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# SITE SERVICING AND SWM STUDY MEMORANDUM

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DATE: 2018-12-12

EMAIL

TO: City of Ottawa IAD Review Officer

SUBJECT: Proposed Amendment to 129 Main Street Site Plan Application  
City File Number: D07-12-10-0196

OUR FILE: DSEL Project No.15-813

ATTACHMENTS:

- Site Plan, SP-1, by Roderick Lahey Architect Inc., Dated September 24<sup>th</sup> 2018 (Proposed Amendment)
- Stormwater Management Plan, SWM-1, by DSEL, Dated January 15<sup>th</sup>, 2016 (Previously Approved)
- Storm Calculation Sheet, by DSEL, Dated January 14<sup>th</sup>, 2016 (Previously Approved)
- Stormwater Management Plan, SWM-1, by DSEL, Dated December 2018 (Proposed Amendment)
- Storm Calculation Sheet, by DSEL, Dated July 2018 (Proposed Amendment)
- Tempest LMF Graph by IPEX
- Triton Stormwater Solutions Sizing Specifications, printed June 26<sup>th</sup>, 2018
- Water Demand Calculation Sheet, by DSEL, Dated November 11<sup>th</sup>, 2015 (Previously Approved)
- Water Demand Calculation Sheet, by DSEL, Dated June 2018 (Proposed Amendment)
- City of Ottawa Boundary Conditions Dated April 23<sup>rd</sup>, 2018
- Wastewater Calculation Sheet, by DSEL, Dated November 11<sup>th</sup>, 2015 (Previously Approved)
- Wastewater Calculation Sheet, by DSEL, Dated June 2018 (Proposed Amendment)

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## 1.0 INTRODUCTION

Roderick Lahey Architect Inc. has retained DSEL to prepare a servicing memo in support of the proposed amendment to the previously approved site plan application for the subject site located

at 129 Main Street (D07-12-10-0196). Please see proposed amended site plan (**SP-1**) dated September 24<sup>th</sup>, 2018, included along with this memo.

The following memo addresses the impact of the updated site plan on the previously approved servicing brief prepared by David Schaeffer Engineering Ltd, dated January 15<sup>th</sup>, 2016.

The previously approved Site Plan proposed **32** residential units and **446 m<sup>2</sup>** of commercial space. The updated Site Plan proposes a revised building design, consisting of **46** residential units and **300 m<sup>2</sup>** of commercial space.

Based on the previously approved Site Servicing and Grading Plan, **SSGP-1**, dated January 15<sup>th</sup>, 2016, the development was proposed to be serviced via the existing sewers and watermain within the Springhurst Avenue right-of-way. As shown by the revised Site Servicing Plan, **SSP-1**, there are no proposed changes.

## 2.0 WATER SUPPLY SERVICING

**Table 1**, below, summarizes the **Water Supply Guidelines** employed in the preparation of the preliminary water demand estimate.

**Table 1 – Water Supply Design Criteria**

Design Parameter	Value
Residential 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Residential Average Daily Demand	350 L/d/P (Previously Approved) 280 L/d/P (Proposed Amendment)***
Residential Maximum Daily Demand	4.9 x Average Daily *
Residential Maximum Hourly	7.4 x Average Daily *
Commercial Retail	2.5 L/m <sup>2</sup> /d
Commercial Maximum Daily Demand	1.5 x avg. day
Commercial Maximum Hour Demand	1.8 x max. day
Minimum Watermain Size	150 mm diameter
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure must not exceed	552 kPa
During fire flow operating pressure must not drop below	140 kPa
*Daily average based on Appendix 4-A from <b>Water Supply Guidelines</b>	
** Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons.	
-Table updated to reflect ISD-2010-2	
***Revised design parameters outlined in Technical Bulletin ISTB-2018-01	

As summarized in *Section 1.0*, the updated Site Plan results in an increase in residential units and a decrease in commercial area. As a result, the previously approved existing water demand will be increased by **12%**, as shown by the attached water demand calculation sheet.

**Table 2**, below, based on the **Water Supply Guidelines** summarizes the estimated water supply demand for the previously approved development.

**Table 2 – Previously Approved Water Demand Summary**

Design Parameter	Estimated Demand <sup>1</sup> (L/min)
Average Daily Demand	12.9
Max Day + Fire Flow	60.7
Peak Hour	92.0
1) Water demand calculation per <b>Water Supply Guidelines</b> . See <b>Appendix</b> for detailed calculations.	

**Table 3**, below, based on the **Water Supply Guidelines** and the site statistics prepared by Roderick Lahey Architect Inc., summarizes the estimated water supply demand and boundary conditions for the amended development.

**Table 3 - Proposed Amendment Water Demand and Boundary Conditions Summary**

Design Parameter	Estimated Demand <sup>1</sup> (L/min)	Boundary Condition <sup>2</sup> (m H <sub>2</sub> O / kPa)
Average Daily Demand	14.5	50.6 / 496.4
Max Day + Fire Flow	69.4 + 4,150 = 4,219.4	30,000 L/min @ 140 kPa
Peak Hour	105.0	41.7 / 409.1
1) Water demand calculation per <b>Water Supply Guidelines</b> . See <b>Appendix</b> for detailed calculations.		
2) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation 64.1m. See <b>Appendix</b> .		

For the purpose of estimating fire flow, National Fire Protection Association (NFPA) standards were utilized. As indicated by Section 11.2.2 from the **NFPA Standards**, fire flow requirements are to be determined by combining the required flow rate for the sprinkler system, along with the anticipated hose stream. As indicated by Table 11.2.2.1 and Table 11.2.3.1.2 extracted from the **NFPA Standards** and included in **Appendix B**, the anticipated fire flow requirements for the sprinkler system is **3,200 L/min** (850 gpm) and the anticipated internal and external total combined inside and outside hose stream demand is **950 L/min** (250 gpm).

As a result, the total fire flow is anticipated to be **4,150 L/min** (1,100 gpm). Based on the boundary conditions provided by the City of Ottawa, sufficient supply is available for fire flow. A certified fire protection system specialist will need to be employed to design the building fire suppression system and confirm the actual fire flow demand.

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand as indicated in the boundary request correspondence included in **Appendix B**.

The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow demand for the demands as indicated by the correspondence in **Appendix B**. The minimum and maximum pressures fall within the required range identified in **Table 1**, above. As a result, the municipal system is capable of providing sufficient water supply during fire flow conditions.

DSEL employed a daily consumption rate of 280 L/person/day to align with the revised wastewater rates identified by City of Ottawa Technical Bulletin ISTB-2018-01. As a result, DSEL is submitting for a deviation from the **Water Supply Guidelines**.

