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BILLBERY CREEK LONG TERM CARE HOME
1533 & 1541 ST. JOSEPH BLVD

Servicing and Stormwater Management Report

BILBERRY CREEK LONG TERM CARE HOME

1533 & 1541 ST. JOSEPH BOULEVARD
OTTAWA, ONTARIO

SERVICING AND STORMWATER MANAGEMENT REPORT

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Engineers, Planners & Landscape Architects

September 16, 2025

City of Ottawa
Planning, Real Estate and Economic Development Department
Development Review – East Branch
110 Laurier Avenue West
Ottawa, ON
K1P 1J1

Attention: **Mr. Kelsey Charie**

Reference: **Servicing and Stormwater Management Report**
Bilberry Creek Long Term Care Home
1533 & 1541 St. Joseph Boulevard, Ottawa, Ontario
Novatech File No.: 125033

Enclosed is a copy of the 'Servicing and Stormwater Management Report' for the proposed development located at 1533 & 1541 St. Joseph Boulevard, in the City of Ottawa. This report addresses the approach to site servicing and stormwater management and is submitted in support of the Site Plan Control application.

Please contact the undersigned, should you have any questions or require additional information.

Yours truly,

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1.0 INTRODUCTION

Novatech has been retained to complete the site servicing and stormwater management design for the proposed Bilberry Creek Redevelopment located at 1533 & 1541 St. Joseph Boulevard, in the City of Ottawa.

This report addresses the approach to servicing and stormwater management and is being submitted in support of the Site Plan Control application for the residential portion of the site. The commercial development is a subject of a separate Site Plan Control application.

1.1 Site Description and Location

The subject site is located on the north side of St. Joseph Boulevard and is bordered by White Sands Golf Course to the north and east and an existing farm to the west.

The 1541 St. Joseph Boulevard parcel has an approximate area of 2.48 ha and is occupied by a long term care building located on the southern portion of the property. The 1533 St. Joseph Boulevard parcel has an approximate area of 1.19 ha and is currently undeveloped. Refer to **Figure 1** which provides an aerial view of the site under existing conditions.

Figure 1 – Aerial Plan

1.2 Pre-Consultation Information

The pre-consultation meeting was held with the City of Ottawa on November 7, 2024, at which time the client was advised of the general submission requirements. Refer to **Appendix A** for feedback from the City of Ottawa following the pre-consultation meeting.

1.3 Proposed Development

The proposed development will consist of a new 2-storey building addition and redevelopment of the existing 3-storey long term care facility. A 1-storey link will be provided between the new addition and the existing building. The site development will include a new surface parking lot, access driveways, loading and landscaped areas. The existing parking lot at the east side of the site will remain. The site will have four access driveways off St. Joseph Boulevard. Refer to **Appendix B** for the proposed Site Plan.

1.4 Background Documents

The following documents were reviewed in preparation of this report:

- Geotechnical Investigation Proposed Long Term Care Facility Addition,1541 St. Joseph Boulevard, Orleans, Ontario, prepared by Kollaard Associates (240798, May 29, 2025)
- Geotechnical Investigation, Proposed Senior Residence, 1533 St. Joseph Boulevard, Ottawa, Ontario, prepared by Patterson Group (PG2696-1, June 20, 2012)
- Stormwater Management Brief, Season's Retirement Residence and Madonna Facility, 1533/1541 St. Joseph Blvd, Ottawa, Ontario, prepared by Novatech (R-2013-200, November 28, 2013)
- City of Ottawa Sewer Design Guidelines (October 2012)
- Ottawa Design Guidelines - Water Distribution (July 2010)
- Stormwater Management Planning and Design Manual, Ministry of the Environment, Ontario (March 2003)

1.5 Site Servicing

The objective of the site servicing design is to provide proper sewage outlets, a suitable domestic water supply and to ensure that appropriate fire protection is provided for the proposed development. The servicing criteria, expected sewage flows, and water demands are to conform to the City of Ottawa municipal design guidelines for sewer and water distribution systems.

The City of Ottawa Servicing Study Guidelines for Development Applications requires that a Development Servicing Study Checklist be included to confirm that each applicable item is deemed complete and ready for review by City of Ottawa Infrastructure Approvals. The completed checklist is provided in **Appendix G**.

Refer to the General Plan of Services (125033-GP) provided in **Appendix H** for detailed site servicing information.

2.0 WATER SERVICING

2.1 Existing Water Servicing

The existing long term care facility is serviced by a 203mm diameter watermain connected to a the existing 305mm diameter watermain stub off of the 1220mm diameter trunk watermain along St. Joseph Boulevard.

2.2 Proposed Water Servicing

The proposed development will continue to be serviced by the existing 203mm watermain connection to the 1220mm diameter watermain. Since the basic water demand for the proposed development is greater than 50 m^3/day, a second connection to the municipal watermain will be provided by looping the proposed 203mm watermain within the site and connecting to the existing 406mm diameter waterman along St. Joseph Boulevard. This will provide redundant water supply to the site in case of municipal watermain failure at any single point in the system.

2.2.1 Proposed Development Domestic Water Demands

The City of Ottawa design criteria were used to calculate the theoretical water demands for the proposed development. The following design criteria were taken from Section 4 – 'Water Distribution Systems' of the Ottawa Design Guidelines – Water Distribution:

- 1-Bedroom Residence: 1.4 persons per unit
- Average Daily Residential Water Demand: 280 L/person/day
- Maximum Day Demand Peaking Factor = 2.5 x Avg. Day Demand
- Peak Hour Demand Peaking Factor = 2.2 x Max. Day Demand
- Staff Daily Water Demand: 75 L/person/day
- Staff Maximum Day Demand Peaking Factor = 1.5 x Avg. Day Demand
- Staff Peak Hour Demand Peaking Factor = 1.8 x Max. Day Demand

The calculated water demands are summarized in **Table 2.1** below. Detailed calculations are included in **Appendix C**.

Table 2.1: Domestic Water Demand

Proposed Development	Avg. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)
Long Term Care Facility	1.04	2.58	5.66

2.2.2 Proposed Development Fire Protection System

The proposed buildings will be fully sprinklered. Water supply for fire protection will be provided from the existing municipal hydrants in St. Joseph Boulevard and a new on-site private hydrant. A fire department siamese connection will be provided on the south façade of the existing building near the main entrance to the long term care facility.

The Fire Underwriters Survey (FUS) was used to estimate fire flow requirements for the proposed development. The fire flow calculations are based on the building information provided by the architect (Type II non-combustible construction with protected openings between floors, and fully

sprinklered buildings). The new addition and the existing building are treated as a single building in the total effective floor area calculations since they are connected with a 1-storey link.

The fire flow demand is estimated to be 117 L/s (7,000 L/min). The detailed FUS fire flow calculations are included in **Appendix C**.

2.2.3 Watermain Hydraulic Analysis

The above domestic water demands, and fire flow requirements were provided to the City of Ottawa. These values were used to generate the municipal watermain network boundary conditions at the two service connection points at St. Joseph Boulevard watermains. **Table 2.2** summarizes the information provided by the City.

Table 2.22: Boundary Conditions

Demand Scenario	Connection 1	Connection 2
Maximum HGL	115.2 m	115.2 m
Minimum HGL	111.4 m	111.4 m
Max Day + Fire Flow (117 L/s)	113.1 m	113.0 m

The following design criteria were taken from Section 4.2.2 – 'Watermain Pressure and Demand Objectives' of the City of Ottawa Design Guidelines for Water Distribution:

- Maximum system pressure is not to exceed 552 kPa (80 psi)
- Minimum system pressures are to be >276 kPa (40 psi) under Peak Hour demand
- Minimum system pressures are to be >140 kPa (20 psi) under Max Day + Fire Flow demand

The hydraulic model EPANET was used for the purpose of analysing the performance of the proposed watermain. The model is based on the watermain boundary conditions provided by the City of Ottawa at the connections to the existing municipal watermain in St. Joseph Boulevard.

A schematic representation of the hydraulic network in provided in **Appendix C**. The schematic depicts the junction and pipe numbers used in the model.

The modelling highlights the system pressures during 1) Maximum Day + Fire Flow Demand, 2) Peak Hour Demand, and 3) Average Day Demand conditions. The residential domestic water demands are applied at the building service (J3). The fire flow demands are applied at the fire hydrant locations (J4 and J6).

It is anticipated that a multi-hydrant approach to firefighting will be required to supply adequate FUS fire flow to the proposed buildings. Based on the City of Ottawa Technical Bulletin ISTB-2018-02, the maximum flow to be considered from a given hydrant is 95 L/s (5,700 L/min). Therefore, a flow of 95 L/s was modelled at the new hydrant (J6) and a flow of 22 L/s was modelled at junction J4. The model indicates that the two hydrants can simultaneously provide a combined flow of 117 L/s at 43.6 psi, meeting the FUS fire flow requirements for the proposed development.

Tables 2.3, **2.4** and **2.5** summarize the demands and hydraulic model results under the various operating conditions. Refer to **Appendix C** for detailed modelling results.

Table 2.3: Hydraulic Model Results – Maximum Day + Fire Flow Demand

Operating Condition	Minimum Pressure
Max Day + Fire Flow Demand	300.8 kPa (43.6 psi)

Table 2.4: Hydraulic Model Results – Peak Hour Demand

Operating Condition	Minimum Pressure
Peak Hour Demand	313.4 kPa (45.5 psi)

Table 2.5: Hydraulic Model Results – Average Day Demand

Operating Condition	Maximum Pressure
Average Day Demand	365.9 kPa (53.1 psi)

Based on the preceding analysis, the proposed watermain system will provide adequate system pressures to the proposed development.

3.0 SANITARY SERVICING

3.1 Existing Sanitary Services

The existing facility is serviced with a 200mm diameter sanitary sewer connected to the existing 375mm diameter sanitary sewer in St. Joseph Boulevard. Three 150mm diameter sanitary services are extended to the existing building.

3.2 Proposed Sanitary Services

The proposed development will continue to be serviced with the existing 200mm diameter sanitary sewer connected to the existing 375mm diameter sanitary sewer in St. Joseph Boulevard. A new 150mm diameter sanitary service will be provided for the new building addition. One of the existing 150mm diameter services in conflict with the proposed building addition will be removed. The existing building internal plumbing will be modified to direct sanitary flows from the existing building to the remaining two 150mm diameter services.

3.2.1 Peak Sanitary Flows

The theoretical peak sanitary flow for the proposed development was calculated based on the following criteria from the City of Ottawa Sewer Design Guidelines:

- 1-Bedroom Residence: 1.4 people per unit
- Average Daily Residential Sewage Flow: 280 L/person/day (ISTB-2018-01)
- Residential Peaking Factor calculated by the Harmon Equation
- Staff Average Daly Volume: 75 L/person/day
- Staff Peaking Factor: 105
- Infiltration Allowance: 0.33 L/s/ha

The peak sanitary flow calculations are summarized in **Table 3.1**. Detailed calculations are included in **Appendix D**.

Table 3.1: Peak Sanitary Flow Summary

Proposed Development	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)
Long Term Care Facility	3.56	0.53	4.13

The peak sanitary flow from the site will increase for approximately 1 L/s compared to existing conditions due to the addition of 64 beds in the new facility.

The above sanitary flow calculations have been provided to the City of Ottawa for the purpose of downstream analysis of the existing municipal sanitary sewer system. The City asset management has confirmed that there is sufficient capacity in the downstream sanitary sewer system to accommodate the 1 L/s increase in the peak sanitary flows from the proposed development. Refer to email correspondence with the City provided in **Appendix D**.

4.0 STORM SERVICING AND STORMWATER MANAGEMENT

4.1 Existing Conditions

The site is located at the top of a tall well-vegetated ravine to the north (approximately 20m high). The topography of the site is characterized by a gentle slope towards the east. Refer to the Pre-Development Storm Drainage Area Plan (Drawing 125033-PRE).

Storm runoff from the existing Madonna LTC facility (Area 'EX-6') is collected via roof drains and directed down the ravine to the north via a series of storm outlets with riprap treatments at the top of the slope to prevent erosion. Storm runoff from the area behind the building (Area 'EX-4') sheet drains down the ravine.

The existing parking lots on the east and west sides of the building (Areas 'EX-5' and 'EX-7') drain to underground StormTech chambers providing stormwater quantity and quality control. During larger storms exceeding the capacity of the chamber systems, stormwater would spill out of the lowest connected catchbasins and flow down the ravine to the north.

The lands south of the existing facility (Areas 'EX-1', 'EX-2' and 'EX-3') are comprised of paved and gravel parking areas, as well as landscaped areas, all of which drain to the roadside ditch along the north side of St. Joseph Boulevard.

4.2 Stormwater Management Criteria

4.2.1 Stormwater Quantity Control

The required stormwater quantity control for the site is to control the post-development peak flows for all storm events to their respective pre-development levels.

4.2.2 Stormwater Quality Control

The required stormwater quality control for the site is to provide an Enhanced level of protection corresponding to 80% removal of total suspended solids (TSS). Oil/Grit Separator unit sizing shall be as per ISO 14034 Environmental Technology Verification (ETV).

4.3 Proposed Conditions

The proposed development will be serviced by on-site storm sewer systems ultimately outletting to the ravine to the north or to the St. Joseph Boulevard roadside ditch. The on-site storm sewer systems will include storm sewers ranging in size from 250mm to 375mm in diameter. On-site storage will be provided by the proposed building roof and StormTech chambers at the northwest corner of the site. Post-development peak flows will be controlled to pre-development levels. No surface storage in the parking areas has been accounted for in the storm servicing design. Refer to the General Plan of Services (Drawing 125033-GP) for details.

The proposed storm drainage and stormwater management design for the site is discussed in the following sections of the report. Refer to the Post-Development Storm Drainage Area Plan (Drawing 125033-STM).

4.3.1 Northeast Areas 'A-7' to 'A-9'

The existing Madonna LTC facility and lands to the north, as well as the existing parking lot and StormTech chambers east of the facility will generally not be impacted under proposed conditions, apart from widening of the walkway around the building.

4.3.2 Southwest Areas 'A-1' to 'A-6' and 'A-10'

The existing lands south of the Madonna LTC facility will be re-developed with new roads, parking and landscaped areas to accommodate the proposed building. Storm runoff from the proposed building will be collected via roof drains and outlet to the proposed storm sewer system to the south. The proposed roads, parking and landscaped areas south of the buildings will also be collected via the proposed storm sewer system to the south which will ultimately outlet to the St. Joseph Boulevard roadside ditch.

4.3.3 Northwest Areas 'A-11' to 'A-17'

The existing lands west of the Madonna LTC facility will also be re-developed with new parking lots and landscaped areas to accommodate the proposed building. Storm runoff from the proposed parking lot and landscaped areas north of the proposed building will be collected via a separate storm sewer system to the north. The storm sewers will connect to two proposed StormTech chamber systems which ultimately outlet to the ravine to the north. A flow spreader is proposed at the outlet to prevent erosion.

4.3.4 Storm Sewers (Minor System)

The proposed storm sewers have been designed using the Rational Method to convey peak flows associated with a 5-year storm event under free flow conditions. The design criteria used in sizing the storm sewers are summarized in **Table 4.1**.

Table 4.1: Storm Sewer Design Parameters

Parameter	Design Criteria
Storm Sewer Design	Rational Method
Return Period	5-year
IDF Rainfall Data	City of Ottawa Sewer Design Guidelines
Initial Time of Concentration (T_c)	10 minutes
Minimum Velocity	0.8 m/s

Parameter	Design Criteria
Maximum Velocity	3.0 m/s
Minimum Diameter	250 mm

Refer to the storm sewer design sheets provided in **Appendix E** and the Post-Development Storm Drainage Area Plan (Drawing 125033-STM).

4.3.5 Overland Flow (Major System)

All storm runoff will be contained within the storm sewers and StormTech chambers for all storms up to and including the 100-year event. For storms larger than the 100-year event with flows that exceed the capacity of the storm sewers and StormTech chambers, storm runoff will pond on the surface and be conveyed through major system flow pathways to the St. Joseph Boulevard roadside ditch or to ravine to the north. The grading design includes maximum 0.35m of surface ponding before spilling over a high point. Refer to the Grading Plan (Drawing 125033-GR).

4.4 Hydrologic & Hydraulic Modeling

The performance of the proposed storm drainage system for the site was evaluated using the PCSWMM hydrologic / hydraulic model. The PCSWMM model schematics and 100-year model output data are provided in **Appendix E**.

4.4.1 Design Storms

The hydrologic analysis was completed using the following synthetic design storms:

- 6-hour Chicago storm distribution
- 12-hour SCS Type II storm distribution

The return periods analyzed include the 2, 5 and 100-year storm events. The IDF parameters used to generate the design storms were taken from the City of Ottawa Sewer Design Guidelines.

The 6-hour Chicago storm distribution generated the highest peak flows and was determined to be the critical storm distribution for the design of the storm sewer system. However, the storage requirements were analyzed using both the 6-hour Chicago and 12-hour SCS Type II storms as the 12-hour SCS Type II distribution generated the highest runoff volumes.

The proposed drainage system was also stress tested using a 100-year+20% design storm. This design storm has a 20% higher intensity and total volume compared to the 100-year event.

To determine the water quality requirements of the site, the model was also run using the 4-hour 25mm Chicago storm event, as per MOE guidelines.

4.4.2 Model Development

A pre-development PCSWMM model has been developed to determine the peak flows from the site outletting to both the St. Joseph Boulevard roadside ditch and the ravine to the north under existing conditions. A post-development model has been developed for the proposed site. The results of the analysis were used to size the StormTech chambers and ensure that the proposed storm drainage system adheres to the allowable release rates.

Storm Drainage Areas

The site has been divided into subcatchments for both pre-development and post-development conditions. Pre-development drainage areas are based on the existing topography and drainage features. Refer to the Pre-Development Storm Drainage Area Plan (Drawing 125033-PRE). Post-

development drainage areas are based on the proposed grading and storm drainage system. Refer to the Post-Development Storm Drainage Area Plan (Drawing 125033-STM).

Subcatchment Model Parameters

Hydrologic modeling parameters for each subcatchment were developed based on existing and proposed land use and topography. A summary of the model parameters is provided in **Table 4.2** and **Table 4.3**.

Table 4.2: Pre-Development Model Parameters

Area ID	Area (ha)	Runoff Coefficient (C)	Percent Impervious (%)	No Depression (%)	Equivalent Width (m)	Average Slope (%)
EX-1	0.307	0.42	31	0	42	2.0
EX-2	0.199	0.68	69	0	28	2.0
EX-3	0.107	0.44	34	0	36	2.0
EX-4	0.301	0.26	9	0	104	5.0
EX-5	0.354	0.60	57	0	42	3.0
EX-6	0.303	0.90	100	100	178	1.5
EX-7	0.037	0.90	100	0	14	6.0

Table 4.3: Post-Development Model Parameters

Area ID	Area (ha)	Runoff Coefficient (C)	Percent Impervious (%)	No Depression (%)	Equivalent Width (m)	Average Slope (%)
A-01	0.080	0.62	60	0	32	2.0
A-02	0.061	0.47	39	0	28	1.5
A-03	0.014	0.60	57	0	12	2.0
A-04	0.023	0.60	57	0	13	2.0
A-05	0.135	0.72	74	0	29	2.0
A-06	0.077	0.30	14	0	26	2.0
A-07	0.268	0.31	16	0	92	5.0
A-08	0.303	0.90	100	100	178	1.5
A-09	0.037	0.90	100	0	14	6.0
A-10	0.173	0.90	100	100	157	2.0
A-11	0.085	0.83	90	0	29	1.5
A-12	0.079	0.69	70	0	34	1.5
A-13	0.052	0.77	81	0	26	2.5
A-14	0.037	0.60	57	0	21	3.5
A-15	0.013	0.60	57	0	12	3.5
A-16	0.022	0.45	36	0	17	3.5
A-17	0.148	0.73	76	0	30	2.0

Infiltration

Infiltration losses for all subcatchments 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 following values from the City of Ottawa 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 following values for depression storage from the City of Ottawa Sewer Design Guidelines were used for all subcatchments.

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

The rooftops were assumed to provide no depression storage (100% zero impervious parameter in PCSWMM).

Impervious Values

Runoff coefficients for each subcatchment were determined based on the existing and proposed land use. Refer to the Pre-Development and Post-Development Storm Drainage Area Plans (Drawings 125033-PRE and 125033-STM) for details. Percent impervious values were calculated using the following equation from the City of Ottawa Sewer Design Guidelines:

$$\%imp = (C - 0.20) / 0.70$$

4.4.3 Model Results

The PCSWMM model was used to ensure that peak flows are controlled to the allowable release rates and that the storm runoff from all storm events is contained on-site within the storm sewer system.

Peak Flows

As shown in **Table 4.4**, peak flows from the site will generally be controlled to pre-development levels. The uncontrolled areas under post-development conditions have been accounted for in the results.

Table 4.4: Summary of Peak Flows

Location	Site Condition	Peak Flow (L/s)					
		6hr Chicago			12hr SCS Type II		
		2yr	5yr	100yr	2yr	5yr	100yr
Ravine	Pre	16	61	243	14	61	140
	Post	16	36	120	11	28	94
	Difference	0	-25	-123	-3	-33	-46
Ditch	Pre	58	91	201	27	49	112
	Post	51	77	150	27	46	87
	Difference	-8	-14	-51	0	-3	-25

Location	Site Condition	Peak Flow (L/s)					
		6hr Chicago			12hr SCS Type II		
		2yr	5yr	100yr	2yr	5yr	100yr
TOTAL	Pre	74	151	444	41	110	252
	Post	67	112	270	39	73	180
	Difference	-7	-39	-174	-3	-37	-71

Hydraulic Grade Line (HGL)

The PCSWMM model was used to estimate the hydraulic grade line (HGL) elevation of the storm sewer system during the 100-year storm event. **Table 4.5** provides a summary of the 100-year HGL elevation at each catchbasin and manhole within the proposed development. The results presented in the table are based on the 6-hour Chicago storm distribution as this storm generated the highest peak flows in the model. The model results indicate that the HGL elevations will be confined within the storm sewer system and ponding will not occur during the 100-year storm event.

Table 4.5: Storm Sewer Hydraulic Grade Line (HGL)

MH ID	Obvert Elevation	T/G Elevation	100-year Event			Stress Test HGL Elev.
			HGL Elevation	Surcharge	Clearance from T/G	
	(m)	(m)	(m)	(m)	(m)	(m)
CB-20	77.14	78.65	77.18	0.04	1.47	77.58
CB-202	76.71	77.70	76.75	0.04	0.95	76.98
CB-208	76.60	77.70	76.70	0.10	1.00	76.84
CB-21	77.15	78.65	77.79	0.64	0.86	78.26
CB-24	76.76	77.85	76.75	0.00	1.10	76.99
CB-25	76.80	77.75	76.85	0.05	0.90	77.06
CB-27	77.05	78.65	77.71	0.66	0.94	78.14
CBMH-200	76.86	78.55	77.06	0.20	1.49	77.39
CBMH-201	76.84	78.60	77.15	0.31	1.45	77.20
CBMH-203	76.65	77.79	76.72	0.07	1.07	76.94
CBMH-205	76.73	77.75	76.85	0.12	0.90	77.06
CBMH-206	76.62	77.55	76.83	0.22	0.72	77.03
MH-112	76.38	78.07	76.69	0.31	1.38	76.74
MH-204	76.29	78.68	76.02	0.00	2.66	76.21
MH-210	76.78	78.80	77.00	0.22	1.80	77.30
OGS	76.47	77.50	76.54	0.08	0.96	76.60

Stress Test

Table 4.5 also provides the estimated HGL elevations for the stress test event. The stress test event represents a 20% increase (rainfall intensity and total precipitation) in the 100-year design event. The model results indicate that the HGL elevations will be confined within the storm sewer system and ponding will not occur during the stress test event. While the model results indicate

no ponding, the site has been graded so that any ponding would occur within the parking lot sags and cascade off-site, ultimately discharging to the St. Joseph Boulevard roadside ditch or the ravine to the north.

Foundation Drains

The proposed building will be slab-on-grade. As such, there are no concerns with the surcharged HGL elevations. The overall grading of the site will allow water to pond in the parking areas and flow overland to the ultimate outlets of the site before impacting the building. Refer to the Grading Plan (Drawing 125033-GR).

4.5 Stormwater Quantity Control

4.5.1 Northwest Parking

Storm runoff from the proposed parking lot and landscaped areas north of the proposed building will be collected via storm sewers outletting to two StormTech chamber systems which ultimately outlet to the ravine to the north. The StormTech chamber systems have been designed to retain and infiltrate all runoff from their respective drainage areas for all storms up to and including the 5-year event. During larger storms exceeding the capacity of the StormTech chamber systems, runoff will spill over the elevated weirs located at the outlet structures of the systems and be conveyed to the storm outlet to the ravine. **Table 4.6** provides a summary of the required storage volumes. Refer to the StormTech chamber sizing and specifications provided in **Appendix E**.

Table 4.6: StormTech Chamber System – Storage Volumes

Location	Model	Runoff Volume* (m^3)			Max. Storage Provided (m^3)
		2-year	5-year	100-year	
Bed 1	MC-3500	71	96	169	105
Bed 2	MC-3500	61	85	153	105

**Based on a 12-hr SCS Type II distribution.*

While the overall drainage area and imperviousness to the ravine will increase under post-development conditions, the proposed StormTech chamber systems will provide sufficient storage and attenuation of storm runoff from the northwest parking areas to limit the post-development peak flows to the ravine to existing levels as demonstrated in **Table 4.4**.

Geotechnical Considerations

As described in the Season's Retirement Residence and Madonna LTC Facility – Stormwater Management Brief prepared by Novatech (November 2013), geotechnical investigations were completed in the northwest corner of the site to determine depth to bedrock and groundwater with respect to the proposed StormTech chambers. It was noted that all test pits were dry upon completion.

The geotechnical investigations indicate that the inferred bedrock surface ranges from 1.30 to 3.15 m below ground surface within the vicinity of the proposed StormTech chambers, and that the bedrock consists primarily of weathered dolomite with a hydraulic conductivity of 10^{-8} m/s. Should bedrock be observed during excavation for the StormTech chambers then rock excavation will be performed to the proposed inverts of the systems (bottom of stone elevations noted on StormTech chamber sizing and specifications report provided in **Appendix E**).

4.5.2 St. Joseph Boulevard Roadside Ditch

While the post-development drainage area to the St. Joseph Boulevard roadside ditch will be slightly less than existing conditions, the impervious area to the ditch will increase due to the proposed building, roads and parking areas. However, the proposed building roof will provide sufficient storage and attenuation of storm runoff from the roof to limit the overall post-development peak flows to the roadside ditch to existing levels as demonstrated in **Table 4.4**.

Proposed Building – Storage & Roof Drains

The roof of the proposed building will provide storage and attenuation of storm runoff using nine (9) roof drains. The roof drains will outlet through the building storm service to the proposed storm sewer system south of the proposed building. The stage-storage-discharge table for the proposed building roof is provided in **Table 4.7**. Storm runoff in excess of the roof storage capacity would spill to the ground below via the overflow scuppers and follow the major overland flow routes to the various storm sewer inlets.

Table 4.7: Proposed Building Roof Storage & Release Rates

Return Period	Max. Depth (m)	Storage Volume (m^3)	Total Release Rate* (L/s)
2-year	0.10	26	8
5-year	0.11	37	8
100-year	0.14	74	9

**Combined flow through all roof drains.*

4.6 Stormwater Quality Control

4.6.1 North of the Proposed Building

Storm runoff from the proposed roads and parking lots north of the proposed building will be treated via the proposed StormTech chamber systems. The systems will be constructed with the Isolator Row PLUS, a row of StormTech chambers with a flared end ramp that sits on top of one layer of ADS PLUS fabric. The Isolator Row PLUS chamber and fabric have been verified to provide 80% TSS removal.

Each StormTech MC-3500 Isolator Row PLUS chamber can treat up to approximately 11 L/s. Based on the PCSWMM model peak flows to the systems during the 4-hour 25mm water quality event (approximately 27 and 23 L/s), at least two to three Isolator Row PLUS chambers per system are needed to provide the required treatment. Nine Isolator Row PLUS chambers will be provided in each StormTech chamber system. Refer to the StormTech chamber sizing and specifications provided in **Appendix E**.

4.6.2 South of the Proposed Building

A Hydroworks HydroDome oil/grit separator (OGS) will be installed at the downstream end of the southern storm sewer system to treat storm runoff from the proposed building and southern roads and parking areas prior to discharging to the St. Joseph Boulevard roadside ditch. The HydroDome is ETV verified, and the unit has been sized using the CETV particle size distribution. A HydroDome HD 6 would treat 100% of the annual runoff and provide 80% TSS removal. Refer to **Appendix E** for Hydroworks Sizing Summary.

5.0 GEOTECHNICAL INVESTIGATIONS

A geotechnical investigation report has been prepared by Kollaard Associates Group for the proposed development. Refer to the Geotechnical Investigation Proposed Long Term Care Facility Addition, 1541 St. Joseph Boulevard, dated May 29, 2025.

6.0 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 entrance,
- 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. These measures will be implemented prior to the commencement of construction and maintained in good order until vegetation has been established.

7.0 CONCLUSIONS AND RECOMMENDATIONS

This report has been prepared in support of the Site Plan Control application for the proposed development. The conclusions are as follows:

Water Servicing

- The proposed development will be serviced by an on-site watermain system connected to the existing 305mm and 406mm diameter watermains in St. Joseph Boulevard.
- The water supply for fire protection will be provided from the new on-site hydrant and the existing municipal fire hydrant in St. Joseph Boulevard.
- The proposed watermain system will provide adequate water supply and pressures to the proposed development.

Sanitary Servicing

- The proposed development will be serviced by the existing 200mm diameter sanitary service connected to the existing 375mm diameter sanitary sewer in St. Joseph Boulevard.
- There is adequate capacity within the existing sanitary service and the municipal sanitary sewer system to service the proposed development.

Storm Servicing & Stormwater Management

- The proposed development will be serviced by on-site storm sewer systems outletting to the ravine to the north or to the St. Joseph Boulevard roadside ditch.
- Stormwater quality control for the site is provided by StormTech Isolator Row PLUS chambers prior to discharging to the ravine, and a HydroDome OGS prior to discharging to the St. Joseph Boulevard roadside ditch.
- The proposed development will control the peak flows for all storm events to their respective pre-development levels.
- There will be no surface ponding during any storm up to and including the 100-year event.
- The roads/parking areas are graded to ensure that ponding depths for storms greater than the 100-year event do not exceed 0.35m.
- Major overland flow routes are provided to the St. Joseph Boulevard roadside ditch and to ravine to the north.

NOVATECH

Prepared by:

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Land Development Engineering

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Water Resources

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Land Development & Public Sector Infrastructure

APPENDIX A

Correspondence

File No.: PC2024-0435

December 2, 2024

Rudy Hanel, Senior Director, Planning
Sienna Senior Living
Via email: rudy.hanel@siennaliving.ca

Subject: Pre-Consultation: Meeting Feedback Proposed Site Plan Control Application – 1533 and 1541 St Joseph Blvd

Please find below information regarding next steps as well as consolidated comments from the above-noted pre-consultation meeting held on November 7, 2024.

Contents

Context

Figure 1: 1533 and 1541 St-Joseph Boulevard is a large site in the Greenbelt Transect, with approximately 238 metres of frontage along St-Joseph Boulevard, an arterial road. Together the two lots have an area of approximately 41, 733 square metres. The above capture is taken from geoOttawa and shows grade changes to the rear of the site, which is heavily treed.

Proposed Concept

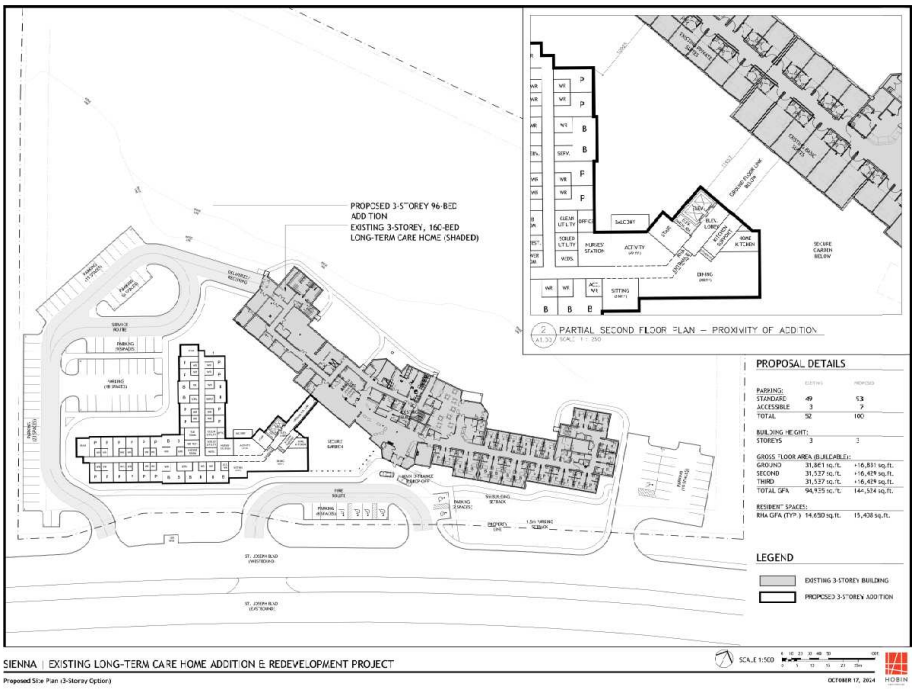


Figure 2: Capture of the proposed concept. The parcel known as 1533 St-Joseph Boulevard is currently vacant. Part of the site is used for parking and access to the existing building on 1541 St-Joseph Boulevard. The lot previously had a long-term care building, which was demolished in 2005. A new 96 bed retirement home is planned that will be connected to the building at 1541 St-Joseph Boulevard, the location of a 3-storey, 160 bed long term care building, which is currently vacant. The structural components of the building at 1541 St-Joseph Boulevard will be reused.

Pre-Consultation Preliminary Assessment

1 ☐	**2** ☐	**3** ☐	**4** ☒	**5** ☐

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. As of June 6, 2024, planning pre-consultations are no longer mandatory as per the Province of Ontario's Bill 185. If the applicant chooses to proceed with further pre-consultation, please complete a Phase 2 Pre-consultation Application Form and submit it together with the necessary studies and/or plans to planningcirculations@ottawa.ca. **It would be beneficial to see the proposal again before the plan coordination occurs, so Staff can comment on whether proposed changes address Staff comments**.
2. In your subsequent pre-consultation submission, please ensure that all comments or issues detailed herein are addressed. A detailed cover letter stating how each issue has been addressed must be included with the submission materials. Please coordinate the numbering of your responses within the cover letter with the comment number(s) herein.

Supporting Information and Material Requirements

The attached **Study and Plan Identification Lists** outline 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.

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

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

Lucy Ramirez, Planner | Lucy.Ramirez@ottawa.ca

Comments:

Official Plan

1. The site is within the Greenbelt Transect of the City of Ottawa's Official Plan (2022), see Schedule B4. The designation is Greenbelt Rural, the site is within the Natural Heritage Feature Overlay (Schedule C11-C), and part of the Bilberry Creek Subwatershed Study Area (Annex 8B-Subwatershed Studies and Environmental Plans).

    a. Per section 8.4, entitled *Ensure development maintains the landscape characteristics of the Greenbelt*, policy (2)
    (2) On lands designated as Greenbelt Rural, the following policies apply:
        (a) Permitted uses include forestry, recreation, agriculture, tourism and small-scale commercial uses;
        (b) Lands located adjacent to lands designated Greenbelt Facility may also be used for operational uses ancillary to the main permitted uses in the Greenbelt Facility designation, provided the ancillary uses have limited employment associated with them; and
        (c) Lot creation is not permitted, except where those lands are public-owned, unless the lands are in a historical settlement where the new lot or lot line adjustments do not extend the existing settlements in length, width or depth, and will be of a size similar to the adjacent lot but not less than 0.8 hectares.

2. An Archaeological Assessment is required since the site is identified in the City's Archaeological Resource Potential Mapping Study as having potential for archaeological resources.

