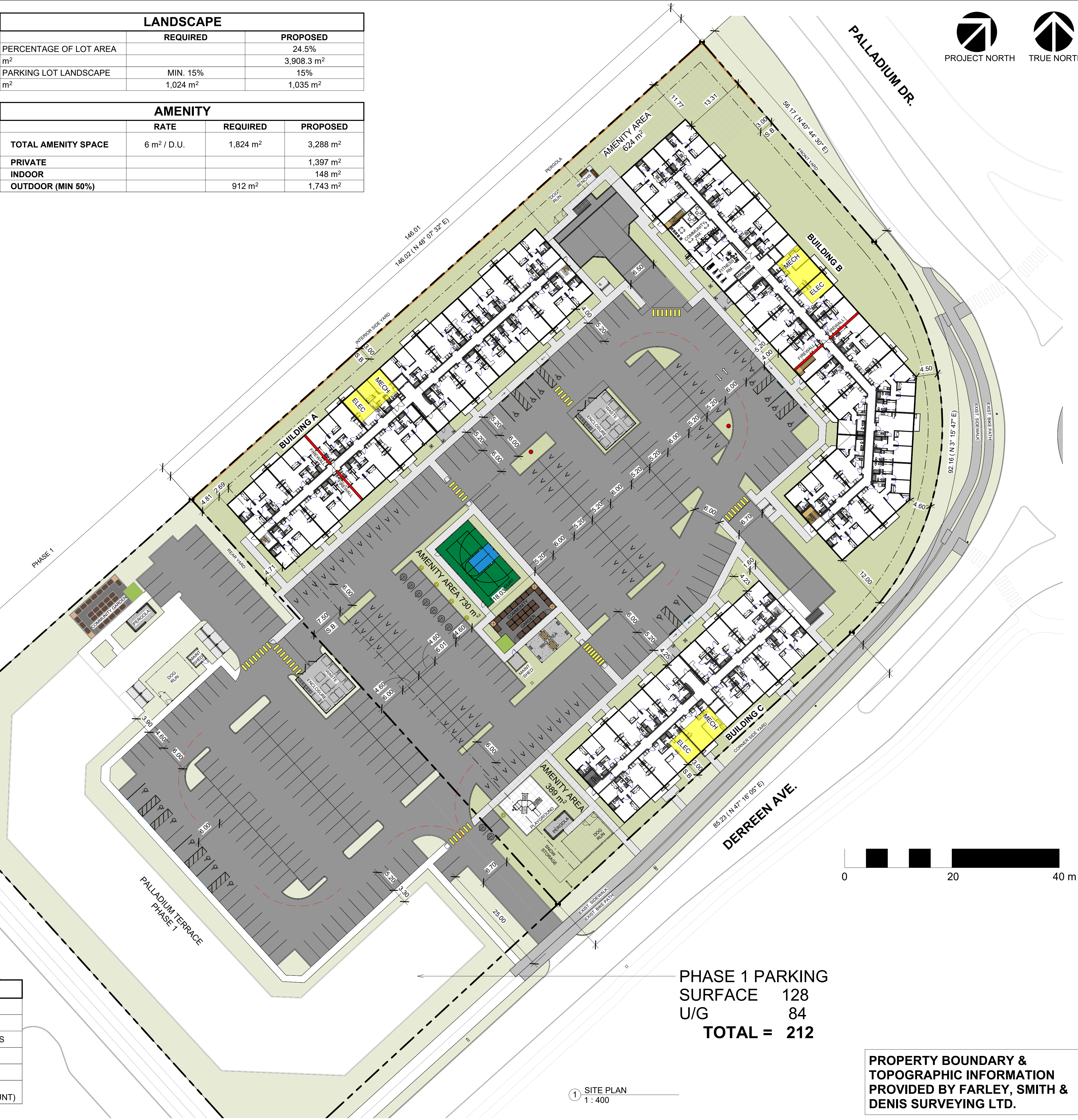
BUILDING INFORMATION				
BUILDING	STORIES	UNIT #	FOOTPRINT	GROSS BLDG AREA
A	6	108	1,640.62 m ²	9,843.72 m ²
B	6	126	1,913.83 m ²	11,482.98 m ²
C	6	72	1,045.58 m ²	6,341.58 m ²
TOTAL			4,600.03 m ²	27,668.28 m ²

UNIT BREAKDOWN				
	BUILDING A	BUILDING B	BUILDING C	
STUDIO	12	12	12	%
1 BED / 1 BATH	13	31	13	17%
2 BED / 1 BATH	7	6	6	8%
2 BED / 2 BATH	64	45	29	40%
3 BED / 2 BATH	12	30	12	17%
TOTAL	108	124	72	
	304 UNITS			

LEGEND			
	PROPERTY LINE		CHAINLINK FENCE
	SETBACK LINE		LANDSCAPE AREA
	BUILDING OUTLINE		CROSSWALK 1.5 X .45 STRIPS
	FIRE HYDRANT		SIDEWALK LETDOWN
	EV CAPABLE CHARGER		ACCESSIBLE PARKING
	WOODEN FENCE		BIKE PARKING (NUMBER REPRESENTS COUNT)

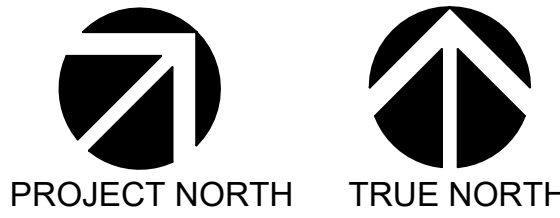
LANDSCAPE		
	REQUIRED	PROPOSED
PERCENTAGE OF LOT AREA		24.5%
m ²		3,908.3 m ²
PARKING LOT LANDSCAPE	MIN. 15%	15%
m ²	1,024 m ²	1,035 m ²

AMENITY			
	RATE	REQUIRED	PROPOSED
TOTAL AMENITY SPACE	6 m ² / D.U.	1,824 m ²	3,288 m ²
PRIVATE			1,397 m ²
INDOOR			148 m ²
OUTDOOR (MIN 50%)		912 m ²	1,743 m ²



PHASE 1 PARKING
SURFACE 128
U/G 84
TOTAL = 212

PROPERTY BOUNDARY &
TOPOGRAPHIC INFORMATION
PROVIDED BY FARLEY, SMITH &
DENIS SURVEYING LTD.



100 St Anns, Campbell River, B.C.
(T)250.286.8045 (F)250.286.8046
www.broadstreet.ca

SITE MAP:



PROJECT STATUS:

CONCEPT

Revision Schedule

No.	Description	Revision Date
A	CONCEPT APPROVED	APR 29, 2025
B	AMENITY REVIEW	JUNE 4, 2025
C	SITE PLAN REVISION	JULY 4, 2025
D	SITE PLAN REVISION - 2	AUG 11, 2025
E	SITE PLAN REVISION - 3	NOV 10, 2025
F	SITE PLAN REVISION - 4	NOV 21, 2025
G	SITE PLAN REVISION - 5	DEC 15, 2025
H	SITE PLAN REVISION - 6	DEC 15, 2025
I	SITE PLAN REVISION - 7	JAN 26, 2026
J	SITE PLAN REVISION - 8	MAR 9, 2026
K	ISSUED FOR DEVELOPMENT PERMIT	APR 22, 2026
L	ISSUED FOR REVIEW	MAY/26/2026

SEAL: ABELARCHITECTURE
THOMAS C. ABEL, ARCHITECT OAA, T: 604-662-6818

TRADE CONTRACTORS SHALL VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES OR INCONSISTENCIES TO SEYMOUR PACIFIC DEVELOPMENTS LTD., WITHOUT DELAY, FOR CLARIFICATION AND/OR CONFIRMATION. DO NOT SCALE DRAWINGS. DESIGNS REPRESENTED AND DRAWINGS USED AS INSTRUMENTS OF SERVICE SHALL REMAIN THE COPYRIGHT AND PROPERTY OF SEYMOUR PACIFIC DEVELOPMENTS LTD. ANY REPRODUCTION OR USE FOR ANY PURPOSE OTHER THAN THAT AUTHORIZED BY SEYMOUR PACIFIC DEVELOPMENTS LTD. IS PROHIBITED.

CONTRACTORS SHALL REMAIN FAMILIAR WITH, SHALL REFER TO, AND SHALL PERFORM IN ACCORDANCE WITH LOCAL LAWS, REGULATIONS AND BUILDING CODES. CONTRACTORS SHALL MAINTAIN GOOD INDUSTRY BUILDING AND SAFETY PRACTICES CONSISTENT WITH THE CONTRACT INTENT AND THE REQUIREMENTS OF JURISDICTIONAL AUTHORITIES.

ADDITIONAL CLAIMS AND COSTS RELATED TO NON-MATERIAL CHANGES WILL NOT BE ACCEPTED BY SEYMOUR PACIFIC DEVELOPMENTS LTD. NON-MATERIAL CHANGES ARE DEEMED TO BE PLAN CHANGES OR SPECIFICATION ADJUSTMENTS THAT DO NOT SUBSTANTIALLY AFFECT THE VALUE, TIME, COST AND QUALITY OF CONSTRUCTION.

CONTRACTORS SHALL MAKE EVERY REASONABLE EFFORT TO MAINTAIN SCHEDULE TARGETS AND PROVIDE GOOD EFFICIENCY, PROGRESS, WORKMANSHIP AND QUALITY TOWARD DEFICIENCY-FREE RESULTS.

PROJECT NAME:

PALLADIUM TERRACE - PHASE 2

PROJECT NUMBER:

VP 2508

ADDRESS:

2765 PALLADIUM DRIVE
OTTAWA, ON

DRAWING TITLE:

SITE PLAN

DRAWN BY: LM

CHECKED BY: BM

DATE: MAR 9, 2026

SCALE: As indicated

DRAWING #:

A1.00

REV #:

L

From: Brad McGregor <brad.mcgregor@broadstreet.ca>

Sent: Monday, March 2, 2026 1:42 PM

To: Anthony Mestwarp <a.mestwarp@novatech-eng.com>; Greg MacDonald <g.Macdonald@novatech-eng.com>; Jeffrey Kelly <j.kelly@novatech-eng.com>

Cc: Greg Winters <G.Winters@novatech-eng.com>; Robert Tran <r.tran@novatech-eng.com>; Anjush Musyaju <a.musyaju@novatech-eng.com>; Brad Byvelds <B.Byvelds@novatech-eng.com>; Ming Fang <m.fang@novatech-eng.com>; Nicole Thomson <n.thomson@novatech-eng.com>

Subject: RE: 125091 Palladium 2

Hi Anthony,

Please see the attached drawings and responses from the designer on these items:

1. Can you please send the roof plans and downspout locations for the buildings once available.
See Attached PDF's for roof plans. Downs to be located on all letter grids. Additional Downs on Building B on GL 7 and 8
2. Can you please confirm the water entry and service entry locations, we have preliminary locations indicated on the attached.
Can the water enter at the side of the building opposite the ramp so that the water meter can be located within the proposed mechanical space? Sanitary service at mid building should be good.
3. Can you confirm the required head room at the bottom of the parking garage access ramps. Presently the ramp for Building C is quite short and may need to be elongated to make the grades work.
3.05M to top of main floor is typical
4. Can you please send confirmation of the building construction (presently we are assuming the same construction as per palladium I)
 - a. Construction material - **Type V same as Palladium 1**
 - i. Type V - Wood frame
 - ii. Type IV - Mass Timber
 - iii. Type III - Ordinary construction
 - iv. Type II - Non-combustible construction
 - v. Type I - Fire resistive construction (2 hrs)
 - b. Provide confirmation of the building footprint similar to the attached plan prepared for the trinity (122179) site
BLDG A: Parkade 1,640.6m2, Main Floor: 1,640.6m2, Upper Floors: 1,662.4m2
BLDG B: Parkade 20,300.3m2, Main Floor: 20,300.3m2, Upper Floors: 20,326.2m2
BLDG C: Parkade 11,254.5m2, Main Floor: 11,254.5m2, Upper Floors: 11,268.1m2
 - c. Sprinkler system design
 - i. Adequately Designed System (NFPA 13) **NFPA 13**
 - ii. Standard Water Supply
 - iii. Fully Supervised System
 - iv. Area of sprinkler coverage (0-100%)

Let me know if you need anything else.

Thanks,

Brad McGregor, (he/him)

Development Manager

BROADSTREET PROPERTIES LTD.

SEYMOUR PACIFIC DEVELOPMENTS LTD.

570 Camiel Sys Street, Winnipeg, MB R2J 4K2

T. 431.478.0685 | C. 431.556.9131

W. www.broadstreet.ca | www.seymourpacific.ca

From: Anthony Mestwarp <a.mestwarp@novatech-eng.com>

Sent: February 27, 2026 3:04 PM

To: Greg MacDonald <g.Macdonald@novatech-eng.com>; Brad McGregor <brad.mcgregor@broadstreet.ca>; Jeffrey Kelly <j.kelly@novatech-eng.com>

Cc: Greg Winters <G.Winters@novatech-eng.com>; Robert Tran <r.tran@novatech-eng.com>; Anjush Musyaju <a.musyaju@novatech-eng.com>; Brad Byvelds <B.Byvelds@novatech-eng.com>; Ming Fang <m.fang@novatech-eng.com>; Nicole Thomson <n.thomson@novatech-eng.com>

Subject: RE: 125091 Palladium 2

Hi Brad,

I hope you are doing well. Some coordination items for the Palladium II site.

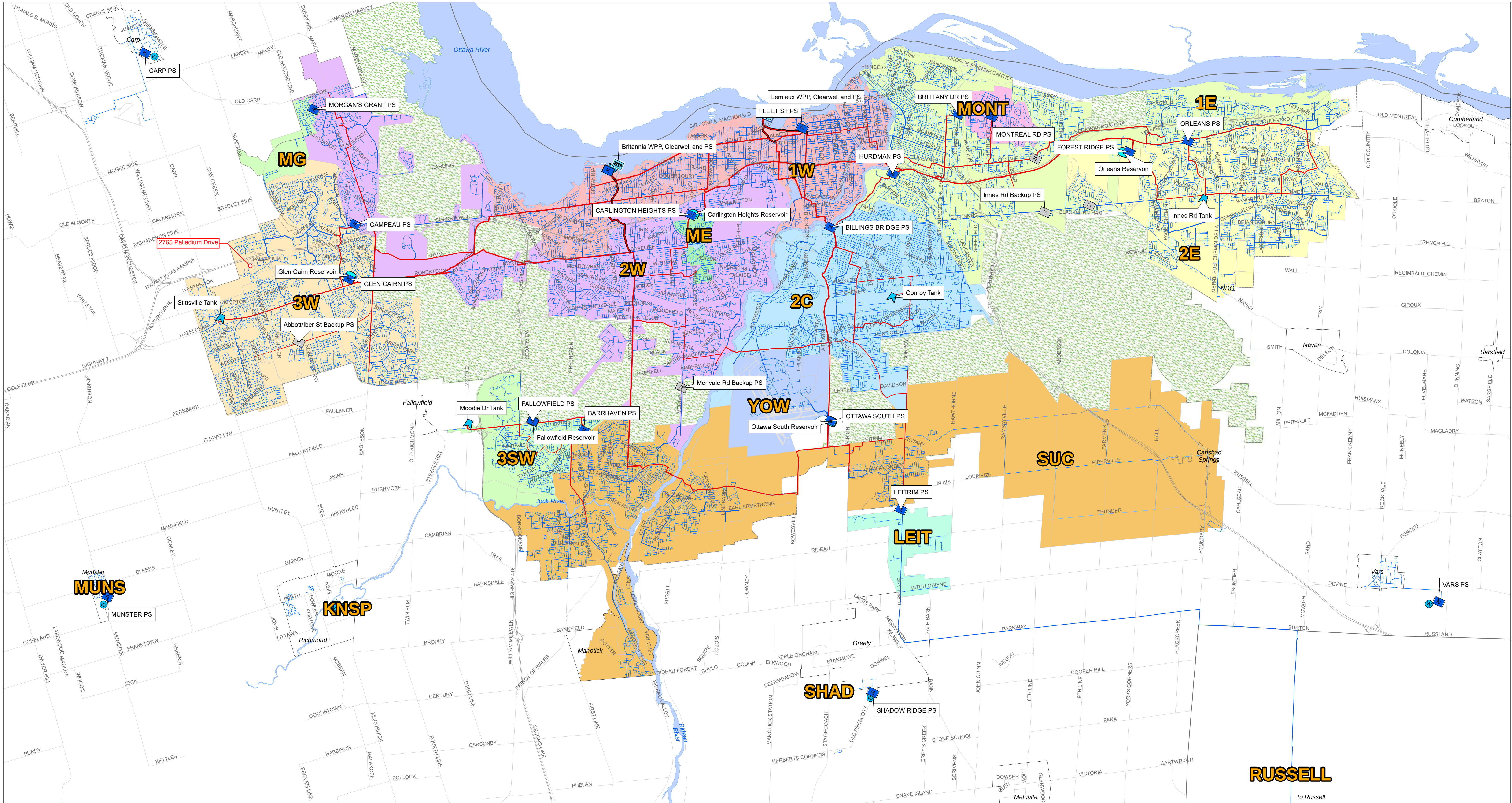
1. Can you please send the roof plans and downspout locations for the buildings once available.
2. Can you please confirm the water entry and service entry locations, we have preliminary locations indicated on the attached.
3. Can you confirm the required head room at the bottom of the parking garage access ramps. Presently the ramp for Building C is quite short and may need to be elongated to make the grades work.
4. Can you please send confirmation of the building construction (presently we are assuming the same construction as per palladium I)
 - a. Construction material
 - i. Type V - Wood frame
 - ii. Type IV - Mass Timber
 - iii. Type III - Ordinary construction
 - iv. Type II - Non-combustible construction
 - v. Type I - Fire resistive construction (2 hrs)
 - b. Provide confirmation of the building footprint similar to the attached plan prepared for the trinity (122179) site
 - c. Sprinkler system design
 - i. Adequately Designed System (NFPA 13)
 - ii. Standard Water Supply
 - iii. Fully Supervised System
 - iv. Area of sprinkler coverage (0-100%)

Thanks,

Anthony Mestwarp, P.Eng., Project Manager | Land Development Engineering
NOVATECH

Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext. 216

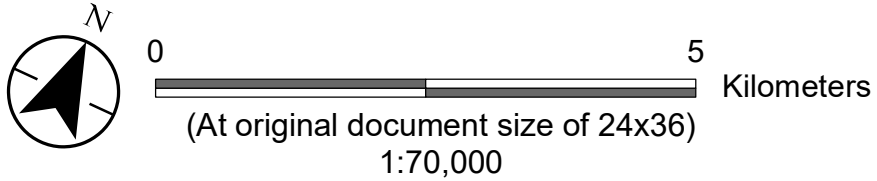


Infrastructure Master Plan - Figure 1-1
Water Distribution System Backbone
Infrastructure

Legend

	Water Purification Plant	Backbone Watermain Diameter	Distribution Watermain Diameter	Pressure Zones		3W		SUC
	Well					EMR		YOW
	Clearwell					LEIT		Greenbelt
	Elevated Tank					ME		
	Reservoir					MG		
	Pump Station (Active)					MONT		
	Pump Station (Backup)					SHADOW RIDGE		

Notes
1. Coordinate System: NAD 1983 CSRS MTM 9
2. Data Sources: Original shapefiles provided by the City of Ottawa; hydraulic model exports.



Water Demand Design Sheet

Boundary Condition Request

Novatech Project #: 125091
Project Name: Palladium Terrace- Phase 2
Date: 3/5/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
Drawing Reference: Site Plan

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

	# of Dwellings	Area (ha.)	Pop. Equiv.	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)	Basic Day Demand (m ³ /day)
Residential Input							
Singles			0.00	0.00	0.00	0.00	0.0
Semis / Townhomes			0.00	0.00	0.00	0.00	0.0
Apartments (1-BR)/Studio	86		120.40	0.39	0.98	2.15	33.7
Apartments (2-BR)	164		344.40	1.12	2.79	6.14	96.4
Apartments (3-BR)	54		167.40	0.54	1.36	2.98	46.9
Industrial / Commercial / Institutional (ICI) Input							
Industrial Area - Light				0.00	0.00	0.00	0.0
Industrial Area - Heavy				0.00	0.00	0.00	0.0
Commercial Area				0.00	0.00	0.00	0.0
Institutional Area				0.00	0.00	0.00	0.0
Other Area				0.00	0.00	0.00	0.0
Totals	304	0.00	632.20	2.05	5.12	11.27	177.0

Summary

i. Type of Development and Units:	3- Multifamily Residential Apartment (6 Storey)
ii. Site Address:	2765 Palladium Drive, Ottawa, ON
iii. Proposed Water Service Connection Location(s):	
iv. Average Day Flow Demand:	2.05 L/s
v. Peak Hour Flow Demand:	11.27 L/s
vi. Maximum Day Flow Demand:	5.12 L/s
vii. Required Fire Flow #1:	17000 L/min
viii. Required Fire Flow #2:	15000 L/min
ix. Required Fire Flow #3:	12000 L/min

Water Demand Design Sheet

Design Parameters

Residential					
Unit Type Population Equiv.	Singles	Semis/ Towns	Apts (1-BR)	Apts (2-BR)	Apts (Avg)
	3.4	2.7	1.4	2.1	3.1
Daily Demand	L/per person/day				
Average Demand	280				
Basic Demand	280				

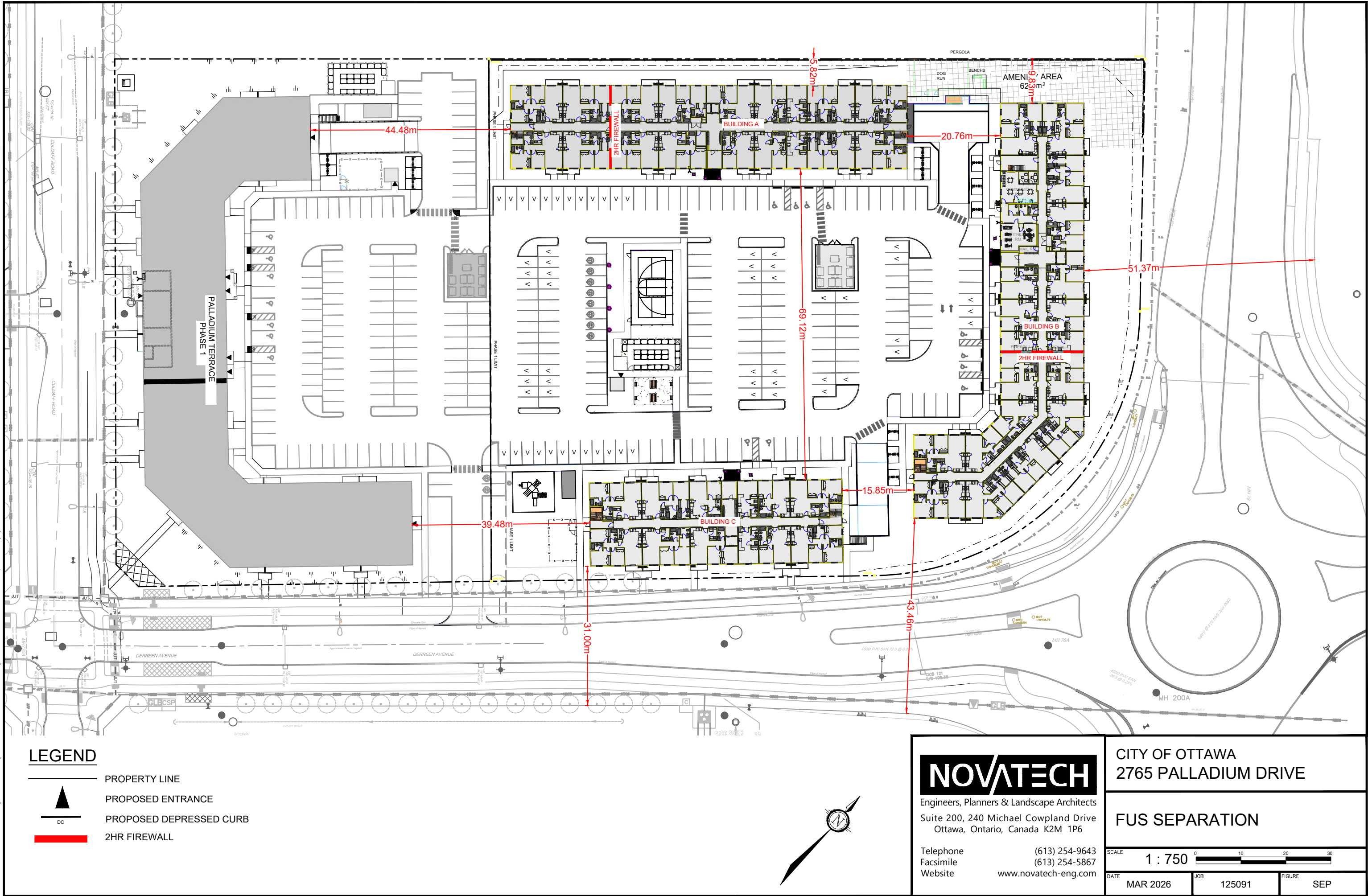
Vulnerable Service Area (VSA)
50
< 50 m³/day
> 50 m³/day

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

Institutional / Commercial / Industrial				
Industrial		Commercial	Institutional	Other Use
Light	Heavy			
L/gross ha/day				L/m²/day
35,000	55,000	28,000	28,000	5
10,000	17,000	17,000	17,000	3

ICI Peaking Factors	Max Day (x Avg Day)	Peak Hour (x Avg Day)
	1.50	2.70

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FUS - Fire Flow Calculations

Novatech Project #: 125091
Project Name: Palladium Terrace- Phase 2
Date: 3/5/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
Drawing Reference: 125091-SEP

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

Building Description: Multifamily Residential Apartment (6 Storey) -A (NE Side)
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)	1243.22				
		Number of Floors/Storeys	6				
		Protected Openings (1 hr) if C<1.0	No				
		Area of structure considered (m ²)			7,459		
	F	Base fire flow without reductions				29,000	
		$F = 220 C (A)^{0.5}$					
Reductions or Surcharges							
3	Occupancy hazard reduction or surcharge			FUS Table 3	Reduction/Surcharge		
	(1)	Non-combustible		-25%	-15%	24,650	
		Limited combustible	Yes	-15%			
		Combustible		0%			
		Free burning		15%			
		Rapid burning		25%			
4	Sprinkler Reduction			FUS Table 4	Reduction		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	-12,325	
		Standard Water Supply	Yes	-10%	-10%		
		Fully Supervised System	Yes	-10%	-10%		
		Cumulative Sub-Total		-50%			
		Area of Sprinklered Coverage (m ²)	7459.32	100%			
	Cumulative Total		-50%				
5	Exposure Surcharge		FUS Table 5		Surcharge		
	(3)	North Side	3.1 - 10 m		20%	4,930	
		East Side	Sprinklered		0%		
		South Side	>30m		0%		
		West Side	2Hr Firewall		0%		
		Cumulative Total		20%			
Results							
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min				L/min	17,000
		(2,000 L/min < Fire Flow < 45,000 L/min)			or	L/s	283
					or	USGPM	4,491

FUS - Fire Flow Calculations

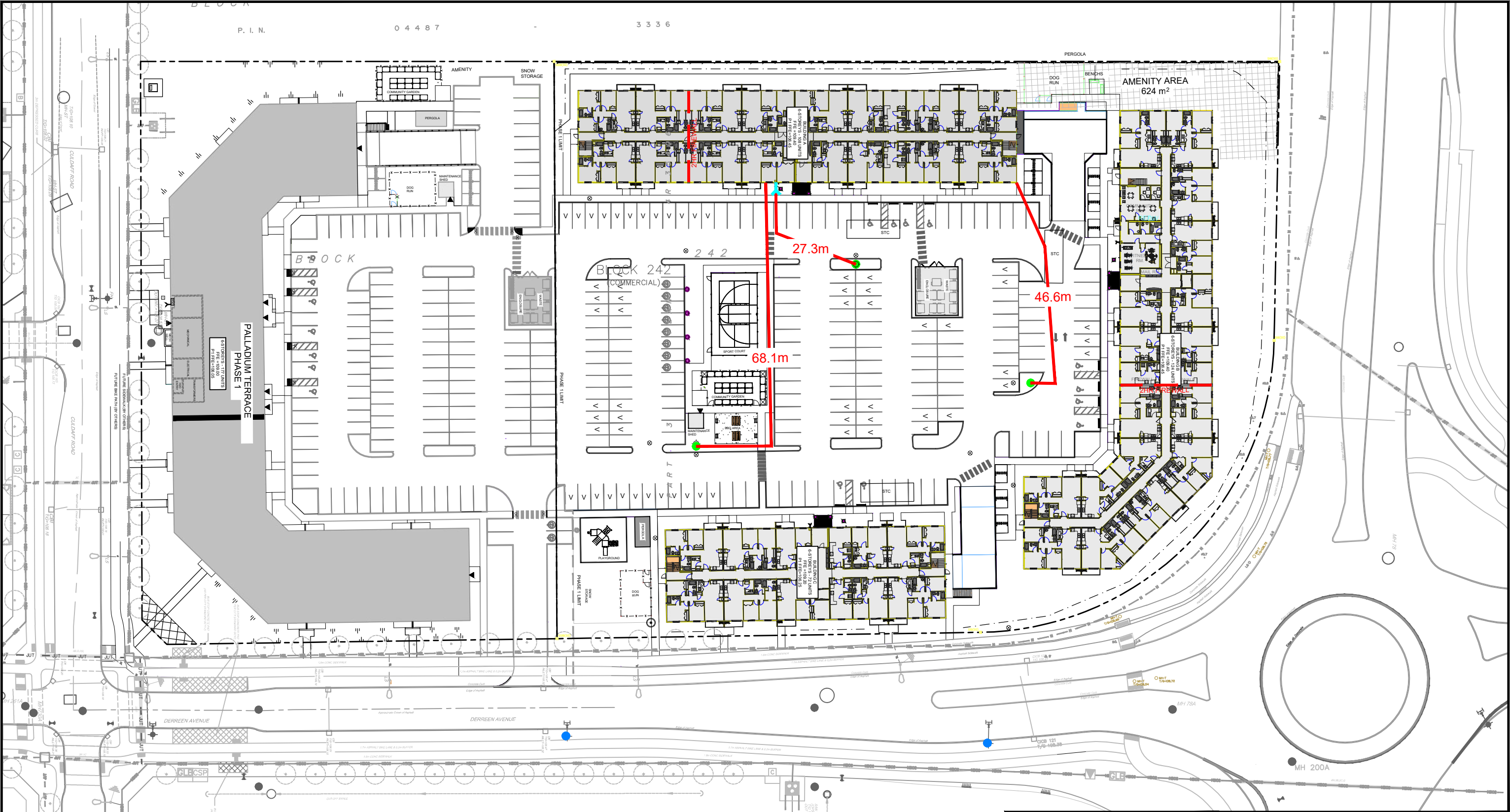
Novatech Project #: 125091
Project Name: Palladium Terrace- Phase 2
Date: 3/5/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
Drawing Reference: 125091-SEP

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

Building Description: Multifamily Residential Apartment (6 Storey) -A (SW Side)
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)	419.15			
		Number of Floors/Storeys	6			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m ²)		2,515		
	F	Base fire flow without reductions				17,000
		F = 220 C (A) ^{0.5}				
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		FUS Table 3	Reduction/Surcharge		
	(1)	Non-combustible		-25%	-15%	14,450
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	Sprinkler Reduction		FUS Table 4	Reduction		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	-7,225
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
		Cumulative Sub-Total		-50%		
		Area of Sprinklered Coverage (m ²)	2514.9	100%		
		Cumulative Total		-50%		
5	Exposure Surcharge		FUS Table 5	Surcharge		
	(3)	North Side	3.1 - 10 m		20%	2,890
		East Side	2Hr Firewall		0%	
		South Side	>30m		0%	
		West Side	>30m		0%	
		Cumulative Total			20%	
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min			L/min	10,000
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	167
				or	USGPM	2,642

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LEGEND

- PROPERTY LINE
- PROPOSED SIAMESE CONNECTION
- EXISTING CLASS AA HYDRANT
- PROPOSED HYDRANT
- DISTANCE FROM HYDRANT TO SIAMESE CONNECTION/ BUILDING ENTRANCE

NOVATECH

Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

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

CITY OF OTTAWA
2765 PALLADIUM DRIVE

COVERAGE PLAN (A)

SCALE 1 : 750
DATE MAR 2026
JOB 125091
FIGURE COV-A (NE)

FUS - Fire Flow Calculations

Novatech Project #: 125091
Project Name: Palladium Terrace- Phase 2
Date: 3/5/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
Drawing Reference: 125091-SEP-B

Legend: Input by User

No Input Required

Reference: Fire Underwriter's Survey Guideline (2020)
Formula Method

Building Description: Multifamily Residential Apartment (6 Storey) -B(NW)

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)	1042.14			6,253	
		Number of Floors/Storeys	6				
		Protected Openings (1 hr) if C<1.0	No				
		Area of structure considered (m ²)					
	F	Base fire flow without reductions					26,000
		$F = 220 C (A)^{0.5}$					
Reductions or Surcharges							
3	Occupancy hazard reduction or surcharge			FUS Table 3	Reduction/Surcharge		
	(1)	Non-combustible		-25%	-15%	22,100	
		Limited combustible	Yes	-15%			
		Combustible		0%			
		Free burning		15%			
		Rapid burning		25%			
4	Sprinkler Reduction			FUS Table 4	Reduction		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	-11,050	
		Standard Water Supply	Yes	-10%	-10%		
		Fully Supervised System	Yes	-10%	-10%		
		Cumulative Sub-Total			-50%		
		Area of Sprinklered Coverage (m ²)	6252.84	100%			
	Cumulative Total			-50%			
5	Exposure Surcharge		FUS Table 5	Surcharge			
	(3)	North Side	3.1 - 10 m		20%	4,420	
		East Side	>30m		0%		
		South Side	2Hr Firewall		0%		
		West Side	Sprinklered		0%		
		Cumulative Total			20%		
Results							
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min				L/min	15,000
		(2,000 L/min < Fire Flow < 45,000 L/min)			or	L/s	250
					or	USGPM	3,963

FUS - Fire Flow Calculations

Novatech Project #: 125091
Project Name: Palladium Terrace- Phase 2
Date: 3/5/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
Drawing Reference: 125091-SEP-B

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

Building Description: Multifamily Residential Apartment (6 Storey) -B(SE)
Type V - Wood frame

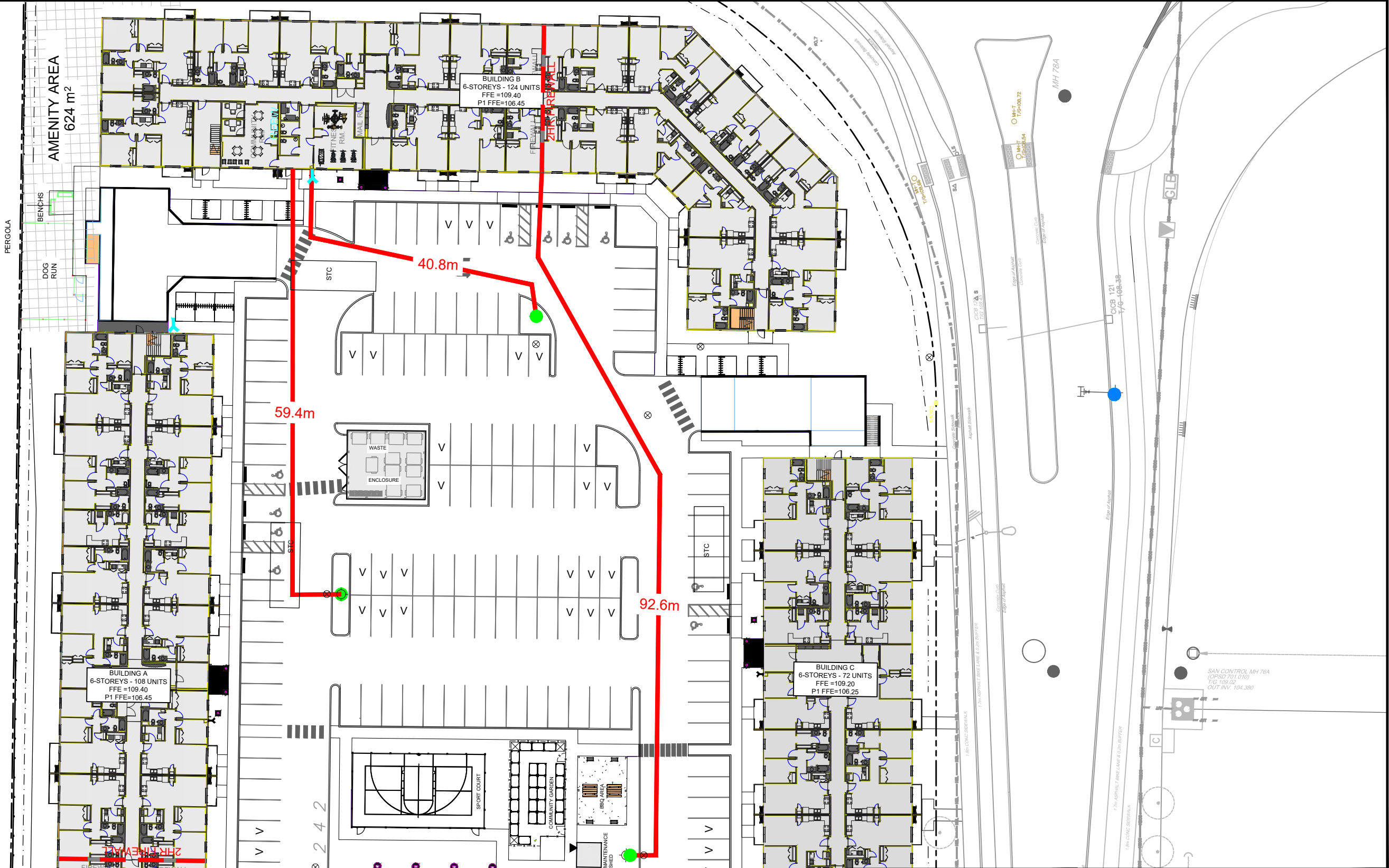
Step			Choose		Value Used	Total Fire Flow
(L/min)						
Base Fire Flow						
1	Construction Material			Multiplier		
	Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction		0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	Floor Area					
	A	Building Footprint (m ²)	897.49			
		Number of Floors/Storeys	6			
		Protected Openings (1 hr) if C<1.0	No			
		Area of structure considered (m ²)		5,385		
	F	Base fire flow without reductions				24,000
		F = 220 C (A) ^{0.5}				
Reductions or Surcharges						
3	Occupancy hazard reduction or surcharge		FUS Table 3	Reduction/Surcharge		
	(1)	Non-combustible		-25%	-15%	20,400
		Limited combustible	Yes	-15%		
		Combustible		0%		
		Free burning		15%		
		Rapid burning		25%		
4	Sprinkler Reduction		FUS Table 4	Reduction		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	-10,200
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	Yes	-10%	-10%	
		Cumulative Sub-Total		-50%		
		Area of Sprinklered Coverage (m ²)	5384.94	100%		
		Cumulative Total		-50%		
5	Exposure Surcharge		FUS Table 5	Surcharge		
	(3)	North Side	2Hr Firewall		0%	0
		East Side	>30m		0%	
		South Side	>30m		0%	
		West Side	Sprinklered		0%	
		Cumulative Total			0%	
Results						
6	(1) + (2) + (3)	Total Required Fire Flow, rounded to nearest 1000L/min			L/min	10,000
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	167
				or	USGPM	2,642

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2 4 3

LEGEND

- PROPERTY LINE
- PROPOSED SIAMESE CONNECTION
- EXISTING CLASS AA HYDRANT
- PROPOSED HYDRANT
- DISTANCE FROM HYDRANT TO SIAMESE CONNECTION/ BUILDING ENTRANCE



NOVATECH

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

CITY OF OTTAWA
2765 PALLADIUM DRIVE

COVERAGE PLAN (B)

SCALE 1 : 500 0 5m 10m 20m

DATE MAR 2026 JOB 125091 FIGURE COV-B (NW)

FUS - Fire Flow Calculations

Novatech Project #: 125091
Project Name: Palladium Terrace- Phase 2
Date: 3/5/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
Drawing Reference: 125091-SEP-C

Legend: Input by User

No Input Required

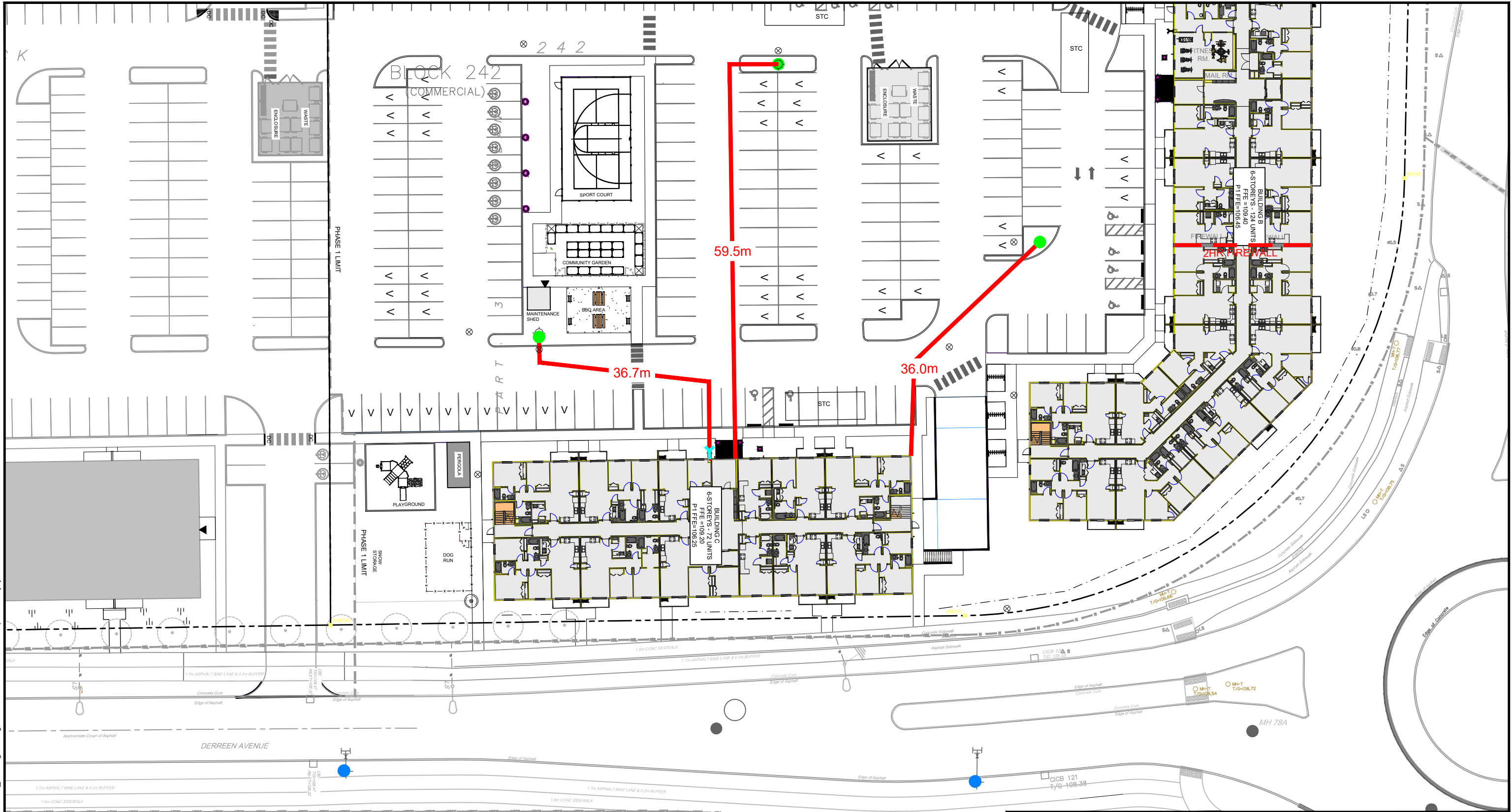
Reference: Fire Underwriter's Survey Guideline (2020)
Formula Method

Building Description: Multifamily Residential Apartment (6 Storey) -C

Type V - Wood frame

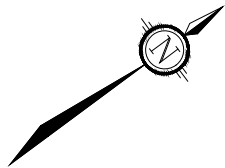
Step				Choose		Value Used	Total Fire Flow (L/min)
Base Fire Flow							
1	Construction Material				Multiplier		
	Coefficient related to type of construction C	Type V - Wood frame	Yes	1.5	1.5		
		Type IV - Mass Timber		Varies			
		Type III - Ordinary construction		1			
		Type II - Non-combustible construction		0.8			
		Type I - Fire resistive construction (2 hrs)		0.6			
2	Floor Area						
	A	Building Footprint (m ²)	1213.83				
		Number of Floors/Storeys	6				
		Protected Openings (1 hr) if C<1.0	No				
		Area of structure considered (m ²)	7,283				
	F	Base fire flow without reductions				28,000	
		F = 220 C (A) ^{0.5}					
Reductions or Surcharges							
3	Occupancy hazard reduction or surcharge			FUS Table 3	Reduction/Surcharge		
	(1)	Non-combustible		-25%	-15%	23,800	
		Limited combustible	Yes	-15%			
		Combustible		0%			
		Free burning		15%			
		Rapid burning		25%			
4	Sprinkler Reduction			FUS Table 4	Reduction		
	(2)	Adequately Designed System (NFPA 13)	Yes	-30%	-30%	-11,900	
		Standard Water Supply	Yes	-10%	-10%		
		Fully Supervised System	Yes	-10%	-10%		
		Cumulative Sub-Total		-50%			
		Area of Sprinklered Coverage (m ²)	7282.98	100%			
Cumulative Total		-50%					
5	Exposure Surcharge		FUS Table 5	Surcharge			
	(3)	North Side	Sprinklered		0%	0	
		East Side	>30m		0%		
		South Side	>30m		0%		
		West Side	>30m		0%		
		Cumulative Total			0%		
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

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LEGEND

- PROPERTY LINE
- PROPOSED SIAMESE CONNECTION
- EXISTING CLASS AA HYDRANT
- PROPOSED HYDRANT
- DISTANCE FROM HYDRANT TO SIAMESE CONNECTION/ BUILDING ENTRANCE



NOVATECH

Engineers, Planners & Landscape Architects
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Website www.novatech-eng.com

CITY OF OTTAWA
2765 PALLADIUM DRIVE

COVERAGE PLAN (C)

SCALE	1 : 500	0 5m 10m 20m
DATE	MAR 2026	JOB 125091
FIGURE	COV-C	

From: Anthony Mestwarp <a.mestwarp@novatech-eng.com>
Sent: Thursday, March 5, 2026 3:42 PM
To: Candow, Julie <julie.candow@ottawa.ca>
Cc: Anjush Musyaju <a.musyaju@novatech-eng.com>; Polyak, Alex <alex.polyak@ottawa.ca>
Subject: 2765 Palladium drive - 125091

Hi Julie/ Alex,

I am working on the design of the 2765 Palladium Drive site. The proposed site is 1.59ha and is located at the intersection of Derreen Avenue and Palladium Drive.

The site is proposed to have three (3), 6-storey wood frame buildings complete with a central parking area. The site will contain 86-1-bed apartments, 164-2-bed apartments and 54 3-bed apartments for a total population of 632 persons.

Site water Demands:

Can you please provide water boundary conditions based on the following:

Average Day demand: **2.05l/s**
Maximum Day demand: **5.12 l/s**
Peak Hour Demand: **11.27 L/s**
Fireflows: **283.2L/s, 250L/s, 200 L/s**

It is proposed to service the site by connecting to the existing watermain within Derreen Avenue at two (2) locations. Figures and calculations are attached for your reference.

Sanitary Allotment

The pre consultation minutes for the site noted the following:

Given that this parcel was anticipated for commercial use in the 195 Huntmar subdivision approval, it is anticipated that the sanitary capacity allocated to this parcel will be exceeded given that a residential use is proposed. The servicing report should identify the proposed sanitary demand and confirm if capacity is available in the downstream sanitary sewer system.

The site was originally accounted for as commercial lands with an assumed flow of 28000L/ha/day, for a total assumed flow of **1.30l/s**.

The proposed residential development will have a design flow of **7.36l/s**, an increase of **6.06l/s**.

As such we have input the increased flow into a revised excel spread sheet for the surrounding subdivision which includes the sanitary system to the intersection of Robert Grant Avenue and Huntmar.

Reviewing the downstream system through the subdivision the existing worst-case capacity was **85.4%** utilization; this increases to **88.1%** in the ultimate condition. As such we do not anticipate conveyance issues in the downstream system.

Can you confirm if the above addresses any concerns that the City may have regarding the sanitary capacity. Calculations are attached for reference.

Please let me know if you have any questions or concerns.