### 3.0 WASTEWATER SERVICING

**Table 4**, below, summarizes the **City Standards** employed in the design of the proposed wastewater sewer system for the previously approved and proposed amendment.

**Table 4 – Wastewater Design Criteria**

Design Parameter	Value
Residential 1 Bedroom Apartment	1.4 P/unit
Average Daily Demand	350 L/d/per (Previously Approved) 280 L/d/per (Proposed Amendment)*
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0 Harmon's Correction Factor. 1 (Previously Approved) Harmon's Correction Factor. 0.8 (Amendment)*
Commercial Floor Space	5 L/m <sup>2</sup> /d
Infiltration and Inflow Allowance	0.05 L/s/ha (Dry) 0.28 L/s/ha (Wet) 0.33 L/s/ha (Total)
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} AR^{2/3} S^{1/2}$
Minimum Sewer Size	200 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
<i>Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012. *Revised design parameters outlined in Technical Bulletin ISTB-2018-01</i>	

**Table 5**, below, demonstrates the estimated peak flow from the previously approved development, see **Appendix C** for associated calculations. Based on the previously approved report, the 450 mm diameter sanitary sewer within Springhurst Avenue has sufficient capacity to support the previously approved development.

**Table 5 – Previously Approved Wastewater Demand Summary**

Design Parameter	Estimated Demand <sup>1</sup> (L/min)
Estimated Average Dry Weather Flow	0.25
Estimated Peak Dry Weather Flow	0.89
Estimated Peak Wet Weather Flow	0.93

**Table 6**, below, demonstrates the estimated peak flow from the proposed development, see **Appendix C** for associated calculations.

**Table 6 – Proposed Amendment Wastewater Demand Summary**

Design Parameter	Estimated Demand <sup>1</sup> (L/min)
Estimated Average Dry Weather Flow	0.26
Estimated Peak Dry Weather Flow	0.88
Estimated Peak Wet Weather Flow	0.93

As demonstrated by **Table 5** and **Table 6**, due to revised design parameters outlined in the City of Ottawa Technical Bulletin ISTB-2018-01, the estimated wastewater flow for the proposed development has remained approximately the same as the previously approved wastewater flow.

As a result, sufficient capacity is available within the Springhurst Avenue sanitary sewer to support the amended development.

#### 4.0 STORMWATER MANAGEMENT

The previously approved storm calculation sheet and associated Stormwater Management Plan, **SWM-1** dated January 15<sup>th</sup>, 2016 is attached for reference. The established allowable release rate for the subject site was determined to be **20.4 L/s**; employing the City of Ottawa IDF parameters for a 5-year storm based on a rational method coefficient of 0.50 with a calculated time of concentration equal to or greater than 10 minutes for **0.14 ha** of the subject site.

**Table 7**, below, summarizes the anticipated release rates and onsite storage required to meet established target release rates from the existing approved stormwater management plan.

**Table 7 - Approved SWM Summary**

Control Area	5-Year Release Rate (L/s)	5-Year Required Storage (m <sup>3</sup> )	100-Year Release Rate (L/s)	100-Year Required Storage (m <sup>3</sup> )	100-Year Available Storage (m <sup>3</sup> )
Unattenuated Areas	3.9	0.0	8.3	0.0	0.0
Roof Controls	3.6	17.0	4.6	37.6	80.5
Attenuated Areas	5.0	2.8	7.5	6.0	6.0
<b>Total</b>	<b>12.5</b>	<b>19.7</b>	<b>20.4</b>	<b>43.5</b>	<b>86.5</b>

Based on the revised calculations the established allowable release rate has been determined as **19.7 L/s**, employing the City of Ottawa IDF parameters for a 5-year storm based on a rational method coefficient of 0.50 with a calculated time of concentration equal to or greater than 10 minutes for **0.136 ha** of the subject site. The reduction in area is a result of the Main Street road widening limits.

To meet the stormwater objectives the proposed development will contain a combination of surface and subsurface storage.

Area A1, shown by drawing **SWM-1**, is tributary to the internal storm sewer connecting to Springhurst Avenue. A Triton S-29 underground storage systems or an approved equivalent storage system will provide **36.0 m<sup>3</sup>** of underground storage and stormwater flow will be attenuated by a Tempest **LMF90 ICD** at the outlet side of STMMH102. The attached storm calculation sheets illustrate the existing approved plan and proposed amendment. An updated **SWM-1** drawing dated December 2018 and calculation sheet is included in **Appendix D**.

**Table 8**, below, summarizes the estimated release rates and onsite storage required to meet the established target release rates.

**Table 8 - Proposed Amendment SWM Summary**

Control Area	5-Year Release Rate	5-Year Required Storage	100-Year Release Rate	100-Year Required Storage	100-Year Available Storage
	(L/s)	(m <sup>3</sup> )	(L/s)	(m <sup>3</sup> )	(m <sup>3</sup> )
Unattenuated Areas (U1)	4.9	0.0	10.4	0.0	0.0
Attenuated Areas (A1)	4.8	16.6	8.5	35.6	36.0
<b>Total</b>	<b>9.7</b>	<b>16.6</b>	<b>19.0</b>	<b>35.6</b>	<b>36.0</b>

Approximately **35.6 m<sup>3</sup>** of underground storage is required and will be provided via a **36.0 m<sup>3</sup>** Triton S-29 storage system, or an approved equivalent, to meet the established release rate of **19.7 L/s**.

## 5.0 CONCLUSION

Roderick Lahey Architect Inc. has retained DSEL to prepare a servicing memo in support of the proposed amendment to the previously approved site plan application for the subject site located at 129 Main Street (D07-12-10-0196). The updated Site Plan proposes a revised building design, consisting of **46** residential units and **300 m<sup>2</sup>** of commercial space to be serviced via the existing sewers within the Springhurst Avenue right-of-way.

The City of Ottawa was contacted to obtain boundary conditions associated with the estimated water demand as indicated in the boundary request correspondence included in **Appendix B**. The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow demand; the minimum and maximum pressures fall within the required range identified in the **Water Supply Guidelines**. As a result, the municipal system is capable of providing sufficient water supply during fire flow conditions.

Based on the revised Site Plan prepared by Roderick Lahey Architect Inc. and the revised design parameters outlined within City of Ottawa Technical Bulletin ISTB-2018-01, the estimated wastewater flow from the proposed development has remained approximately the same. As a result, the existing 450 mm diameter sanitary sewer within Springhurst Avenue has sufficient capacity to support the proposed development.