Zoning

3. The site is zoned Rural Institutional Subzone 5, rural exception 472 (RI5 (472r)). The rural exception permits ***residential care facility*** and ***retirement home***.

    a. ***Residential care facility means*** *an establishment providing supervised or supportive in-house care for those who need assistance with daily living, that may also provide on-going medical or nursing care or counselling and social support services and which may include services such as medical, counselling, and personal services. (établissement de soins pour bénéficiaires internes)*
    b. ***Retirement home*** *means a building or a part of a building containing rooming units or a combination of rooming and dwelling units, providing residence mostly to senior citizens who do not require assistance with daily living, and which may provide ancillary health, personal service, and*

recreational services to serve the residents of the home, and may have up to 25 per cent of its gross floor area devoted to providing supervised or supportive in-house care for those who need assistance with daily living including on-going medical care, nursing care, counselling and social support services. (maison de retraite) (By-law 2016-131)

Minor Variances

4. At the meeting, the Applicant indicated that minor variances may be sought. In your zoning confirmation report (ZCR) please identify all the minor variances that you'll be seeking from the Committee of Adjustment (CofA). Prior to applying to the CofA, please consult with staff in Development Review regarding the exact minor variances so you can receive comments on the minor variances and whether planning staff can support them. Planning Staff cannot approve your site plan control application until the Committee of Adjustment has approved the minor variances.
5. Please note that minor variance applications are handled by the Committee of Adjustment. The Planning Department provides comments on Committee of Adjustment applications; however, the Committee of Adjustment makes the decision. For more information on the Committee of Adjustment please visit: https://ottawa.ca/en/city-hall/planning-and-development/committee-adjustment. The Committee of Adjustment can be contacted directly at cofa@ottawa.ca or at (613)-580-2436.
6. Committee of Adjustment process takes approximately 12 to 14 weeks from application submission to the end of the appeal period. My understanding is that once your application has been deemed complete it takes four to six weeks before the application is heard at a Committee hearing.
7. The minor variance process can be coordinated to occur concurrently with the site plan control approval process.

Site Plan

8. Staff understand that the existing building at 1541 St-Joseph Boulevard received Site Plan Control Approval on October 7, 2005 (D07-12-05-0025), that SPC approvals were obtained for a building at 1533 St-Joseph Boulevard that was never built. To proceed a new SPC application is required, the SPC area should encompass the proposed building, exterior changes to the site, and any areas/changes not subject to prior SPC approval.

9. The Site Plan must show be drawn fully to scale, showing all required accessibility features, soft landscaping areas, snow storage, and more.

Feel free to contact Lucy Ramirez, Planner (Development Review), for follow-up questions.

Urban Design

Christopher Moise, Architect | Urban Designer| Planner | Christopher.Moise@ottawa.ca

Comments:

10. We have reviewed the previously approved site plan and believe this site plan displays a more suitable building location and accessory parking location then the previous.
11. We recommend the two building elevations should employ noble materials facing the public street and should be similar in execution, making them read as of the same family of design execution.
12. We recommend indicating where new tree planting will occur on the site to off-set the removal of mature trees from the western side of the property.
13. We recommend providing street trees along the length of the property to help tie the site in with its environs.
14. We recommend suitable landscaping and amenity for the future tenants in the interstitial spaces created in-front of the buildings and between them.

Submission Requirements

15. An Urban Design Brief is required. Please see *Attachment 3* a customized Terms of Reference to guide the preparation of the submission.
    a. The Urban Design Brief should be structured by generally following the headings highlighted under **Section 3 – Contents of these Terms of Reference**.
16. Additional drawings and studies are required as shown on the SPIL. Please follow the terms of reference (Planning application submission information and materials | City of Ottawa) to prepare these drawings and studies. These include:
    a. Landscape Plan.
    b. Elevations.

Feel free to contact Christopher Moise, Architect | Urban Designer| Planner (Public Realm and Urban Design), for follow-up questions.

Engineering

Kelsey Charie, Project Manager | Kelsey.Charie@ottawa.ca

Comments:

Water

17. Watermain looping is recommended for areas with water demands over 50m^3/day to avoid creating a vulnerable service area. District Metering Area (DMA) Chamber(s) are required for private developments serviced by a connection 150 mm or larger or when there are two or more private connections to the public watermain. Refer to the City of Ottawa Water Distribution Guidelines.
18. Please be advised that capacity of the existing system will be determined after Water Boundary conditions are requested. Water Boundary condition requests must be submitted to the City Project Manager, Development Review by the civil design engineer or consultant prior to submission and include the following information:
    i. Location(s) of water service and connections (provide a map);
    ii. Type of development
    iii. Average daily demand: ___ l/s;
    iv. Maximum daily demand: ___l/s;
    v. Maximum hourly daily demand: ___ l/s;
    vi. Amount of fire flow required (as per Ontario Building Code or Fire Underwriter Surveys (See technical Bulletin ISTB-2021-03);
    vii. Supporting calculations for all demands listed above
19. Demonstrate adequate hydrant coverage for fire protection. Please review Technical Bulletin ISTB-2018-02, Appendix I Table 1 – maximum flow to be considered from a given hydrant;
20. If required, show proposed emergency route (to be satisfactory to Fire Services).

Sanitary Sewers

21. A monitoring maintenance hole may be required just inside the property line. See the sewer use by-law for details.
22. Provide an analysis to demonstrate that there is adequate residual capacity in the receiving and downstream wastewater system to accommodate the proposed development.
23. A maintenance hole is required to be installed over the public sewer where private sewer connection to the public sewer exceeds 50% of the public sewer diameter. If a maintenance hole is proposed to be installed over existing City infrastructure, clearly indicate on the design drawings the applicable Standard City Drawing. For example, S12.1 or doghouse structure / S12.2, etc.

Stormwater Management

24. Please refer to the previously approved servicing reports for their design criteria. The latest approved Stormwater Management Brief was completed by Novatech Engineering and dated June 15, 2012.
    a. Stormwater Quality:
        i. Provide Enhanced level of protection (80%) for suspended solids removal. (This is a newer guideline than the 70% requirement in 2012.)
        ii. Characterize the water quality to be protected and Stormwater Contaminants (e.g., suspended solids, nutrients, bacteria, water temperature) for potential impact on the Natural Environment, and control as necessary;
        iii. If an Oil/Grit Separator unit is to be used, the unit sizing shall be as per ISO 14034 Environmental Technology Verification (ETV)
    b. Stormwater Quantity:
        i. Control the post-development peak flows for all storm events to their respective pre-development levels. (ie: the post development peak 2 year storm event is controlled to the 2 year pre-development storm event and so on for the 5 and 100 year events.)

Geotechnical and Slope Stability

25. Sensitive Marine Clay (SMC) is widely found across Ottawa- geotechnical reports should include Atterberg Limits, consolidation testing, sensitivity values, and vane shear test. Refer to City of Ottawa Geotechnical and Slope Stability Guidelines.
26. In the pre-consultation meeting a landslide hazard risk assessment report was discussed. Please ensure the geotechnical report addresses these concerns and details how the subject site meets all applicable design criteria requirements if it is deemed that a LHRA report is not required.
27. While a geotechnical report was completed in 2012 for the previous approval, the report will need to be updated. Please ensure there is sufficient borehole data within the limits of the proposed building. Please also ensure that the report has an updated slope stability analysis for the new proposal.

Additional Engineering Notes

28. Any future road widening setbacks, existing easements or proposed easements should be shown on all plans. Proposed infrastructure shall not be located within setbacks.
29. For any proposed exterior light fixtures, please provide certification from a licensed professional engineer confirming lighting has been designed only using fixtures that meet the criteria for full cut-off classification as recognized by the Illuminating Engineering Society of North America and result in minimal light spillage onto adjacent properties (maximum allowable spillage is 0.5 fc).
30. An MECP Environmental Compliance Approval may be required for the proposed development. Please contact the Ministry of the Environment, Conservation and Parks, Ottawa District Office, to arrange a pre-submission consultation:
    a. Charlie Primeau at (613) 521-3450, ext. 251 or Charlie.Primeau@ontario.ca
    b. Emily Diamond at (613) 521-3450, ext. 238 or Emily.Diamond@ontario.ca
31. Plans are to be submitted on standard A1 size (594mm x 841mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400, or 1:500).

Feel free to contact Kelsey Charie, Project Manager (Infrastructure), for follow-up questions.

Noise

Reed Adams, Engineer | Reed.Adams@ottawa.ca

32. A noise study will be required due to proximity to St. Joseph.

Comments:

Feel free to contact Reed Adams, Engineer (Transportation), for follow-up questions.

Transportation

Reed Adams, Engineer | Reed.Adams@ottawa.ca

Comments:

Transportation Impact Assessment (TIA):

33. TIA is required unless it can be shown that less than 60 trips/hr during peak times are being triggered.
34. Please submit the Scoping/Forecasting report to reed.adams@ottawa.ca at your earliest convenience. The applicant is responsible to submit the Scoping Report prior to application and must allow for a 14 day circulation period.
35. The Strategy Report must be submitted with the formal submission to deem complete. The applicant is strongly encouraged to submit the Strategy Report to the TPM prior to formal submission and allow for a 14 day circulation period.
36. Complete and submit the Transportation Demand Management Measures Checklist and the Transportation Demand Management Supportive Development Design and Infrastructure Checklist in support of the application.
37. If an Road Modification Approval (RMA) is required to support the proposed development, the functional plan and/or RMA plans must be submitted with the formal submission to deem complete. Request base mapping asap if RMA is required, contact Engineering Services
38. The “Urban” area designation is based upon the Transportation Master Plan ‘Inner Urban’ area (i.e. 400m Radius for study area).

Right-of-Way (ROW):

39. Ensure that the development proposal complies with the Right-of-Way protection requirements of the Official Plan's Schedule C16.

- Any requests for exceptions to ROW protection requirements must be discussed with Transportation Planning and concurrence provided by Transportation Planning management

Signage:

40. Removal of the no u-turn and the no left turn signs at the median fronting the site would require proof that their removal would be safe from a traffic perspective.
    - This can be done via a TIA (if required) or a memo that proves their removal would not be a safety risk.
    - Road modifications may be required if the removal of the left turn restriction is approved, which would trigger an RMA

Transit:

41. Upgrade existing transit stop #2637 (the stop fronting the site) to include a paved transit standing area to the specifications of the City.

Site Plan:

42. As the site proposed is residential, AODA legislation applies for all areas accessible to the public (i.e. outdoor pathways, parking, etc.).
43. Ensure site access meets the City's Private Approach Bylaw.
44. Show all details of the roads abutting the site; include such items as pavement markings, accesses and/or sidewalks.
45. Turning movement diagrams required for all accesses showing the largest vehicle to access/egress the site.
46. Turning movement diagrams required for internal movements (loading areas, garbage).
47. Show all curb radii measurements; ensure that all curb radii are reduced as much as possible and fall within TAC guidelines (Figure 8.5.1).
48. Show dimensions for site elements (i.e. lane/aisle widths, access width and throat length, parking stalls, sidewalks, pedestrian pathways, etc.)
49. Parking stalls at the end of dead-end parking aisles require adequate turning around space.

Feel free to contact Reed Adams, Engineer (Transportation), for follow-up questions.

Environment

Kim MacDonald, Environmental Planner | Kim.Macdonald3@ottawa.ca

Comments:

50. According to Official Plan (OP) Schedule B - Greenbelt Transect, the two properties are located within the Greenbelt Transect Policy Area (i.e., Greenbelt Rural). As such, OP Section 8, Greenbelt Designations and the Greenbelt Rural policies are applicable, including the policies for “Natural Environment Areas” (Section 8.1) and the protection of forest canopy cover/significant woodlands.
51. The two properties are surrounded by NCC parcels and woodlands that are over 60 years old.
52. According to OP Schedule C11-C, Natural Heritage System (East), the Natural Heritage Feature Overlay is applicable to the subject area (i.e., the two separate properties).
    - OP Section 4.8.1, “Protect the City’s natural Environment through identification of a Natural Heritage System, Natural Heritage Features and related policies.”
53. The subject area is located within the Eastern Subwatershed Study Area/Green’s Creek Downstream Reach according to OP Annex 8A –Watershed and Subwatersheds.
54. LID SWM strategies should be considered and discussed early in the development process.
55. Based on the above, the development application must be supported by an integrated EIS/TCR demonstrating appropriate regard to the surrounding natural features, threatened and endangered species, etc.
    a. Adequate development setbacks must be clearly identified on the site plan, landscaping plan, etc.
    b. All environmental constraints associated with the site must be shown on the proposed plan (s) for the development site (i.e., geotechnical limits and/or confirmed areas of significant habitat for endangered and threatened species).
    c. An up-to-date MNRF Information Gathering Form/response should be included within the report.

d. Sediment and erosion control measures should be discussed, including a maintenance/inspection schedule (pre, during, and post until the site has been reestablished to pre-conditions or better).

e. The Bird Sage Design Guidelines should be consulted and discussed early in the process and prior to the design phase. For example, glass corners, passageways, and railings should be avoided or treated to reduce the risk in such a natural area.

Feel free to contact Kimberley MacDonald, Environmental Planner for follow-up questions.

Forestry

Hayley Murray, Planning Forester | Hayley.Murray@ottawa.ca

Comments

56. A Tree Conservation Report (TCR) and Landscape Plan are submission requirements.
57. Retention of existing trees over removal and replacement is a priority under the official plan. You will need to consider trees early on in the design of the property to prioritize retention of healthy trees outside of the as of right building footprint.
58. Planning Forestry would not support a minor variance to locate new parking spaces at a reduced setback in the front yard if it would require the removal of healthy trees. Explore other options for additional accessible parking.
59. The National Capital Commission (NCC) is the owner of the properties surrounding this site. If removal of a boundary or adjacently owned tree was requested, a tree removal permit cannot be issued unless consent is provided by NCC.
60. If there are Sensitive Marine Clay soils on site, the site design must account for suitable space and setbacks for trees. The Geotechnical Report must provide direction on tree planting restrictions. Trees must still be incorporated into the site design and along the street frontage, where feasible.
61. Natural Heritage Feature identified on the City's Natural Heritage Overlay applies to the northern portion of this site. The EIS must provide direction for retention and mitigation measures to be applied in the TCR. The EIS and TCR must provide direction on tree planting recommendations for the site as native species must be planted in such close proximity to a Natural Heritage Feature. The EIS

and TCR can be combined if all reporting requirements have been provided. The EIS will influence the TCR so combining them is reasonable in this scenario.

62. Trees outside of the Natural Heritage Feature must be individually inventoried in the TCR.

Tree Conservation Report requirements.

63. The following Tree Conservation Report (TCR) requirements have been adapted from the Schedule E of the Urban Tree Protection Guidelines – for more information on these requirements please contact hayley.murray@ottawa.ca

    a. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City

    b. Any tree 10 cm in diameter or greater and City-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.

    c. The TCR must contain 2 separate plans/maps:

    i. Plan/Map 1 - show existing conditions with tree cover information.

    ii. Plan/Map 2 - show proposed development with tree cover information.

    d. The TCR must list all trees on site, as well as off-site trees if the CRZ (critical root zone) extends into the developed area, by species, diameter, and health condition. Please note that averages can be used if there are forested areas.

    e. Please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)

    f. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained.

    g. The removal of trees on a property line will require the permission of both property owners.

    h. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca

i. The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

j. Removal of a City tree is not permitted unless justified. If justified, monetary compensation for the value of the tree must be paid before a tree removal permit is issued.

Landscape Plan (LP) requirements.

64. Landscape Plan Terms of Reference must be adhered to for all tree planting: Click Here. For more information on these requirements please contact hayley.murray@ottawa.ca

Additional Elements for Tree Planting in the Right of Way:

65. Please ensure any retained trees are shown on the LP

    a. Sensitive Marine Clay - Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines.

    b. 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 minimum soil volumes requested.

    c. The city requests that consideration be given to planting native species wherever there is a high probability of survival to maturity.

    d. 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

66. Minimum Setbacks

    a. Maintain 1.5m from sidewalk or MUP/cycle track or water service laterals.

    b. Maintain 2.5m from curb

    c. Coniferous species require a minimum 4.5m setback from curb, sidewalk, or MUP/cycle track/pathway.

d. 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.

e. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

67. Tree specifications

a. Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.

b. Maximize the use of large deciduous species wherever possible to maximize future canopy coverage.

c. Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and if possible, include watering and warranty as described in the specification.

d. No root barriers, dead-man anchor systems, or planters are permitted.

e. No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

68. Hard surface planting

a. If there are hard surface plantings, a planting detail must be provided.

b. Curb style planters are highly recommended.

c. No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.

d. Trees are to be planted at grade.

Feel free to contact Hayley Murray, Planning Forester, for follow-up questions.

Parkland

Phil Castro, Planner – Parks and Facilities Planning | Phil.Castro@ottawa.ca

Comments:

69. PFP will be requesting **cash-in-lieu of conveyance of parkland** for parkland dedication in accordance with the Parkland Dedication By-law.

70. PFP requests the following information to confirm and calculate the parkland conveyance:
    a. Previous Parkland dedication details
    b. Gross land area, in square meters
    c. Number of residential units proposed/existing
    d. Gross floor area of proposed residential development
    e. Gross floor area of proposed/existing commercial development
    f. The proportion of commercial/residential development proposed on site.
71. Please note, if the proposed unit count, land use changes or gross floor area changes, then the parkland dedication requirement will be re-evaluated accordingly.

Feel free to contact Phil Castro, Parks Planner, for follow-up questions.

Rideau Valley Conservation Authority

Stephen Bohan, Planner, Rideau Valley Conservation Authority | stephen.bohan@rvca.ca

Comments:

72. Landslide hazard and risk assessment - The report would assess the site conditions, documented historical landslides in the surrounding area and the proposed development to determine the potential for a landslide to occur and the potential risks to life and property in the event that a landslide occurs. A terms of reference for the report should be submitted to RVCA prior to initiation to confirm the scope of the assessment is in line with RVCA guidelines.
73. Geotechnical report – to assess the existing soil stratigraphy on the subject lands.
74. Stormwater management report – Outlining how the proposed stormwater management design conforms with requirements for water quantity and water balance per the Ministry of Environment, Conservation and Parks' Stormwater Management Planning and Design Manual
75. Shoring and foundation plans - Details for the proposed excavation and shoring methods to be utilized for any proposed excavation. Details regarding proposed mitigation measures/foundation treatments for reducing risks associated with

undertaking site alteration and construction within sensitive marine clays conditions if applicable.

76. Dewater plans - If dewatering will be required as a component of the development, a plan/report should be submitted that identifies the applicable details (e.g., how long will dewatering occur, what are the anticipated volumes, where will water be discharged to and what method/set up will be used to discharge the water).

77. Engineering drawings/plans – Including site plan, grading plan, site servicing plan, erosion and sediment control plan, cross-sections and associated details.

Feel free to contact Stephen Bohan, Planner, for follow-up questions.

Other

Supplementary Information

78. Attachment 7 entitled *Supplementary Development Information* provides additional information on matters for consideration throughout the application approval and development process.

High Performance Development Stand (HPDS)

79. 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.

Affordable Housing Community Improvement Plan (CIP)

80. 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.*

Fees

To proceed as proposed, the following applications are required:

a. Site Plan Control - Complex

Additional information regarding fees related to planning applications can be found here. Applicable fees outlined below. **Please note these are the 2024 fees, fees increase every year**.

Site Plan Control Application Fees

Site Plan Control – Non-Rural Area		
Complex	**$72,000.22**	
Includes	Planning Fee: $63,193.00	
	On-Site Sign Fee: $1,023.78 (incl. HST)	
	Legal Fee: $7,783.44 (incl. HST)	
Plus	Initial Engineering Design Review and Inspection Fee:	$1,000 (incl. HST) (value of Hard and Soft Servicing <$50,000); or
		$5,000 (incl. HST) (value of Hard and Soft Servicing $50,000-$300,000); or
		$10,000 *(incl. HST)* (value of Hard and Soft Servicing >$300,000)
	Conservation Authority Fee: $1,120.00	

Engineering Design Review and Inspection Fee

Engineering Design Review and Inspection fees of **5.0%** of the value of the Hard Servicing (roads, sewers, watermains, sidewalks, curbs, stormwater etc.) and **2.50%** of the Soft Servicing (lot grading, sodding, driveway treatment etc.) are payable prior to Final Approval and should be forwarded to the Assigned Staff. The Engineering Design Review and Inspection Flat Rate Fee collected at submission will be credited to these fees.

Fee for appraisal services

Any development application to which cash-in-lieu of parkland is applicable and for which an appraisal is required will be subject to a fee for appraisal services of $926.60 ($820.00 + $106.60 HST).

The Conservation Authority will invoice for any additional fees and technical report review as required.

Concluding Remarks

All of the above comments or issues should be addressed in a subsequent submission 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.

Regards,

Lucy Ramirez

Attachments:

Attachment 1.	Study and Plan Identification List (SPIL) Site Plan Control
Attachment 2.	List of Technical Agencies to Consult
Attachment 3.	Urban Design Brief
Attachment 4.	Supplementary Development Information
Attachment 5.	High Performance Development Standards (HPDS) Overview for Applicants
Attachment 6.	High Performance Checklist
Attachment 7.	Site Plan Checklist – City of Ottawa Accessible Design Standards

c.c.

Alex Polyak, Infrastructure Project Manager (Development Review), City of Ottawa

Christopher Moise, Architect | Urban Designer| Planner, Public Realm and Urban Design, City of Ottawa

Hayley Murray, Forester - Planning, City of Ottawa

Kris Haynes, Senior Engineer, City of Ottawa

Katie Turk, Senior Planner, City of Ottawa

Kim MacDonald, Environmental Planner, City of Ottawa

Kelsey Charie, Infrastructure Project Manager (Development Review), City of Ottawa

Phil Castro, Planner (Parks and Facilities Planning), City of Ottawa

Reed Adams, Project Manager (Transportation), City of Ottawa

Stephen Bohan, Planner, Rideau Valley Conservation Authority (RVCA)

Ted Horton, Senior Planner, National Capital Commission (NCC)

Zoha Rashid, Planner (Development Review), City of Ottawa

APPENDIX B

Site Plan

NEW GENERATOR SEE ELEC.'L DWGS.

EXISTING TRANSFORMER TO REMAIN

RETAINING WALL

GAZEBO STAFF BREAK AREA

RETAINING WALL

GARBAGE/RECYCLING EARTH BERM

DELIVERIES/ RECEIVING

1-STOREY STORAGE EXTERIOR ACCESS

FENCE & GATE SEE LANDSCAPE DWGS.

SECURE GARDEN

1-STOREY LINK

EXISTING 3-STOREY 160 BED LONG-TERM CARE HOME
FFE: 78.05

NEW 2-STOREY 64-BED LONG-TERM CARE ADDITION
FFE: 79.20

MAIN ENTRANCE & DROP-OFF

EXISTING FIRE HYDRANT TO BE RELOCATED

FIRE ROUTE

EXISTING PARKING TO REMAIN

EXISTING FIRE HYDRANT TO REMAIN

EXISTING BUS STOP

EXISTING HYDRO POLE TO REMAIN

EDGE OF ASPHALT ROAD

DASHED PAINT LINE

BACK OF CURB

REGIONAL ROAD No. 34 MTO
(Formerly THE KING'S HIGHWAY No. 17 OTTAWA-MONTREAL ROAD)

CONCESSION 10

PART 39-2000, 4R-2201

237917 LOT WIDTH

PART 1 PLAN 4R-22014 SUBJECT TO EASEMENT AS IN INST. CL8762

5R-3797

no.	date	revision
2	SEPT. 16/25	ISSUED FOR SITE PLAN CONTROL
1	JULY 24/25	ISSUED FOR CLASS D
A	JUNE 6/25	ISSUED FOR MLTC PRELIMINARY PLAN SUBMISSION

It is the responsibility of the appropriate contractor to check and verify all dimensions on site and report all errors and/or omissions to the architect.

All contractors must comply with all pertinent codes and by-laws.

Do not scale drawings.

This drawing may not be used for construction until signed.

ONTARIO ASSOCIATION OF ARCHITECTS
KARIM J. HOBIN
LICENCE
3049

Hobin Architecture Incorporated
63 Pamilla Street
Ottawa, Ontario
Canada K1S 3K7
T: 613-238-7200
F: 613-235-2065
E: mail@hobinarc.com
hobinarc.com

HOBIN ARCHITECTURE

PROJECT/LOCATION:
BILBERRY CREEK
LONG TERM CARE HOME

DRAWING TITLE:
SITE PLAN
PROPOSED ADDITION AND REDEVELOPMENT

DRAWN BY:	DATE:	SCALE:
ML/RF	APR. 2025	1:300

PROJECT NORTH / TRUE NORTH

PROJECT: 2442

DRAWING NO.: A1.02

REVISION NO.:

None
None

APPENDIX C

Water Demands, FUS Calculations, Boundary Conditions

BILBERRY CREEK LONG TERM CARE HOME
1533 & 1541 ST. JOSEPH BLVD
WATER DEMAND

Existing Facility Number of Beds	160	
Proposed Addition Number of Beds	64	
Persons per Bed	1.4	
Total Population	314	
Average Day Demand	280	L/c/day
Average Day Demand	1.02	L/s
Maximum Day Demand (2.5 x avg. day)	2.54	L/s
Peak Hour Demand (2.2 x max. day)	5.59	L/s
Number of Staff	32	
Average Day Demand	75	L/c/day
Average Day Demand	0.03	L/s
Maximum Day Demand (1.5 x avg. day)	0.04	L/s
Peak Hour Demand (1.8 x max. day)	0.08	L/s
Total Average Day Demand	**1.04**	**L/s**
Total Maximum Day Demand	**2.58**	**L/s**
Total Peak Hour Demand	**5.66**	**L/s**

FUS - Fire Flow Calculations

NOVATECH
Engineers, Planners & Landscape Architects

Novatech Project #: 125033
Project Name: 1533 & 1541 St Joseph Blvd
Date: 8/6/2025
Input By: MS
Reviewed By:
Drawing Reference:

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

Building Description: 2-Store Addition and 3-Storey Existing Long Term Care Facility
Type II - Non-combustible construction

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		1.5	0.8	
		Type IV - Mass Timber		Varies		
		Type III - Ordinary construction		1		
		Type II - Non-combustible construction	Yes	0.8		
		Type I - Fire resistive construction (2 hrs)		0.6		
2	**Floor Area**					
	A	First Floor (m^2)	4760			
		Second Floor (m^2)	4704			
		Third Floor (m^2)	3027			
		Number of Floors/Storeys	3			
		Protected Openings (1 hr) if C<1.0	Yes			
		Area of structure considered (m^2)			**6,693**	
	F	**Base fire flow without reductions**				**14,000**
		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%	**11,900**
		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%	**-4,760**
		Standard Water Supply	Yes	-10%	-10%	
		Fully Supervised System	No	-10%		
				Cumulative Sub-Total	**-40%**	
		Area of Sprinklered Coverage (m^2)	12491	100%		
				Cumulative Total	**-40%**	
5	**Exposure Surcharge**		**FUS Table 5**		**Surcharge**	
	(3)	North Side	>30m		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**	**7,000**
		(2,000 L/min < Fire Flow < 45,000 L/min)		or	L/s	**117**
				or	USGPM	1,849

BILBERRY CREEK LONG TERM CARE HOME

1533 & 1541 ST. JOSEPH BLVD

WATERMAIN MODELING RESULTS

Maximum Day + Fire Flow Demand

Network Table - Nodes

Node ID	Elevation m	Demand LPS	Head m	Pressure m	kPa	psi
Junc J1	79.45	0	112.8	33.35	327.2	47.5
Junc J2	79.25	22	112.43	33.18	325.5	47.2
Junc J3	79.1	0	112.71	33.61	329.7	47.8
Junc J4	77.9	2.58	112.71	34.81	341.5	49.5
Junc J5	78.65	0	112.44	33.79	331.5	48.1
Junc J6	78.5	95	109.16	30.66	300.8	43.6
Junc J7	78.6	0	113.08	34.48	338.2	49.1
Resvr R1	113.1	-46.46	113.1	0	0.0	0.0
Resvr R2	113	-73.12	113	0	0.0	0.0

Maximum Day + Fire Flow Demand

Network Table - Links

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Unit Headloss m/km
Pipe P1	10.1	300	120	46.46	0.7	1.8
Pipe P2	18.7	200	110	46.46	1.5	15.3
Pipe P3	17.7	200	110	24.46	0.8	4.7
Pipe P4	118	200	110	2.58	0.1	0.1
Pipe P5	20	150	100	22	1.2	18.5
Pipe P6	72	200	110	21.88	0.7	3.8
Pipe P7	15.8	200	110	-73.12	2.3	35.3
Pipe P8	11.8	150	100	95	5.4	278.0

Peak Hour Demand

Network Table - Nodes

Node ID	Elevation m	Demand LPS	Head m	Pressure m	kPa	psi
Junc J1	79.45	0	111.4	31.95	313.4	45.5
Junc J2	79.25	0	111.4	32.15	315.4	45.7
Junc J3	79.1	0	111.4	32.3	316.9	46.0
Junc J4	77.9	5.66	111.36	33.46	328.2	47.6
Junc J5	78.65	0	111.4	32.75	321.3	46.6
Junc J6	78.5	0	111.4	32.9	322.7	46.8
Junc J7	78.6	0	111.4	32.8	321.8	46.7
Resvr R1	111.4	-3.47	111.4	0	0.0	0.0
Resvr R2	111.4	-2.19	111.4	0	0.0	0.0

Peak Hour Demand

Network Table - Links

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s	Unit Headloss m/km
Pipe P1	10.1	300	120	3.47	0.1	0.0
Pipe P2	18.7	200	110	3.47	0.1	0.1
Pipe P3	17.7	200	110	3.47	0.1	0.1
Pipe P4	118	200	110	5.66	0.2	0.3
Pipe P5	20	150	100	0	0.0	0.0
Pipe P6	72	200	110	-2.19	0.1	0.1
Pipe P7	15.8	200	110	-2.19	0.1	0.1
Pipe P8	11.8	150	100	0	0.0	0.0

BILBERRY CREEK LONG TERM CARE HOME
1533 & 1541 ST. JOSEPH BLVD
WATERMAIN MODELING RESULTS

Average Day Demand

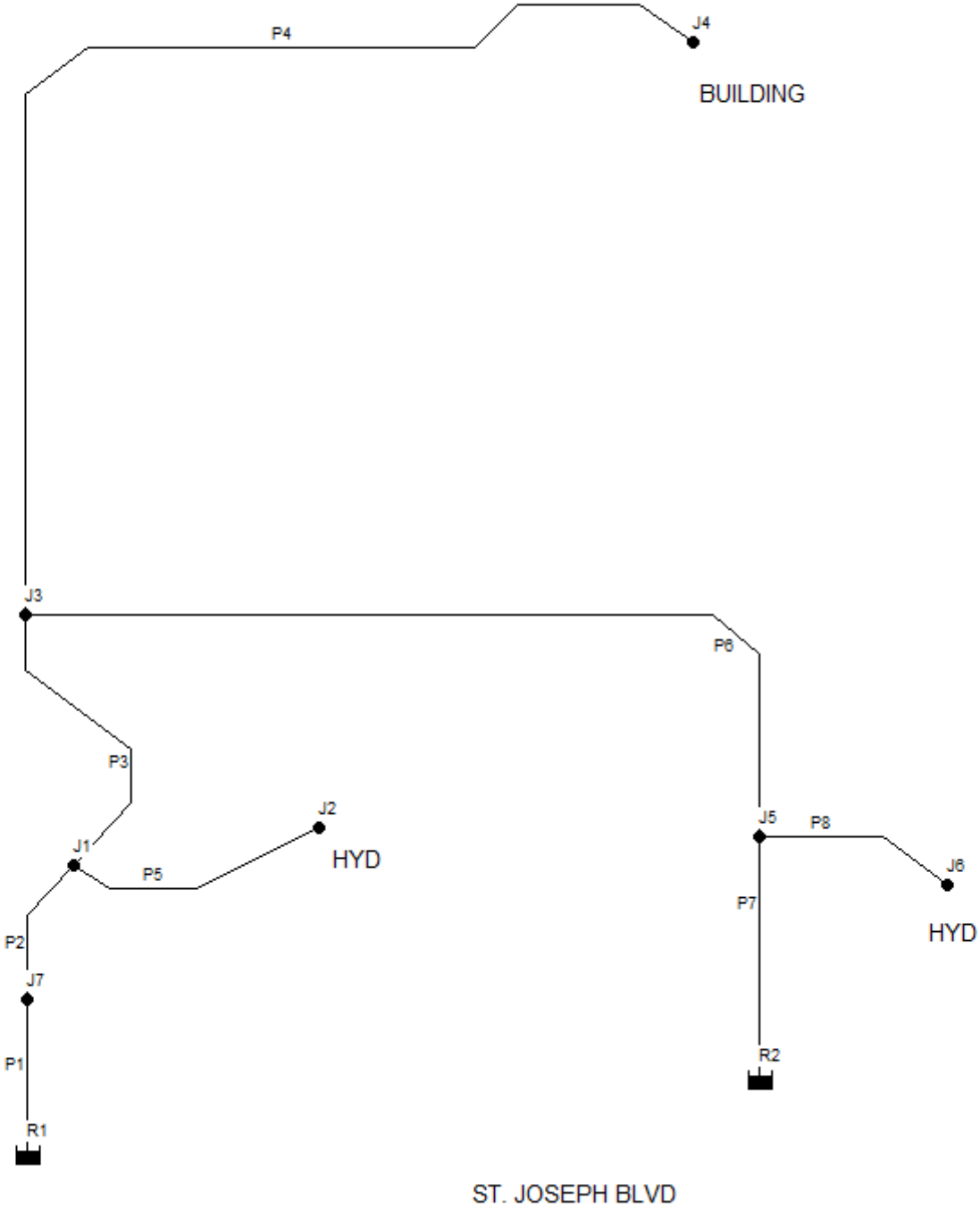
Network Table - Nodes

	Elevation	Demand	Head	Pressure		
Node ID	m	LPS	m	m	kPa	psi
Junc J1	79.45	0	115.2	35.75	350.7	50.9
Junc J2	79.25	0	115.2	35.95	352.7	51.2
Junc J3	79.1	0	115.2	36.1	354.1	51.4
Junc J4	77.9	1.04	115.2	37.3	365.9	53.1
Junc J5	78.65	0	115.2	36.55	358.6	52.0
Junc J6	78.5	0	115.2	36.7	360.0	52.2
Junc J7	78.6	0	115.2	36.6	359.0	52.1
Resvr R1	115.2	-0.64	115.2	0		
Resvr R2	115.2	-0.4	115.2	0		

Network Table - Links

	Length	Diameter	Roughness	Flow	Velocity	Unit Headloss
Link ID	m	mm		LPS	m/s	m/km
Pipe P1	10.1	300	120	0.64	0.0	0.0
Pipe P2	18.7	200	110	0.64	0.0	0.0
Pipe P3	17.7	200	110	0.64	0.0	0.0
Pipe P4	118	200	110	1.04	0.0	0.0
Pipe P5	20	150	100	0	0.0	0.0
Pipe P6	72	200	110	-0.4	0.0	0.0
Pipe P7	15.8	200	110	-0.4	0.0	0.0
Pipe P8	11.8	150	100	0	0.0	0.0

1533 & 1541 ST. JOSEPH BLVD
WATERMAIN NETWORK



Miro Savic

From: Charie, Kelsey <kelsey.charie@ottawa.ca>
Sent: Friday, August 22, 2025 3:22 PM
To: Miro Savic
Cc: Francois Thauvette
Subject: RE: 1533 St. Joseph Boulevard - Water Boundary Conditions Request
Attachments: 1533 St. Joseph Blvd August 2025.pdf

Hi Miro,

Here are the results from water resources!

Have a great weekend,
Kelsey

The following are boundary conditions, HGL, for hydraulic analysis at 1533 St. Joseph Blvd (zone 1E) assumed to be connected via two connections to the 406 mm watermain on St. Joseph Blvd (see attached PDF for location).

Both Connections:
Minimum HGL: 111.4 m
Maximum HGL: 115.2 m
Max Day + Fire Flow (117 L/s): 113.1 (Connection 1), 113.0m (Connection 2)

These are for current conditions and are based on computer model simulation.

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.
"The IWSD has recently updated their water modelling software. Any significant difference between previously received BC results and newly received BC results could be attributed to this update."

From: Miro Savic <m.savic@novatech-eng.com>
Sent: August 19, 2025 2:16 PM
To: Charie, Kelsey <kelsey.charie@ottawa.ca>
Cc: f.thauvette <f.thauvette@novatech-eng.com>
Subject: RE: 1533 St. Joseph Boulevard - Water Boundary Conditions Request

Please do as we are aiming to make SPA submission next week.

Thank you,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 205

From: Charie, Kelsey <kelsey.charie@ottawa.ca>
Sent: Tuesday, August 19, 2025 2:12 PM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: RE: 1533 St. Joseph Boulevard - Water Boundary Conditions Request

Thanks Miro,

Yes that looks like what they need. I'll get this off to them right away.

Kelsey

From: Miro Savic <m.savic@novatech-eng.com>
Sent: August 19, 2025 1:43 PM
To: Charie, Kelsey <kelsey.charie@ottawa.ca>
Cc: f.thauvette <f.thauvette@novatech-eng.com>
Subject: RE: 1533 St. Joseph Boulevard - Water Boundary Conditions Request

Hi Kelsey,

Attached are the updated water demands with the 164 beds in the existing facility removed from the calculations. Is this what the water resources are looking for?