Regards,

Anthony Mestwarp, P.Eng., Project Manager | Land Development Engineering
NOVATECH

Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext. 216

Boundary Conditions 2765 Palladium Drive – 2026

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	123	2.05
Maximum Daily Demand	307	5.12
Peak Hour	676	11.27
Fire Flow Demand #1	12,000	200.00
Fire Flow Demand #2	15,000	250.00
Fire Flow Demand #3	17,000	283.33

Location



Results

Connection 1 - Derreen Ave West

Demand Scenario	Head (m)	Pressure¹ (psi)
Maximum HGL	160.6	78.0
Peak Hour	155.4	70.0
Max Day plus Fire Flow #1	150.9	64.0
Max Day plus Fire Flow #2	148.0	60.0
Max Day plus Fire Flow #3	145.8	57.0

¹ Ground Elevation = 106.0 m

Connection 2 - Derreen Ave East

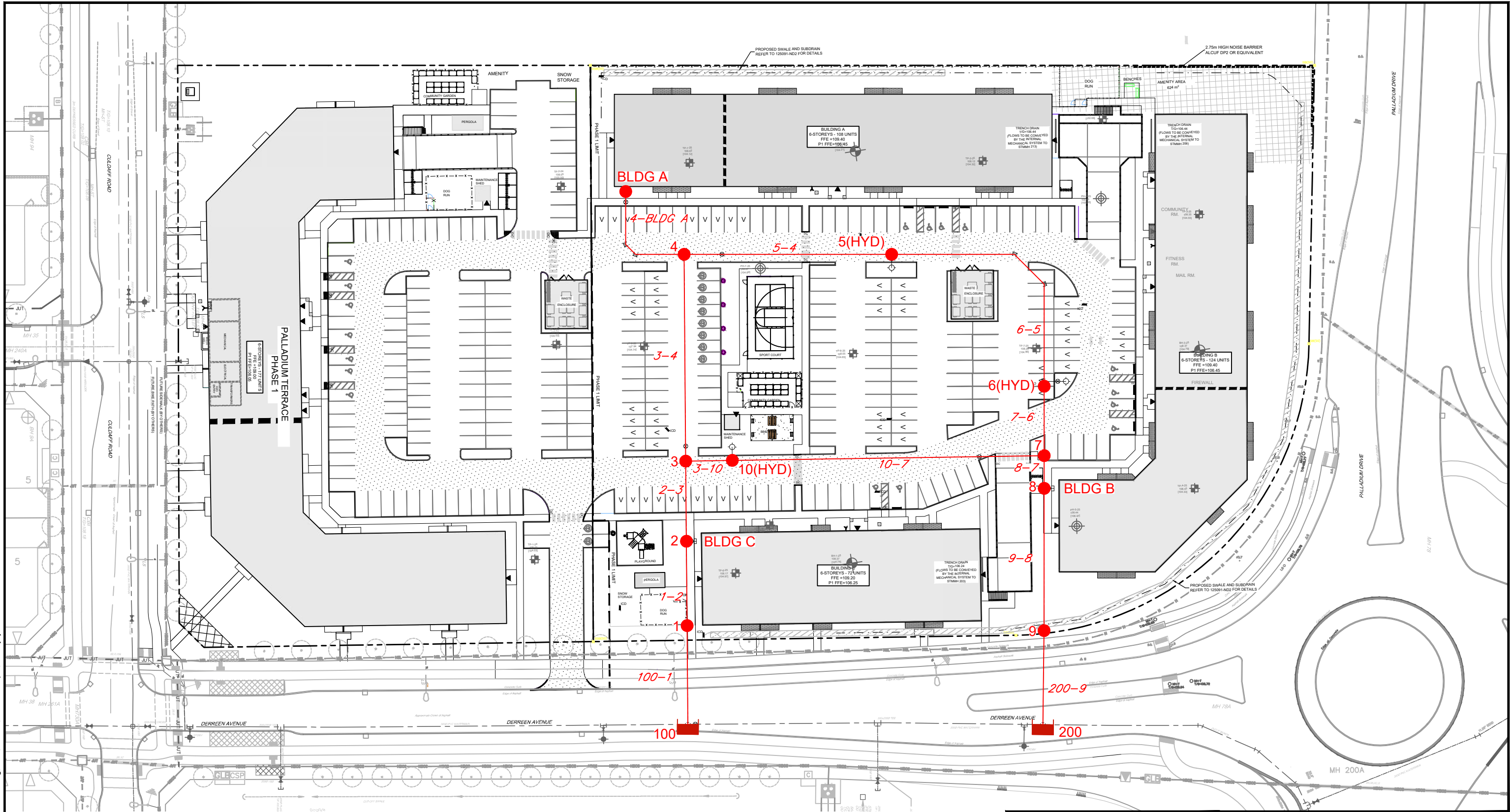
Demand Scenario	Head (m)	Pressure¹ (psi)
Maximum HGL	160.6	77.6
Peak Hour	155.4	70.2
Max Day plus Fire Flow #1	151.5	64.6
Max Day plus Fire Flow #2	148.8	60.9
Max Day plus Fire Flow #3	146.9	58.1

¹ Ground Elevation = 106.0 m

Disclaimer

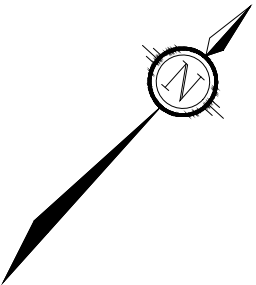
The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary 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.

M:\2025\125091\CAD\Civil\Figures\Service\125091-EPA.dwg, EPA, Mar 16, 2026 - 4:03pm, amusyaju



LEGEND

- 5-4 200mmØ WATERMAIN PIPE
- 4 WATERMAIN NODE
- 400 RESERVOIR



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CITY OF OTTAWA
PALLADIUM 2

WATERMAIN LAYOUT PLAN

SCALE	1 : 750	0 10 20 30
DATE	JUNE 2026	JOB 125091
FIGURE	EPA	

Water Demand Design Sheet



Novatech Project #: 125091

Project Name: Palladium Terrace- Phase 2

Date: 6/8/2026

Input By: Anjush Musyaju, EIT

Reviewed By: Anthony Mestwarp, P.Eng

Drawing Reference: Site Plan

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		Basic Day Demand Daily Volume (m³)
	Singles	Semis / Towns	Apts (2-BR)	Apts (1-BR)	Apts (3-BR)	Pop. Equiv.	Res. Average Day Flow Demand (L/s)	Maximum Day Demand			Peak Hour Demand			Required Fire Flow (RFF)	Max Day + RFF (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)		
1						0.00	0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	0.0
2			35	25	12	145.70	0.47	2.50	1.50	1.18	5.50	2.70	2.60		1.18	40.8
3						0.00	0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	0.0
4						0.00	0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	0.0
Building A			71	25	12	221.30	0.72	2.50	1.50	1.79	5.50	2.70	3.94		1.79	62.0
5(HYD)						0.00	0.00	2.50	1.50	0.00	5.50	2.70	0.00	17,000	283.33	0.0
6(HYD)						0.00	0.00	2.50	1.50	0.00	5.50	2.70	0.00	17,000	283.33	0.0
7						0.00	0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	0.0
8			51	43	30	260.30	0.84	2.50	1.50	2.11	5.50	2.70	4.64		2.11	72.9
J9						0.00	0.00	2.50	1.50	0.00	5.50	2.70	0.00		0.00	0.0
10(HYD)						0.00	0.00	2.50	1.50	0.00	5.50	2.70	0.00	17,000	283.33	0.0
Totals	0	0	157	93	54	627.30	2.03	2.50	1.50	5.08	5.50	2.70	11.18			175.6

Demand Parameters

Residential					
Unit Type Population Equiv.	Singles	Semis/ Towns	Apts (2-BR)	Apts (1-BR)	Apts (3-BR)
	3.4	2.7	2.1	1.4	3.1
Dailly Demand	L/per person/day				
Average Demand	280				
Basic Demand	280				

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
	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				Vulnerable Service Area (VSA) Review ***
FUS (L/min)	Comments	OBC (L/min)	Comments	
> 2,000	Min FUS	< 9,000	Unsprinklered Non- Combustible	
10,000 13,000	Low Density - Singles/Towns Complies w/ TB2014-01 Cap. (10m rear spacing, 6 units max, <600 m²) Non-complying w/TB2014-01. Calculate.			50
				< 50 m³/day
				> 50 m³/day
15,000	Medium Density Back-to-back Towns.			
20,000 5,000	High Density Wood Frame 4-Storey Fire-Resisitve Podium/Multi-Storey			
	High Contiguous / Hazard Areas			
	Max FUS			

Pipe Data Table

Novatech Project #: 125091

Legend: Input by User

Project Name: Palladium Terrace- Phase 2

Date: 6/8/2026

Input By: Anjush Musyaju, EIT

Reviewed By: Anthony Mestwarp, P.Eng

Drawing Reference: Site Plan

Note: Hydraulic modelling completed using EPANET 2.2.

Link ID	Length (m)	Diameter (mm)	C-Factor (m)
100-1	19.91	204	110
1-2	17.02	204	110
2-3	16.17	204	110
3-4	41.70	204	110
5-4	41.83	204	110
6-5	53.86	204	110
7-6	14.00	204	110
8-7	6.60	204	110
9-8	28.68	204	100
200-9	18.97	204	110
3-10	9.40	204	110
10-7	62.89	204	110
4-BLDG'A'	23.30	204	110

Water Demand Design Sheet



Maximum Pressure During Average Day (AVDY) Conditions

Novatech Project #: 125091

Project Name: Palladium Terrace- Phase 2

Date: 6/8/2026

Input By: Anjush Musyaju, EIT

Reviewed By: Anthony Mestwarp

Drawing Reference: Site Plan

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)
1	108.91	0.00	160.60	51.69	74	0
2	109.05	0.47	160.60	51.55	73	0
3	108.48	0.00	160.60	52.12	74	1
4	108.71	0.00	160.60	51.89	74	3
Building A	109.30	0.72	160.60	51.30	73	4
5(HYD)	108.90	0.00	160.60	51.70	74	6
6(HYD)	108.68	0.00	160.60	51.92	74	4
7	109.09	0.00	160.60	51.51	73	3
8	109.20	0.84	160.60	51.40	73	0
J9	108.57	0.00	160.60	52.03	74	0
10(HYD)	108.57	0.00	160.60	52.03	74	1

Water Demand Design Sheet



Minimum Pressure During Peak Hour (PKHR) Conditions

Novatech Project #: 125091

Project Name: Palladium Terrace- Phase 2

Date: 6/8/2026

Input By: Anjush Musyaju, E

Reviewed By: Anthony Mestwarp, P.Eng

Drawing Reference: Site Plan

Legend: Input by User No Input Required

Acceptable (≥ 40 psi)

Unacceptable (< 40 psi)

Note: Hydraulic modelling completed using EPANET 2.0.

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
1	108.91	0.00	155.39	46.48	66
2	109.05	2.60	155.39	46.34	66
3	108.48	0.00	155.39	46.91	67
4	108.71	0.00	155.38	46.67	66
Building A	109.30	3.94	155.38	46.08	66
5(HYD)	108.90	0.00	155.39	46.49	66
6(HYD)	108.68	0.00	155.39	46.71	66
7	109.09	0.00	155.39	46.30	66
8	109.20	4.64	155.39	46.19	66
J9	108.57	0.00	155.39	46.82	67
10(HYD)	108.57	0.00	155.39	46.82	67

Water Demand Design Sheet



Minimum Pressure During Max Day Plus Fire Flow (MXDY+FF) Condition - 5 (HYD)

Novatech Project #: 125091

Legend: Input by User No Input Required

Project Name: Palladium Terrace- Phase 2

Acceptable (≥ 20 psi)

Date: 6/8/2026

Unacceptable (< 20 psi)

Input By: Anjush Musyaju, E

Note: Hydraulic modelling completed using EPANET 2.0.

Reviewed By: Anthony Mestwarp, P.Eng

Drawing Reference: Site Plan

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
1	108.91	0.00	143.73	34.82	50
2	109.05	1.18	141.96	32.91	47
3	108.48	0.00	140.30	31.82	45
4	108.71	0.00	136.13	27.42	39
Building A	109.30	1.79	136.13	26.83	38
5(HYD)	108.90	283.33	132.05	23.15	33
6(HYD)	108.68	0.00	138.60	29.92	43
7	109.09	0.00	140.30	31.21	44
8	109.20	2.11	141.08	31.88	45
J9	108.57	0.00	144.58	36.01	51
10(HYD)	108.57	0.00	140.30	31.73	45

Water Demand Design Sheet



Minimum Pressure During Max Day Plus Fire Flow (MXDY+FF) Condition- 6(HYD)

Novatech Project #: 125091

Legend: Input by User No Input Required

Project Name: Palladium Terrace- Phase 2

Acceptable (≥ 20 psi)

Date: 6/8/2026

Unacceptable (< 20 psi)

Input By: Anjush Musyaju, E

Note: Hydraulic modelling completed using EPANET 2.0.

Reviewed By: Anthony Mestwarp, P.Eng

Drawing Reference: Site Plan

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
1	108.91	0.00	143.95	35.04	50
2	109.05	1.18	142.38	33.33	47
3	108.48	0.00	140.90	32.42	46
4	108.71	0.00	139.50	30.79	44
Building A	109.30	1.79	139.50	30.20	43
5(HYD)	108.90	0.00	138.16	29.26	42
6(HYD)	108.68	283.33	136.43	27.75	39
7	109.09	0.00	139.60	30.51	43
8	109.20	2.11	140.47	31.27	44
J9	108.57	0.00	144.34	35.77	51
10(HYD)	108.57	0.00	140.73	32.16	46

Water Demand Design Sheet



Minimum Pressure During Max Day Plus Fire Flow (MXDY+FF) Condition - 10(HYD)

Novatech Project #: 125091

Legend: Input by User No Input Required

Project Name: Palladium Terrace- Phase 2

Acceptable (≥ 20 psi)

Date: 6/8/2026

Unacceptable (< 20 psi)

Input By: Anjush Musyaju, E

Note: Hydraulic modelling completed using EPANET 2.0.

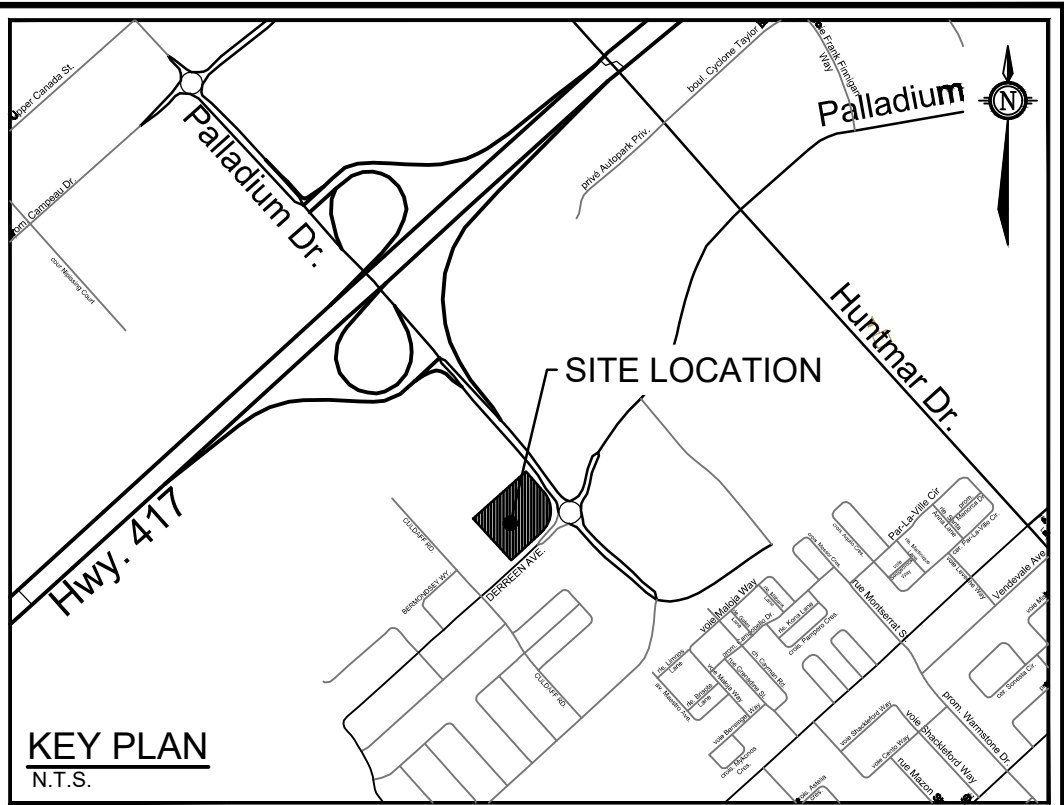
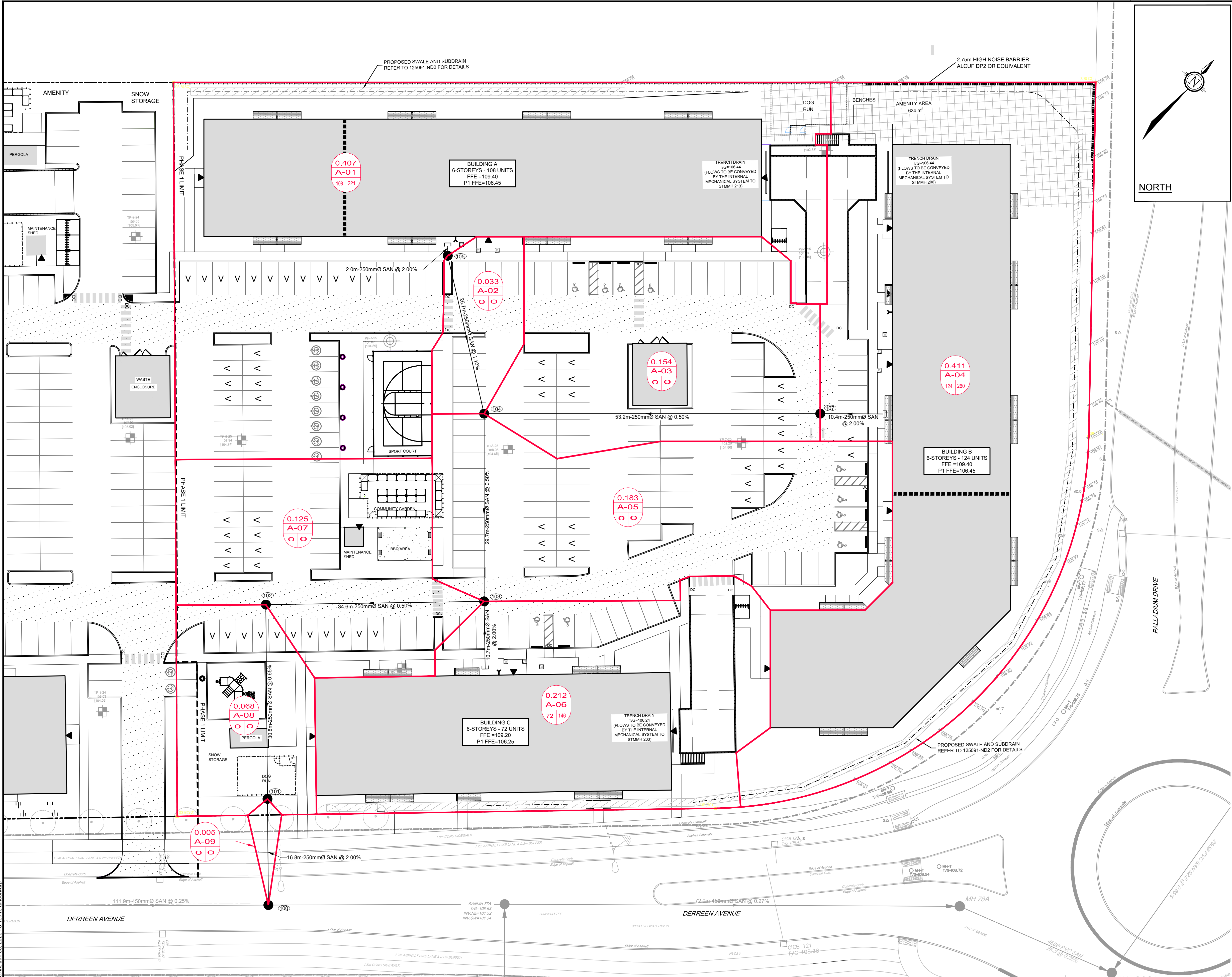
Reviewed By: Anthony Mestwarp, P.Eng

Drawing Reference: Site Plan

Node	Elevation (m)	Demand (L/s)	Total Head (m)	Pressure (m)	Pressure (psi)
1	108.91	0.00	143.42	34.51	49
2	109.05	1.18	141.39	32.34	46
3	108.48	0.00	139.49	31.01	44
4	108.71	0.00	139.92	31.21	44
Building A	109.30	1.79	139.92	30.62	44
5(HYD)	108.90	0.00	140.38	31.48	45
6(HYD)	108.68	0.00	140.98	32.30	46
7	109.09	0.00	141.14	32.05	46
8	109.20	2.11	141.82	32.62	46
J9	108.57	0.00	144.88	36.31	52
10(HYD)	108.57	283.33	137.77	29.20	42

Appendix C

Sanitary Servicing



NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, 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.

NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
1.	ISSUED FOR SITEPLAN APPLICATION	06/08/26	ARM

SCALE

1:300

0 3 6 9 12

DESIGN	FOR REVIEW ONLY
ARM	
CHECKED GJM	
DRAWN AM	
CHECKED ARM	
APPROVED GJM	

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Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
PALLADIUM 2

DRAWING NAME
GRADING PLAN

PROJECT No.	REV	REV#1
125091		

125091-SAN

M:\2025\125091\CAD\Civil\125091-SAN.dwg SAN - Jun 08, 2026 - 3:15pm, amreshwarp

SANITARY SEWER DESIGN SHEET



Novatech Project #: 125091
Project Name: Palladium 2
Date: 3/27/2026
Revised: 6/8/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
Drawing Reference: 125091-SAN

Legend: Design Input by User
As-Built Input by User
Cumulative Cell
Calculated Design Cell Output
Reference: City of Ottawa - Sewer Design Guidelines (2012 and TBs)
MOE - Design Guidelines for Sewage Works (2008)

Location				Demand														Design Capacity							
Street	Area ID	From MH	To MH	Residential Flow										Extraneous Flow Area Method		Total Design Flow	Proposed Sewer Pipe Sizing / Design								
				Studio/ 1-BR Apt	2-BR Apt	3-BR Apt	Park Area	Population	Cumulative Population	Average Pop. Flow	Design Peaking Factor M	Peak Design Pop. Flow	Res. Drainage Area	Cumulative Res. Drainage Area	Cumulative Extraneous Drainage Area	Design Extraneous Flow	Total Peak Design Flow	Pipe Length	Pipe Size (mm) and Material	Pipe ID Actual	Roughness	Design Grade	Capacity	Full Flow Velocity	Q(D) / Qfull
								(in 1000's)	(in 1000's)	Q(q) (L/s)		Q(p) (L/s)	(ha.)	(ha.)	(ha.)	Q(e) (L/s)	Q(D) (L/s)	(m)		(m)	n	So (%)	Qfull (L/s)	(m/s)	
	A-01	Building A	105	25	71	12		0.221	0.221	0.72	3.51	2.51	0.407	0.407	0.407	0.13	2.65	2.0	250 PVC	0.254	0.013	2.00	87.7	1.73	3.0%
	A-02	105	104					0.000	0.221	0.72	3.51	2.51	0.033	0.441	0.441	0.15	2.66	25.7	250 PVC	0.254	0.013	1.10	65.1	1.28	4.1%
	A-04	Building B	107	43	51	30		0.260	0.260	0.84	3.48	2.94	0.411	0.411	0.411	0.14	3.07	10.4	250 PVC	0.254	0.013	2.00	87.7	1.73	3.5%
	A-03	107	104					0.000	0.260	0.84	3.48	2.94	0.154	0.565	0.565	0.19	3.12	53.2	250 PVC	0.254	0.013	0.50	43.9	0.87	7.1%
	A-05	104	103					0.000	0.482	1.56	3.39	5.28	0.183	1.188	1.188	0.39	5.68	29.7	250 PVC	0.254	0.013	0.50	43.9	0.87	12.9%
	A-06	Building C	103	25	35	12		0.146	0.146	0.47	3.56	1.68	0.212	0.212	0.212	0.07	1.75	10.7	250 PVC	0.254	0.013	2.00	87.7	1.73	2.0%
	A-07	103	102					0.000	0.627	2.03	3.34	6.78	0.125	1.525	1.525	0.50	7.29	34.6	250 PVC	0.254	0.013	0.50	43.9	0.87	16.6%
	A-08	102	101					0.000	0.627	2.03	3.34	6.78	0.068	1.593	1.593	0.53	7.31	30.8	250 PVC	0.254	0.013	0.65	50.0	0.99	14.6%
	A-09	101	100					0.000	0.627	2.03	3.34	6.78	0.005	1.598	1.598	0.53	7.31	16.8	250 PVC	0.254	0.013	2.00	87.7	1.73	8.3%
Totals				93	157	54	0.000	0.627	0.627	2.03	3.34	6.78	1.598	1.598	1.598	0.53	7.31	213.9							

Demand Equation / Parameters

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

Definitions

- Q(D) = Peak Design Flow (L/s)
Q(p) = Peak Design Population Flow (L/s)
Q(q) = Average Population Flow (L/s)

P = Residential Population =
q = Average Capita Flow
M = Harmon Formula
K = Harmon Correction Factor
Q(ici) = Industrial / Commercial / Institutional Flow (L/s)
Q(e) = Extraneous Flow (L/s)
- Appartments
Studio/ 1-BR2-BR3- BR
1.42.13.1
- Institutional / Commercial / IndustrialIndustrialCommercial / Institutional
Design =3500028000L/gross ha/day
ICI Peak *
Design =1.01.5* ICI Peak = 1.0 Default, 1.5 if ICI in contributing area is >20% (design only)

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 (m²)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

SANITARY SEWER DESIGN SHEET



nvatech Project #: 123194
Project Name: Palladium 2
Date: 6/13/2024
Revised: 02/05/2025 (Anthony Mestwarp)
Revised: 08/13/2025 (Anthony Mestwarp)
Input By: Anjush Musyaju
Reviewed By: Anthony Mestwarp P.Eng.
Drawing Reference: 123194-SAN

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

Reference: City of Ottawa - Sewer Design Guidelines (2012 a
MOE - Design Guidelines for Sewage Works (200

Location				Demand																			Design Capacity									
Street	Area ID	From MH	To MH	Residential Flow																	Extraneous Flow Area Method		Total Design Flow	Proposed Sewer Pipe Sizing / Design								
				1 bed	2 bed	3bed	Population	Cumulative Population	Average Pop. Flow	Design Peaking Factor M	Peak Design Pop. Flow	Res. Drainage Area	Cumulative Res. Drainage Area	Commercial / Institutional Area	Cumulative Commercial / Institutional Area	Park Area	Cumulativ Park area	Average Design Commercial / Institutional Flow	Commercial / Institutional Peaking Factor	Cumulative ICI Area	Peak Design ICI Flow	Cumulative Extraneous Drainage Area	Design Extraneous Flow Q(e) (L/s)	Total Peak Design Flow	Pipe Length	Pipe Size (mm) and Material	Pipe ID Actual	Roughness	Design Grade	Capacity	Full Flow Velocity	Q(D) / Qfull
				(in 1000's)	(in 1000's)	Q(q) (L/s)		Q(p) (L/s)	(ha.)	(ha.)	(ha.)	(ha.)		(L/s)		(ha.)	Q (ici) (L/s)	(ha.)	(L/s)	Q(D) (L/s)	(m)		(m)	n	So (%)	Qfull (L/s)	(m/s)					
Culdaff rd	425 Culdaff Road	BLDG	Ex. 71A	48	93	36	0.374	0.374	1.21	3.43	4.16	0.973	0.973	0.000	0.000		0.00	1.00	0.000	0.00	0.973	0.32	4.48	3.0	200 PVC	0.203	0.013	1.00	34.2	1.06	13.1%	
Culdaff rd	425 Culdaff Road	71A	72a				0.000	0.374	1.21	3.43	4.16	0.000	0.973	0.000	0.000		0.00	1.00	0.000	0.00	0.973	0.32	4.48	15.0	250 PVC	0.254	0.013	0.65	50.0	0.99	9.0%	
DownStream Analysis																																
Culdaff rd		70A	72A				0.000	0.000	0.00	3.80	0.00	0.190	0.630	27.300	27.300		8.85	1.50	27.300	13.27	27.930	9.22	22.49	76.0	250 PVC	0.254	0.013	0.30	34.0	0.67	66.2%	
Culdaff rd		72A	73A				0.000	0.374	1.21	3.43	4.16	0.160	1.763	0.000	27.300		8.85	1.50	27.300	13.27	29.063	9.59	27.02	76.0	250 PVC	0.254	0.013	0.30	34.0	0.67	79.5%	
Derreen Ave		730A	73A				0.000	5.586	18.10	2.76	49.96		82.890	0.000	0.000		0.00	1.00	0.000	0.00	82.890	27.35	77.32	10.0	375 PVC	0.381	0.013	0.30	100.2	0.88	77.2%	
Culdaff Road		64A	73A				0.000	1.447	4.69	3.15	14.78	0.110	12.630	0.000	1.670	0.530	0.60	1.00	2.200	0.60	14.830	4.89	20.28	10.0	375 PVC	0.381	0.013	0.30	100.2	0.88	20.2%	
Derreen Avenue		73A	75A				0.000	7.407	24.00	2.67	64.00	0.090	97.373	0.000	28.970		0.530	9.45	1.50	29.500	14.17	126.343	41.69	119.86	35.5	450 PVC	0.457	0.013	0.25	148.7	0.91	80.6%
	Block 241	74A	75A				0.000	0.000	0.00	3.80	0.00	0.000	0.000	1.060	1.060		0.000	0.34	1.50	1.060	0.52	1.060	0.35	0.87	15.5	250 PVC	0.254	0.013	0.65	50.0	0.99	1.7%
Derreen Avenue		75A	77A				0.000	7.407	24.00	2.67	64.00	0.310	97.683	0.000	30.030		0.530	9.79	1.50	30.560	14.68	127.713	42.15	120.83	112.0	450 PVC	0.457	0.013	0.25	148.7	0.91	81.2%
	2765 Palladium Road		77A				0.000	0.000	0.00	3.80	0.00		0.000	1.594	1.594		0.000	0.52	1.50	1.594	0.77	1.594	0.53	1.30	20.0	200 PVC	0.203	0.013	1.00	34.2	1.06	3.8%
	Block 240		77A				0.000	0.000	0.00	3.80	0.00		0.000	0.640	0.640		0.000	0.21	1.50	0.640	0.31	0.640	0.21	0.52	16.0	250 PVC	0.254	0.013	0.65	50.0	0.99	1.0%
Derreen Avenue		77A	78A				0.000	7.407	24.00	2.67	64.00	0.200	97.883	0.000	32.264		0.530	10.51	1.50	32.794	15.77	130.147	42.95	122.72	72.0	450 PVC	0.457	0.013	0.25	148.7	0.91	82.5%
Derreen Avenue		78A	200A				0.000	7.407	24.00	2.67	64.00	0.140	98.023	0.000	32.264		0.530	10.51	1.50	32.794	15.77	130.287	42.99	122.77	26.5	450 PVC	0.457	0.013	0.25	148.7	0.91	82.6%
	Commercial	251A	200A				0.000	0.000	0.00	3.80	0.00		0.000	1.350	1.350		0.000	0.44	1.50	1.350	0.66	1.350	0.45	1.10	90.5	250 PVC	0.254	0.013	0.65	50.0	0.99	2.2%
Robert Grant Ave		200A	201A				0.000	7.407	24.00	2.67	64.00	2.190	100.213	0.000	33.614		0.530	10.95	1.50	34.144	16.43	133.827	44.16	124.59	67.0	450 PVC	0.457	0.013	0.25	148.7	0.91	83.8%
Robert Grant Ave		201A	202A				0.000	7.407	24.00	2.67	64.00	0.260	100.473	0.000	34.964		0.530	11.39	1.50	35.494	17.08	135.437	44.69	125.78	70.0	450 PVC	0.457	0.013	0.25	148.7	0.91	84.6%
Robert Grant Ave		202A	203A				0.000	7.407	24.00	2.67	64.00	0.230	100.703	0.000	34.964		0.530	11.39	1.50	35.494	17.08	135.667	44.77	125.85	63.5	450 PVC	0.457	0.013	0.25	148.7	0.91	84.6%
Robert Grant Ave		203A	204A				0.000	7.407	24.00	2.67	64.00	0.430	101.133	0.000	34.964		0.530	11.39	1.50	35.494	17.08	136.097	44.91	126.00	83.5	450 PVC	0.457	0.013	0.25	148.7	0.91	84.7%
	Stittsville Main Street	2000A	204A				0.000	0.028	0.09	3.69	0.33	1.010	1.010		0.000		0.000	0.00	1.00	0.000	0.00	1.010	0.33	0.67	100.0	250 PVC	0.254	0.013	0.65	50.0	0.99	1.3%
Robert Grant Ave		204A	205A				0.000	7.435	24.10	2.66	64.21	0.690	102.833	0.000	34.964		0.530	11.39	1.50	35.494	17.08	137.797	45.47	126.77	110.0	450 PVC	0.457	0.013	0.25	148.7	0.91	85.2%
Robert Grant Ave		205A	206A				0.000	7.435	24.10	2.66	64.21	0.590	103.423	0.000	34.964		0.530	11.39	1.50	35.494	17.08	138.387	45.67	126.96	114.5	450 PVC	0.457	0.013	0.25	148.7	0.91	85.4%
Robert Grant Ave		206A	207A				0.000	7.435	24.10	2.66	64.21	0.160	103.583	7.460	42.424		0.530	13.81	1.50	42.954	20.71	146.007	48.18	133.10	37.0	450 PVC	0.457	0.013	0.30	162.9	0.99	81.7%
Robert Grant Ave		207A	208A				0.000	7.435	24.10	2.66	64.21	0.860	104.443		42.424		0.530	13.81	1.50	42.954	20.71	146.867	48.47	133.39	43.5	450 PVC	0.457	0.013	0.30	162.9	0.99	81.9%
Robert Grant Ave		208A	209A				0.000	7.435	24.10	2.66	64.21	0.340	104.783		42.424		0.530	13.81	1.50	42.954	20.71	147.207	48.58	133.50	90.5	450 PVC	0.457	0.013	0.30	162.9	0.99	81.9%
Robert Grant Ave		209A	210A				0.000	7.435	24.10	2.66	64.21	0.380	105.163		42.424		0.530	13.81	1.50	42.954	20.71	147.587	48.70	133.63	101.5	450 PVC	0.457	0.013	0.30	162.9	0.99	82.0%
Robert Grant Ave		210A	211A				0.000	7.435	24.10	2.66	64.21	0.270	105.433		42.424		0.530	13.81	1.50	42.954	20.71	147.857	48.79	133.71	73.0	450 PVC	0.457	0.013	0.30	162.9	0.99	82.1%
Robert Grant Ave		211A	217A				0.000	7.435	24.10	2.66	64.21	0.380	105.813		42.424		0.530	13.81	1.50	42.954	20.71	148.237	48.92	133.84	110.0	450 PVC	0.457	0.013	0.30	162.9	0.99	82.2%
Robert Grant Ave		217A	Huntmar				0.000	7.435	24.10	2.66	64.21	0.000	105.813	5.060	47.484		0.530	15.45	1.50	48.014	23.17	153.297	50.59	137.97	110.0	450 PVC	0.457	0.013	0.30	162.9	0.99	84.7%
Totals				48	93	36	0.374	0.374	1.21	3.43	4.16	0.973	0.973		0.000	0.000		0.00	1.00	0.000	0.00	0.973	0.32	4.48	3.0							

- Demand Equation / Parameters**
- Q(D) = Q(p) + Q(ici) + Q(e)
 - Q(p) = (P x q x M x K / 86,400)
 - q = 280 L/per person/day (design)
 - M = Harmon Formula (maximum of 4.0)
 - K = 0.8 (design)
 - Park flow is considered equivalent to a single unit / ha
Park Demand = 9300 L/ha/day
 - Q(ici) = ICI Area x ICI Flow x ICI Peak
 - Q(e) = 0.33 L/s/ha (design)

Definitions

Q(D) = Peak Design Flow (L/s)
Q(p) = Peak Design Population Flow (L/s)
Q(q) = Average Population Flow (L/s)

1-Bed Apartment	2-Bed Apartment	3-Bed Apartment	Single	Townhome
1.4	2.1	3.1	3.4	2.7

P = Residential Population =
q = Average Capita Flow
M = Harmon Formula
K = Harmon Correction Factor
Q(ici) = Industrial / Commercial / Institutional Flow (L/s)
Q(e) = Extraneous Flow (L/s)

Institutional / Commercial / Indu	Industrial	Commercial / Institutional
Design = 35000	28000	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)
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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 (m²)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

SANITARY SEWER DESIGN SHEET



Novatech Project #: 123194
Project Name: 425 Culdaff Road
Date: 6/13/2024
Revised: 02/05/2025 (Anthony Mestwarp)
Revised: 08/13/2025 (Anthony Mestwarp)
Revised: 03/05/2026 (Anthony Mestwarp)
Revised: 06/08/2026 (Anthony Mestwarp)
Input By: Anjush Musyaju
Reviewed By: Anthony Mestwarp P.Eng.
Drawing Reference: 123194-SAN

Legend: Design Input by User
As-Built Input by User
Cumulative Cell
Calculated Design Cell Output
Reference: City of Ottawa - Sewer Design Guidelines (2012 and MOE - Design Guidelines for Sewage Works (2008)

Location				Demand																					Design Capacity							
Street	Area ID	From MH	To MH	Residential Flow																		Extraneous Flow Area Method		Total Design Flow	Proposed Sewer Pipe Sizing / Design							
				1 bed	2 bed	3bed	Population	Cumulative Population	Average Pop. Flow	Design Peaking Factor M	Peak Design Pop. Flow	Res. Drainage Area	Cumulative Res. Drainage Area	Commercial / Institutional Area	Cumulative Commercial / Institutional Area	Park Area	Cumlativ Park area	Average Design Commercial / Institutional Flow	Commercial / Institutional Peaking Factor	Cumulative ICI Area	Peak Design ICI Flow	Cumulative Extraneous Drainage Area	Design Extraneous Flow Q(e) (L/s)	Total Peak Design Flow Q(D) (L/s)	Pipe Length	Pipe Size (mm) and Material	Pipe ID Actual	Roughness	Design Grade	Capacity	Full Flow Velocity	Q(D) / Qfull
							(in 1000's)	(in 1000's)	Q(q) (L/s)		Q(p) (L/s)	(ha.)	(ha.)	(ha.)	(ha.)			(L/s)		(ha.)	Q (ici) (L/s)	(ha.)			(m)		(m)	n	So (%)	Qfull (L/s)	(m/s)	
Culdaff rd	425 Culdaff Road	BLDG	Ex. 71A	48	93	36	0.374	0.374	1.21	3.43	4.16	0.973	0.973	0.000	0.000			0.00	1.00	0.000	0.00	0.973	0.32	4.48	3.0	200 PVC	0.203	0.013	1.00	34.2	1.06	13.1%
Culdaff rd	425 Culdaff Road	71A	72a				0.000	0.374	1.21	3.43	4.16	0.000	0.973	0.000	0.000			0.00	1.00	0.000	0.00	0.973	0.32	4.48	15.0	250 PVC	0.254	0.013	0.65	50.0	0.99	9.0%
Culdaff rd		70A	72A				0.000	0.000	0.00	3.80	0.00	0.190	0.630	27.300	27.300			8.85	1.50	27.300	13.27	27.930	9.22	22.49	76.0	250 PVC	0.254	0.013	0.30	34.0	0.67	66.2%
Culdaff rd		72A	73A				0.000	0.374	1.21	3.43	4.16	0.160	1.763	0.000	27.300			8.85	1.50	27.300	13.27	29.063	9.59	27.02	76.0	250 PVC	0.254	0.013	0.30	34.0	0.67	79.5%
Derreen Ave		730A	73A				0.000	5.586	18.10	2.76	49.96		82.890	0.000	0.000			0.00	1.00	0.000	0.00	82.890	27.35	77.32	10.0	375 PVC	0.381	0.013	0.30	100.2	0.88	77.2%
Culdaff Road		64A	73A				0.000	1.447	4.69	3.15	14.78	0.110	12.630	0.000	1.670	0.530	0.530	0.60	1.00	2.200	0.60	14.830	4.89	20.28	10.0	375 PVC	0.381	0.013	0.30	100.2	0.88	20.2%
Derreen Avenue		73A	75A				0.000	7.407	24.00	2.67	64.00	0.090	97.373	0.000	28.970		0.530	9.45	1.50	29.500	14.17	126.343	41.69	119.86	35.5	450 PVC	0.457	0.013	0.25	148.7	0.91	80.6%
	Block 241	74A	75A				0.000	0.000	0.00	3.80	0.00	0.000	0.000	1.060	1.060		0.000	0.34	1.50	1.060	0.52	1.060	0.35	0.87	15.5	250 PVC	0.254	0.013	0.65	50.0	0.99	1.7%
Derreen Avenue		75A	New Manhole				0.000	7.407	24.00	2.67	64.00	0.310	97.683	0.000	30.030		0.530	9.79	1.50	30.560	14.68	127.713	42.15	120.83	74.5	450 PVC	0.457	0.013	0.25	148.7	0.91	81.2%
	2765 Palladium Road		New Manhole	93	157	54	0.627	0.627	2.03	3.34	6.78	1.594	1.594		0.000		0.000	0.00	1.00	0.000	0.00	1.594	0.53	7.31	20.0	200 PVC	0.203	0.013	1.00	34.2	1.06	21.4%
Derreen Avenue		New Manhole	77A				0.000	8.034	26.04	2.64	68.71	0.310	99.587	0.000	30.030		0.530	9.79	1.50	30.560	14.68	129.617	42.77	126.16	37.4	450 PVC	0.457	0.013	0.25	148.7	0.91	84.8%
	Block 240		77A				0.000	0.000	0.00	3.80	0.00		0.000	0.640	0.640		0.000	0.21	1.50	0.640	0.31	0.640	0.21	0.52	16.0	250 PVC	0.254	0.013	0.65	50.0	0.99	1.0%
Derreen Avenue		77A	78A				0.000	8.034	26.04	2.64	68.71	0.200	99.787	0.000	30.670		0.530	10.00	1.50	31.200	14.99	130.457	43.05	126.75	72.0	450 PVC	0.457	0.013	0.25	148.7	0.91	85.2%
Derreen Avenue		78A	200A				0.000	8.034	26.04	2.64	68.71	0.140	99.927	0.000	30.670		0.530	10.00	1.50	31.200	14.99	130.597	43.10	126.80	26.5	450 PVC	0.457	0.013	0.25	148.7	0.91	85.3%
	Commercial	251A	200A				0.000	0.000	0.00	3.80	0.00		0.000	1.350	1.350		0.000	0.44	1.50	1.350	0.66	1.350	0.45	1.10	90.5	250 PVC	0.254	0.013	0.65	50.0	0.99	2.2%
Robert Grant Ave		200A	201A				0.000	8.034	26.04	2.64	68.71	2.190	102.117	0.000	32.020		0.530	10.43	1.50	32.550	15.65	134.137	44.27	128.62	67.0	450 PVC	0.457	0.013	0.25	148.7	0.91	86.5%
Robert Grant Ave		201A	202A				0.000	8.034	26.04	2.64	68.71	0.260	102.377	0.000	33.370		0.530	10.87	1.50	33.900	16.31	135.747	44.80	129.81	70.0	450 PVC	0.457	0.013	0.25	148.7	0.91	87.3%
Robert Grant Ave		202A	203A				0.000	8.034	26.04	2.64	68.71	0.230	102.607	0.000	33.370		0.530	10.87	1.50	33.900	16.31	135.977	44.87	129.89	63.5	450 PVC	0.457	0.013	0.25	148.7	0.91	87.3%
Robert Grant Ave		203A	204A				0.000	8.034	26.04	2.64	68.71	0.430	103.037	0.000	33.370		0.530	10.87	1.50	33.900	16.31	136.407	45.01	130.03	83.5	450 PVC	0.457	0.013	0.25	148.7	0.91	87.4%
	Stittsville Main Street	2000A	204A				0.000	0.028	0.09	3.69	0.33	1.010	1.010		0.000		0.000	0.00	1.00	0.000	0.00	1.010	0.33	0.67	100.0	250 PVC	0.254	0.013	0.65	50.0	0.99	1.3%
Robert Grant Ave		204A	205A				0.000	8.062	26.13	2.64	68.91	0.690	104.737	0.000	33.370		0.530	10.87	1.50	33.900	16.31	138.107	45.58	130.80	110.0	450 PVC	0.457	0.013	0.25	148.7	0.91	88.0%
Robert Grant Ave		205A	206A				0.000	8.062	26.13	2.64	68.91	0.590	105.327	0.000	33.370		0.530	10.87	1.50	33.900	16.31	138.697	45.77	130.99	114.5	450 PVC	0.457	0.013	0.25	148.7	0.91	88.1%
Robert Grant Ave		206A	207A				0.000	8.062	26.13	2.64	68.91	0.160	105.487	7.460	40.830		0.530	13.29	1.50	41.360	19.93	146.317	48.28	137.13	37.0	450 PVC	0.457	0.013	0.30	162.9	0.99	84.2%
Robert Grant Ave		207A	208A				0.000	8.062	26.13	2.64	68.91	0.860	106.347		40.830		0.530	13.29	1.50	41.360	19.93	147.177	48.57	137.42	43.5	450 PVC	0.457	0.013	0.30	162.9	0.99	84.4%
Robert Grant Ave		208A	209A				0.000	8.062	26.13	2.64	68.91	0.340	106.687		40.830		0.530	13.29	1.50	41.360	19.93	147.517	48.68	137.53	90.5	450 PVC	0.457	0.013	0.30	162.9	0.99	84.4%
Robert Grant Ave		209A	210A				0.000	8.062	26.13	2.64	68.91	0.380	107.067		40.830		0.530	13.29	1.50	41.360	19.93	147.897	48.81	137.65	101.5	450 PVC	0.457	0.013	0.30	162.9	0.99	84.5%
Robert Grant Ave		210A	211A				0.000	8.062	26.13	2.64	68.91	0.270	107.337		40.830		0.530	13.29	1.50	41.360	19.93	148.167	48.89	137.74	73.0	450 PVC	0.457	0.013	0.30	162.9	0.99	84.6%
Robert Grant Ave		211A	217A				0.000	8.062	26.13	2.64	68.91	0.380	107.717		40.830		0.530	13.29	1.50	41.360	19.93	148.547	49.02	137.87	110.0	450 PVC	0.457	0.013	0.30	162.9	0.99	84.6%
Robert Grant Ave		217A	Huntmar				0.000	8.062	26.13	2.64	68.91	0.000	107.717	5.060	45.890		0.530	14.93	1.50	46.420	22.39	153.607	50.69	142.00	110.0	450 PVC	0.457	0.013	0.30	162.9	0.99	87.2%
Totals				48	93	36	0.374	0.374	1.21	3.43	4.16	0.973	0.973		0.000	0.000		0.00	1.00	0.000	0.00	0.973	0.32	4.48	3.0							

Demand Equation / Parameters

1. Q(D) = Q(p) + Q(ici) + Q(e)

2. Q(p) = (P x q x M x K / 86,400)

3. q = 280 L/per person/day

4. M = Harmon Formula (maximum of 4.0)

5. K = 0.8

6. Park flow is considered equivalent to a single unit / ha
Park Demand = 9300 L/ha/day

7. Q(ici) = ICI Area x ICI Flow x ICI Peak

8. Q(e) = 0.33 L/s/ha
- (design)

(design)

(design)

(design)

Definitions

Q(D) = Peak Design Flow (L/s)

Q(p) = Peak Design Population Flow (L/s)

Q(q) = Average Population Flow (L/s)

1-Bed Apartment1-Bed Apartment3-Bed Apartment

Single Townhome

P = Residential Population = 1.4 2.1 3.1

3.4 2.7

q = Average Capita Flow

M = Harmon Formula

K = Harmon Correction Factor

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

ICI Peak *

Design = 1.0 1.5

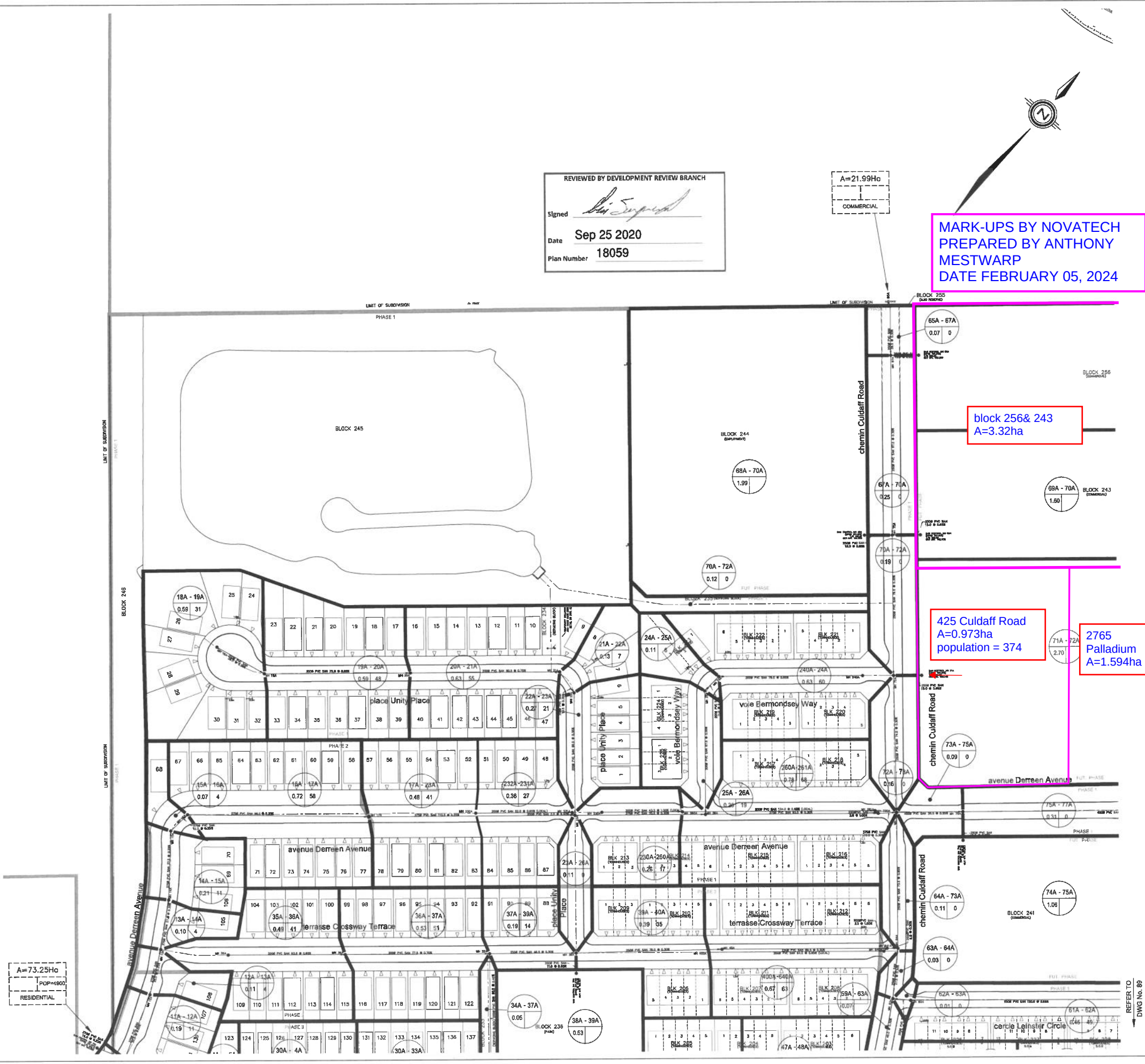
* ICI Peak = 1.0 Default, 1.5 if ICI in contributing area is >20% (design only)

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 (m²)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient



REVIEWED BY DEVELOPMENT REVIEW BRANCH
Signed *[Signature]*
Date Sep 25 2020
Plan Number 18059