Based on the revised calculations the established allowable release rate has been determined as **19.7 L/s**, employing the City of Ottawa IDF parameters for a 5-year storm based on a rational method coefficient of 0.50 with a calculated time of concentration equal to or greater than 10 minutes. The revised allowable release rate proposes a 4% decrease in stormwater outletting to the municipal system from the previously approved report. It is estimated that **35.6 m<sup>3</sup>** of storage provided via an underground storage system will be required to meet this release rate.

DSEL trusts that the above will be sufficient to support an amendment to the previously approved stormwater management plan, water supply servicing and wastewater servicing to allow the proposed development to proceed. Please contact the undersigned if you have any questions.

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



**Per: Alison J. Gosling, EIT.**

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



*Job #15813*  
**Per: Adam D. Fobert, P.Eng.**





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***APPENDIX A***

***Pre-Consultation***

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# DEVELOPMENT SERVICING STUDY CHECKLIST

15-813

12/12/2018

4.1 General Content		
<input type="checkbox"/>	Executive Summary (for larger reports only).	N/A
<input checked="" type="checkbox"/>	Date and revision number of the report.	Report Cover Sheet
<input checked="" type="checkbox"/>	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
<input checked="" type="checkbox"/>	Plan showing the site and location of all existing services.	EX-1
<input checked="" type="checkbox"/>	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0
<input type="checkbox"/>	Summary of Pre-consultation Meetings with City and other approval agencies.	N/A
<input type="checkbox"/>	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 defensible design criteria.	N/A
<input checked="" type="checkbox"/>	Statement of objectives and servicing criteria.	Section 1.0
<input type="checkbox"/>	Identification of existing and proposed infrastructure available in the immediate area.	EX-1
<input type="checkbox"/>	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).	N/A
<input checked="" type="checkbox"/>	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.	GP-1
<input type="checkbox"/>	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.	N/A
<input type="checkbox"/>	Proposed phasing of the development, if applicable.	N/A
<input checked="" type="checkbox"/>	Reference to geotechnical studies and recommendations concerning servicing.	EX-1, GP-1, SSP-1, EC-1
<input checked="" type="checkbox"/>	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	SP-1
4.2 Development Servicing Report: Water		
<input type="checkbox"/>	Confirm consistency with Master Servicing Study, if available	N/A
<input checked="" type="checkbox"/>	Availability of public infrastructure to service proposed development	EX-1
<input type="checkbox"/>	Identification of system constraints	N/A
<input checked="" type="checkbox"/>	Identify boundary conditions	Section 2.0
<input checked="" type="checkbox"/>	Confirmation of adequate domestic supply and pressure	Section 2.0

<input checked="" type="checkbox"/>	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.	Section 2.0
<input type="checkbox"/>	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.	N/A
<input type="checkbox"/>	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
<input type="checkbox"/>	Address reliability requirements such as appropriate location of shut-off valves	N/A
<input type="checkbox"/>	Check on the necessity of a pressure zone boundary modification	N/A
<input checked="" type="checkbox"/>	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	Section 2.0
<input type="checkbox"/>	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.	N/A
<input type="checkbox"/>	Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
<input checked="" type="checkbox"/>	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 2.0
<input type="checkbox"/>	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

**4.3 Development Servicing Report: Wastewater**

<input checked="" type="checkbox"/>	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).	Section 3.0
<input type="checkbox"/>	Confirm consistency with Master Servicing Study and/or justifications for deviations.	N/A
<input type="checkbox"/>	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.	N/A
<input checked="" type="checkbox"/>	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 3.0
<input checked="" type="checkbox"/>	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)	Section 3.0
<input checked="" type="checkbox"/>	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix ‘C’) format.	Section 3.0, Appendix C
<input checked="" type="checkbox"/>	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 3.0
<input type="checkbox"/>	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).	N/A

<input type="checkbox"/>	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	N/A
<input type="checkbox"/>	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
<input type="checkbox"/>	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
<input type="checkbox"/>	Special considerations such as contamination, corrosive environment etc.	N/A

**4.4 Development Servicing Report: Stormwater Checklist**

<input type="checkbox"/>	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	N/A
<input type="checkbox"/>	Analysis of available capacity in existing public infrastructure.	N/A
<input checked="" type="checkbox"/>	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
<input checked="" type="checkbox"/>	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.	Section 4.0
<input type="checkbox"/>	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	N/A
<input checked="" type="checkbox"/>	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 4.0
<input type="checkbox"/>	Set-back from private sewage disposal systems.	N/A
<input type="checkbox"/>	Watercourse and hazard lands setbacks.	N/A
<input checked="" type="checkbox"/>	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
<input type="checkbox"/>	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
<input checked="" type="checkbox"/>	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 4.0
<input type="checkbox"/>	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
<input checked="" type="checkbox"/>	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.	Section 4.0, Appendix D
<input type="checkbox"/>	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
<input type="checkbox"/>	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	N/A
<input type="checkbox"/>	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.	N/A
<input type="checkbox"/>	Identification of potential impacts to receiving watercourses	N/A
<input type="checkbox"/>	Identification of municipal drains and related approval requirements.	N/A

<input checked="" type="checkbox"/>	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 4.0
<input type="checkbox"/>	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
<input type="checkbox"/>	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
<input checked="" type="checkbox"/>	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	EC-1
<input type="checkbox"/>	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.	N/A
<input type="checkbox"/>	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

**4.5 Approval and Permit Requirements: Checklist**

<input type="checkbox"/>	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 ct. 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.	N/A
<input type="checkbox"/>	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
<input type="checkbox"/>	Changes to Municipal Drains.	N/A
<input type="checkbox"/>	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

**4.6 Conclusion Checklist**

<input checked="" type="checkbox"/>	Clearly stated conclusions and recommendations	Section 5.0
<input type="checkbox"/>	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.	
<input type="checkbox"/>	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

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***APPENDIX B***

***Water Supply***

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**129 Main Street**  
**Proposed Site Conditions**  
**PREVIOUSLY APPROVED**



**Water Demand Design Flows per Unit Count**  
**City of Ottawa - Water Distribution Guidelines, July 2010**

**Domestic Demand**

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4		0
Semi-detached	2.7		0
Townhouse	2.7		0
Apartment			0
Bachelor	1.4		0
1 Bedroom	1.4	26	37
2 Bedroom	2.1	6	13
3 Bedroom	3.1		0
Average	1.8		0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min
<b>Total Domestic Demand</b>	50	17.5	12.2	85.8	59.5	129.5	89.9