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 205

From: Charie, Kelsey <kelsey.charie@ottawa.ca>
Sent: Tuesday, August 19, 2025 10:42 AM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: Francois Thauvette <f.thauvette@novatech-eng.com>
Subject: RE: 1533 St. Joseph Boulevard - Water Boundary Conditions Request

Hi Miro,

Water Resources got back to me and has requested the removal of the existing demands and only account for proposed demand, since their water model already takes existing demands into account.

If you can get me the revised water demands, I'll make sure Water Resources processes the request asap.

Thanks,

Kelsey Charie
Project Manager | Gestionnaire de projet
Development Review - East Branch | Direction de l'examen des projets d'aménagement, Est
Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
110 Laurier Avenue West | 110 avenue Laurier ouest
City of Ottawa | Ville d'Ottawa

From: Adams, Reed <reed.adams@ottawa.ca>
Sent: August 08, 2025 9:51 AM
To: Miro Savic <m.savic@novatech-eng.com>
Cc: f.thauvette <f.thauvette@novatech-eng.com>; Charie, Kelsey <kelsey.charie@ottawa.ca>
Subject: Re: 1533 St. Joseph Boulevard - Water Boundary Conditions Request

Hi Miro,

Thanks for sending this over. I've cc'd Kelsey Charie who is the engineering lead on this file. He'll be getting back to you within 10 business days when the water resources team provides us with boundary conditions.

Thanks again,

Reed

From: Miro Savic <m.savic@novatech-eng.com>
Sent: Thursday, August 7, 2025 2:02 PM
To: Adams, Reed <reed.adams@ottawa.ca>
Cc: f.thauvette <f.thauvette@novatech-eng.com>
Subject: 1533 St. Joseph Boulevard - Water Boundary Conditions Request

Hello Reed,

I'm writing to request water boundary conditions for the proposed Bilberry Creek Long Term Care Home development located at 1533&1541 St. Joseph Boulevard.

The proposed development consists of a new 2-storey building addition and redevelopment of the existing 3-store long terms care facility.

The existing facility is serviced by a single 203mm watermain feed connected to the existing 305mm watermain stub connected to the 1220mm trunk watermain in St. Joseph Boulevard.

Since the daily water demand for the proposed development will exceed 50m^3, a second water service is proposed to be looped through the site and connected to the existing 406mm watermain in St. Joseph Boulevard.

Refer to the attached sketch showing the existing water service and approximate location of the second water service connection.

The FUS fire flow and domestic water demands for the proposed development are estimated as follows:

- FUS Fire Flow = 117 L/s (7,000 L/min)
- Average Day Demand = 1.04 L/s
- Maximum Day Demand = 2.58 L/s
- Peak Hour Demand = 5.66 L/s

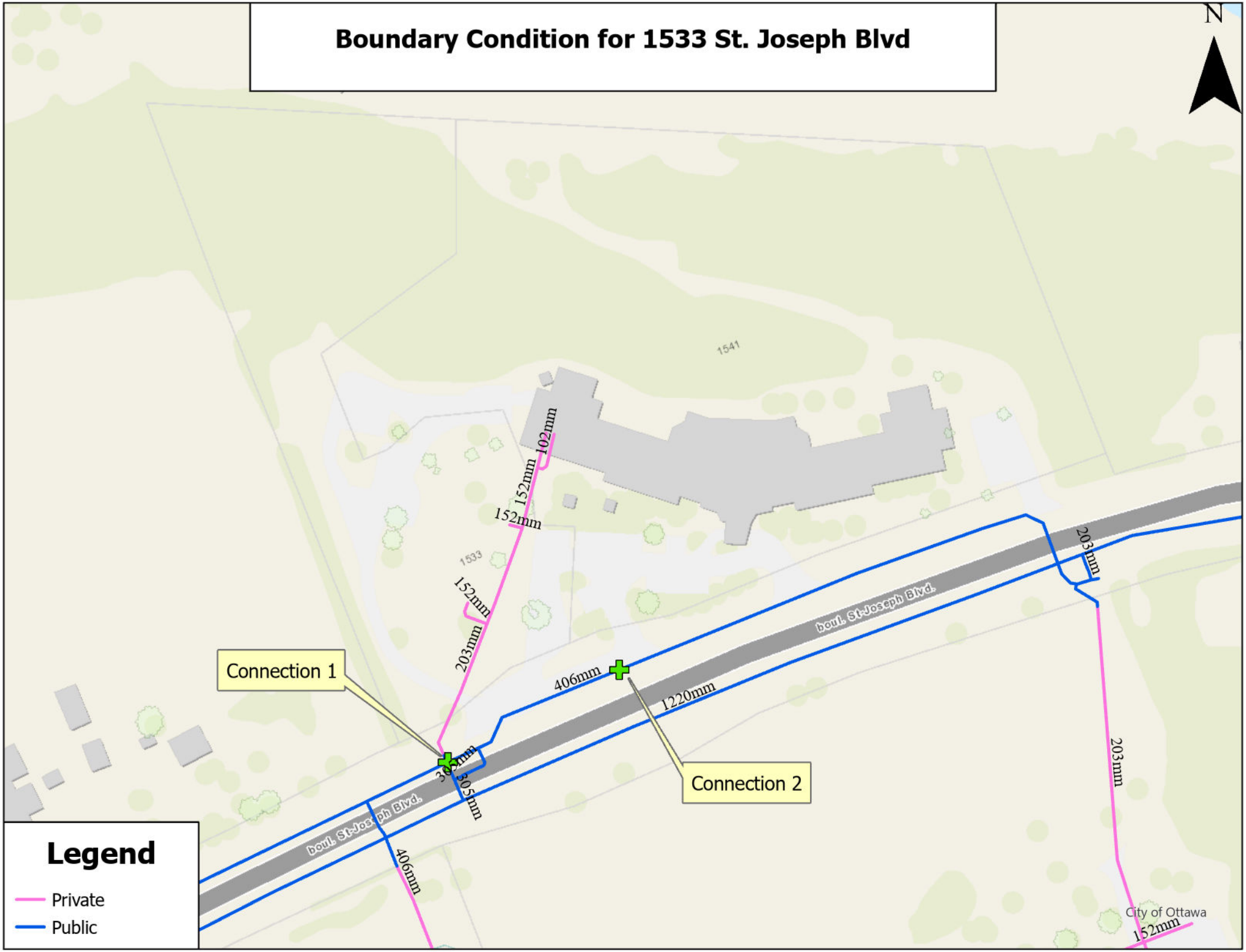
The FUS fire flow and domestic water demand calculations are attached.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867


Boundary Condition for 1533 St. Joseph Blvd
N
1541
1533
102mm
152mm
152mm
152mm
203mm
Connection 1
406mm
1220mm
boul. St-Joseph Blvd.
203mm
Connection 2
305mm
305mm
boul. St-Joseph Blvd.
406mm
203mm
City of Ottawa
152mm
Legend
Private
Public

APPENDIX D

Sanitary Flow Calculation

BILBERRY CREEK LONG TERM CARE HOME
1533 & 1541 ST. JOSEPH BOULEVARD
SANITARY FLOW

Existing Facility Number of Beds	160	
Proposed Addition Number of Beds	64	
Persons per Bed	1.4	
Total Population	314	
Average Daily Flow	280	L/c/day
Peak Factor (Harmon Formula)	3.5	
Peak Residential Flow	**3.56**	**L/s**
Number of Employees	32	
Average Daily Flow per Employee	75	L/c/day
Peak Factor	1.5	
Peak Commercial Flow	**0.04**	**L/s**
Site Area	1.6	ha
Infiltration Allowance	0.33	L/s/ha
Peak Extraneous Flow	**0.53**	**L/s**
Total Peak Sanitary Flow	**4.13**	**L/s**

Miro Savic

From: Charie, Kelsey <kelsey.charie@ottawa.ca>
Sent: Tuesday, August 12, 2025 8:52 AM
To: Miro Savic
Cc: Francois Thauvette
Subject: RE: 1533 & 1541 St. Joseph Boulevard - Downstream Sanitary Capacity

Hi Miro,

Asset Management has confirmed that there is capacity in the sanitary system for the proposed increase of 1.0 L/s.

I'll let know when I hear back from Water Resources.

Regards,

Kelsey Charie
Project Manager | Gestionnaire de projet
Development Review - East Branch | Direction de l'examen des projets d'aménagement, Est
Planning, Development and Building Services Department (PDBS) | Direction générale des services de la planification, de l'aménagement et du bâtiment (DGSPAB)
110 Laurier Avenue West | 110 avenue Laurier ouest
City of Ottawa | Ville d'Ottawa

From: Miro Savic <m.savic@novatech-eng.com>
Sent: August 08, 2025 1:04 PM
To: Charie, Kelsey <kelsey.charie@ottawa.ca>
Cc: f.thauvette <f.thauvette@novatech-eng.com>
Subject: 1533 & 1541 St. Joseph Boulevard - Downstream Sanitary Capacity

Hello Kelsey,

I'm writing to confirm if there are any capacity constraints in the municipal sanitary sewer system to accommodate the proposed development at 1533 & 1541 St. Joseph Boulevard.

The proposed development consists of a new 2-storey building addition and redevelopment of the existing 3-storey long term care facility. The proposed building addition will add 64 beds to the 160 beds in the existing long term care home. See the attached preliminary site plan for details.

The existing site is serviced with a 200mm diameter sanitary sewer connected to the existing 375mm sanitary sewer in St. joseph Boulevard. Three 150mm diameter sanitary services are extended to the existing building. See snipped for GeoOttawa showing the existing sanitary infrastructure below. A new sanitary service bill be provided for the new building addition and connected to the existing 200mm sanitary sewer currently servicing the site.

The peak sanitary flow for the proposed development is estimated to be 4.1L/s. Detailed calculations are attached. The proposed addition will increase the peak sanitary flow from the site compered to existing conditions for approximately 1.0 L/s.

Can the city please confirm if there are any capacity constraints in the municipal sanitary sewer system downstream of the site.

Regards,

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering
NOVATECH
Engineers, Planners & Landscape Architects

APPENDIX E

Storm Sewer and Stormwater Management Calculations

1533 & 1541 St Joseph Blvd
1:5 yr Storm Design Sheet

NOVATECH
Engineers, Planners & Landscape Architects

PROJECT NO: 125033
DESIGNED BY: LC
CHECKED BY: MS
DATE: July 15, 2025

AREA	FROM MH	TO MH	AREA (ha)			INDIV 2.78 AC	ACCUM 2.78 AC	TIME OF CONC. (min)	RAINFALL INTENSITY (mm/hr)	CONTROLLED FLOW* Q (L/s)	PEAK FLOW Q (L/s)	PROPOSED SEWER								
			Total Area	C= 0.20	C = 0.90							TYPE OF PIPE	PIPE SIZE (mm)	PIPE ID (mm)	GRADE (%)	LENGTH (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min)	PERCENTAGE OF CAPACITY
A-1	CB 20	CBMH 200	0.080	0.032	0.048	0.14	0.14	10.00	104.19		14.4	PVC	250	254.0	0.80	40.0	**55.5**	1.10	0.61	26%
A-2	CBMH 200	CBMH 206	0.061	0.025	0.036	0.10	0.24	10.61	101.08		24.4	PVC	300	304.8	0.35	65.3	**59.7**	0.82	1.33	41%
A-3	CB 25	CBMH 205	0.014	0.006	0.008	0.02	0.02	10.00	104.19		2.4	PVC	250	254.0	0.50	12.2	**43.9**	0.87	0.23	6%
A-4	CBMH 205	CBMH 206	0.023	0.010	0.013	0.04	0.06	10.23	102.97		6.3	PVC	250	254.0	0.50	22.5	**43.9**	0.87	0.43	14%
A-5	CBMH 206	STMMH 207	0.135	0.034	0.101	0.27	0.57	11.94	94.96		54.6	PVC	375	381.0	0.30	34.3	**100.2**	0.88	0.65	54%
	STMMH 207	HW 2					0.57	12.59	92.25		53.0	PVC	375	381.0	0.30	5.4	**100.2**	0.88	0.10	53%
A-11	CB 27	CBMH 201	0.085	0.009	0.076	0.20	0.20	10.00	104.19		20.3	PVC	250	254.0	0.50	41.4	**43.9**	0.87	0.80	46%
A-12	CB 21	MAIN	0.079	0.024	0.055	0.15	0.15	10.00	104.19		15.7	PVC	250	254.0	0.50	23.8	**43.9**	0.87	0.46	36%
A-13	CBMH 201	CHAMBER	0.077	0.014	0.063	0.17	0.51	10.80	100.16		51.2	PVC	300	304.8	0.50	12.1	**71.3**	0.98	0.21	72%
A-14	CB 24	CBMH 202	0.037	0.016	0.021	0.06	0.06	10.00	104.19		6.4	PVC	250	254.0	0.50	11.8	**43.9**	0.87	0.23	15%
A-15	CBMH 202	CBMH 203	0.013	0.006	0.007	0.02	0.08	10.23	103.01		8.5	PVC	250	254.0	0.50	15.6	**43.9**	0.87	0.30	19%
A-16	CBMH 203	CHAMBER	0.022	0.014	0.008	0.03	0.11	10.53	101.49		11.2	PVC	250	254.0	0.50	9.6	**43.9**	0.87	0.18	25%

NOTES:
1) Refer to Novatech Drawing 125033-GP for storm structure designations, storm pipe details and control structure tables.
2) Refer to Novatech Drawing 125033-STM for the on-site tributary drainage areas

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

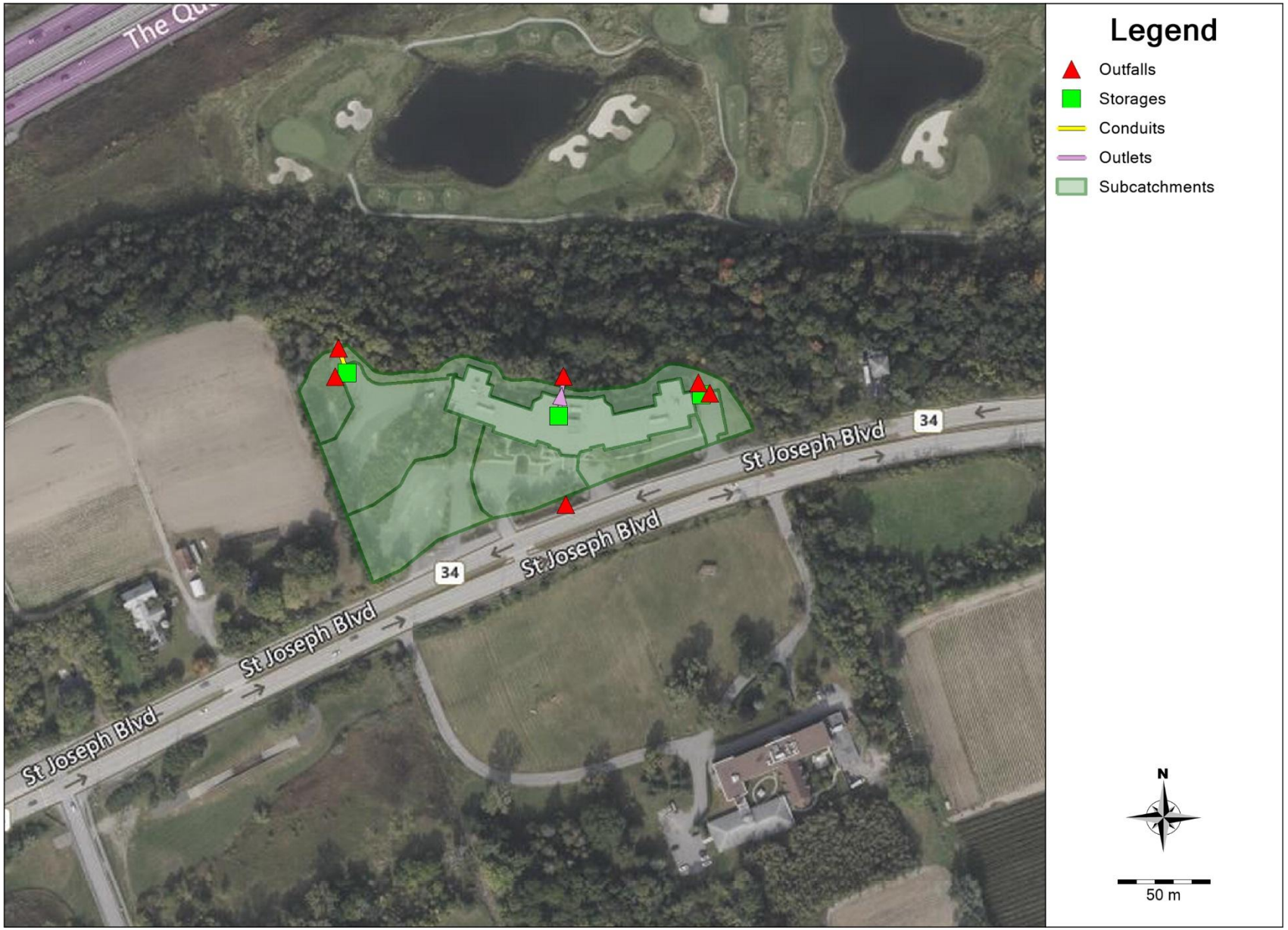
Notes:

1) City of Ottawa Rainfall-Intensity Curve
2) Min Velocity = 0.80 m/sec.
3) 5 year Intensity = 998.071 / (Time in min + 6.053) $^{0.814}$

1533 & 1541 St. Joseph Boulevard – Bilberry Creek (125033)
Pre-Development PCSWMM Model Schematic

NOVATECH
Engineers, Planners & Landscape Architects

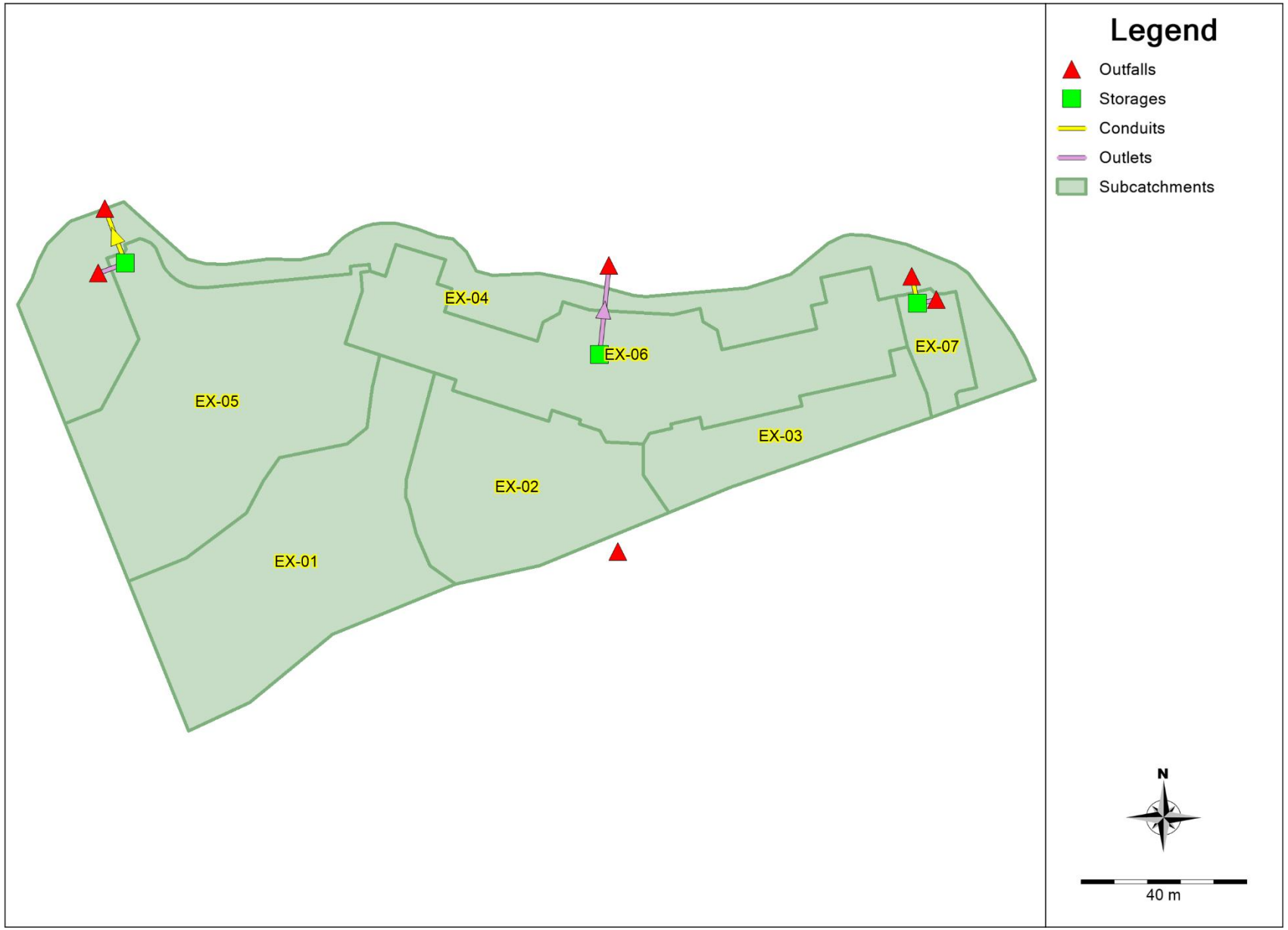
Overall Model Schematic



1533 & 1541 St. Joseph Boulevard – Bilberry Creek (125033)
Pre-Development PCSWMM Model Schematic

NOVATECH
Engineers, Planners & Landscape Architects

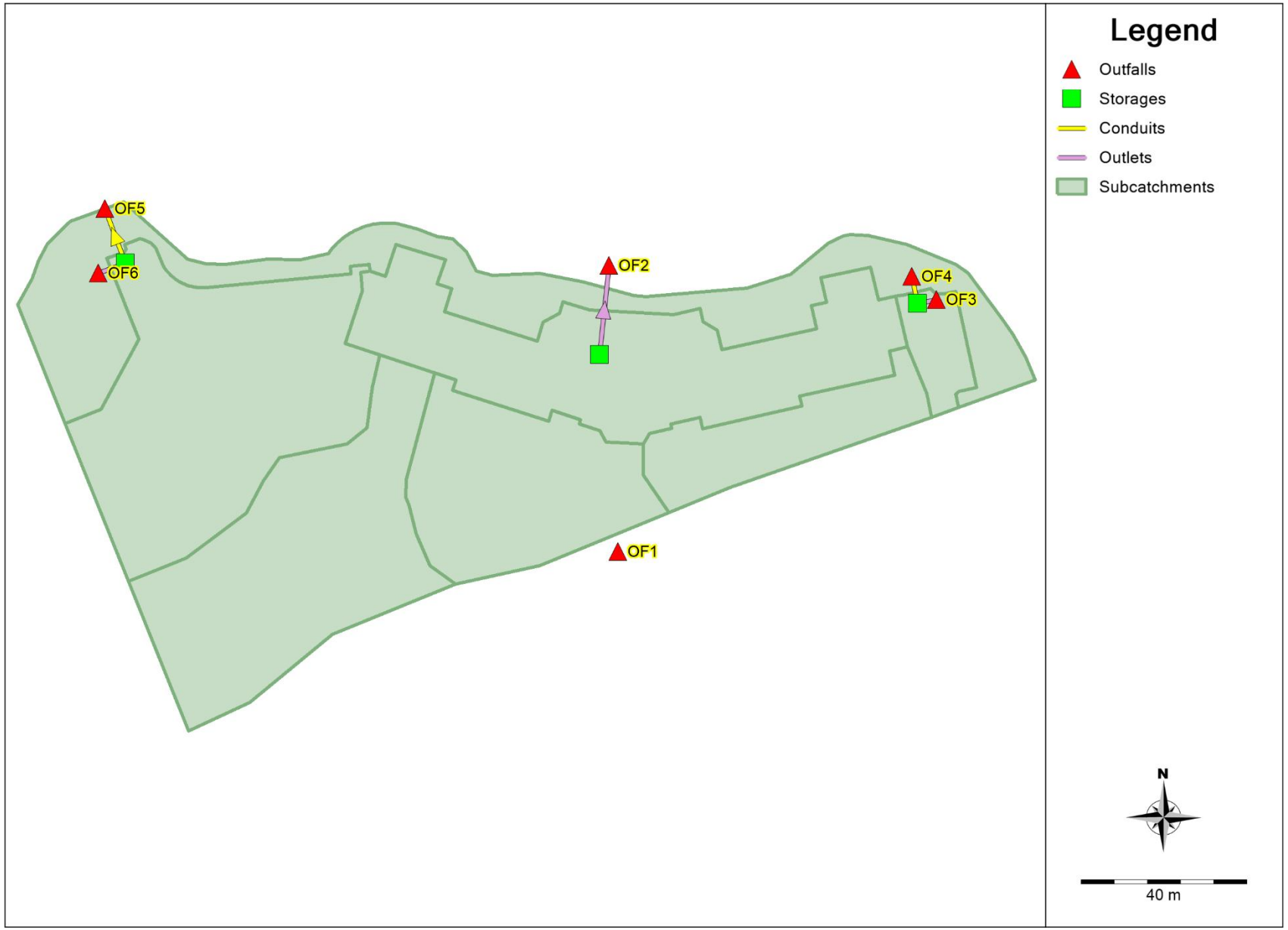
Catchment IDs



1533 & 1541 St. Joseph Boulevard – Bilberry Creek (125033)
Pre-Development PCSWMM Model Schematic

NOVATECH
Engineers, Planners & Landscape Architects

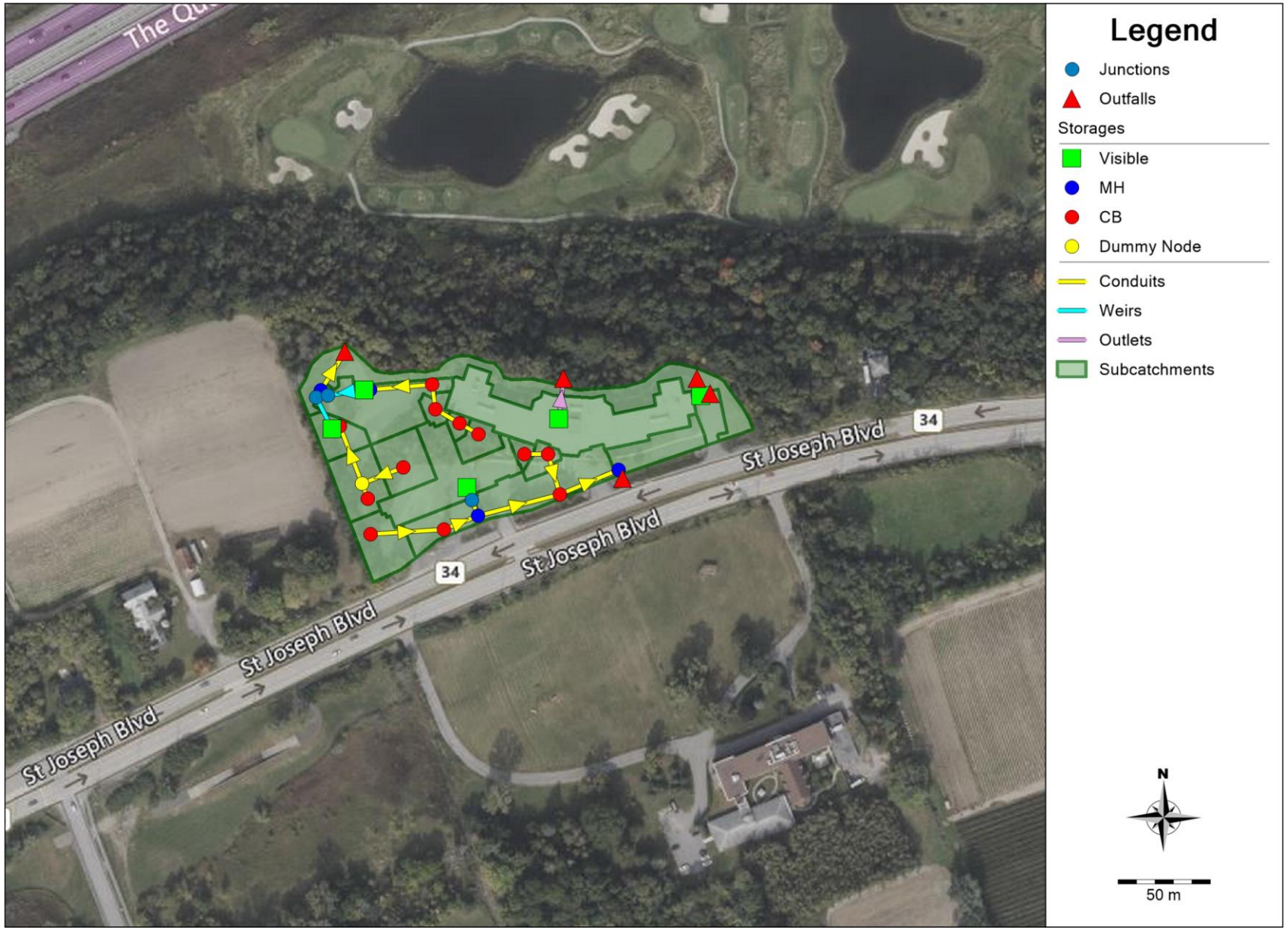
Outfalls



1533 & 1541 St. Joseph Boulevard – Bilberry Creek (125033)
Post-Development PCSWMM Model Schematic

NOVATECH
Engineers, Planners & Landscape Architects

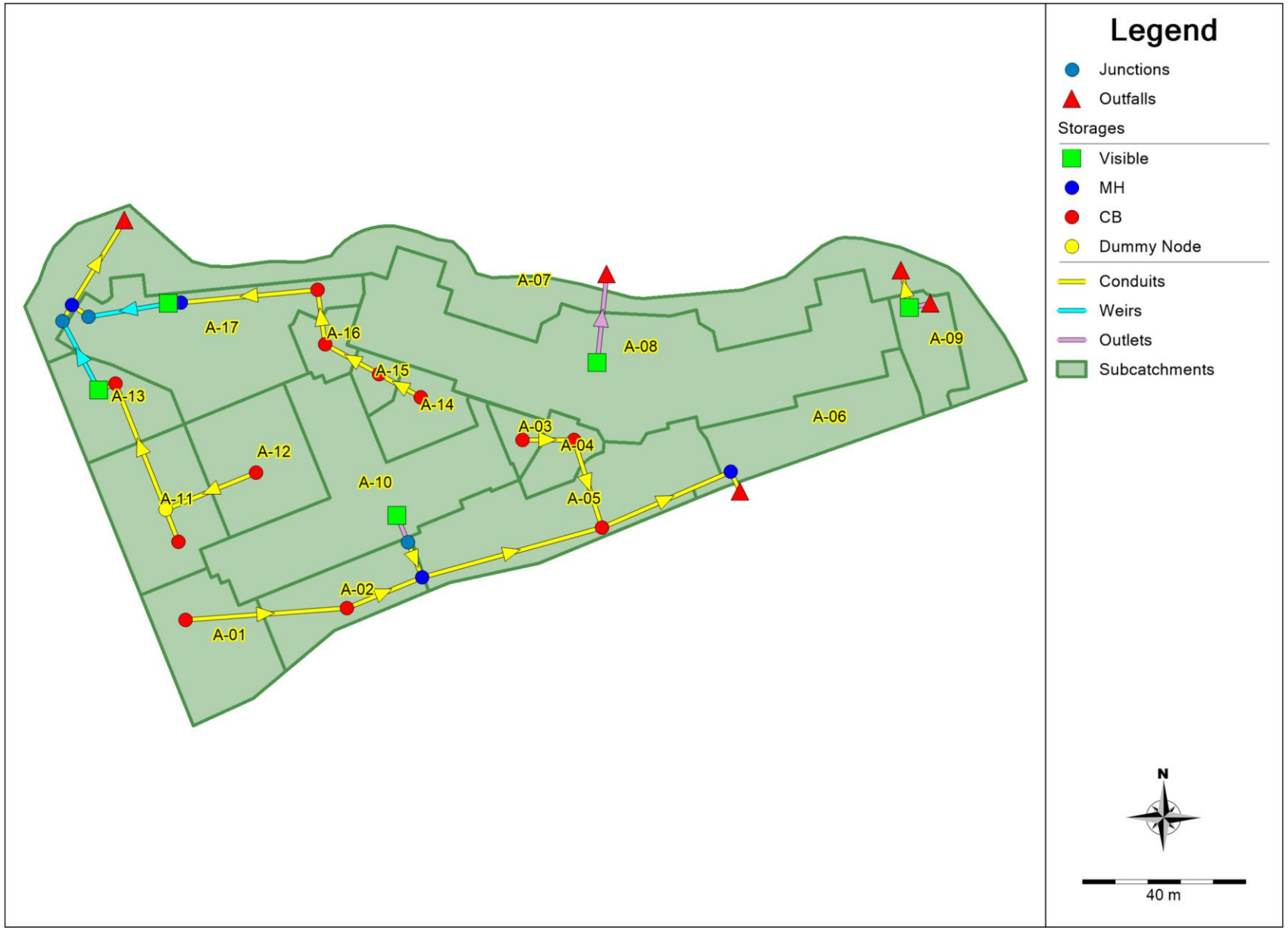
Overall Model Schematic



1533 & 1541 St. Joseph Boulevard – Bilberry Creek (125033)
Post-Development PCSWMM Model Schematic

NOVATECH
Engineers, Planners & Landscape Architects

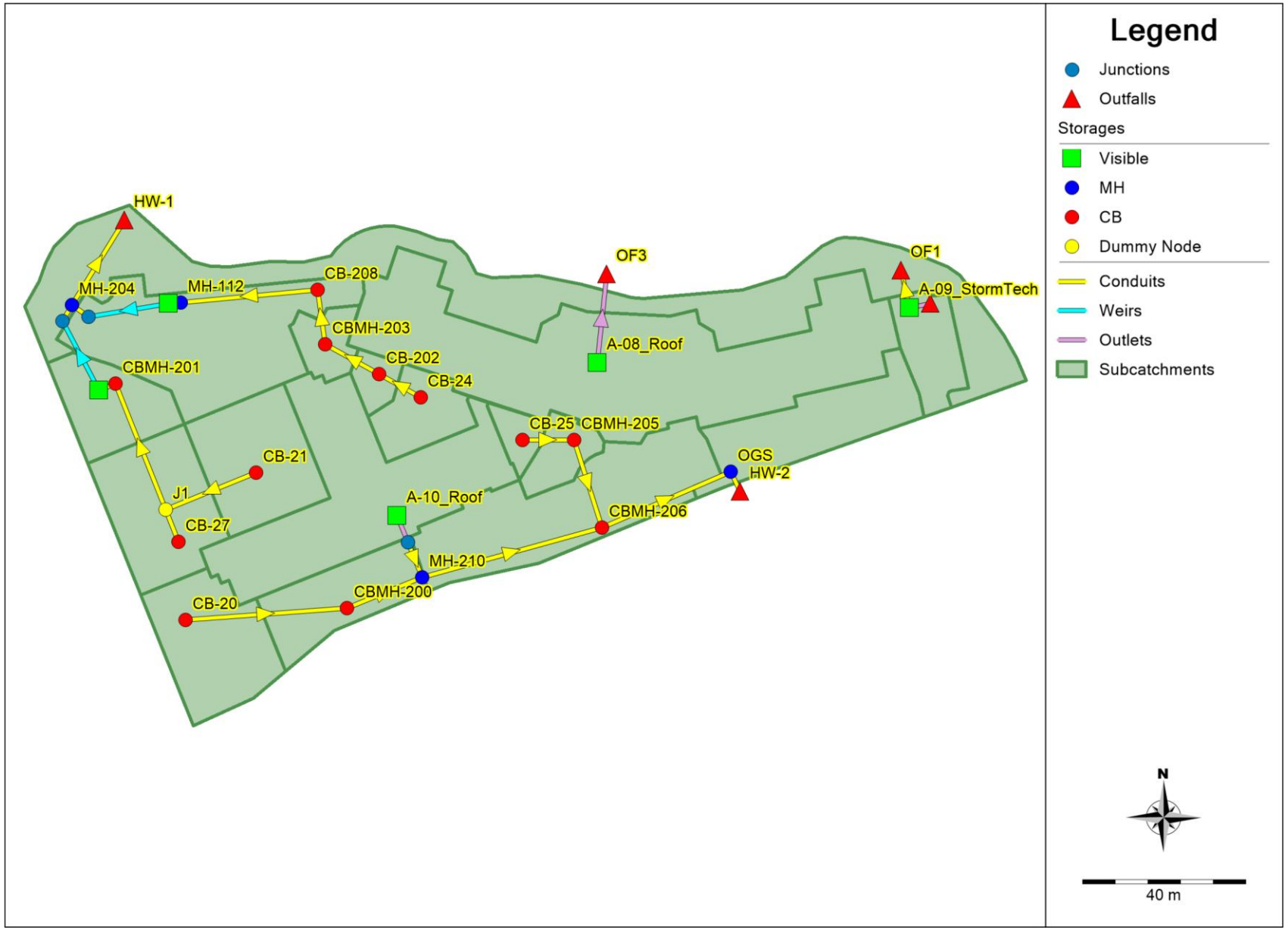
Catchment IDs



1533 & 1541 St. Joseph Boulevard – Bilberry Creek (125033)
Post-Development PCSWMM Model Schematic