A=21.99Ha
COMMERCIAL

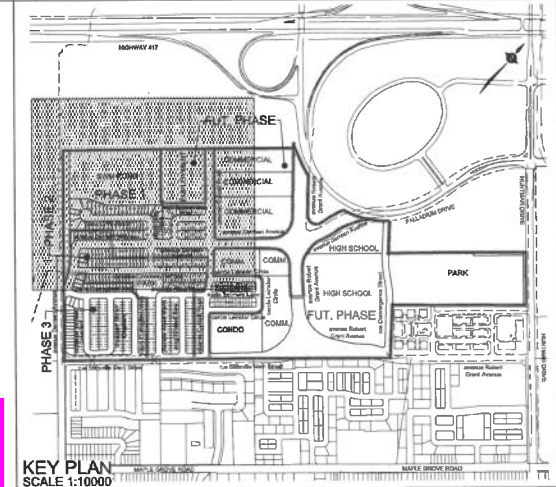
MARK-UPS BY NOVATECH
PREPARED BY ANTHONY
MESTWARP
DATE FEBRUARY 05, 2024

block 256& 243
A=3.32ha

425 Cudaff Road
A=0.973ha
population = 374

2765
Palladium
A=1.594ha

A=73.25Ha
POP=4800
RESIDENTIAL



- LEGEND
- SANITARY DRAINAGE BOUNDARY
 - SANITARY SUB-DRAINAGE BOUNDARY
 - SANITARY DRAINAGE BOUNDARY (OTHER PHASES)
 - UPSTREAM MH TO DOWNSTREAM MH
 - AREA IN HECTARES
 - POPULATION
 - UPSTREAM MH TO DOWNSTREAM MH
 - AREA IN OTHER PHASES IN HECTARES
 - POPULATION
 - EXTERNAL AREA IN HECTARES
 - EXTERNAL POPULATION
 - DENSITY (PERSONS/HECTARE)
 - EXTERNAL LAND USE
 - MAINTENANCE HOLE
 - CAP

TOPOGRAPHIC INFORMATION
CITY OF OTTAWA 1:1 MAP, RECEIVED ON OCTOBER 4, 2016, FEEDMILL CREEK
TOPOGRAPHIC SURVEY (JULY 25, 2019) AND PALLADIUM DRIVE TOPOGRAPHIC
SURVEY (JUNE 23, 2020) PROVIDED BY STANTEC (PROJECT No. 161613545-111)
LEGAL INFORMATION
M-PLAN PROVIDED BY STANTEC GEOMATICS LTD., PROJECT No. 16-16-135-45
(195 HUNTMAR ROAD), RECEIVED ON MAY 21, 2020.
3rd SUBMISSION 20-07-09

ELEVATION NOTE

NOTATIONS SHOWN HEREON ARE GEODETIC (COVID-1928:1978) AND ARE
BASED FROM THE CAN-NET VRS NETWORK MONUMENT: OTTAWA

ELEVATION = 85.205m

No.	BY	DATE	DESCRIPTION
3	W.L.	20-07-09	3rd SUBMISSION
2	W.L.	20-04-03	2nd SUBMISSION
1	W.L.	19-12-23	1st SUBMISSION

PROJECT No. 12-624

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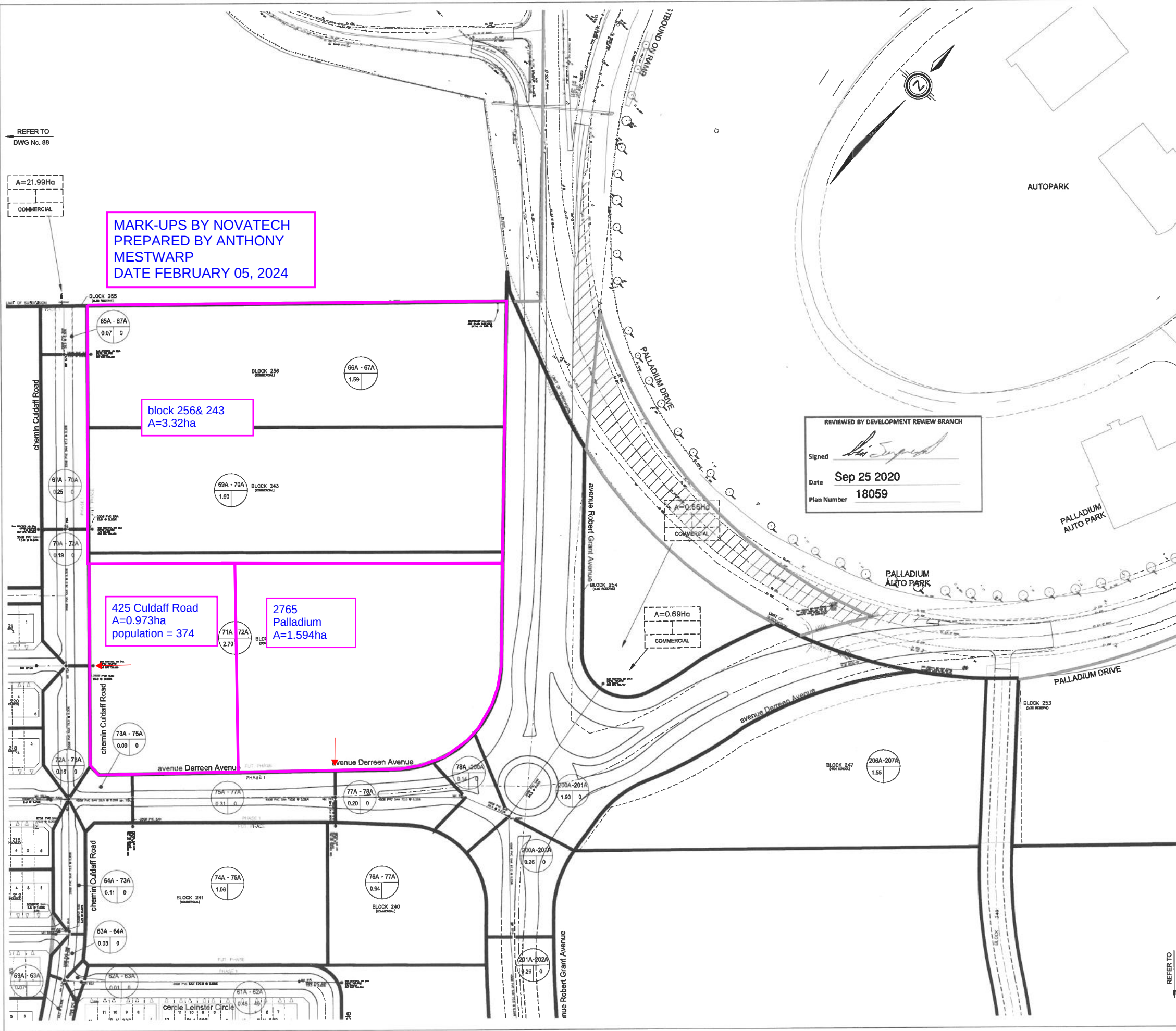
SANITARY DRAINAGE PLAN

2325483
ONTARIO LTD.

195 HUNTMAR DRIVE

120 Iber Road, Unit 103
Stittville, ON K2S 1E9
Tel: (613) 836-0555
Fax: (613) 836-7183
www.DSEL.ca

DRAWN BY: R.A./A.K.	CHECKED BY: W.L.	SHEET NO.
DESIGNED BY: W.L.	CHECKED BY: C.M.	88
SCALE: 1:1000	DATE: DECEMBER 2019	



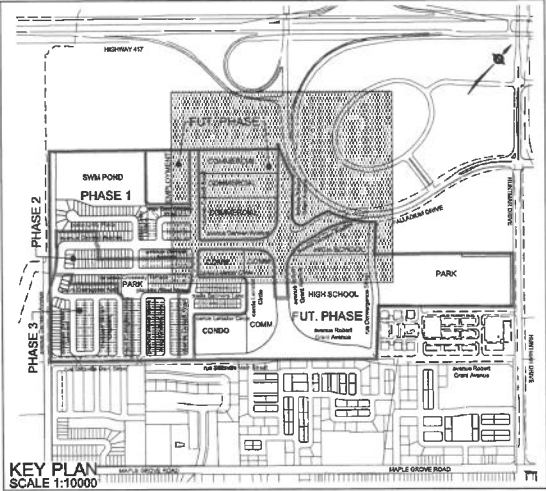
MARK-UPS BY NOVATECH
PREPARED BY ANTHONY
MESTWARP
DATE FEBRUARY 05, 2024

block 256 & 243
A=3.32ha

425 Cudaff Road
A=0.973ha
population = 374

2765 Palladium
A=1.594ha

REVIEWED BY DEVELOPMENT REVIEW BRANCH
Signed *[Signature]*
Date Sep 25 2020
Plan Number 18059



- LEGEND
- SANITARY DRAINAGE BOUNDARY
 - SANITARY SUB-DRAINAGE BOUNDARY
 - SANITARY DRAINAGE BOUNDARY (OTHER PHASES)
 - UPSTREAM MH TO DOWNSTREAM MH
 - AREA IN HECTARES
 - POPULATION
 - EXTERNAL AREA IN HECTARES
 - EXTERNAL POPULATION
 - DENSITY (PERSONS/HECTARE)
 - EXTERNAL LAND USE
 - MAINTENANCE HOLE
 - CAP

TOPOGRAPHIC INFORMATION
CITY OF OTTAWA 1:10,000 MAP, RECEIVED ON OCTOBER 4, 2015. FEEDMILL CREEK TOPOGRAPHIC SURVEY (JULY 28, 2018) AND PALLADIUM DRIVE TOPOGRAPHIC SURVEY (JUNE 23, 2020) PROVIDED BY STANTEC (PROJECT No. 161613545-111)
LEGAL INFORMATION
M-PLAN PROVIDED BY STANTEC GEOMATICS LTD., PROJECT No. 16-16-135-45 (195 HUNTMAR ROAD), RECEIVED ON MAY 21, 2020.
3rd SUBMISSION 20-07-09

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CNO-1828-1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK MONUMENT, OTTAWA.

ELEVATION = 95.205m

No.	BY	DATE	DESCRIPTION
3	W.L.	20-07-01	3rd SUBMISSION
2	W.L.	20-04-01	2nd SUBMISSION
1	W.L.	19-12-23	1st SUBMISSION

Ottawa CITY OF OTTAWA

PROJECT No. 12-624

2325483 ONTARIO LTD.

195 HUNTMAR DRIVE

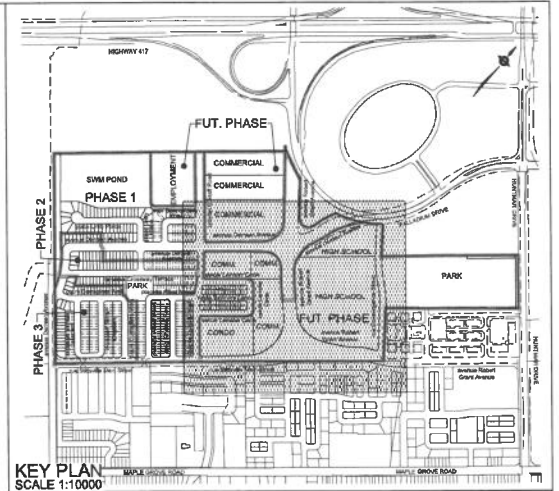
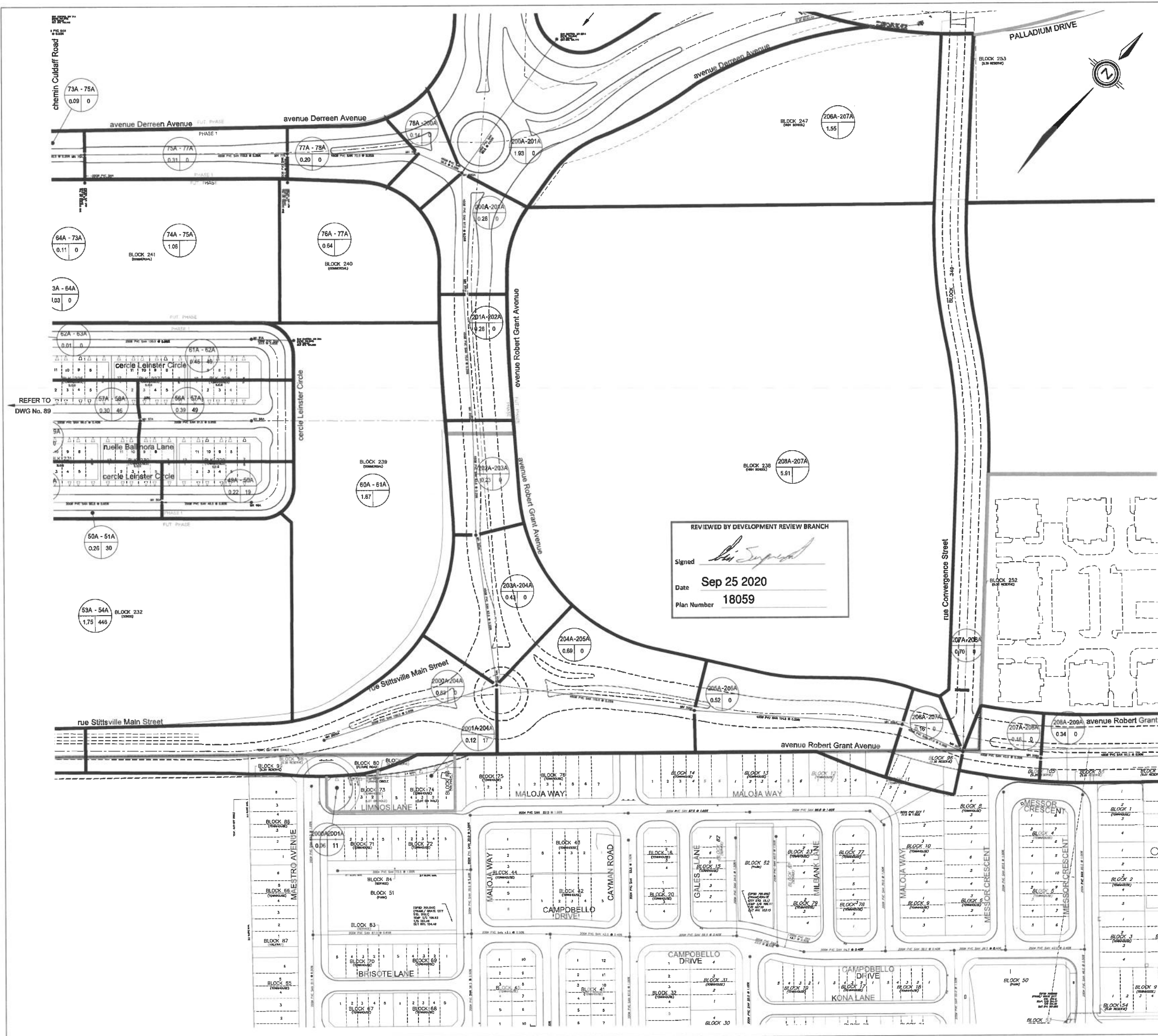
SANITARY DRAINAGE PLAN

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www.DSEL.ca

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www.DSEL.ca

DRAWN BY: R.A./A.K. CHECKED BY: W.L. SHEET No. 90
DESIGNED BY: W.L. CHECKED BY: C.M.
SCALE: 1:1000 DATE: DECEMBER 2019



- LEGEND**
- SANITARY DRAINAGE BOUNDARY
 - SANITARY SUB-DRAINAGE BOUNDARY
 - SANITARY DRAINAGE BOUNDARY (OTHER PHASES)
 - UPSTREAM MH TO DOWNSTREAM MH
 - AREA IN HECTARES
 - POPULATION
 - UPSTREAM MH TO DOWNSTREAM MH
 - AREA IN OTHER PHASES IN HECTARES
 - POPULATION
 - EXTERNAL AREA IN HECTARES
 - EXTERNAL POPULATION
 - DENSITY (PERSONS/HECTARE)
 - EXTERNAL LAND USE
 - MAINTENANCE HOLE
 - CAP

TOPOGRAPHIC INFORMATION
CITY OF OTTAWA 1:10000 MAPPING, RECEIVED ON OCTOBER 4, 2016. FREEMILL CREEK TOPOGRAPHIC SURVEY (JULY 26, 2019) AND PALLADIUM DRIVE TOPOGRAPHIC SURVEY (JUNE 23, 2020) PROVIDED BY STANTEC (PROJECT No. 161613545-111)
LEGAL INFORMATION
W-PLAN PROVIDED BY STANTEC GEOMATICS LTD., PROJECT No. 16-16-135-45 (195 HUNTMAR ROAD), RECEIVED ON MAY 21, 2020.
3rd SUBMISSION 20-07-09

ELEVATION NOTE
ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928/1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK MONUMENT: OTTAWA

ELEVATION = 95.205m

No	BY	DATE	DESCRIPTION
3	W.L.	20-07-09	3rd SUBMISSION
2	W.L.	20-04-03	2nd SUBMISSION
1	W.L.	19-12-23	1st SUBMISSION

Ottawa CITY OF OTTAWA

PROJECT No. 12-624

SANITARY DRAINAGE PLAN

2325483
ONTARIO LTD.

195 HUNTMAR DRIVE

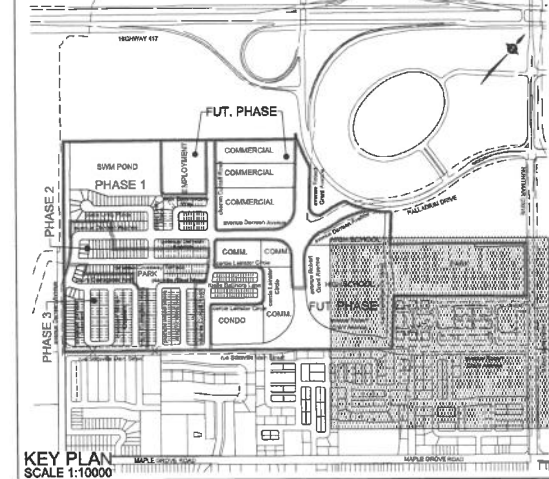
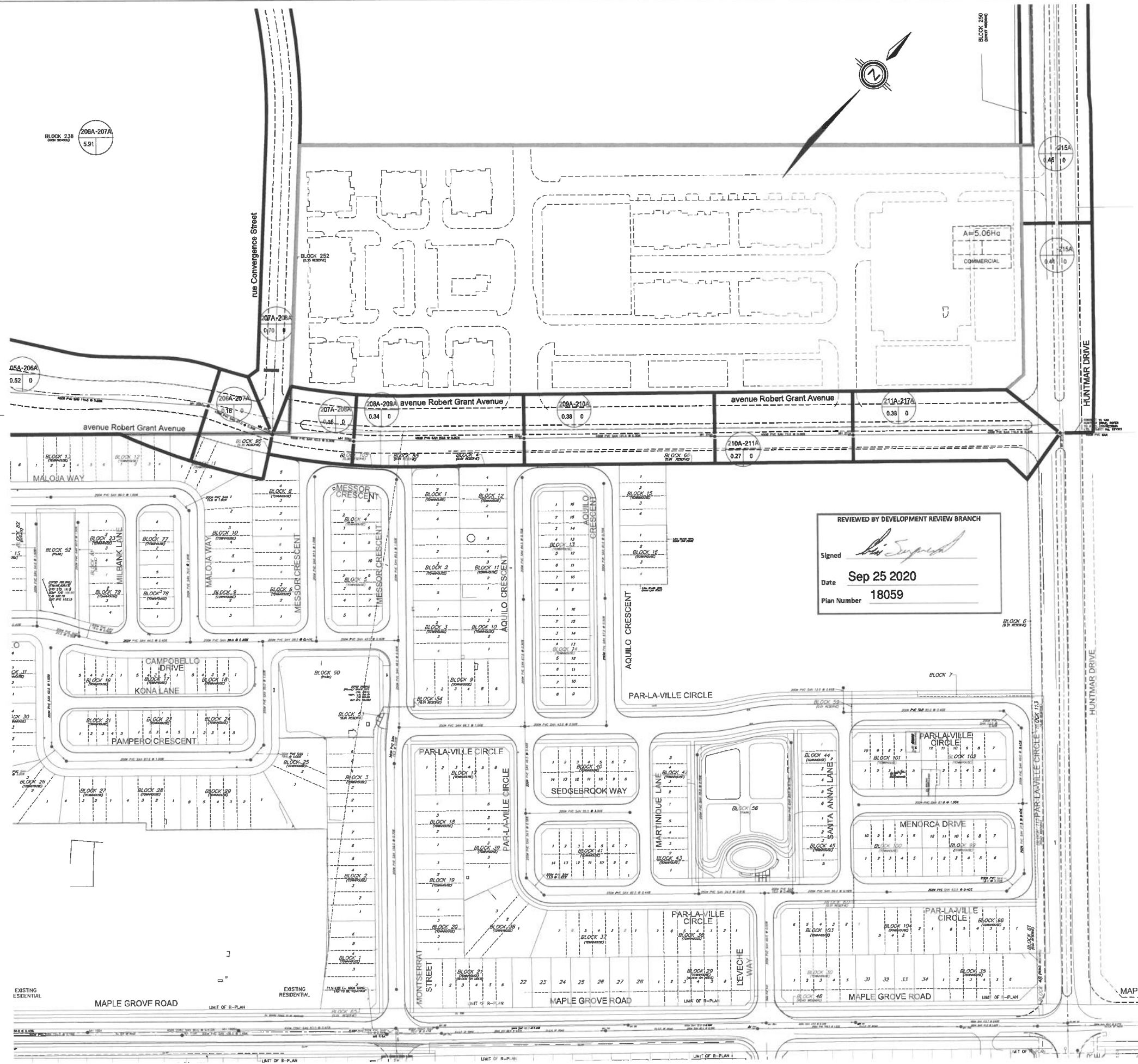
DSEL
david schaeffer engineering ltd

120 Iber Road, Unit 103
Stittville, ON K2S 1E9
Tel: (613) 838-9658
Fax: (613) 838-7163
www.DSEL.ca

DRAWN BY: R.A./A.K.
DESIGNED BY: W.L.
SCALE: 1:1000

CHECKED BY: W.L.
CHECKED BY: C.M.
DATE: DECEMBER 2019

SHEET No.
91



LEGEND

SANITARY DRAINAGE BOUNDARY	==
SANITARY SUB-DRAINAGE BOUNDARY	---
SANITARY DRAINAGE BOUNDARY (OTHER PHASES)	---
UPSTREAM MH TO DOWNSTREAM MH	43A-44A
AREA IN HECTARES	0.78 61
POPULATION	107
UPSTREAM MH TO DOWNSTREAM MH	43A-44A
AREA IN OTHER PHASES IN HECTARES	0.78 61
POPULATION	107
EXTERNAL AREA IN HECTARES	A=53.63
EXTERNAL POPULATION	POP=5738
DENSITY (PERSONS/HECTARE)	107
EXTERNAL LAND USE	RESIDENTIAL
MAINTENANCE HOLE	MH102A
CAP	1020A

TOPOGRAPHIC INFORMATION
CITY OF OTTAWA 1:10,000 MAPPING, RECEIVED ON OCTOBER 4, 2016. FEEDMILL CREEK TOPOGRAPHIC SURVEY (JULY 26, 2019) AND PALLADIUM DRIVE TOPOGRAPHIC SURVEY (JUNE 23, 2020) PROVIDED BY STANTEC (PROJECT No. 161613545-111)
LEGAL INFORMATION
MAP PROVIDED BY STANTEC GEOMATICS LTD., PROJECT No. 16-16-135-45 (195 HUNTMAR ROAD), RECEIVED ON MAY 21, 2020.
3rd SUBMISSION 20-07-09

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928/1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK MONUMENT: OTTAWA

ELEVATION = 95.205m

No.	BY	DATE	DESCRIPTION
3	W.L.	20-07-09	3rd SUBMISSION
2	W.L.	20-04-03	2nd SUBMISSION
1	W.L.	19-12-23	1st SUBMISSION

Ottawa CITY OF OTTAWA

PROJECT No. 12-624

2325483
ONTARIO LTD.

195 HUNTMAR DRIVE

SANITARY DRAINAGE PLAN

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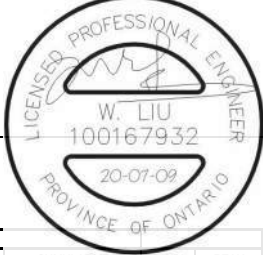
DRAWN BY: R.A./A.K.
DESIGNED BY: W.L.
SCALE: 1:1000

CHECKED BY: W.L.
CHECKED BY: C.M.
DATE: DECEMBER 2019

SHEET No.
93

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013



LOCATION			RESIDENTIAL AREA AND POPULATION										COMM		INSTIT		PARK		C+H	INFILTRATION			TOTAL	PIPE			RATIO		VEL.	
STREET		FROM M.H.	TO M.H.	AREA (ha)	UNITS	UNITS Singles	UNITS Townhouse	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	Q act/Q cap	(FULL) (m/s)	(ACT.) (m/s)
Block 240 (Commercial)																														
		76A	77A						0.00				0.64	0.64		0.00		0.00	0.31	0.64	0.64	0.21	0.52	16.0	250	0.65	47.94	0.01	0.98	0.31
To avenue Derreen Avenue, Pipe 77A - 78A									0.00	0				0.64		0.00		0.00		0.64										
Block 241 (Commercial)																														
		74A	75A						0.00				1.06	1.06		0.00		0.00	0.52	1.06	1.06	0.35	0.87	15.5	250	0.65	47.94	0.02	0.98	0.37
To avenue Derreen Avenue, Pipe 75A - 77A									0.00	0				1.06		0.00		0.00		1.06										
Block 244 (Employment)																														
		68A	70A						0.00				1.99	1.99		0.00		0.00	0.97	1.99	1.99	0.66	1.62	15.0	250	0.65	47.94	0.03	0.98	0.45
To chemin Culdaff Road, Pipe 70A - 72A									0.00	0				1.99		0.00		0.00		1.99										
Block 243 (Commercial)																														
		69A	70A						0.00				1.60	1.60		0.00		0.00	0.78	1.60	1.60	0.53	1.31	15.0	250	0.65	47.94	0.03	0.98	0.42
To chemin Culdaff Road, Pipe 70A - 72A									0.00	0				1.60		0.00		0.00		1.60										
Block 256 (Commercial)																														
		66A	67A						0.00				1.59	1.59		0.00		0.00	0.77	1.59	1.59	0.52	1.30	15.0	250	0.65	47.94	0.03	0.98	0.42
To chemin Culdaff Road, Pipe 67A - 70A									0.00	0				1.59		0.00		0.00		1.59										
Block 233 (Servicing Block)																														
Contribution From cours Curraglass Walk, Pipe 30A - 33A									1.42	139				0.00		0.00		0.00		1.42	1.42									
Contribution From cours Curraglass Walk, Pipe 32A - 33A									1.15	120				0.00		0.00		0.00		1.15	1.15									
		33A	34A	0.01				0	2.58	259	3.48	2.92		0.00		0.00		0.00	0.00	0.01	2.58	0.85	3.78	12.0	200	0.40	20.74	0.18	0.66	0.50
		34A	37A	0.05				0	2.63	259	3.48	2.92		0.00		0.00		0.00	0.00	0.05	2.63	0.87	3.79	60.5	200	0.45	22.00	0.17	0.70	0.52
To terrasse Crossway Terrace, Pipe 37A - 39A									2.63	259				0.00		0.00		0.00			2.63									
terrasse Crossway Terrace																														
		35A	36A	0.49	12	12		41	0.49	41	3.67	0.49		0.00		0.00		0.00	0.00	0.49	0.49	0.16	0.65	63.5	200	0.65	26.44	0.02	0.84	0.35
		36A	37A	0.53	15	15		51	1.02	92	3.60	1.07		0.00		0.00		0.00	0.00	0.53	1.02	0.34	1.41	77.5	200	0.70	27.44	0.05	0.87	0.45
Contribution From Block 223, Pipe 34A - 37A									2.63	259				0.00		0.00		0.00		2.63	2.63									
		37A	39A	0.19	4	4		14	3.84	365	3.43	4.06		0.00		0.00		0.00	0.00	0.19	3.84	1.27	5.33	46.5	250	0.30	32.57	0.16	0.66	0.49
Contribution From Block 236 (Park), Pipe 38A - 39A									0.00	0				0.00		0.00		0.53		0.53	0.53	0.17	0.17	11.0	200	0.65	26.44	0.01	0.84	0.23
		400A	640A	0.67	23		23	63	0.67	63	3.63	0.74		0.00		0.00		0.00	0.00	0.67	0.67	0.22	0.96	94.5	200	0.65	26.44	0.04	0.84	0.40
		640A	641A						0.67	63	3.63	0.74		0.00		0.00		0.00	0.00	0.67	0.67	0.22	0.96	2.5	200	1.00	32.80	0.03	1.04	0.46
		39A	40A	0.39	13		13	35	4.23	400	3.42	4.43		0.00		0.00		0.53	0.09	0.39	4.76	1.57	6.09	79.0	250	0.30	32.57	0.19	0.66	0.51
		40A	641A						4.23	400	3.42	4.43		0.00		0.00		0.53	0.00	0.00	4.76	1.57	6.00	89.5	250	0.30	32.57	0.18	0.66	0.51
		641A	64A						4.90	463	3.39	5.09		0.00		0.00		0.53	0.00	0.00	5.43	1.79	6.88	6.0	250	0.30	32.57	0.21	0.66	0.52
To chemin Culdaff Road, Pipe 64A - 73A									4.90	463				0.00		0.00		0.53			5.43									
rang Kindred Row																														
		45A	46A	0.71	22		22	60	0.71	60	3.64	0.71		0.00		0.00		0.00	0.00	0.71	0.71	0.23	0.94	78.5	200	0.65	26.44	0.04	0.84	0.39
		46A	47A	0.58	22		22	60	1.29	120	3.58	1.39		0.00		0.00		0.00	0.00	0.58	1.29	0.43	1.82	90.5	200	0.65	26.44	0.07	0.84	0.48
To placette Allied Mews, Pipe 47A - 48A									1.29	120				0.00		0.00		0.00			1.29									
ruelle Ballinora Lane																														
		56A	57A	0.39	18		18	49	0.39	49	3.65	0.58		0.00		0.00		0.00	0.00	0.39	0.39	0.13	0.71	61.5	200	0.65	26.44	0.03	0.84	0.36
		57A	58A	0.30			17	46	0.69	95	3.60	1.11		0.00		0.00		0.00	0.00	0.30	0.69	0.23	1.34	66.0	200	0.40	20.74	0.06	0.66	0.37
		58A	59A	0.01					0.70	95	3.60	1.11		0.00		0.00		0.00	0.00	0.01	0.70	0.23	1.34	10.5	200	0.40	20.74	0.06	0.66	0.37
To chemin Culdaff Road, Pipe 59A - 63A									0.70	95				0.00		0.00		0.00		0.70										

DESIGN PARAMETERS										Designed:		PROJECT:				
Park Flow =	9300	L/ha/da	0.10764	I/s/ha						R.A.	195 Huntmar Drive					
Average Daily Flow =	280	l/p/day														
Comm/Inst Flow =	28000	L/ha/da	0.3241	I/s/ha												
Industrial Flow =	35000	L/ha/da	0.40509	I/s/ha							City of Ottawa					
Max Res. Peak Factor =	4.00															
Commercial/Inst./Park Peak Factor =	1.50															
Institutional =	0.32	I/s/ha														

624 San3.xlsx

624 San3.xlsx

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

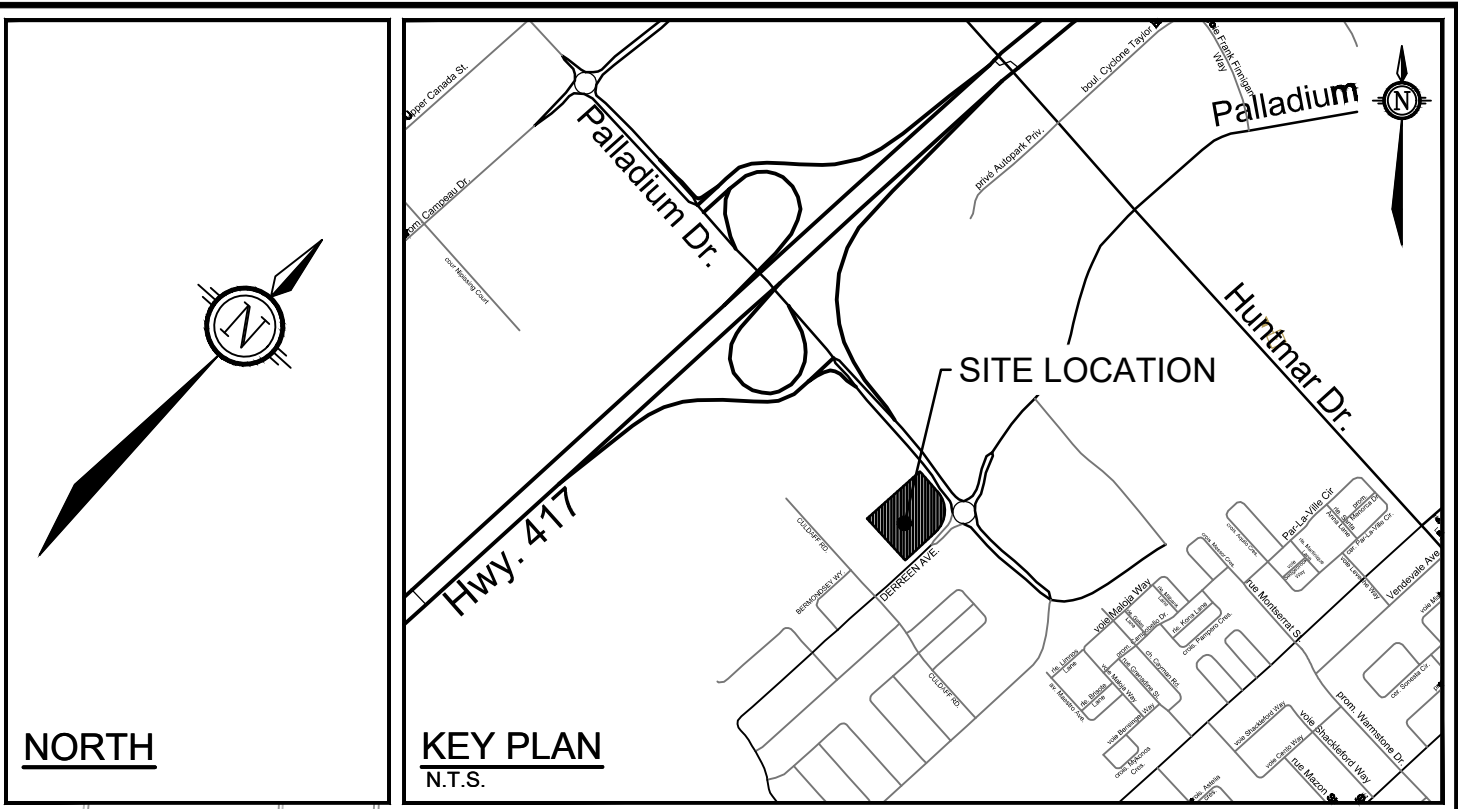
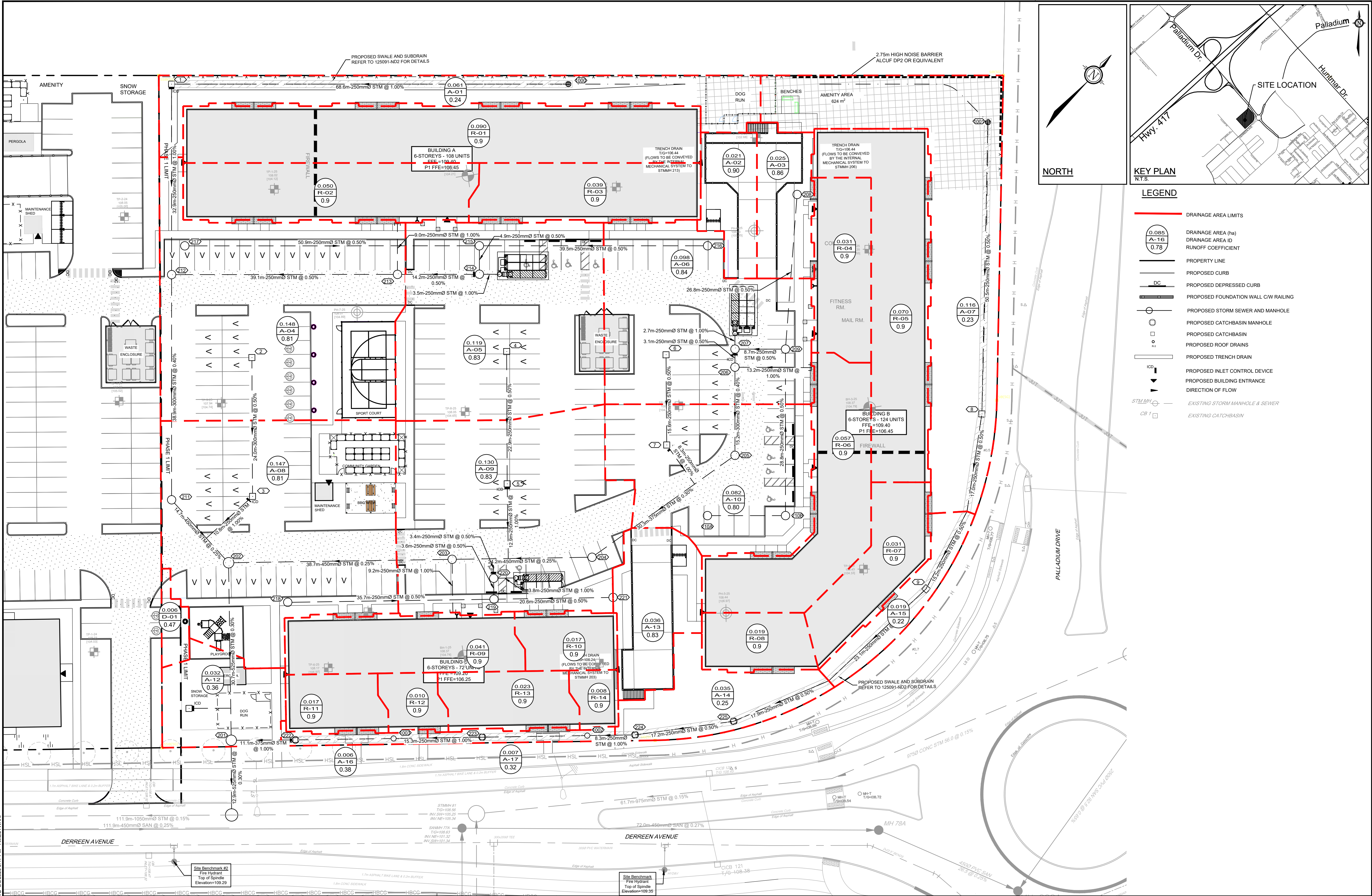


LOCATION				RESIDENTIAL AREA AND POPULATION										COMM		INSTIT		PARK		C+H	INFILTRATION				PIPE						
STREET		FROM M.H.	TO M.H.	AREA	UNITS	UNITS	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA	ACCU. AREA (ha)	AREA	ACCU. AREA (ha)	AREA	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST	DIA	SLOPE	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL.			
				(ha)		Singles	Townhouse		AREA (ha)	POP.			(ha)	(ha)	(ha)	(ha)	(ha)	(ha)					(m)	(mm)	(%)			(FULL) (m/s)	(ACT.) (m/s)		
		30A	4A	0.28	7	7		24	0.28	24	3.70	0.29		0.00		0.00	0.00	0.00	0.28	0.28	0.09	0.38	67.5	200	1.20	35.93	0.01	1.14	0.37		
Contribution From croissant Billrian Crescent, Pipe 3A - 4A									1.48	104				0.00		0.00	0.00	0.00	1.48	1.48											
		4A	5A	0.11	2	2		7	1.87	135	3.56	1.56		0.00		0.00	0.00	0.00	0.11	1.87	0.62	2.18	24.5	200	0.40	20.74	0.10	0.66	0.42		
		5A	6A	0.17	3	3		11	2.04	146	3.56	1.68		0.00		0.00	0.00	0.00	0.17	2.04	0.67	2.36	21.5	200	0.40	20.74	0.11	0.66	0.44		
		6A	11A						2.04	146	3.56	1.68		0.00		0.00	0.00	0.00	2.04	2.04	0.67	2.36	16.5	200	0.40	20.74	0.11	0.66	0.44		
To avenue Derreen Avenue, Pipe 11A - 12A									2.04	146				0.00		0.00	0.00		2.04												
Future Development													0.66						0.66	0.66											
		251A	200A						0.00				0.69	1.35		0.00	0.00	0.66	0.69	1.35	0.45	1.10	90.5	250	0.65	47.94	0.02	0.98	0.39		
To avenue Robert Grant Avenue, Pipe 200A - 201A									0.00	0				1.35		0.00	0.00		1.35												
avenue Derreen Avenue																															
		7A	8A	0.67	7	7		24	0.67	24	3.70	0.29		0.00		0.00	0.00	0.00	0.67	0.67	0.22	0.51	90.0	200	0.65	26.44	0.02	0.84	0.33		
		8A	9A	0.26	7	7		24	0.93	48	3.65	0.57		0.00		0.00	0.00	0.00	0.26	0.93	0.31	0.88	63.0	200	0.40	20.74	0.04	0.66	0.33		
		9A	11A	0.07					1.00	48	3.65	0.57		0.00		0.00	0.00	0.00	0.07	1.00	0.33	0.90	28.0	200	0.40	20.74	0.04	0.66	0.33		
Contribution From Future Development, Pipe 10A - 11A									73.25	4900				0.00		0.00		73.25	73.25												
Contribution From cours Curraglass Walk, Pipe 6A - 11A									2.04	146				0.00		0.00	0.00		2.04	2.04											
		11A	12A	0.19	3	3		11	76.48	5105	2.79	46.15		0.00		0.00	0.00	0.19	76.48	25.24	71.38	37.0	375	0.25	87.67	0.81	0.79	0.88			
		12A	13A	0.11	1	1		4	76.59	5109	2.79	46.18		0.00		0.00	0.00	0.11	76.59	25.27	71.45	25.0	375	0.25	87.67	0.82	0.79	0.88			
		13A	14A	0.10	1	1		4	76.69	5113	2.79	46.21		0.00		0.00	0.00	0.10	76.69	25.31	71.52	27.0	375	0.25	87.67	0.82	0.79	0.88			
		14A	15A	0.21	3	3		11	76.90	5124	2.79	46.30		0.00		0.00	0.00	0.21	76.90	25.38	71.67	37.5	375	0.25	87.67	0.82	0.79	0.88			
		15A	16A	0.07	1	1		4	76.97	5128	2.79	46.33		0.00		0.00	0.00	0.07	76.97	25.40	71.73	12.5	375	0.25	87.67	0.82	0.79	0.88			
		16A	17A	0.72	17	17		58	77.69	5186	2.78	46.79		0.00		0.00	0.00	0.72	77.69	25.64	72.43	98.0	375	0.25	87.67	0.83	0.79	0.89			
		17A	23A	0.48	12	12		41	78.17	5227	2.78	47.12		0.00		0.00	0.00	0.48	78.17	25.80	72.92	110.5	375	0.25	87.67	0.83	0.79	0.89			
Contribution From place Unity Place, Pipe 22A - 23A									2.21	162				0.00		0.00	0.00	2.21	2.21												
		232A	231A	0.36	8	8		27	0.36	27	3.69	0.32		0.00		0.00	0.00	0.36	0.36	0.12	0.44	52.0	200	0.65	26.44	0.02	0.84	0.32			
		231A	23A						0.36	27	3.69	0.32		0.00		0.00	0.00	0.00	0.36	0.12	0.44	2.0	200	0.40	20.74	0.02	0.66	0.26			
To avenue Derreen Avenue, Pipe 23A - 26A									0.36	27				0.00		0.00	0.00	0.36													
		230A	260A	0.26	6		6	17	0.26	17	3.71	0.20		0.00		0.00	0.00	0.26	0.26	0.09	0.29	43.5	200	1.00	32.80	0.01	1.04	0.32			
		260A	261A	0.78	25		25	68	1.04	85	3.61	0.99		0.00		0.00	0.00	0.78	1.04	0.34	1.34	104.0	200	0.40	20.74	0.06	0.66	0.37			
		261A	730A						1.04	85	3.61	0.99		0.00		0.00	0.00	0.00	1.04	0.34	1.34	2.0	200	1.00	32.80	0.04	1.04	0.51			
To avenue Derreen Avenue, Pipe 730A - 73A									1.04	85				0.00		0.00	0.00	1.04													
		23A	26A	0.11				0	80.85	5416	2.77	48.62		0.00		0.00	0.00	0.11	80.85	26.68	75.30	70.5	375	0.30	96.03	0.78	0.87	0.96			
Contribution From voie Bermondsey Way, Pipe 25A - 26A									1.00	85				0.00		0.00	0.00	1.00	1.00												
		26A	730A						81.85	5501	2.77	49.29		0.00		0.00	0.00	0.00	81.85	27.01	76.30	93.5	375	0.30	96.03	0.79	0.87	0.96			
		730A	73A						82.89	5586	2.76	49.96		0.00		0.00	0.00	0.00	82.89	27.35	77.32	10.0	375	0.30	96.03	0.81	0.87	0.97			
Contribution From chemin Culdaff Road, Pipe 64A - 73A									12.63	1447				1.67		0.00	0.53	14.83	14.83												
Contribution From chemin Culdaff Road, Pipe 72A - 73A									0.79	0				29.87		0.00	0.00	30.66	30.66												
		73A	75A	0.09				0	96.40	7033	2.68	61.17		31.54		0.00	0.53	15.42	0.09	128.47	42.40	118.98	35.5	450	0.25	142.55	0.83	0.90	1.00		
Contribution From Block 241, Pipe 74A - 75A									0.00	0				1.06		0.00	0.00	1.06	129.53												
		75A	77A	0.31				0	96.71	7033	2.68	61.17		32.60		0.00	0.53	15.93	0.31	129.84	42.85	119.95	112.0	450	0.25	142.55	0.84	0.90	1.00		
Contribution From Block 240, Pipe 76A - 77A									0.00	0				0.64		0.00	0.00	0.64	130.48												
		77A	78A	0.20				0	96.91	7033	2.68	61.17		33.24		0.00	0.53	16.24	0.20	130.68	43.12	120.54	72.0	450	0.25	142.55	0.85	0.90	1.01		
		78A	200A	0.14				0	97.05	7033	2.68	61.17		33.24		0.00	0.53	16.24	0.14	130.82	43.17	120.58	26.5	450	0.25	142.55	0.85	0.90	1.01		
To avenue Robert Grant Avenue, Pipe 200A - 201A									97.05	7033				33.24		0.00	0.53			130.82											
avenue Robert Grant Avenue																															
Contribution From Future Development, Pipe 251A - 200A									0.00	0				1.35		0.00	0.00	1.35	1.35												
Contribution From avenue Derreen Avenue, Pipe 78A - 200A									97.05	7033				33.24		0.00	0.53		130.82	130.82											
				0.26				0	97.31	7033				34.59		0.00	0.53		0.26	132.43											
		200A	201A	1.93				0	99.24	7033	2.68	61.17		34.59		0.00	0.53	16.90	1.93	134.36	44.34	122.41	67.0	450	0.25	142.55	0.86	0.90	1.01		

DESIGN PARAMETERS						Designed: R.A.		PROJECT: 195 Huntmar Drive								
Park Flow =	9300	L/ha/da	0.10764	I/s/ha			Checked: W.L.	LOCATION: City of Ottawa								
Average Daily Flow =	280	I/p/day			Industrial Peak Factor = as per MOE Graph											
Comm/Inst Flow =	28000	L/ha/da	0.3241	I/s/ha	Extraneous Flow =	0.330		L/s/ha								
Industrial Flow =	35000	L/ha/da	0.40509	I/s/ha	Minimum Velocity =	0.600		m/s								
Max Res. Peak Factor =	4.00				Manning's n =	0.013		(Conc)								
Commercial/Inst./Park Peak Factor =	1.50				Townhouse coeff=	2.7	(Pvc)	0.013								
Institutional =	0.32	I/s/ha			Single house coeff=	3.4			Dwg. Reference:	File Ref:	12-624	Date:		Sheet No.		4
									Sanitary Drainage Plan, Dwg. No. 87-93			July 2020			of	5

Manning's $n=0.013$ 

Appendix D
Storm Servicing



- LEGEND**
- DRAINAGE AREA LIMITS
 - DRAINAGE AREA (ha)
 - DRAINAGE AREA ID
 - RUNOFF COEFFICIENT
 - PROPERTY LINE
 - PROPOSED CURB
 - PROPOSED DEPRESSED CURB
 - PROPOSED FOUNDATION WALL CW RAILING
 - PROPOSED STORM SEWER AND MANHOLE
 - PROPOSED CATCHBASIN MANHOLE
 - PROPOSED CATCHBASIN
 - PROPOSED ROOF DRAINS
 - PROPOSED TRENCH DRAIN
 - PROPOSED INLET CONTROL DEVICE
 - PROPOSED BUILDING ENTRANCE
 - DIRECTION OF FLOW
 - EXISTING STORM MANHOLE & SEWER
 - EXISTING CATCHBASIN

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS,
WATERMANS, 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
1.	ISSUED FOR SITEPLAN APPLICATION	06/08/26	ARM

SCALE

1:300

0 3 6 9 12

DESIGN

ARM

CHECKED

GJM

DRAWN

AM

CHECKED

ARM

APPROVED

GJM

FOR REVIEW ONLY

LOCATION
CITY OF OTTAWA
PALLADIUM 2

DRAWING NAME
STORM WATER MANAGEMENT
PLAN

PROJECT No.
125091

REV
REV#1

DRAWING No.
125091-STM

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

M:\2025\125091\CAD\CIVIL\125091-STM.DWG 6/8/2026 3:47 PM - AMESTWARP

STORM SEWER DESIGN SHEET



Novatech Project #: 125091
Project Name: Palladium 2
Date: 3/27/2026
Revised: 6/8/2026
Input By: Anjush Musyaju, EIT
Reviewed By: Anthony Mestwarp, P.Eng
Drawing Reference: 125091-SWM

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)