**Institutional / Commercial / Industrial Demand**

Property Type	Unit Rate	Units	Avg. Daily		Max Day		Peak Hour	
			m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min
Commercial floor space	2.5 L/m <sup>2</sup> /d	446	1.12	0.8	1.7	1.2	3.0	2.1
Office	75 L/9.3m <sup>2</sup> /d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
<b>Total I/CI Demand</b>			1.1	0.8	1.7	1.2	3.0	2.1
<b>Total Demand</b>			<b>18.6</b>	<b>12.9</b>	<b>87.4</b>	<b>60.7</b>	<b>132.5</b>	<b>92.0</b>



Water Demand Design Flows per Unit Count  
City of Ottawa - Water Distribution Guidelines, July 2010



**Domestic Demand**

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4		0
Semi-detached	2.7		0
Townhouse	2.7		0
Apartment			0
Bachelor	1.4		0
1 Bedroom	1.4	36	51
2 Bedroom	2.1	10	21
3 Bedroom	3.1		0
Average	1.8		0

	Pop	Avg. Daily		Max Day †		Peak Hour ††	
		m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min
<b>Total Domestic Demand</b>	72	20.2	14.0	98.8	68.6	149.2	103.6

**Institutional / Commercial / Industrial Demand**

Property Type	Unit Rate	Units	Avg. Daily		Max Day †		Peak Hour ††	
			m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min	m <sup>3</sup> /d	L/min
Commercial floor space	2.5 L/m <sup>2</sup> /d	300	0.75	0.5	1.1	0.8	2.0	1.4
Office	75 L/9.3m <sup>2</sup> /d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
<b>Total I/CI Demand</b>			0.8	0.5	1.1	0.8	2.0	1.4
<b>Total Demand</b>			<b>20.9</b>	<b>14.5</b>	<b>99.9</b>	<b>69.4</b>	<b>151.2</b>	<b>105.0</b>

‡ Residential Max Day Peaking Factor =  
† Commercial Max Day Peaking Factor =

4.9 †† Residential Peak Hour Peaking Factor = 7.4  
1.5 †† Commercial Peak Hour Peaking Factor = 1.8

**Boundary Conditions Unit Conversion**

	Height (m)	Elevation (m)	m H <sub>2</sub> O	PSI	kPa		L/s	L/min
<b>Avg. DD</b>	114.7	64.1	50.6	72.0	496.4	Fire Flow @ 140kPa	500	30000
<b>Fire Flow</b>			0.0	0.0	0.0			
<b>Peak Hour</b>	105.8	64.1	41.7	59.3	409.1			

---

**From:** Wu, John [<mailto:John.Wu@ottawa.ca>]  
**Sent:** Monday, April 23, 2018 8:56 AM  
**To:** Alison Gosling <[AGosling@dsel.ca](mailto:AGosling@dsel.ca)>  
**Subject:** RE: Job:15-813 - 129 Main Street

Here is the result:

The following are boundary conditions, HGL, for hydraulic analysis at 129 Main (zone 1W) assumed to be connected to the 203mm on Springhurst (see attached PDF for location).

Minimum HGL = 105.8m

Maximum HGL = 114.7m

Available Flow @ 20psi assuming a ground elevation of 64.1m = 500 L/s

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.*



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***APPENDIX C***

***Wastewater Collection***

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**129 Main Street**  
**Proposed Development**  
 PREVIOUSLY APPROVED

Wastewater Design Flows per Unit Count  
 City of Ottawa Sewer Design Guidelines, 2004



Site Area 0.141 ha

**Extraneous Flow Allowances**

Infiltration / Inflow 0.04 L/s

**Domestic Contributions**

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4	26	37
2 Bedroom	2.1	6	13
3 Bedroom	3.1		0
Average	1.8		0

**Total Pop 50**

**Average Domestic Flow 0.20 L/s**

**Peaking Factor 4.00**

**Peak Domestic Flow 0.81 L/s**

**Institutional / Commercial / Industrial Contributions**

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5 L/m <sup>2</sup> /d	446	0.05
Hospitals	900 L/bed/d		0.00
School	70 L/student/d		0.00
Industrial - Light**	35,000 L/gross ha/d		0.00
Industrial - Heavy**	55,000 L/gross ha/d		0.00

**Average I/C/I Flow 0.05**

**Peak Institutional / Commercial Flow 0.08**

**Peak Industrial Flow\*\* 0.00**

**Peak I/C/I Flow 0.08**

\* assuming a 12 hour commercial operation

\*\* peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B

<b>Total Estimated Average Dry Weather Flow Rate</b>	<b>0.25 L/s</b>
<b>Total Estimated Peak Dry Weather Flow Rate</b>	<b>0.89 L/s</b>
<b>Total Estimated Peak Wet Weather Flow Rate</b>	<b>0.93 L/s</b>



Wastewater Design Flows per Unit Count  
City of Ottawa Sewer Design Guidelines, 2004

Site Area 0.141 ha

## Extraneous Flow Allowances

Infiltration / Inflow 0.04 L/s

## Domestic Contributions

Unit Type	Unit Rate	Units	Pop
Single Family	3.4		0
Semi-detached and duplex	2.7		0
Townhouse	2.7		0
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4	36	51
2 Bedroom	2.1	10	21
3 Bedroom	3.1		0
Average	1.8		0

Total Pop 72

Average Domestic Flow 0.23 L/s

Peaking Factor 3.62

Peak Domestic Flow 0.85 L/s

## Institutional / Commercial / Industrial Contributions

Property Type	Unit Rate	No. of Units	Avg Wastewater (L/s)
Commercial floor space*	5 L/m <sup>2</sup> /d	300	0.03
Hospitals	900 L/bed/d		0.00
School	70 L/student/d		0.00
Industrial - Light**	35,000 L/gross ha/d		0.00
Industrial - Heavy**	55,000 L/gross ha/d		0.00

Average I/C/I Flow 0.03

Peak Institutional / Commercial Flow 0.03

Peak Industrial Flow\*\* 0.00

Peak I/C/I Flow 0.03

\* assuming a 12 hour commercial operation

\*\* peak industrial flow per City of Ottawa Sewer Design Guidelines Appendix 4B

Total Estimated Average Dry Weather Flow Rate	0.27 L/s
Total Estimated Peak Dry Weather Flow Rate	0.88 L/s
Total Estimated Peak Wet Weather Flow Rate	0.92 L/s