NOVATECH
Engineers, Planners & Landscape Architects

Catchbasins, Manholes, Storages & Outfalls



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

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 7
Number of nodes ........... 9
Number of links ........... 5
Number of pollutants ...... 0
Number of land uses ....... 0


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


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------------------
EX-01                       0.31     42.00     31.00    2.0000 Raingage             OF1
EX-02                       0.20     28.00     69.00    2.0000 Raingage             OF1
EX-03                       0.11     36.00     34.00    2.0000 Raingage             OF1
EX-04                       0.30    104.00      9.00    5.0000 Raingage             OF2
EX-05                       0.35     42.00     57.00    3.0000 Raingage             EX-05_StormTech
EX-06                       0.30    178.00    100.00    1.5000 Raingage             EX-06_Roof
EX-07                       0.04     14.00    100.00    6.0000 Raingage             EX-07_StormTech


************
```

```
Node Summary
************
                                       Invert      Max.    Ponded    External
Name                 Type                Elev.     Depth      Area    Inflow
-------------------------------------------------------------------------------
OF1                  OUTFALL              0.00      0.00       0.0
OF2                  OUTFALL             88.45      0.00       0.0
OF3                  OUTFALL             73.33      0.00       0.0
OF4                  OUTFALL             74.75      0.15       0.0
OF5                  OUTFALL             77.00      0.15       0.0
OF6                  OUTFALL             75.50      0.00       0.0
EX-05_StormTech      STORAGE             75.50      2.38       0.0
EX-06_Roof           STORAGE             88.45      0.15       0.0
EX-07_StormTech      STORAGE             73.33      2.65       0.0


************
Link Summary
************
Name              From Node        To Node          Type            Length    %Slope Roughness
-----------------------------------------------------------------------------------------------
C1                EX-07_StormTech  OF4              CONDUIT           10.0   10.8635    0.0130
C2                EX-05_StormTech  OF5              CONDUIT           10.0    7.3195    0.0130
EX-05_StormTech_Infil EX-05_StormTech  OF6              OUTLET
EX-06_Roof_Drains EX-06_Roof       OF2              OUTLET
EX-07_StormTech_Infil EX-07_StormTech  OF3              OUTLET


**********************
Cross Section Summary
**********************
                                    Full     Full     Hyd.     Max.   No. of     Full
Conduit           Shape            Depth     Area     Rad.    Width  Barrels     Flow
-----------------------------------------------------------------------------------------
C1                RECT_OPEN         0.15     0.45     0.14     3.00        1  3022.83
C2                RECT_OPEN         0.15     0.45     0.14     3.00        1  2481.24


****************
```

```
Analysis Options
*****************
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... DYNWAVE
Surcharge Method ..... EXTRAN
Starting Date ..... 08/14/2025 00:00:00
Ending Date ..... 08/15/2025 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 ..... 1
Head Tolerance ..... 0.001500 m


**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.132        82.323
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.042        26.084
Surface Runoff ...........         0.090        55.774
Final Storage ............         0.001         0.522
Continuity Error (%) .....        -0.070

**************************        Volume        Volume
```

```
Flow Routing Continuity        hectare-m      10^6 ltr
**************************     ---------     ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.090         0.897
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.085         0.849
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 ......         0.005         0.048
Continuity Error (%) .....        -0.008


***************************
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      :   100.00 %
      0.871 -  0.758 sec      :     0.00 %
      0.758 -  0.660 sec      :     0.00 %
      0.660 -  0.574 sec      :     0.00 %
      0.574 -  0.500 sec      :     0.00 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  ------------------------------------------------------------------------------------------------------------------------
----
                          Total      Total      Total      Total     Imperv       Perv      Total       Total      Peak
Runoff
                         Precip      Runon       Evap      Infil    Runoff     Runoff     Runoff      Runoff    Runoff
Coeff
  Subcatchment               mm         mm         mm         mm         mm         mm         mm    10^6 ltr       LPS
  ------------------------------------------------------------------------------------------------------------------------
----
  EX-01                   82.32       0.00       0.00      38.70      25.06      18.11      43.17        0.13     79.22
0.524
  EX-02                   82.32       0.00       0.00      16.71      55.76       8.82      64.58        0.13     84.22
0.784
  EX-03                   82.32       0.00       0.00      35.45      27.49      18.91      46.40        0.05     37.71
0.564
  EX-04                   82.32       0.00       0.00      48.64       7.27      26.32      33.59        0.10     96.05
0.408
  EX-05                   82.32       0.00       0.00      23.46      46.07      11.96      58.02        0.21    133.52
0.705
  EX-06                   82.32       0.00       0.00       0.00      82.42       0.00      82.42        0.25    150.29
1.001
  EX-07                   82.32       0.00       0.00       0.00      80.86       0.00      80.86        0.03     18.35
0.982
```

```
  ******************
  Node Depth Summary
  ******************

  ---------------------------------------------------------------------------
                            Average  Maximum  Maximum  Time of Max    Reported
                              Depth    Depth      HGL   Occurrence   Max Depth
  Node                 Type    Meters   Meters   Meters  days hr:min      Meters
  ---------------------------------------------------------------------------
  OF1                  OUTFALL   0.00     0.00     0.00     0  00:00        0.00
  OF2                  OUTFALL   0.00     0.00    88.45     0  00:00        0.00
  OF3                  OUTFALL   0.00     0.00    73.33     0  00:00        0.00
  OF4                  OUTFALL   0.00     0.00    74.75     0  00:00        0.00
  OF5                  OUTFALL   0.00     0.03    77.03     0  02:10        0.03
  OF6                  OUTFALL   0.00     0.00    75.50     0  00:00        0.00
  EX-05_StormTech      STORAGE   1.61     2.26    77.76     0  02:05        2.26
  EX-06_Roof           STORAGE   0.02     0.13    88.58     0  02:31        0.13
  EX-07_StormTech      STORAGE   1.01     1.40    74.73     0  06:11        1.40


  ******************
  Node Inflow Summary
  ******************

  ------------------------------------------------------------------------------------------------
                            Maximum  Maximum                  Lateral       Total        Flow
                            Lateral    Total  Time of Max      Inflow      Inflow     Balance
                             Inflow   Inflow   Occurrence      Volume      Volume       Error
  Node                 Type     LPS      LPS  days hr:min    10^6 ltr    10^6 ltr     Percent
  ------------------------------------------------------------------------------------------------
  OF1                  OUTFALL  201.16   201.16     0  02:10       0.311       0.311       0.000
  OF2                  OUTFALL   96.05   109.68     0  02:10       0.101       0.351       0.000
  OF3                  OUTFALL    0.00     0.20     0  00:42           0      0.0168       0.000
  OF4                  OUTFALL    0.00     0.00     0  00:00           0           0       0.000 ltr
  OF5                  OUTFALL    0.00   133.11     0  02:10           0       0.146       0.000
  OF6                  OUTFALL    0.00     0.30     0  00:48           0      0.0251       0.000
  EX-05_StormTech      STORAGE  133.52   133.52     0  02:10       0.205       0.205      -0.034
  EX-06_Roof           STORAGE  150.29   150.29     0  02:10        0.25        0.25       0.000
  EX-07_StormTech      STORAGE   18.35    18.35     0  02:10      0.0299      0.0299       0.006
```

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
EX-05_StormTech	0.042	80.0	0.0	0.0	0.053	100.0	0 02:05	133.41
EX-06_Roof	0.026	15.6	0.0	0.0	0.148	89.5	0 02:31	18.15
EX-07_StormTech	0.019	51.7	0.0	0.0	0.026	71.8	0 06:11	0.20

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF1	27.34	13.15	201.16	0.311
OF2	83.92	4.83	109.68	0.351
OF3	97.15	0.20	0.20	0.017
OF4	0.00	0.00	0.00	0.000
OF5	17.91	9.42	133.11	0.146
OF6	97.02	0.30	0.30	0.025
System	53.89	27.90	444.40	0.849

****
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
C2	CONDUIT	133.11	0 02:10	1.77	0.05	0.17
EX-05_StormTech_Infil	DUMMY	0.30	0 00:48			
EX-06_Roof_Drains	DUMMY	18.15	0 02:31			
EX-07_StormTech_Infil	DUMMY	0.20	0 00:42			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.82	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00

```
************************
Conduit Surcharge Summary
************************

No conduits were surcharged.


Analysis begun on:  Tue Sep  9 15:24:08 2025
Analysis ended on:  Tue Sep  9 15:24:08 2025
Total elapsed time: < 1 sec
```

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

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 17
Number of nodes ........... 30
Number of links ........... 26
Number of pollutants ...... 0
Number of land uses ....... 0


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


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------------
A-01                        0.08     32.00     60.00    2.0000 Raingage             CB-20
A-02                        0.06     28.00     39.00    1.5000 Raingage             CBMH-200
A-03                        0.01     12.00     57.00    2.0000 Raingage             CB-25
A-04                        0.02     13.00     57.00    2.0000 Raingage             CBMH-205
A-05                        0.14     29.00     74.00    2.0000 Raingage             CBMH-206
A-06                        0.08     26.00     14.00    2.0000 Raingage             HW-2
A-07                        0.27     92.00     16.00    5.0000 Raingage             OF3
A-08                        0.30    178.00    100.00    1.5000 Raingage             A-08_Roof
A-09                        0.04     14.00    100.00    6.0000 Raingage             A-09_StormTech
A-10                        0.17    157.00    100.00    2.0000 Raingage             A-10_Roof
```

```
A-11                        0.08     29.00     90.00    1.5000 Raingage             CB-27
A-12                        0.08     34.00     70.00    1.5000 Raingage             CB-21
A-13                        0.05     26.00     81.00    2.5000 Raingage             CBMH-201
A-14                        0.04     21.00     57.00    3.5000 Raingage             CB-24
A-15                        0.01     12.00     57.00    3.5000 Raingage             CB-202
A-16                        0.02     17.00     36.00    3.5000 Raingage             CBMH-203
A-17                        0.15     30.00     76.00    2.0000 Raingage             CB-208


************
Node Summary
************
                                       Invert      Max.    Ponded    External
Name                 Type                Elev.     Depth      Area    Inflow
-------------------------------------------------------------------------------
259_(STM)            JUNCTION            76.63      2.17       0.0
J2                   JUNCTION            76.51      2.17       0.0
J3                   JUNCTION            75.99      2.69       0.0
HW-1                 OUTFALL             75.85      0.38       0.0
HW-2                 OUTFALL             76.07      0.38       0.0
OF1                  OUTFALL             74.75      0.15       0.0
OF2                  OUTFALL             73.33      0.00       0.0
OF3                  OUTFALL             88.45      0.00       0.0
A-08_Roof            STORAGE             88.45      0.15       0.0
A-09_StormTech       STORAGE             73.33      2.65       0.0
A-10_Roof            STORAGE             80.00      0.15       0.0
CB-20                STORAGE             76.89      1.76       0.0
CB-202               STORAGE             76.46      1.24       0.0
CB-208               STORAGE             76.30      1.40       0.0
CB-21                STORAGE             76.90      1.75       0.0
CB-24                STORAGE             76.51      1.34       0.0
CB-25                STORAGE             76.55      1.20       0.0
CB-27                STORAGE             76.80      1.85       0.0
CBMH-200             STORAGE             76.56      1.99       0.0
CBMH-201             STORAGE             76.54      2.06       0.0
CBMH-203             STORAGE             76.40      1.39       0.0
CBMH-205             STORAGE             76.48      1.27       0.0
CBMH-206             STORAGE             76.24      1.31       0.0
J1                   STORAGE             76.76      1.88       0.0
```

MH-112	STORAGE	76.00	2.07	0.0
MH-204	STORAGE	75.91	2.77	0.0
MH-210	STORAGE	76.48	2.32	0.0
OGS	STORAGE	76.09	1.41	0.0
StormTech_1	STORAGE	75.44	3.16	0.0
StormTech_2	STORAGE	75.00	3.07	0.0

****
Link Summary
****

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	A-09_StormTech	OF1	CONDUIT	10.0	10.8635	0.0130
STM-100_(STM)	CBMH-203	CB-208	CONDUIT	13.5	0.2972	0.0130
STM-101_(STM)	CB-202	CBMH-203	CONDUIT	15.1	0.3318	0.0130
STM-102_(STM)	CBMH-205	CBMH-206	CONDUIT	22.5	0.4898	0.0130
STM-103_(STM)	CBMH-206	OGS	CONDUIT	34.3	0.2913	0.0130
STM-104_(STM)	OGS	HW-2	CONDUIT	5.4	0.3731	0.0130
STM-105_(STM)	CB-24	CB-202	CONDUIT	11.6	0.3439	0.0130
STM-106_(STM)	CB-25	CBMH-205	CONDUIT	12.7	0.4721	0.0130
STM-107_(STM)	CB-20	CBMH-200	CONDUIT	39.6	0.8077	0.0130
STM-109_(1)_(STM)	MH-210	CBMH-206	CONDUIT	45.6	0.3508	0.0130
STM-109_(STM)	CBMH-200	MH-210	CONDUIT	19.9	0.3519	0.0130
STM-110_(STM)	CB-208	MH-112	CONDUIT	33.0	0.6669	0.0130
STM-123_(STM)	J3	MH-204	CONDUIT	5.0	0.4040	0.0130
STM-124_(STM)	MH-112	StormTech_2	CONDUIT	3.0	0.3311	0.0130
STM-127_(STM)	259_(STM)	MH-210	CONDUIT	9.1	0.9847	0.0130
STM-128_(STM)	J2	MH-204	CONDUIT	4.6	0.4376	0.0130
STM-92_(STM)	CB-21	J1	CONDUIT	23.7	0.5053	0.0130
STM-93_(STM)_1	CB-27	J1	CONDUIT	8.5	0.4946	0.0130
STM-93_(STM)_2	J1	CBMH-201	CONDUIT	32.9	0.5104	0.0130
STM-94_(STM)	CBMH-201	StormTech_1	CONDUIT	4.4	0.6772	0.0130
STM-95_(STM)	MH-204	HW-1	CONDUIT	24.2	0.2478	0.0130
W1	StormTech_1	J2	WEIR			
W2	StormTech_2	J3	WEIR			
A-08_Roof_Drains	A-08_Roof	OF3	OUTLET			
A-09_StormTech_Infil	A-09_StormTech	OF2	OUTLET			
A-10_Roof_Drains	A-10_Roof	259_(STM)	OUTLET			

****
Cross Section Summary
****

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	RECT_OPEN	0.15	0.45	0.14	3.00	1	3022.83
STM-100_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	32.42
STM-101_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	34.26
STM-102_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	41.62
STM-103_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	94.63
STM-104_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	107.11
STM-105_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	34.88
STM-106_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	40.86
STM-107_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	53.45
STM-109_(1)_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	57.28
STM-109_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	57.37
STM-110_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	78.97
STM-123_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	111.45
STM-124_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	100.90
STM-127_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	59.02
STM-128_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	116.00
STM-92_(STM)	CIRCULAR	0.25	0.05	0.06	0.25	1	42.27
STM-93_(STM)_1	CIRCULAR	0.25	0.05	0.06	0.25	1	41.82
STM-93_(STM)_2	CIRCULAR	0.25	0.05	0.06	0.25	1	42.49
STM-94_(STM)	CIRCULAR	0.30	0.07	0.07	0.30	1	79.58
STM-95_(STM)	CIRCULAR	0.38	0.11	0.09	0.38	1	87.29

****
Analysis Options
****
Flow Units ..... LPS
Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO

```
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Infiltration Method ...... HORTON
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 08/17/2025 00:00:00
Ending Date .............. 08/18/2025 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 ........ 1
Head Tolerance ........... 0.001500 m
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.132	82.323
Evaporation Loss	0.000	0.000
Infiltration Loss	0.028	17.376
Surface Runoff	0.104	64.435
Final Storage	0.001	0.593
Continuity Error (%)	-0.098	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.104	1.035
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000

External Outflow	0.080	0.799
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	0.023	0.234
Continuity Error (%)	0.242	

```
*************************
Highest Continuity Errors
*************************
Node J1 (1.97%)
Node CB-202 (1.80%)
Node CBMH-203 (1.76%)
Node CB-208 (1.55%)
Node MH-112 (1.17%)
```

```
***************************
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           :     0.01 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      :    99.34 %
      0.871 -  0.758 sec      :     0.54 %
      0.758 -  0.660 sec      :     0.04 %
      0.660 -  0.574 sec      :     0.02 %
      0.574 -  0.500 sec      :     0.07 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  ---------------------------------------------------------------------------------------------------------------------
----
                          Total      Total      Total      Total     Imperv       Perv      Total      Total      Peak
Runoff
                         Precip      Runon       Evap      Infil    Runoff     Runoff     Runoff     Runoff    Runoff
Coeff
  Subcatchment               mm         mm         mm         mm         mm         mm         mm   10^6 ltr       LPS
  ---------------------------------------------------------------------------------------------------------------------
----
  A-01                    82.32       0.00       0.00      21.13      48.51      11.82      60.33       0.05     35.50
0.733
  A-02                    82.32       0.00       0.00      32.53      31.54      17.71      49.25       0.03     23.44
0.598
  A-03                    82.32       0.00       0.00      22.51      46.09      12.93      59.02       0.01      6.47
0.717
  A-04                    82.32       0.00       0.00      22.62      46.09      12.81      58.90       0.01     10.37
0.716
  A-05                    82.32       0.00       0.00      13.79      59.81       7.63      67.44       0.09     61.60
0.819
  A-06                    82.32       0.00       0.00      46.62      11.32      24.20      35.52       0.03     21.31
0.432
```

```
  A-07                    82.32       0.00       0.00      44.81      12.93      24.38      37.32       0.10     91.44
0.453
  A-08                    82.32       0.00       0.00       0.00      82.42       0.00      82.42       0.25    150.29
1.001
  A-09                    82.32       0.00       0.00       0.00      80.86       0.00      80.86       0.03     18.35
0.982
  A-10                    82.32       0.00       0.00       0.00      82.43       0.00      82.43       0.14     85.81
1.001
  A-11                    82.32       0.00       0.00       5.22      72.75       3.03      75.77       0.06     41.60
0.920
  A-12                    82.32       0.00       0.00      15.79      56.59       8.92      65.52       0.05     36.59
0.796
  A-13                    82.32       0.00       0.00       9.92      65.49       5.75      71.24       0.04     25.14
0.865
  A-14                    82.32       0.00       0.00      22.54      46.10      12.90      58.99       0.02     17.00
0.717
  A-15                    82.32       0.00       0.00      22.45      46.09      13.00      59.09       0.01      6.07
0.718
  A-16                    82.32       0.00       0.00      33.58      29.10      19.16      48.26       0.01      9.64
0.586
  A-17                    82.32       0.00       0.00      12.72      61.43       7.05      68.48       0.10     68.08
0.832