Storm Design Event = 2 Year

Location				Flow									Design Capacity								
													Proposed Sewer Pipe Sizing / Design								
Street	Area ID	From MH	To MH	Hardscape Area	Pervious Area	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
	R-02	217	215	0.050	0.000	0.050	0.90	0.13	0.13	10.00	76.81	9.7	50.9	250 PVC	0.254	0.013	0.50	43.9	0.87	0.98	22.1%
	R-03	216	215	0.039	0.000	0.039	0.90	0.10	0.10	10.00	76.81	7.6	39.5	250 PVC	0.254	0.013	0.50	43.9	0.87	0.76	17.2%
		215	214					0.00	0.22	10.98	73.24	16.5	4.9	250 PVC	0.254	0.013	0.50	43.9	0.87	0.09	37.5%
		214	213					0.00	0.22	11.07	72.91	16.4	14.2	250 PVC	0.254	0.013	0.50	43.9	0.87	0.27	37.3%
	A-02	Building A	213	0.021	0.000	0.021	0.90	0.05	0.05	10.00	76.81	4.1	9.0	250 PVC	0.254	0.013	1.00	62.0	1.22	0.12	6.6%
		213	212					0.00	0.28	11.35	71.99	20.0	39.1	250 PVC	0.254	0.013	0.50	43.9	0.87	0.75	45.6%
	A-01	212	211	0.004	0.058	0.061	0.24	0.04													
	R-01			0.090	0.000	0.090	0.90	0.22	0.54	12.10	69.58	37.9	38.9	300 PVC	0.3048	0.013	0.40	63.8	0.87	0.74	59.4%
	A-04	211	202	0.128	0.020	0.148	0.81	0.33													
	A-08			0.128	0.019	0.147	0.81	0.33	1.21	12.84	67.38	81.3	14.7	450 CONC	0.4572	0.013	0.25	148.7	0.91	0.27	54.7%
	R-04	208	209	0.031	0.000	0.031	0.90	0.08	0.08	10.00	76.81	6.0	26.8	250 PVC	0.254	0.013	0.50	43.9	0.87	0.52	13.7%
	R-06	210B	209	0.057	0.000	0.057	0.90	0.14	0.14	10.00	76.81	11.0	28.8	250 PVC	0.254	0.013	0.50	43.9	0.87	0.55	25.2%
		209	207					0.00	0.22	10.55	74.74	16.6	8.7	250 PVC	0.254	0.013	0.50	43.9	0.87	0.17	37.8%
		207	206					0.00	0.22	10.72	74.14	16.4	3.1	250 PVC	0.254	0.013	0.50	43.9	0.87	0.06	37.5%
	A-03	Building B	206	0.023	0.002	0.025	0.86	0.06	0.06	10.00	76.81	4.5	13.2	250 PVC	0.254	0.013	1.00	62.0	1.22	0.18	7.2%
		206	205					0.00	0.28	10.78	73.93	20.7	15.2	300 PVC	0.3048	0.013	0.40	63.8	0.87	0.29	32.5%
	A-06	205	204	0.089	0.009	0.098	0.84	0.23													
	A-10			0.071	0.011	0.082	0.80	0.18	0.69	11.07	72.92	50.5	30.3	375 PVC	0.381	0.013	0.30	100.2	0.88	0.57	50.4%
	R-09	218	219	0.041	0.000	0.041	0.90	0.10	0.10	10.00	76.81	7.8	35.7	250 PVC	0.254	0.013	0.50	43.9	0.87	0.69	17.9%
	R-10	221	219	0.017	0.000	0.017	0.90	0.04	0.04	10.00	76.81	3.2	20.6	250 PVC	0.254	0.013	0.50	43.9	0.87	0.40	7.4%
		219	220					0.00	0.14	10.69	74.26	10.7	3.6	250 PVC	0.254	0.013	0.50	43.9	0.87	0.07	24.4%
		220	204-203					0.00	0.14	10.76	74.02	10.7	3.4	250 PVC	0.254	0.013	0.50	43.9	0.87	0.07	24.3%
	A-05	204	203	0.108	0.011	0.119	0.83	0.28													
	A-09			0.116	0.014	0.130	0.83	0.30	1.41	11.65	71.01	100.3	24.2	450 CONC	0.4572	0.013	0.25	148.7	0.91	0.45	67.4%
	A-13	Building C	203	0.032	0.004	0.036	0.83	0.08	0.08	10.00	76.81	6.3	9.2	250 PVC	0.254	0.013	1.00	62.0	1.22	0.13	10.2%
		203	202					0.00	1.49	12.09	69.61	104.0	38.7	450 PVC	0.4572	0.013	0.25	148.7	0.91	0.71	70.0%
	A-12	202	201	0.008	0.025	0.032	0.36	0.03	2.73	13.11	66.61	182.1	30.7	525 CONC	0.5334	0.013	0.30	245.7	1.10	0.47	74.1%

Location				Flow									Design Capacity									
													Proposed Sewer Pipe Sizing / Design									
Street	Area ID	From MH	To MH	Hardscape Area	Pervious Area	Area	Runoff Coefficient	Indivi.	Accum.	Time of Conc.	Rain Intensity	Total Uncontrolled Peak Flow	Pipe Length	Pipe Size (mm) and Material	Pipe ID Actual	Roughness	Design Grade	Capacity	Full Flow Velocity	Time of Flow	Q / Qfull	
				0.9	0.2	A (ha.)	C	2.78 AC	2.78 AC	Tc (min.)	I (mm/hr)	Q (L/s)	(m)		(m)	n	So (%)	Qfull (L/s)	(m/s)	(min.)		
	R-05	222	201	0.070	0.000	0.070	0.90	0.17														
	A-07			0.004	0.112	0.116	0.23	0.07														
	R-07			0.031	0.000	0.031	0.90	0.08														
	A-15			0.000	0.019	0.019	0.22	0.01														
	R-08			0.019	0.000	0.019	0.90	0.05														
	A-14			0.002	0.032	0.035	0.25	0.02														
	R-14			0.008	0.000	0.008	0.90	0.02														
	R-13			0.023	0.000	0.023	0.90	0.06														
	A-17			0.001	0.006	0.007	0.32	0.01														
	R-12			0.010	0.000	0.010	0.90	0.03														
	R-11			0.017	0.000	0.017	0.90	0.04														
	A-16			0.001	0.004	0.006	0.38	0.01		0.57	10.00	76.81	43.4	11.1	375 CONC	0.381	0.013	1.00	182.9	1.60	0.12	23.7%
		201	Existing					0.00	3.30	13.11	66.61	219.8	12.9	525 CONC	0.5334	0.013	0.30	245.7	1.10	0.20	89.4%	
Totals						1.59		3.30														

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 (m²)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

STORM SEWER DESIGN SHEET



Novatech Project #: 125091
Project Name: Palladium 2
Date: 6/26/2024
Revised 2/5/2025
Revised 6/8/2026
Input By: Anthony Mestwarp
Reviewed By: Greg Macdonald
Drawing Reference: 125091-SWM, 123194-SWM, drawings 95,96

- 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				Demand										Design Capacity									
				Area		Flow								Proposed Sewer Pipe Sizing / Design									
				Area	Weighted Runoff Coefficient C	Indivi.	Accum.	Time of Conc.	Rain Intensity (mm/hr)				Peak Flow	Total Uncontrolled Peak Flow	Pipe Length	Pipe Size (mm) and Material	Pipe ID Actual	Roughness	Design Grade	Capacity	Full Flow Velocity	Time of Flow	Q / Qfull
		From MH	To MH			2.78 AC	2.78 AC	Tc (min.)	I				(L/s)	Q (L/s)	(m)		(m)	n	So (%)	Qfull (L/s)	(m/s)	(min.)	
		79	81			0.00	1.53	12.79	67.53	5-yr	10-yr	100-yr	103.32	473.1	61.5	975 CONC	0.9906	0.013	0.15	905.5	1.17	0.87	52.2%
				0.38	0.70	0.74	0.74	12.79		91.45			67.63										
						0.00	2.82	12.79			107.14		302.13										
						0.00	0.00	12.79					0.00										
2765 Palladium Road	Refer to Site Design Sheet for calculation Details		81	1.59	0.75	3.30	3.30	13.11	66.63				219.96	220.0	12.9	525 CONC	0.5334	0.013	0.30	245.7	1.10	0.20	89.5%
						0.00	0.00	13.11					0.00										
						0.00	0.00	13.11					0.00										
						0.00	0.00	13.11					0.00										
Block 240		80	81	0.64	0.80	1.42	1.42	10.00	76.81				109.32	109.3	20.0	525 CONC	0.5334	0.013	0.20	200.6	0.90	0.37	54.5%
						0.00	0.00	10.00					0.00										
						0.00	0.00	10.00					0.00										
						0.00	0.00	10.00					0.00										
425 Culdaff	Refer to Novatech project 123194 STM design sheet for calculation details		81-83	0.62	0.81	1.39	1.39	12.50	68.38				95.15	95.2	10.0	450 PVC	0.4572	0.013	1.00	297.4	1.81	0.09	32.0%
						0.00	0.00	12.50					0.00										
						0.00	0.00	12.50					0.00										
						0.00	0.00	12.50					0.00										
Derreen Avenue		81	83	0.39	0.73	0.79	1.53	13.66	65.12	88.14			134.94	924.0	112.0	1050 CONC	1.0668	0.013	0.15	1103.3	1.23	1.51	83.7%
						0.00	2.82	13.66			103.25		291.16										
						0.00	0.00	13.66					0.00										
Block 241		82	83	1.06	0.80	2.36	2.36	10.00	76.81				181.06	181.1	19.5	675 CONC	0.6858	0.013	0.15	339.6	0.92	0.35	53.3%
						0.00	0.00	10.00					0.00										
						0.00	0.00	10.00					0.00										
						0.00	0.00	10.00					0.00										
Derreen Avenue		83	84			0.00	10.00	15.17	61.36	83.00			613.81	1015.0	40.5	1050 CONC	1.0668	0.013	0.20	1274.0	1.43	0.47	79.7%
						0.00	1.53	15.17					127.06										
						0.00	2.82	15.17			97.19		274.08										
						0.00	0.00	15.17					0.00										
Culdaff Road		73	84	0.19	0.74	0.39	18.14	16.58	58.27	78.78			1057.08	1168.9	79.0	1350 CONC	1.3716	0.013	0.11	1846.8	1.25	1.05	63.3%
						0.00	1.42	16.58					111.86										
						0.00	0.00	16.58					0.00										
						0.00	0.00	16.58					0.00										
Culdaff Road		84	86	0.19	0.74	0.39	3.34	17.63	56.18	75.91			253.69	2085.4	74.5	1650 CONC	1.6764	0.013	0.11	3153.6	1.43	0.87	66.1%
						0.00	2.82	17.63			88.86		250.60										
						0.00	0.00	17.63					0.00										
425 Culdaff	Refer to site design sheet for calculation details	85	86	0.35	0.61	0.59	0.59	10.24	75.90				44.53	44.5	17.3	900 CONC	0.9144	0.013	0.15	731.4	1.11	0.26	6.1%
						0.00	0.00	10.24					0.00										
						0.00	0.00	10.24					0.00										
						0.00	0.00	10.24					0.00										
Culdaff Road		86	87		0.00	0.00	28.73	18.50	54.57	73.72			1567.88	2057.6	26.0	1650 CONC	1.6764	0.013	0.11	3153.6	1.43	0.30	65.2%
						0.00	3.34	18.50					246.36										
						0.00	2.82	18.50			86.29		243.33										
						0.00	0.00	18.50					0.00										

STORM SEWER DESIGN SHEET



Location				Demand										Design Capacity										
				Area		Flow								Proposed Sewer Pipe Sizing / Design										
		From MH	To MH	Area	Weighted Runoff Coefficient	Indivi.	Accum.	Time of Conc.	Rain Intensity (mm/hr)				Peak Flow	Total Uncontrolled Peak Flow	Pipe Length	Pipe Size (mm) and Material	Pipe ID Actual	Roughness	Design Grade	Capacity	Full Flow Velocity	Time of Flow	Q / Qfull	
					C				2.78 AC	2.78 AC	Tc (min.)	I												
													2-yr	5-yr	10-yr	100-yr	(L/s)	Q (L/s)	(m)		(m)	n	So (%)	Qfull (L/s)
Culdaff Road		87	94		0.00	0.00	28.73	18.81	54.04					1552.46	2064.3	16.5	1650 CONC	1.6764	0.013	0.11	3153.6	1.43	0.19	65.5%
				0.18	0.74	0.37	3.71	18.81		72.99			270.93											
						0.00	2.82	18.81			85.42		240.90											
						0.00	0.00	18.81					0.00											
Culdaff Road		93	94		0.00	0.00	7.38	12.30	68.97					509.28	573.7	16.5	975 CONC	0.9906	0.013	0.15	905.5	1.17	0.23	63.4%
						0.00	12.30		93.43				64.47											
						0.00	0.00	12.30					0.00											
						0.00	0.00	12.30					0.00											
Block 235		94	95	0.37	0.59	0.61	36.72	19.00	53.70					1971.94	2530.6	109.0	1650 CONC	1.6764	0.013	0.15	3682.6	1.67	1.09	68.7%
						0.00	4.40	19.00		72.53			319.28											
						0.00	2.82	19.00			84.89		239.38											
						0.00	0.00	19.00					0.00											
Block 244		91	95	1.99	0.80	4.43	4.43	10.00	76.81					339.92	339.9	6.5	825 CONC	0.8382	0.013	0.15	580.0	1.05	0.10	58.6%
						0.00	0.00	10.00					0.00											
						0.00	0.00	10.00					0.00											
						0.00	0.00	10.00					0.00											
Block 235		95	96			0.00	41.15	20.09	51.89					2135.17	2674.8	57.0	1650 CONC	1.6764	0.013	0.15	3682.6	1.67	0.57	72.6%
						0.00	4.40	20.09		70.06			308.41											
						0.00	2.82	20.09			81.99		231.20											
						0.00	0.00	20.09					0.00											
Block 235		96	HW			0.00	41.15	20.66	51.00					2098.43	2628.6	12.5	1650 CONC	1.6764	0.013	0.15	3682.6	1.67	0.12	71.4%
						0.00	4.40	20.66		68.84			303.05											
						0.00	2.82	20.66			80.56		227.17											
						0.00	0.00	20.66					0.00											
Totals				15.90											172.0									

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 (m²)
R = Hydraulic Radius of wetted area (dia./4 for full pipes)
So = Pipe slope/gradient

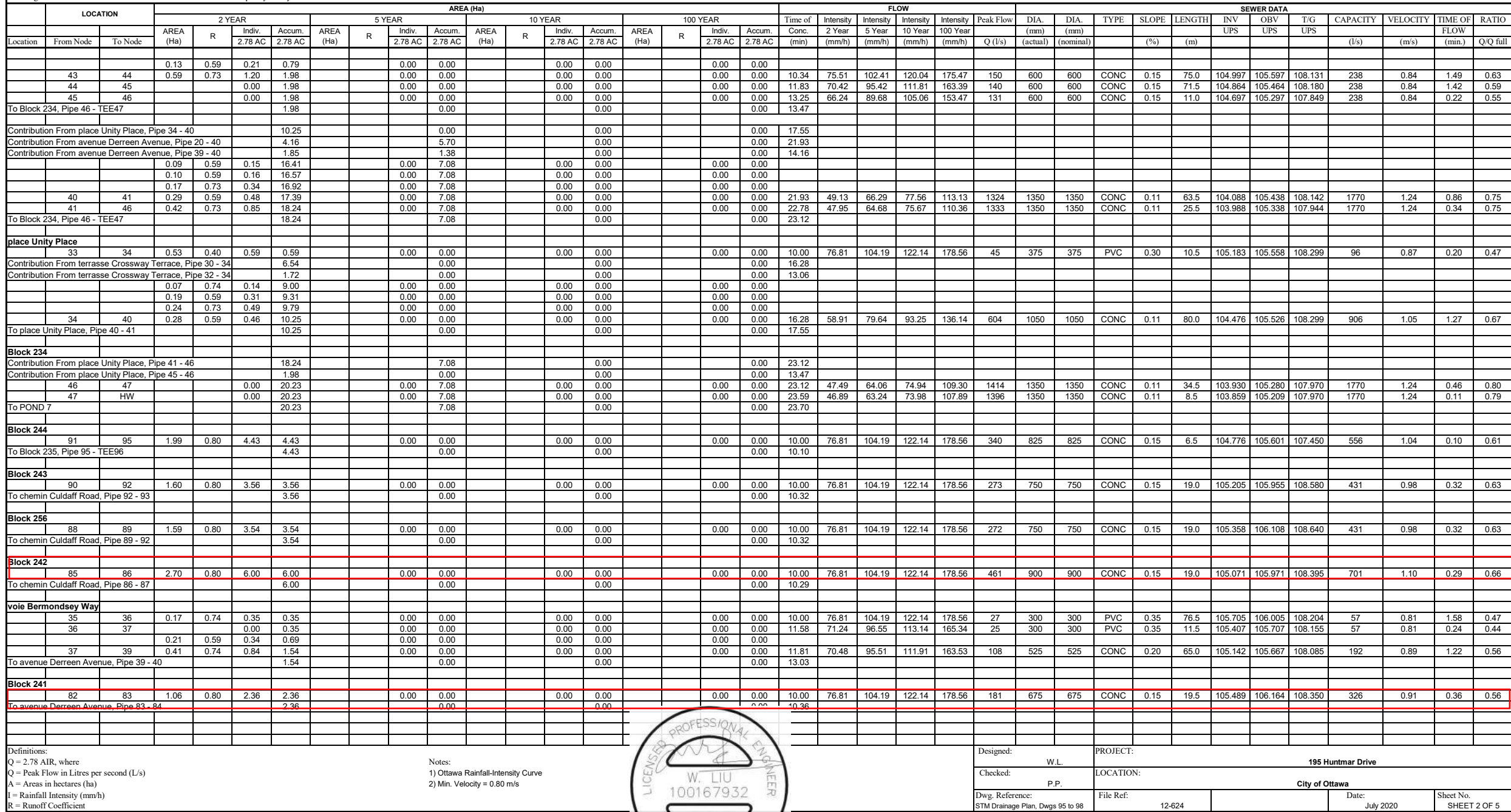
STORM SEWER CALCULATION SHEET (RATIONAL METHOD)



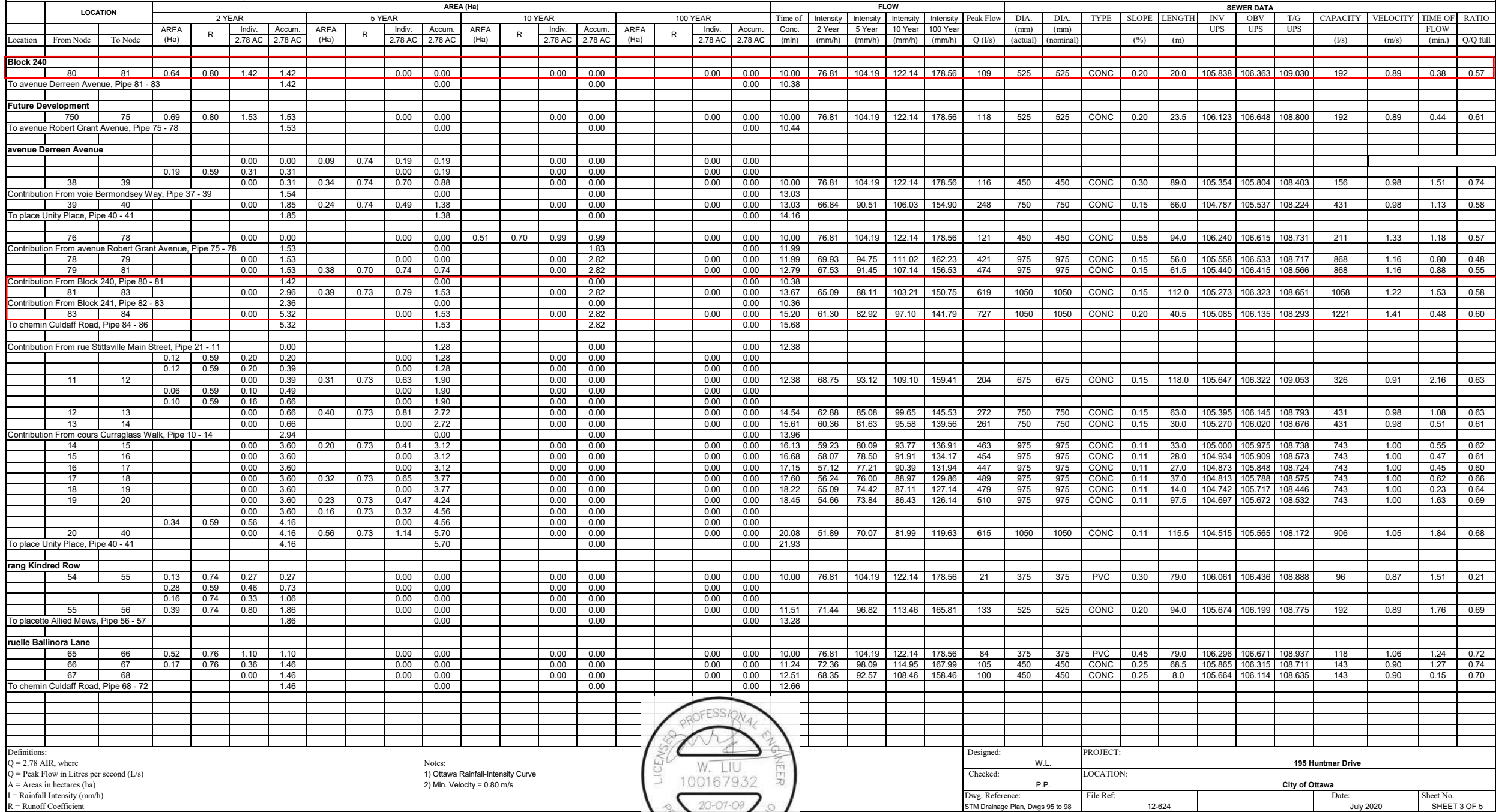
Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

LOCATION			AREA (Ha)																FLOW							SEWER DATA											
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA.	DIA.	TYPE	SLOPE	LENGTH	INV	OBV	T/G	CAPACITY	VELOCITY	TIME OF	RATIO	
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(mm) (actual)	(mm) (nominal)		(%)	(m)	UPS	UPS	UPS	(l/s)	(m/s)	FLOW (min.)	Q/Q full	
croissant Billrian Crescent																																					
	1	2			0.00	0.00								0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.35	11.0	106.154	106.454	108.992	57	0.81	0.23	0.00
			0.15	0.59	0.25	0.25								0.00	0.00			0.00	0.00																		
	2	3	0.45	0.74	0.93	1.17								0.00	0.00			0.00	0.00	10.23	75.95	103.01	120.75	176.51	89	375	375	PVC	0.50	82.5	106.040	106.415	108.924	124	1.12	1.22	0.72
	3	4	0.27	0.74	0.56	1.73								0.00	0.00			0.00	0.00	11.45	71.65	97.10	113.79	166.30	124	525	525	CONC	0.20	77.5	105.477	106.002	109.044	192	0.89	1.45	0.64
To cours Curraglass Walk, Pipe 4 - 26						1.73									0.00				0.00	12.91																	
	5	6			0.00	0.00								0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	0	300	300	PVC	0.35	11.5	106.231	106.531	109.136	57	0.81	0.24	0.00
			0.15	0.59	0.25	0.25								0.00	0.00			0.00	0.00																		
	6	7	0.33	0.74	0.68	0.92								0.00	0.00			0.00	0.00	10.24	75.91	102.96	120.69	176.42	70	375	375	PVC	0.35	78.0	106.116	106.491	109.067	104	0.94	1.38	0.68
			0.06	0.59	0.10	1.02								0.00	0.00			0.00	0.00																		
	7	8	0.27	0.74	0.56	1.58								0.00	0.00			0.00	0.00	11.62	71.09	96.35	112.90	164.98	112	525	525	CONC	0.30	82.5	105.768	106.218	108.940	236	1.09	1.26	0.48
To cours Curraglass Walk, Pipe 8 - 9						1.58									0.00				0.00	12.88																	
cours Curraglass Walk																																					
			0.18	0.59	0.30	0.30								0.00	0.00			0.00	0.00																		
	23	24	0.36	0.74	0.74	1.04								0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	80	450	450	CONC	0.20	97.5	105.981	106.431	109.055	128	0.80	2.03	0.62
			0.25	0.74	0.51	1.55								0.00	0.00			0.00	0.00																		
	24	25	0.28	0.59	0.46	2.01								0.00	0.00			0.00	0.00	12.03	69.81	94.58	110.82	161.93	140	450	450	CONC	0.70	60.5	105.766	106.216	108.952	239	1.50	0.67	0.59
	25	26	0.08	0.74	0.16	2.17								0.00	0.00			0.00	0.00	12.70	67.79	91.81	107.56	157.15	147	450	450	CONC	0.70	13.5	105.312	105.762	108.883	239	1.50	0.15	0.62
To Block 233, Pipe 26 - 27						2.17									0.00				0.00	12.85																	
Contribution From croissant Billrian Crescent, Pipe 3 - 4						1.73									0.00				0.00	12.91																	
	4	26	0.14	0.73	0.28	2.01								0.00	0.00			0.00	0.00	12.91	67.20	91.00	106.61	155.74	135	525	525	CONC	0.20	60.0	105.262	105.787	108.981	192	0.89	1.13	0.70
To Block 233, Pipe 26 - 27						2.01									0.00				0.00	14.03																	
			0.25	0.59	0.41	0.41								0.00	0.00			0.00	0.00																		
	4	8	0.27	0.73	0.55	0.96								0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	74	375	375	PVC	0.65	73.0	106.070	106.445	108.976	141	1.28	0.95	0.52
Contribution From croissant Billrian Crescent, Pipe 7 - 8						1.58									0.00				0.00	12.88																	
	8	9			0.00	2.54								0.00	0.00			0.00	0.00	12.88	67.26	91.08	106.70	155.88	171	600	600	CONC	0.20	20.5	105.370	105.970	108.887	275	0.97	0.35	0.62
	9	10			0.00	2.54								0.00	0.00			0.00	0.00	13.24	66.27	89.72	105.11	153.54	168	600	600	CONC	0.20	23.5	105.299	105.899	108.731	275	0.97	0.40	0.61
	10	14	0.20	0.73	0.41	2.94								0.00	0.00			0.00	0.00	13.64	65.18	88.23	103.34	150.95	192	675	675	CONC	0.15	17.5	105.177	105.852	108.582	326	0.91	0.32	0.59
To avenue Derreen Avenue, Pipe 14 - 15						2.94									0.00				0.00	13.96																	
Block 233																																					
Contribution From cours Curraglass Walk, Pipe 25 - 26						2.17									0.00				0.00	12.85																	
Contribution From cours Curraglass Walk, Pipe 4 - 26						2.01									0.00				0.00	14.03																	
	26	27			0.00	4.19								0.00	0.00			0.00	0.00	14.03	64.15	86.82	101.70	148.54	269	675	675	CONC	0.20	9.5	104.992	105.667	108.818	376	1.05	0.15	0.71
	27	30	0.05	0.59	0.08	4.27								0.00	0.00			0.00	0.00	14.18	63.77	86.30	101.08	147.63	272	750	750	CONC	0.11	60.0	104.898	105.648	108.775	369	0.84	1.20	0.74
To terrasse Crossway Terrace, Pipe 30 - 34						4.27									0.00				0.00	15.38																	
terrasse Crossway Terrace																																					
	31	32	0.15	0.74	0.31	0.31								0.00	0.00			0.00	0.00	10.00	76.81	104.19	122.14	178.56	24	300	300	PVC	0.35	74.0	105.649	105.949	108.404	57	0.81	1.52	0.41
			0.36	0.59	0.59	0.90								0.00	0.00			0.00	0.00																		
	32	34	0.40	0.74	0.82	1.72								0.00	0.00			0.00	0.00	11.52	71.41	96.78	113.41	165.73	123	525	525	CONC	0.20	82.0	105.165	105.690	108.342	192	0.89	1.54	0.64
To place Unity Place, Pipe 34 - 40						1.72									0.00				0.00	13.06																	
			0.18	0.59	0.30	0.30								0.00	0.00			0.00	0.00																		

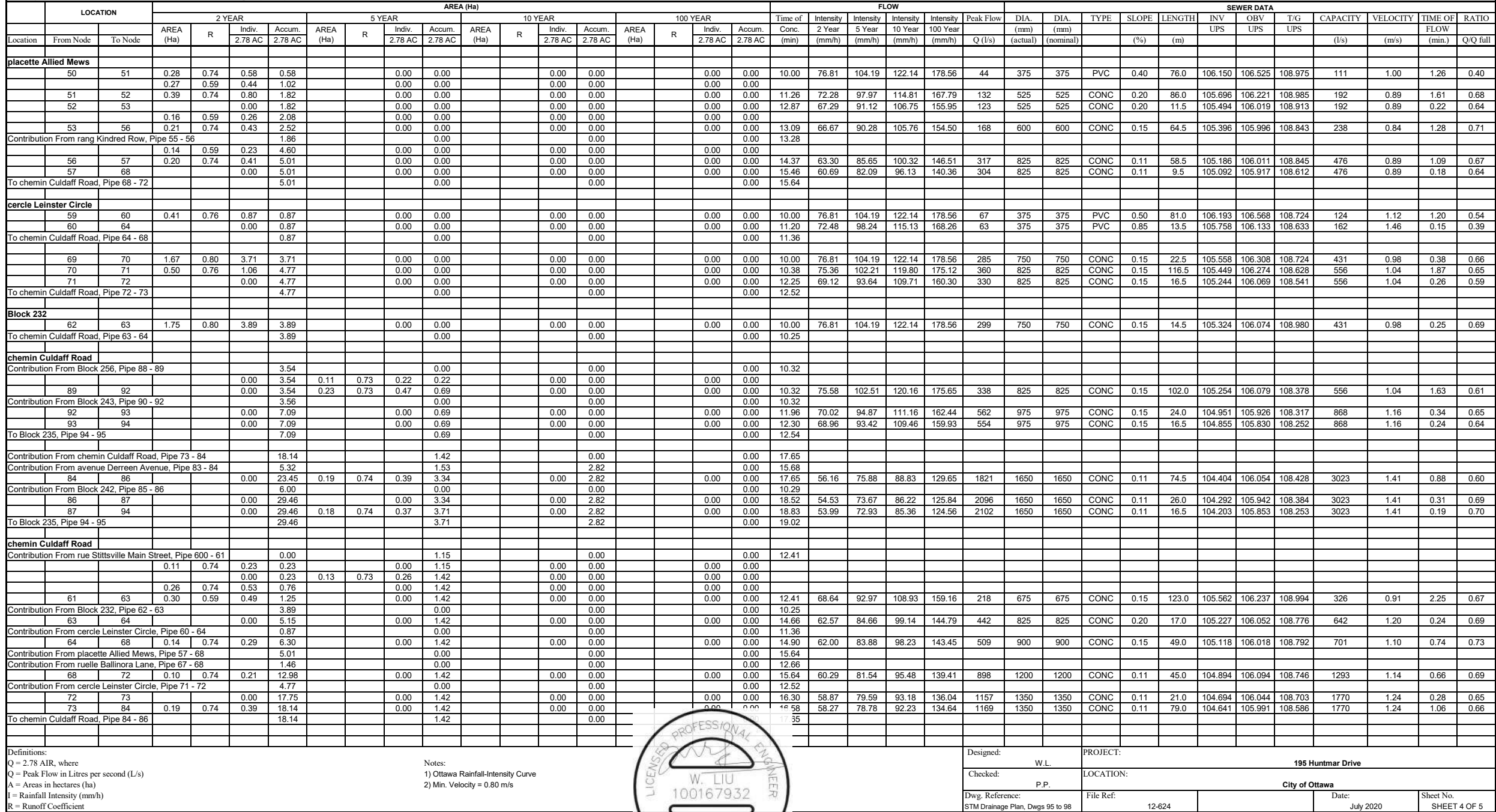
		Local Roads Return Frequency = 2 years
		Collector Roads Return Frequency = 5 years
Manning	0.013	Arterial Roads Return Frequency = 10 years



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



Manning	0.013	Local Roads Return Frequency = 2 years Collector Roads Return Frequency = 5 years Arterial Roads Return Frequency = 10 years
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STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

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

Manning	0.013
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LOCATION			AREA (Ha)																FLOW							SEWER DATA												
			AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Time of Conc. (min)	Intensity 2 Year (mm/h)	Intensity 5 Year (mm/h)	Intensity 10 Year (mm/h)	Intensity 100 Year (mm/h)	Peak Flow Q (l/s)	DIA. (mm) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	INV UPS	OBV UPS	T/G UPS	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min.)	RATIO Q/Q full		
Block 235																																						
Contribution From chemin Culdaff Road, Pipe 87 - 94						29.46				3.71				2.82				0.00	19.02																			
Contribution From chemin Culdaff Road, Pipe 93 - 94						7.09				0.69				0.00				0.00	12.54																			
			0.05	0.59	0.08	36.64				4.40				0.00			0.00	2.82																				
			0.12	0.59	0.20	36.83				4.40				0.00			0.00	2.82																				
	94	95	0.20	0.59	0.33	37.16				4.40				0.00			0.00	2.82		53.65	72.47	84.81	123.77	2552	1650	1650	CONC	0.15	109.0	104.155	105.805	108.157	3530	1.65	1.10	0.72		
Contribution From Block 244, Pipe 91 - 95						4.43				0.00				0.00			0.00	10.10																				
	95	96			0.00	41.59				4.40				0.00			0.00	2.82		51.83	69.98	81.89	119.48	2694	1650	1650	CONC	0.15	57.0	103.975	105.625	108.200	3530	1.65	0.58	0.76		
	96	HW			0.00	41.59				4.40				0.00			0.00	2.82		50.93	68.75	80.45	117.36	2647	1650	1650	CONC	0.15	12.5	103.869	105.519	108.200	3530	1.65	0.13	0.75		
To POND						41.59				4.40				2.82				0.00	20.83																			
rue Convergence Street																																						
	Fut. 208	Fut. 209			0.00	0.00	0.51	0.70	0.99	0.99				0.00	0.00		0.00	0.00	10.00	76.81	104.19	122.14	178.56	103	450	450	CONC	0.25	75.5	101.982	102.432	104.432	143	0.90	1.40	0.73		
To rue Stittsville Main Street, Fut. Pipe 209 - 210						0.00				0.99				0.00			0.00	0.00	11.40																			
avenue Robert Grant Avenue																																						
	74	75			0.00	0.00				0.00	0.44	0.70	0.86	0.86			0.00	0.00	10.00	76.81	104.19	122.14	178.56	105	450	450	CONC	0.45	91.0	106.660	107.110	109.141	191	1.20	1.26	0.55		
Contribution From Future Development, Pipe 750 - 75						1.53				0.00				0.00			0.00	10.44																				
	75	78			0.00	1.53				0.00	0.00	0.50	0.70	0.97	1.83		0.00	0.00	11.26	72.28	97.97	114.81	167.80	321	750	750	CONC	0.15	42.5	105.851	106.601	108.921	431	0.98	0.73	0.74		
To avenue Derreen Avenue, Pipe 78 - 79						1.53				0.00				1.83			0.00	11.99																				
rue Stittsville Main Street																																						
	Fut. 22	Fut. 21			0.00	0.00	0.31	0.74	0.64	0.64				0.00	0.00		0.00	0.00	10.00	76.81	104.19	122.14	178.56	66	375	375	PVC	0.30	72.0	106.358	106.733	109.002	96	0.87	1.38	0.69		
	Fut. 21	11			0.00	0.00	0.31	0.74	0.64	1.28				0.00	0.00		0.00	0.00	11.38	71.88	97.43	114.17	166.86	124	525	525	CONC	0.30	65.0	105.992	106.517	108.986	236	1.09	1.00	0.53		
To avenue Derreen Avenue, Pipe 11 - 12						0.00				1.28				0.00			0.00	12.38																				
	Fut. 590	Fut. 600			0.00	0.00	0.38	0.74	0.78	0.78				0.00	0.00		0.00	0.00	10.00	76.81	104.19	122.14	178.56	81	375	375	PVC	0.40	91.0	106.519	106.894	109.064	111	1.00	1.51	0.73		
	Fut. 600	61			0.00	0.00	0.18	0.74	0.37	1.15				0.00	0.00		0.00	0.00	11.51	71.45	96.84	113.48	165.84	112	450	450	CONC	0.45	65.0	106.080	106.530	109.069	191	1.20	0.90	0.58		
To chemin Culdaff Road, Pipe 61 - 63						0.00				1.15				0.00			0.00	12.41																				
POND 7 OUTLET																																						
	300	3000																																				
	3000	301																																				
	301	302																																				
	302	303																																				
	303	304																																				
	304	305																																				
	305	306																																				
	306	307																																				
Contribution From existing culvert- 2-year flow																																						
	307	308																																				
	308	309																																				

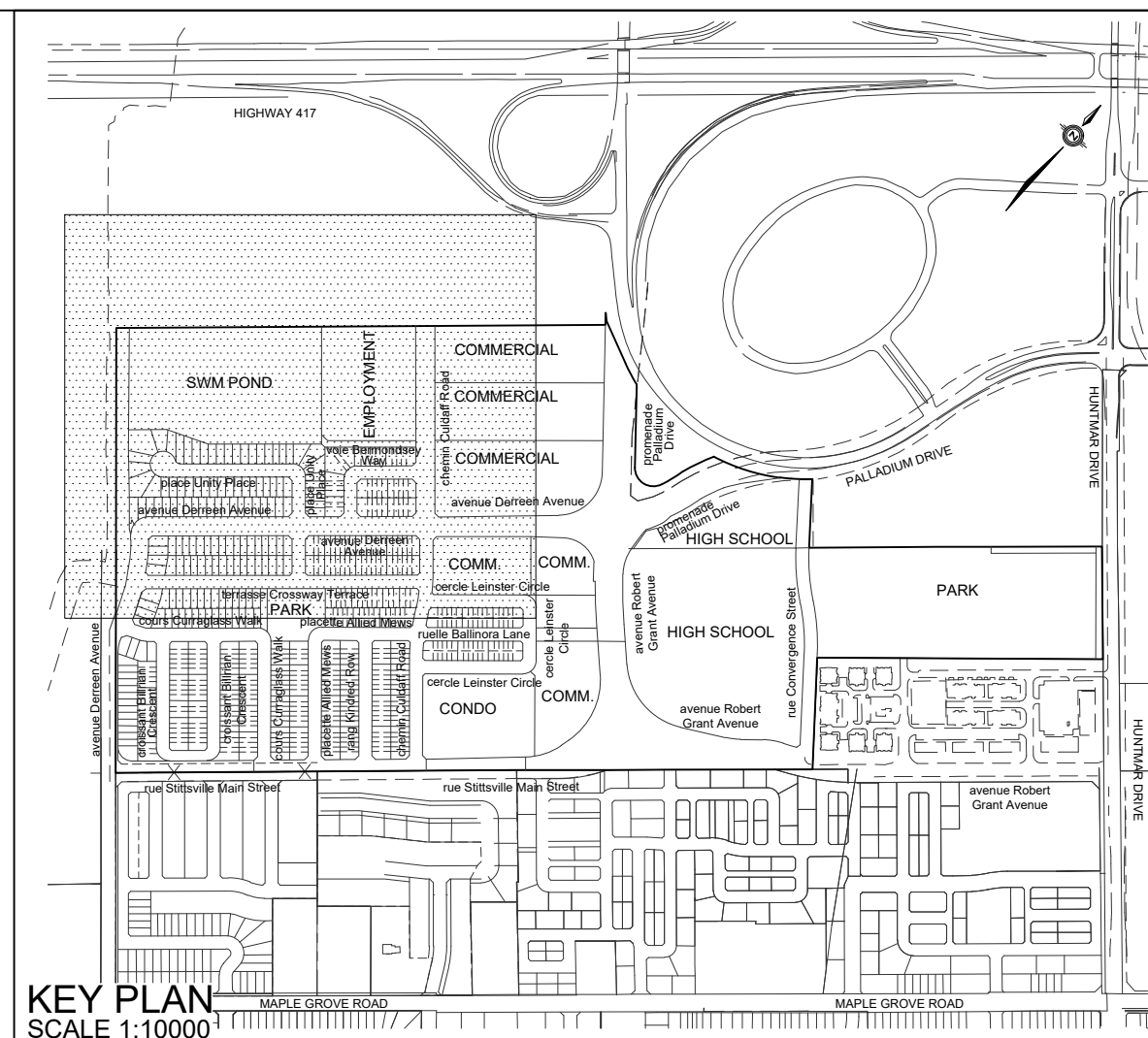
Definitions:
 $Q = 2.78 \text{ AIR}$, where
 Q = Peak Flow in Litres per second (L/s)
 A = Areas in hectares (ha)
 I = Rainfall Intensity (mm/h)
 R = Runoff Coefficient

Notes:

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

Designed:	PROJECT:			
W.L.	195 Huntmar Drive			
Checked:	LOCATION:			
P.P.	City of Ottawa			
Dwg. Reference:	File Ref:	Date:	Sheet No.	
STM Drainage Plan, Dwg's 95 to 98	12-624	July 2020	SHEET 5 OF 5	





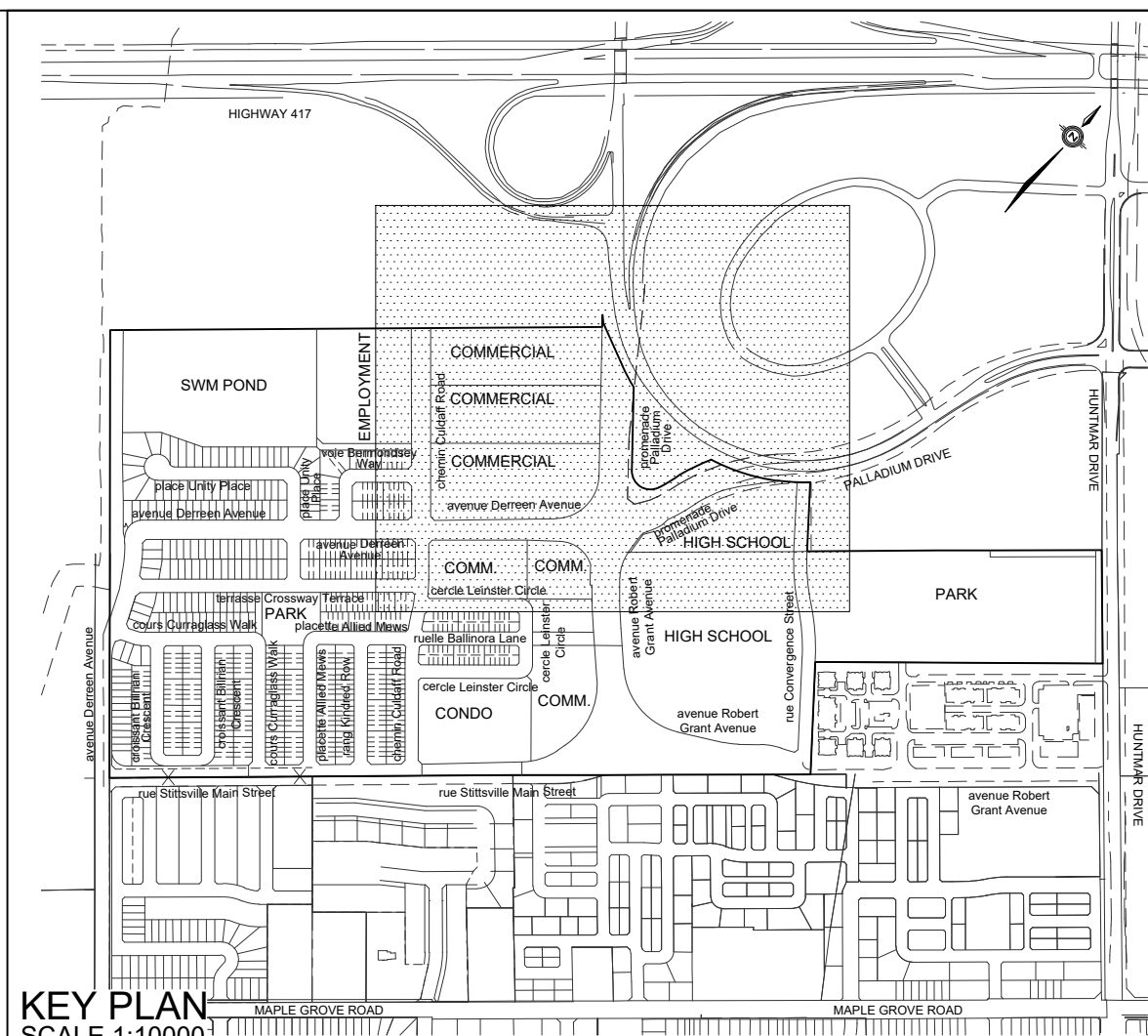
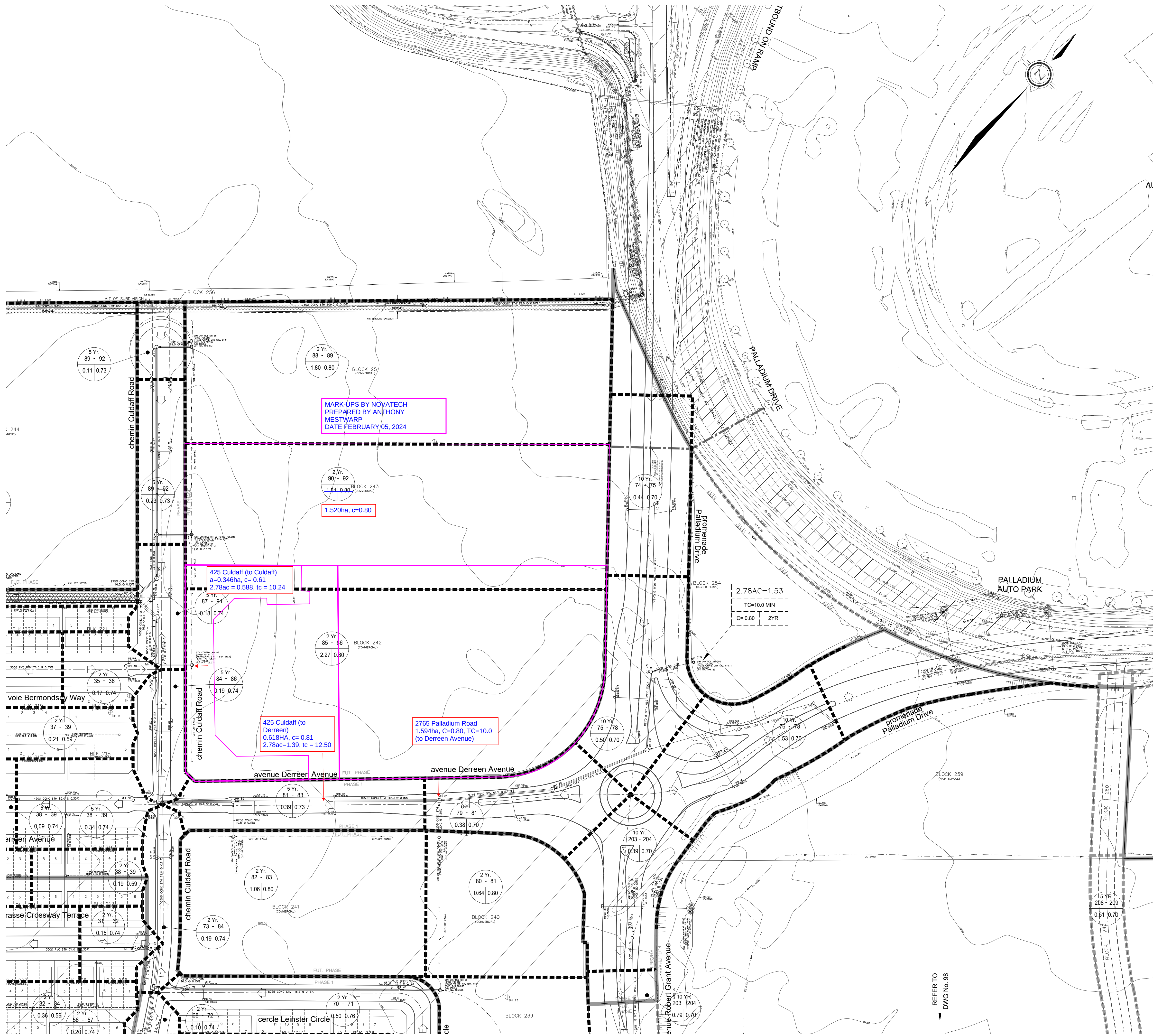
EXTERNAL OVERLAND FLOW DIRECTION

EMERGENCY OVERLAND FLOW DIRECTION

10.0

DRAWN BY:	R.A./A.K.	CHECKED BY:	W.L.	SHEET N
DESIGNED BY:	W.L.	CHECKED BY:	C.M.	
SCALE:	1:1000	DATE:	DECEMBER 2019	

REFER TO
DWG No 97



LEGEND

STORM DRAINAGE BOUNDARY	---
SUB-DRAINAGE BOUNDARY	---
STORM DRAINAGE BOUNDARY (OTHER PHASES)	---
STORM FREQUENCY	2Yr
UPSTREAM MH TO DOWNSTREAM MH	43-44
AREA IN HECTARES	0.37/0.51
RUNOFF COEFFICIENT	2.78AC=14.40
EXTERNAL 2.78AC	TC=14.5 MIN
EXTERNAL TIME OF CONCENTRATION	C=0.70 2YR
EXTERNAL BLENDED RUNOFF COEFFICIENT	21-23
EXTERNAL STORM FREQUENCY	0.28/0.78
UPSTREAM MH TO DOWNSTREAM MH	21-23
AREA IN OTHER PHASES IN HECTARES	0.28/0.78
RUNOFF COEFFICIENT	LS
STREET CATCHBASIN & LEAD	MH202
STREET CATCHBASIN WITH CLOSED LID & LEAD	CBMH201
MAINTENANCE HOLE	CBMH201
CURB INLET CATCHBASIN & LEAD	CBMH201
CATCHBASIN/ MAINTENANCE HOLE	CBMH201
INTERCONNECTED CATCH BASIN & LEADS	CBMH201
CAP	CBMH201
OVERLAND FLOW DIRECTION	→
EXTERNAL OVERLAND FLOW DIRECTION	→
EMERGENCY OVERLAND FLOW DIRECTION	→

TOPOGRAPHIC INFORMATION
CITY OF OTTAWA 1:10,000 MAPPING, RECEIVED ON OCTOBER 4, 2016. FEEDMILL CREEK TOPOGRAPHIC SURVEY (JULY 26, 2019) AND PALLADIUM DRIVE TOPOGRAPHIC SURVEY (JUNE 23, 2020) PROVIDED BY STANTEC (PROJECT No. 161613545-111)
LEGAL INFORMATION
M-PLAN PROVIDED BY STANTEC GEOMATICS LTD., PROJECT No. 16-16-135-45 (195 HUNTMAR ROAD), RECEIVED ON MAY 17, 2021.

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928/1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK MONUMENT: OTTAWA
ELEVATION = 95.205m

9	W.L.	21-05-20	REVISED AS PER MPLAN CHANGE
8	W.L.	21-04-20	REVISED AS PER MPLAN CHANGE
7	W.L.	21-04-08	REVISED AS PER NEW N/S ARTERIAL ROAD DESIGN
6	W.L.	21-03-18	REVISED AS PER CITY COMMENTS
5	W.L.	21-03-05	REVISED AS PER CITY COMMENTS
4	W.L.	20-11-09	4th SUBMISSION
3	W.L.	20-07-09	3rd SUBMISSION
2	W.L.	20-04-03	2nd SUBMISSION
1	W.L.	19-12-23	1st SUBMISSION
No.	BY	DATE	DESCRIPTION



PROJECT No. 12-624

100167932

PROF. 2020

STORM DRAINAGE PLAN

2325483
ONTARIO LTD.

195 HUNTMAR DRIVE

DSEL
david schaeffer engineering ltd

120 Iher Road, Unit 103
Stittsville, ON K2S 1E9
Tel: (613) 836-0856
Fax: (613) 836-7153
www.DSEL.ca

DRAWN BY:	R.A./A.K.	CHECKED BY:	W.L.	SHEET NO.
DESIGNED BY:	W.L.	CHECKED BY:	C.M.	96
SCALE:	1:1000	DATE:	DECEMBER 2019	

REFER TO
DWG No. 95

REFER TO
DWG No. 98

Committee of Adjustment
Received | Reçu le

2023-06-05

City of Ottawa | Ville d'Ottawa
Comité de dérogation



Consent
COMMENTS TO THE COMMITTEE OF ADJUSTMENT
Panel 3

Site Address: 2765 Palladium Drive
Legal Description: Block 242, Plan 4M-1687

No.: D08-01-23/B-00118 & D08-01-23/B-00119

Date: June 1, 2023

Hearing Date: June 6, 2023

Planner: Luke Teeft

Official Plan Designation: Mixed Industrial, Minor Corridor
Zoning: GM[2654] – General Mixed Use, Exception 2654

DEPARTMENT COMMENTS

The Planning, Real Estate, and Economic Development Department has **No Concerns** with the application as submitted subject to the following requested conditions.