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***APPENDIX D***

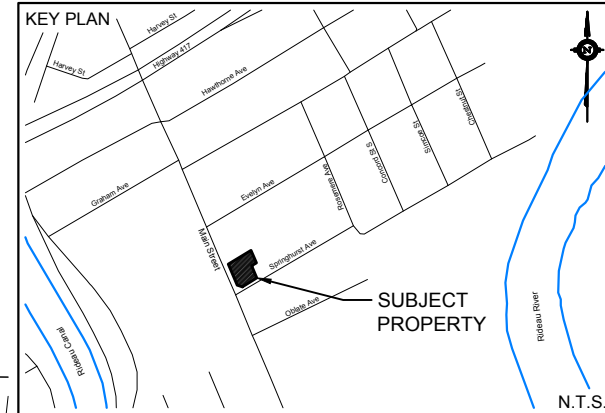
***Stormwater Management***

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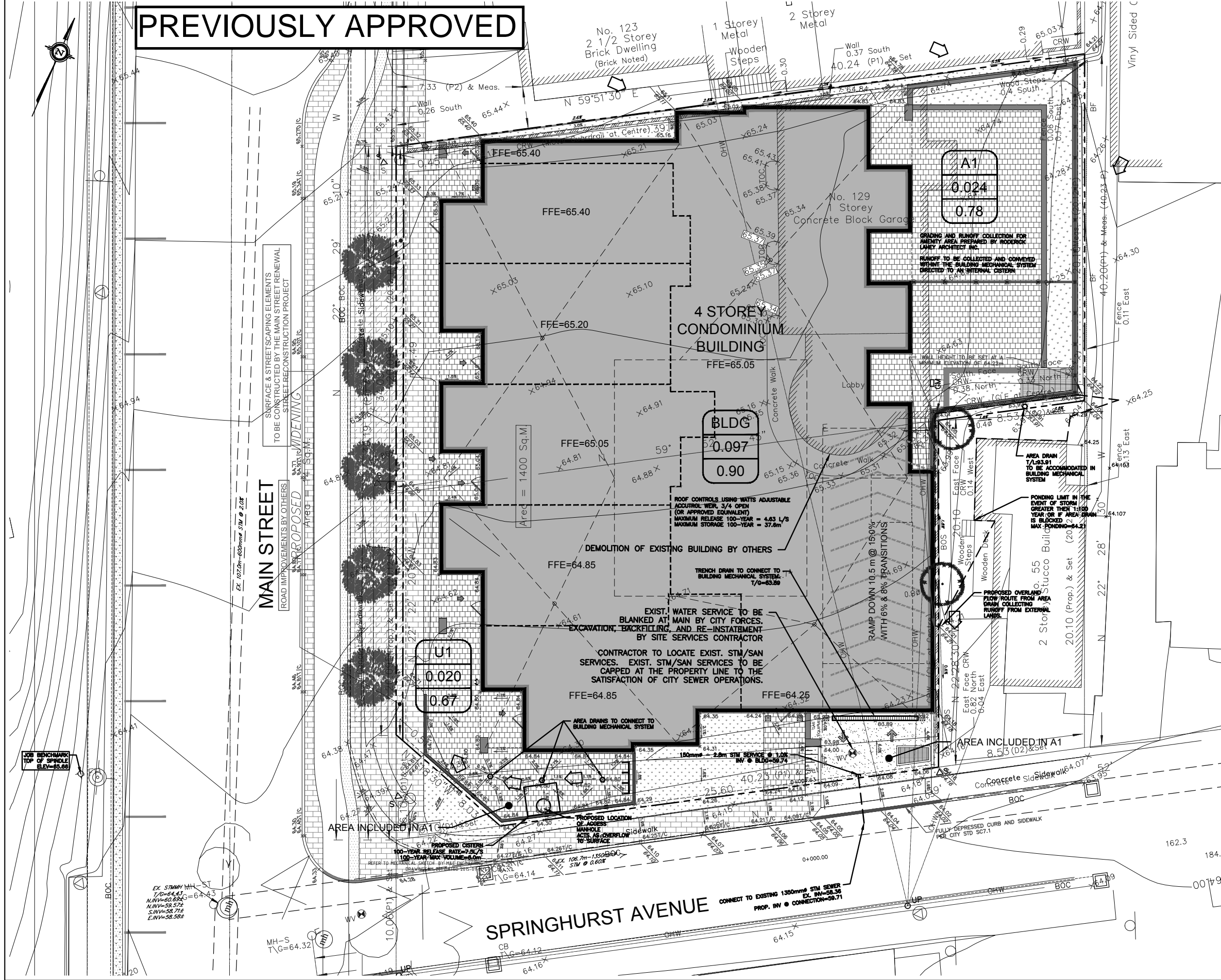
**PREVIOUSLY APPROVED**



- LEGEND**
- PROPERTY LINE
  - PROPOSED STORM SEWER
  - DRAINAGE DIVIDE
  - PROPOSED SWALE
  - PROPOSED PERFORATED SUBDRAIN
  - MAJOR SYSTEM FLOW ROUTE
  - PROPOSED STORM MANHOLE
  - PROPOSED CATCH BASIN
  - PROPOSED CB 'T'
- EX6**

**4.010**

**0.19**
- DRAINAGE AREA ID  
 AREA IN Ha  
 RATIONAL METHOD RUNOFF COEFFICIENT



**NOT FOR CONSTRUCTION**

**TOPOGRAPHIC INFORMATION**  
 TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.  
 PROJ. NO. 7828-08 R.Lahey P1 L14#8 & 19 RP28 TOPO D2  
 DATED NOVEMBER 17, 2010

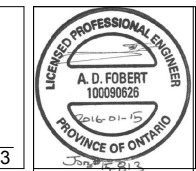
**SITE PLAN INFORMATION**  
 SITE PLAN PROVIDED BY RODERICK LAHEY ARCHITECT INC.  
 PROJ. NO. 0822  
 RECEIVED NOVEMBER 23, 2015

**GEOTECHNICAL STUDY**  
 GEOTECHNICAL RECOMMENDATIONS PROVIDED BY PATERSON GROUP INC.  
 PROJ. NO. PG2036-1  
 DATED APRIL 7, 2010

**SITE SERVICING AND STORMWATER MANAGEMENT STUDY**  
 SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL  
 PROJ. NO. 15-813  
 DATED JANUARY 2016

**BENCH MARK**  
 TOP OF SPINDLE OF FIRE HYDRANT LOCATED AT THE INTERSECTION OF MAIN STREET AND SPRINGHURST AVENUE  
 ELEV=65.66