  ******************
  Node Depth Summary
  ******************

  ------------------------------------------------------------------------------
                               Average  Maximum  Maximum  Time of Max    Reported
                                 Depth    Depth      HGL   Occurrence   Max Depth
  Node                 Type      Meters   Meters   Meters  days hr:min      Meters
  ------------------------------------------------------------------------------
  259_(STM)            JUNCTION    0.02     0.38    77.01     0  02:10        0.36
  J2                   JUNCTION    0.01     0.09    76.60     0  02:30        0.09
  J3                   JUNCTION    0.01     0.08    76.07     0  02:44        0.08
  HW-1                 OUTFALL     0.01     0.10    75.95     0  02:45        0.10
  HW-2                 OUTFALL     0.02     0.38    76.44     0  02:05        0.38
  OF1                  OUTFALL     0.00     0.00    74.75     0  00:00        0.00
  OF2                  OUTFALL     0.00     0.00    73.33     0  00:00        0.00
  OF3                  OUTFALL     0.00     0.00    88.45     0  00:00        0.00
```

A-08_Roof	STORAGE	0.02	0.13	88.58	0	02:31	0.13
A-09_StormTech	STORAGE	1.01	1.40	74.73	0	06:11	1.40
A-10_Roof	STORAGE	0.02	0.14	80.14	0	02:36	0.14
CB-20	STORAGE	0.01	0.29	77.18	0	02:10	0.27
CB-202	STORAGE	0.19	0.29	76.75	0	02:10	0.29
CB-208	STORAGE	0.34	0.40	76.70	0	02:44	0.39
CB-21	STORAGE	0.20	0.89	77.79	0	02:10	0.89
CB-24	STORAGE	0.15	0.24	76.75	0	02:10	0.24
CB-25	STORAGE	0.00	0.30	76.85	0	02:10	0.30
CB-27	STORAGE	0.29	0.91	77.71	0	02:10	0.90
CBMH-200	STORAGE	0.01	0.50	77.06	0	02:10	0.48
CBMH-201	STORAGE	0.52	0.61	77.15	0	02:30	0.61
CBMH-203	STORAGE	0.25	0.32	76.72	0	02:10	0.32
CBMH-205	STORAGE	0.01	0.37	76.85	0	02:10	0.36
CBMH-206	STORAGE	0.03	0.59	76.83	0	02:10	0.58
J1	STORAGE	0.33	0.91	77.67	0	02:10	0.91
MH-112	STORAGE	0.61	0.69	76.69	0	02:44	0.69
MH-204	STORAGE	0.01	0.11	76.02	0	02:45	0.11
MH-210	STORAGE	0.02	0.52	77.00	0	02:10	0.51
OGS	STORAGE	0.03	0.45	76.54	0	02:10	0.45
StormTech_1	STORAGE	1.53	1.71	77.15	0	02:30	1.70
StormTech_2	STORAGE	1.52	1.69	76.69	0	02:44	1.69

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
259_(STM)	JUNCTION	0.00	8.80	0	02:09	0	0.143	-0.006
J2	JUNCTION	0.00	15.08	0	02:30	0	0.0426	-0.002
J3	JUNCTION	0.00	7.95	0	02:44	0	0.0293	0.002
HW-1	OUTFALL	0.00	14.65	0	02:45	0	0.0718	0.000
HW-2	OUTFALL	21.31	150.02	0	02:10	0.0274	0.361	0.000

OF1	OUTFALL	0.00	0.00	0	00:00	0	0	0.000 ltr
OF2	OUTFALL	0.00	0.20	0	00:42	0	0.0168	0.000
OF3	OUTFALL	91.44	105.07	0	02:10	0.1	0.35	0.000
A-08_Roof	STORAGE	150.29	150.29	0	02:10	0.25	0.25	0.000
A-09_StormTech	STORAGE	18.35	18.35	0	02:10	0.0299	0.0299	0.006
A-10_Roof	STORAGE	85.81	85.81	0	02:10	0.143	0.143	-0.001
CB-20	STORAGE	35.50	35.50	0	02:10	0.0483	0.0483	0.020
CB-202	STORAGE	6.07	22.59	0	02:10	0.00768	0.0307	1.829
CB-208	STORAGE	68.08	98.98	0	02:10	0.101	0.143	1.575
CB-21	STORAGE	36.59	36.59	0	02:10	0.0518	0.0526	1.052
CB-24	STORAGE	17.00	17.00	0	02:10	0.0218	0.0223	0.971
CB-25	STORAGE	6.47	6.47	0	02:10	0.00826	0.00826	-0.011
CB-27	STORAGE	41.60	41.60	0	02:10	0.0644	0.0648	0.421
CBMH-200	STORAGE	23.44	54.57	0	02:10	0.03	0.0783	-0.097
CBMH-201	STORAGE	25.14	100.63	0	02:10	0.037	0.153	0.861
CBMH-203	STORAGE	9.64	31.76	0	02:10	0.0106	0.0418	1.793
CBMH-205	STORAGE	10.37	16.30	0	02:09	0.0135	0.0218	0.107
CBMH-206	STORAGE	61.60	132.63	0	02:10	0.091	0.334	0.137
J1	STORAGE	0.00	76.90	0	02:10	0	0.118	2.005
MH-112	STORAGE	0.00	97.36	0	02:10	0	0.141	1.187
MH-204	STORAGE	0.00	15.25	0	02:44	0	0.0719	0.002
MH-210	STORAGE	0.00	60.21	0	02:10	0	0.221	-0.137
OGS	STORAGE	0.00	129.89	0	02:10	0	0.334	0.062
StormTech_1	STORAGE	0.00	100.38	0	02:10	0	0.149	0.087
StormTech_2	STORAGE	0.00	97.38	0	02:10	0	0.136	0.126

****
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
259_(STM)	JUNCTION	0.08	0.125	1.795
A-08_Roof	STORAGE	24.00	0.134	0.016

A-10_Roof	STORAGE	24.00	0.144	0.006

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
A-08_Roof	0.026	15.7	0.0	0.0	0.148	89.5	0 02:31	18.14
A-09_StormTech	0.019	51.7	0.0	0.0	0.026	71.8	0 06:11	0.20
A-10_Roof	0.008	9.9	0.0	0.0	0.074	90.0	0 02:36	8.80
CB-20	0.000	0.4	0.0	0.0	0.000	16.2	0 02:10	33.00
CB-202	0.000	15.6	0.0	0.0	0.000	23.1	0 02:10	22.14
CB-208	0.000	24.2	0.0	0.0	0.000	28.4	0 02:44	97.36
CB-21	0.000	11.4	0.0	0.0	0.000	50.7	0 02:10	35.83
CB-24	0.000	11.0	0.0	0.0	0.000	18.2	0 02:10	16.52
CB-25	0.000	0.4	0.0	0.0	0.000	25.0	0 02:10	5.95
CB-27	0.000	15.7	0.0	0.0	0.000	48.9	0 02:10	41.08
CBMH-200	0.000	0.6	0.0	0.0	0.001	25.0	0 02:10	51.42
CBMH-201	0.001	25.4	0.0	0.0	0.001	29.6	0 02:30	100.38
CBMH-203	0.000	17.8	0.0	0.0	0.000	23.2	0 02:10	31.94
CBMH-205	0.000	0.6	0.0	0.0	0.000	29.0	0 02:10	15.62
CBMH-206	0.000	2.3	0.0	0.0	0.001	44.8	0 02:10	129.89
J1	0.000	0.0	0.0	0.0	0.000	0.0	0 00:00	75.81
MH-112	0.001	29.5	0.0	0.0	0.001	33.5	0 02:44	97.38
MH-204	0.000	0.4	0.0	0.0	0.000	4.1	0 02:45	14.65
MH-210	0.000	1.0	0.0	0.0	0.001	22.5	0 02:10	62.47
OGS	0.000	2.0	0.0	0.0	0.001	32.3	0 02:10	129.89
StormTech_1	0.096	91.4	0.0	0.0	0.105	100.0	0 02:28	15.08
StormTech_2	0.096	91.1	0.0	0.0	0.105	100.0	0 02:42	7.95

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
HW-1	20.70	4.00	14.65	0.072
HW-2	29.60	14.70	150.02	0.361
OF1	0.00	0.00	0.00	0.000
OF2	97.15	0.20	0.20	0.017
OF3	83.95	4.95	105.07	0.350
System	46.28	23.85	255.28	0.799

****
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
STM-100_(STM)	CONDUIT	31.94	0 02:10	0.66	0.99	1.00
STM-101_(STM)	CONDUIT	22.14	0 02:10	0.58	0.65	1.00
STM-102_(STM)	CONDUIT	15.62	0 02:10	0.58	0.38	1.00
STM-103_(STM)	CONDUIT	129.89	0 02:10	1.18	1.37	1.00
STM-104_(STM)	CONDUIT	129.89	0 02:10	1.18	1.21	1.00
STM-105_(STM)	CONDUIT	16.52	0 02:10	0.57	0.47	0.99
STM-106_(STM)	CONDUIT	5.95	0 02:09	0.44	0.15	1.00

STM-107_(STM)	CONDUIT	33.00	0	02:07	0.87	0.62	1.00
STM-109_(1)_(STM)	CONDUIT	62.47	0	02:11	0.88	1.09	1.00
STM-109_(STM)	CONDUIT	51.42	0	02:10	0.84	0.90	1.00
STM-110_(STM)	CONDUIT	97.36	0	02:10	1.45	1.23	1.00
STM-123_(STM)	CONDUIT	7.84	0	02:44	0.53	0.07	0.19
STM-124_(STM)	CONDUIT	97.38	0	02:10	1.35	0.97	1.00
STM-127_(STM)	CONDUIT	11.28	0	02:12	0.78	0.19	1.00
STM-128_(STM)	CONDUIT	15.11	0	02:30	0.76	0.13	0.24
STM-92_(STM)	CONDUIT	35.83	0	02:10	0.73	0.85	1.00
STM-93_(STM)_1	CONDUIT	41.08	0	02:10	0.84	0.98	1.00
STM-93_(STM)_2	CONDUIT	75.81	0	02:10	1.54	1.78	1.00
STM-94_(STM)	CONDUIT	100.38	0	02:10	1.49	1.26	1.00
STM-95_(STM)	CONDUIT	14.65	0	02:45	0.55	0.17	0.29
W1	WEIR	15.08	0	02:30			0.04
W2	WEIR	7.95	0	02:44			0.02
A-08_Roof_Drains	DUMMY	18.14	0	02:31			
A-09_StormTech_Infil	DUMMY	0.20	0	00:42			
A-10_Roof_Drains	DUMMY	8.80	0	02:09			

****
Flow Classification Summary
****

	Adjusted	Fraction of Time in Flow Class								
Conduit	/Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STM-100_(STM)	1.00	0.03	0.00	0.00	0.91	0.00	0.00	0.06	0.00	0.00
STM-101_(STM)	1.00	0.03	0.00	0.00	0.95	0.00	0.00	0.02	0.01	0.00
STM-102_(STM)	1.00	0.03	0.00	0.00	0.02	0.00	0.00	0.95	0.01	0.00
STM-103_(STM)	1.00	0.01	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
STM-104_(STM)	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.70	0.00
STM-105_(STM)	1.00	0.03	0.00	0.00	0.93	0.00	0.00	0.04	0.01	0.00
STM-106_(STM)	1.00	0.03	0.00	0.00	0.07	0.00	0.00	0.90	0.04	0.00
STM-107_(STM)	1.00	0.03	0.00	0.00	0.05	0.02	0.00	0.89	0.06	0.00
STM-109_(1)_(STM)	1.00	0.01	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
STM-109_(STM)	1.00	0.01	0.02	0.00	0.27	0.00	0.00	0.70	0.25	0.00
STM-110_(STM)	1.00	0.03	0.00	0.00	0.91	0.00	0.00	0.07	0.00	0.00
STM-123_(STM)	1.00	0.10	0.00	0.00	0.01	0.00	0.00	0.89	0.00	0.00
STM-124_(STM)	1.00	0.03	0.00	0.00	0.91	0.00	0.00	0.06	0.00	0.00
STM-127_(STM)	1.00	0.01	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
STM-128_(STM)	1.00	0.10	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.00
STM-92_(STM)	1.00	0.03	0.00	0.00	0.93	0.00	0.00	0.04	0.01	0.00
STM-93_(STM)_1	1.00	0.03	0.00	0.00	0.97	0.00	0.00	0.00	0.05	0.00
STM-93_(STM)_2	1.00	0.03	0.00	0.00	0.92	0.00	0.00	0.06	0.00	0.00
STM-94_(STM)	1.00	0.03	0.00	0.00	0.91	0.00	0.00	0.06	0.00	0.00
STM-95_(STM)	1.00	0.10	0.00	0.00	0.90	0.00	0.00	0.00	0.70	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
STM-100_(STM)	21.40	21.41	21.49	0.01	0.05
STM-101_(STM)	0.03	0.03	21.37	0.01	0.01
STM-102_(STM)	0.09	0.09	0.16	0.01	0.01
STM-103_(STM)	0.09	0.16	0.09	0.17	0.09
STM-104_(STM)	0.11	0.13	0.11	0.10	0.11
STM-105_(STM)	0.01	0.01	0.03	0.01	0.01
STM-106_(STM)	0.04	0.04	0.08	0.01	0.01
STM-107_(STM)	0.02	0.02	0.11	0.01	0.01
STM-109_(1)_(STM)	0.12	0.12	0.16	0.04	0.05
STM-109_(STM)	0.10	0.10	0.11	0.01	0.01
STM-110_(STM)	21.46	21.51	21.70	0.12	0.01
STM-124_(STM)	21.70	21.70	21.70	0.01	0.01
STM-127_(STM)	0.08	0.08	0.11	0.01	0.01
STM-92_(STM)	0.24	0.24	21.86	0.01	0.01
STM-93_(STM)_1	21.82	21.82	21.88	0.01	0.01
STM-93_(STM)_2	21.85	21.88	21.94	0.19	0.17
STM-94_(STM)	21.77	21.94	21.77	0.13	0.01

1533 & 1541 St. Joseph Boulevard - Bilberry Creek (125033)
Post-Development Model Output (100-year 6-hour Chicago)

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Analysis begun on:  Tue Sep  9 15:20:35 2025
Analysis ended on:  Tue Sep  9 15:20:37 2025
Total elapsed time: 00:00:02
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PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
VISIT OUR APP

1533 & 1541 ST. JOSEPH BLVD.

OTTAWA, ON, CANADA

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUCTURES", AND MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 75 mm (3").
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 23° C / 73° F), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 150 mm (6") SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 300 mm (12") INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE; AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

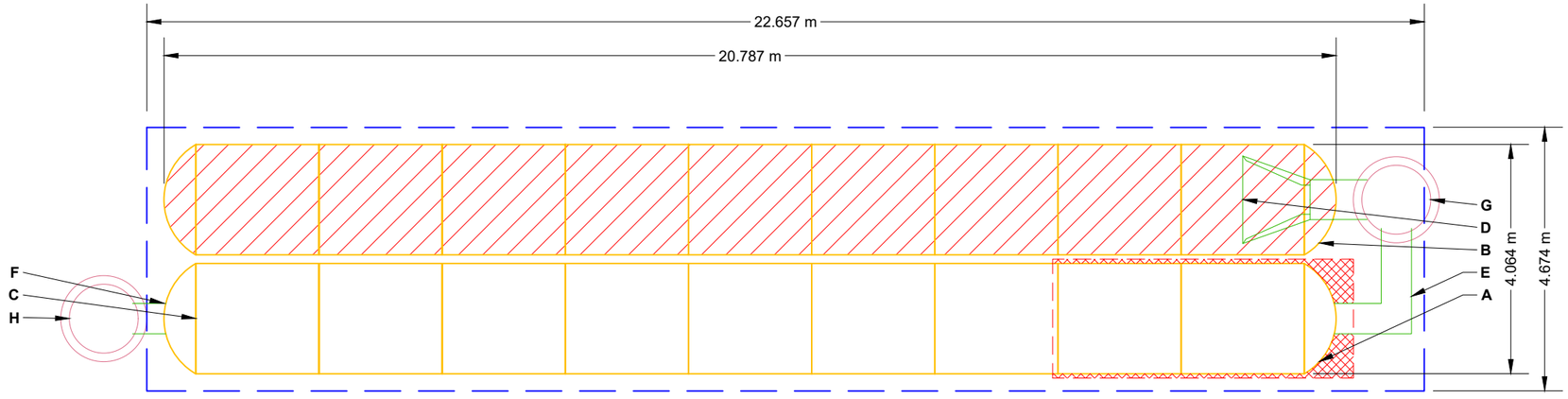
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT: BED 1		PROPOSED ELEVATIONS: BED 1	
18	STORMTECH MC-3500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	79.250
4	STORMTECH MC-3500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	77.421
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	77.269
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	77.269
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	77.269
105.6	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	77.117
		TOP OF MC-3500 CHAMBER:	76.812
		450 mm x 450 mm TOP MANIFOLD INVERT:	76.177
		600 mm ISOLATOR ROW PLUS INVERT:	75.721
105.9	SYSTEM AREA (m^2)	450 mm BOTTOM CONNECTION INVERT:	75.714
54.7	SYSTEM PERIMETER (m)	BOTTOM OF MC-3500 CHAMBER:	75.669
		BOTTOM OF STONE:	75.440

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	450 mm TOP PRE-CORED END CAP, PART#: MC3500IEPP18TC / TYP OF ALL 450 mm TOP CONNECTIONS	509 mm	
PREFABRICATED END CAP	B	600 mm BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP24BC / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	52 mm	
PREFABRICATED END CAP	C	450 mm BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP18BC / TYP OF ALL 450 mm BOTTOM CONNECTIONS	45 mm	
FLAMP	D	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	E	450 mm x 450 mm TOP MANIFOLD, ADS N-12	509 mm	
PIPE CONNECTION	F	450 mm BOTTOM CONNECTION	45 mm	
CONCRETE STRUCTURE	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		156 L/s IN
CONCRETE STRUCTURE	H	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		113 L/s OUT



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 5.334 m OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

1533 & 1541 ST. JOSEPH BLVD.
OTTAWA, ON, CANADA

DATE: 08/27/2025
PROJECT #:
DRAWN: OR
CHECKED: N/A

DATE	DWN	CHK

StormTech®
Chamber System

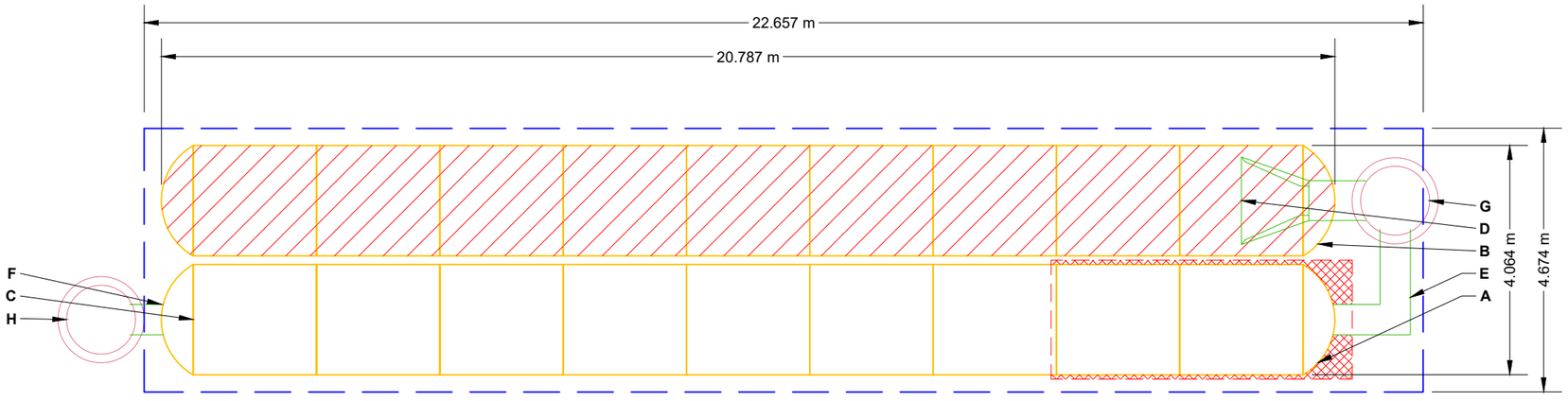
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SCALE = 1 : 100

PROPOSED LAYOUT: BED 2		PROPOSED ELEVATIONS: BED 2	
18	STORMTECH MC-3500 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	78.810
4	STORMTECH MC-3500 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	76.981
305	STONE ABOVE (mm)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	76.829
229	STONE BELOW (mm)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	76.829
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	76.829
105.6	INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	76.676
		TOP OF MC-3500 CHAMBER:	76.372
		450 mm x 450 mm TOP MANIFOLD INVERT:	75.737
		600 mm ISOLATOR ROW PLUS INVERT:	75.281
105.9	SYSTEM AREA (m^2)	450 mm BOTTOM CONNECTION INVERT:	75.274
54.7	SYSTEM PERIMETER (m)	BOTTOM OF MC-3500 CHAMBER:	75.229
		BOTTOM OF STONE:	75.000

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	450 mm TOP PRE-CORED END CAP, PART#: MC3500IEPP18TC / TYP OF ALL 450 mm TOP CONNECTIONS	509 mm	
PREFABRICATED END CAP	B	600 mm BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP24BC / TYP OF ALL 600 mm BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	52 mm	
PREFABRICATED END CAP	C	450 mm BOTTOM PRE-CORED END CAP, PART#: MC3500IEPP18BC / TYP OF ALL 450 mm BOTTOM CONNECTIONS	45 mm	
FLAMP	D	INSTALL FLAMP ON 600 mm ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	E	450 mm x 450 mm TOP MANIFOLD, ADS N-12	509 mm	
PIPE CONNECTION	F	450 mm BOTTOM CONNECTION	45 mm	
CONCRETE STRUCTURE	G	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		156 L/s IN
CONCRETE STRUCTURE	H	OCS (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		113 L/s OUT



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 5.334 m OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- **NOT FOR CONSTRUCTION**: THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

1533 & 1541 ST. JOSEPH BLVD.
OTTAWA, ON, CANADA
DATE: 08/27/2025
DRAWN: OR
CHECKED: N/A
PROJECT #:

DATE	DWN	CHK

StormTech® Chamber System

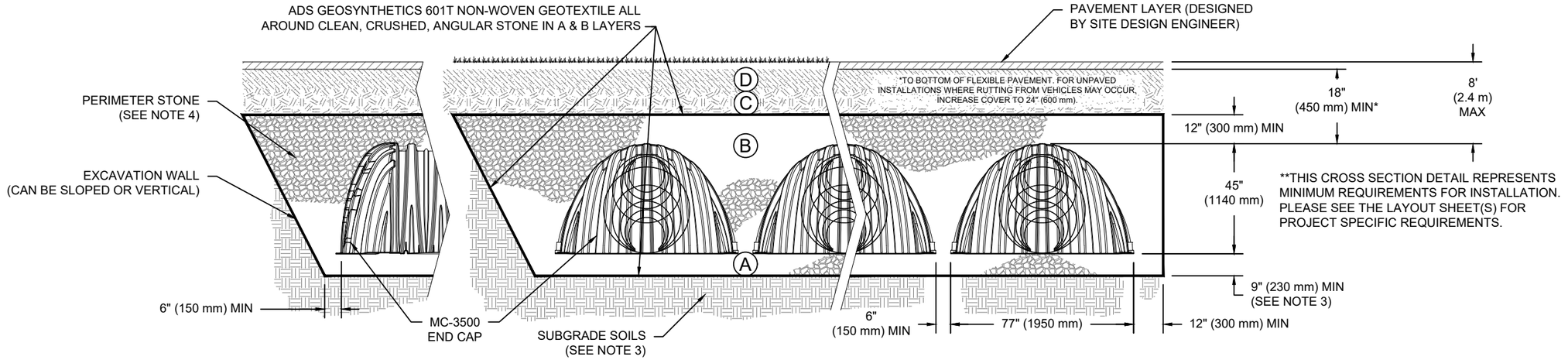
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SCALE = 1 : 100

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

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

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



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS. REFERENCE STORMTECH DESIGN MANUAL FOR BEARING CAPACITY GUIDANCE.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

1533 & 1541 ST. JOSEPH BLVD.
OTTAWA, ON, CANADA
DATE: 08/27/2025
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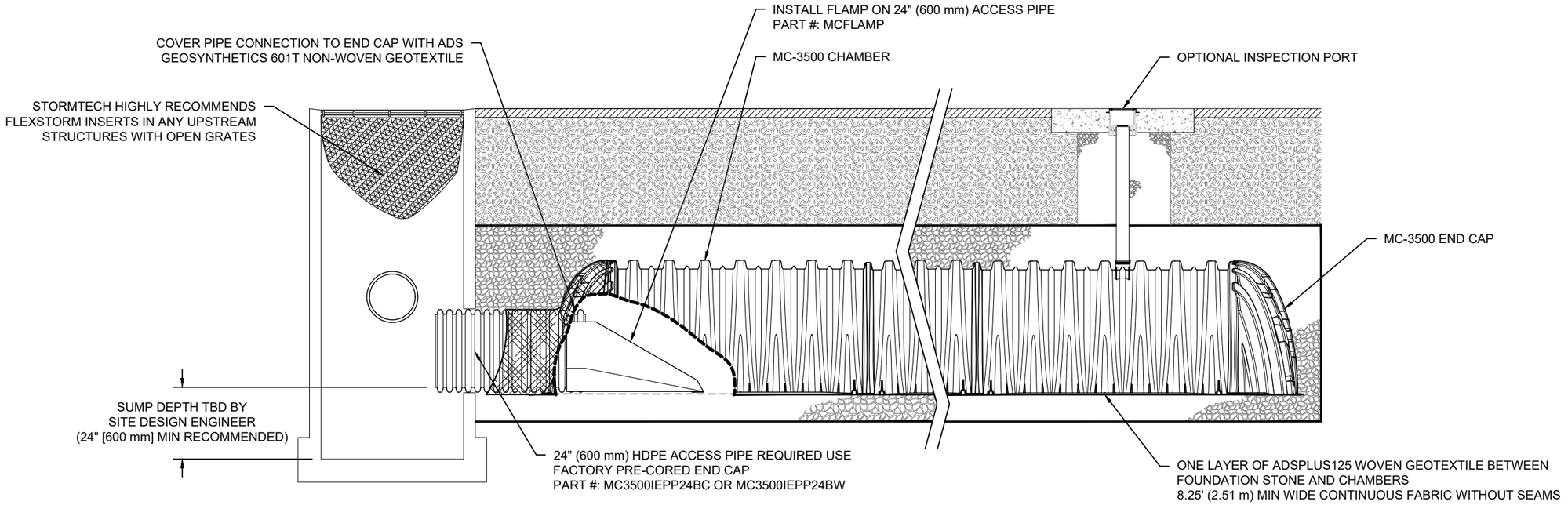
StormTech® Chamber System