DISCUSSION AND RATIONALE

The subject property is designated as Mixed Industrial and Minor Corridor in Schedule B5 of the Official Plan. Mixed Industrial areas are clusters of economic activity that are less impactful and provide a broader range of non-residential uses than Industrial areas. Minor Corridors are intended to provide a mix of residential and non-residential uses that are compatible with a dense mixed-use urban environment.

The subject site is zoned GM[2654] – General Mixed Use, Exception 2654. The purpose of the General Mixed-Use Zone is to permit a range of residential and non-residential uses in the General Urban Area and other specific areas identified in the Official Plan (By-law 2013-58).

The applicant proposes to sever the property at 2765 Palladium Drive into two separate parcels. The severed parcel identified as Part 1 and 2 in the attached 4M plan will have 119.53 metres of frontage on Culdaff Road, a depth of 78.5 metres and an area of 9730.18 square metres. This parcel will be known municipally as 425 Culdaff Road. The retained parcel identified as Part 3 in the attached 4M plan will



have 148.33 metres of frontage on Palladium Drive, a depth of 85.23 metres and an area of 15,940.04 square metres. This parcel will continue to be known municipally as 2765 Palladium Road.

Staff have determined that lot creation at this location poses no risk to nearby properties or complications for the future use of the lands. The severance provides an opportunity for increased density and diversity of uses on the subject property. Staff have no concerns with the proposal subject to the following conditions.

ADDITIONAL COMMENTS:

Building Code Services:

No comments.

Civil Engineering:

- Staff have reviewed the Grading and Servicing design submitted as part of the Subdivision application including the subject land. The existing plans show drainage from Part 3 (2765 Palladium Drive) towards Parts 1 and 2 (425 Culdaff Road). At the time of Site Plan and/or Building Permit, the applicant will be required to regrade Part 3 (2765 Palladium Drive) or provide adequate on-site storm structures to contain drainage within 2765 Palladium Drive and discharge overland flow towards the City's right-of-way. Separate water and sewer connections to the municipal services along Derreen Avenue will also be required.
- The only engineering condition imposed is the Noise study. As the vacant land will be about 155 metres from an arterial road (Palladium Drive), this condition is included in anticipation of residential development that would go directly to building permit instead of a site plan.

CONDITIONS:

If approved, the Planning, Real Estate and Economic Development Department requests that the Committee of Adjustment impose the following condition(s) on the application(s):

1. That the Owner(s) provide plans, drawings or reports as may be required to demonstrate, to the satisfaction of the **Manager, Right-of-Way, Heritage, and Urban Design Department or his/her designate** that a private approach that conforms with the Private Approach By-law (2003-447) can



reasonably be established on both the retained and severed parcels, to be confirmed in writing from the Department to the Committee.

2. That the Owner(s) provide evidence (payment receipt) to the Committee that payment has been made to the City of Ottawa of cash-in-lieu of the conveyance of land for park or other public recreational purposes, plus applicable appraisal costs. The value of the land otherwise required to be conveyed shall be determined by the City of Ottawa in accordance with the provisions of By-Law No. 2009-95, as amended. Information regarding the appraisal process can be obtained by contacting the Planner.
3. That the Owner(s) prepare a noise attenuation study in compliance with the City of Ottawa Environmental Noise Control Guidelines to the satisfaction of the **General Manager, Planning, Infrastructure and Economic Development Department, or his/her designate**. The Owner(s) shall also enter into an agreement with the City that requires the Owner to implement any noise control attenuation measures recommended in the approved study. The Agreement will also deal with any covenants/notices recommended in the approved study, that shall be registered on the land title and bind future owners on subsequent transfers, warning purchasers and/or tenants of expected noise levels due to the existing source of environmental noise. The Agreement shall be to the satisfaction of the **General Manager, Planning, Infrastructure and Economic Development Department, or his/her designate**. The Committee requires a copy of the Agreement and written confirmation from **City Legal Services** that it has been registered on title.;

or

Design the dwelling units with the provision for adding central air conditioning at the occupant's discretion and enter into an Agreement with the City, at the expense of the Owner, which is to be registered on title to deal with the covenants/ notices that shall run with the land and bind future owners on subsequent transfers, warning purchasers and/or tenants of expected noise levels due to the existing source of environmental noise. The following two conditions will be included in the above-noted Agreement:

- i) "The Purchaser/Lessee for himself, his heirs, executors, administrators, successors and assigns, acknowledges being advised that this dwelling unit has been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. Installation of central air conditioning by the Purchaser/Lessee will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within



the City of Ottawa's and the Ministry of the Environment and Climate Change's noise criteria;" and

ii) "The Purchaser/Lessee for himself, his heirs, executors, administrators, successors and assigns acknowledges being advised that noise levels due to increasing roadway traffic may be of concern, occasionally interfering with some activities of the dwelling occupants as the outdoor sound level exceeds the City of Ottawa's and the Ministry of the Environment and Climate Change's noise criteria.

A handwritten signature in blue ink, appearing to read "Luke Teeft".

Luke Teeft
Planner I, Development Review, PRED
Dept.

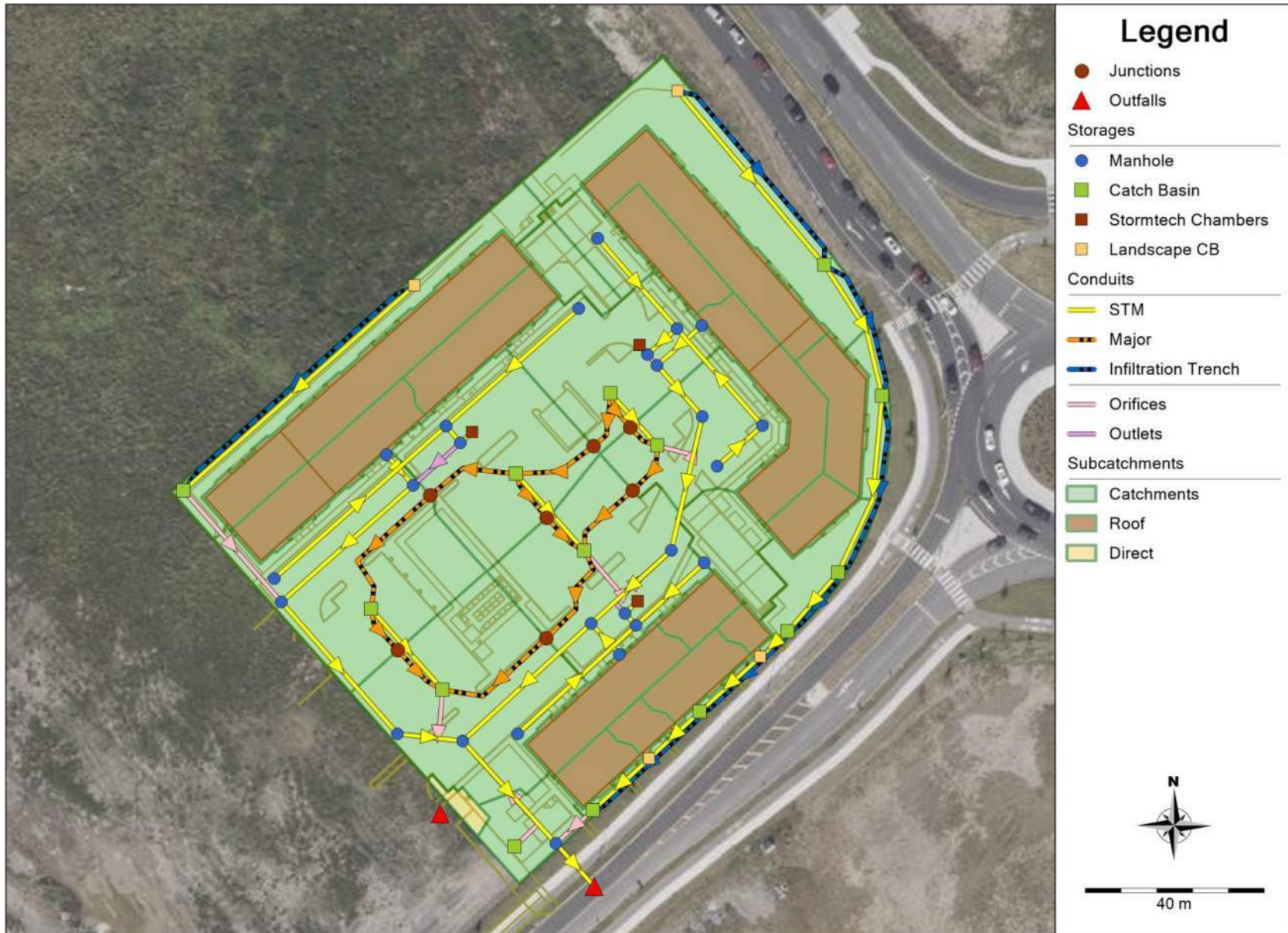
A handwritten signature in blue ink, appearing to read "Lisa Stern".

Lisa Stern, MCIP, RPP
Planner III, Development Review, PRED
Dept.

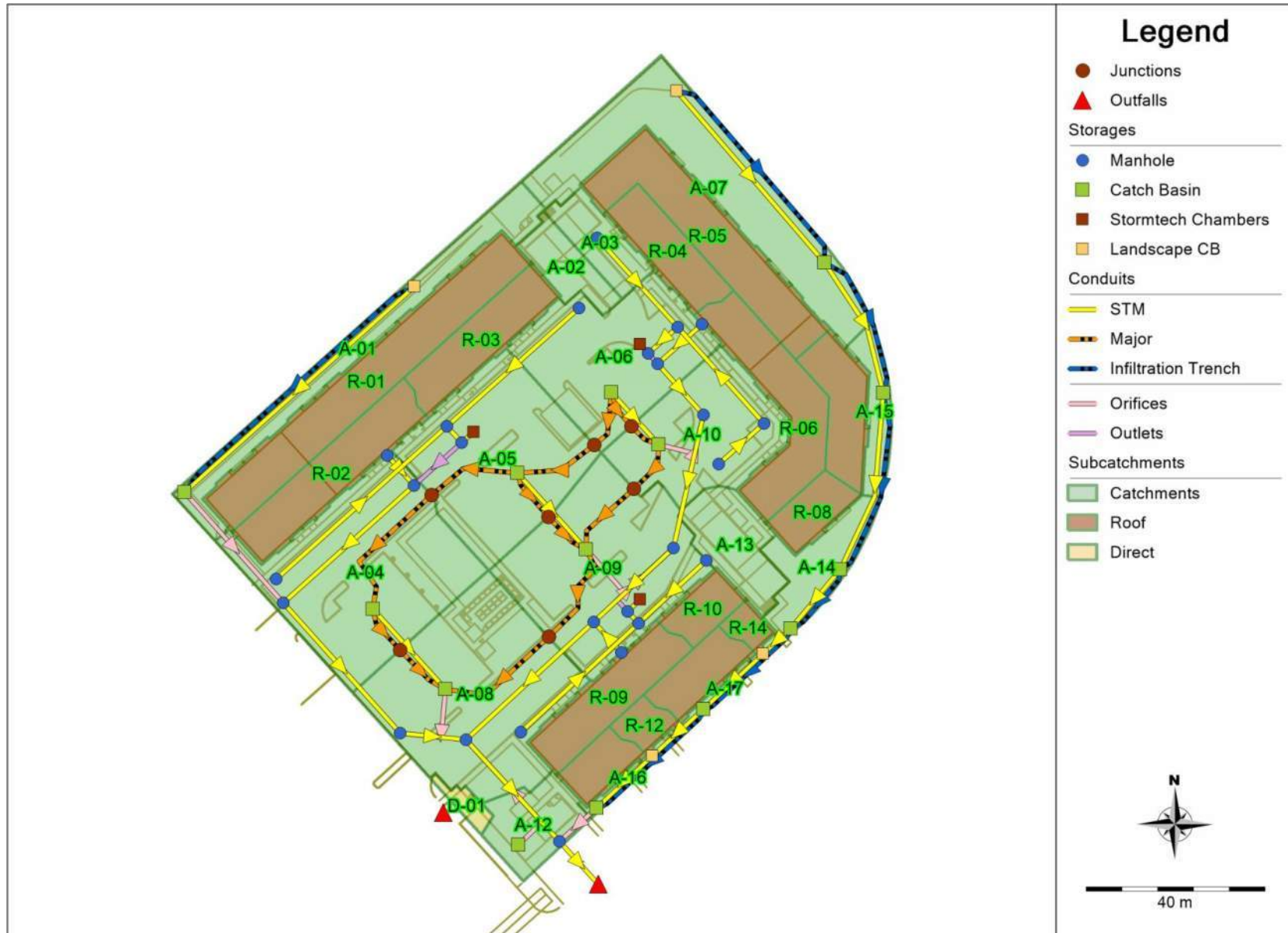
Appendix E

PCSWMM Modeling

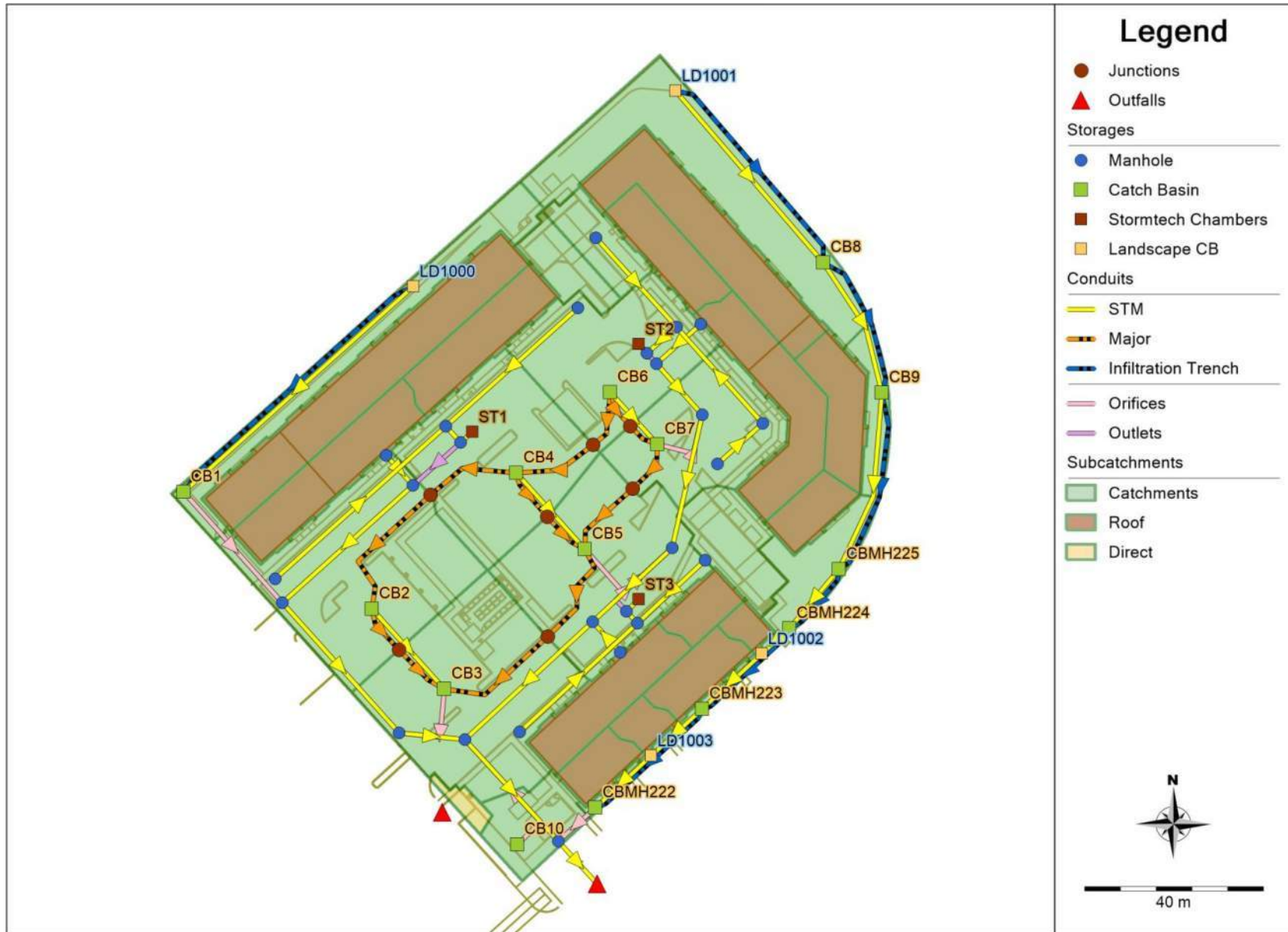
Overall Model Schematic



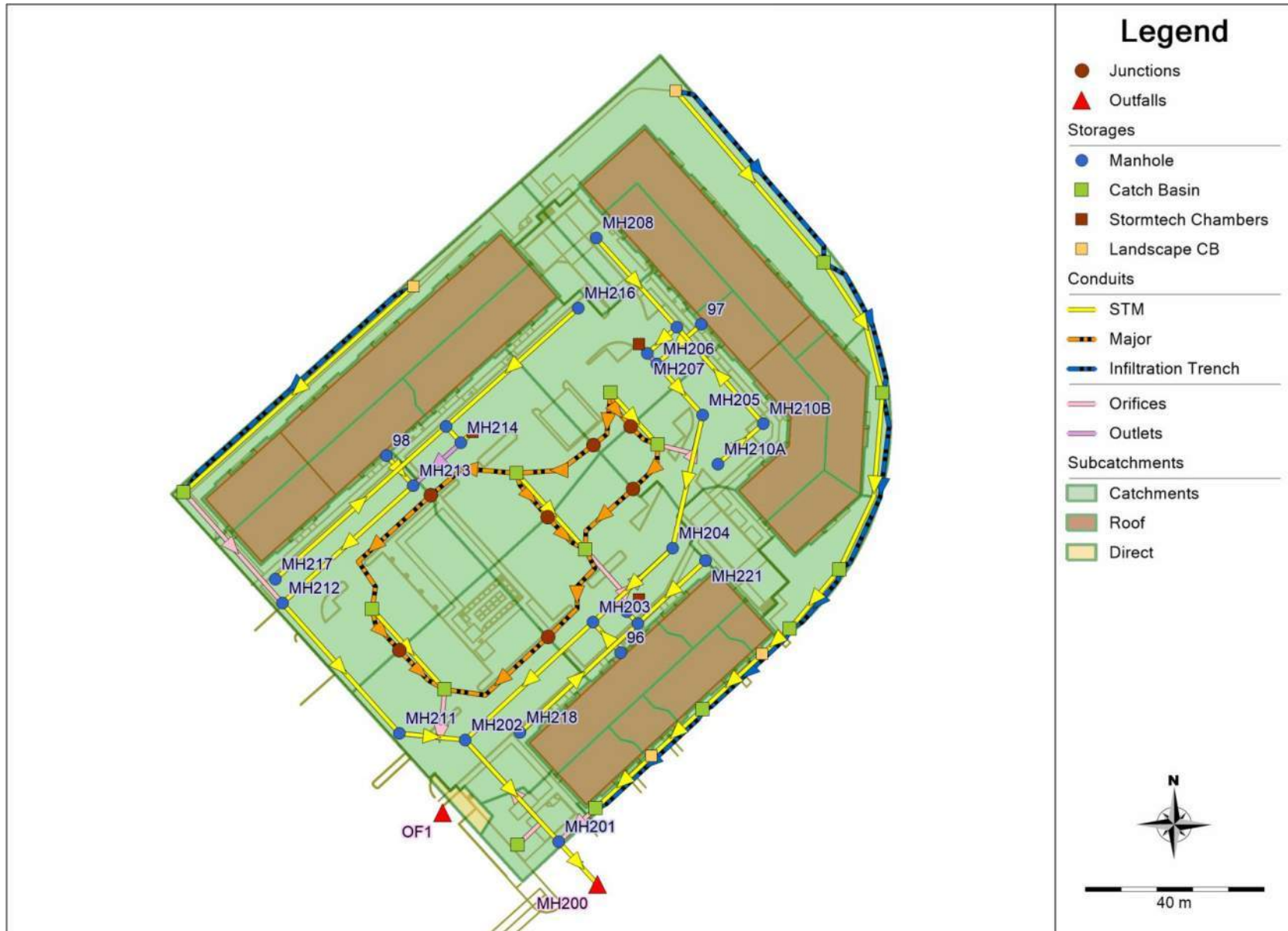
Subcatchment IDs



Catchbasins and Stormtech Chambers



Manholes and Outfalls



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

WARNING 03: negative offset ignored for Link C21
 WARNING 03: negative offset ignored for Link C21

 Element Count

Number of rain gages 1
 Number of subcatchments ... 31
 Number of nodes 55
 Number of links 67
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
Raingage	01-C6hr-2yr	INTENSITY	10 min.

 Subcatchment Summary

Name Outlet	Area	Width	%Imperv	%Slope	Rain Gage
A-01 LD1000	0.06	152.50	6.00	2.5000	Raingage
A-02 98	0.02	26.25	100.00	2.0000	Raingage
A-03 97	0.03	27.78	94.00	2.0000	Raingage
A-04 CB2	0.15	82.22	87.00	2.5000	Raingage
A-05 CB4	0.12	70.00	90.00	2.5000	Raingage
A-06 CB6	0.10	61.88	91.00	2.5000	Raingage
A-07 LD1001	0.12	128.89	4.00	6.0000	Raingage
A-08 CB3	0.15	70.00	89.00	2.0000	Raingage
A-09 CB5	0.13	76.47	90.00	2.0000	Raingage
A-10 CB7	0.08	58.57	86.00	2.5000	Raingage
A-12 CB10	0.03	35.56	23.00	2.5000	Raingage
A-13 96	0.04	27.69	90.00	2.0000	Raingage

Palladium II - 125091
PCSWMM Model Outputs
6-hour 2-year Chicago

A-14 CBMH225	0.04	29.17	7.00	11.0000	Raingage
A-15 CB9	0.02	63.33	3.00	20.0000	Raingage
A-16 LD1003	0.01	60.00	26.00	9.0000	Raingage
A-17 LD1002	0.01	70.00	17.00	3.5000	Raingage
D-01 OF1	0.01	15.00	39.00	3.5000	Raingage
R-01 LD1000	0.09	90.00	100.00	3.0000	Raingage
R-02 MH217	0.05	55.56	100.00	3.0000	Raingage
R-03 MH216	0.04	39.00	100.00	3.0000	Raingage
R-04 MH208	0.03	31.00	100.00	3.0000	Raingage
R-05 LD1001	0.07	70.00	100.00	3.0000	Raingage
R-06 MH210A	0.06	57.00	100.00	3.0000	Raingage
R-07 CB9	0.03	34.44	100.00	3.0000	Raingage
R-08 CBMH225	0.02	21.11	100.00	3.0000	Raingage
R-09 MH218	0.04	45.56	100.00	3.0000	Raingage
R-10 MH221	0.02	17.00	100.00	3.0000	Raingage
R-11 LD1003	0.02	18.89	100.00	3.0000	Raingage
R-12 LD1003	0.01	11.11	100.00	3.0000	Raingage
R-13 LD1002	0.02	25.56	100.00	3.0000	Raingage
R-14 LD1002	0.01	8.89	100.00	3.0000	Raingage

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
HP-A-04	JUNCTION	108.70	1.00	0.0	
HP-A-05	JUNCTION	108.75	1.00	0.0	
HP-A-05-2	JUNCTION	109.02	1.00	0.0	
HP-A-06	JUNCTION	108.78	1.00	0.0	
HP-A-06-2	JUNCTION	108.80	1.00	0.0	
HP-A-07	JUNCTION	108.75	1.00	0.0	
HP-A-09	JUNCTION	108.73	1.00	0.0	
MH200	OUTFALL	105.72	0.53	0.0	
OF1	OUTFALL	0.00	0.00	0.0	
96	STORAGE	106.32	2.70	0.0	
97	STORAGE	106.59	2.51	0.0	
98	STORAGE	106.67	2.39	0.0	
CB1	STORAGE	106.66	3.04	0.0	

Palladium II - 125091
PCSWMM Model Outputs
6-hour 2-year Chicago

CB10	STORAGE	107.40	2.20	0.0
CB2	STORAGE	107.15	2.20	0.0
CB3	STORAGE	107.00	2.35	0.0
CB4	STORAGE	107.25	2.20	0.0
CB5	STORAGE	107.13	2.32	0.0
CB6	STORAGE	107.30	2.20	0.0
CB7	STORAGE	107.19	2.41	0.0
CB8	STORAGE	107.41	2.01	0.0
CB9	STORAGE	107.20	2.37	0.0
CBMH222	STORAGE	106.01	2.56	0.0
CBMH223	STORAGE	106.55	2.04	0.0
CBMH224	STORAGE	106.83	2.66	0.0
CBMH225	STORAGE	106.95	2.45	0.0
LD1000	STORAGE	107.41	2.42	0.0
LD1001	STORAGE	107.67	2.04	0.0
LD1002	STORAGE	106.74	2.86	0.0
LD1003	STORAGE	106.39	3.26	0.0
MH201	STORAGE	105.75	2.99	0.0
MH202	STORAGE	105.85	2.70	0.0
MH203	STORAGE	106.03	2.74	0.0
MH204	STORAGE	106.10	2.72	0.0
MH205	STORAGE	106.27	2.63	0.0
MH206	STORAGE	106.41	2.41	0.0
MH207	STORAGE	106.48	2.36	0.0
MH208	STORAGE	106.78	2.45	0.0
MH209	STORAGE	106.59	2.51	0.0
MH210A	STORAGE	107.30	1.70	0.0
MH210B	STORAGE	107.17	2.08	0.0
MH211	STORAGE	105.97	2.65	0.0
MH212	STORAGE	106.28	2.44	0.0
MH213	STORAGE	106.54	2.52	0.0
MH214	STORAGE	106.62	2.35	0.0
MH215	STORAGE	106.69	2.40	0.0
MH216	STORAGE	106.95	2.12	0.0
MH217	STORAGE	107.35	1.50	0.0
MH218	STORAGE	107.00	1.93	0.0
MH219	STORAGE	106.21	2.81	0.0
MH220	STORAGE	106.18	2.72	0.0
MH221	STORAGE	106.37	2.72	0.0
ST1	STORAGE	106.67	0.99	0.0
ST2	STORAGE	106.52	0.99	0.0
ST3	STORAGE	106.28	0.99	0.0

Link Summary

Name		From Node	To Node	Type	Length	%

C1		CB4	HP-A-05	CONDUIT	2.0	-
15.1717	0.0130					
C10		HP-A-04	CB3	CONDUIT	2.0	
17.7743	0.0130					
C11		CB4	HP-A-05-2	CONDUIT	2.0	-
29.7331	0.0130					

Palladium II - 125091
PCSWMM Model Outputs
6-hour 2-year Chicago

C12		HP-A-05-2	CB2	CONDUIT	2.0	
35.5544	0.0130					
C13		CB6	HP-A-06-2	CONDUIT	2.0	-
15.1717	0.0130					
C14		HP-A-06-2	CB4	CONDUIT	2.0	
17.7743	0.0130					
C15		LD1001	CB8	CONDUIT	50.5	
0.5154	0.0350					
C16		CB8	CB9	CONDUIT	32.2	
0.6522	0.0350					
C17		CB9	CBMH225	CONDUIT	41.0	
0.6095	0.0350					
C18		CBMH225	CBMH224	CONDUIT	17.2	
0.6977	0.0350					
C19		CBMH224	CBMH223	CONDUIT	26.4	
1.0591	0.0350					
C2		HP-A-05	CB5	CONDUIT	2.0	
15.1717	0.0130					
C20		CBMH223	CBMH222	CONDUIT	32.3	
1.6721	0.0350					
C21		LD1000	CB1	CONDUIT	68.6	
1.0932	0.0350					
C3		CB6	HP-A-06	CONDUIT	2.0	-
14.1393	0.0130					
C4		HP-A-06	CB7	CONDUIT	2.0	
9.0367	0.0130					
C5		CB7	HP-A-07	CONDUIT	2.0	-
7.5212	0.0130					
C6		HP-A-07	CB5	CONDUIT	2.0	
15.1717	0.0130					
C7		CB5	HP-A-09	CONDUIT	2.0	-
14.1393	0.0130					
C8		HP-A-09	CB3	CONDUIT	2.0	
19.3525	0.0130					
C9		CB2	HP-A-04	CONDUIT	2.0	-
17.7743	0.0130					
STM-25		MH212	MH211	CONDUIT	39.7	
0.4026	0.0130					
STM-26		MH211	MH202	CONDUIT	14.7	
0.2725	0.0130					
STM-27		MH202	MH201	CONDUIT	30.7	
0.2932	0.0130					
STM-28		MH201	MH200	CONDUIT	12.9	
0.2322	0.0130					
STM-29		CB2	CB3	CONDUIT	24.0	
0.5000	0.0130					
STM-31		CB4	CB5	CONDUIT	22.9	
0.4810	0.0130					
STM-33		CB6	CB7	CONDUIT	15.6	
0.5128	0.0130					
STM-35		MH206	MH205	CONDUIT	15.2	
0.3934	0.0130					
STM-36		MH205	MH204	CONDUIT	30.3	
0.2966	0.0130					
STM-37		MH204	MH203	CONDUIT	24.2	
0.2480	0.0130					
STM-37_(1)		MH203	MH202	CONDUIT	38.6	
0.2587	0.0130					
STM-39		MH213	MH212	CONDUIT	39.1	
0.5120	0.0130					

Palladium II - 125091
PCSWMM Model Outputs
6-hour 2-year Chicago

STM-40	98	MH213	CONDUIT	8.9
0.8939 0.0130				
STM-41	97	MH206	CONDUIT	13.2
0.9827 0.0130				
STM-42	96	MH203	CONDUIT	9.2
0.9772 0.0130				
STM-44	MH218	MH219	CONDUIT	35.7
0.5048 0.0130				
STM-45	MH221	MH219	CONDUIT	20.6
0.4857 0.0130				
STM-46	MH219	MH220	CONDUIT	3.6
0.5525 0.0130				
STM-48	MH217	MH215	CONDUIT	50.9
0.4908 0.0130				
STM-49	MH215	MH214	CONDUIT	4.9
0.4082 0.0130				
STM-50	MH216	MH215	CONDUIT	39.5
0.5070 0.0130				
STM-53	ST3	MH220	CONDUIT	3.8
1.0417 0.0130				
STM-54	ST1	MH214	CONDUIT	3.5
1.1429 0.0130				
STM-55	MH208	MH209	CONDUIT	26.7
0.4864 0.0130				
STM-56	MH210B	MH209	CONDUIT	28.8
0.4865 0.0130				
STM-57	MH209	MH207	CONDUIT	8.7
0.4577 0.0130				
STM-60	ST2	MH207	CONDUIT	2.7
1.1112 0.0130				
STM-70	LD1000	CB1	CONDUIT	68.6
1.0057 0.0130				
STM-71	LD1001	CB8	CONDUIT	50.5
0.4955 0.0130				
STM-72	CB8	CB9	CONDUIT	32.2
0.5590 0.0130				
STM-74	CB9	CBMH225	CONDUIT	41.0
0.5363 0.0130				
STM-77	CBMH224	LD1002	CONDUIT	8.3
0.9674 0.0130				
STM-77_(1)	LD1002	CBMH223	CONDUIT	18.2
0.9907 0.0130				
STM-78	CBMH223	LD1003	CONDUIT	15.3
0.9792 0.0130				
STM-78_(1)	LD1003	CBMH222	CONDUIT	17.0
1.0012 0.0130				
STM-79	CBMH225	CBMH224	CONDUIT	17.2
0.5233 0.0130				
STM-83	MH210A	MH210B	CONDUIT	13.5
0.5185 0.0130				
O-CB1	CB1	MH212	ORIFICE	
O-CB10	CB10	MH202	ORIFICE	
O-CB3	CB3	MH211	ORIFICE	
O-Cb5	CB5	MH204	ORIFICE	
O-CB7	CB7	MH205	ORIFICE	
O-CBMH222	CBMH222	MH201	ORIFICE	
O-MH206	MH207	MH206	OUTLET	
O-MH214	MH214	MH213	OUTLET	
O-MH220	MH220	MH204	OUTLET	

 Cross Section Summary

Full Conduit Flow	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels

C1 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C10 69215.12	RECT_OPEN	1.00	3.00	0.60	3.00	1
C11 89521.02	RECT_OPEN	1.00	3.00	0.60	3.00	1
C12 97892.98	RECT_OPEN	1.00	3.00	0.60	3.00	1
C13 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C14 69215.12	RECT_OPEN	1.00	3.00	0.60	3.00	1
C15 88.97	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C16 100.08	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C17 96.75	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C18 103.51	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C19 127.53	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C2 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C20 160.25	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C21 129.57	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C3 61733.10	RECT_OPEN	1.00	3.00	0.60	3.00	1
C4 49352.50	RECT_OPEN	1.00	3.00	0.60	3.00	1
C5 45024.40	RECT_OPEN	1.00	3.00	0.60	3.00	1
C6 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C7 61733.10	RECT_OPEN	1.00	3.00	0.60	3.00	1
C8 72222.70	RECT_OPEN	1.00	3.00	0.60	3.00	1
C9 69215.12	RECT_OPEN	1.00	3.00	0.60	3.00	1
STM-25 61.36	CIRCULAR	0.30	0.07	0.07	0.30	1
STM-26 148.83	CIRCULAR	0.45	0.16	0.11	0.45	1
STM-27 232.87	CIRCULAR	0.53	0.22	0.13	0.53	1
STM-28	CIRCULAR	0.53	0.22	0.13	0.53	1

Palladium II - 125091
PCSWMM Model Outputs
6-hour 2-year Chicago

STM-29 68.38	CIRCULAR	0.30	0.07	0.07	0.30	1
STM-31 41.25	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-33 42.59	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-35 60.66	CIRCULAR	0.30	0.07	0.07	0.30	1
STM-36 95.50	CIRCULAR	0.38	0.11	0.09	0.38	1
STM-37 142.00	CIRCULAR	0.45	0.16	0.11	0.45	1
STM-37_(1) 145.03	CIRCULAR	0.45	0.16	0.11	0.45	1
STM-39 42.56	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-40 56.23	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-41 58.95	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-42 58.79	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-44 42.25	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-45 41.45	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-46 44.20	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-48 41.66	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-49 37.99	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-50 42.34	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-53 60.70	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-54 63.58	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-55 41.47	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-56 41.48	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-57 40.23	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-60 62.69	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-70 59.64	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-71 41.86	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-72 44.46	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-74 43.55	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-77 58.49	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-77_(1) 59.19	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-78 58.85	CIRCULAR	0.25	0.05	0.06	0.25	1

STM-78_(1)	CIRCULAR	0.25	0.05	0.06	0.25	1
59.51						
STM-79	CIRCULAR	0.25	0.05	0.06	0.25	1
43.02						
STM-83	CIRCULAR	0.25	0.05	0.06	0.25	1
42.82						

Analysis Options

Flow Units LPS

Process Models:

Rainfall/Runoff	YES
RDII	NO
Snowmelt	NO
Groundwater	NO
Flow Routing	YES
Ponding Allowed	YES
Water Quality	NO
Infiltration Method	HORTON
Flow Routing Method	DYNWAVE
Surcharge Method	EXTRAN
Starting Date	04/17/2026 00:00:00
Ending Date	04/19/2026 00:00:00
Antecedent Dry Days	0.0
Report Time Step	00:01:00
Wet Time Step	00:01:00
Dry Time Step	00:01:00
Routing Time Step	1.00 sec
Variable Time Step	YES
Maximum Trials	8
Number of Threads	16
Head Tolerance	0.001500 m

*****	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	0.059	36.858
Evaporation Loss	0.000	0.000
Infiltration Loss	0.012	7.824
Surface Runoff	0.045	28.335
Final Storage	0.001	0.735
Continuity Error (%)	-0.095	

*****	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.045	0.451
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.045	0.451
Flooding Loss	0.000	0.000

Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	-0.049	

 Time-Step Critical Elements

 None

 Highest Flow Instability Indexes

 All links are stable.

 Most Frequent Nonconverging Nodes

 Convergence obtained at all time steps.

 Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.66 %
0.871 - 0.758 sec	:	0.13 %
0.758 - 0.660 sec	:	0.08 %
0.660 - 0.574 sec	:	0.05 %
0.574 - 0.500 sec	:	0.08 %

 Subcatchment Runoff Summary

Perv		Total	Total	Total	Total	Total	Imperv
Runoff	Runoff	Runoff	Peak	Runoff	Evap	Infil	Runoff
Subcatchment	Runoff	Precip	Runoff	Runoff	mm	mm	mm
mm	mm	10^6 ltr	mm	mm	mm	mm	mm
			LPS	Coeff			
A-01			36.86	0.00	0.00	34.04	2.12
0.62	2.74	0.00	2.31	0.074			

Palladium II - 125091
PCSWMM Model Outputs
6-hour 2-year Chicago

A-02			36.86	0.00	0.00	0.00	35.33
0.00	35.33	0.01	4.48	0.959			
A-03			36.86	0.00	0.00	2.15	33.21
0.06	33.28	0.01	5.15	0.903			
A-04			36.86	0.00	0.00	4.69	30.73
0.10	30.83	0.05	28.23	0.837			
A-05			36.86	0.00	0.00	3.60	31.79
0.09	31.88	0.04	23.44	0.865			
A-06			36.86	0.00	0.00	3.24	32.15
0.08	32.23	0.03	19.72	0.874			
A-07			36.86	0.00	0.00	34.87	1.41
0.52	1.93	0.00	3.08	0.052			
A-08			36.86	0.00	0.00	3.97	31.44
0.08	31.52	0.05	28.50	0.855			
A-09			36.86	0.00	0.00	3.60	31.79
0.08	31.87	0.04	25.56	0.865			
A-10			36.86	0.00	0.00	5.05	30.38
0.12	30.50	0.03	15.56	0.827			
A-12			36.86	0.00	0.00	28.02	8.12
0.37	8.49	0.00	1.95	0.230			
A-13			36.86	0.00	0.00	3.60	31.79
0.09	31.88	0.01	7.11	0.865			
A-14			36.86	0.00	0.00	33.77	2.47
0.52	2.99	0.00	1.16	0.081			
A-15			36.86	0.00	0.00	34.85	1.06
0.94	2.00	0.00	1.40	0.054			
A-16			36.86	0.00	0.00	26.46	9.21
0.87	10.08	0.00	0.80	0.273			
A-17			36.86	0.00	0.00	29.77	6.01
0.87	6.88	0.00	0.74	0.187			
D-01			36.86	0.00	0.00	22.00	13.77
0.50	14.27	0.00	0.66	0.387			
R-01			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.03	19.20	1.001			
R-02			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.02	10.67	1.001			
R-03			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.01	8.32	1.001			
R-04			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.01	6.61	1.001			
R-05			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.03	14.94	1.001			
R-06			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.02	12.16	1.001			
R-07			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.01	6.61	1.001			
R-08			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.01	4.05	1.001			
R-09			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.02	8.75	1.001			
R-10			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.01	3.63	1.001			
R-11			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.01	3.63	1.001			
R-12			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.00	2.13	1.001			
R-13			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.01	4.91	1.001			
R-14			36.86	0.00	0.00	0.00	36.90
0.00	36.90	0.00	1.71	1.001			

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
HP-A-04	JUNCTION	0.00	0.00	108.70	0 00:00	0.00
HP-A-05	JUNCTION	0.00	0.00	108.75	0 00:00	0.00
HP-A-05-2	JUNCTION	0.00	0.00	109.02	0 00:00	0.00
HP-A-06	JUNCTION	0.00	0.00	108.78	0 00:00	0.00
HP-A-06-2	JUNCTION	0.00	0.00	108.80	0 00:00	0.00
HP-A-07	JUNCTION	0.00	0.00	108.75	0 00:00	0.00
HP-A-09	JUNCTION	0.00	0.00	108.73	0 00:00	0.00
MH200	OUTFALL	0.01	0.40	106.12	0 02:11	0.40
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
96	STORAGE	0.00	0.06	106.38	0 02:10	0.06
97	STORAGE	0.00	0.05	106.64	0 02:10	0.05
98	STORAGE	0.00	0.05	106.72	0 02:10	0.05
CB1	STORAGE	0.01	0.49	107.15	0 02:12	0.49
CB10	STORAGE	0.00	0.06	107.46	0 02:10	0.06
CB2	STORAGE	0.01	1.19	108.34	0 02:10	1.19
CB3	STORAGE	0.01	1.32	108.32	0 02:10	1.32
CB4	STORAGE	0.01	0.94	108.19	0 02:10	0.94
CB5	STORAGE	0.01	1.03	108.16	0 02:10	1.03
CB6	STORAGE	0.01	0.97	108.27	0 02:10	0.97
CB7	STORAGE	0.01	1.07	108.26	0 02:10	1.06
CB8	STORAGE	0.00	0.07	107.48	0 02:10	0.07
CB9	STORAGE	0.00	0.09	107.29	0 02:10	0.09
CBMH222	STORAGE	0.01	0.91	106.92	0 02:13	0.91
CBMH223	STORAGE	0.00	0.37	106.92	0 02:14	0.37
CBMH224	STORAGE	0.00	0.09	106.92	0 02:13	0.09
CBMH225	STORAGE	0.00	0.10	107.05	0 02:10	0.10
LD1000	STORAGE	0.00	0.07	107.48	0 02:10	0.07
LD1001	STORAGE	0.00	0.08	107.75	0 02:10	0.08
LD1002	STORAGE	0.00	0.19	106.93	0 02:14	0.19
LD1003	STORAGE	0.01	0.53	106.92	0 02:13	0.53
MH201	STORAGE	0.01	0.48	106.23	0 02:11	0.48
MH202	STORAGE	0.01	0.42	106.27	0 02:10	0.42
MH203	STORAGE	0.01	0.34	106.37	0 02:10	0.34
MH204	STORAGE	0.01	0.30	106.40	0 02:10	0.30
MH205	STORAGE	0.01	0.19	106.46	0 02:10	0.19
MH206	STORAGE	0.00	0.08	106.49	0 02:10	0.08
MH207	STORAGE	0.01	0.37	106.85	0 02:20	0.37
MH208	STORAGE	0.00	0.07	106.85	0 02:19	0.07
MH209	STORAGE	0.01	0.26	106.85	0 02:20	0.26
MH210A	STORAGE	0.00	0.11	107.41	0 02:10	0.11
MH210B	STORAGE	0.00	0.10	107.27	0 02:10	0.10
MH211	STORAGE	0.01	0.32	106.29	0 02:10	0.32
MH212	STORAGE	0.01	0.11	106.39	0 02:10	0.11
MH213	STORAGE	0.00	0.08	106.62	0 02:10	0.08
MH214	STORAGE	0.01	0.37	106.99	0 02:20	0.37
MH215	STORAGE	0.01	0.30	106.99	0 02:20	0.30

Total Flow			Maximum	Maximum			Lateral		
Inflow	Balance		Lateral	Total	Time of Max		Inflow		
Volume	Error		Inflow	Inflow	Occurrence		Volume		
Node		Type	LPS	LPS	days	hr:min	10^6	ltr	10^6
ltr	Percent								

0	HP-A-04	JUNCTION	0.00	0.00	0	00:00	0		
0	0.000 ltr								
0	HP-A-05	JUNCTION	0.00	0.00	0	00:00	0		
0	0.000 ltr								
0	HP-A-05-2	JUNCTION	0.00	0.00	0	00:00	0		
0	0.000 ltr								
0	HP-A-06	JUNCTION	0.00	0.00	0	00:00	0		
0	0.000 ltr								
0	HP-A-06-2	JUNCTION	0.00	0.00	0	00:00	0		
0	0.000 ltr								
0	HP-A-07	JUNCTION	0.00	0.00	0	00:00	0		
0	0.000 ltr								
0	HP-A-09	JUNCTION	0.00	0.00	0	00:00	0		
0	0.000 ltr								
0.45	MH200	OUTFALL	0.00	192.33	0	02:11	0		
0.000856	0.000								
0.000856	OF1	OUTFALL	0.66	0.66	0	02:10	0.000856		
0.0115	96	STORAGE	7.11	7.11	0	02:10	0.0115		
0.00832	0.132								
0.00742	97	STORAGE	5.15	5.15	0	02:10	0.00832		
0.00742	0.004								
0.0349	98	STORAGE	4.48	4.48	0	02:10	0.00742		
0.00272	0.006								
0.0456	CB1	STORAGE	0.00	20.95	0	02:10	0		
0.092	-0.162								
0.00272	CB10	STORAGE	1.95	1.95	0	02:10	0.00272		
0.0456	0.001								
0.092	CB2	STORAGE	28.23	28.23	0	02:10	0.0456		
	-0.011								
	CB3	STORAGE	28.50	55.67	0	02:10	0.0463		
	-0.000								

Palladium II - 125091
PCSWMM Model Outputs
6-hour 2-year Chicago

CB4		STORAGE	23.44	23.44	0	02:10	0.0379
0.0379	-0.008						
CB5		STORAGE	25.56	48.44	0	02:10	0.0414
0.0794	-0.003						
CB6		STORAGE	19.72	19.72	0	02:10	0.0319
0.0319	-0.002						
CB7		STORAGE	15.56	34.76	0	02:10	0.025
0.0569	0.003						
CB8		STORAGE	0.00	17.03	0	02:10	0
0.0281	-0.001						
CB9		STORAGE	8.01	24.32	0	02:10	0.0118
0.0399	-0.003						
CBMH222		STORAGE	0.00	32.36	0	02:06	0
0.0704	-0.114						
CBMH223		STORAGE	0.00	35.10	0	02:10	0
0.0598	-0.215						
CBMH224		STORAGE	0.00	28.28	0	02:10	0
0.048	-0.026						
CBMH225		STORAGE	5.22	28.69	0	02:10	0.00806
0.048	-0.002						
LD1000		STORAGE	21.51	21.51	0	02:10	0.0349
0.0349	0.073						
LD1001		STORAGE	18.02	18.02	0	02:10	0.0281
0.0281	-0.010						
LD1002		STORAGE	7.36	21.90	0	02:10	0.0119
0.0332	0.355						
LD1003		STORAGE	6.56	20.43	0	02:06	0.0106
0.0297	0.175						
MH201		STORAGE	0.00	192.62	0	02:10	0
0.45	0.007						
MH202		STORAGE	0.00	174.69	0	02:10	0
0.379	-0.141						
MH203		STORAGE	0.00	102.34	0	02:10	0
0.21	0.089						
MH204		STORAGE	0.00	96.44	0	02:10	0
0.198	0.024						
MH205		STORAGE	0.00	44.50	0	02:10	0
0.0976	0.022						
MH206		STORAGE	0.00	10.30	0	02:10	0
0.0407	0.005						
MH207		STORAGE	0.00	18.58	0	02:05	0
0.0408	-0.203						
MH208		STORAGE	6.61	6.61	0	02:10	0.0114
0.0114	0.835						
MH209		STORAGE	0.00	18.78	0	02:10	0
0.0324	0.088						
MH210A		STORAGE	12.16	12.16	0	02:10	0.021
0.021	-0.004						
MH210B		STORAGE	0.00	12.16	0	02:10	0
0.021	-0.004						
MH211		STORAGE	0.00	73.16	0	02:10	0
0.167	0.065						
MH212		STORAGE	0.00	18.95	0	02:10	0
0.0751	-0.073						
MH213		STORAGE	0.00	9.62	0	02:10	0
0.0402	0.000						
MH214		STORAGE	0.00	18.09	0	02:04	0
0.0409	-0.119						
MH215		STORAGE	0.00	18.99	0	02:10	0
0.0327	-0.247						

Palladium II - 125091
 PCSWMM Model Outputs
 6-hour 2-year Chicago

MH216		STORAGE	8.32	8.32	0	02:10	0.0144
0.0144	1.018						
MH217		STORAGE	10.67	10.67	0	02:10	0.0185
0.0185	-0.011						
MH218		STORAGE	8.75	8.75	0	02:10	0.0151
0.0151	-0.010						
MH219		STORAGE	0.00	12.37	0	02:07	0
0.0214	-0.124						
MH220		STORAGE	0.00	11.86	0	02:04	0
0.025	-0.010						
MH221		STORAGE	3.63	3.63	0	02:10	0.00627
0.00627	0.411						
ST1		STORAGE	0.00	13.55	0	02:04	0
0.00812	0.083						
ST2		STORAGE	0.00	14.12	0	02:04	0
0.00849	0.031						
ST3		STORAGE	0.00	7.84	0	02:04	0
0.00358	0.110						

 Node Surcharge Summary

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
ST1	STORAGE	0.47	0.071	0.669
ST2	STORAGE	0.51	0.078	0.662

 Node Flooding Summary

No nodes were flooded.