No.	BY	YY.MM.DD	DESCRIPTION
3	S.L.M.	16.01.15	UPDATED AS PER CITY COMMENTS/ISSUED MYLAR PRINTING
2	S.L.M.	16.01.14	UPDATED AS PER CITY COMMENTS/ISSUED FOR MUNICIPAL REVIEW
1	S.L.M.	15.11.30	SITE PLAN AMENDMENT/ISSUED FOR MUNICIPAL REVIEW



PROJECT No. 15-813

**STORMWATER MANAGEMENT PLAN**  
**129 MAIN STREET**

© DSEL

RODERICK LAHEY ARCHITECT INC.  
 56 Beech Street  
 Ottawa, Ontario, K1S 3J6  
 Tel. (613) 724-9932

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

**DRAWN BY:** B.N.C. **CHECKED BY:** A.D.F. **DRAWING NO.** SWM-1 **SHEET NO.** 1 of 1  
**DESIGNED BY:** B.N.C. **CHECKED BY:** A.D.F.  
**SCALE:** 1:100 **DATE:** JANUARY 2016





129 Main Street  
Proposed Conditions  
PREVIOUSLY APPROVED



Stormwater - Proposed Development  
City of Ottawa Sewer Design Guidelines, 2012

Target Flow Rate

Area	0.14 ha
C	0.50 Rational Method runoff coefficient
t <sub>c</sub>	10.0 min
<b>5-year</b>	
i	104.2 mm/hr
Q	20.4 L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Total Area	0.020 ha
C	0.67 Rational Method runoff coefficient

t <sub>c</sub> (min)	5-year					100-year				
	i (mm/hr)	Q <sub>actual</sub> (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )	i (mm/hr)	Q <sub>actual</sub> (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )
10.0	104.2	3.9	3.9	0.0	0.0	178.6	8.3	8.3	0.0	0.0

Note:  
C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Building ID	BLDG
Roof Area	0.097 ha
C	0.90 Rational Method runoff coefficient <i>Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations</i>
t <sub>c</sub>	10 min, t <sub>c</sub> at outlet without restriction

Estimated Number of Roof Drains

Building Length	35
Building Width	25
Number of Drains	4
m <sup>2</sup> / Drain	241.5 max 232.25m <sup>2</sup> /notch as recommended by Zurn for Ottawa

Watts Adjustable Accutrol Weir, 3/4 Open						
d (m)	A (m <sup>2</sup> )	V <sub>acc</sub> (m <sup>3</sup> )	V <sub>avail</sub> (m <sup>3</sup> )	Q <sub>notch</sub> (L/s)	Q <sub>roof</sub> (L/s)	V <sub>drawdown</sub> (hr)
0.000	0	0.0	0.0	0.00	0.00	0.00
0.025	60.4	0.5	0.5	0.32	1.26	0.11
0.050	241.5	3.5	4.0	0.63	2.52	0.50
0.075	543.4	9.6	13.6	0.87	3.47	1.26
0.100	966.0	18.6	32.2	1.10	4.42	2.43
0.125	966.0	24.2	56.4	1.34	5.36	3.68
0.150	966.0	24.2	80.5	1.58	6.31	4.75

t <sub>c</sub> (min)	5-year					100-year				
	i (mm/hr)	Q <sub>actual</sub> (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )	i (mm/hr)	Q <sub>actual</sub> (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )
10	104.2	25.2	3.6	21.5	12.9	178.6	47.9	4.6	43.3	26.0
15	83.6	20.2	3.6	16.5	14.9	142.9	38.3	4.6	33.7	30.3
20	70.3	17.0	3.6	13.3	16.0	120.0	32.2	4.6	27.6	33.1
25	60.9	14.7	3.6	11.1	16.6	103.8	27.9	4.6	23.2	34.9
30	53.9	13.0	3.6	9.4	16.9	91.9	24.7	4.6	20.0	36.0
35	48.5	11.7	3.6	8.1	17.0	82.6	22.2	4.6	17.5	36.8
40	44.2	10.7	3.6	7.0	16.9	75.1	20.2	4.6	15.5	37.3
45	40.6	9.8	3.6	6.2	16.7	69.1	18.5	4.6	13.9	37.5
50	37.7	9.1	3.6	5.5	16.4	64.0	17.2	4.6	12.5	37.6
55	35.1	8.5	3.6	4.8	16.0	59.6	16.0	4.6	11.4	37.5
60	32.9	8.0	3.6	4.3	15.5	55.9	15.0	4.6	10.4	37.3
65	31.0	7.5	3.6	3.9	15.0	52.6	14.1	4.6	9.5	37.0
70	29.4	7.1	3.6	3.5	14.5	49.8	13.4	4.6	8.7	36.7
75	27.9	6.7	3.6	3.1	13.9	47.3	12.7	4.6	8.1	36.2
80	26.6	6.4	3.6	2.8	13.3	45.0	12.1	4.6	7.4	35.7
85	25.4	6.1	3.6	2.5	12.7	43.0	11.5	4.6	6.9	35.2
90	24.3	5.9	3.6	2.2	12.0	41.1	11.0	4.6	6.4	34.6
95	23.3	5.6	3.6	2.0	11.3	39.4	10.6	4.6	6.0	33.9
100	22.4	5.4	3.6	1.8	10.6	37.9	10.2	4.6	5.5	33.3
105	21.6	5.2	3.6	1.6	9.9	36.5	9.8	4.6	5.2	32.5
110	20.8	5.0	3.6	1.4	9.2	35.2	9.4	4.6	4.8	31.8

5-year Q <sub>roof</sub>	3.64 L/s	100-year Q <sub>roof</sub>	4.63 L/s
5-year Max. Storage Required	17.0 m <sup>3</sup>	100-year Max. Storage Required	37.6 m <sup>3</sup>
5-year Storage Depth	0.080 m	100-year Storage Depth	0.000 m
5-year Estimated Drawdown Time	1.48 hr	10-year Estimated Drawdown Time	0.00 hr

Estimated Post Development Peak Flow from Attenuated Areas

**129 Main Street  
Proposed Conditions  
PREVIOUSLY APPROVED**

Area ID A1  
Available Sub-surface Storage

Area 0.024  
Runoff Coefficient 0.78 Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations

**Stage Attenuated Areas Storage Summary**

	Stage (m)	Surface Storage			Surface and Subsurface Storage			
		A (m <sup>2</sup> )	h <sub>o</sub> (m)	delta d (m)	V* (m <sup>3</sup> )	V <sub>acc</sub> ** (m <sup>3</sup> )	Q <sub>release</sub> † (L/s)	V <sub>drawdown</sub> (hr)
Orifice INV	60.90		0.00			0.0	0.0	0.00
1/2 Cistern	62.45		1.55	1.55	3.0	3.0	5.4	0.15
HWL Cistern	64.00		3.10	1.55	3.0	6.0	7.5	0.22