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473



MC-3500 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

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

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

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

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

NOTES

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

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

1533 & 1541 ST. JOSEPH BLVD.
OTTAWA, ON, CANADA
DATE: 08/27/2025 | DRAWN: OR | CHECKED: N/A
PROJECT #:

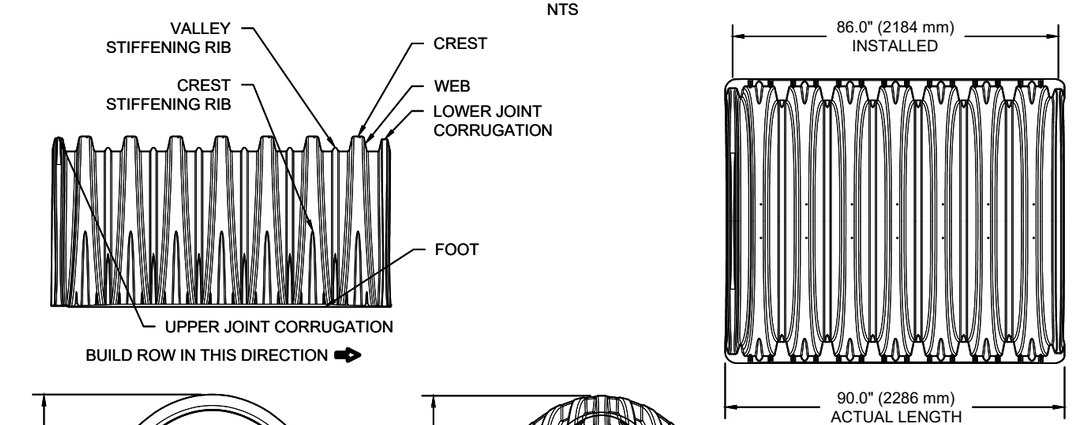
DATE	DWN	CHK

StormTech® Chamber System

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

MC-3500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

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

NOMINAL END CAP SPECIFICATIONS

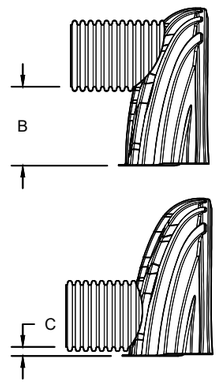
SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m³)
WEIGHT	49 lbs.	(22.2 kg)

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

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

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

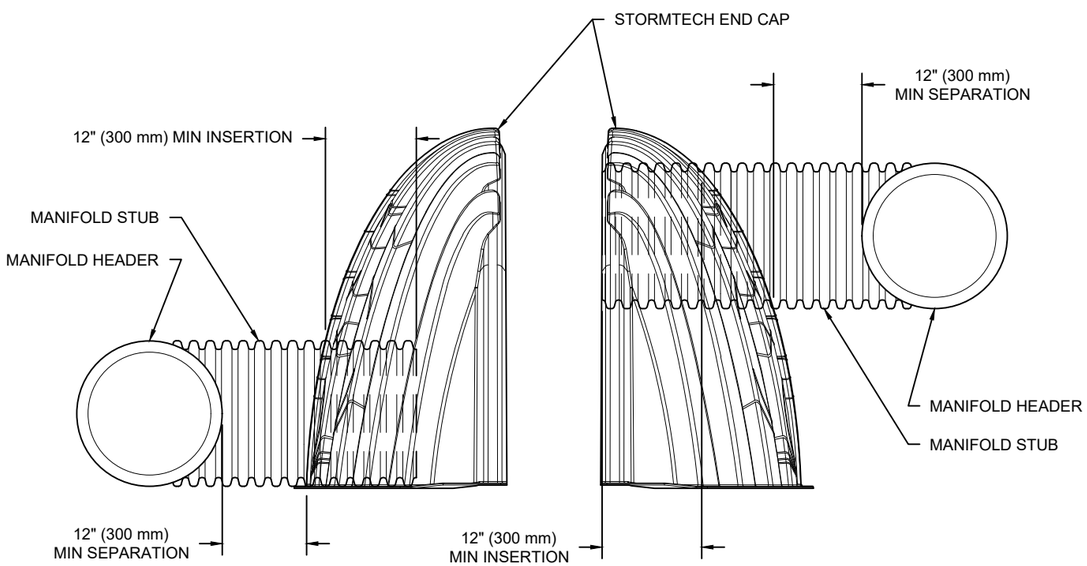
NOTE: ALL DIMENSIONS ARE NOMINAL



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

MC-SERIES END CAP INSERTION DETAIL

NTS



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

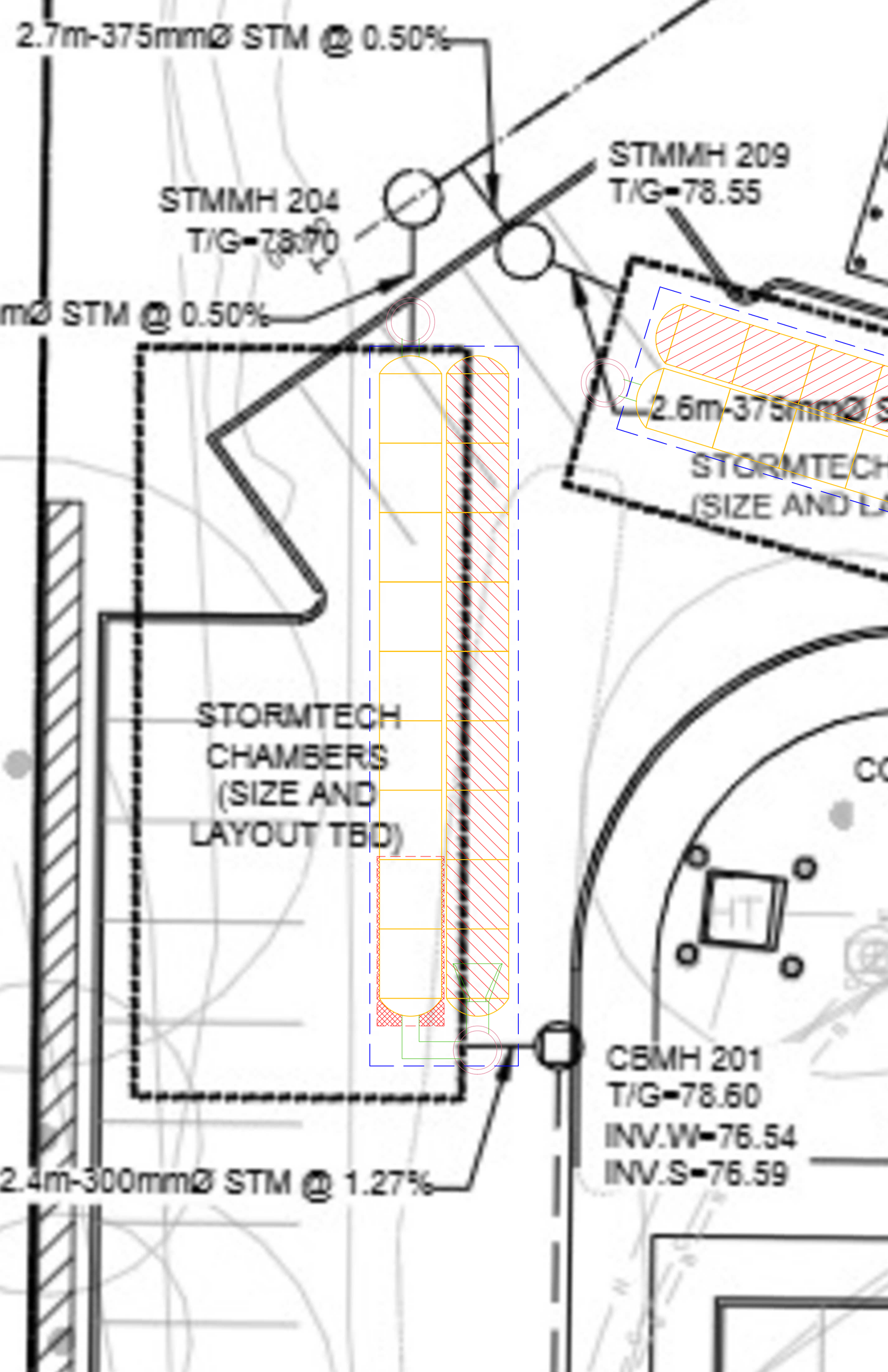
1533 & 1541 ST. JOSEPH BLVD.
OTTAWA, ON, CANADA
DATE: 08/27/2025
DRAWN: OR
PROJECT #:
CHECKED: N/A

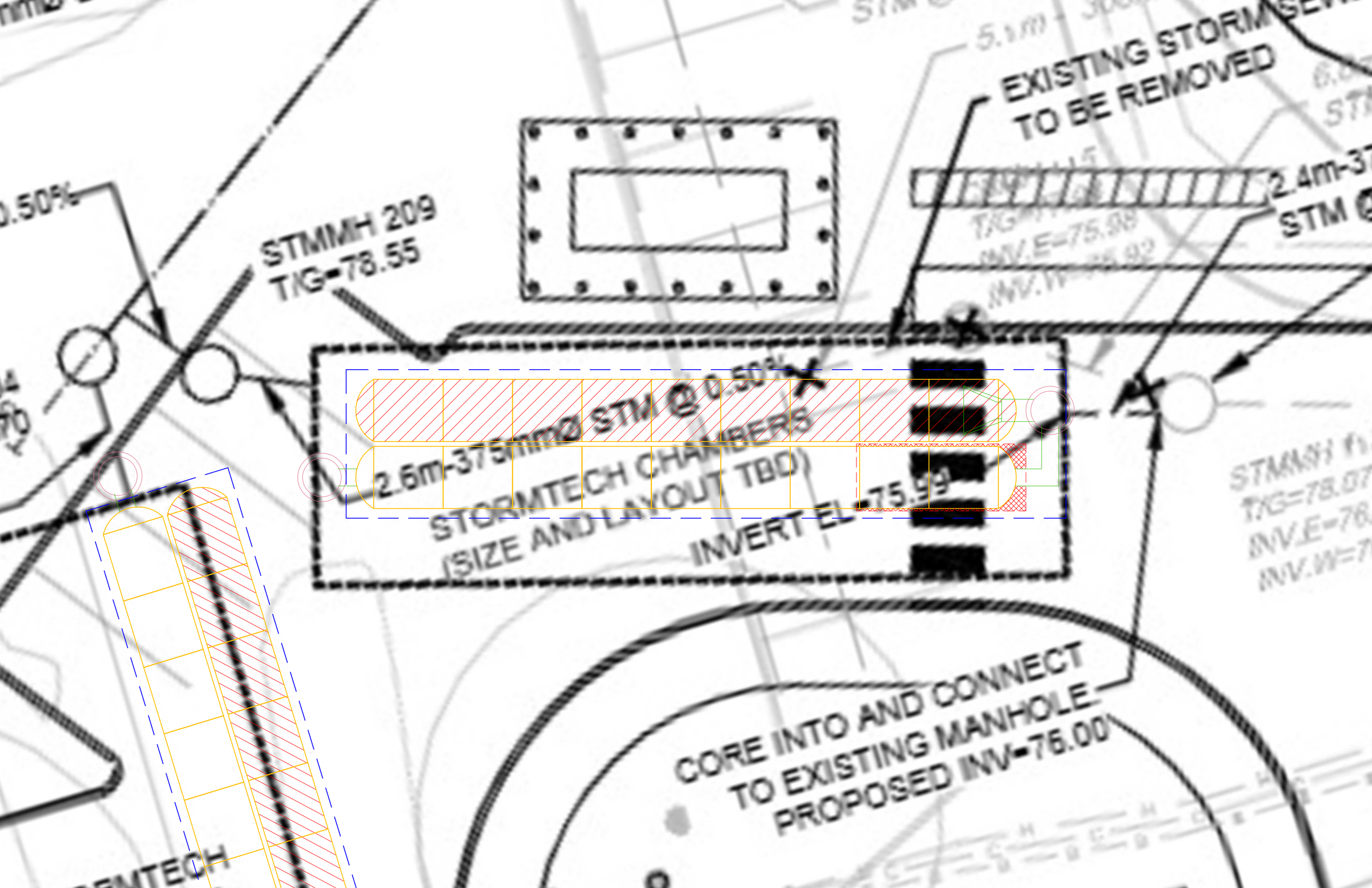
DATE	DWN	CHK

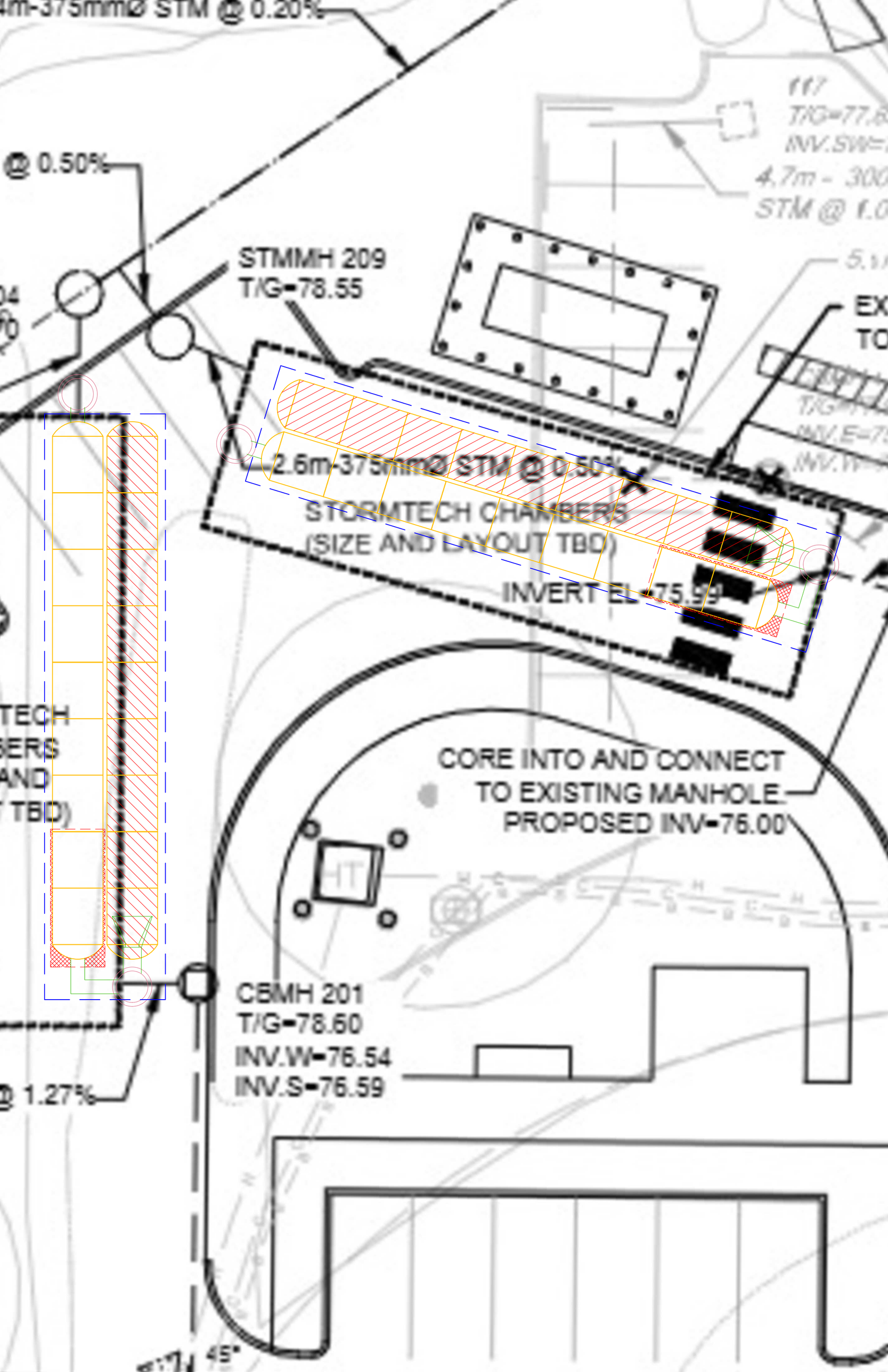
StormTech®
Chamber System

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

SHEET
6 OF 6


2.7m-375mmØ STM @ 0.50%
STMMH 204
T/G=78.70
STMMH 209
T/G=78.55
mØ STM @ 0.50%
2.6m-375mmØ S
STORMTECH
(SIZE AND L
STORMTECH
CHAMBERS
(SIZE AND
LAYOUT TBD)
CBMH 201
T/G=78.60
INV.W=76.54
INV.S=76.59
2.4m-300mmØ STM @ 1.27%


EXISTING STORM SEWER
TO BE REMOVED
STMMH 209
T/G=78.55
2.4m-375mmØ STM @ 0.50%
2.6m-375mmØ STM @ 0.50%
STORMTECH CHAMBERS
(SIZE AND LAYOUT TBD)
INVERT EL=75.99
CORE INTO AND CONNECT
TO EXISTING MANHOLE
PROPOSED INV=76.00


4m-375mmØ STM @ 0.20%
@ 0.50%
STMMH 209
T/G=78.55
2.6m-375mmØ STM @ 0.50%
STORMTECH CHAMBERS
(SIZE AND LAYOUT TBD)
INVERT EL=75.99
CORE INTO AND CONNECT
TO EXISTING MANHOLE
PROPOSED INV=76.00
CBMH 201
T/G=78.60
INV.W=76.54
INV.S=76.59
@ 1.27%
45°

Hydroworks Sizing Summary

Bilberry Creek

09-11-2025

Recommended Size: HydroDome HD 6

Hydroworks Sizing Program Version 5.8.5

A HydroDome HD 6 is recommended to provide 80 % annual TSS removal based on a drainage area of .49 (ha) with an imperviousness of 75 % and Ottawa CDA, Ontario rainfall for the ETV particle size distribution (Calgary).

The recommended HydroDome HD 6 treats 100 % of the annual runoff and provides 80 % annual TSS removal for the Ottawa CDA rainfall records and ETV particle size distribution (Calgary).

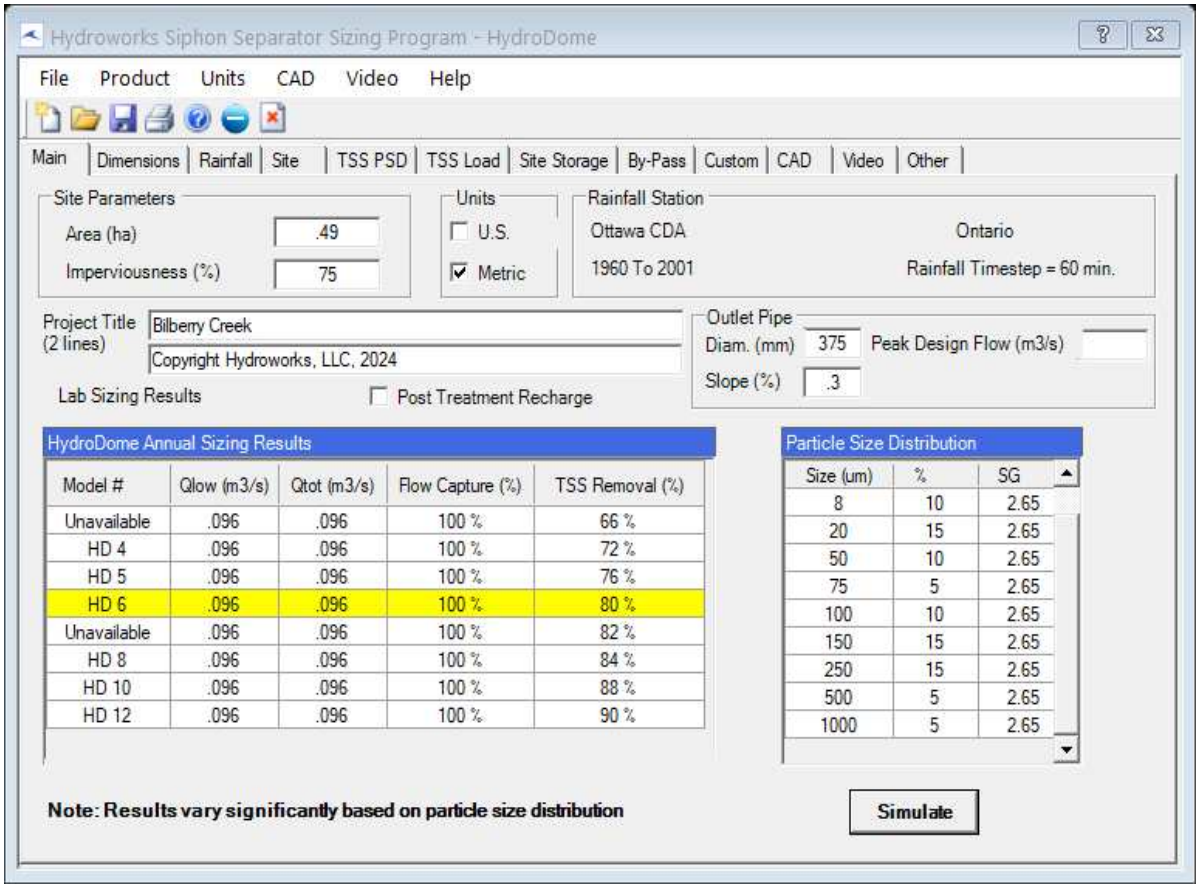
The HydroDome has a siphon which creates a discontinuity in headloss. Since a peak flow was not specified, headloss was calculated using the full pipe flow of .1 (m3/s) for the given 375 (mm) pipe diameter at .3% slope. The headloss was calculated to be 273 (mm) above the crown of the 375 (mm) outlet pipe.

This summary report provides the main parameters that were used for sizing. These parameters are shown on the summary tables and graphs provided in this report.

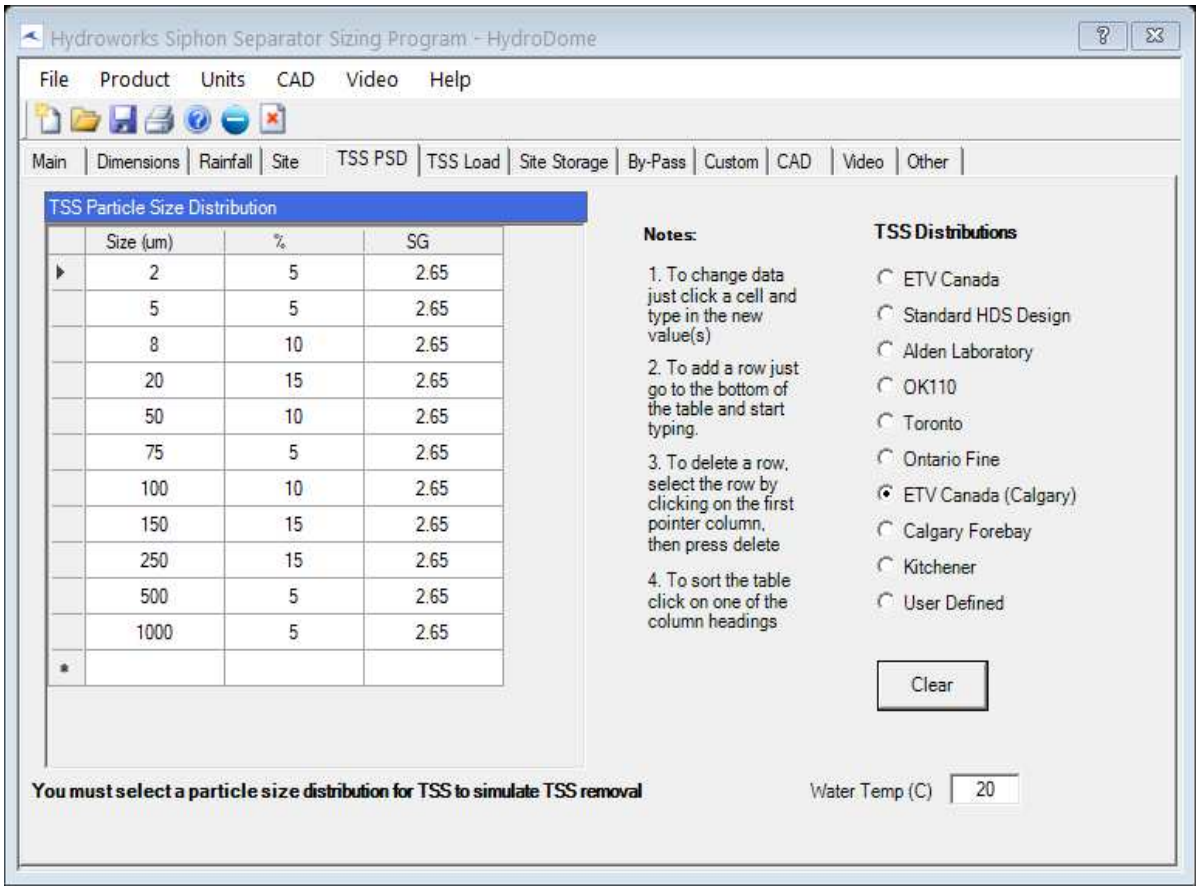
If you have any questions regarding this sizing summary please do not hesitate to contact Hydroworks at 888-290-7900 or email us at support@hydroworks.com.

The sizing program is for sizing purposes only and does not address any site specific parameters such as hydraulic gradeline, tailwater submergence, groundwater, soils bearing capacity, etc. Headloss calculations are not a hydraulic gradeline calculation since this requires a starting water level and an analysis of the entire system downstream of the HydroDome .

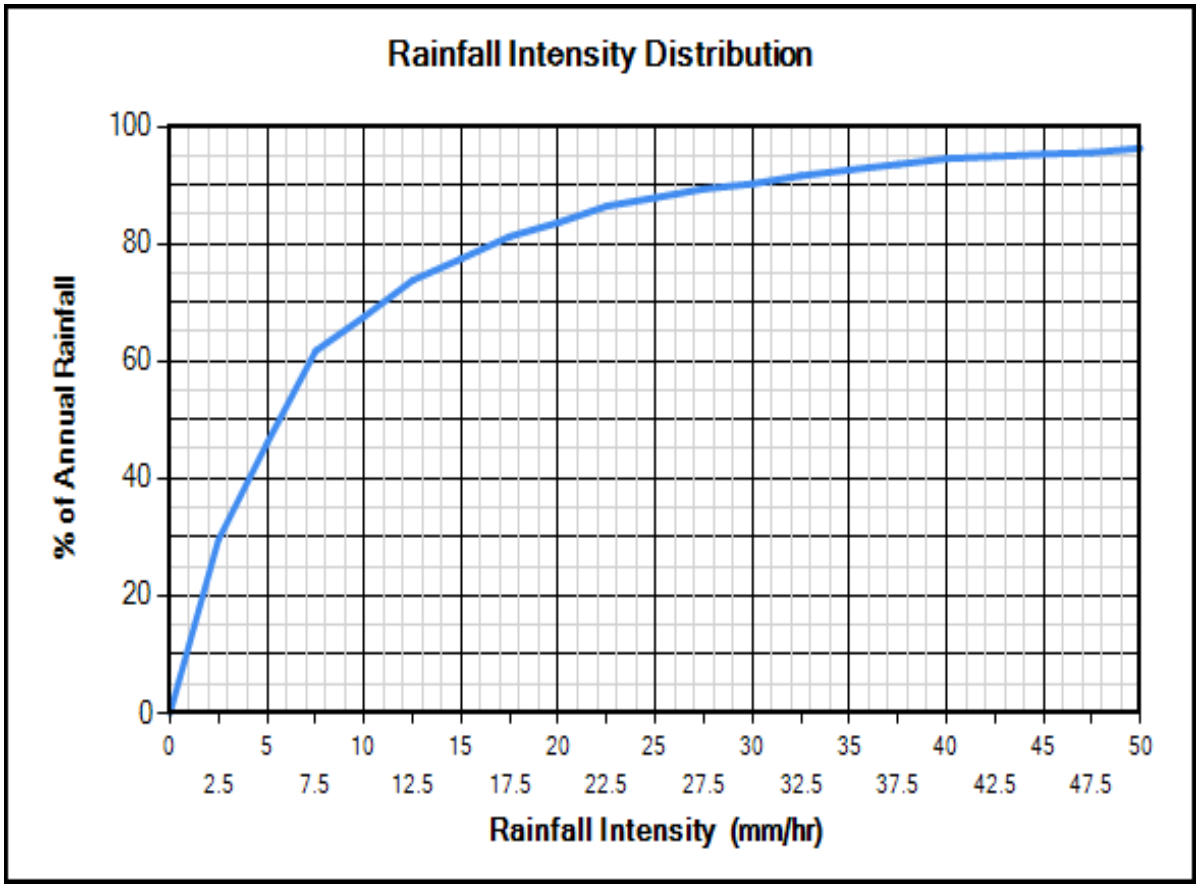
TSS Removal Sizing Summary



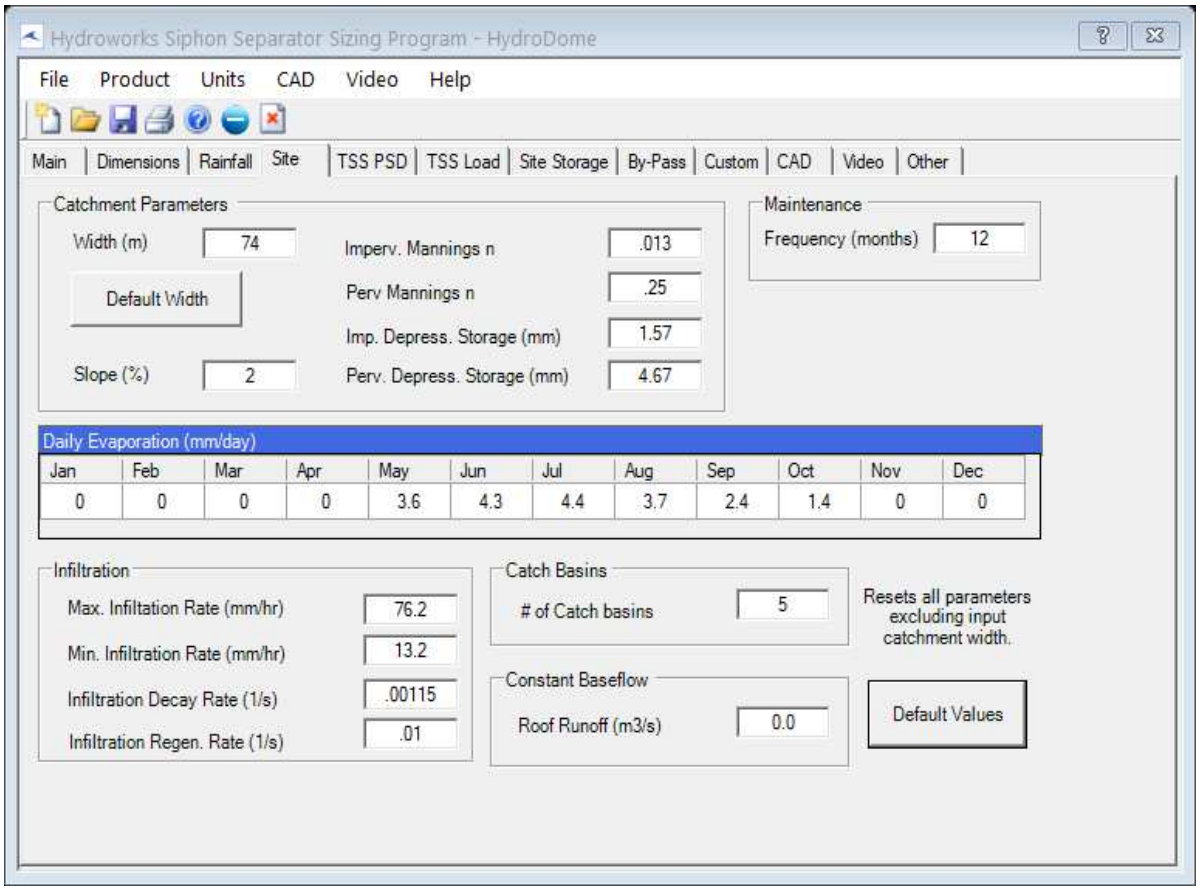
TSS Particle Size Distribution



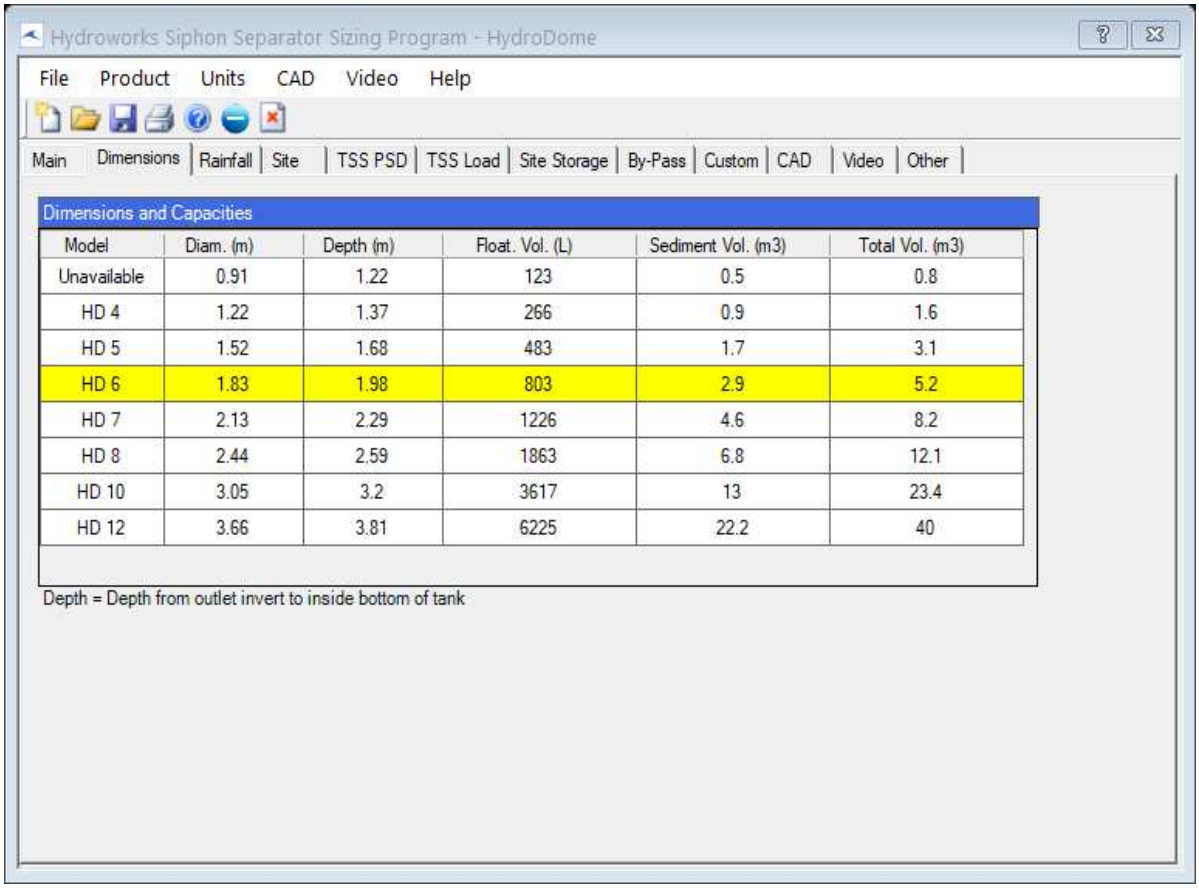
Rainfall Station - Ottawa CDA, Ontario(1960 To 2001)



Site Physical Characteristics



Dimensions And Capacities

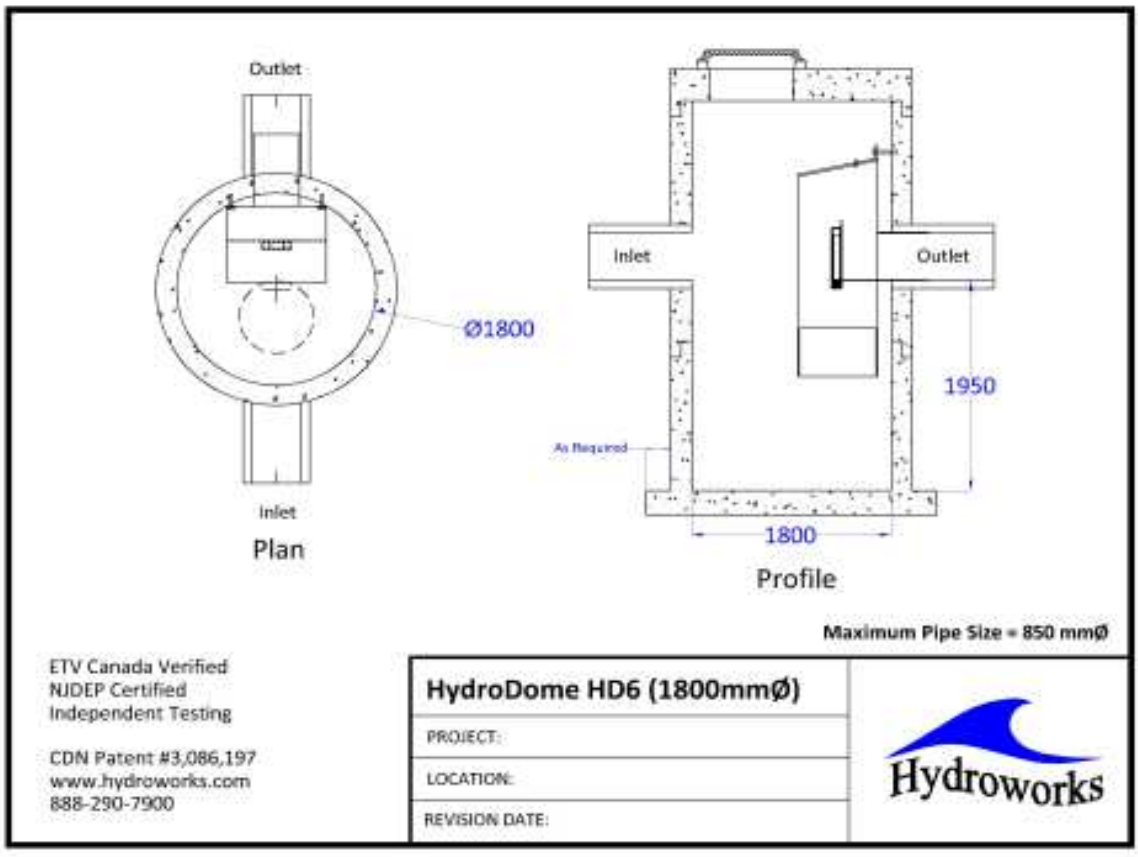


Dimensions and Capacities

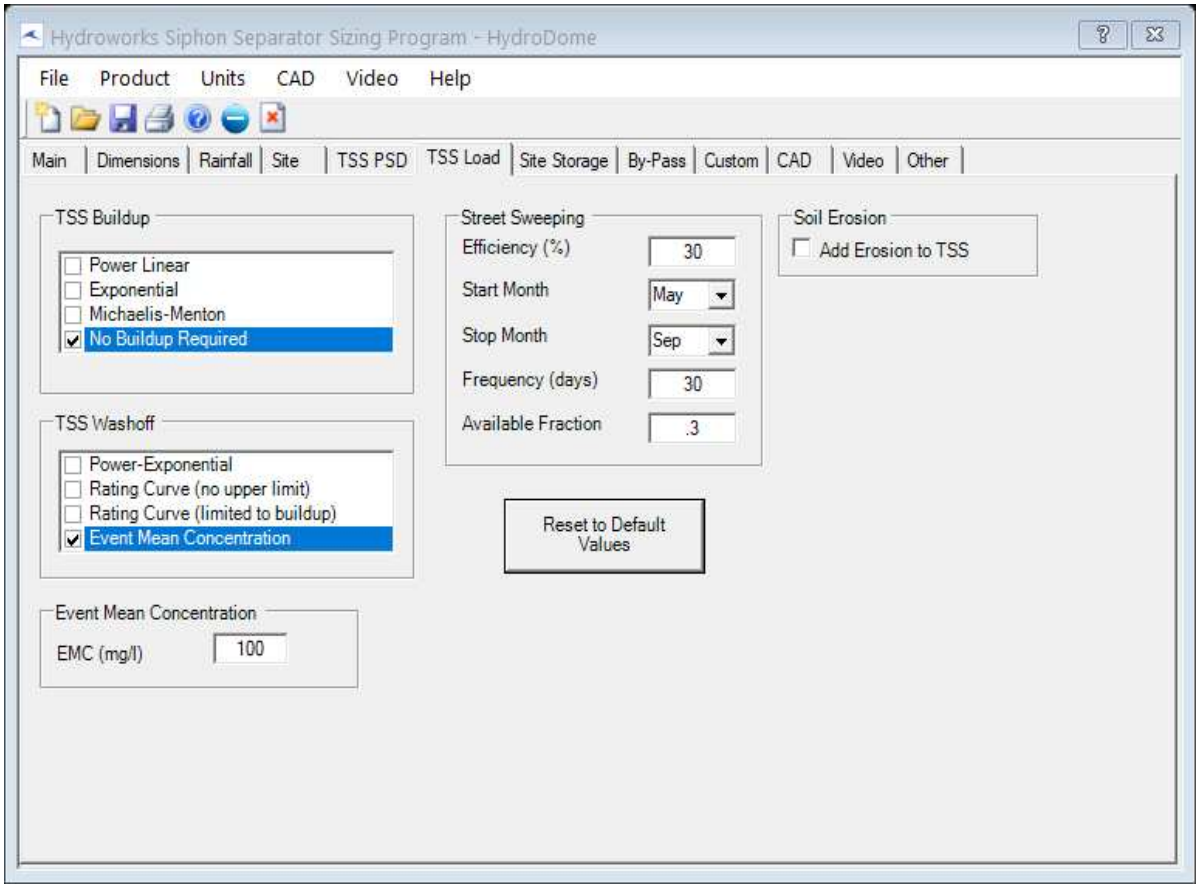
Model	Diam. (m)	Depth (m)	Float. Vol. (L)	Sediment Vol. (m3)	Total Vol. (m3)
Unavailable	0.91	1.22	123	0.5	0.8
HD 4	1.22	1.37	266	0.9	1.6
HD 5	1.52	1.68	483	1.7	3.1
HD 6	1.83	1.98	803	2.9	5.2
HD 7	2.13	2.29	1226	4.6	8.2
HD 8	2.44	2.59	1863	6.8	12.1
HD 10	3.05	3.2	3617	13	23.4
HD 12	3.66	3.81	6225	22.2	40

Depth = Depth from outlet invert to inside bottom of tank

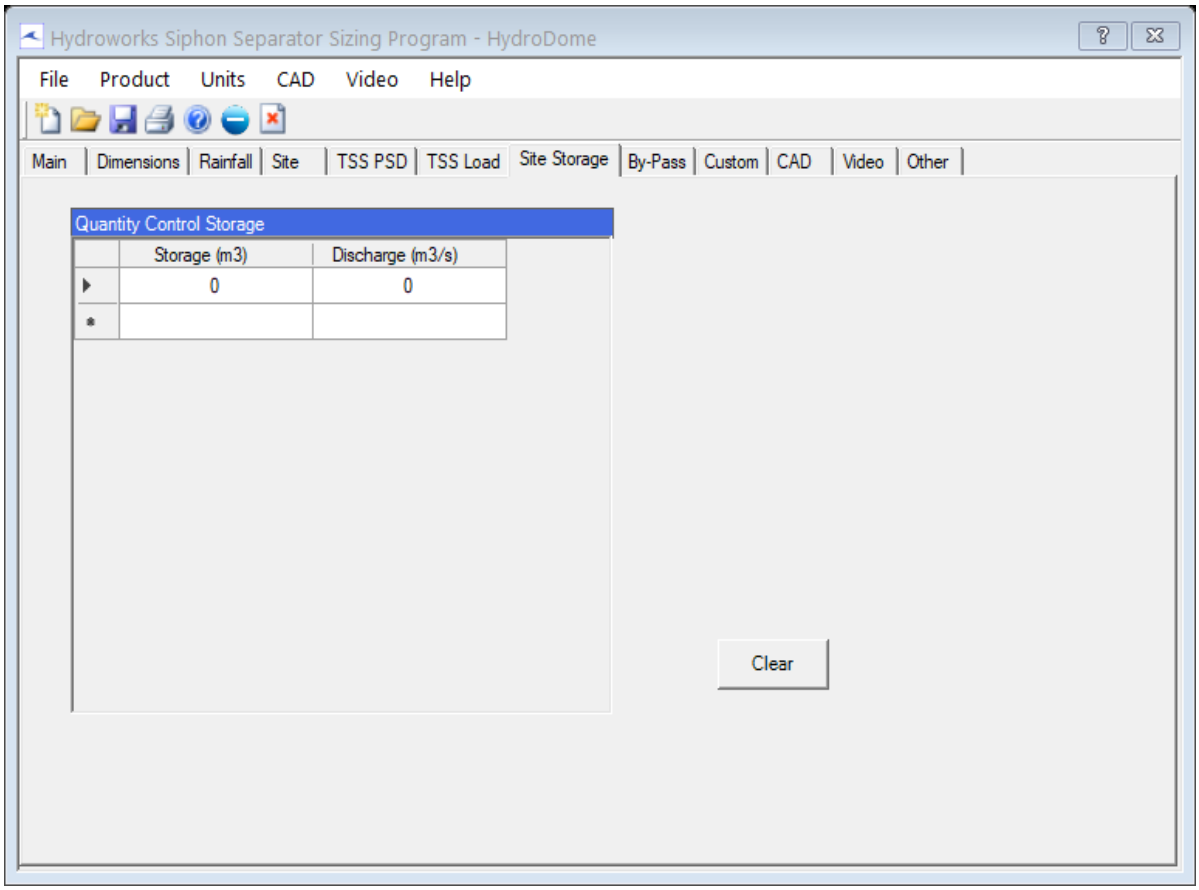
Generic HD 6 CAD Drawing



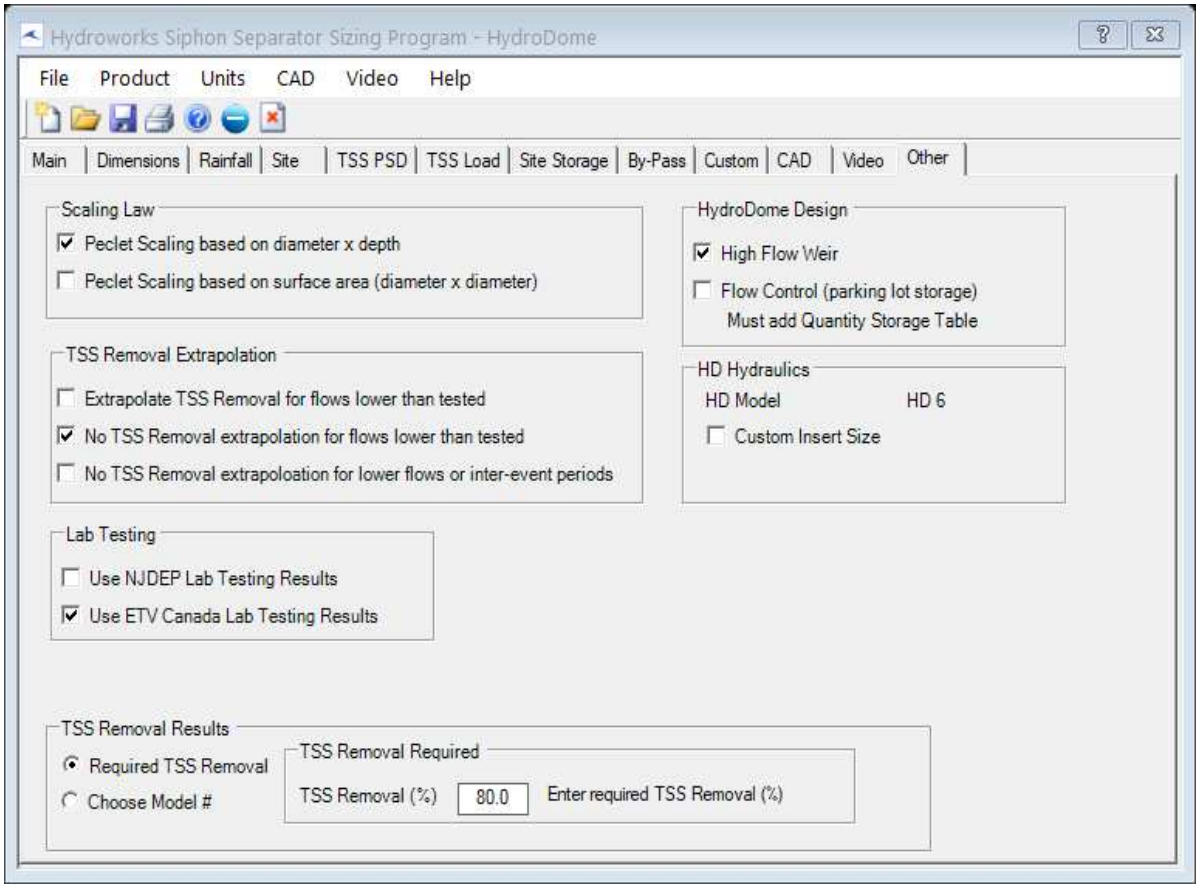
TSS Buildup And Washoff



Upstream Quantity Storage



Other Parameters



Flagged Issues

If there is underground detention storage upstream of the HydroDome please contact Hydroworks to ensure it has been modeled correctly.

Hydroworks Sizing Program - Version 5.8.5
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APPENDIX F

Flow Control Roof Drain Information

1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 1

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.79	L/s
C =	0.90		Vol(max) =	2.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	4.86	1.46
10	104.19	4.17	3.38	2.03
15	83.56	3.34	2.55	2.30
20	70.25	2.81	2.02	2.43
25	60.90	2.44	1.65	2.47
30	53.93	2.16	1.37	2.46
35	48.52	1.94	1.15	2.42
40	44.18	1.77	0.98	2.35
45	40.63	1.63	0.84	2.26
50	37.65	1.51	0.72	2.15
55	35.12	1.41	0.62	2.03
60	32.94	1.32	0.53	1.90
65	31.04	1.24	0.45	1.77
70	29.37	1.18	0.39	1.62
75	27.89	1.12	0.33	1.47
90	24.29	0.97	0.18	0.98
105	21.58	0.86	0.07	0.47
120	19.47	0.78	-0.01	-0.08

1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 1

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.87	L/s
C =	1.00		Vol(max) =	5.9	m3

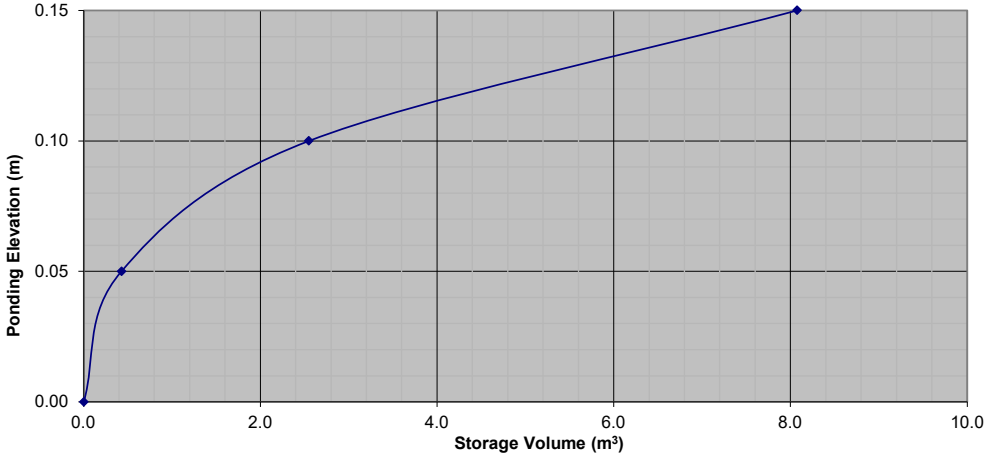
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	9.93	2.98
10	178.56	7.94	7.07	4.24
15	142.89	6.36	5.49	4.94
20	119.95	5.34	4.47	5.36
25	103.85	4.62	3.75	5.62
30	91.87	4.09	3.22	5.79
35	82.58	3.67	2.80	5.89
40	75.15	3.34	2.47	5.93
45	69.05	3.07	2.20	5.94
50	63.95	2.84	1.97	5.92
55	59.62	2.65	1.78	5.88
60	55.89	2.49	1.62	5.82
65	52.65	2.34	1.47	5.74
70	49.79	2.21	1.34	5.65
75	47.26	2.10	1.23	5.54
90	41.11	1.83	0.96	5.18
105	36.50	1.62	0.75	4.75
120	32.89	1.46	0.59	4.27

Watts Accutrol Flow Control Roof Drains:			RD-100-A-ADJ set to 1/4 Exposed		
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3) Required**	**Provided**
1:5 Year	0.79	0.79	10	2.5	8.1
1:100 Year	0.87	0.87	13	5.9	8.1

Roof Drain Storage Table for RD 1

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.1	0.4
0.10	67.7	2.5
0.15	153.3	8.1

Stage Storage Curve: Area R-1
Controlled Roof Drain RD 1



1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 2

OTTAWA IDF CURVE

Area =	0.017	ha	Qallow =	0.79	L/s
C =	0.90		Vol(max) =	2.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.00	5.21	1.56
10	104.19	4.43	3.64	2.19
15	83.56	3.55	2.76	2.49
20	70.25	2.99	2.20	2.64
25	60.90	2.59	1.80	2.70
30	53.93	2.29	1.50	2.71
35	48.52	2.06	1.27	2.67
40	44.18	1.88	1.09	2.61
45	40.63	1.73	0.94	2.53
50	37.65	1.60	0.81	2.43
55	35.12	1.49	0.70	2.32
60	32.94	1.40	0.61	2.20
65	31.04	1.32	0.53	2.07
70	29.37	1.25	0.46	1.93
75	27.89	1.19	0.40	1.78
90	24.29	1.03	0.24	1.31
105	21.58	0.92	0.13	0.81
120	19.47	0.83	0.04	0.27

1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 2

OTTAWA IDF CURVE

Area =	0.017	ha	Qallow =	0.87	L/s
C =	1.00		Vol(max) =	6.5	m3

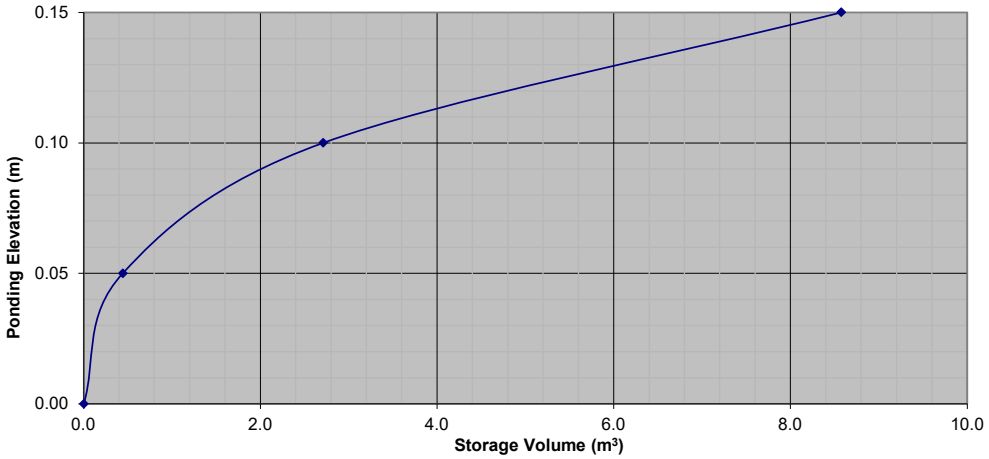
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	11.47	10.60	3.18
10	178.56	8.44	7.57	4.54
15	142.89	6.75	5.88	5.29
20	119.95	5.67	4.80	5.76
25	103.85	4.91	4.04	6.06
30	91.87	4.34	3.47	6.25
35	82.58	3.90	3.03	6.37
40	75.15	3.55	2.68	6.44
45	69.05	3.26	2.39	6.46
50	63.95	3.02	2.15	6.46
55	59.62	2.82	1.95	6.43
60	55.89	2.64	1.77	6.38
65	52.65	2.49	1.62	6.31
70	49.79	2.35	1.48	6.23
75	47.26	2.23	1.36	6.13
90	41.11	1.94	1.07	5.79
105	36.50	1.72	0.85	5.39
120	32.89	1.55	0.68	4.93

Watts Accutrol Flow Control Roof Drains:			RD-100-A-ADJ set to 1/4 Exposed		
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3)**	
				Required	**Provided**
1:5 Year	0.79	0.79	10	2.7	8.6
1:100 Year	0.87	0.87	13	6.5	8.6

Roof Drain Storage Table for RD 2

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.7	0.4
0.10	72.9	2.7
0.15	161.7	8.6

Stage Storage Curve: Area R-1
Controlled Roof Drain RD 2



1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 3

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.79	L/s
C =	0.90		Vol(max) =	2.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.36	5.57	1.67
10	104.19	4.69	3.90	2.34
15	83.56	3.76	2.97	2.68
20	70.25	3.16	2.37	2.85
25	60.90	2.74	1.95	2.93
30	53.93	2.43	1.64	2.95
35	48.52	2.19	1.40	2.93
40	44.18	1.99	1.20	2.88
45	40.63	1.83	1.04	2.81
50	37.65	1.70	0.91	2.72
55	35.12	1.58	0.79	2.61
60	32.94	1.48	0.69	2.50
65	31.04	1.40	0.61	2.37
70	29.37	1.32	0.53	2.24
75	27.89	1.26	0.47	2.10
90	24.29	1.09	0.30	1.64
105	21.58	0.97	0.18	1.15
120	19.47	0.88	0.09	0.62

1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 3

OTTAWA IDF CURVE

Area =	0.018	ha	Qallow =	0.87	L/s
C =	1.00		Vol(max) =	7.0	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	12.14	11.27	3.38
10	178.56	8.94	8.07	4.84
15	142.89	7.15	6.28	5.65
20	119.95	6.00	5.13	6.16
25	103.85	5.20	4.33	6.49
30	91.87	4.60	3.73	6.71
35	82.58	4.13	3.26	6.85
40	75.15	3.76	2.89	6.94
45	69.05	3.46	2.59	6.98
50	63.95	3.20	2.33	6.99
55	59.62	2.98	2.11	6.97
60	55.89	2.80	1.93	6.94
65	52.65	2.63	1.76	6.88
70	49.79	2.49	1.62	6.81
75	47.26	2.36	1.49	6.73
90	41.11	2.06	1.19	6.41
105	36.50	1.83	0.96	6.02
120	32.89	1.65	0.78	5.59

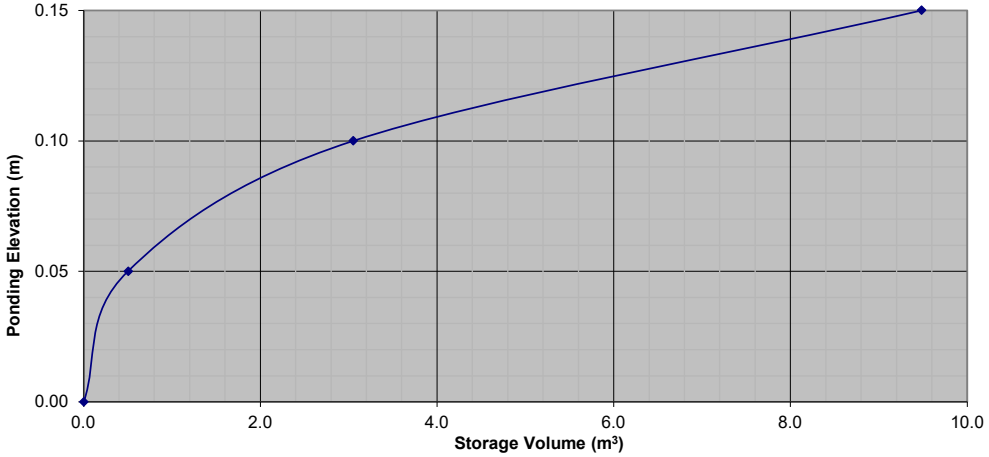
Watts Accutrol Flow Control Roof Drains: RD-100-A-ADJ set to 1/4 Exposed

Design Event	Flow/Drain (L/s)	Total Flow (L/s)	Ponding (cm)	Storage (m^3) Required	Storage (m^3) Provided
1:5 Year	0.79	0.79	10	2.9	9.5
1:100 Year	0.87	0.87	13	7.0	9.5

Roof Drain Storage Table for RD 3

Elevation	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	20.1	0.5
0.10	81.7	3.0
0.15	175.7	9.5

Stage Storage Curve: Area R-1
Controlled Roof Drain RD 3



1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 4

OTTAWA IDF CURVE

Area =	0.024	ha	Qallow =	0.95	L/s
C =	0.90		Vol(max) =	4.1	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	8.48	7.53	2.26
10	104.19	6.26	5.31	3.18
15	83.56	5.02	4.07	3.66
20	70.25	4.22	3.27	3.92
25	60.90	3.66	2.71	4.06
30	53.93	3.24	2.29	4.12
35	48.52	2.91	1.96	4.12
40	44.18	2.65	1.70	4.09
45	40.63	2.44	1.49	4.02
50	37.65	2.26	1.31	3.93
55	35.12	2.11	1.16	3.82
60	32.94	1.98	1.03	3.70
65	31.04	1.86	0.91	3.57
70	29.37	1.76	0.81	3.42
75	27.89	1.67	0.72	3.26
90	24.29	1.46	0.51	2.75
105	21.58	1.30	0.35	2.18
120	19.47	1.17	0.22	1.58

1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 4

OTTAWA IDF CURVE

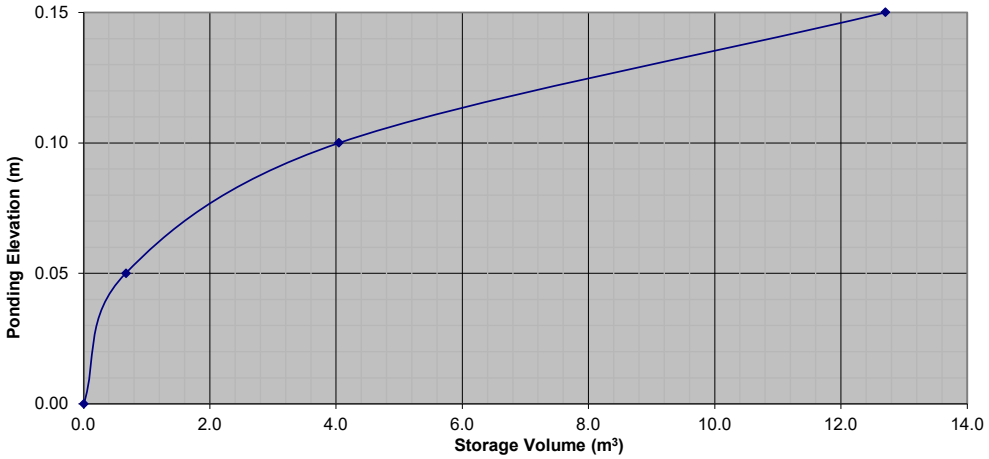
Area =	0.024	ha	Qallow =	1.10	L/s
C =	1.00		Vol(max) =	9.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	16.19	15.09	4.53
10	178.56	11.91	10.81	6.49
15	142.89	9.53	8.43	7.59
20	119.95	8.00	6.90	8.28
25	103.85	6.93	5.83	8.74
30	91.87	6.13	5.03	9.05
35	82.58	5.51	4.41	9.26
40	75.15	5.01	3.91	9.39
45	69.05	4.61	3.51	9.47
50	63.95	4.27	3.17	9.50
55	59.62	3.98	2.88	9.50
60	55.89	3.73	2.63	9.47
65	52.65	3.51	2.41	9.41
70	49.79	3.32	2.22	9.33
75	47.26	3.15	2.05	9.24
90	41.11	2.74	1.64	8.87
105	36.50	2.44	1.34	8.41
120	32.89	2.19	1.09	7.88

Watts Accutrol Flow Control Roof Drains:			RD-100-A-ADJ set to 1/2 Exposed		
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3) Required**	**Storage (m^3) Provided**
1:5 Year	0.95	0.95	10	4.1	12.7
1:100 Year	1.10	1.10	13	9.5	12.7

Roof Drain Storage Table for RD 4		
4.00	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	26.7	0.7
0.10	108.3	4.0
0.15	238.1	12.7

Stage Storage Curve: Area R-1
Controlled Roof Drain RD 4



1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 5

OTTAWA IDF CURVE

Area =	0.022	ha	Qallow =	0.95	L/s
C =	0.90		Vol(max) =	3.6	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	7.77	6.82	2.05
10	104.19	5.74	4.79	2.87
15	83.56	4.60	3.65	3.28
20	70.25	3.87	2.92	3.50
25	60.90	3.35	2.40	3.60
30	53.93	2.97	2.02	3.63
35	48.52	2.67	1.72	3.61
40	44.18	2.43	1.48	3.56
45	40.63	2.24	1.29	3.47
50	37.65	2.07	1.12	3.37
55	35.12	1.93	0.98	3.24
60	32.94	1.81	0.86	3.11
65	31.04	1.71	0.76	2.96
70	29.37	1.62	0.67	2.80
75	27.89	1.54	0.59	2.63
90	24.29	1.34	0.39	2.09
105	21.58	1.19	0.24	1.50
120	19.47	1.07	0.12	0.88

1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 5

OTTAWA IDF CURVE

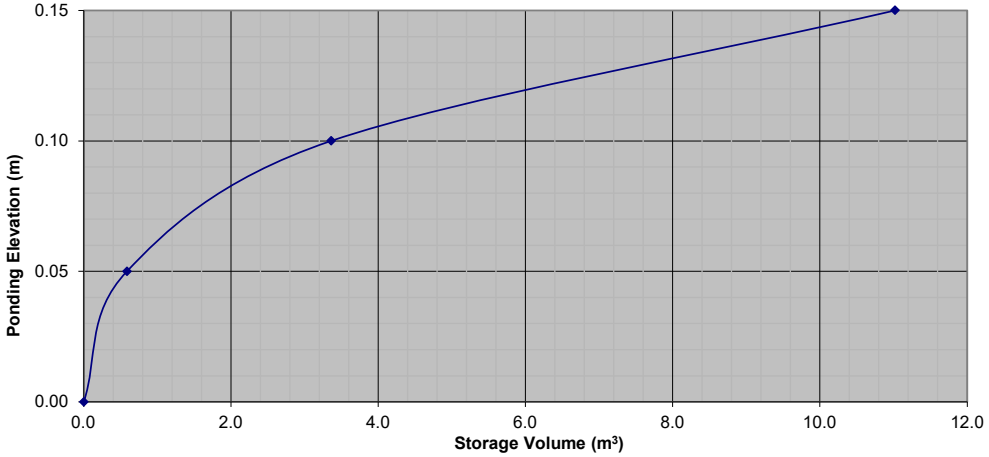
Area =	0.022	ha	Qallow =	1.10	L/s
C =	1.00		Vol(max) =	8.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	14.84	13.74	4.12
10	178.56	10.92	9.82	5.89
15	142.89	8.74	7.64	6.88
20	119.95	7.34	6.24	7.48
25	103.85	6.35	5.25	7.88
30	91.87	5.62	4.52	8.13
35	82.58	5.05	3.95	8.30
40	75.15	4.60	3.50	8.39
45	69.05	4.22	3.12	8.43
50	63.95	3.91	2.81	8.43
55	59.62	3.65	2.55	8.40
60	55.89	3.42	2.32	8.35
65	52.65	3.22	2.12	8.27
70	49.79	3.05	1.95	8.17
75	47.26	2.89	1.79	8.06
90	41.11	2.51	1.41	7.64
105	36.50	2.23	1.13	7.13
120	32.89	2.01	0.91	6.57

Watts Accutrol Flow Control Roof Drains:			RD-100-A-ADJ set to 1/2 Exposed		
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3) Required**	**Storage (m^3) Provided**
1:5 Year	0.95	0.95	10	3.6	11.0
1:100 Year	1.10	1.10	13	8.4	11.0

Roof Drain Storage Table for RD 5		
4.00	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	23.5	0.6
0.10	87.3	3.4
0.15	219.1	11.0

Stage Storage Curve: Area R-1
Controlled Roof Drain RD 5



1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 6

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	1.10	L/s
C =	0.90		Vol(max) =	2.7	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	6.71	5.61	1.68
10	104.19	4.95	3.85	2.31
15	83.56	3.97	2.87	2.58
20	70.25	3.34	2.24	2.69
25	60.90	2.89	1.79	2.69
30	53.93	2.56	1.46	2.63
35	48.52	2.31	1.21	2.53
40	44.18	2.10	1.00	2.40
45	40.63	1.93	0.83	2.24
50	37.65	1.79	0.69	2.07
55	35.12	1.67	0.57	1.88
60	32.94	1.57	0.47	1.68
65	31.04	1.48	0.38	1.47