 Storage Volume Summary

Max Occurrence	Maximum Outflow Storage Unit hr:min LPS	Average Volume 1000 m ³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m ³	Max Pcnt Full	Time of days
96 00:00	7.10	0.000	0.0	0.0	0.0	0.000	0.0	0
97 00:00	5.13	0.000	0.0	0.0	0.0	0.000	0.0	0

Palladium II - 125091
 PCSWMM Model Outputs
 6-hour 2-year Chicago

98		0.000	0.0	0.0	0.0	0.000	0.0	0
00:00	4.48							
CB1		0.000	0.3	0.0	0.0	0.000	16.2	0
02:12	9.81							
CB10		0.000	0.0	0.0	0.0	0.000	0.0	0
02:10	1.86							
CB2		0.000	0.0	0.0	0.0	0.000	0.0	0
02:10	27.21							
CB3		0.000	0.0	0.0	0.0	0.000	0.0	0
02:10	54.68							
CB4		0.000	0.0	0.0	0.0	0.000	0.0	0
02:10	22.94							
CB5		0.000	0.0	0.0	0.0	0.000	0.0	0
02:10	47.92							
CB6		0.000	0.0	0.0	0.0	0.000	0.1	0
02:10	19.21							
CB7		0.000	0.0	0.0	0.0	0.000	0.1	0
02:10	34.27							
CB8		0.000	0.1	0.0	0.0	0.000	3.7	0
02:10	16.60							
CB9		0.000	0.1	0.0	0.0	0.000	3.9	0
02:10	23.62							
CBMH222		0.000	0.5	0.0	0.0	0.001	35.4	0
02:13	22.21							
CBMH223		0.000	0.2	0.0	0.0	0.000	18.1	0
02:14	30.09							
CBMH224		0.000	0.1	0.0	0.0	0.000	3.4	0
02:13	28.35							
CBMH225		0.000	0.1	0.0	0.0	0.000	4.2	0
02:10	28.28							
LD1000		0.000	0.1	0.0	0.0	0.000	3.0	0
02:10	20.95							
LD1001		0.000	0.1	0.0	0.0	0.000	3.9	0
02:10	17.03							
LD1002		0.000	0.1	0.0	0.0	0.000	6.6	0
02:14	21.84							
LD1003		0.000	0.2	0.0	0.0	0.000	16.2	0
02:13	17.12							
MH201		0.000	0.5	0.0	0.0	0.001	16.2	0
02:11	192.33							
MH202		0.000	0.4	0.0	0.0	0.001	15.6	0
02:10	172.91							
MH203		0.000	0.4	0.0	0.0	0.001	12.3	0
02:10	101.08							
MH204		0.000	0.3	0.0	0.0	0.001	11.1	0
02:10	95.61							
MH205		0.000	0.3	0.0	0.0	0.000	7.2	0
02:10	44.24							
MH206		0.000	0.2	0.0	0.0	0.000	3.5	0
02:10	10.26							
MH207		0.000	0.4	0.0	0.0	0.000	15.6	0
02:20	17.94							
MH208		0.000	0.1	0.0	0.0	0.000	2.9	0
02:19	6.83							
MH209		0.000	0.3	0.0	0.0	0.000	10.3	0
02:20	18.58							
MH210A		0.000	0.2	0.0	0.0	0.000	6.2	0
02:10	12.16							
MH210B		0.000	0.2	0.0	0.0	0.000	4.9	0
02:10	12.16							

Palladium II - 125091
PCSWMM Model Outputs
6-hour 2-year Chicago

MH211		0.000	0.3	0.0	0.0	0.001	11.9	0
02:10	71.86							
MH212		0.000	0.3	0.0	0.0	0.000	4.7	0
02:10	18.84							
MH213		0.000	0.2	0.0	0.0	0.000	3.4	0
02:10	9.44							
MH214		0.000	0.4	0.0	0.0	0.000	15.8	0
02:20	17.32							
MH215		0.000	0.3	0.0	0.0	0.000	12.6	0
02:20	18.09							
MH216		0.000	0.1	0.0	0.0	0.000	3.6	0
02:03	8.56							
MH217		0.000	0.2	0.0	0.0	0.000	6.1	0
02:10	10.67							
MH218		0.000	0.2	0.0	0.0	0.000	4.0	0
02:10	8.75							
MH219		0.000	0.2	0.0	0.0	0.000	9.8	0
02:13	11.86							
MH220		0.000	0.2	0.0	0.0	0.000	11.3	0
02:13	11.48							
MH221		0.000	0.1	0.0	0.0	0.000	4.3	0
02:13	3.63							
ST1		0.000	0.7	0.0	0.0	0.008	32.5	0
02:20	2.61							
ST2		0.000	0.7	0.0	0.0	0.008	33.3	0
02:20	6.41							
ST3		0.000	0.3	0.0	0.0	0.003	20.9	0
02:12	1.75							

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
MH200	17.64	15.36	192.33	0.450
OF1	3.27	0.13	0.66	0.001
System	10.45	15.49	192.58	0.451

Link Flow Summary

Link	Type	Maximum Flow LPS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C10	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C11	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
C12	CONDUIT	0.00	0 00:00	0.00	0.00	0.00

Palladium II - 125091
PCSWMM Model Outputs
6-hour 2-year Chicago

C13	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C14	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C15	CONDUIT	7.92	0	02:10	0.29	0.09	0.14
C16	CONDUIT	8.31	0	02:10	0.29	0.08	0.15
C17	CONDUIT	11.17	0	02:10	0.33	0.12	0.18
C18	CONDUIT	12.98	0	02:10	0.39	0.13	0.17
C19	CONDUIT	13.44	0	02:10	0.42	0.11	0.42
C2	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C20	CONDUIT	16.12	0	02:10	0.16	0.10	0.84
C21	CONDUIT	10.27	0	02:10	0.23	0.08	0.49
C3	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C4	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C6	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C7	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C8	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C9	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
STM-25	CONDUIT	18.84	0	02:10	0.77	0.31	0.47
STM-26	CONDUIT	71.86	0	02:10	0.83	0.48	0.73
STM-27	CONDUIT	172.91	0	02:10	0.88	0.74	0.85
STM-28	CONDUIT	192.33	0	02:11	0.99	0.93	0.84
STM-29	CONDUIT	27.21	0	02:10	0.43	0.40	1.00
STM-31	CONDUIT	22.94	0	02:10	0.47	0.56	1.00
STM-33	CONDUIT	19.21	0	02:10	0.43	0.45	1.00
STM-35	CONDUIT	10.26	0	02:10	0.61	0.17	0.32
STM-36	CONDUIT	44.24	0	02:10	0.79	0.46	0.55
STM-37	CONDUIT	95.61	0	02:10	0.85	0.67	0.70
STM-37_(1)	CONDUIT	101.08	0	02:10	0.88	0.70	0.75
STM-39	CONDUIT	9.44	0	02:10	0.69	0.22	0.32
STM-40	CONDUIT	4.48	0	02:10	0.64	0.08	0.20
STM-41	CONDUIT	5.13	0	02:10	0.70	0.09	0.21
STM-42	CONDUIT	7.10	0	02:10	0.80	0.12	0.39
STM-44	CONDUIT	8.75	0	02:10	0.70	0.21	0.30
STM-45	CONDUIT	3.63	0	02:07	0.45	0.09	0.67
STM-46	CONDUIT	11.86	0	02:04	0.39	0.27	1.00
STM-48	CONDUIT	10.67	0	02:10	0.71	0.26	0.35
STM-49	CONDUIT	18.09	0	02:04	0.67	0.48	1.00
STM-50	CONDUIT	8.56	0	02:03	0.62	0.20	0.57
STM-53	CONDUIT	7.84	0	02:04	0.73	0.13	0.91
STM-54	CONDUIT	13.55	0	02:04	0.59	0.21	1.00
STM-55	CONDUIT	6.83	0	02:03	0.57	0.16	0.54
STM-56	CONDUIT	12.16	0	02:10	0.72	0.29	0.38
STM-57	CONDUIT	18.58	0	02:05	0.73	0.46	1.00
STM-60	CONDUIT	14.12	0	02:04	0.65	0.23	1.00
STM-70	CONDUIT	10.68	0	02:10	0.69	0.18	0.64
STM-71	CONDUIT	9.11	0	02:10	0.70	0.22	0.31
STM-72	CONDUIT	8.29	0	02:10	0.70	0.19	0.29
STM-74	CONDUIT	12.45	0	02:10	0.78	0.29	0.36
STM-77	CONDUIT	15.03	0	02:10	0.92	0.26	0.54
STM-77_(1)	CONDUIT	21.84	0	02:10	1.08	0.37	0.88
STM-78	CONDUIT	14.34	0	02:06	0.86	0.24	1.00
STM-78_(1)	CONDUIT	17.12	0	02:04	0.95	0.29	1.00
STM-79	CONDUIT	15.29	0	02:10	0.83	0.36	0.40
STM-83	CONDUIT	12.16	0	02:10	0.70	0.28	0.39
O-CB1	ORIFICE	9.81	0	02:12			1.00
O-CB10	ORIFICE	1.86	0	02:10			0.73
O-CB3	ORIFICE	54.68	0	02:10			1.00

O-Cb5	ORIFICE	47.92	0	02:10	1.00
O-CB7	ORIFICE	34.27	0	02:10	1.00
O-CBMH222	ORIFICE	22.21	0	02:17	1.00
O-MH206	DUMMY	5.61	0	02:20	
O-MH214	DUMMY	5.64	0	02:20	
O-MH220	DUMMY	4.55	0	02:13	

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Flow Classification Summary
*****
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[illegible]

C8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STM-25	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00
STM-26	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.00
STM-27	1.00	0.01	0.00	0.00	0.14	0.00	0.00	0.85	0.10
STM-28	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.84
STM-29	1.00	0.02	0.00	0.00	0.03	0.00	0.00	0.95	0.02
STM-31	1.00	0.02	0.00	0.00	0.09	0.00	0.00	0.89	0.06
STM-33	1.00	0.02	0.00	0.00	0.02	0.00	0.00	0.96	0.01
STM-35	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00
STM-36	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00
STM-37	1.00	0.01	0.00	0.00	0.12	0.00	0.00	0.88	0.02
STM-37_(1)	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.00
STM-39	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00
STM-40	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00
STM-41	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.98	0.00
STM-42	1.00	0.02	0.00	0.00	0.00	0.00	0.00	0.97	0.00
STM-44	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
STM-45	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.01
STM-46	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.00
STM-48	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
STM-49	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.00
STM-50	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.97	0.02
STM-53	1.00	0.04	0.00	0.00	0.02	0.00	0.00	0.94	0.00
STM-54	1.00	0.01	0.03	0.00	0.09	0.00	0.00	0.87	0.05
STM-55	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.01
STM-56	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
STM-57	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.00
STM-60	1.00	0.01	0.03	0.00	0.09	0.00	0.00	0.87	0.05
STM-70	1.00	0.67	0.00	0.00	0.02	0.00	0.00	0.31	0.02

Palladium II - 125091
 PCSWMM Model Outputs
 6-hour 2-year Chicago

STM-71	1.00	0.67	0.00	0.00	0.00	0.00	0.00	0.33	0.00
0.00									
STM-72	1.00	0.58	0.00	0.00	0.00	0.00	0.00	0.42	0.00
0.00									
STM-74	1.00	0.55	0.00	0.00	0.00	0.00	0.00	0.45	0.00
0.00									
STM-77	1.00	0.48	0.00	0.00	0.00	0.00	0.00	0.51	0.00
0.00									
STM-77_(1)	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
STM-78	1.00	0.46	0.00	0.00	0.01	0.00	0.00	0.53	0.00
0.00									
STM-78_(1)	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98	0.00
0.00									
STM-79	1.00	0.51	0.00	0.00	0.00	0.00	0.00	0.49	0.00
0.00									
STM-83	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00									

 Conduit Surcharge Summary

Conduit	Hours Full			Hours	
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
C20	0.01	0.01	0.42	0.01	0.01
STM-29	0.19	0.19	0.22	0.01	0.01
STM-31	0.19	0.19	0.22	0.01	0.01
STM-33	0.19	0.19	0.21	0.01	0.01
STM-46	0.25	0.25	0.33	0.01	0.01
STM-49	0.40	0.40	0.47	0.01	0.01
STM-54	0.47	0.47	0.63	0.01	0.01
STM-57	0.20	0.20	0.40	0.01	0.01
STM-60	0.51	0.51	0.62	0.01	0.01
STM-70	0.01	0.01	0.37	0.01	0.01
STM-77_(1)	0.01	0.01	0.21	0.01	0.01
STM-78	0.22	0.22	0.36	0.01	0.01
STM-78_(1)	0.37	0.37	0.46	0.01	0.01

Analysis begun on: Fri May 15 11:16:31 2026
 Analysis ended on: Fri May 15 11:16:37 2026
 Total elapsed time: 00:00:06

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

WARNING 03: negative offset ignored for Link C21
 WARNING 03: negative offset ignored for Link C21

Element Count

Number of rain gages 1
 Number of subcatchments ... 31
 Number of nodes 55
 Number of links 67
 Number of pollutants 0
 Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
Raingage	02-C6hr-5yr	INTENSITY	10 min.

Subcatchment Summary

Name Outlet	Area	Width	%Imperv	%Slope	Rain Gage
A-01 LD1000	0.06	152.50	6.00	2.5000	Raingage
A-02 98	0.02	26.25	100.00	2.0000	Raingage
A-03 97	0.03	27.78	94.00	2.0000	Raingage
A-04 CB2	0.15	82.22	87.00	2.5000	Raingage
A-05 CB4	0.12	70.00	90.00	2.5000	Raingage
A-06 CB6	0.10	61.88	91.00	2.5000	Raingage
A-07 LD1001	0.12	128.89	4.00	6.0000	Raingage
A-08 CB3	0.15	70.00	89.00	2.0000	Raingage
A-09 CB5	0.13	76.47	90.00	2.0000	Raingage
A-10 CB7	0.08	58.57	86.00	2.5000	Raingage
A-12 CB10	0.03	35.56	23.00	2.5000	Raingage
A-13 96	0.04	27.69	90.00	2.0000	Raingage

Palladium II - 125091
PCSWMM Model Outputs
6-hour 5-year Chicago

A-14 CBMH225	0.04	29.17	7.00	11.0000	Raingage
A-15 CB9	0.02	63.33	3.00	20.0000	Raingage
A-16 LD1003	0.01	60.00	26.00	9.0000	Raingage
A-17 LD1002	0.01	70.00	17.00	3.5000	Raingage
D-01 OF1	0.01	15.00	39.00	3.5000	Raingage
R-01 LD1000	0.09	90.00	100.00	3.0000	Raingage
R-02 MH217	0.05	55.56	100.00	3.0000	Raingage
R-03 MH216	0.04	39.00	100.00	3.0000	Raingage
R-04 MH208	0.03	31.00	100.00	3.0000	Raingage
R-05 LD1001	0.07	70.00	100.00	3.0000	Raingage
R-06 MH210A	0.06	57.00	100.00	3.0000	Raingage
R-07 CB9	0.03	34.44	100.00	3.0000	Raingage
R-08 CBMH225	0.02	21.11	100.00	3.0000	Raingage
R-09 MH218	0.04	45.56	100.00	3.0000	Raingage
R-10 MH221	0.02	17.00	100.00	3.0000	Raingage
R-11 LD1003	0.02	18.89	100.00	3.0000	Raingage
R-12 LD1003	0.01	11.11	100.00	3.0000	Raingage
R-13 LD1002	0.02	25.56	100.00	3.0000	Raingage
R-14 LD1002	0.01	8.89	100.00	3.0000	Raingage

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
HP-A-04	JUNCTION	108.70	1.00	0.0	
HP-A-05	JUNCTION	108.75	1.00	0.0	
HP-A-05-2	JUNCTION	109.02	1.00	0.0	
HP-A-06	JUNCTION	108.78	1.00	0.0	
HP-A-06-2	JUNCTION	108.80	1.00	0.0	
HP-A-07	JUNCTION	108.75	1.00	0.0	
HP-A-09	JUNCTION	108.73	1.00	0.0	
MH200	OUTFALL	105.72	0.53	0.0	
OF1	OUTFALL	0.00	0.00	0.0	
96	STORAGE	106.32	2.70	0.0	
97	STORAGE	106.59	2.51	0.0	
98	STORAGE	106.67	2.39	0.0	
CB1	STORAGE	106.66	3.04	0.0	

Palladium II - 125091
PCSWMM Model Outputs
6-hour 5-year Chicago

CB10	STORAGE	107.40	2.20	0.0
CB2	STORAGE	107.15	2.20	0.0
CB3	STORAGE	107.00	2.35	0.0
CB4	STORAGE	107.25	2.20	0.0
CB5	STORAGE	107.13	2.32	0.0
CB6	STORAGE	107.30	2.20	0.0
CB7	STORAGE	107.19	2.41	0.0
CB8	STORAGE	107.41	2.01	0.0
CB9	STORAGE	107.20	2.37	0.0
CBMH222	STORAGE	106.01	2.56	0.0
CBMH223	STORAGE	106.55	2.04	0.0
CBMH224	STORAGE	106.83	2.66	0.0
CBMH225	STORAGE	106.95	2.45	0.0
LD1000	STORAGE	107.41	2.42	0.0
LD1001	STORAGE	107.67	2.04	0.0
LD1002	STORAGE	106.74	2.86	0.0
LD1003	STORAGE	106.39	3.26	0.0
MH201	STORAGE	105.75	2.99	0.0
MH202	STORAGE	105.85	2.70	0.0
MH203	STORAGE	106.03	2.74	0.0
MH204	STORAGE	106.10	2.72	0.0
MH205	STORAGE	106.27	2.63	0.0
MH206	STORAGE	106.41	2.41	0.0
MH207	STORAGE	106.48	2.36	0.0
MH208	STORAGE	106.78	2.45	0.0
MH209	STORAGE	106.59	2.51	0.0
MH210A	STORAGE	107.30	1.70	0.0
MH210B	STORAGE	107.17	2.08	0.0
MH211	STORAGE	105.97	2.65	0.0
MH212	STORAGE	106.28	2.44	0.0
MH213	STORAGE	106.54	2.52	0.0
MH214	STORAGE	106.62	2.35	0.0
MH215	STORAGE	106.69	2.40	0.0
MH216	STORAGE	106.95	2.12	0.0
MH217	STORAGE	107.35	1.50	0.0
MH218	STORAGE	107.00	1.93	0.0
MH219	STORAGE	106.21	2.81	0.0
MH220	STORAGE	106.18	2.72	0.0
MH221	STORAGE	106.37	2.72	0.0
ST1	STORAGE	106.67	0.99	0.0
ST2	STORAGE	106.52	0.99	0.0
ST3	STORAGE	106.28	0.99	0.0

Link Summary

Name		From Node	To Node	Type	Length	%

C1		CB4	HP-A-05	CONDUIT	2.0	-
15.1717	0.0130					
C10		HP-A-04	CB3	CONDUIT	2.0	
17.7743	0.0130					
C11		CB4	HP-A-05-2	CONDUIT	2.0	-
29.7331	0.0130					

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C12		HP-A-05-2	CB2	CONDUIT	2.0	
35.5544	0.0130					
C13		CB6	HP-A-06-2	CONDUIT	2.0	-
15.1717	0.0130					
C14		HP-A-06-2	CB4	CONDUIT	2.0	
17.7743	0.0130					
C15		LD1001	CB8	CONDUIT	50.5	
0.5154	0.0350					
C16		CB8	CB9	CONDUIT	32.2	
0.6522	0.0350					
C17		CB9	CBMH225	CONDUIT	41.0	
0.6095	0.0350					
C18		CBMH225	CBMH224	CONDUIT	17.2	
0.6977	0.0350					
C19		CBMH224	CBMH223	CONDUIT	26.4	
1.0591	0.0350					
C2		HP-A-05	CB5	CONDUIT	2.0	
15.1717	0.0130					
C20		CBMH223	CBMH222	CONDUIT	32.3	
1.6721	0.0350					
C21		LD1000	CB1	CONDUIT	68.6	
1.0932	0.0350					
C3		CB6	HP-A-06	CONDUIT	2.0	-
14.1393	0.0130					
C4		HP-A-06	CB7	CONDUIT	2.0	
9.0367	0.0130					
C5		CB7	HP-A-07	CONDUIT	2.0	-
7.5212	0.0130					
C6		HP-A-07	CB5	CONDUIT	2.0	
15.1717	0.0130					
C7		CB5	HP-A-09	CONDUIT	2.0	-
14.1393	0.0130					
C8		HP-A-09	CB3	CONDUIT	2.0	
19.3525	0.0130					
C9		CB2	HP-A-04	CONDUIT	2.0	-
17.7743	0.0130					
STM-25		MH212	MH211	CONDUIT	39.7	
0.4026	0.0130					
STM-26		MH211	MH202	CONDUIT	14.7	
0.2725	0.0130					
STM-27		MH202	MH201	CONDUIT	30.7	
0.2932	0.0130					
STM-28		MH201	MH200	CONDUIT	12.9	
0.2322	0.0130					
STM-29		CB2	CB3	CONDUIT	24.0	
0.5000	0.0130					
STM-31		CB4	CB5	CONDUIT	22.9	
0.4810	0.0130					
STM-33		CB6	CB7	CONDUIT	15.6	
0.5128	0.0130					
STM-35		MH206	MH205	CONDUIT	15.2	
0.3934	0.0130					
STM-36		MH205	MH204	CONDUIT	30.3	
0.2966	0.0130					
STM-37		MH204	MH203	CONDUIT	24.2	
0.2480	0.0130					
STM-37_(1)		MH203	MH202	CONDUIT	38.6	
0.2587	0.0130					
STM-39		MH213	MH212	CONDUIT	39.1	
0.5120	0.0130					

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STM-40	98	MH213	CONDUIT	8.9
0.8939 0.0130				
STM-41	97	MH206	CONDUIT	13.2
0.9827 0.0130				
STM-42	96	MH203	CONDUIT	9.2
0.9772 0.0130				
STM-44	MH218	MH219	CONDUIT	35.7
0.5048 0.0130				
STM-45	MH221	MH219	CONDUIT	20.6
0.4857 0.0130				
STM-46	MH219	MH220	CONDUIT	3.6
0.5525 0.0130				
STM-48	MH217	MH215	CONDUIT	50.9
0.4908 0.0130				
STM-49	MH215	MH214	CONDUIT	4.9
0.4082 0.0130				
STM-50	MH216	MH215	CONDUIT	39.5
0.5070 0.0130				
STM-53	ST3	MH220	CONDUIT	3.8
1.0417 0.0130				
STM-54	ST1	MH214	CONDUIT	3.5
1.1429 0.0130				
STM-55	MH208	MH209	CONDUIT	26.7
0.4864 0.0130				
STM-56	MH210B	MH209	CONDUIT	28.8
0.4865 0.0130				
STM-57	MH209	MH207	CONDUIT	8.7
0.4577 0.0130				
STM-60	ST2	MH207	CONDUIT	2.7
1.1112 0.0130				
STM-70	LD1000	CB1	CONDUIT	68.6
1.0057 0.0130				
STM-71	LD1001	CB8	CONDUIT	50.5
0.4955 0.0130				
STM-72	CB8	CB9	CONDUIT	32.2
0.5590 0.0130				
STM-74	CB9	CBMH225	CONDUIT	41.0
0.5363 0.0130				
STM-77	CBMH224	LD1002	CONDUIT	8.3
0.9674 0.0130				
STM-77_(1)	LD1002	CBMH223	CONDUIT	18.2
0.9907 0.0130				
STM-78	CBMH223	LD1003	CONDUIT	15.3
0.9792 0.0130				
STM-78_(1)	LD1003	CBMH222	CONDUIT	17.0
1.0012 0.0130				
STM-79	CBMH225	CBMH224	CONDUIT	17.2
0.5233 0.0130				
STM-83	MH210A	MH210B	CONDUIT	13.5
0.5185 0.0130				
O-CB1	CB1	MH212	ORIFICE	
O-CB10	CB10	MH202	ORIFICE	
O-CB3	CB3	MH211	ORIFICE	
O-Cb5	CB5	MH204	ORIFICE	
O-CB7	CB7	MH205	ORIFICE	
O-CBMH222	CBMH222	MH201	ORIFICE	
O-MH206	MH207	MH206	OUTLET	
O-MH214	MH214	MH213	OUTLET	
O-MH220	MH220	MH204	OUTLET	

 Cross Section Summary

Full Conduit Flow	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels

C1 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C10 69215.12	RECT_OPEN	1.00	3.00	0.60	3.00	1
C11 89521.02	RECT_OPEN	1.00	3.00	0.60	3.00	1
C12 97892.98	RECT_OPEN	1.00	3.00	0.60	3.00	1
C13 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C14 69215.12	RECT_OPEN	1.00	3.00	0.60	3.00	1
C15 88.97	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C16 100.08	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C17 96.75	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C18 103.51	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C19 127.53	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C2 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C20 160.25	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C21 129.57	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C3 61733.10	RECT_OPEN	1.00	3.00	0.60	3.00	1
C4 49352.50	RECT_OPEN	1.00	3.00	0.60	3.00	1
C5 45024.40	RECT_OPEN	1.00	3.00	0.60	3.00	1
C6 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C7 61733.10	RECT_OPEN	1.00	3.00	0.60	3.00	1
C8 72222.70	RECT_OPEN	1.00	3.00	0.60	3.00	1
C9 69215.12	RECT_OPEN	1.00	3.00	0.60	3.00	1
STM-25 61.36	CIRCULAR	0.30	0.07	0.07	0.30	1
STM-26 148.83	CIRCULAR	0.45	0.16	0.11	0.45	1
STM-27 232.87	CIRCULAR	0.53	0.22	0.13	0.53	1
STM-28	CIRCULAR	0.53	0.22	0.13	0.53	1

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STM-29 68.38	CIRCULAR	0.30	0.07	0.07	0.30	1
STM-31 41.25	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-33 42.59	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-35 60.66	CIRCULAR	0.30	0.07	0.07	0.30	1
STM-36 95.50	CIRCULAR	0.38	0.11	0.09	0.38	1
STM-37 142.00	CIRCULAR	0.45	0.16	0.11	0.45	1
STM-37_(1) 145.03	CIRCULAR	0.45	0.16	0.11	0.45	1
STM-39 42.56	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-40 56.23	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-41 58.95	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-42 58.79	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-44 42.25	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-45 41.45	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-46 44.20	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-48 41.66	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-49 37.99	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-50 42.34	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-53 60.70	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-54 63.58	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-55 41.47	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-56 41.48	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-57 40.23	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-60 62.69	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-70 59.64	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-71 41.86	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-72 44.46	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-74 43.55	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-77 58.49	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-77_(1) 59.19	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-78 58.85	CIRCULAR	0.25	0.05	0.06	0.25	1

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STM-78_(1)	CIRCULAR	0.25	0.05	0.06	0.25	1
59.51						
STM-79	CIRCULAR	0.25	0.05	0.06	0.25	1
43.02						
STM-83	CIRCULAR	0.25	0.05	0.06	0.25	1
42.82						

Analysis Options

Flow Units LPS

Process Models:

Rainfall/Runoff	YES
RDII	NO
Snowmelt	NO
Groundwater	NO
Flow Routing	YES
Ponding Allowed	YES
Water Quality	NO
Infiltration Method	HORTON
Flow Routing Method	DYNWAVE
Surcharge Method	EXTRAN
Starting Date	04/17/2026 00:00:00
Ending Date	04/19/2026 00:00:00
Antecedent Dry Days	0.0
Report Time Step	00:01:00
Wet Time Step	00:01:00
Dry Time Step	00:01:00
Routing Time Step	1.00 sec
Variable Time Step	YES
Maximum Trials	8
Number of Threads	16
Head Tolerance	0.001500 m

*****	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	0.078	49.037
Evaporation Loss	0.000	0.000
Infiltration Loss	0.014	8.989
Surface Runoff	0.063	39.370
Final Storage	0.001	0.735
Continuity Error (%)	-0.115	

*****	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.063	0.627
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.063	0.627
Flooding Loss	0.000	0.000

Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	-0.051	

 Time-Step Critical Elements

 None

 Highest Flow Instability Indexes

 All links are stable.

 Most Frequent Nonconverging Nodes

 Convergence obtained at all time steps.

 Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.68 %
0.871 - 0.758 sec	:	0.13 %
0.758 - 0.660 sec	:	0.07 %
0.660 - 0.574 sec	:	0.05 %
0.574 - 0.500 sec	:	0.08 %

 Subcatchment Runoff Summary

Perv		Total	Total	Total	Total	Total	Imperv
Runoff	Runoff	Runoff	Peak	Runoff	Evap	Infil	Runoff
Subcatchment	Runoff	Precip	Runoff	Runon			
mm	mm	mm	mm	Coeff	mm	mm	mm
	10^6 ltr	LPS					
A-01		49.04	0.00		0.00	39.08	2.85
7.06	9.91	0.01	10.69	0.202			

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A-02			49.04	0.00	0.00	0.00	47.53
0.00	47.53	0.01	6.08	0.969			
A-03			49.04	0.00	0.00	2.46	44.68
0.49	45.16	0.01	7.11	0.921			
A-04			49.04	0.00	0.00	5.38	41.34
1.00	42.35	0.06	40.91	0.864			
A-05			49.04	0.00	0.00	4.13	42.77
0.78	43.55	0.05	33.36	0.888			
A-06			49.04	0.00	0.00	3.71	43.25
0.71	43.95	0.04	27.87	0.896			
A-07			49.04	0.00	0.00	40.14	1.90
6.97	8.87	0.01	17.35	0.181			
A-08			49.04	0.00	0.00	4.55	42.29
0.85	43.13	0.06	40.87	0.880			
A-09			49.04	0.00	0.00	4.13	42.77
0.78	43.55	0.06	36.41	0.888			
A-10			49.04	0.00	0.00	5.78	40.87
1.09	41.96	0.03	22.65	0.856			
A-12			49.04	0.00	0.00	32.32	10.93
5.46	16.38	0.01	5.31	0.334			
A-13			49.04	0.00	0.00	4.12	42.77
0.79	43.56	0.02	10.10	0.888			
A-14			49.04	0.00	0.00	38.86	3.32
6.78	10.10	0.00	5.49	0.206			
A-15			49.04	0.00	0.00	39.93	1.43
7.73	9.16	0.00	3.96	0.187			
A-16			49.04	0.00	0.00	30.35	12.37
6.07	18.44	0.00	1.38	0.376			
A-17			49.04	0.00	0.00	34.11	8.08
6.69	14.78	0.00	1.55	0.301			
D-01			49.04	0.00	0.00	25.21	18.52
4.74	23.26	0.00	1.39	0.474			
R-01			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.04	26.05	1.001			
R-02			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.02	14.47	1.001			
R-03			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.02	11.29	1.001			
R-04			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.02	8.97	1.001			
R-05			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.03	20.26	1.001			
R-06			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.03	16.50	1.001			
R-07			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.02	8.97	1.001			
R-08			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.01	5.50	1.001			
R-09			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.02	11.87	1.001			
R-10			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.01	4.92	1.001			
R-11			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.01	4.92	1.001			
R-12			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.00	2.89	1.001			
R-13			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.01	6.66	1.001			
R-14			49.04	0.00	0.00	0.00	49.10
0.00	49.10	0.00	2.32	1.001			

 Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
HP-A-04	JUNCTION	0.00	0.00	108.70	0 00:00	0.00
HP-A-05	JUNCTION	0.00	0.00	108.75	0 00:00	0.00
HP-A-05-2	JUNCTION	0.00	0.00	109.02	0 00:00	0.00
HP-A-06	JUNCTION	0.00	0.00	108.78	0 00:00	0.00
HP-A-06-2	JUNCTION	0.00	0.00	108.80	0 00:00	0.00
HP-A-07	JUNCTION	0.00	0.00	108.75	0 00:00	0.00
HP-A-09	JUNCTION	0.00	0.00	108.73	0 00:00	0.00
MH200	OUTFALL	0.02	0.53	106.25	0 02:07	0.52
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
96	STORAGE	0.00	0.18	106.50	0 02:12	0.18
97	STORAGE	0.00	0.06	106.65	0 02:09	0.06
98	STORAGE	0.00	0.06	106.73	0 02:10	0.06
CB1	STORAGE	0.01	0.82	107.48	0 02:12	0.82
CB10	STORAGE	0.00	0.15	107.55	0 02:10	0.15
CB2	STORAGE	0.01	1.32	108.47	0 02:10	1.32
CB3	STORAGE	0.01	1.44	108.44	0 02:10	1.44
CB4	STORAGE	0.01	1.30	108.55	0 02:10	1.29
CB5	STORAGE	0.01	1.38	108.51	0 02:10	1.37
CB6	STORAGE	0.01	1.31	108.61	0 02:10	1.31
CB7	STORAGE	0.01	1.40	108.59	0 02:10	1.40
CB8	STORAGE	0.00	0.12	107.53	0 02:10	0.11
CB9	STORAGE	0.00	0.14	107.34	0 02:10	0.14
CBMH222	STORAGE	0.02	1.25	107.26	0 02:17	1.25
CBMH223	STORAGE	0.01	0.71	107.26	0 02:18	0.71
CBMH224	STORAGE	0.01	0.43	107.26	0 02:18	0.43
CBMH225	STORAGE	0.00	0.32	107.27	0 02:18	0.32
LD1000	STORAGE	0.00	0.10	107.51	0 02:10	0.10
LD1001	STORAGE	0.00	0.13	107.80	0 02:10	0.13
LD1002	STORAGE	0.01	0.52	107.26	0 02:18	0.52
LD1003	STORAGE	0.01	0.87	107.26	0 02:17	0.87
MH201	STORAGE	0.02	0.60	106.35	0 02:10	0.60
MH202	STORAGE	0.01	0.56	106.41	0 02:12	0.56
MH203	STORAGE	0.01	0.47	106.50	0 02:12	0.47
MH204	STORAGE	0.01	0.43	106.53	0 02:12	0.43
MH205	STORAGE	0.01	0.28	106.55	0 02:12	0.28
MH206	STORAGE	0.01	0.14	106.55	0 02:13	0.14
MH207	STORAGE	0.01	0.51	106.99	0 02:20	0.51
MH208	STORAGE	0.00	0.21	106.99	0 02:20	0.21
MH209	STORAGE	0.01	0.40	106.99	0 02:20	0.40
MH210A	STORAGE	0.00	0.13	107.43	0 02:10	0.13
MH210B	STORAGE	0.00	0.12	107.29	0 02:10	0.12
MH211	STORAGE	0.01	0.45	106.42	0 02:12	0.45
MH212	STORAGE	0.01	0.16	106.44	0 02:11	0.16
MH213	STORAGE	0.01	0.10	106.64	0 02:10	0.10
MH214	STORAGE	0.01	0.50	107.12	0 02:20	0.50
MH215	STORAGE	0.01	0.44	107.13	0 02:20	0.43

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MH216	STORAGE	0.00	0.18	107.13	0	02:20	0.18
MH217	STORAGE	0.00	0.11	107.46	0	02:10	0.11
MH218	STORAGE	0.00	0.09	107.09	0	02:10	0.09
MH219	STORAGE	0.01	0.39	106.60	0	02:13	0.39
MH220	STORAGE	0.01	0.42	106.60	0	02:13	0.42
MH221	STORAGE	0.00	0.23	106.60	0	02:13	0.23
ST1	STORAGE	0.01	0.45	107.12	0	02:20	0.45
ST2	STORAGE	0.01	0.47	106.99	0	02:20	0.47
ST3	STORAGE	0.01	0.32	106.60	0	02:13	0.32

Node Inflow Summary

Total Inflow Volume Node ltr	Flow Balance Error Percent	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	10^6
HP-A-04	0.000	JUNCTION	0.00	0.00	0 00:00	0	
HP-A-05	0.000	JUNCTION	0.00	0.00	0 00:00	0	
HP-A-05-2	0.000	JUNCTION	0.00	0.00	0 00:00	0	
HP-A-06	0.000	JUNCTION	0.00	0.00	0 00:00	0	
HP-A-06-2	0.000	JUNCTION	0.00	0.00	0 00:00	0	
HP-A-07	0.000	JUNCTION	0.00	0.00	0 00:00	0	
HP-A-09	0.000	JUNCTION	0.00	0.00	0 00:00	0	
MH200	0.626	OUTFALL	0.00	217.01	0 02:13	0	
OF1	0.0014	OUTFALL	1.39	1.39	0 02:10	0.0014	
96	0.0157	STORAGE	10.10	10.10	0 02:10	0.0157	
97	0.0113	STORAGE	7.11	7.11	0 02:10	0.0113	
98	0.00998	STORAGE	6.08	6.08	0 02:10	0.00998	
CB1	0.0502	STORAGE	0.00	36.04	0 02:10	0	
CB10	0.00524	STORAGE	5.31	5.31	0 02:10	0.00524	
CB2	0.0627	STORAGE	40.91	40.91	0 02:10	0.0627	
CB3	0.126	STORAGE	40.87	68.84	0 02:10	0.0634	

Palladium II - 125091
PCSWMM Model Outputs
6-hour 5-year Chicago

CB4		STORAGE	33.36	33.36	0	02:10	0.0518
0.0518	0.008						
CB5		STORAGE	36.41	60.93	0	02:10	0.0566
0.108	0.003						
CB6		STORAGE	27.87	27.87	0	02:10	0.0435
0.0435	0.016						
CB7		STORAGE	22.65	42.00	0	02:03	0.0344
0.0779	0.000						
CB8		STORAGE	0.00	35.81	0	02:10	0
0.0445	-0.342						
CB9		STORAGE	12.93	45.84	0	02:10	0.017
0.0616	0.741						
CBMH222		STORAGE	0.00	38.02	0	02:04	0
0.105	-0.091						
CBMH223		STORAGE	0.00	48.11	0	02:06	0
0.0905	-0.199						
CBMH224		STORAGE	0.00	47.17	0	02:08	0
0.0742	-0.268						
CBMH225		STORAGE	10.99	54.82	0	02:10	0.0129
0.074	-0.327						
LD1000		STORAGE	36.73	36.73	0	02:10	0.0502
0.0502	0.097						
LD1001		STORAGE	37.61	37.61	0	02:10	0.0447
0.0447	0.421						
LD1002		STORAGE	10.52	33.23	0	02:07	0.0163
0.042	0.380						
LD1003		STORAGE	9.19	24.82	0	02:04	0.0144
0.0417	0.171						
MH201		STORAGE	0.00	217.02	0	02:12	0
0.626	0.016						
MH202		STORAGE	0.00	195.59	0	02:09	0
0.52	-0.130						
MH203		STORAGE	0.00	118.69	0	02:08	0
0.285	0.105						
MH204		STORAGE	0.00	111.51	0	02:08	0
0.269	0.023						
MH205		STORAGE	0.00	52.25	0	02:09	0
0.132	-0.008						
MH206		STORAGE	0.00	13.44	0	02:10	0
0.0544	-0.091						
MH207		STORAGE	0.00	24.64	0	02:04	0
0.055	-0.195						
MH208		STORAGE	8.97	8.97	0	02:10	0.0152
0.0152	0.752						
MH209		STORAGE	0.00	25.47	0	02:07	0
0.0431	0.095						
MH210A		STORAGE	16.50	16.50	0	02:10	0.028
0.028	-0.004						
MH210B		STORAGE	0.00	16.50	0	02:10	0
0.028	-0.005						
MH211		STORAGE	0.00	80.54	0	02:09	0
0.23	0.049						
MH212		STORAGE	0.00	24.54	0	02:10	0
0.104	-0.192						
MH213		STORAGE	0.00	12.38	0	02:10	0
0.0537	0.127						
MH214		STORAGE	0.00	23.68	0	02:04	0
0.0551	-0.075						
MH215		STORAGE	0.00	25.75	0	02:08	0
0.0435	-0.305						

Palladium II - 125091
 PCSWMM Model Outputs
 6-hour 5-year Chicago

MH216		STORAGE	11.29	11.29	0	02:10	0.0191
0.0191	0.819						
MH217		STORAGE	14.47	14.47	0	02:10	0.0246
0.0246	-0.011						
MH218		STORAGE	11.87	11.87	0	02:10	0.0201
0.0201	-0.010						
MH219		STORAGE	0.00	16.77	0	02:04	0
0.0285	-0.024						
MH220		STORAGE	0.00	15.66	0	02:03	0
0.034	-0.009						
MH221		STORAGE	4.92	4.92	0	02:10	0.00835
0.00835	0.075						
ST1		STORAGE	0.00	18.32	0	02:03	0
0.0115	0.060						
ST2		STORAGE	0.00	19.43	0	02:03	0
0.0119	0.028						
ST3		STORAGE	0.00	11.31	0	02:03	0
0.00551	0.082						

 Node Surcharge Summary

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
ST1	STORAGE	0.88	0.203	0.537
ST2	STORAGE	0.90	0.216	0.524

 Node Flooding Summary

No nodes were flooded.

 Storage Volume Summary

Max Occurrence	Maximum Outflow Storage Unit hr:min LPS	Average Volume 1000 m ³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m ³	Max Pcnt Full	Time of days
96 00:00	9.97	0.000	0.0	0.0	0.0	0.000	0.0	0
97 00:00	7.15	0.000	0.0	0.0	0.0	0.000	0.0	0

Palladium II - 125091
PCSWMM Model Outputs
6-hour 5-year Chicago

98		0.000	0.0	0.0	0.0	0.000	0.0	0
00:00	6.08							
CB1		0.000	0.5	0.0	0.0	0.000	26.9	0
02:12	12.89							
CB10		0.000	0.0	0.0	0.0	0.000	0.0	0
02:10	4.89							
CB2		0.000	0.0	0.0	0.0	0.005	0.5	0
02:10	41.99							
CB3		0.000	0.0	0.0	0.0	0.004	0.2	0
02:10	57.33							
CB4		0.000	0.0	0.0	0.0	0.003	0.3	0
02:10	41.72							
CB5		0.000	0.0	0.0	0.0	0.001	0.1	0
02:10	55.91							
CB6		0.000	0.0	0.0	0.0	0.003	0.6	0
02:10	30.43							
CB7		0.000	0.0	0.0	0.0	0.001	0.1	0
02:10	39.64							
CB8		0.000	0.1	0.0	0.0	0.000	5.7	0
02:10	34.48							
CB9		0.000	0.1	0.0	0.0	0.000	5.8	0
02:10	44.79							
CBMH222		0.000	0.9	0.0	0.0	0.001	48.6	0
02:17	26.26							
CBMH223		0.000	0.5	0.0	0.0	0.001	34.8	0
02:18	33.84							
CBMH224		0.000	0.2	0.0	0.0	0.000	16.3	0
02:18	41.67							
CBMH225		0.000	0.2	0.0	0.0	0.000	12.9	0
02:18	47.17							
LD1000		0.000	0.1	0.0	0.0	0.000	4.1	0
02:10	36.04							
LD1001		0.000	0.1	0.0	0.0	0.000	6.2	0
02:10	35.81							
LD1002		0.000	0.3	0.0	0.0	0.000	18.3	0
02:18	30.43							
LD1003		0.000	0.4	0.0	0.0	0.000	26.7	0
02:17	20.52							
MH201		0.000	0.6	0.0	0.0	0.001	20.2	0
02:10	217.01							
MH202		0.000	0.5	0.0	0.0	0.001	20.7	0
02:12	193.98							
MH203		0.000	0.4	0.0	0.0	0.001	17.2	0
02:12	115.89							
MH204		0.000	0.4	0.0	0.0	0.001	15.8	0
02:12	109.00							
MH205		0.000	0.3	0.0	0.0	0.000	10.7	0
02:12	51.00							
MH206		0.000	0.2	0.0	0.0	0.000	6.0	0
02:13	12.77							
MH207		0.000	0.6	0.0	0.0	0.001	21.4	0
02:20	23.51							
MH208		0.000	0.2	0.0	0.0	0.000	8.5	0
02:20	9.31							
MH209		0.000	0.4	0.0	0.0	0.000	15.9	0
02:20	24.64							
MH210A		0.000	0.2	0.0	0.0	0.000	7.5	0
02:10	16.50							
MH210B		0.000	0.2	0.0	0.0	0.000	5.9	0
02:10	16.50							

Palladium II - 125091
PCSWM Model Outputs
6-hour 5-year Chicago

MH211		0.000	0.4	0.0	0.0	0.001	17.1	0
02:12	86.48							
MH212		0.000	0.3	0.0	0.0	0.000	6.7	0
02:11	25.05							
MH213		0.000	0.2	0.0	0.0	0.000	3.9	0
02:10	12.16							
MH214		0.000	0.6	0.0	0.0	0.001	21.4	0
02:20	22.51							
MH215		0.000	0.5	0.0	0.0	0.000	18.1	0
02:20	23.68							
MH216		0.000	0.2	0.0	0.0	0.000	8.3	0
02:20	11.47							
MH217		0.000	0.3	0.0	0.0	0.000	7.2	0
02:10	14.47							
MH218		0.000	0.2	0.0	0.0	0.000	4.7	0
02:10	11.87							
MH219		0.000	0.3	0.0	0.0	0.000	13.9	0
02:13	15.66							
MH220		0.000	0.3	0.0	0.0	0.000	15.4	0
02:13	15.15							
MH221		0.000	0.2	0.0	0.0	0.000	8.5	0
02:13	4.92							
ST1		0.000	1.1	0.0	0.0	0.011	46.0	0
02:20	2.71							
ST2		0.000	1.1	0.0	0.0	0.012	47.3	0
02:20	6.00							
ST3		0.000	0.5	0.0	0.0	0.005	32.4	0
02:13	2.02							

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
MH200	17.76	20.93	217.01	0.626
OF1	4.29	0.17	1.39	0.001
System	11.03	21.10	217.42	0.627

Link Flow Summary

Link	Type	Maximum Flow LPS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.00	0 00:00	0.00	0.00	0.05
C10	CONDUIT	0.00	0 00:00	0.00	0.00	0.05
C11	CONDUIT	0.00	0 00:00	0.00	0.00	0.05
C12	CONDUIT	0.00	0 00:00	0.00	0.00	0.06

Palladium II - 125091
PCSWMM Model Outputs
6-hour 5-year Chicago

C13	CONDUIT	0.00	0	00:00	0.00	0.00	0.06
C14	CONDUIT	0.00	0	00:00	0.00	0.00	0.05
C15	CONDUIT	15.11	0	02:10	0.36	0.17	0.22
C16	CONDUIT	15.73	0	02:10	0.36	0.16	0.23
C17	CONDUIT	19.37	0	02:10	0.37	0.20	0.36
C18	CONDUIT	21.13	0	02:08	0.44	0.20	0.68
C19	CONDUIT	24.01	0	02:09	0.43	0.19	0.89
C2	CONDUIT	0.00	0	00:00	0.00	0.00	0.03
C20	CONDUIT	20.40	0	02:09	0.16	0.13	1.00
C21	CONDUIT	16.38	0	02:10	0.24	0.13	0.59
C3	CONDUIT	0.00	0	00:00	0.00	0.00	0.06
C4	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C6	CONDUIT	0.00	0	00:00	0.00	0.00	0.03
C7	CONDUIT	0.00	0	00:00	0.00	0.00	0.03
C8	CONDUIT	0.00	0	00:00	0.00	0.00	0.05
C9	CONDUIT	0.00	0	00:00	0.00	0.00	0.06
STM-25	CONDUIT	25.05	0	02:17	0.82	0.41	0.77
STM-26	CONDUIT	86.48	0	02:16	0.86	0.58	1.00
STM-27	CONDUIT	193.98	0	02:12	0.91	0.83	1.00
STM-28	CONDUIT	217.01	0	02:13	1.03	1.05	1.00
STM-29	CONDUIT	41.99	0	02:16	0.59	0.61	1.00
STM-31	CONDUIT	41.72	0	02:13	0.85	1.01	1.00
STM-33	CONDUIT	30.43	0	02:12	0.62	0.71	1.00
STM-35	CONDUIT	12.77	0	02:08	0.64	0.21	0.58
STM-36	CONDUIT	51.00	0	02:08	0.79	0.53	0.84
STM-37	CONDUIT	109.00	0	02:08	0.88	0.77	0.98
STM-37_(1)	CONDUIT	115.89	0	02:07	0.89	0.80	1.00
STM-39	CONDUIT	12.16	0	02:10	0.74	0.29	0.38
STM-40	CONDUIT	6.08	0	02:10	0.69	0.11	0.24
STM-41	CONDUIT	7.15	0	02:10	0.76	0.12	0.26
STM-42	CONDUIT	9.97	0	02:09	0.86	0.17	0.86
STM-44	CONDUIT	11.87	0	02:10	0.76	0.28	0.35
STM-45	CONDUIT	4.92	0	02:04	0.47	0.12	0.96
STM-46	CONDUIT	15.66	0	02:03	0.39	0.35	1.00
STM-48	CONDUIT	14.47	0	02:10	0.77	0.35	0.41
STM-49	CONDUIT	23.68	0	02:04	0.67	0.62	1.00
STM-50	CONDUIT	11.47	0	02:02	0.65	0.27	0.85
STM-53	CONDUIT	11.31	0	02:03	0.59	0.19	1.00
STM-54	CONDUIT	18.32	0	02:03	0.57	0.29	1.00
STM-55	CONDUIT	9.31	0	02:02	0.60	0.22	0.92
STM-56	CONDUIT	16.50	0	02:10	0.77	0.40	0.45
STM-57	CONDUIT	24.64	0	02:04	0.78	0.61	1.00
STM-60	CONDUIT	19.43	0	02:03	0.59	0.31	1.00
STM-70	CONDUIT	19.66	0	02:10	0.63	0.33	0.70
STM-71	CONDUIT	20.70	0	02:10	0.89	0.49	0.48
STM-72	CONDUIT	18.76	0	02:10	0.88	0.42	0.45
STM-74	CONDUIT	25.42	0	02:10	0.91	0.58	0.72
STM-77	CONDUIT	22.81	0	02:07	0.97	0.39	1.00
STM-77_(1)	CONDUIT	30.43	0	02:06	1.14	0.51	1.00
STM-78	CONDUIT	16.36	0	02:04	0.85	0.28	1.00
STM-78_(1)	CONDUIT	20.52	0	02:04	0.95	0.34	1.00
STM-79	CONDUIT	27.58	0	02:09	0.95	0.64	1.00
STM-83	CONDUIT	16.50	0	02:10	0.75	0.39	0.46
O-CB1	ORIFICE	12.89	0	02:12			1.00
O-CB10	ORIFICE	4.89	0	02:10			1.00
O-CB3	ORIFICE	57.33	0	02:10			1.00

C8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C9	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STM-25	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.00
STM-26	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.00
STM-27	1.00	0.01	0.00	0.00	0.14	0.00	0.00	0.85	0.10
STM-28	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.84
STM-29	1.00	0.02	0.00	0.00	0.04	0.00	0.00	0.94	0.03
STM-31	1.00	0.02	0.00	0.00	0.11	0.00	0.00	0.87	0.08
STM-33	1.00	0.02	0.00	0.00	0.03	0.00	0.00	0.95	0.02
STM-35	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.00
STM-36	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.00
STM-37	1.00	0.01	0.00	0.00	0.12	0.00	0.00	0.87	0.02
STM-37_(1)	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.00
STM-39	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00
STM-40	1.00	0.02	0.00	0.00	0.01	0.00	0.00	0.97	0.00
STM-41	1.00	0.02	0.00	0.00	0.00	0.01	0.00	0.97	0.00
STM-42	1.00	0.02	0.00	0.00	0.01	0.00	0.00	0.97	0.00
STM-44	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
STM-45	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.01
STM-46	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.01
STM-48	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
STM-49	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00
STM-50	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.02
STM-53	1.00	0.04	0.00	0.00	0.03	0.00	0.00	0.93	0.00
STM-54	1.00	0.01	0.03	0.00	0.10	0.00	0.00	0.87	0.05
STM-55	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.01
STM-56	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
STM-57	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.96	0.00
STM-60	1.00	0.01	0.02	0.00	0.10	0.00	0.00	0.87	0.05
STM-70	1.00	0.67	0.00	0.00	0.03	0.00	0.00	0.31	0.02

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STM-71	1.00	0.67	0.00	0.00	0.00	0.00	0.00	0.33	0.00
0.00									
STM-72	1.00	0.58	0.00	0.00	0.00	0.00	0.00	0.42	0.00
0.00									
STM-74	1.00	0.55	0.00	0.00	0.01	0.00	0.00	0.44	0.01
0.00									
STM-77	1.00	0.48	0.00	0.00	0.01	0.00	0.00	0.50	0.00
0.00									
STM-77_(1)	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00
0.00									
STM-78	1.00	0.46	0.00	0.00	0.02	0.00	0.00	0.52	0.00
0.00									
STM-78_(1)	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.00
0.00									
STM-79	1.00	0.51	0.00	0.00	0.01	0.00	0.00	0.48	0.00
0.00									
STM-83	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
0.00									

Conduit Surcharge Summary

Conduit	Hours Full			Hours	
	Both Ends	Upstream	Dnstream	Above Full Normal Flow	Capacity Limited
C19	0.01	0.01	0.35	0.01	0.01
C20	0.35	0.35	0.76	0.01	0.01
C21	0.01	0.01	0.41	0.01	0.01
STM-25	0.01	0.01	0.06	0.01	0.01
STM-26	0.06	0.06	0.11	0.01	0.01
STM-27	0.11	0.11	0.16	0.01	0.01
STM-28	0.11	0.17	0.11	0.11	0.11
STM-29	0.31	0.31	0.34	0.01	0.01
STM-31	0.26	0.26	0.32	0.01	0.01
STM-33	0.27	0.27	0.30	0.01	0.01
STM-37	0.01	0.01	0.06	0.01	0.01
STM-37_(1)	0.07	0.07	0.11	0.01	0.01
STM-42	0.01	0.01	0.07	0.01	0.01
STM-45	0.01	0.01	0.41	0.01	0.01
STM-46	0.60	0.60	0.66	0.01	0.01
STM-49	0.83	0.83	0.88	0.01	0.04
STM-50	0.01	0.01	0.64	0.01	0.01
STM-53	0.38	0.38	0.50	0.01	0.01
STM-54	0.88	0.88	1.01	0.01	0.01
STM-55	0.01	0.01	0.50	0.01	0.01
STM-57	0.69	0.69	0.81	0.01	0.01
STM-60	0.90	0.90	1.00	0.01	0.01
STM-70	0.01	0.01	0.67	0.01	0.01
STM-74	0.01	0.01	0.18	0.01	0.01
STM-77	0.38	0.38	0.47	0.01	0.01
STM-77_(1)	0.48	0.48	0.61	0.01	0.01
STM-78	0.61	0.61	0.71	0.01	0.01
STM-78_(1)	0.72	0.72	0.80	0.01	0.01
STM-79	0.23	0.23	0.35	0.01	0.01

Analysis begun on: Fri May 15 10:05:05 2026
Analysis ended on: Fri May 15 10:05:15 2026
Total elapsed time: 00:00:10

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)

WARNING 03: negative offset ignored for Link C21
 WARNING 03: negative offset ignored for Link C21

Element Count

Number of rain gages 1
 Number of subcatchments ... 31
 Number of nodes 55
 Number of links 67
 Number of pollutants 0
 Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
Raingage	03-C6hr-100yr	INTENSITY	10 min.