\* V=Incremental storage volume  
 \*\*V<sub>acc</sub>=Total surface and sub-surface  
 † Q<sub>release</sub> = Release rate from Tempest LMF 70 Release Rate

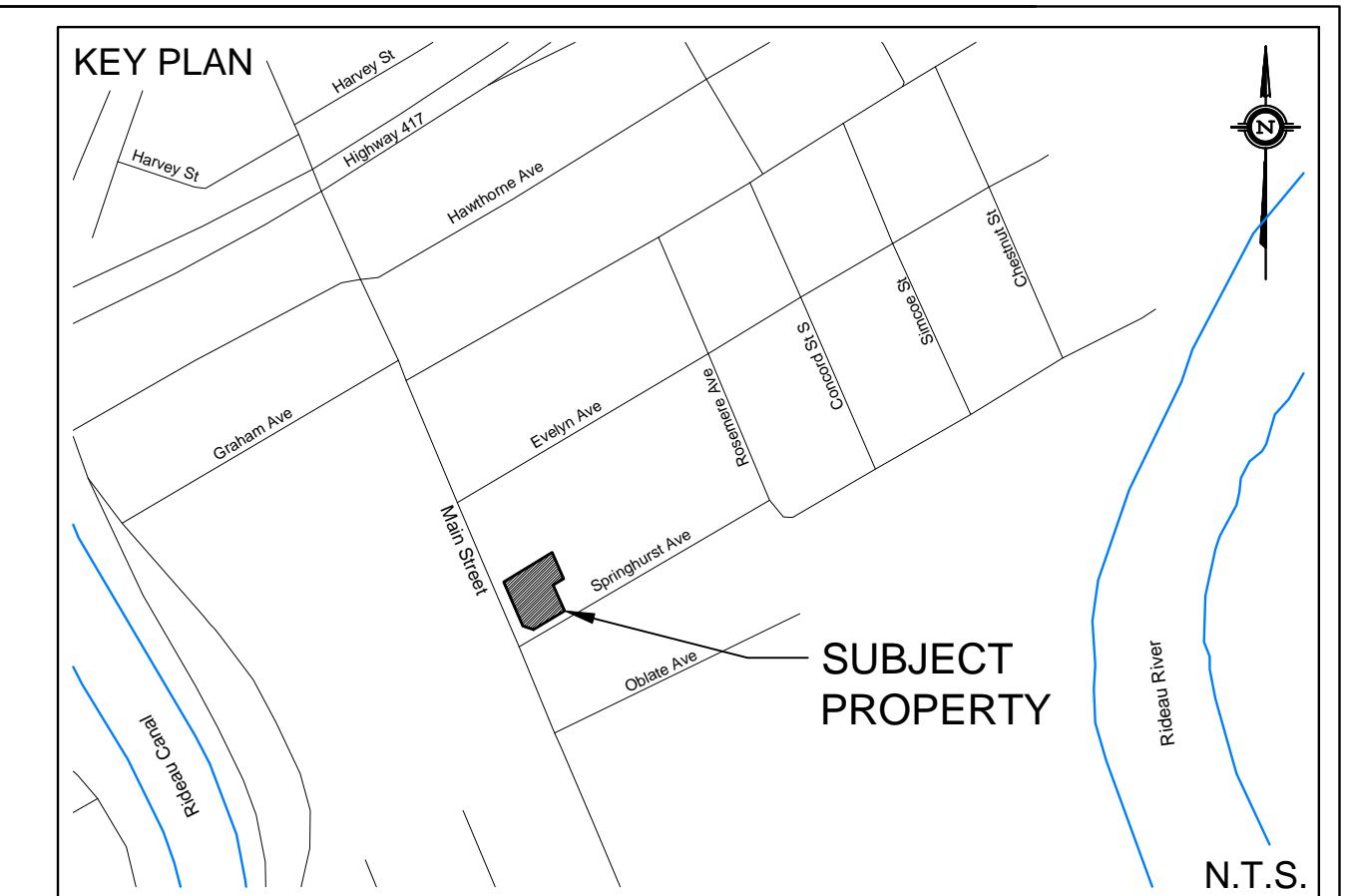
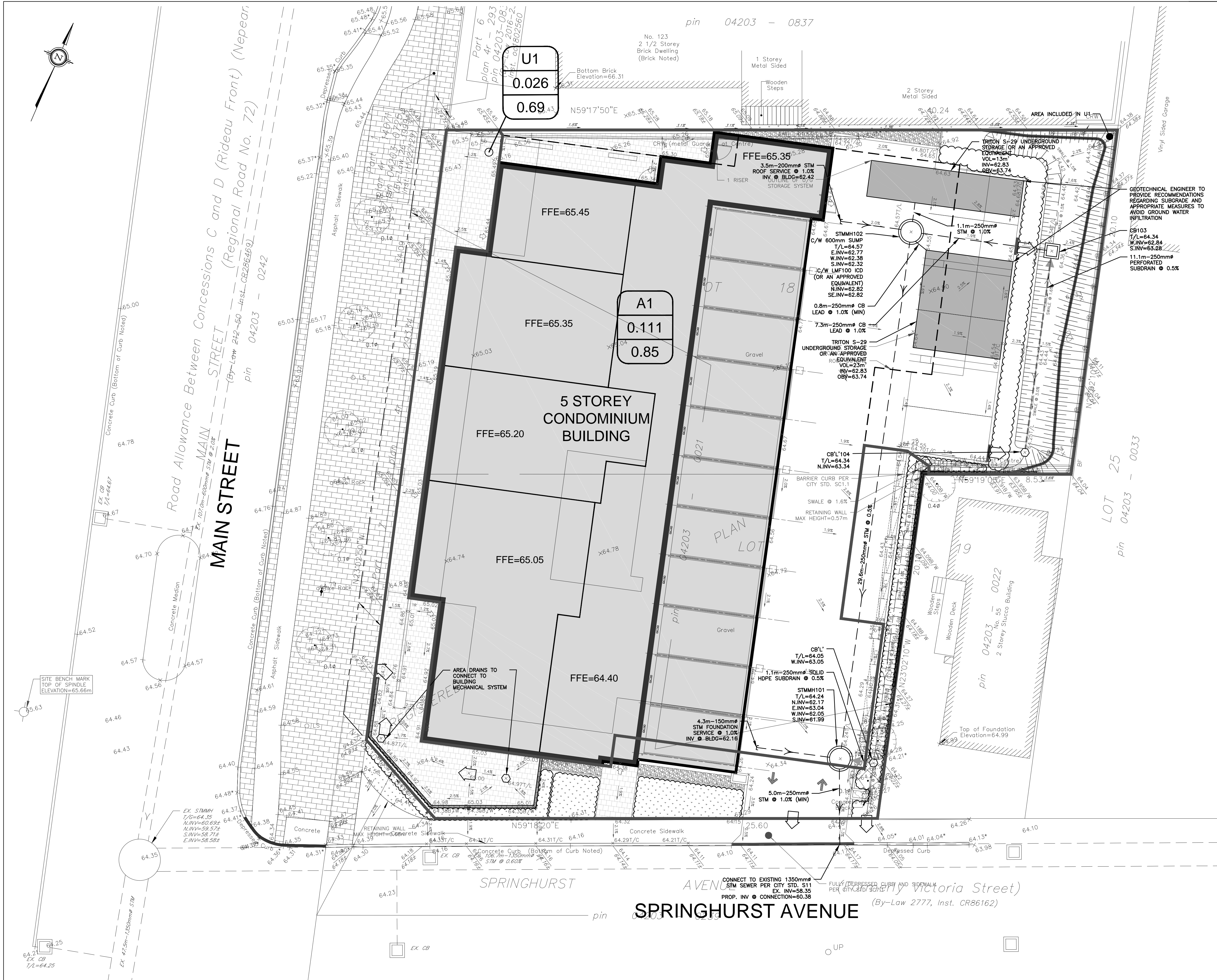
t <sub>c</sub> (min)	5-year					100-year				
	i (mm/hr)	Q <sub>actual</sub> † (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )	i (mm/hr)	Q <sub>actual</sub> † (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )
10	104.2	9.1	5.0	4.1	2.4	178.6	16.2	7.5	8.8	5.3
15	83.6	8.0	5.0	3.0	2.7	142.9	13.9	7.5	6.5	5.8
20	70.3	7.3	5.0	2.3	2.8	120.0	12.4	7.5	5.0	6.0
25	60.9	6.8	5.0	1.8	2.7	103.8	11.4	7.5	3.9	5.9
30	53.9	6.4	5.0	1.5	2.6	91.9	10.6	7.5	3.1	5.6
35	48.5	6.2	5.0	1.2	2.5	82.6	10.0	7.5	2.5	5.3
40	44.2	5.9	5.0	1.0	2.3	75.1	9.5	7.5	2.0	4.9
45	40.6	5.8	5.0	0.8	2.1	69.1	9.1	7.5	1.7	4.5
50	37.7	5.6	5.0	0.6	1.8	64.0	8.8	7.5	1.3	4.0
55	35.1	5.5	5.0	0.5	1.6	59.6	8.5	7.5	1.0	3.4
60	32.9	5.4	5.0	0.4	1.3	55.9	8.3	7.5	0.8	2.9
65	31.0	5.3	5.0	0.3	1.1	52.6	8.1	7.5	0.6	2.3
70	29.4	5.2	5.0	0.2	0.8	49.8	7.9	7.5	0.4	1.7
75	27.9	5.1	5.0	0.1	0.5	47.3	7.7	7.5	0.2	1.1
80	26.6	5.0	5.0	0.0	0.2	45.0	7.6	7.5	0.1	0.4
85	25.4	5.0	5.0	0.0	0.0	43.0	7.4	7.5	0.0	0.0
90	24.3	4.9	4.9	0.0	0.0	41.1	7.3	7.5	0.0	0.0
95	23.3	4.9	4.9	0.0	0.0	39.4	7.2	7.5	0.0	0.0
100	22.4	4.8	4.8	0.0	0.0	37.9	7.1	7.5	0.0	0.0
105	21.6	4.8	4.8	0.0	0.0	36.5	7.0	7.5	0.0	0.0
110	20.8	4.7	4.7	0.0	0.0	35.2	6.9	7.5	0.0	0.0