70	29.37	1.40	0.30	1.24
75	27.89	1.33	0.23	1.02
90	24.29	1.15	0.05	0.29
105	21.58	1.03	-0.07	-0.47
120	19.47	0.93	-0.17	-1.26

1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 6

OTTAWA IDF CURVE

Area =	0.019	ha	Qallow =	1.34	L/s
C =	1.00		Vol(max) =	6.3	m3

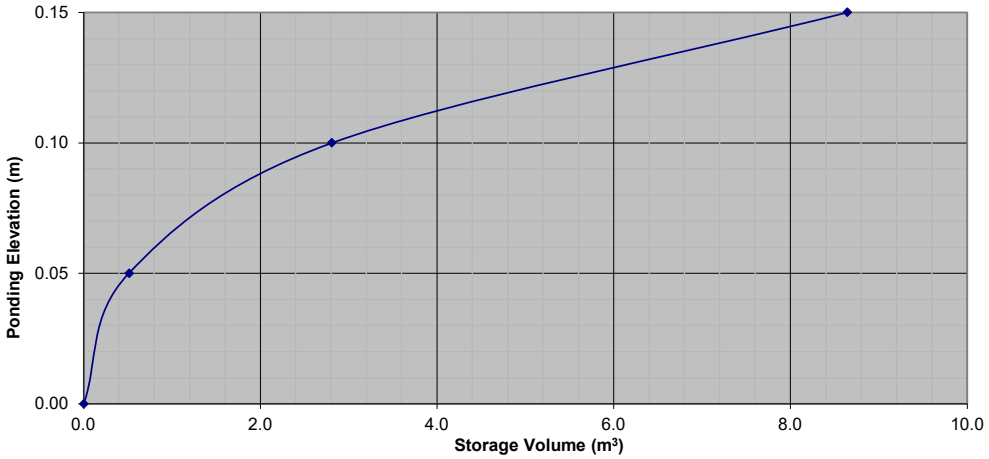
Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	12.82	11.48	3.44
10	178.56	9.43	8.09	4.85
15	142.89	7.55	6.21	5.59
20	119.95	6.34	5.00	5.99
25	103.85	5.49	4.15	6.22
30	91.87	4.85	3.51	6.32
35	82.58	4.36	3.02	6.35
40	75.15	3.97	2.63	6.31
45	69.05	3.65	2.31	6.23
50	63.95	3.38	2.04	6.11
55	59.62	3.15	1.81	5.97
60	55.89	2.95	1.61	5.80
65	52.65	2.78	1.44	5.62
70	49.79	2.63	1.29	5.42
75	47.26	2.50	1.16	5.20
90	41.11	2.17	0.83	4.49
105	36.50	1.93	0.59	3.70
120	32.89	1.74	0.40	2.86

Watts Accutrol Flow Control Roof Drains:			RD-100-A-ADJ set to 3/4 Exposed		
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3) Required**	**Provided**
1:5 Year	1.10	1.10	10	2.7	8.6
1:100 Year	1.34	1.34	13	6.3	8.6

Roof Drain Storage Table for RD 6

4.00	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	20.5	0.5
0.10	71.3	2.8
0.15	162.1	8.6

Stage Storage Curve: Area R-1
Controlled Roof Drain RD 6



1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 7

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.79	L/s
C =	0.90		Vol(max) =	2.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	4.86	1.46
10	104.19	4.17	3.38	2.03
15	83.56	3.34	2.55	2.30
20	70.25	2.81	2.02	2.43
25	60.90	2.44	1.65	2.47
30	53.93	2.16	1.37	2.46
35	48.52	1.94	1.15	2.42
40	44.18	1.77	0.98	2.35
45	40.63	1.63	0.84	2.26
50	37.65	1.51	0.72	2.15
55	35.12	1.41	0.62	2.03
60	32.94	1.32	0.53	1.90
65	31.04	1.24	0.45	1.77
70	29.37	1.18	0.39	1.62
75	27.89	1.12	0.33	1.47
90	24.29	0.97	0.18	0.98
105	21.58	0.86	0.07	0.47
120	19.47	0.78	-0.01	-0.08

1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 7

OTTAWA IDF CURVE

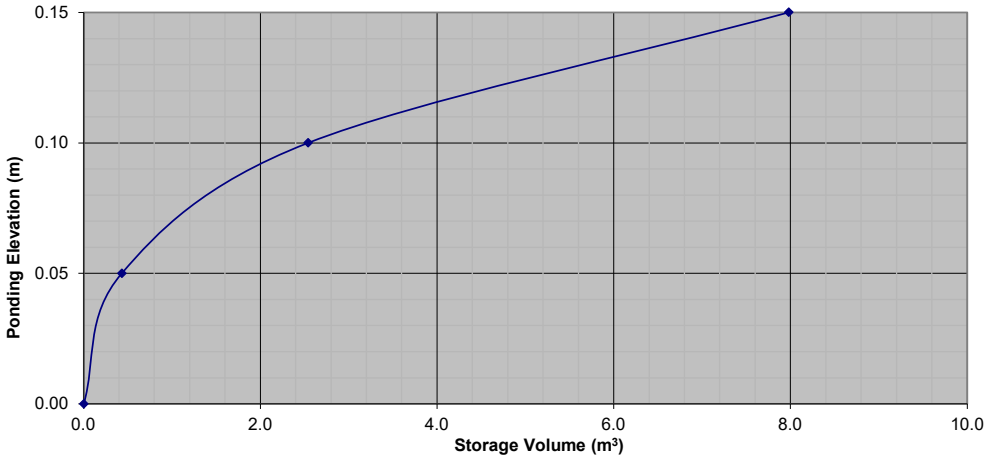
Area =	0.016	ha	Qallow =	0.87	L/s
C =	1.00		Vol(max) =	5.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	9.93	2.98
10	178.56	7.94	7.07	4.24
15	142.89	6.36	5.49	4.94
20	119.95	5.34	4.47	5.36
25	103.85	4.62	3.75	5.62
30	91.87	4.09	3.22	5.79
35	82.58	3.67	2.80	5.89
40	75.15	3.34	2.47	5.93
45	69.05	3.07	2.20	5.94
50	63.95	2.84	1.97	5.92
55	59.62	2.65	1.78	5.88
60	55.89	2.49	1.62	5.82
65	52.65	2.34	1.47	5.74
70	49.79	2.21	1.34	5.65
75	47.26	2.10	1.23	5.54
90	41.11	1.83	0.96	5.18
105	36.50	1.62	0.75	4.75
120	32.89	1.46	0.59	4.27

Watts Accutrol Flow Control Roof Drains:			RD-100-A-ADJ set to 1/4 Exposed		
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3)**	
				Required	**Provided**
1:5 Year	0.79	0.79	10	2.5	8.0
1:100 Year	0.87	0.87	13	5.9	8.0

Roof Drain Storage Table for RD 7		
4.00	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	17.3	0.4
0.10	66.9	2.5
0.15	150.7	8.0

Stage Storage Curve: Area R-1
Controlled Roof Drain RD 7



1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 8

OTTAWA IDF CURVE

Area =	0.013	ha	Qallow =	0.79	L/s
C =	0.90		Vol(max) =	1.8	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	4.59	3.80	1.14
10	104.19	3.39	2.60	1.56
15	83.56	2.72	1.93	1.74
20	70.25	2.28	1.49	1.79
25	60.90	1.98	1.19	1.79
30	53.93	1.75	0.96	1.74
35	48.52	1.58	0.79	1.65
40	44.18	1.44	0.65	1.55
45	40.63	1.32	0.53	1.44
50	37.65	1.22	0.43	1.30
55	35.12	1.14	0.35	1.16
60	32.94	1.07	0.28	1.01
65	31.04	1.01	0.22	0.86
70	29.37	0.96	0.17	0.69
75	27.89	0.91	0.12	0.53
90	24.29	0.79	0.00	0.00
105	21.58	0.70	-0.09	-0.55
120	19.47	0.63	-0.16	-1.13

1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 8

OTTAWA IDF CURVE

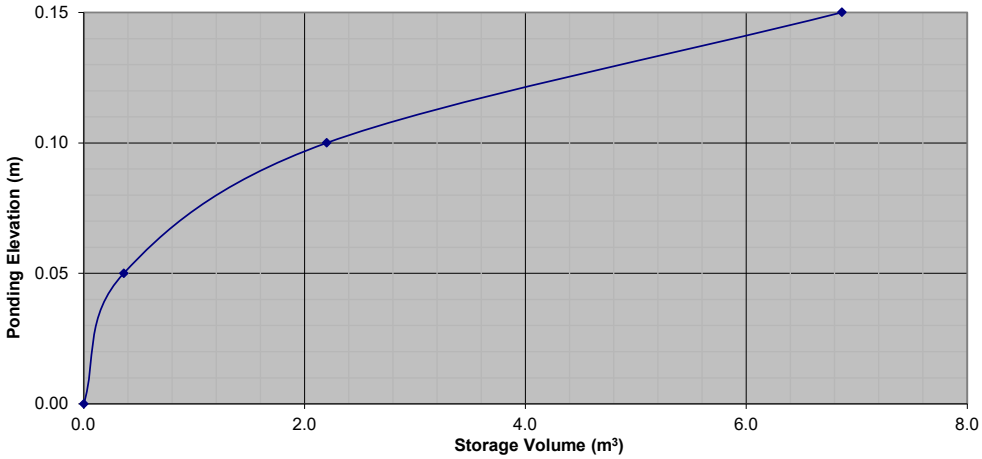
Area =	0.013	ha	Qallow =	0.87	L/s
C =	1.00		Vol(max) =	4.4	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	8.77	7.90	2.37
10	178.56	6.45	5.58	3.35
15	142.89	5.16	4.29	3.86
20	119.95	4.34	3.47	4.16
25	103.85	3.75	2.88	4.32
30	91.87	3.32	2.45	4.41
35	82.58	2.98	2.11	4.44
40	75.15	2.72	1.85	4.43
45	69.05	2.50	1.63	4.39
50	63.95	2.31	1.44	4.32
55	59.62	2.15	1.28	4.24
60	55.89	2.02	1.15	4.14
65	52.65	1.90	1.03	4.03
70	49.79	1.80	0.93	3.90
75	47.26	1.71	0.84	3.77
90	41.11	1.49	0.62	3.33
105	36.50	1.32	0.45	2.83
120	32.89	1.19	0.32	2.30

Watts Accutrol Flow Control Roof Drains:			RD-100-A-ADJ set to 1/4 Exposed		
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3) Required**	**Storage (m^3) Provided**
1:5 Year	0.79	0.79	10	1.8	6.9
1:100 Year	0.87	0.87	13	4.4	6.9

Roof Drain Storage Table for RD 8		
4.00	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	14.5	0.4
0.10	58.9	2.2
0.15	127.7	6.9

Stage Storage Curve: Area R-1
Controlled Roof Drain RD 8



1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:5 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 9

OTTAWA IDF CURVE

Area =	0.016	ha	Qallow =	0.79	L/s
C =	0.90		Vol(max) =	2.5	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	141.18	5.65	4.86	1.46
10	104.19	4.17	3.38	2.03
15	83.56	3.34	2.55	2.30
20	70.25	2.81	2.02	2.43
25	60.90	2.44	1.65	2.47
30	53.93	2.16	1.37	2.46
35	48.52	1.94	1.15	2.42
40	44.18	1.77	0.98	2.35
45	40.63	1.63	0.84	2.26
50	37.65	1.51	0.72	2.15
55	35.12	1.41	0.62	2.03
60	32.94	1.32	0.53	1.90
65	31.04	1.24	0.45	1.77
70	29.37	1.18	0.39	1.62
75	27.89	1.12	0.33	1.47
90	24.29	0.97	0.18	0.98
105	21.58	0.86	0.07	0.47
120	19.47	0.78	-0.01	-0.08

1533 & 1541 ST. JOSEPH BLVD
PROJECT NO: 125033
REQUIRED STORAGE - 1:100 YEAR EVENT
AREA A-3 Controlled Roof Drain RD 9

OTTAWA IDF CURVE

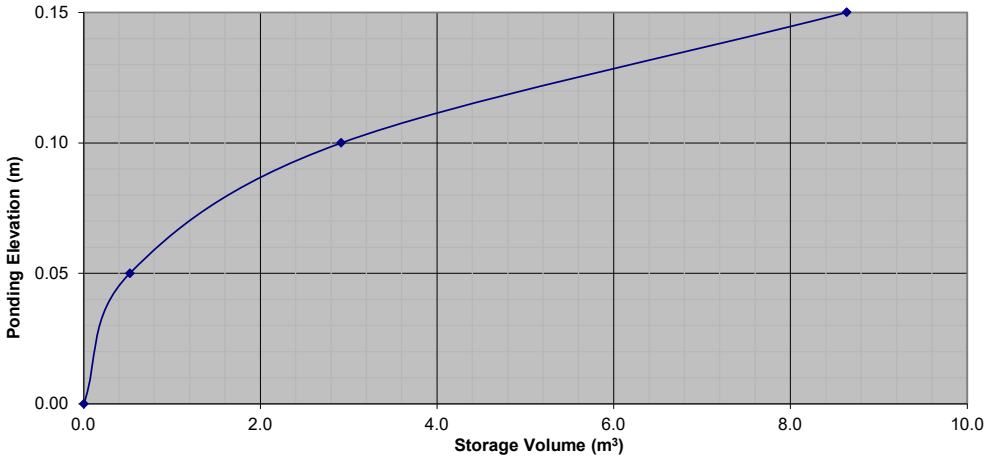
Area =	0.016	ha	Qallow =	0.87	L/s
C =	1.00		Vol(max) =	5.9	m3

Time (min)	Intensity (mm/hr)	Q (L/s)	Qnet (L/s)	Vol (m3)
5	242.70	10.80	9.93	2.98
10	178.56	7.94	7.07	4.24
15	142.89	6.36	5.49	4.94
20	119.95	5.34	4.47	5.36
25	103.85	4.62	3.75	5.62
30	91.87	4.09	3.22	5.79
35	82.58	3.67	2.80	5.89
40	75.15	3.34	2.47	5.93
45	69.05	3.07	2.20	5.94
50	63.95	2.84	1.97	5.92
55	59.62	2.65	1.78	5.88
60	55.89	2.49	1.62	5.82
65	52.65	2.34	1.47	5.74
70	49.79	2.21	1.34	5.65
75	47.26	2.10	1.23	5.54
90	41.11	1.83	0.96	5.18
105	36.50	1.62	0.75	4.75
120	32.89	1.46	0.59	4.27

Watts Accutrol Flow Control Roof Drains:			RD-100-A-ADJ set to 1/4 Exposed		
Design Event	**Flow/Drain (L/s)**	**Total Flow (L/s)**	**Ponding (cm)**	**Storage (m^3)**	
				Required	**Provided**
1:5 Year	0.79	0.79	10	2.5	8.6
1:100 Year	0.87	0.87	13	5.9	8.6

Roof Drain Storage Table for RD 9		
4.00	Area RD 1	Total Volume
m	m^2	m^3
0.00	0	0
0.05	20.9	0.5
0.10	74.7	2.9
0.15	154.1	8.6

Stage Storage Curve: Area R-1
Controlled Roof Drain RD 9



WATTS®	Adjustable Accutrol Weir Tag: _____	Adjustable Flow Control for Roof Drains

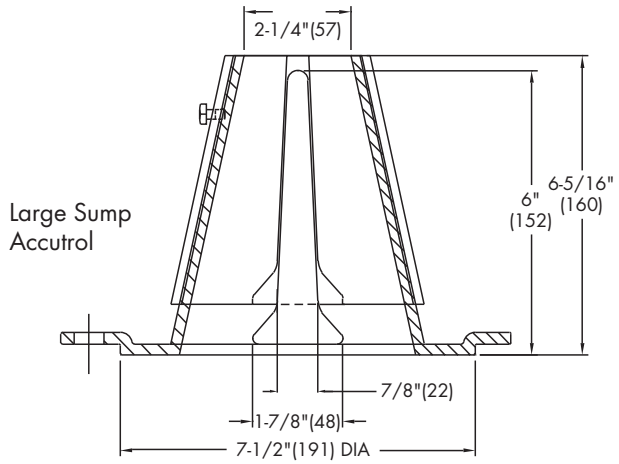
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

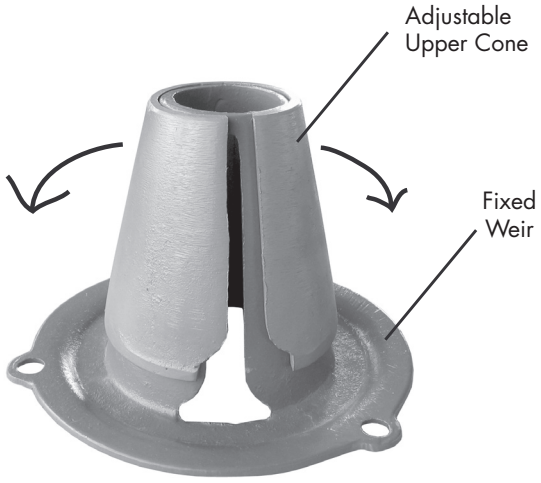
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the flow rate for depths over 2" of head, set the slot in the adjustable upper cone according to the flow rate required. Refer to Table 1 below.
Note: Flow rates are directly proportional to the amount of weir opening that is exposed.

EXAMPLE:

For example, if the adjustable upper cone is set to cover 1/2 of the weir opening, flow rates above 2"of head will be restricted to 2-1/2 gpm per inch of head.

Therefore, at 3"of head, the flow rate through the Accutrol Weir that has 1/2 the slot exposed will be:
[5 gpm (per inch of head) x 2 inches of head] + 2-1/2 gpm (for the third inch of head) = 12-1/2 gpm.





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

Weir Opening Exposed	1"	2"	3"	4"	5"	6"
	Flow Rate (gallons per minute)					
Fully Exposed	5	10	15	20	25	30
3/4	5	10	13.75	17.5	21.25	25
1/2	5	10	12.5	15	17.5	20
1/4	5	10	11.25	12.5	13.75	15
Closed	5	5	5	5	5	5

Job Name _____ Contractor _____

Job Location _____ Contractor's P.O. No. _____

Engineer _____ Representative _____

USA: Tel: (800) 338-2581 • Fax: (828) 248-3929 • Watts.com
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068 • Watts.ca
Latin America: Tel: (52) 81-1001-8600 • Fax: (52) 81-8000-7091 • Watts.com

WATTS®
A Watts Water Technologies Company

APPENDIX G

Development Servicing Study Checklist

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

- ☐ Executive Summary (for larger reports only).
- ☒ Date and revision number of the report.
- ☒ Location map and plan showing municipal address, boundary, and layout of proposed development.
- ☒ Plan showing the site and location of all existing services.
- ☒ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- ☒ Summary of Pre-consultation Meetings with City and other approval agencies.
- ☒ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.
- ☒ Statement of objectives and servicing criteria.
- ☒ Identification of existing and proposed infrastructure available in the immediate area.
- ☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).
- ☐ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- ☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- ☐ Proposed phasing of the development, if applicable.

☒ Reference to geotechnical studies and recommendations concerning servicing.

☒ All preliminary and formal site plan submissions should have the following information:
- Metric scale
- North arrow (including construction North)
- Key plan
- Name and contact information of applicant and property owner
- Property limits including bearings and dimensions
- Existing and proposed structures and parking areas
- Easements, road widening and rights-of-way
- Adjacent street names

4.2 Development Servicing Report: Water

☐ Confirm consistency with Master Servicing Study, if available
☒ Availability of public infrastructure to service proposed development
☐ Identification of system constraints
☒ Identify boundary conditions
☒ Confirmation of adequate domestic supply and pressure
☒ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.
☒ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.
☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
☒ Address reliability requirements such as appropriate location of shut-off valves
☐ Check on the necessity of a pressure zone boundary modification.
☒ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

- ☒ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.
- ☐ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- ☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.
- ☒ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

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

4.4 Development Servicing Report: Stormwater Checklist

- ☒ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- ☐ Analysis of available capacity in existing public infrastructure.
- ☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- ☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.
- ☒ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- ☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- ☐ Set-back from private sewage disposal systems.
- ☐ Watercourse and hazard lands setbacks.
- ☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- ☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- ☒ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- ☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- ☒ Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.
- ☐ Any proposed diversion of drainage catchment areas from one outlet to another.
- ☒ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- ☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100 year return period storm event.
- ☐ Identification of potential impacts to receiving watercourses
- ☐ Identification of municipal drains and related approval requirements.
- ☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.
- ☒ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

- ☒ Inclusion of hydraulic analysis including hydraulic grade line elevations.
- ☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- ☐ Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- ☐ Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

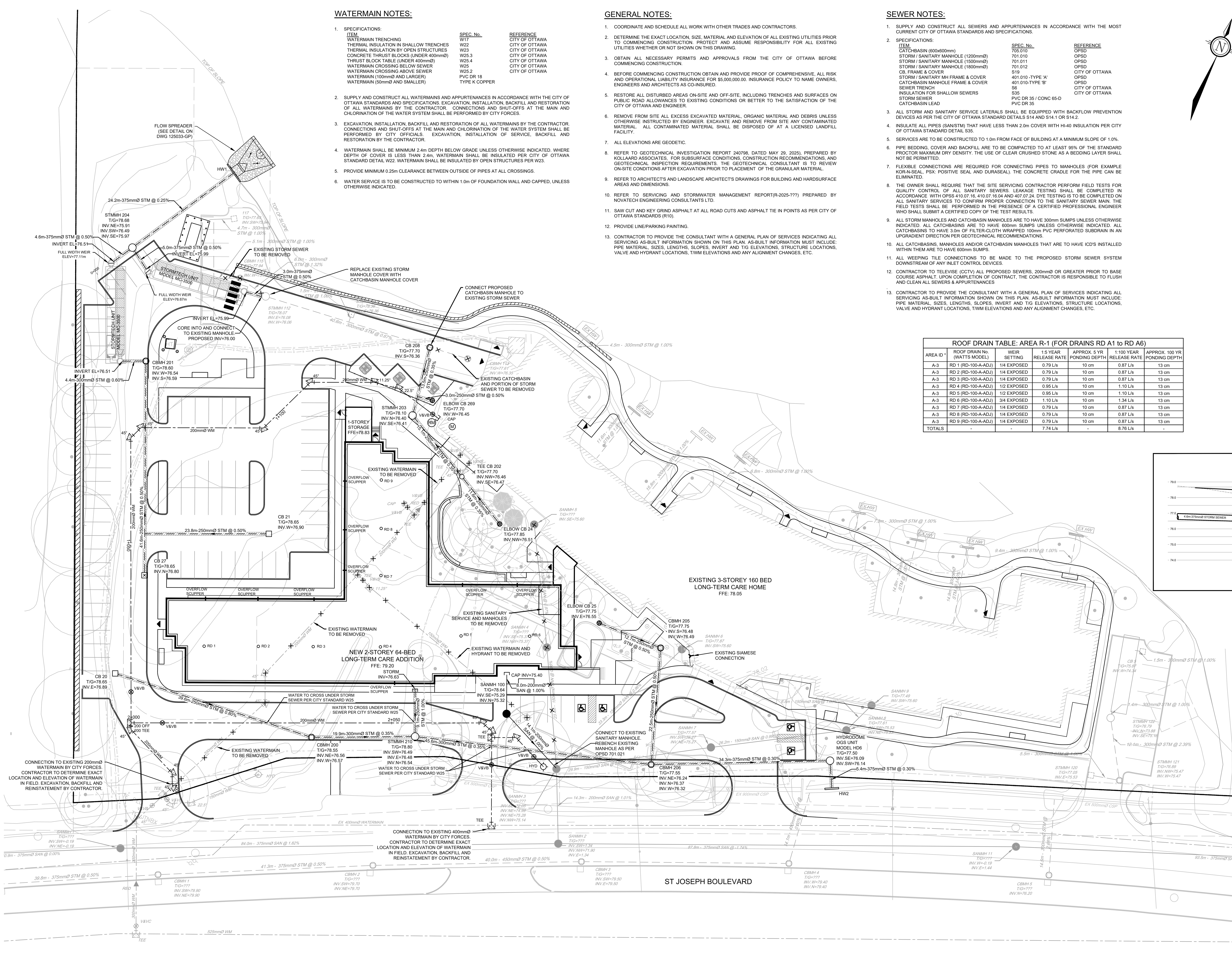
- ☐ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority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

4.6 Conclusion Checklist

- ☒ Clearly stated conclusions and recommendations
- ☐ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.
- ☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

APPENDIX H

Drawings



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 BY OPEN STRUCTURES	W23	CITY OF OTTAWA
CONCRETE THRUST BLOCKS (UNDER 400mmØ)	W25.3	CITY OF OTTAWA
THRUST BLOCK TABLE (UNDER 400mmØ)	W25.4	CITY OF OTTAWA
WATERMAIN CROSSING BELOW SEWER	W25	CITY OF OTTAWA
WATERMAIN CROSSING ABOVE SEWER	W25.2	CITY OF OTTAWA
WATERMAIN (100mmØ AND LARGER)	PVC DR 18	
WATERMAIN (50mmØ AND SMALLER)	TYPE K COPPER	

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 FORCES.

3. 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. EXCAVATION, INSTALLATION OF SERVICE, BACKFILL AND RESTORATION BY THE CONTRACTOR.

4. WATERMAIN SHALL BE MINIMUM 2.4m DEPTH BELOW GRADE UNLESS OTHERWISE INDICATED. WHERE DEPTH OF COVER IS LESS THAN 2.4m, WATERMAIN SHALL BE INSULATED PER CITY OF OTTAWA STANDARD DETAIL W22. WATERMAIN SHALL BE INSULATED BY OPEN STRUCTURES PER W23.

5. PROVIDE MINIMUM 0.25m CLEARANCE BETWEEN OUTSIDE OF PIPES AT ALL CROSSINGS.

6. WATER SERVICE IS TO BE CONSTRUCTED TO WITHIN 1.0m OF FOUNDATION WALL AND CAPPED, UNLESS OTHERWISE INDICATED.

GENERAL NOTES:

1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL INVESTIGATION REPORT 240798, DATED MAY 29, 2025), PREPARED BY KOLLAARD ASSOCIATES, FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS, AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARDSURFACE AREAS AND DIMENSIONS.
10. REFER TO SERVICING AND STORMWATER MANAGEMENT REPORT(R-2025-???) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).
12. PROVIDE LINE/PARKING PAINTING.
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

SEWER NOTES:

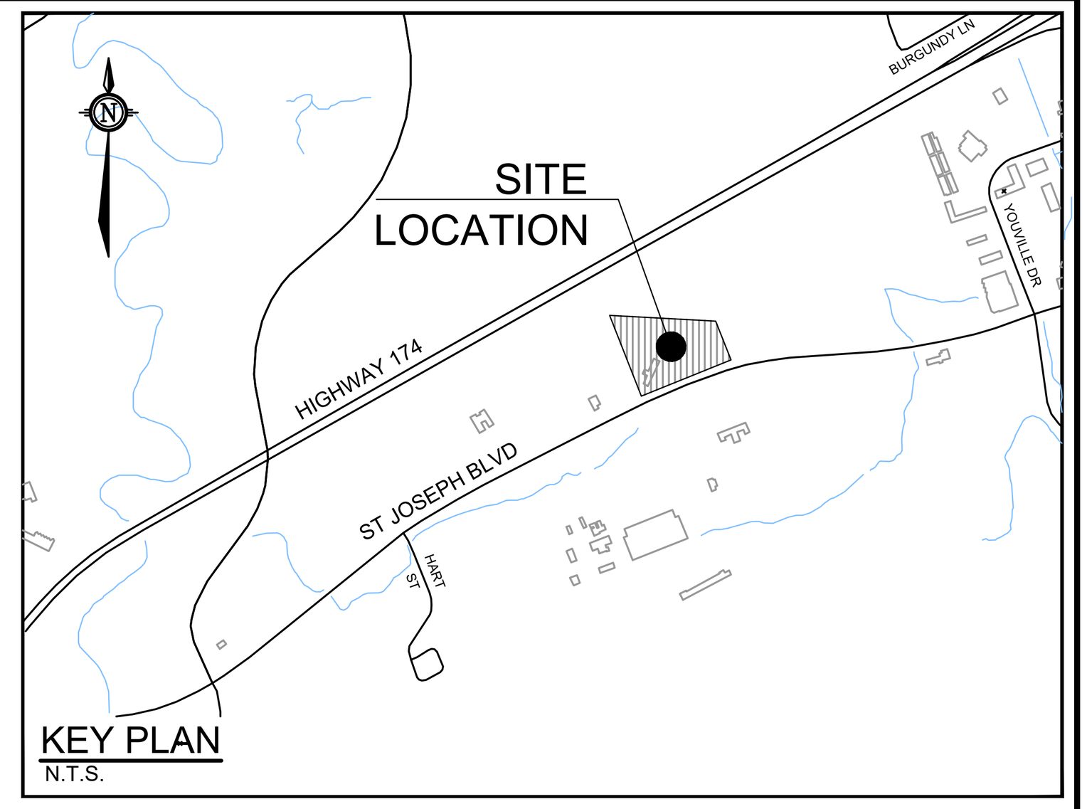
1. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE MOST CURRENT CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
2. SPECIFICATIONS:

ITEM	SPEC. No.	REFERENCE
CATCHBASIN (600x600mm)	705.010	OPSD
STORM / SANITARY MANHOLE (1200mmØ)	701.010	OPSD
STORM / SANITARY MANHOLE (1500mmØ)	701.011	OPSD
STORM / SANITARY MANHOLE (1800mmØ)	701.012	OPSD
CB, FRAME & COVER	S19	CITY OF OTTAWA
STORM / SANITARY MH FRAME & COVER	401.010 -TYPE 'A'	OPSD