Subcatchment Summary

Name Outlet	Area	Width	%Imperv	%Slope	Rain Gage
A-01 LD1000	0.06	152.50	6.00	2.5000	Raingage
A-02 98	0.02	26.25	100.00	2.0000	Raingage
A-03 97	0.03	27.78	94.00	2.0000	Raingage
A-04 CB2	0.15	82.22	87.00	2.5000	Raingage
A-05 CB4	0.12	70.00	90.00	2.5000	Raingage
A-06 CB6	0.10	61.88	91.00	2.5000	Raingage
A-07 LD1001	0.12	128.89	4.00	6.0000	Raingage
A-08 CB3	0.15	70.00	89.00	2.0000	Raingage
A-09 CB5	0.13	76.47	90.00	2.0000	Raingage
A-10 CB7	0.08	58.57	86.00	2.5000	Raingage
A-12 CB10	0.03	35.56	23.00	2.5000	Raingage
A-13 96	0.04	27.69	90.00	2.0000	Raingage

Palladium II - 125091
 PCSWMM Model Outputs
 6-hour 100-year Chicago

A-14 CBMH225	0.04	29.17	7.00	11.0000	Raingage
A-15 CB9	0.02	63.33	3.00	20.0000	Raingage
A-16 LD1003	0.01	60.00	26.00	9.0000	Raingage
A-17 LD1002	0.01	70.00	17.00	3.5000	Raingage
D-01 OF1	0.01	15.00	39.00	3.5000	Raingage
R-01 LD1000	0.09	90.00	100.00	3.0000	Raingage
R-02 MH217	0.05	55.56	100.00	3.0000	Raingage
R-03 MH216	0.04	39.00	100.00	3.0000	Raingage
R-04 MH208	0.03	31.00	100.00	3.0000	Raingage
R-05 LD1001	0.07	70.00	100.00	3.0000	Raingage
R-06 MH210A	0.06	57.00	100.00	3.0000	Raingage
R-07 CB9	0.03	34.44	100.00	3.0000	Raingage
R-08 CBMH225	0.02	21.11	100.00	3.0000	Raingage
R-09 MH218	0.04	45.56	100.00	3.0000	Raingage
R-10 MH221	0.02	17.00	100.00	3.0000	Raingage
R-11 LD1003	0.02	18.89	100.00	3.0000	Raingage
R-12 LD1003	0.01	11.11	100.00	3.0000	Raingage
R-13 LD1002	0.02	25.56	100.00	3.0000	Raingage
R-14 LD1002	0.01	8.89	100.00	3.0000	Raingage

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
HP-A-04	JUNCTION	108.70	1.00	0.0	
HP-A-05	JUNCTION	108.75	1.00	0.0	
HP-A-05-2	JUNCTION	109.02	1.00	0.0	
HP-A-06	JUNCTION	108.78	1.00	0.0	
HP-A-06-2	JUNCTION	108.80	1.00	0.0	
HP-A-07	JUNCTION	108.75	1.00	0.0	
HP-A-09	JUNCTION	108.73	1.00	0.0	
MH200	OUTFALL	105.72	0.53	0.0	
OF1	OUTFALL	0.00	0.00	0.0	
96	STORAGE	106.32	2.70	0.0	
97	STORAGE	106.59	2.51	0.0	
98	STORAGE	106.67	2.39	0.0	
CB1	STORAGE	106.66	3.04	0.0	

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PCSWM Model Outputs
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CB10	STORAGE	107.40	2.20	0.0
CB2	STORAGE	107.15	2.20	0.0
CB3	STORAGE	107.00	2.35	0.0
CB4	STORAGE	107.25	2.20	0.0
CB5	STORAGE	107.13	2.32	0.0
CB6	STORAGE	107.30	2.20	0.0
CB7	STORAGE	107.19	2.41	0.0
CB8	STORAGE	107.41	2.01	0.0
CB9	STORAGE	107.20	2.37	0.0
CBMH222	STORAGE	106.01	2.56	0.0
CBMH223	STORAGE	106.55	2.04	0.0
CBMH224	STORAGE	106.83	2.66	0.0
CBMH225	STORAGE	106.95	2.45	0.0
LD1000	STORAGE	107.41	2.42	0.0
LD1001	STORAGE	107.67	2.04	0.0
LD1002	STORAGE	106.74	2.86	0.0
LD1003	STORAGE	106.39	3.26	0.0
MH201	STORAGE	105.75	2.99	0.0
MH202	STORAGE	105.85	2.70	0.0
MH203	STORAGE	106.03	2.74	0.0
MH204	STORAGE	106.10	2.72	0.0
MH205	STORAGE	106.27	2.63	0.0
MH206	STORAGE	106.41	2.41	0.0
MH207	STORAGE	106.48	2.36	0.0
MH208	STORAGE	106.78	2.45	0.0
MH209	STORAGE	106.59	2.51	0.0
MH210A	STORAGE	107.30	1.70	0.0
MH210B	STORAGE	107.17	2.08	0.0
MH211	STORAGE	105.97	2.65	0.0
MH212	STORAGE	106.28	2.44	0.0
MH213	STORAGE	106.54	2.52	0.0
MH214	STORAGE	106.62	2.35	0.0
MH215	STORAGE	106.69	2.40	0.0
MH216	STORAGE	106.95	2.12	0.0
MH217	STORAGE	107.35	1.50	0.0
MH218	STORAGE	107.00	1.93	0.0
MH219	STORAGE	106.21	2.81	0.0
MH220	STORAGE	106.18	2.72	0.0
MH221	STORAGE	106.37	2.72	0.0
ST1	STORAGE	106.67	0.99	0.0
ST2	STORAGE	106.52	0.99	0.0
ST3	STORAGE	106.28	0.99	0.0

Link Summary

Name		From Node	To Node	Type	Length	%

C1		CB4	HP-A-05	CONDUIT	2.0	-
15.1717	0.0130					
C10		HP-A-04	CB3	CONDUIT	2.0	
17.7743	0.0130					
C11		CB4	HP-A-05-2	CONDUIT	2.0	-
29.7331	0.0130					

Palladium II - 125091
PCSWMM Model Outputs
6-hour 100-year Chicago

C12		HP-A-05-2	CB2	CONDUIT	2.0	
35.5544	0.0130					
C13		CB6	HP-A-06-2	CONDUIT	2.0	-
15.1717	0.0130					
C14		HP-A-06-2	CB4	CONDUIT	2.0	
17.7743	0.0130					
C15		LD1001	CB8	CONDUIT	50.5	
0.5154	0.0350					
C16		CB8	CB9	CONDUIT	32.2	
0.6522	0.0350					
C17		CB9	CBMH225	CONDUIT	41.0	
0.6095	0.0350					
C18		CBMH225	CBMH224	CONDUIT	17.2	
0.6977	0.0350					
C19		CBMH224	CBMH223	CONDUIT	26.4	
1.0591	0.0350					
C2		HP-A-05	CB5	CONDUIT	2.0	
15.1717	0.0130					
C20		CBMH223	CBMH222	CONDUIT	32.3	
1.6721	0.0350					
C21		LD1000	CB1	CONDUIT	68.6	
1.0932	0.0350					
C3		CB6	HP-A-06	CONDUIT	2.0	-
14.1393	0.0130					
C4		HP-A-06	CB7	CONDUIT	2.0	
9.0367	0.0130					
C5		CB7	HP-A-07	CONDUIT	2.0	-
7.5212	0.0130					
C6		HP-A-07	CB5	CONDUIT	2.0	
15.1717	0.0130					
C7		CB5	HP-A-09	CONDUIT	2.0	-
14.1393	0.0130					
C8		HP-A-09	CB3	CONDUIT	2.0	
19.3525	0.0130					
C9		CB2	HP-A-04	CONDUIT	2.0	-
17.7743	0.0130					
STM-25		MH212	MH211	CONDUIT	39.7	
0.4026	0.0130					
STM-26		MH211	MH202	CONDUIT	14.7	
0.2725	0.0130					
STM-27		MH202	MH201	CONDUIT	30.7	
0.2932	0.0130					
STM-28		MH201	MH200	CONDUIT	12.9	
0.2322	0.0130					
STM-29		CB2	CB3	CONDUIT	24.0	
0.5000	0.0130					
STM-31		CB4	CB5	CONDUIT	22.9	
0.4810	0.0130					
STM-33		CB6	CB7	CONDUIT	15.6	
0.5128	0.0130					
STM-35		MH206	MH205	CONDUIT	15.2	
0.3934	0.0130					
STM-36		MH205	MH204	CONDUIT	30.3	
0.2966	0.0130					
STM-37		MH204	MH203	CONDUIT	24.2	
0.2480	0.0130					
STM-37_(1)		MH203	MH202	CONDUIT	38.6	
0.2587	0.0130					
STM-39		MH213	MH212	CONDUIT	39.1	
0.5120	0.0130					

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STM-40	98	MH213	CONDUIT	8.9
0.8939 0.0130				
STM-41	97	MH206	CONDUIT	13.2
0.9827 0.0130				
STM-42	96	MH203	CONDUIT	9.2
0.9772 0.0130				
STM-44	MH218	MH219	CONDUIT	35.7
0.5048 0.0130				
STM-45	MH221	MH219	CONDUIT	20.6
0.4857 0.0130				
STM-46	MH219	MH220	CONDUIT	3.6
0.5525 0.0130				
STM-48	MH217	MH215	CONDUIT	50.9
0.4908 0.0130				
STM-49	MH215	MH214	CONDUIT	4.9
0.4082 0.0130				
STM-50	MH216	MH215	CONDUIT	39.5
0.5070 0.0130				
STM-53	ST3	MH220	CONDUIT	3.8
1.0417 0.0130				
STM-54	ST1	MH214	CONDUIT	3.5
1.1429 0.0130				
STM-55	MH208	MH209	CONDUIT	26.7
0.4864 0.0130				
STM-56	MH210B	MH209	CONDUIT	28.8
0.4865 0.0130				
STM-57	MH209	MH207	CONDUIT	8.7
0.4577 0.0130				
STM-60	ST2	MH207	CONDUIT	2.7
1.1112 0.0130				
STM-70	LD1000	CB1	CONDUIT	68.6
1.0057 0.0130				
STM-71	LD1001	CB8	CONDUIT	50.5
0.4955 0.0130				
STM-72	CB8	CB9	CONDUIT	32.2
0.5590 0.0130				
STM-74	CB9	CBMH225	CONDUIT	41.0
0.5363 0.0130				
STM-77	CBMH224	LD1002	CONDUIT	8.3
0.9674 0.0130				
STM-77_(1)	LD1002	CBMH223	CONDUIT	18.2
0.9907 0.0130				
STM-78	CBMH223	LD1003	CONDUIT	15.3
0.9792 0.0130				
STM-78_(1)	LD1003	CBMH222	CONDUIT	17.0
1.0012 0.0130				
STM-79	CBMH225	CBMH224	CONDUIT	17.2
0.5233 0.0130				
STM-83	MH210A	MH210B	CONDUIT	13.5
0.5185 0.0130				
O-CB1	CB1	MH212	ORIFICE	
O-CB10	CB10	MH202	ORIFICE	
O-CB3	CB3	MH211	ORIFICE	
O-Cb5	CB5	MH204	ORIFICE	
O-CB7	CB7	MH205	ORIFICE	
O-CBMH222	CBMH222	MH201	ORIFICE	
O-MH206	MH207	MH206	OUTLET	
O-MH214	MH214	MH213	OUTLET	
O-MH220	MH220	MH204	OUTLET	

 Cross Section Summary

Full Conduit Flow	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels

C1 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C10 69215.12	RECT_OPEN	1.00	3.00	0.60	3.00	1
C11 89521.02	RECT_OPEN	1.00	3.00	0.60	3.00	1
C12 97892.98	RECT_OPEN	1.00	3.00	0.60	3.00	1
C13 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C14 69215.12	RECT_OPEN	1.00	3.00	0.60	3.00	1
C15 88.97	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C16 100.08	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C17 96.75	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C18 103.51	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C19 127.53	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C2 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C20 160.25	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C21 129.57	RECT_CLOSED	0.55	0.19	0.11	0.35	1
C3 61733.10	RECT_OPEN	1.00	3.00	0.60	3.00	1
C4 49352.50	RECT_OPEN	1.00	3.00	0.60	3.00	1
C5 45024.40	RECT_OPEN	1.00	3.00	0.60	3.00	1
C6 63947.17	RECT_OPEN	1.00	3.00	0.60	3.00	1
C7 61733.10	RECT_OPEN	1.00	3.00	0.60	3.00	1
C8 72222.70	RECT_OPEN	1.00	3.00	0.60	3.00	1
C9 69215.12	RECT_OPEN	1.00	3.00	0.60	3.00	1
STM-25 61.36	CIRCULAR	0.30	0.07	0.07	0.30	1
STM-26 148.83	CIRCULAR	0.45	0.16	0.11	0.45	1
STM-27 232.87	CIRCULAR	0.53	0.22	0.13	0.53	1
STM-28	CIRCULAR	0.53	0.22	0.13	0.53	1

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6-hour 100-year Chicago

STM-29 68.38	CIRCULAR	0.30	0.07	0.07	0.30	1
STM-31 41.25	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-33 42.59	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-35 60.66	CIRCULAR	0.30	0.07	0.07	0.30	1
STM-36 95.50	CIRCULAR	0.38	0.11	0.09	0.38	1
STM-37 142.00	CIRCULAR	0.45	0.16	0.11	0.45	1
STM-37_(1) 145.03	CIRCULAR	0.45	0.16	0.11	0.45	1
STM-39 42.56	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-40 56.23	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-41 58.95	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-42 58.79	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-44 42.25	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-45 41.45	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-46 44.20	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-48 41.66	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-49 37.99	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-50 42.34	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-53 60.70	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-54 63.58	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-55 41.47	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-56 41.48	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-57 40.23	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-60 62.69	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-70 59.64	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-71 41.86	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-72 44.46	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-74 43.55	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-77 58.49	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-77_(1) 59.19	CIRCULAR	0.25	0.05	0.06	0.25	1
STM-78 58.85	CIRCULAR	0.25	0.05	0.06	0.25	1

STM-78_(1)	CIRCULAR	0.25	0.05	0.06	0.25	1
59.51						
STM-79	CIRCULAR	0.25	0.05	0.06	0.25	1
43.02						
STM-83	CIRCULAR	0.25	0.05	0.06	0.25	1
42.82						

Analysis Options

Flow Units LPS

Process Models:

Rainfall/Runoff	YES
RDII	NO
Snowmelt	NO
Groundwater	NO
Flow Routing	YES
Ponding Allowed	YES
Water Quality	NO
Infiltration Method	HORTON
Flow Routing Method	DYNWAVE
Surcharge Method	EXTRAN
Starting Date	04/17/2026 00:00:00
Ending Date	04/19/2026 00:00:00
Antecedent Dry Days	0.0
Report Time Step	00:01:00
Wet Time Step	00:01:00
Dry Time Step	00:01:00
Routing Time Step	1.00 sec
Variable Time Step	YES
Maximum Trials	8
Number of Threads	16
Head Tolerance	0.001500 m

	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Initial LID Storage	0.001	0.735
Total Precipitation	0.131	82.323
Evaporation Loss	0.000	0.000
Infiltration Loss	0.018	11.247
Surface Runoff	0.113	71.192
Final Storage	0.001	0.735
Continuity Error (%)	-0.139	

	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.113	1.133
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.001
External Outflow	0.114	1.136

Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.001	0.006
Final Stored Volume	0.001	0.006
Continuity Error (%)	-0.126	

 Highest Continuity Errors

 Node MH215 (-1.04%)
 Node CB8 (-1.03%)

 Time-Step Critical Elements

 None

 Highest Flow Instability Indexes

 Link O-CBMH222 (40)

 Most Frequent Nonconverging Nodes

 Convergence obtained at all time steps.

 Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	1.00 sec
Maximum Time Step	:	1.00 sec
% of Time in Steady State	:	0.00
Average Iterations per Step	:	2.00
% of Steps Not Converging	:	0.00
Time Step Frequencies	:	
1.000 - 0.871 sec	:	99.74 %
0.871 - 0.758 sec	:	0.09 %
0.758 - 0.660 sec	:	0.05 %
0.660 - 0.574 sec	:	0.05 %
0.574 - 0.500 sec	:	0.08 %

 Subcatchment Runoff Summary

	Total	Total	Total	Total	Total	Total	Imperv
Down	Total	Total	Peak	Runoff			

Palladium II - 125091
PCSWMM Model Outputs
6-hour 100-year Chicago

Runoff Subcatchment mm	Runoff mm	Runoff 10^6 ltr	Precip		Runon Coeff mm	Evap mm	Infil mm	Runoff mm
			Runoff	Runoff				
			mm	LPS				

A-01			82.32	0.00				
28.60	33.54	0.02	26.51	0.407	0.00	48.90	4.94	
A-02			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.02	10.42	1.001				
A-03			82.32	0.00	0.00	3.10	77.49	
1.86	79.35	0.02	12.31	0.964				
A-04			82.32	0.00	0.00	6.75	71.71	
3.98	75.69	0.11	72.26	0.919				
A-05			82.32	0.00	0.00	5.18	74.19	
3.07	77.26	0.09	58.32	0.938				
A-06			82.32	0.00	0.00	4.66	75.01	
2.77	77.78	0.08	48.58	0.945				
A-07			82.32	0.00	0.00	50.10	3.29	
29.02	32.32	0.04	48.92	0.393				
A-08			82.32	0.00	0.00	5.71	73.35	
3.36	76.72	0.11	71.93	0.932				
A-09			82.32	0.00	0.00	5.18	74.18	
3.07	77.25	0.10	63.71	0.938				
A-10			82.32	0.00	0.00	7.26	70.89	
4.29	75.19	0.06	39.99	0.913				
A-12			82.32	0.00	0.00	40.28	18.95	
23.18	42.12	0.01	13.68	0.512				
A-13			82.32	0.00	0.00	5.18	74.19	
3.07	77.26	0.03	17.65	0.939				
A-14			82.32	0.00	0.00	48.51	5.77	
28.14	33.91	0.01	14.91	0.412				
A-15			82.32	0.00	0.00	50.21	2.47	
29.91	32.39	0.01	8.35	0.393				
A-16			82.32	0.00	0.00	38.25	21.43	
23.04	44.47	0.00	2.72	0.540				
A-17			82.32	0.00	0.00	42.93	14.00	
25.68	39.69	0.00	3.13	0.482				
D-01			82.32	0.00	0.00	31.64	32.12	
18.69	50.81	0.00	2.76	0.617				
R-01			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.07	44.64	1.001				
R-02			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.04	24.80	1.001				
R-03			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.03	19.34	1.001				
R-04			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.03	15.38	1.001				
R-05			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.06	34.72	1.001				
R-06			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.05	28.27	1.001				
R-07			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.03	15.38	1.001				
R-08			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.02	9.42	1.001				
R-09			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.03	20.34	1.001				
R-10			82.32	0.00	0.00	0.00	82.44	
0.00	82.44	0.01	8.43	1.001				

Palladium II - 125091
PCSWM Model Outputs
6-hour 100-year Chicago

R-11		82.32	0.00	0.00	0.00	82.44
0.00	82.44	0.01	8.43	1.001		
R-12		82.32	0.00	0.00	0.00	82.44
0.00	82.44	0.01	4.96	1.001		
R-13		82.32	0.00	0.00	0.00	82.44
0.00	82.44	0.02	11.41	1.001		
R-14		82.32	0.00	0.00	0.00	82.44
0.00	82.44	0.01	3.97	1.001		

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
HP-A-04	JUNCTION	0.00	0.00	108.70	0 00:00	0.00
HP-A-05	JUNCTION	0.00	0.00	108.75	0 00:00	0.00
HP-A-05-2	JUNCTION	0.00	0.00	109.02	0 00:00	0.00
HP-A-06	JUNCTION	0.00	0.00	108.78	0 00:00	0.00
HP-A-06-2	JUNCTION	0.00	0.00	108.80	0 00:00	0.00
HP-A-07	JUNCTION	0.00	0.00	108.75	0 00:00	0.00
HP-A-09	JUNCTION	0.00	0.00	108.73	0 00:00	0.00
MH200	OUTFALL	0.31	0.35	106.07	0 02:11	0.35
OF1	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
96	STORAGE	0.00	0.25	106.57	0 02:10	0.24
97	STORAGE	0.00	0.09	106.68	0 02:05	0.09
98	STORAGE	0.00	0.08	106.75	0 02:07	0.08
CB1	STORAGE	0.03	1.50	108.16	0 02:20	1.50
CB10	STORAGE	0.00	0.77	108.17	0 02:10	0.76
CB2	STORAGE	0.02	1.42	108.57	0 02:11	1.42
CB3	STORAGE	0.03	1.54	108.54	0 02:11	1.54
CB4	STORAGE	0.02	1.40	108.65	0 02:11	1.40
CB5	STORAGE	0.02	1.49	108.62	0 02:10	1.49
CB6	STORAGE	0.02	1.43	108.73	0 02:11	1.43
CB7	STORAGE	0.02	1.53	108.72	0 02:10	1.53
CB8	STORAGE	0.01	0.55	107.96	0 02:20	0.55
CB9	STORAGE	0.01	0.76	107.96	0 02:21	0.76
CBMH222	STORAGE	0.08	1.93	107.94	0 02:21	1.93
CBMH223	STORAGE	0.03	1.40	107.95	0 02:21	1.40
CBMH224	STORAGE	0.02	1.12	107.95	0 02:21	1.12
CBMH225	STORAGE	0.02	1.01	107.96	0 02:21	1.00
LD1000	STORAGE	0.01	0.76	108.17	0 02:20	0.76
LD1001	STORAGE	0.01	0.30	107.97	0 02:20	0.30
LD1002	STORAGE	0.03	1.21	107.95	0 02:21	1.21
LD1003	STORAGE	0.04	1.55	107.94	0 02:21	1.55
MH201	STORAGE	0.29	0.58	106.33	0 02:11	0.58
MH202	STORAGE	0.19	0.57	106.42	0 02:10	0.57
MH203	STORAGE	0.02	0.53	106.56	0 02:10	0.53
MH204	STORAGE	0.02	0.51	106.61	0 02:10	0.51
MH205	STORAGE	0.01	0.38	106.65	0 02:10	0.38
MH206	STORAGE	0.01	0.24	106.65	0 02:10	0.24
MH207	STORAGE	0.03	0.91	107.39	0 02:21	0.91
MH208	STORAGE	0.01	0.61	107.39	0 02:20	0.61

Palladium II - 125091
 PCSWMM Model Outputs
 6-hour 100-year Chicago

MH209	STORAGE	0.02	0.80	107.39	0	02:20	0.80
MH210A	STORAGE	0.01	0.18	107.48	0	02:09	0.18
MH210B	STORAGE	0.01	0.23	107.40	0	02:20	0.23
MH211	STORAGE	0.07	0.48	106.45	0	02:11	0.48
MH212	STORAGE	0.01	0.21	106.49	0	02:10	0.21
MH213	STORAGE	0.01	0.12	106.66	0	02:08	0.12
MH214	STORAGE	0.03	0.88	107.50	0	02:21	0.88
MH215	STORAGE	0.03	0.81	107.50	0	02:20	0.81
MH216	STORAGE	0.01	0.55	107.50	0	02:20	0.55
MH217	STORAGE	0.01	0.16	107.51	0	02:20	0.16
MH218	STORAGE	0.00	0.12	107.12	0	02:10	0.12
MH219	STORAGE	0.02	0.74	106.95	0	02:20	0.74
MH220	STORAGE	0.02	0.77	106.95	0	02:20	0.77
MH221	STORAGE	0.01	0.58	106.95	0	02:20	0.58
ST1	STORAGE	0.02	0.83	107.50	0	02:21	0.83
ST2	STORAGE	0.03	0.87	107.39	0	02:21	0.87
ST3	STORAGE	0.01	0.67	106.95	0	02:20	0.67

 Node Inflow Summary

Total		Flow		Maximum	Maximum		Lateral
Inflow	Balance			Lateral	Total	Time of Max	Inflow
Volume	Error			Inflow	Inflow	Occurrence	Volume
Node		Type		LPS	LPS	days hr:min	10^6 ltr
ltr	Percent						10^6

HP-A-04		JUNCTION		0.00	0.00	0 00:00	0
0	0.000 ltr						
HP-A-05		JUNCTION		0.00	0.00	0 00:00	0
0	0.000 ltr						
HP-A-05-2		JUNCTION		0.00	0.00	0 00:00	0
0	0.000 ltr						
HP-A-06		JUNCTION		0.00	0.00	0 00:00	0
0	0.000 ltr						
HP-A-06-2		JUNCTION		0.00	0.00	0 00:00	0
0	0.000 ltr						
HP-A-07		JUNCTION		0.00	0.00	0 00:00	0
0	0.000 ltr						
HP-A-09		JUNCTION		0.00	0.00	0 00:00	0
0	0.000 ltr						
MH200		OUTFALL		0.00	270.18	0 02:11	0
1.13	0.000						
OF1		OUTFALL		2.76	2.76	0 02:10	0.00305
0.00305	0.000						
96		STORAGE		17.65	17.65	0 02:10	0.0278
0.0278	0.138						
97		STORAGE		12.31	12.31	0 02:10	0.0198
0.0198	0.419						
98		STORAGE		10.42	10.42	0 02:10	0.0173
0.0173	0.198						

Palladium II - 125091
 PCSWMM Model Outputs
 6-hour 100-year Chicago

CB1		STORAGE	0.00	57.11	0	02:04	0
0.0946	-0.458						
CB10		STORAGE	13.68	13.68	0	02:10	0.0135
0.0135	0.000						
CB2		STORAGE	72.26	72.26	0	02:10	0.112
0.112	0.043						
CB3		STORAGE	71.93	103.36	0	02:10	0.113
0.225	0.015						
CB4		STORAGE	58.32	58.32	0	02:10	0.0919
0.0919	0.001						
CB5		STORAGE	63.71	87.56	0	02:10	0.1
0.192	0.008						
CB6		STORAGE	48.58	48.58	0	02:10	0.077
0.077	0.000						
CB7		STORAGE	39.99	56.17	0	02:10	0.0617
0.139	-0.004						
CB8		STORAGE	0.00	80.36	0	02:08	0
0.0942	-1.024						
CB9		STORAGE	23.73	93.30	0	02:07	0.0317
0.127	0.170						
CBMH222		STORAGE	0.00	42.64	0	02:06	0
0.209	-0.025						
CBMH223		STORAGE	0.00	64.27	0	02:03	0
0.183	-0.126						
CBMH224		STORAGE	0.00	71.93	0	02:04	0
0.155	-0.193						
CBMH225		STORAGE	24.33	96.77	0	02:05	0.0275
0.154	-0.332						
LD1000		STORAGE	71.15	71.15	0	02:10	0.0947
0.0947	0.016						
LD1001		STORAGE	83.64	83.64	0	02:10	0.0952
0.0952	1.102						
LD1002		STORAGE	18.51	47.97	0	02:03	0.0283
0.0743	0.250						
LD1003		STORAGE	16.11	29.03	0	02:01	0.0249
0.0785	0.023						
MH201		STORAGE	0.00	270.22	0	02:11	0
1.14	-0.002						
MH202		STORAGE	0.00	241.18	0	02:10	0
0.925	-0.058						
MH203		STORAGE	0.00	139.66	0	02:10	0
0.499	0.002						
MH204		STORAGE	0.00	124.99	0	02:10	0
0.471	-0.000						
MH205		STORAGE	0.00	60.45	0	02:10	0
0.231	0.014						
MH206		STORAGE	0.00	20.82	0	02:10	0
0.0922	-0.114						
MH207		STORAGE	0.00	37.67	0	02:07	0
0.0944	-0.056						
MH208		STORAGE	15.38	15.38	0	02:10	0.0256
0.0256	0.351						
MH209		STORAGE	0.00	42.16	0	02:08	0
0.0719	-0.612						
MH210A		STORAGE	28.27	28.27	0	02:10	0.047
0.047	0.474						
MH210B		STORAGE	0.00	28.41	0	02:10	0
0.0468	0.687						
MH211		STORAGE	0.00	92.95	0	02:11	0
0.411	0.040						

Palladium II - 125091
 PCSWMM Model Outputs
 6-hour 100-year Chicago

MH212		STORAGE	0.00	36.12	0	02:10	0
0.186	-0.185						
MH213		STORAGE	0.00	18.82	0	02:10	0
0.0906	0.150						
MH214		STORAGE	0.00	37.15	0	02:03	0
0.0942	-0.032						
MH215		STORAGE	0.00	43.37	0	02:07	0
0.0726	-1.027						
MH216		STORAGE	19.34	19.34	0	02:10	0.0322
0.0322	0.322						
MH217		STORAGE	24.80	24.80	0	02:10	0.0412
0.0412	1.750						
MH218		STORAGE	20.34	20.34	0	02:10	0.0338
0.0338	0.693						
MH219		STORAGE	0.00	26.78	0	02:10	0
0.0476	-0.537						
MH220		STORAGE	0.00	24.63	0	02:10	0
0.0594	-0.003						
MH221		STORAGE	8.43	8.43	0	02:10	0.014
0.014	0.106						
ST1		STORAGE	0.00	29.86	0	02:03	0
0.0209	0.022						
ST2		STORAGE	0.00	29.83	0	02:02	0
0.0221	0.002						
ST3		STORAGE	0.00	18.39	0	02:02	0
0.0115	0.033						

 Node Surcharge Summary

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
ST1	STORAGE	1.74	0.580	0.160
ST2	STORAGE	1.73	0.617	0.123

 Node Flooding Summary

No nodes were flooded.

 Storage Volume Summary

Max Occurrence	Maximum Outflow	Average Volume	Avg Pcnt	Evap Pcnt	Exfil Pcnt	Maximum Volume	Max Pcnt	Time of
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Palladium II - 125091
PCSWMM Model Outputs
6-hour 100-year Chicago

Storage Unit	1000 m ³	Full	Loss	Loss	1000 m ³	Full	days
hr:min LPS							

96	0.000	0.0	0.0	0.0	0.000	0.0	0
00:00 17.31							
97	0.000	0.0	0.0	0.0	0.000	0.0	0
00:00 12.65							
98	0.000	0.0	0.0	0.0	0.000	0.0	0
00:00 10.42							
CB1	0.000	1.1	0.0	0.0	0.001	49.5	0
02:20 17.68							
CB10	0.000	0.0	0.0	0.0	0.000	0.0	0
02:10 12.46							
CB2	0.000	0.0	0.0	0.0	0.021	2.2	0
02:11 46.80							
CB3	0.000	0.0	0.0	0.0	0.021	1.4	0
02:11 59.32							
CB4	0.000	0.0	0.0	0.0	0.017	1.9	0
02:11 44.70							
CB5	0.000	0.0	0.0	0.0	0.013	0.9	0
02:10 58.23							
CB6	0.000	0.0	0.0	0.0	0.018	3.2	0
02:11 34.18							
CB7	0.000	0.0	0.0	0.0	0.005	0.8	0
02:10 41.40							
CB8	0.000	0.5	0.0	0.0	0.000	27.6	0
02:20 69.67							
CB9	0.000	0.6	0.0	0.0	0.000	32.1	0
02:21 76.15							
CBMH222	0.000	2.9	0.0	0.0	0.002	75.3	0
02:21 31.98							
CBMH223	0.000	1.6	0.0	0.0	0.002	68.4	0
02:21 32.10							
CBMH224	0.000	0.9	0.0	0.0	0.001	42.2	0
02:21 54.92							
CBMH225	0.000	0.9	0.0	0.0	0.001	41.0	0
02:21 71.93							
LD1000	0.000	0.5	0.0	0.0	0.000	31.4	0
02:20 57.11							
LD1001	0.000	0.3	0.0	0.0	0.000	14.6	0
02:20 80.36							
LD1002	0.000	1.0	0.0	0.0	0.000	42.3	0
02:21 40.31							
LD1003	0.000	1.2	0.0	0.0	0.000	47.6	0
02:21 22.51							
MH201	0.000	9.6	0.0	0.0	0.001	19.3	0
02:11 270.18							
MH202	0.000	6.9	0.0	0.0	0.001	21.3	0
02:10 240.62							
MH203	0.000	0.6	0.0	0.0	0.001	19.4	0
02:10 137.90							
MH204	0.000	0.6	0.0	0.0	0.001	18.7	0
02:10 125.88							
MH205	0.000	0.4	0.0	0.0	0.000	14.4	0
02:10 59.32							
MH206	0.000	0.3	0.0	0.0	0.000	10.1	0
02:10 19.08							
MH207	0.000	1.2	0.0	0.0	0.001	38.4	0
02:21 35.78							

Palladium II - 125091
 PCSWMM Model Outputs
 6-hour 100-year Chicago

MH208		0.000	0.6	0.0	0.0	0.001	25.0	0
02:20	15.58							
MH209		0.000	1.0	0.0	0.0	0.001	31.9	0
02:20	37.67							
MH210A		0.000	0.3	0.0	0.0	0.000	10.8	0
02:09	28.41							
MH210B		0.000	0.3	0.0	0.0	0.000	10.9	0
02:20	29.05							
MH211		0.000	2.6	0.0	0.0	0.001	18.0	0
02:11	93.61							
MH212		0.000	0.4	0.0	0.0	0.000	8.6	0
02:10	33.65							
MH213		0.000	0.3	0.0	0.0	0.000	4.9	0
02:08	19.37							
MH214		0.000	1.2	0.0	0.0	0.001	37.4	0
02:21	35.39							
MH215		0.000	1.1	0.0	0.0	0.001	33.9	0
02:20	37.15							
MH216		0.000	0.7	0.0	0.0	0.001	26.2	0
02:20	19.26							
MH217		0.000	0.4	0.0	0.0	0.000	10.5	0
02:20	26.71							
MH218		0.000	0.2	0.0	0.0	0.000	6.4	0
02:10	20.34							
MH219		0.000	0.7	0.0	0.0	0.001	26.4	0
02:20	24.63							
MH220		0.000	0.7	0.0	0.0	0.001	28.4	0
02:20	23.25							
MH221		0.000	0.4	0.0	0.0	0.001	21.4	0
02:20	8.01							
ST1		0.001	2.5	0.0	0.0	0.021	84.1	0
02:21	3.60							
ST2		0.001	2.6	0.0	0.0	0.022	87.9	0
02:21	6.05							
ST3		0.000	1.4	0.0	0.0	0.011	68.2	0
02:20	3.29							

 Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
MH200	39.37	16.87	270.18	1.134
OF1	7.34	0.23	2.76	0.003
System	23.36	17.10	271.40	1.138

 Link Flow Summary

Maximum	Time of Max	Maximum	Max/	Max/
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Link	Type	Flow LPS	Occurrence days hr:min	Veloc m/sec	Full Flow	Full Depth
C1	CONDUIT	0.00	0 00:00	0.00	0.00	0.10
C10	CONDUIT	0.00	0 00:00	0.00	0.00	0.09
C11	CONDUIT	0.00	0 00:00	0.00	0.00	0.10
C12	CONDUIT	0.00	0 00:00	0.00	0.00	0.11
C13	CONDUIT	0.00	0 00:00	0.00	0.00	0.12
C14	CONDUIT	0.00	0 00:00	0.00	0.00	0.10
C15	CONDUIT	42.74	0 02:10	0.45	0.48	0.77
C16	CONDUIT	33.75	0 02:09	0.40	0.34	1.00
C17	CONDUIT	42.19	0 02:07	0.43	0.44	1.00
C18	CONDUIT	43.15	0 02:06	0.50	0.42	1.00
C19	CONDUIT	39.35	0 02:06	0.39	0.31	1.00
C2	CONDUIT	0.00	0 00:00	0.00	0.00	0.08
C20	CONDUIT	26.77	0 02:05	0.16	0.17	1.00
C21	CONDUIT	31.46	0 02:09	0.25	0.24	1.00
C3	CONDUIT	0.00	0 00:00	0.00	0.00	0.12
C4	CONDUIT	0.00	0 00:00	0.00	0.00	0.06
C5	CONDUIT	0.00	0 00:00	0.00	0.00	0.06
C6	CONDUIT	0.00	0 00:00	0.00	0.00	0.08
C7	CONDUIT	0.00	0 00:00	0.00	0.00	0.08
C8	CONDUIT	0.00	0 00:00	0.00	0.00	0.09
C9	CONDUIT	0.00	0 00:00	0.00	0.00	0.11
STM-25	CONDUIT	33.65	0 02:11	0.87	0.55	0.85
STM-26	CONDUIT	93.61	0 02:11	0.82	0.63	1.00
STM-27	CONDUIT	240.62	0 02:11	1.11	1.03	1.00
STM-28	CONDUIT	270.18	0 02:11	1.40	1.30	0.84
STM-29	CONDUIT	46.80	0 02:36	0.66	0.68	1.00
STM-31	CONDUIT	44.70	0 02:29	0.91	1.08	1.00
STM-33	CONDUIT	34.18	0 02:27	0.70	0.80	1.00
STM-35	CONDUIT	19.08	0 02:10	0.67	0.31	0.90
STM-36	CONDUIT	59.32	0 02:10	0.81	0.62	1.00
STM-37	CONDUIT	125.88	0 02:11	0.89	0.89	1.00
STM-37_(1)	CONDUIT	137.90	0 02:10	0.91	0.95	1.00
STM-39	CONDUIT	19.37	0 02:10	0.81	0.46	0.53
STM-40	CONDUIT	10.42	0 02:08	0.79	0.19	0.32
STM-41	CONDUIT	12.65	0 02:07	0.87	0.21	0.53
STM-42	CONDUIT	17.31	0 02:09	0.98	0.29	0.99
STM-44	CONDUIT	20.34	0 02:10	0.89	0.48	0.47
STM-45	CONDUIT	8.01	0 02:02	0.42	0.19	1.00
STM-46	CONDUIT	24.63	0 02:10	0.50	0.56	1.00
STM-48	CONDUIT	26.71	0 02:07	0.87	0.64	0.82
STM-49	CONDUIT	37.15	0 02:03	0.76	0.98	1.00
STM-50	CONDUIT	19.26	0 02:03	0.68	0.45	1.00
STM-53	CONDUIT	18.39	0 02:02	0.51	0.30	1.00
STM-54	CONDUIT	29.86	0 02:03	0.61	0.47	1.00
STM-55	CONDUIT	15.58	0 02:01	0.66	0.38	1.00
STM-56	CONDUIT	29.05	0 02:08	0.88	0.70	0.95
STM-57	CONDUIT	37.67	0 02:07	0.77	0.94	1.00
STM-60	CONDUIT	29.83	0 02:02	0.61	0.48	1.00
STM-70	CONDUIT	32.41	0 02:04	0.81	0.54	1.00
STM-71	CONDUIT	45.31	0 02:08	1.04	1.08	1.00
STM-72	CONDUIT	39.65	0 02:07	0.95	0.89	1.00
STM-74	CONDUIT	43.19	0 02:05	1.00	0.99	1.00
STM-77	CONDUIT	29.65	0 02:03	0.93	0.51	1.00
STM-77_(1)	CONDUIT	40.31	0 02:03	1.19	0.68	1.00

STM-78	CONDUIT	14.80	0	02:01	0.81	0.25	1.00
STM-78_(1)	CONDUIT	22.51	0	02:01	0.85	0.38	1.00
STM-79	CONDUIT	40.77	0	02:04	1.07	0.95	1.00
STM-83	CONDUIT	28.41	0	02:10	0.85	0.66	0.66
O-CB1	ORIFICE	17.68	0	02:20			1.00
O-CB10	ORIFICE	12.46	0	02:10			1.00
O-CB3	ORIFICE	59.32	0	02:12			1.00
O-Cb5	ORIFICE	58.23	0	02:10			1.00
O-CB7	ORIFICE	41.40	0	02:10			1.00
O-CBMH222	ORIFICE	31.98	0	02:39			1.00
O-MH206	DUMMY	9.26	0	02:21			
O-MH214	DUMMY	9.10	0	02:21			
O-MH220	DUMMY	7.67	0	02:20			

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Flow Classification Summary
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	Adjusted	Fraction of Time in Flow Class							
Inlet Conduit Ctrl	/Actual Length	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	
C1 0.00	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	
C10 0.00	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	
C11 0.00	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	
C12 0.00	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	
C13 0.00	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	
C14 0.00	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	
C15 0.00	1.00	0.57	0.10	0.00	0.33	0.00	0.00	0.24	
C16 0.00	1.00	0.53	0.05	0.00	0.42	0.00	0.00	0.56	
C17 0.00	1.00	0.49	0.06	0.00	0.45	0.00	0.00	0.44	
C18 0.00	1.00	0.46	0.05	0.00	0.49	0.00	0.00	0.33	
C19 0.00	1.00	0.42	0.05	0.00	0.53	0.00	0.00	0.86	
C2 0.00	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	
C20 0.00	1.00	0.00	0.43	0.00	0.57	0.00	0.00	0.96	
C21 0.00	1.00	0.47	0.20	0.00	0.33	0.00	0.00	0.36	
C3 0.00	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	

C4	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C5	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C6	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C7	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C8	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
C9	1.00	0.99	0.01	0.00	0.00	0.00	0.00	0.00	0.00
0.00									
STM-25	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.01
0.00									
STM-26	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
STM-27	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
STM-28	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
0.00									
STM-29	1.00	0.00	0.00	0.00	0.07	0.00	0.00	0.93	0.04
0.00									
STM-31	1.00	0.00	0.00	0.00	0.12	0.00	0.00	0.88	0.11
0.00									
STM-33	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.03
0.00									
STM-35	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
STM-36	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
STM-37	1.00	0.00	0.00	0.00	0.12	0.00	0.00	0.88	0.00
0.00									
STM-37_(1)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.16
0.00									
STM-39	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
STM-40	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.03
0.00									
STM-41	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.03
0.00									
STM-42	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00
0.00									
STM-44	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.01
0.00									
STM-45	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.01
0.00									
STM-46	1.00	0.00	0.00	0.00	0.06	0.00	0.00	0.94	0.01
0.00									
STM-48	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.01
0.00									
STM-49	1.00	0.00	0.00	0.00	0.06	0.00	0.00	0.94	0.00
0.00									
STM-50	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.01
0.00									
STM-53	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00
0.00									
STM-54	1.00	0.00	0.00	0.00	0.12	0.00	0.00	0.88	0.06
0.00									

STM-56 0.00	1.00	0.00	0.00	0.00	0.02	0.00	0.00	0.98	0.01
STM-57 0.00	1.00	0.00	0.00	0.00	0.05	0.00	0.00	0.95	0.00
STM-60 0.00	1.00	0.00	0.00	0.00	0.12	0.00	0.00	0.88	0.05
STM-70 0.00	1.00	0.67	0.00	0.00	0.04	0.00	0.00	0.29	0.02
STM-71 0.00	1.00	0.67	0.00	0.00	0.02	0.00	0.00	0.31	0.01
STM-72 0.00	1.00	0.58	0.00	0.00	0.02	0.00	0.00	0.40	0.00
STM-74 0.00	1.00	0.55	0.00	0.00	0.03	0.00	0.00	0.42	0.00
STM-77 0.00	1.00	0.47	0.00	0.00	0.03	0.00	0.00	0.49	0.00
STM-77_(1) 0.00	1.00	0.00	0.00	0.00	0.03	0.00	0.00	0.97	0.00
STM-78 0.00	1.00	0.43	0.00	0.00	0.03	0.00	0.00	0.53	0.00
STM-78_(1) 0.00	1.00	0.00	0.00	0.00	0.04	0.00	0.00	0.96	0.00
STM-79 0.00	1.00	0.51	0.00	0.00	0.03	0.00	0.00	0.46	0.00
STM-83 0.00	1.00	0.00	0.00	0.00	0.01	0.00	0.00	0.99	0.00

 Conduit Surcharge Summary

Conduit	Hours Full			Hours Above Full	
	Both Ends	Upstream	Dnstream	Normal Flow	Capacity Limited
C15	0.01	0.01	0.04	0.01	0.01
C16	0.04	0.04	0.57	0.01	0.01
C17	0.57	0.57	0.87	0.01	0.01
C18	0.87	0.87	1.00	0.01	0.01
C19	1.00	1.00	1.24	0.01	0.01
C20	1.24	1.24	1.58	0.01	0.01
C21	0.42	0.42	1.11	0.01	0.01
STM-25	0.01	0.01	0.09	0.01	0.01
STM-26	0.09	0.09	0.18	0.01	0.01
STM-27	0.24	0.24	0.33	0.07	0.07
STM-28	0.01	0.41	0.01	0.51	0.01
STM-29	0.64	0.64	0.75	0.01	0.01
STM-31	0.54	0.54	0.66	0.02	0.02
STM-33	0.55	0.55	0.66	0.01	0.01
STM-36	0.01	0.01	0.13	0.01	0.01
STM-37	0.14	0.14	0.23	0.01	0.01
STM-37_(1)	0.18	0.26	0.18	0.01	0.18
STM-42	0.01	0.01	0.26	0.01	0.01
STM-45	0.85	0.85	1.07	0.01	0.01
STM-46	1.22	1.22	1.28	0.01	0.01
STM-48	0.01	0.01	0.69	0.01	0.01

Palladium II - 125091
 PCSWMM Model Outputs
 6-hour 100-year Chicago

STM-49	1.69	1.70	1.74	0.01	0.14
STM-50	1.05	1.05	1.54	0.01	0.01
STM-53	1.04	1.04	1.14	0.01	0.01
STM-54	1.74	1.74	1.86	0.01	0.01
STM-55	1.11	1.11	1.39	0.01	0.01
STM-56	0.01	0.01	0.55	0.01	0.01
STM-57	1.54	1.55	1.65	0.01	0.13
STM-60	1.73	1.73	1.82	0.01	0.01
STM-70	0.71	0.71	1.32	0.01	0.01
STM-71	0.26	0.26	0.69	0.04	0.01
STM-72	0.70	0.70	0.91	0.01	0.01
STM-74	0.94	0.94	1.15	0.01	0.01
STM-77	1.26	1.26	1.33	0.01	0.01
STM-77_(1)	1.34	1.34	1.45	0.01	0.01
STM-78	1.45	1.45	1.54	0.01	0.01
STM-78_(1)	1.54	1.54	1.64	0.01	0.01
STM-79	1.17	1.17	1.24	0.01	0.01

Analysis begun on: Tue May 12 14:31:49 2026
 Analysis ended on: Tue May 12 14:31:56 2026
 Total elapsed time: 00:00:07

Palladium II - 125091
5mm Retention Calculations

Site Infiltration Requirement				
Total Site Area			1.594 ha	
Retention Requirement			5 mm	
Total Retention Volume Required			79.7 m ³	
Depression Storage				
Depression storage on paved and landscaped areas as per City guidelines.				
Assume no depression storage on pitched roof or entrance ramp to parking				
Land Use			Paved	Landscaped
Area (ha)			0.520	0.350
Depression Storage (mm)			1.57	4.67
Depression Storage Vol (m ³)			8.2	16.3
Total Depression Storage Vol (m ³)			24.5	
Infiltration Storage				
Storage in clearstone layer below Stormtech chambers and infiltration trenches.				
Storage Location	R-02 & R-03 Chambers	R-04 & R-06 Chambers	R-09 & R-10 Chambers	Trenches
Length (m)	8.85	8.85	8.85	263.18
Width (m)	4.65	4.65	3.28	1.25
Depth (m)	0.6	0.6	0.6	0.3
Porosity	0.4	0.4	0.4	0.3
Infiltration Rate (mm/hr)	15	15	15	15
Drawdown Time (hrs)	40	40	40	20
Volume (m ³)	9.9	9.9	7.0	29.6
Total Infiltration Vol (m ³)	56.3			
Total Retention Volume (m ³)	80.8			
Depression + Infiltration Storage				

CB 2		
Elevation	Area	Volume
108.35	0.37	0.000
108.40	22.794	0.579
108.45	70.827	2.920
108.50	135.195	8.070
108.55	216.128	16.853
108.60	316.549	30.170
108.65	437.985	49.034

CB 3		
Elevation	Area	Volume
108.35	0.37	0.000
108.40	28.026	0.710
108.45	93.301	3.743
108.50	193.651	10.917
108.55	332.821	24.079
108.60	514.875	45.271
108.65	697.248	75.574

CB 4		
Elevation	Area	Volume
108.45	0.37	0.000
108.50	19.66	0.501
108.55	61.8	2.537
108.60	127.556	7.271
108.65	217.49	15.897
108.70	319.37	29.319
108.75	434.261	48.160

CB 5		
Elevation	Area	Volume
108.45	0.37	0.000
108.50	25.885	0.656
108.55	85.521	3.442
108.60	170.957	9.853
108.65	288.631	21.343
108.70	444.05	39.660
108.73	561.671	54.746

CB 6		
Elevation	Area	Volume
108.50	0.37	0.000
108.55	17.754	0.453
108.60	52.52	2.210
108.65	99.822	6.019
108.70	154.732	12.382
108.75	218.381	21.710
108.78	260.135	28.888

CB 7		
Elevation	Area	Volume
108.60	0.37	0.000
108.65	24.518	0.622
108.70	74.644	3.101
108.75	144.764	8.586

CB 10		
Elevation	Area	Volume
108.60	0.37	0.000
108.65	23.038	0.585
108.70	72.137	2.965
108.71	85.829	3.754

Palladium II - 125091

ROW Ponding Depths

Structure	T/G (m)	Max. Static Ponding (Spill Depth)		2-yr Event (6hr)				5-yr Event (6hr)				100-yr Event (6hr)				100-yr Event (+20%) (6hr)			
		Elev. (m)	Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)	Elev. (m)	Depth (m)	Cascading Flow?	Cascade Depth (m)
CB1	108.70	109.00	0.30	107.14	0.00	N	0.00	107.47	0.00	N	0.00	108.16	0.00	N	0.00	108.55	0.00	N	0.00
CB10	108.60	108.75	0.15	107.46	0.00	N	0.00	107.56	0.00	N	0.00	108.17	0.00	N	0.00	108.60	0.00	N	0.00
CB2	108.35	108.70	0.35	108.34	0.00	N	0.00	108.47	0.12	N	0.00	108.57	0.22	N	0.00	108.60	0.25	N	0.00
CB3	108.35	108.65	0.30	108.32	0.00	N	0.00	108.44	0.09	N	0.00	108.54	0.19	N	0.00	108.57	0.22	N	0.00
CB4	108.45	108.75	0.30	108.20	0.00	N	0.00	108.55	0.10	N	0.00	108.65	0.20	N	0.00	108.68	0.23	N	0.00
CB5	108.45	108.73	0.28	108.16	0.00	N	0.00	108.51	0.06	N	0.00	108.62	0.17	N	0.00	108.65	0.20	N	0.00
CB6	108.50	108.78	0.28	108.28	0.00	N	0.00	108.61	0.11	N	0.00	108.73	0.23	N	0.00	108.76	0.26	N	0.00
CB7	108.60	108.75	0.15	108.26	0.00	N	0.00	108.59	0.00	N	0.00	108.72	0.12	N	0.00	108.75	0.15	N	0.00
CB8	108.42	108.61	0.19	107.48	0.00	N	0.00	107.53	0.00	N	0.00	107.96	0.00	N	0.00	108.30	0.00	N	0.00
CB9	108.57	108.96	0.39	107.29	0.00	N	0.00	107.34	0.00	N	0.00	107.96	0.00	N	0.00	108.29	0.00	N	0.00
CBMH222	108.57	108.90	0.33	106.92	0.00	N	0.00	107.26	0.00	N	0.00	107.94	0.00	N	0.00	108.27	0.00	N	0.00
CBMH223	108.59	108.68	0.09	106.92	0.00	N	0.00	107.26	0.00	N	0.00	107.95	0.00	N	0.00	108.28	0.00	N	0.00
CBMH224	108.49	108.62	0.13	106.92	0.00	N	0.00	107.27	0.00	N	0.00	107.95	0.00	N	0.00	108.28	0.00	N	0.00
CBMH225	108.40	108.62	0.22	107.05	0.00	N	0.00	107.27	0.00	N	0.00	107.96	0.00	N	0.00	108.29	0.00	N	0.00
LD1000	108.83	0.00	0.00	107.47	0.00	N	0.00	107.50	0.00	N	0.00	108.17	0.00	N	0.00	108.56	0.00	N	0.00
LD1001	108.71	0.00	0.00	107.75	0.00	N	0.00	107.80	0.00	N	0.00	107.97	0.00	N	0.00	108.30	0.00	N	0.00
LD1002	108.60	108.69	0.09	106.93	0.00	N	0.00	107.27	0.00	N	0.00	107.95	0.00	N	0.00	108.28	0.00	N	0.00
LD1003	108.65	109.00	0.35	106.92	0.00	N	0.00	107.26	0.00	N	0.00	107.94	0.00	N	0.00	108.27	0.00	N	0.00

Appendix F

Drawings

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 DIMENSIONS AND INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION. IF THERE IS ANY DISCREPANCY THE CONTRACTOR IS TO NOTIFY THE ENGINEER PROMPTLY.
8. THE SITE BENCHMARK BENCHMARK IS THE TOP OF HYDRANT SPINDEL (ELEV = 109.29), LOCATED ON DERREEN AVENUE ACROSS THE ROAD FROM THE PROJECTION OF THE SOUTH PROPERTY LINE. BENCHMARK #2 IS THE TOP OF HYDRANT SPINDEL (ELEV = 109.35), LOCATED ON DERREEN AVENUE ACROSS THE ROAD FROM THE PROJECTION OF THE SOUTH PROPERTY LINE. ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO THE CGVD-1928/1978 (MONUMENT No. 19770882). REFER TO THE FARLEY, SMITH & DENIS SURVEYING LTD. 2025 TOPOGRAPHIC SKETCH OF # PART OF BLOCK 242, REGISTERED PLAN 4M-1687, CITY OF OTTAWA.
9. REFER TO GEOTECHNICAL REPORT (No. PG7573-1, DATED JUNE 30, 2025), 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.
10. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
11. REFER TO SERVICING AND STORMWATER MANAGEMENT REPORT PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD. (DATED JUNE 10, 2026).
12. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
13. PROVIDE LINE/PARKING PAINTING.
14. 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/W/M ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.
15. CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.

SEWER NOTES:

SPECIFICATIONS:	SPEC. No.	REFERENCE
ITEM	705.010	OPSD
CATCHBASIN (600x600mm)	705.010	OPSD
STORM / SANITARY MANHOLE (12000)	701.010	OPSD
STORM / SANITARY MANHOLE (15000)	701.011	OPSD
STORM / SANITARY MANHOLE (18000)	701.012	OPSD
CB, FRAME & COVER	400.020	OPSD
WATERTIGHT FRAME & COVER	401.030	OPSD
STORM / SANITARY MH FRAME	S25	CITY OF OTTAWA
SANITARY COVER	S24	CITY OF OTTAWA
STORM COVER (CLOSED)	S24.1	CITY OF OTTAWA
STORM COVER (OPEN)	S28.1	CITY OF OTTAWA
SEWER TRENCH	S6 & S7	CITY OF OTTAWA
LANDSCAPE CATCHBASINS	S30 & S31	CITY OF OTTAWA
LANDSCAPE PERFORATED PIPE	S29	CITY OF OTTAWA
SANITARY SEWER	PVC DR 35	
CATCHBASIN LEAD	PVC DR 35	
STORM SEWER (<450mmØ)	PVC DR 35	
STORM SEWER (>450mmØ)	CONC CLASS 65D (UNLESS OTHERWISE NOTED)	

- INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 2.0m COVER WITH 50mmxX1200mm HI-40 INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION (REFER TO DETAIL).
2. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0% (2.0% IS PREFERRED).
3. SEWER SERVICE CONNECTIONS PER CITY OF OTTAWA DETAILS S11 AND S11.1.
4. DUE TO THE PRESENCE OF FILL MATERIAL ACROSS THE SUBJECT SITE, IT IS RECOMMENDED THAT THE FILL MATERIAL BE SUB-EXCAVATED A MINIMUM OF 300 MM BELOW PROPOSED SEWER OR WATER PIPES AND PROOF-ROLLED USING SUITABLY SIZED COMPACTION EQUIPMENT. THE BEDDING LAYER SHOULD THEN BE PLACED AND SHOULD CONSIST OF OPSS GRANULAR A WITH A MINIMUM THICKNESS OF 300 MM. IF THE BEDDING IS PLACED ON BEDROCK, THE THICKNESS OF THE BEDDING SHOULD BE A MINIMUM OF 300 MM FOR SEWER OR WATER PIPES. THE BEDDING MATERIAL SHOULD EXTEND TO THE SPRING LINE OF THE PIPE.
5. COVER MATERIAL, FROM THE SPRING LINE TO A MINIMUM OF 300 MM ABOVE THE OVERT OF THE PIPE SHOULD CONSIST OF OPSS GRANULAR A CRUSHED STONE. THE BEDDING AND COVER MATERIALS SHOULD BE PLACED IN MAXIMUM 225 MM THICK LIFTS AND COMPACTED TO 99% OF THE SPMD.
6. 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) SHOULD MATCH THE SOILS EXPOSED AT THE TRENCH WALLS TO REDUCE THE POTENTIAL 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 SPMD.
7. 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.
8. 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.
9. STORM MANHOLES AND CBMHS ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED.
10. CONTRACTOR TO TELEVIEW (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.
11. ALL CATCHBASINS AND CATCHBASIN MANHOLES TO BE PROVIDED WITH MINIMUM 3 METER LONG PERFORATED SUBDRAINS EXTENDING IN TWO DIRECTIONS AT THE SUBGRADE LEVEL. SUBDRAIN IS TO BE PROVIDED AT THE TRANSITIONS BETWEEN DIFFERENT PAVEMENT COMPOSITIONS. THE SUBGRADE SURFACE SHOULD BE SHAPED TO PROMOTE WATER FLOW TO THE DRAINAGE LINES.

WATERMAIN NOTES:

1. SPECIFICATIONS:
- | ITEM | SPEC. No. | REFERENCE |
|--|-------------|----------------|
| WATERMAIN TRENCHING | W17 | CITY OF OTTAWA |
| THERMAL INSULATION IN SHALLOW TRENCHES | W22 | CITY OF OTTAWA |
| THERMAL INSULATION AT OPEN STRUCTURES | W23 | CITY OF OTTAWA |
| WATERMAIN CROSSING BELOW SEWER/ABOVE SEWER | W25 / W25.2 | CITY OF OTTAWA |
| VALVE AND VALVE BOX | W24 | CITY OF OTTAWA |
| DISTRICT METERING AREA CHAMBER | W3 | CITY OF OTTAWA |
| FIRE HYDRANT | W19 | 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. ANY WATERMAIN WITH LESS THAN 2.4m COVER TO BE INSULATED PER THE SHOWN DETAIL.
4. PROVIDE A MINIMUM VERTICAL CLEARANCE OF 0.50m ABOVE AND BELOW BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS PER CITY OF OTTAWA STANDARDS W25/W25.2
5. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.
6. CATHODIC PROTECTION REQUIRED FOR ALL IRON FITTINGS CITY OF OTTAWA STANDARD DETAILS W-39, 40, 41, 42, 43 AND 44.
7. PROVIDE THERMAL INSULATION FOR WATERMAIN AT OPEN STRUCTURES PER CITY OF OTTAWA STANDARD DETAIL W-23.
8. IF WATERMAIN MUST BE DEFLECTED TO MEET ALIGNMENT, ENSURE THAT THE AMOUNT OF DEFLECTION USED IS LESS THAN HALF THAT RECOMMENDED BY THE MANUFACTURER.

GRADING NOTES:

1. TOPSOIL AND FILL, SUCH AS THOSE CONTAINING SIGNIFICANT AMOUNTS OF ORGANIC OR DELTERIOUS MATERIALS, SHOULD BE STRIPPED FROM UNDER ANY BUILDINGS, PAVED AREAS, PIPE BEDDING AND OTHER SETTLEMENT SENSITIVE STRUCTURES. AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. SITE-EXCAVATED SOIL CAN BE PLACED AS GENERAL LANDSCAPING FILL WHERE SETTLEMENT IS A MINOR CONCERN OF THE GROUND SURFACE. THESE MATERIALS SHOULD BE SPREAD IN THIN LIFTS AND AT LEAST COMPACTED BY THE TRACKS OF THE SPREADING EQUIPMENT TO MINIMIZE VOIDS. IF THESE MATERIALS ARE TO BE PLACED TO INCREASE THE SUBGRADE LEVEL FOR AREAS TO BE PAVED, THE FILL SHOULD BE COMPACTED IN MAXIMUM 300 mm THICK LIFTS AND TO A MINIMUM DENSITY OF 95% OF THE RESPECTIVE SPMD.
3. CONSIDERATION MAY BE GIVEN FOR LEAVING IN-SITU FILL IN PLACE AT THE SUBGRADE LEVEL OF PAVED AREAS PROVIDED IT IS REVIEWED IN THE FIELD AT THE TIME OF CONSTRUCTION BY PATERSON PERSONNEL AND SUBSEQUENTLY PROOF-ROLLER BY A SUITABLY-SIZED SHEEPSFOOT ROLLER. PROOF-ROLLING SHOULD BE COMPLETED UNDER DRY AND ABOVE-FREEZING CONDITIONS AND UNDER THE SUPERVISION OF PATERSON PERSONNEL.
4. 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, AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
5. FILL USED FOR GRADING BENEATH THE BASE AND SUBBASE LAYERS OF PAVED AREAS SHOULD CONSIST, UNLESS OTHERWISE SPECIFIED, OF CLEAN IMPORTED GRANULAR FILL, SUCH AS OPSS GRANULAR A, GRANULAR B TYPE I OR SELECT SUBGRADE MATERIAL. THIS MATERIAL SHOULD BE TESTED AND APPROVED PRIOR TO DELIVERY TO THE SITE. THE FILL SHOULD BE PLACED IN LIFTS GREATER THAN 300 mm THICK AND COMPACTED USING SUITABLE COMPACTION EQUIPMENT FOR THE LIFT THICKNESS. FILL PLACED BENEATH THE PAVED AREAS SHOULD BE COMPACTED TO AT LEAST 95% OF ITS SPMD.
6. THE PAVEMENT GRANULAR BASE AND SUBBASE SHOULD BE PLACED IN MAXIMUM 300 MM THICK LIFTS AND COMPACTED TO A MINIMUM OF 100% OF THE SPMD WITH SUITABLE VIBRATORY EQUIPMENT.
7. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
8. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
9. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
10. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED.
11. BACKFILL MATERIAL BELOW SIDEWALK AND WALKWAY SUBGRADE AREAS OR OTHER SETTLEMENT SENSITIVE STRUCTURES WHICH ARE NOT ADJACENT TO THE BUILDINGS SHOULD CONSIST OF FREE-DRAINING, NON-FROST SUSCEPTIBLE MATERIAL. THIS MATERIAL SHOULD BE PLACED IN MAXIMUM 300 MM THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 98% OF ITS SPMD UNDER DRY AND ABOVE FREEZING CONDITIONS.
12. 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:

CAR ONLY PARKING AREAS

- 50mm HL3 OR SUPERPAVE 12.5
- 150mm OPSS GRAN "A" CRUSHED STONE
- 300mm OPSS GRAN "B" TYPE II (SUBGRADE - EITHER FILL, IN SITU SOIL, OR OPSS GRANULAR B TYPE I OR II MATERIAL PLACED OVER IN SITU SOIL.)

LOCAL RESIDENTIAL ROADWAYS, ACCESS LANES AND HEAVY-TRUCK PARKING AREAS

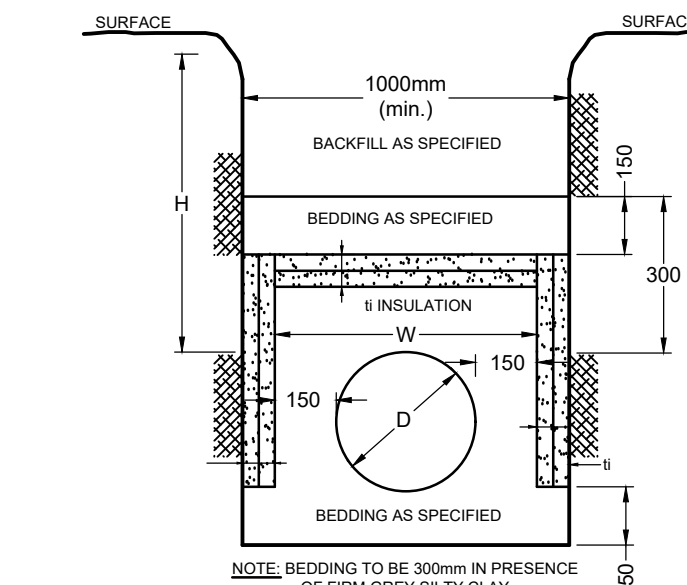
- 40mm HL3 OR SUPERPAVE 12.5
- 50mm HL3 OR SUPERPAVE 19.0
- 150mm OPSS GRAN "A" CRUSHED STONE
- 400mm OPSS GRAN "B" TYPE II (SUBGRADE - EITHER FILL, IN SITU SOIL, OR OPSS GRANULAR B TYPE I OR II MATERIAL PLACED OVER IN SITU SOIL.)

SEWER & WATERMAIN INSULATION NOTES:

1. INSULATE ALL SEWER PIPES THAT HAVE LESS THAN 2.0m COVER AND ALL WATERMAIN WITH LESS THAN 2.4m OF COVER WITH EXPANDED POLYSTYRENE INSULATION AS PER OPSS 1109.030.
2. THE THICKNESS OF INSULATION SHALL BE THE EQUIVALENT OF 25mm FOR EVERY 300mm REDUCTION IN THE REQUIRED DEPTH OF COVER WITH 50mm MINIMUM (SEE TABLE)

COVER SEWER / WATER (mm)	INSULATION THICKNESS (mm)
2000-1700 / 2400-2100	50
1700-1400 / 2100-1800	75
1400-1100 / 1800-1500	100

T = THICKNESS OF INSULATION (mm)
W = WIDTH OF INSULATION (mm)
W = D + 300 (1000 min.)
D = O.D OF PIPE (mm)



INSULATION DETAIL FOR SHALLOW SEWERS & WATERMAIN
N.T.S.

PIPE CROSSING TABLE			
CROSSING	LOWER PIPE	HIGHER PIPE	CLEARANCE
①	250mmØ SAN OBV = 104.70	1050mmØ STM INV = 105.06*	±0.36m
②	450mmØ SAN OBV = 101.96	200mmØ WM INV = 104.68	±2.72m
③	200mmØ WM OBV = 104.57	1050mmØ STM INV = 105.07*	±0.50m
④	250mmØ SAN OBV = 104.98	375mmØ STM INV = 105.32	±0.36m
⑤	200mmØ WM OBV = 105.47	375mmØ STM INV = 105.37	±0.50m
⑥	250mmØ SAN OBV = 105.31	450mmØ STM INV = 105.85*	±0.54m
⑦	450mmØ STM OBV = 106.49*	200mmØ WM INV = 106.99	±0.50m
⑧	250mmØ SAN OBV = 105.40	200mmØ WM INV = 106.89	±1.49m
⑨	250mmØ SAN OBV = 105.78	250mmØ STM INV = 106.86	±1.08m
⑩	250mmØ STM OBV = 106.55	250mmØ STM INV = 106.86	±0.31m
⑪	250mmØ SAN OBV = 105.64	450mmØ STM INV = 105.94*	±0.30m
⑫	250mmØ SAN OBV = 105.62	200mmØ WM INV = 106.07	±0.45m
⑬	200mmØ WM OBV = 105.70	375mmØ STM INV = 106.20	±0.50m
⑭	200mmØ WM OBV = 105.74	375mmØ STM INV = 106.24	±0.50m
⑮	200mmØ WM OBV = 106.17	250mmØ STM INV = 107.13	±0.96m
⑯	250mmØ SAN OBV = 105.77	250mmØ STM INV = 107.20	±1.44m
⑰	250mmØ SAN OBV = 105.63	250mmØ STM INV = 107.28	±1.65m
⑱	250mmØ SAN OBV = 106.03	200mmØ WM INV = 106.53	±0.50m
⑲	250mmØ SAN OBV = 106.08	300mmØ STM INV = 106.40	±0.33m
⑳	250mmØ SAN OBV = 106.71	250mmØ STM INV = 107.03	±0.32m
㉑	250mmØ STM OBV = 106.80	250mmØ STM INV = 107.05	±0.25m
㉒	200mmØ WM OBV = 105.86	250mmØ STM INV = 106.36	±0.50m
㉓	200mmØ WM OBV = 106.52	250mmØ STM INV = 107.34	±0.82m
㉔	250mmØ SAN OBV = 106.22	200mmØ WM INV = 106.72	±0.50m
㉕	250mmØ SAN OBV = 106.26	250mmØ STM INV = 106.57	±0.31m
㉖	250mmØ STM OBV = 106.89	250mmØ STM INV = 107.17	±0.28m
㉗	250mmØ SAN OBV = 106.32	250mmØ STM INV = 107.16	±0.84m
㉘	450mmØ SAN OBV = 101.75*	200mmØ WM INV = 105.65	±3.90m
㉙	200mmØ WM OBV = 104.77	975mmØ STM INV = 105.27*	±0.50m
㉚	200mmØ WM OBV = 106.05	250mmØ STM INV = 106.90	±0.85m

PROPOSED 200mmØ WATER SERVICE (0+000.0)			
STATION	SURFACE ELEVATION	T/W/M ELEVATION	COMMENTS
0+000.00	108.47	106.02	CONNECTION TO EXISTING 300mmØ WATERMAIN
0+002.66	108.51	104.88	CROSS ABOVE 450mmØ SAN (±2.72m CLEARANCE)
0+005.10	108.53	104.57	CROSS BELOW 1050mmØ STM AS PER CITY OF OTTAWA STANDARD W25 (±0.50m CLEARANCE)
0+018.01	108.85	105.47	CROSS BELOW 375mmØ STM AS PER CITY OF OTTAWA STANDARD W25 (±0.50m CLEARANCE)
0+019.91	108.91	105.47	DMA PER CITY OF OTTAWA DETAIL W3
0+036.92	108.96	106.56	200mmX200mm TEE
0+048.79	108.53	107.19	CROSS ABOVE 450mmØ STM AS PER CITY OF OTTAWA STANDARD W25 (±0.50m CLEARANCE)
0+050.29	108.51	107.09	CROSS ABOVE 250mmØ SAN (±1.49m CLEARANCE)
0+053.09	108.48	106.08	200mmX200mm TEE
0+056.10	108.43	106.03	PROPOSED VALVE AND VALVE BOX
0+094.78	108.71	106.31	200mmX200mm TEE

PROPOSED 200mmØ WATER SERVICE (1+000.0)			
STATION	SURFACE ELEVATION	T/W/M ELEVATION	COMMENTS
1+000.0	108.40	105.91	CONNECTION TO EXISTING 300mmØ WATERMAIN
1+002.65	108.43	105.85	CROSS ABOVE 450mmØ SAN (±3.90m CLEARANCE)
1+008.93	108.44	104.77	CROSS BELOW 975mmØ STM AS PER CITY OF OTTAWA STANDARD W25 (±0.50m CLEARANCE)
1+018.97	108.57	105.87	PROPOSED VALVE AND VALVE BOX
1+020.22	108.45	106.05	CROSS BELOW 250 mmØ STM (±0.85m CLEARANCE)
1+047.65	109.20	106.80	200mmX200mm TEE
1+054.24	109.09	106.69	200mmX200mm TEE
1+061.51	108.84	105.74	CROSS BELOW 375mmØ STM AS PER CITY OF OTTAWA STANDARD W25 (±0.50m CLEARANCE)
1+063.93	108.79	106.17	CROSS BELOW 250mmØ CB LEAD(±0.96m CLEARANCE)
1+069.23	108.70	106.30	200mmX150mm TEE (HYD)
1+080.50	108.67	106.73	CROSS ABOVE 250mmØ SAN AS PER CITY OF OTTAWA STANDARD W25.2(±0.50m CLEARANCE)
1+088.85	108.65	106.25	45° BEND
1+097.34	108.80	106.40	45° BEND
1+122.12	108.90	106.50	200mmX150mm TEE (HYD)
1+136.95	108.90	106.92	CROSS ABOVE 250mmØ SAN AS PER CITY OF OTTAWA STANDARD W25.2(±0.50m CLEARANCE)
1+156.32	108.74	106.34	PROPOSED VALVE AND VALVE BOX
1+163.93	108.71	106.31	200mmX200mm TEE
1+173.71	108.65	106.25	45° BEND
1+176.55	108.70	106.30	45° BEND
1+178.24	108.77	105.86	CROSS BELOW 250mmØ STM AS PER CITY OF OTTAWA STANDARD W25 (±0.50m CLEARANCE)
1+183.25	108.91	106.51	CROSS BELOW 250mmØ STM(±0.82m CLEARANCE)
1+185.07	109.08	106.68	PROPOSED VALVE AND VALVE BOX
1+187.21	109.30	106.90	CAP SERVICE 1.0m FROM THE FOUNDATION WALL

PROPOSED 200mmØ WATER SERVICE (2+000.0)			
STATION	SURFACE ELEVATION	T/W/M ELEVATION	COMMENTS
2+000.0	108.48	106.08	200mmX200mm TEE
2+009.40	108.57	106.17	200mmX150mm TEE (HYD)
2+029.96	108.67	106.27	CROSS ABOVE 250mmØ SAN (±0.45m CLEARANCE)
2+041.15	108.75	106.35	CROSS BELOW 250mmØ CB LEAD (±0.69m CLEARANCE)
2+061.84	108.07	105.70	CROSS BELOW 375mmØ STM AS PER CITY OF OTTAWA STANDARD W25 (±0.50m CLEARANCE)
2+059.2	108.95	106.55	PROPOSED VALVE AND VALVE BOX
2+072.28	109.09	106.69	200mmX200mm TEE

* CONTRACTOR TO CONFIRM THE ELEVATION OF THE EXISTING WATER STUB/MAIN AND NOTIFY THE ENGINEER IF DIFFERENT

ICD SIZING AND FLOWS						
STRUCTURE	ORIFICE ICD SIZE	ICD INVERT (m)	T/G (m)	100-yr HGL (m)	100-yr HEAD (m)	100-yr RELEASE RATE (L/s)
CB 1	83mm PLATE	106.66	108.70	108.15	1.46	17.7
CB 3	152mm PLATE	107.00	108.35	108.63	1.55	59.3
CB 5	152mm PLATE	107.13	108.45	108.62	1.41	58.2
CB 7	127mm PLATE	107.19	108.60	108.72	1.47	41.4
CB 10	83mm PLATE	107.40	108.60	108.17	0.73	12.5
MH 207	105mm PLATE	106.48	108.84	107.39	0.86	9.3
MH 214	105mm PLATE	106.62	108.95	107.50	0.83	9.1
MH 220	100mm PLATE	106.18	108.90	106.95	0.72	7.7
CBMH 222	108mm PLATE	106.01	108.57	107.94	1.88	32.0

SANITARY MANHOLES THAT REQUIRE WATER TIGHT LIDS (PER OPSS 401.030)

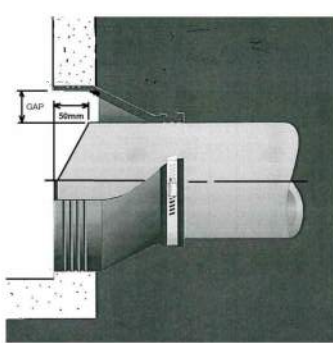
MANHOLE ID
102
104

STORM MANHOLES THAT REQUIRE WATER TIGHT LIDS (PER OPSS 401.030)

MANHOLE ID
202

Pipe Connections to Structures

For concrete pipe connections to structures OPSS 708.020 applies. Use of Kor-N-Seal and equivalent type products limited to 825mm ID and less.



- For PVC pipe connections to structures OPSS 708.020 applies with the condition that flexible watertight connectors shall be approved cast-in-place or boot gaskets listed in MW-22.15.

- For Kor-N-Seal and equivalent type products with a gap between the pipe and the cored hole, taper back the top half of the PVC pipe until the overt is 50mm behind the inside wall of the maintenance hole to prevent rubbing and eventual cracking of the overt by cleaning hoses. Hoses shall rub on the concrete edge not the overt.

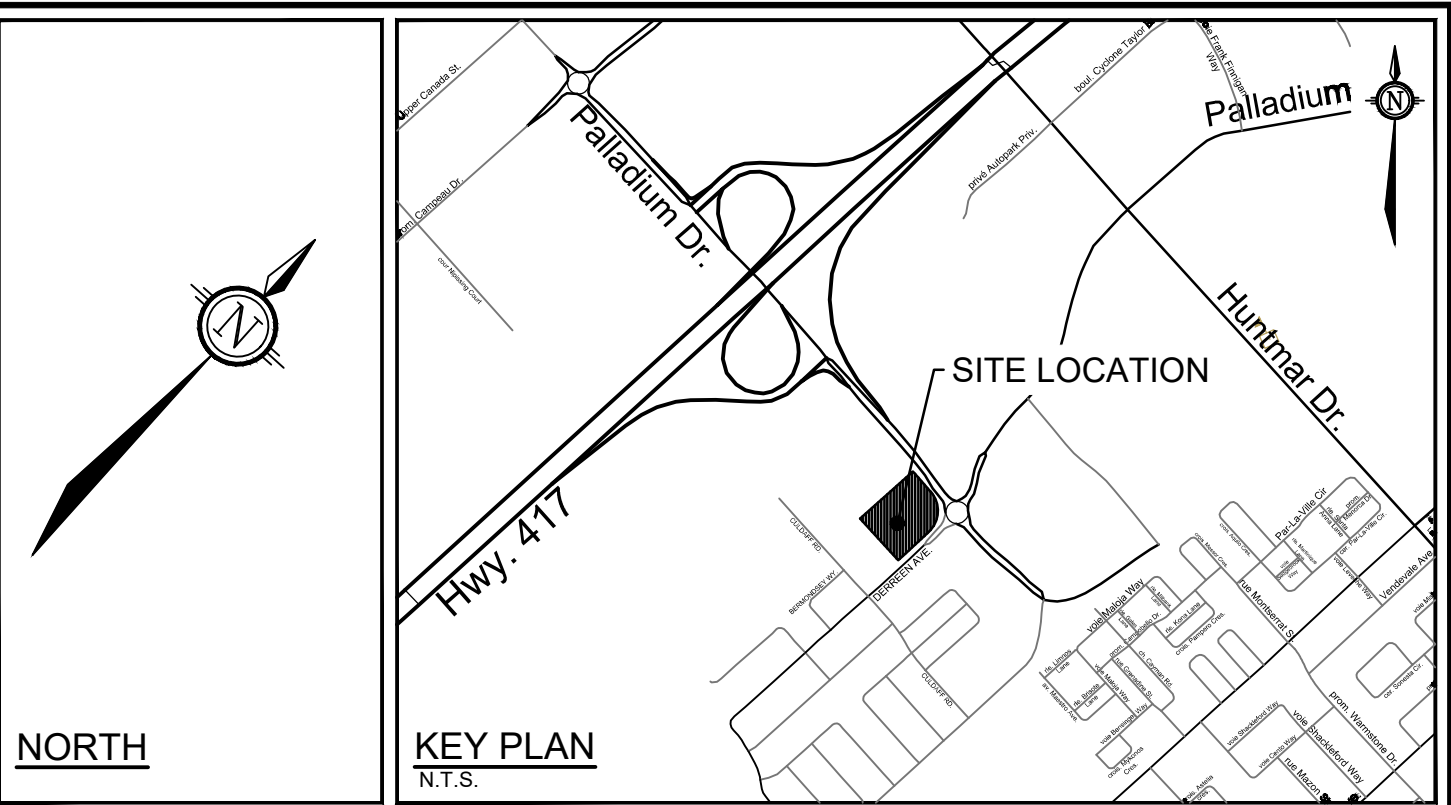
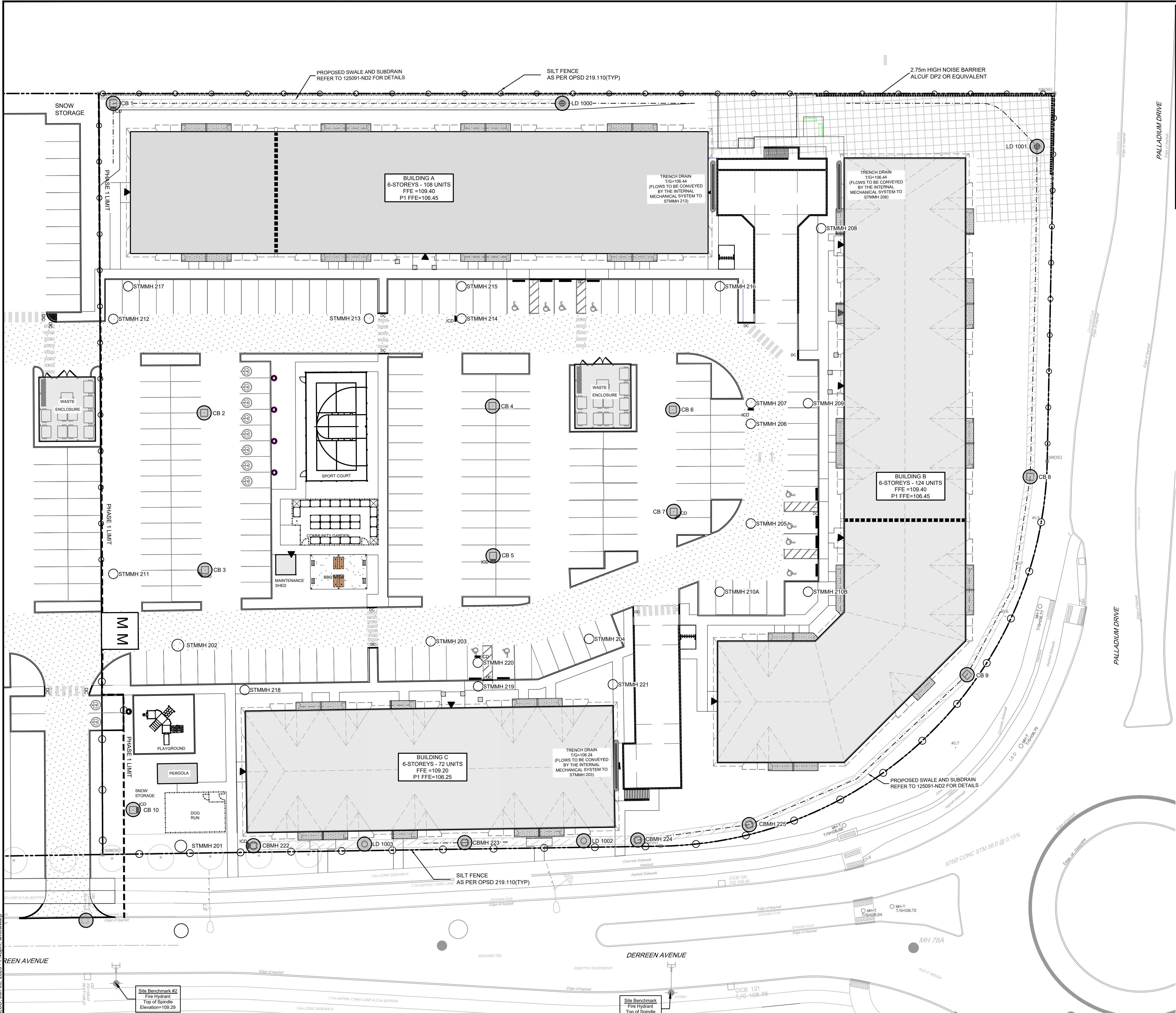
Field Testing
Leakage testing shall be completed in accordance with OPSS MUNI 410.07.16 and in accordance with the plumbing code. Subsection 410.07.16 of OPSS MUNI 410 is amended by the following:

PIPE CONNECTIONS TO STRUCTURES
(EXCERPTED FROM OTTAWA F-4100)

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.

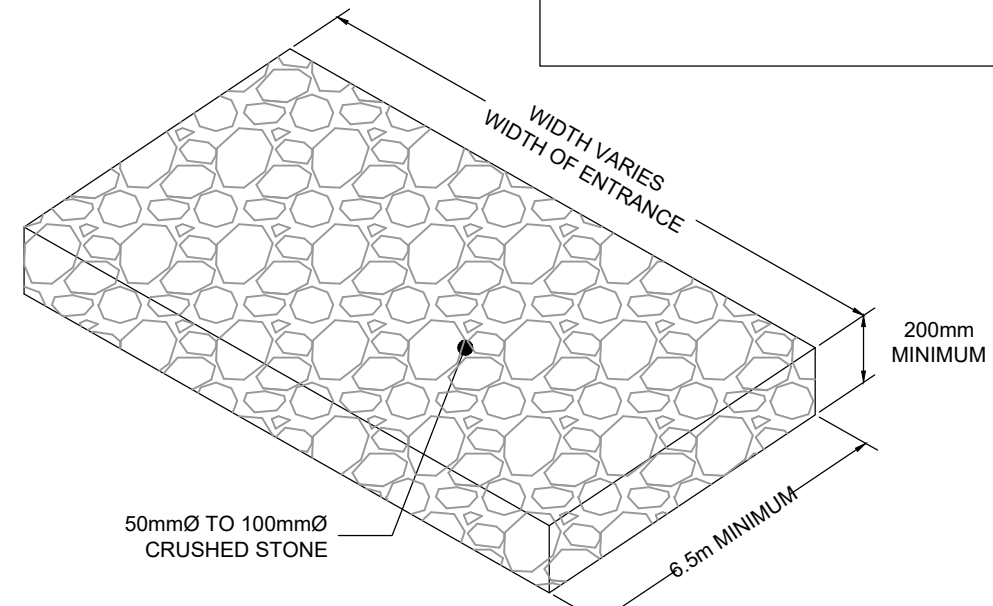
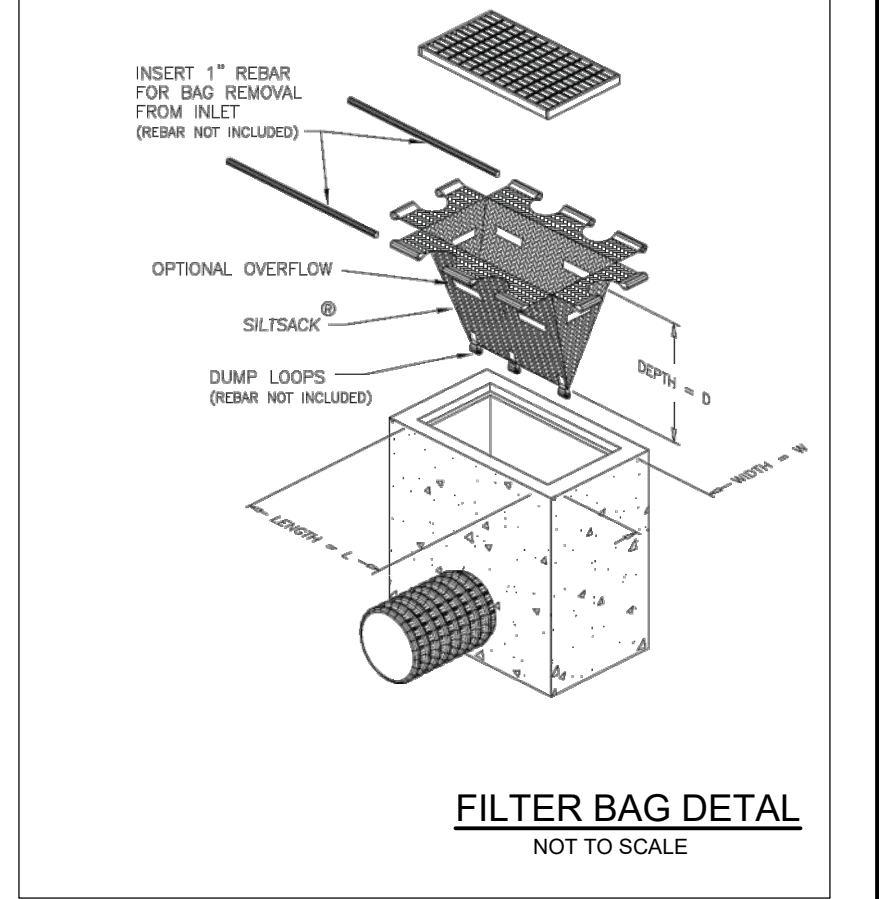
NOT FOR
CONSTRUCTION

1.	ISSUED FOR SITEPLAN APPLICATION		JUNE 10/26	ARM
No.	REVISION		DATE	BY



- LEGEND**
- | | | | |
|-----|---|-----|---|
| --- | PROPERTY LINE | --- | SWALE |
| --- | PHASE 1 LIMIT | --- | PROPOSED FIREWALL |
| --- | PROPOSED CURB | --- | PROPOSED BIKE RACKS |
| --- | PROPOSED DEPRESSED CURB | --- | PROPOSED ROOF LIMITS |
| --- | PROPOSED FOUNDATION WALL C/W RAILING | --- | PROPOSED FILTER BAGS AT CATCHBASINS, CATCHBASIN MANHOLES AND TRENCHDRAINS |
| --- | PROPOSED TACTILE WALKING SURFACE INDICATOR (TWSI) | --- | PROPOSED MUD MAT |
| --- | PROPOSED STORM SEWER AND MANHOLE | --- | LIGHT DUTY SILT FENCE (OPSD 219.110) |
| --- | PROPOSED CATCHBASIN MANHOLE | --- | EXISTING STORM MANHOLE |
| --- | PROPOSED CATCHBASIN | --- | CB 1 |
| --- | PROPOSED LANDSCAPE DRAIN | --- | EXISTING CATCHBASIN |
| --- | PROPOSED TRENCH DRAIN | | |
| --- | PROPOSED INLET CONTROL DEVICE | | |
| --- | PROPOSED BUILDING ENTRANCE | | |

- EROSION AND SEDIMENT CONTROL NOTES:**
- THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
- 1) THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA, 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 FILTER CLOTHS ACROSS MANHOLE/CATCHBASIN LIDS TO PREVENT SEDIMENTS FROM ENTERING STRUCTURES AND INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.
 - 2) THE CONTRACTOR SHALL PLACE FILTER BAGS UNDER THE CATCHBASIN AND MANHOLE GRATES FOR THE DURATION OF CONSTRUCTION AND WILL REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION.
 - 3) SILT FENCING FOR ENTIRE PERIMETER OF SITE, SHALL BE UTILIZED TO CONTROL EROSION FROM THE SITE DURING CONSTRUCTION.
 - 4) THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
 - 5) PROVIDE MUD MATS AT ALL CONSTRUCTION ACCESS POINTS TO MINIMIZE SEDIMENT TRANSPORT OFFSITE.
 - 6) EROSION AND SEDIMENT CONTROL MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA SITE INSPECTOR OR CONSERVATION AUTHORITY.



MUD MAT DETAIL
NOT TO SCALE
REFER TO 125091-ND FOR ADDITIONAL NOTES & DETAILS

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, 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.

NOT FOR CONSTRUCTION

No.	REVISION	DATE	BY
1.	ISSUED FOR SITEPLAN APPLICATION	JUNE 10/26	ARM

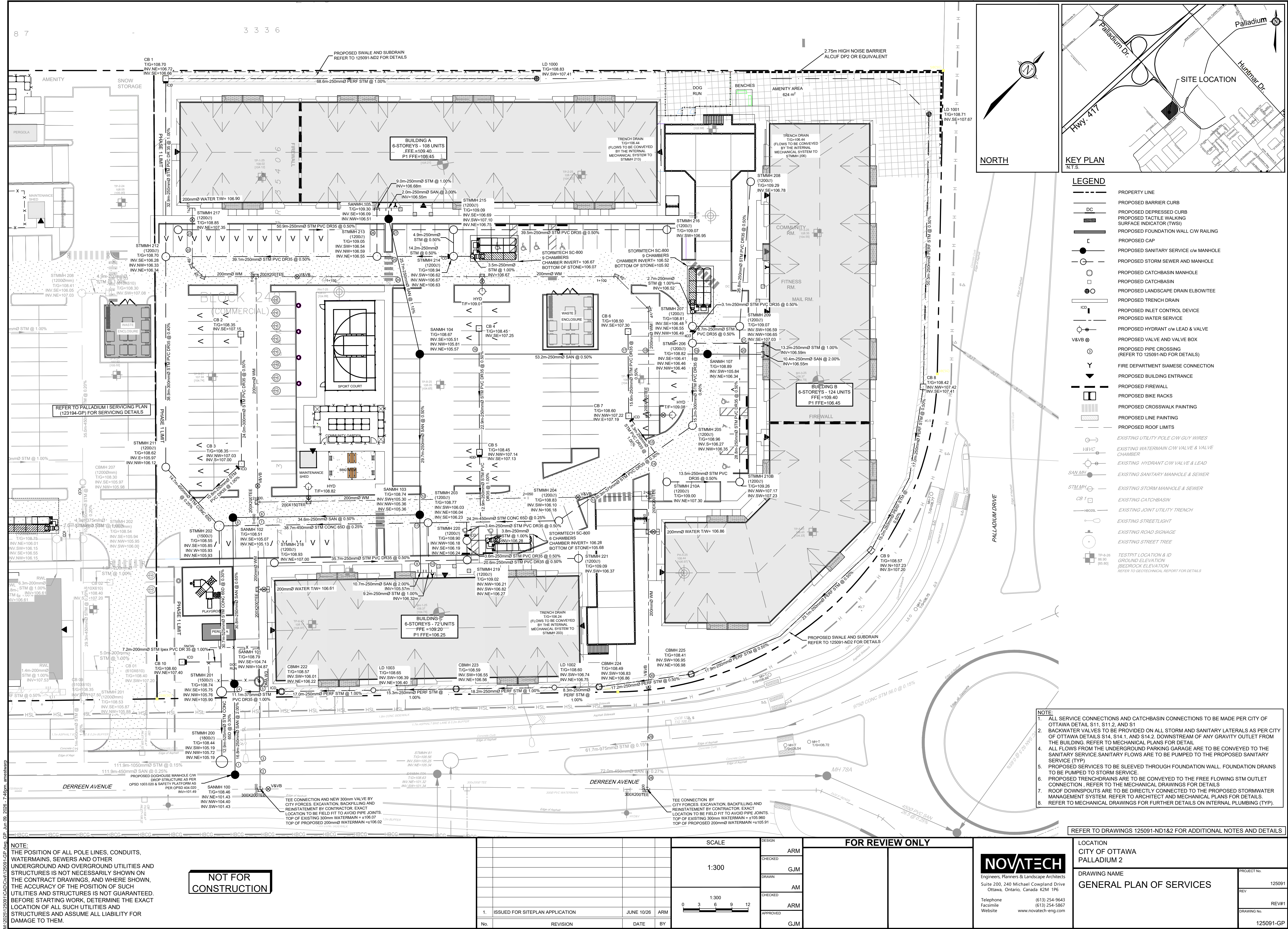
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	APPROVED GJM

FOR REVIEW ONLY

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 PALLADIUM 2	PROJECT No. 125091
DRAWING NAME EROSION AND SEDIMENT CONTROL PLAN	REV#1 REV
	DRAWING No. 125091-ESC

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NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS,
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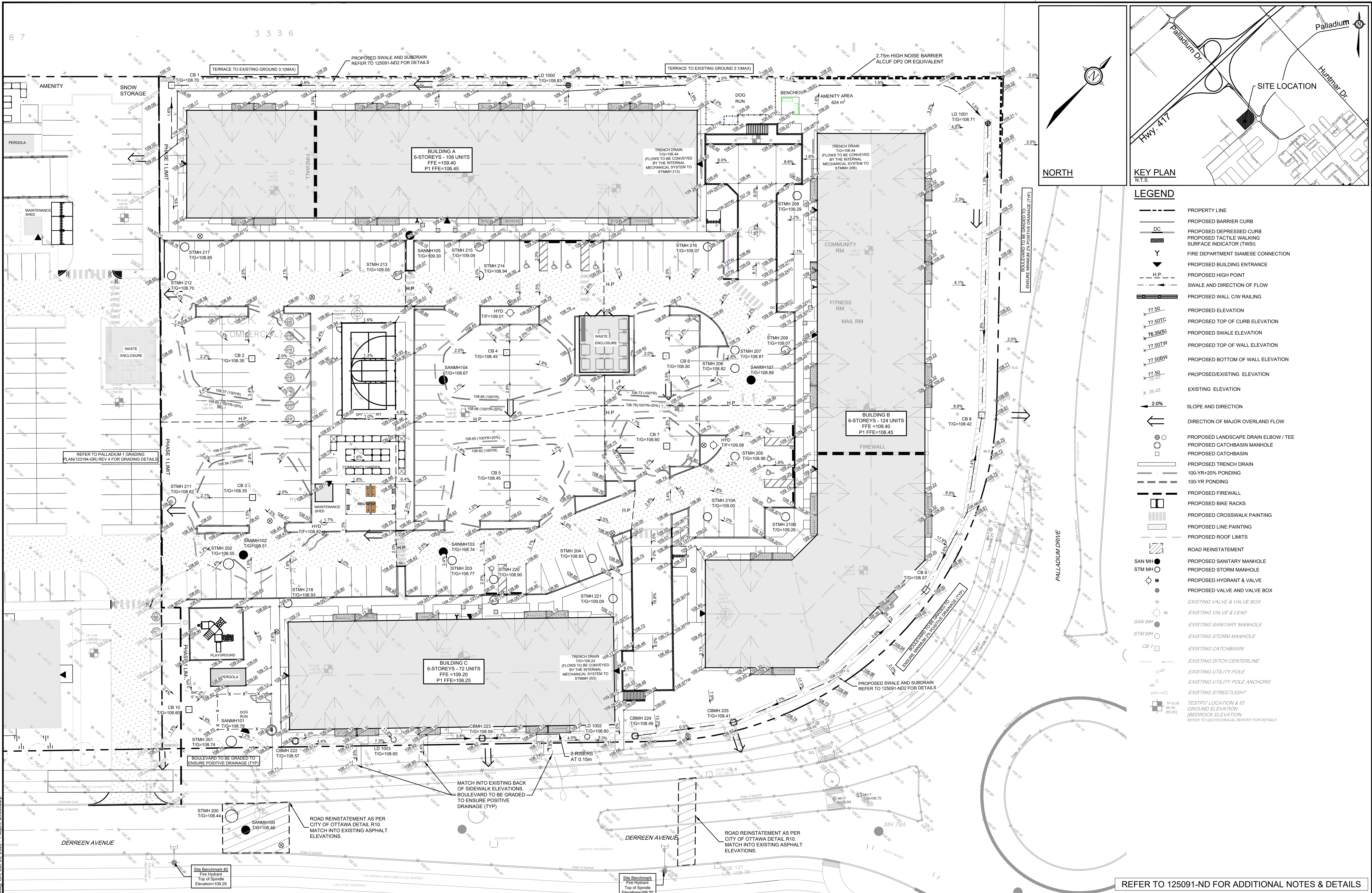
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LOCATION	DRAWING NAME	PROJECT No.
CITY OF OTTAWA PALLADIUM 2	GENERAL PLAN OF SERVICES	125091
		REV#1
		DRAWING No.
		125091-GP

CITY FILE No. Dxx-xx-XXXXXX
CITY PLAN No. XXXXX



NOTE: THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, 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.				SCALE 1:300 0 3 6 9 12				FOR REVIEW ONLY				LOCATION CITY OF OTTAWA PALLADIUM 2 DRAWING NAME GRADING PLAN			
1. ISSUED FOR SITEPLAN APPLICATION				JUNE 10/26				ARM				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			
No. REVISION				DATE				BY				PROJECT No. 125091			
1. ISSUED FOR SITEPLAN APPLICATION				JUNE 10/26				ARM				REV#1			
No. REVISION				DATE				BY				DRAWING No. 125091-GR			

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CITY FILE NO. Dxx-xx-XXXX

CITY PLAN No. XXXXX