CATCHBASIN MANHOLE FRAME & COVER	401.010-TYPE 'B'	OPSD
SEWER TRENCH	S6	CITY OF OTTAWA
INSULATION FOR SHALLOW SEWERS	S35	CITY OF OTTAWA
STORM SEWER	PVC DR 35 / CONC 65-D	
CATCHBASIN LEAD	PVC DR 35	

3. ALL STORM AND SANITARY SERVICE LATERALS SHALL BE EQUIPPED WITH BACKFLOW PREVENTION DEVICES AS PER THE CITY OF OTTAWA STANDARD DETAILS S14 AND S14.1 OR S14.2.
4. INSULATE ALL PIPES (SAN/STM) THAT HAVE LESS THAN 2.0m COVER WITH HI-40 INSULATION PER CITY OF OTTAWA STANDARD DETAIL S35.
5. SERVICES ARE TO BE CONSTRUCTED TO 1.0m FROM FACE OF BUILDING AT A MINIMUM SLOPE OF 1.0%.
6. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY. THE USE OF CLEAR CRUSHED STONE AS A BEDDING LAYER SHALL NOT BE PERMITTED.
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. ALL STORM MANHOLES AND CATCHBASIN MANHOLES ARE TO HAVE 300mm SUMPS UNLESS OTHERWISE INDICATED. ALL CATCHBASINS ARE TO HAVE 600mm SUMPS UNLESS OTHERWISE INDICATED. ALL CATCHBASINS TO HAVE 3.0m OF FILTER-CLOTH WRAPPED 100mm PVC PERFORATED SUBDRAIN IN AN UPGRADIENT DIRECTION PER GEOTECHNICAL RECOMMENDATIONS.
10. ALL CATCHBASINS, MANHOLES AND/OR CATCHBASIN MANHOLES THAT ARE TO HAVE ICD'S INSTALLED WITHIN THEM ARE TO HAVE 600mm SUMPS.
11. ALL WEEPING TILE CONNECTIONS TO BE MADE TO THE PROPOSED STORM SEWER SYSTEM DOWNSTREAM OF ANY INLET CONTROL DEVICES.
12. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmØ OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES
13. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GENERAL PLAN OF SERVICES INDICATING ALL SERVICING AS-BUILT INFORMATION SHOWN ON THIS PLAN. AS-BUILT INFORMATION MUST INCLUDE: PIPE MATERIAL, SIZES, LENGTHS, SLOPES, INVERT AND T/G ELEVATIONS, STRUCTURE LOCATIONS, VALVE AND HYDRANT LOCATIONS, T/WM ELEVATIONS AND ANY ALIGNMENT CHANGES, ETC.

ROOF DRAIN TABLE: AREA R-1 (FOR DRAINS RD A1 to RD A6)

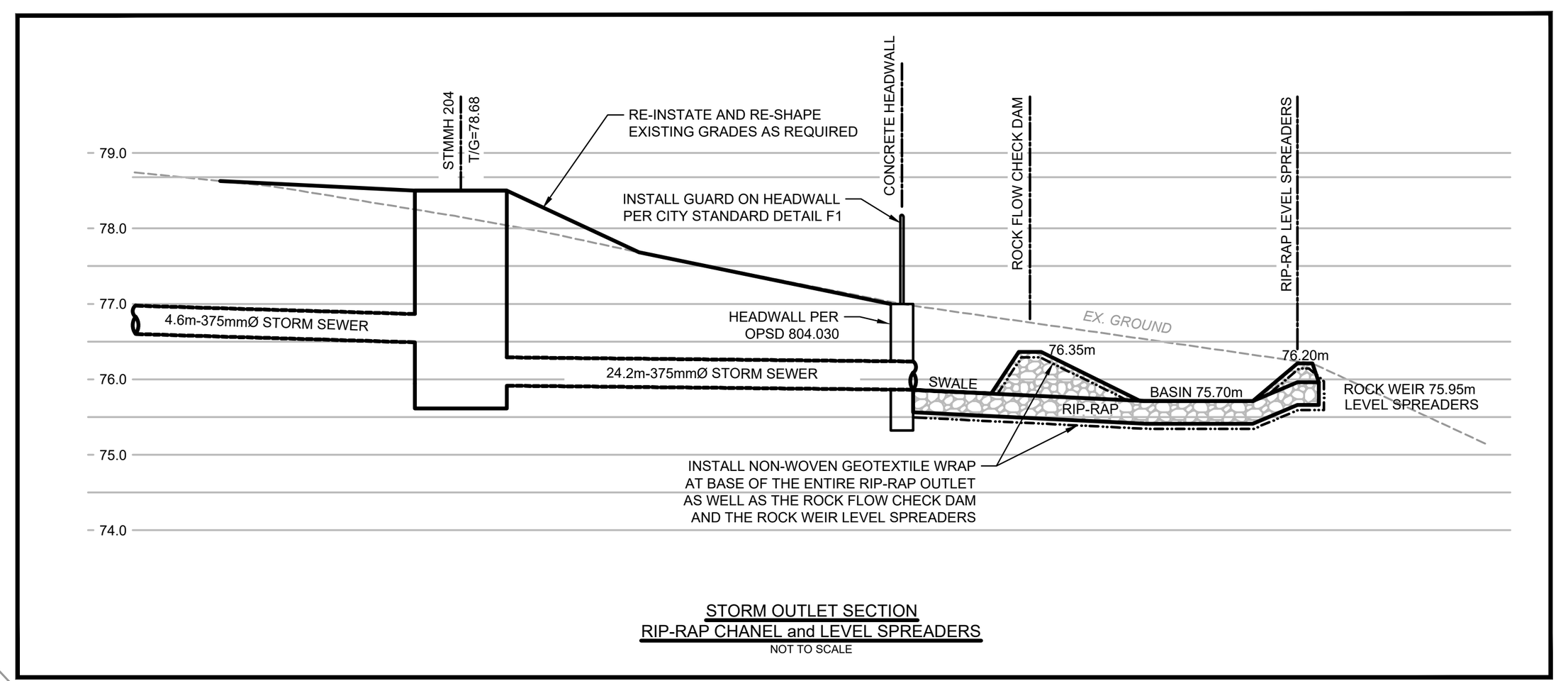
AREA ID *	ROOF DRAIN No. (WATTS MODEL)	WEIR SETTING	1:5 YEAR RELEASE RATE	APPROX. 5 YR PONDING DEPTH	1:100 YEAR RELEASE RATE	APPROX. 100 YR PONDING DEPTH
A-3	RD 1 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
A-3	RD 2 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
A-3	RD 3 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
A-3	RD 4 (RD-100-A-ADJ)	1/2 EXPOSED	0.95 L/s	10 cm	1.10 L/s	13 cm
A-3	RD 5 (RD-100-A-ADJ)	1/2 EXPOSED	0.95 L/s	10 cm	1.10 L/s	13 cm
A-3	RD 6 (RD-100-A-ADJ)	3/4 EXPOSED	1.10 L/s	10 cm	1.34 L/s	13 cm
A-3	RD 7 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
A-3	RD 8 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
A-3	RD 9 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
TOTALS	-	-	7.74 L/s	-	8.76 L/s	-



KEY PLAN
N.T.S.

LEGEND

- PROPERTY LINE
- PROPOSED CURB
- PROPOSED DEPRESSED CURB (DC)
- PROPOSED CAP
- PROPOSED SANITARY SEWER AND MANHOLE
- PROPOSED STORM SEWER AND MANHOLE
- PROPOSED INSULATION PER CITY STANDARD S35
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED WATER SERVICE
- PROPOSED HYDRANT c/w LEAD & VALVE
- V&VB PROPOSED VALVE AND VALVE BOX
- PROPOSED BUILDING ENTRANCE
- DIRECTION OF FLOW
- PROPOSED RETAINING WALL
- (M) (RM) PROPOSED WATER METER AND REMOTE METER
- (PRV) PROPOSED PRESSURE REDUCING VALVE
- *EXISTING UTILITY POLE C/W GUY WIRES*
- V&VC *EXISTING WATERMAIN C/W VALVE & VALVE CHAMBER*
- *EXISTING HYDRANT C/W VALVE & LEAD*
- SAN MH *EXISTING SANITARY MANHOLE & SEWER*
- STM MH *EXISTING STORM MANHOLE & SEWER*
- *EXISTING CATCHBASIN*
- X REMOVALS



STORM OUTLET SECTION
RIP-RAP CHANNEL and LEVEL SPREADERS
NOT TO SCALE

200mmØ WATERMAIN TABLE

CHAINAGE	FINISHED GRADE	TOP OF WATERMAIN	COMMENT
1+000.0	79.36	±76.96	CONNECT TO EXISTING WITH 45° HORIZ BEND
1+002.7	79.26	76.86	45° HORIZONTAL BEND
1+014.1	79.14	76.74	45° HORIZONTAL BEND
1+015.4	79.10	76.70	200mm x 200mm TEE CONNECTION
1+021.4	78.82	76.42	VALVE AND VALVE BOX
1+050.0	78.80	76.40	TOP OF WATERMAIN
1+070.1	78.94	76.54	45° HORIZONTAL BEND
1+072.9	78.86	76.46	45° HORIZONTAL BEND
1+096.4	78.80	76.40	45° HORIZONTAL BEND
1+109.0	78.55	76.15	45° HORIZONTAL BEND
1+121.3	78.15	75.75	11.25° HORIZONTAL BEND
1+126.1	78.05	75.65	22.5° HORIZONTAL BEND
1+134.3	77.85	75.45	VALVE AND VALVE BOX
1+135.7	77.80	75.40	CAP AT BUILDING

200mmØ WATERMAIN TABLE

CHAINAGE	FINISHED GRADE	TOP OF WATERMAIN	COMMENT
2+000.0	79.09	76.69	200mm x 200mm TEE CONNECTION
2+006.0	78.94	76.54	VALVE AND VALVE BOX
2+025.0	78.68	76.28	TOP OF WATERMAIN
2+050.0	78.74	76.34	TOP OF WATERMAIN
2+067.4	78.69	76.29	45° HORIZONTAL BEND
2+070.0	78.67	76.27	45° HORIZONTAL BEND
2+071.0	78.65	76.25	HYDRANT TEE
2+076.3	78.61	76.21	VALVE AND VALVE BOX
2+087.9	78.91	76.51	CONNECT TO EXISTING

NOTE:
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2	ISSUED FOR SPC APPLICATION	SEPT 16/25	MS
1	ISSUED FOR CLASS D	JULY 24/25	MS

SCALE 1:300

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LICENSED PROFESSIONAL ENGINEER M. SAVIC 100102651 9/16/2025 PROVINCE OF ONTARIO

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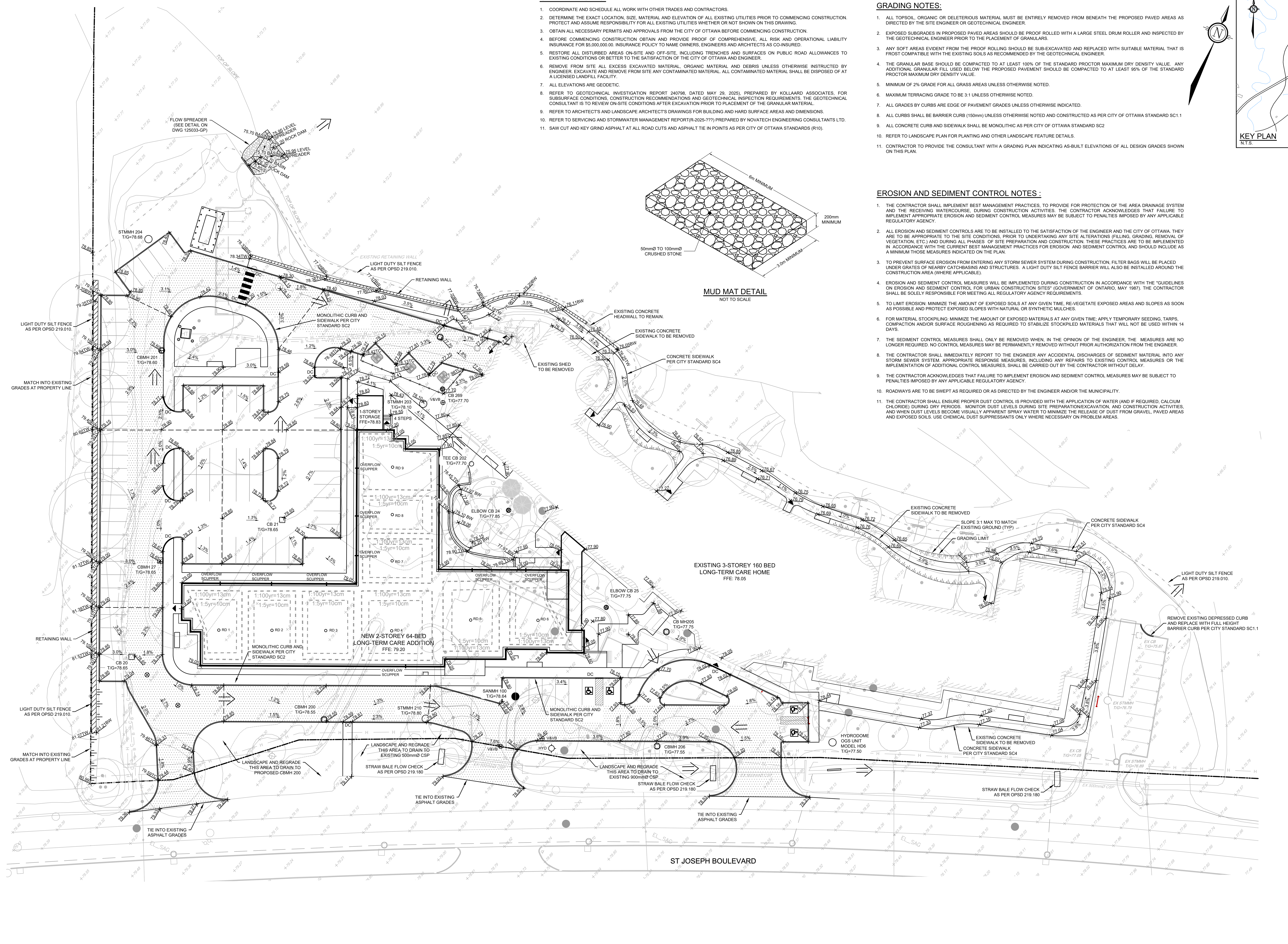
LOCATION
CITY OF OTTAWA
1533 & 1541 ST JOSEPH BOULEVARD

DRAWING NAME
GENERAL PLAN OF SERVICES

PROJECT No. 125033
REV # 2
DRAWING No. 125033-GP



GENERAL NOTES:

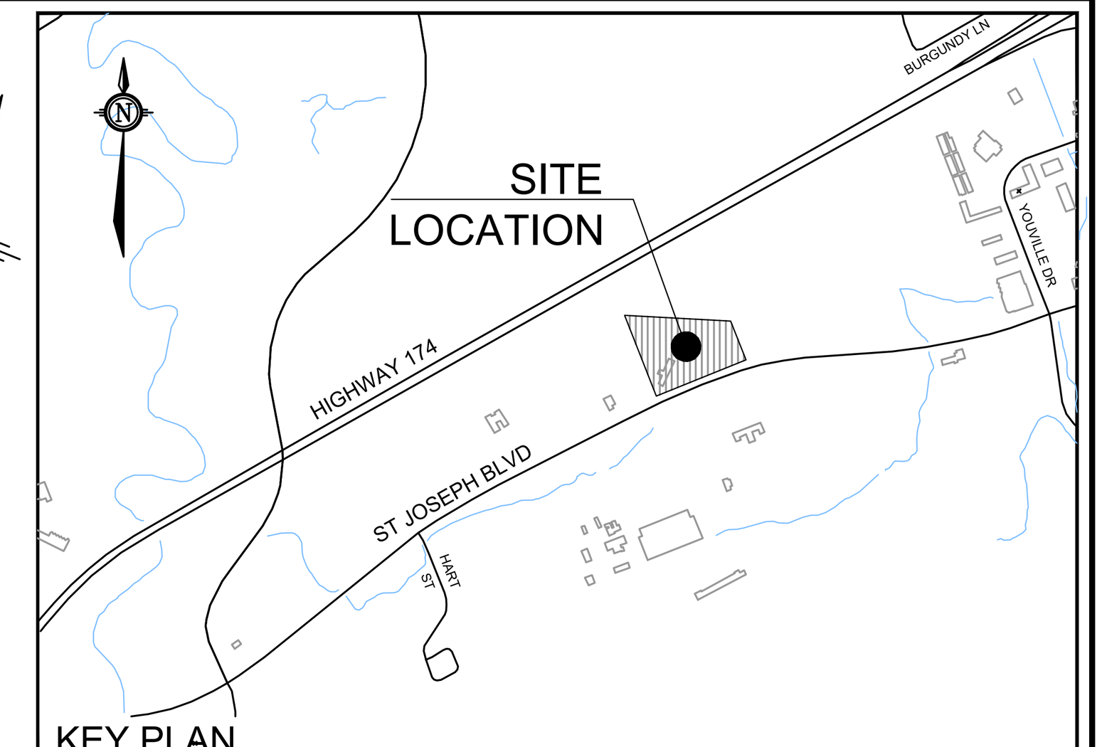
1. COORDINATE AND SCHEDULE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
2. DETERMINE THE EXACT LOCATION, SIZE, MATERIAL AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION. PROTECT AND ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THIS DRAWING.
3. OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF OTTAWA BEFORE COMMENCING CONSTRUCTION.
4. BEFORE COMMENCING CONSTRUCTION OBTAIN AND PROVIDE PROOF OF COMPREHENSIVE, ALL RISK AND OPERATIONAL LIABILITY INSURANCE FOR $5,000,000.00. INSURANCE POLICY TO NAME OWNERS, ENGINEERS AND ARCHITECTS AS CO-INSURED.
5. RESTORE ALL DISTURBED AREAS ON-SITE AND OFF-SITE, INCLUDING TRENCHES AND SURFACES ON PUBLIC ROAD ALLOWANCES TO EXISTING CONDITIONS OR BETTER TO THE SATISFACTION OF THE CITY OF OTTAWA AND ENGINEER.
6. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL, ORGANIC MATERIAL AND DEBRIS UNLESS OTHERWISE INSTRUCTED BY ENGINEER. EXCAVATE AND REMOVE FROM SITE ANY CONTAMINATED MATERIAL. ALL CONTAMINATED MATERIAL SHALL BE DISPOSED OF AT A LICENSED LANDFILL FACILITY.
7. ALL ELEVATIONS ARE GEODETIC.
8. REFER TO GEOTECHNICAL INVESTIGATION REPORT 240798, DATED MAY 29, 2025), PREPARED BY KOLLAARD ASSOCIATES, FOR SUBSURFACE CONDITIONS, CONSTRUCTION RECOMMENDATIONS AND GEOTECHNICAL INSPECTION REQUIREMENTS. THE GEOTECHNICAL CONSULTANT IS TO REVIEW ON-SITE CONDITIONS AFTER EXCAVATION PRIOR TO PLACEMENT OF THE GRANULAR MATERIAL.
9. REFER TO ARCHITECT'S AND LANDSCAPE ARCHITECT'S DRAWINGS FOR BUILDING AND HARD SURFACE AREAS AND DIMENSIONS.
10. REFER TO SERVICING AND STORMWATER MANAGEMENT REPORT(R-2025-???) PREPARED BY NOVATECH ENGINEERING CONSULTANTS LTD.
11. SAW CUT AND KEY GRIND ASPHALT AT ALL ROAD CUTS AND ASPHALT TIE IN POINTS AS PER CITY OF OTTAWA STANDARDS (R10).

GRADING NOTES:

1. ALL TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL MUST BE ENTIRELY REMOVED FROM BENEATH THE PROPOSED PAVED AREAS AS DIRECTED BY THE SITE ENGINEER OR GEOTECHNICAL ENGINEER.
2. EXPOSED SUBGRADES IN PROPOSED PAVED AREAS SHOULD BE PROOF ROLLED WITH A LARGE STEEL DRUM ROLLER AND INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF GRANULARS.
3. ANY SOFT AREAS EVIDENT FROM THE PROOF ROLLING SHOULD BE SUB-EXCAVATED AND REPLACED WITH SUITABLE MATERIAL THAT IS FROST COMPATIBLE WITH THE EXISTING SOILS AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.
4. THE GRANULAR BASE SHOULD BE COMPACTED TO AT LEAST 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE. ANY ADDITIONAL GRANULAR FILL USED BELOW THE PROPOSED PAVEMENT SHOULD BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY VALUE.
5. MINIMUM OF 2% GRADE FOR ALL GRASS AREAS UNLESS OTHERWISE NOTED.
6. MAXIMUM TERRACING GRADE TO BE 3:1 UNLESS OTHERWISE NOTED.
7. ALL GRADES BY CURBS ARE EDGE OF PAVEMENT GRADES UNLESS OTHERWISE INDICATED.
8. ALL CURBS SHALL BE BARRIER CURB (150mm) UNLESS OTHERWISE NOTED AND CONSTRUCTED AS PER CITY OF OTTAWA STANDARD SC1.1
9. ALL CONCRETE CURB AND SIDEWALK SHALL BE MONOLITHIC AS PER CITY OF OTTAWA STANDARD SC2
10. REFER TO LANDSCAPE PLAN FOR PLANTING AND OTHER LANDSCAPE FEATURE DETAILS.
11. CONTRACTOR TO PROVIDE THE CONSULTANT WITH A GRADING PLAN INDICATING AS-BUILT ELEVATIONS OF ALL DESIGN GRADES SHOWN ON THIS PLAN.

EROSION AND SEDIMENT CONTROL NOTES :

1. 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.
2. ALL EROSION AND SEDIMENT CONTROLS ARE TO BE INSTALLED TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA. THEY ARE TO BE 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. THESE PRACTICES ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL AND SHOULD INCLUDE AS A MINIMUM THOSE MEASURES INDICATED ON THE PLAN.
3. TO PREVENT SURFACE EROSION FROM ENTERING ANY STORM SEWER SYSTEM DURING CONSTRUCTION, FILTER BAGS WILL BE PLACED UNDER GRATES OF NEARBY CATCHBASINS AND STRUCTURES. A LIGHT DUTY SILT FENCE BARRIER WILL ALSO BE INSTALLED AROUND THE CONSTRUCTION AREA (WHERE APPLICABLE).
4. EROSION AND SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED DURING CONSTRUCTION IN ACCORDANCE WITH THE "GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES" (GOVERNMENT OF ONTARIO, MAY 1987). THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEETING ALL REGULATORY AGENCY REQUIREMENTS.
5. TO LIMIT EROSION: MINIMIZE THE AMOUNT OF EXPOSED SOILS AT ANY GIVEN TIME, RE-VEGETATE EXPOSED AREAS AND SLOPES AS SOON AS POSSIBLE AND PROTECT EXPOSED SLOPES WITH NATURAL OR SYNTHETIC MULCHES.
6. FOR MATERIAL STOCKPILING: MINIMIZE THE AMOUNT OF EXPOSED MATERIALS AT ANY GIVEN TIME; APPLY TEMPORARY SEEDING, TARPS, COMPACTION AND/OR SURFACE ROUGHENING AS REQUIRED TO STABILIZE STOCKPILED MATERIALS THAT WILL NOT BE USED WITHIN 14 DAYS.
7. THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE ENGINEER, THE MEASURES ARE NO LONGER REQUIRED. NO CONTROL MEASURES MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER.
8. THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE ENGINEER ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO ANY STORM SEWER SYSTEM. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.
9. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
10. ROADWAYS ARE TO BE SWEPT AS REQUIRED OR AS DIRECTED BY THE ENGINEER AND/OR THE MUNICIPALITY.
11. THE CONTRACTOR SHALL ENSURE PROPER DUST CONTROL IS PROVIDED WITH THE APPLICATION OF WATER (AND IF REQUIRED, CALCIUM CHLORIDE) DURING DRY PERIODS. MONITOR DUST LEVELS DURING SITE PREPARATION/EXCAVATION, AND CONSTRUCTION ACTIVITIES, AND WHEN DUST LEVELS BECOME VISUALLY APPARENT SPRAY WATER TO MINIMIZE THE RELEASE OF DUST FROM GRAVEL, PAVED AREAS AND EXPOSED SOILS. USE CHEMICAL DUST SUPPRESSANTS ONLY WHERE NECESSARY ON PROBLEM AREAS.



KEY PLAN
N.T.S.

LEGEND

	PROPERTY LINE
77.50	PROPOSED ELEVATION
76.35(S)	PROPOSED SWALE ELEVATION
76.35TW	PROPOSED TOP OF WALL ELEVATION
76.35BW	PROPOSED BOTTOM OF WALL ELEVATION
76.35TC	PROPOSED TOP OF CURB ELEVATION
76.45	EXISTING ELEVATION
	PROPOSED BUILDING ENTRANCE
	DIRECTION OF MAJOR OVERLAND FLOW
	TWSI (PER CITY DETAIL SC7.3)
	PROPOSED SAN MANHOLE
	PROPOSED STORM MANHOLE
	PROPOSED CATCHBASIN MANHOLE
	PROPOSED CATCHBASIN
RD	PROPOSED ROOF DRAIN
	PROPOSED FIRE HYDRANT
V&VB	PROPOSED VALVE AND VALVE BOX
	PROPOSED RETAINING WALL
H.P.	PROPOSED HIGH POINT
	PROPOSED CURB
DC	PROPOSED DEPRESSED CURB
	PROPOSED SWALE AND DIRECTION OF FLOW
	TERRACING 3:1 SLOPE MAX (UNLESS OTHERWISE INDICATED)
2.0%	SLOPE AND DIRECTION
	PROPOSED SITE LIGHTING (REFER TO ARCHITECTURAL DRAWINGS)
T	PROPOSED TRANSFORMER PAD LOCATION
SG	PROPOSED SWITCHGEAR PAD
GM	PROPOSED GAS METER LOCATION
	100-YR PONDING LIMITS

PAVEMENT STRUCTURES:

LIGHT DUTY
50mm HL3/SP12.5mm CAT. B
150mm GRANULAR "A"
300mm GRANULAR "B" TYPE II

HEAVY DUTY
40mm HL3/SP12.5mm CAT. B
50mm HL8/SP19.0mm CAT. B
150mm GRANULAR "A"
300mm GRANULAR "B" TYPE II

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SCALE 1:300

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APPROVED	MS

LICENSED PROFESSIONAL ENGINEER
M. SAVIC
100102651
9/16/2025
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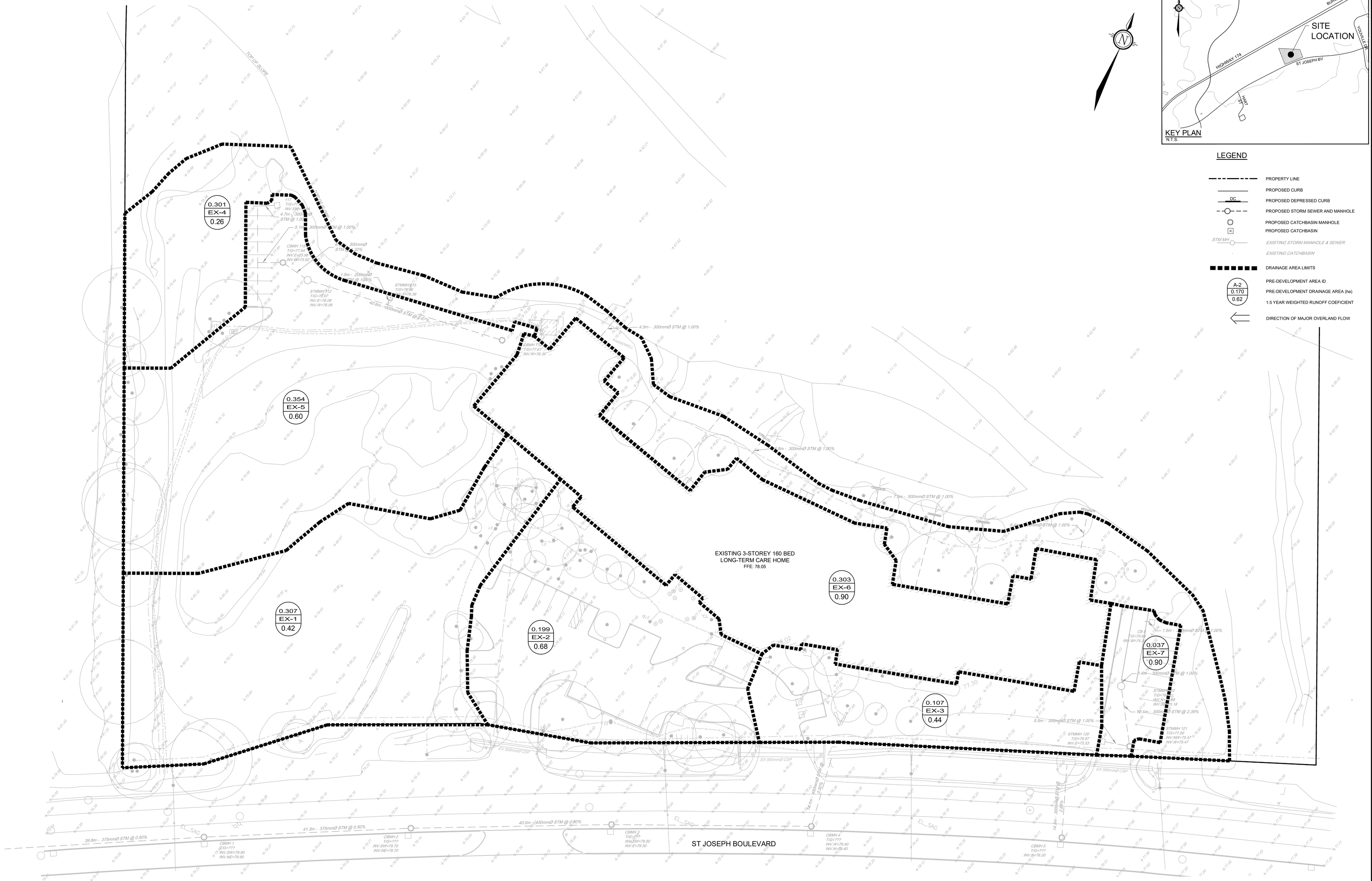
Website www.novatech-eng.com

LOCATION
CITY OF OTTAWA
1533 & 1541 ST JOSEPH BOULEVARD

DRAWING NAME
GRADING AND EROSION & SEDIMENT CONTROL PLAN

PROJECT No. 125033
REV # 2
DRAWING No. 125033-GR



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LOCATION
CITY OF OTTAWA
1533 & 1541 ST JOSEPH BOULEVARD

DRAWING NAME
PRE-DEVELOPMENT STORM DRAINAGE AREA PLAN

PROJECT No. 125033
REV REV # 1
DRAWING No. 125033-PRE

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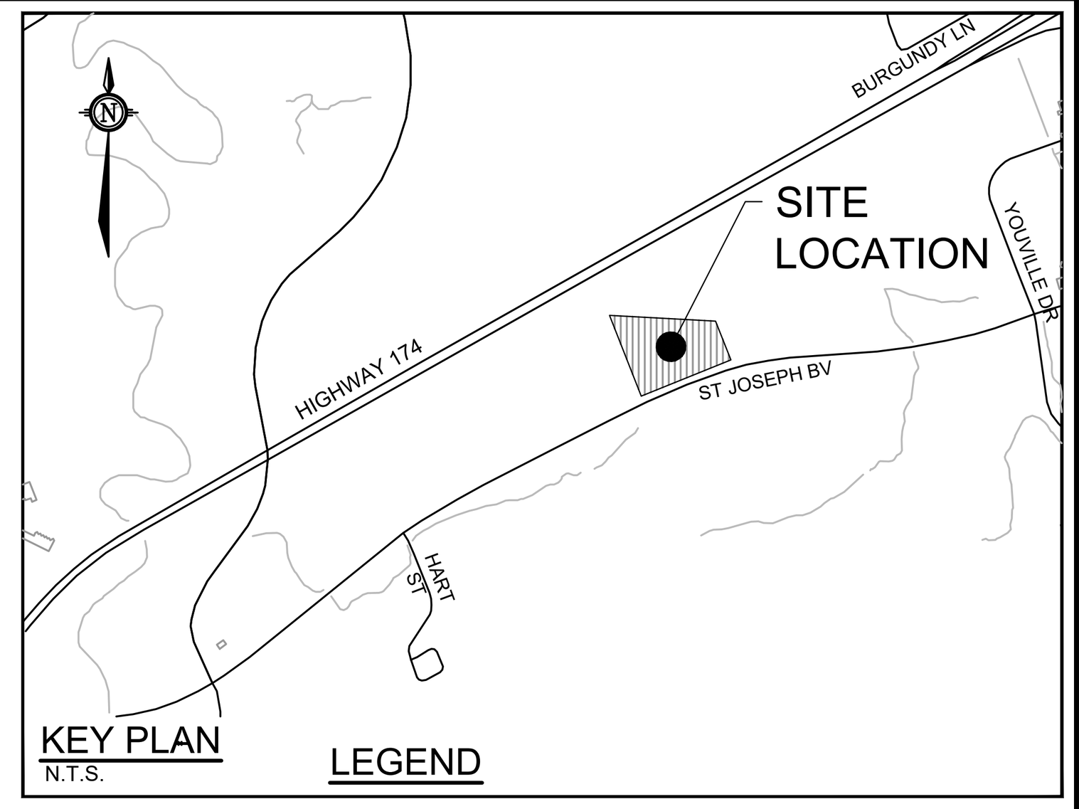
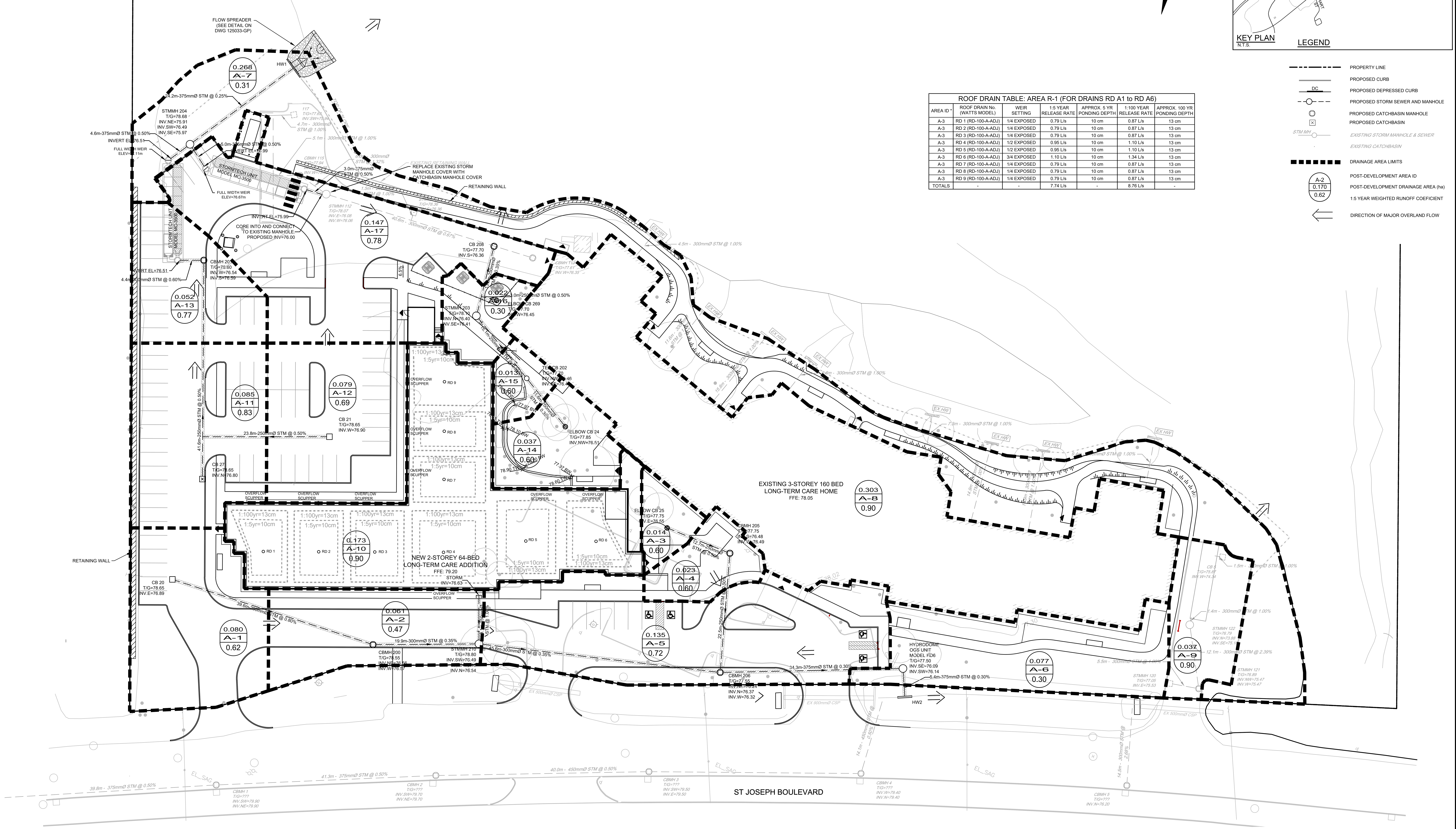


LEGEND

- PROPERTY LINE
- PROPOSED CURB
- PROPOSED DEPRESSED CURB
- PROPOSED STORM SEWER AND MANHOLE
- PROPOSED CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- EXISTING STORM MANHOLE & SEWER
- EXISTING CATCHBASIN
- DRAINAGE AREA LIMITS
- POST-DEVELOPMENT AREA ID (A-2)
- POST-DEVELOPMENT DRAINAGE AREA (ha) (0.170)
- 1:5 YEAR WEIGHTED RUNOFF COEFICIENT (0.62)
- DIRECTION OF MAJOR OVERLAND FLOW

ROOF DRAIN TABLE: AREA R-1 (FOR DRAINS RD A1 to RD A6)						
AREA ID *	ROOF DRAIN No. (WATTS MODEL)	WEIR SETTING	1:5 YEAR RELEASE RATE	APPROX. 5 YR PONDING DEPTH	1:100 YEAR RELEASE RATE	APPROX. 100 YR PONDING DEPTH
A-3	RD 1 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
A-3	RD 2 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
A-3	RD 3 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
A-3	RD 4 (RD-100-A-ADJ)	1/2 EXPOSED	0.95 L/s	10 cm	1.10 L/s	13 cm
A-3	RD 5 (RD-100-A-ADJ)	1/2 EXPOSED	0.95 L/s	10 cm	1.10 L/s	13 cm
A-3	RD 6 (RD-100-A-ADJ)	3/4 EXPOSED	1.10 L/s	10 cm	1.34 L/s	13 cm
A-3	RD 7 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
A-3	RD 8 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
A-3	RD 9 (RD-100-A-ADJ)	1/4 EXPOSED	0.79 L/s	10 cm	0.87 L/s	13 cm
TOTALS	-	-	7.74 L/s	-	8.76 L/s	-



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LOCATION
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1533 & 1541 ST JOSEPH BOULEVARD

DRAWING NAME
POST-DEVELOPMENT STORM DRAINAGE AREA PLAN

PROJECT No. 125033
REV: REV # 1
DRAWING No. 125033-STM

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