5-year Q<sub>attenuated</sub> 4.99 L/s  
 5-year Max. Storage Required 2.8 m<sup>3</sup>  
 Est. 5-year Storage Elevation 62.33 m

100-year Q<sub>attenuated</sub> 7.47 L/s  
 100-year Max. Storage Required 6.0 m<sup>3</sup>  
 Est. 100-year Storage Elevation 63.97 m

Control Area	5-Year Release Rate (L/s)	5-Year Required Storage (m <sup>3</sup> )	100-Year Release Rate (L/s)	100-Year Required Storage (m <sup>3</sup> )	100-Year Available Storage (m <sup>3</sup> )
Unattenuated Areas	3.9	0.0	8.3	0.0	0.0
Roof Controls	3.6	17.0	4.6	37.6	80.5
Controlled Area	5.0	2.8	7.5	6.0	6.0
<b>Total</b>	<b>12.5</b>	<b>19.7</b>	<b>20.4</b>	<b>43.5</b>	<b>86.5</b>





**LEGEND**

---	PROPERTY LINE	○	PROPOSED STORM MANHOLE
- - - -	PROPOSED STORM SEWER	□	PROPOSED CATCH BASIN
---	DRAINAGE DIVIDE	○	PROPOSED CB 'T', CB 'L', AREA DRAIN
---	PROPOSED SWALE	○	TRITON S-29 UNDERGROUND STORAGE OR AN APPROVED EQUIVALENT
- - - -	PROPOSED PERFORATED SUBDRAIN	▨	RETAINING WALL
→	EMERGENCY FLOW ROUTE		
EX6	DRAINAGE AREA ID		
4.010	AREA IN H <sub>o</sub>		
0.19	RATIONAL METHOD RUNOFF COEFFICIENT		

**NOT FOR CONSTRUCTION**

**TOPOGRAPHIC INFORMATION**  
 TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBECK LTD.  
 PROJ. NO. 17941-18  
 DATED JUNE 6, 2018

**SITE PLAN INFORMATION**  
 SITE PLAN PROVIDED BY RODERICK LAHEY ARCHITECT INC.  
 PROJ. NO. 0622  
 ISSUED SEPTEMBER 24, 2018

**GEOTECHNICAL STUDY**  
 GEOTECHNICAL RECOMMENDATIONS PROVIDED BY PATERSON GROUP INC.  
 PROJ. NO. PG2036-1  
 DATED APRIL 7, 2010

**SITE SERVICING AND STORMWATER MANAGEMENT STUDY**  
 SERVICING AND STORMWATER MANAGEMENT RECOMMENDATIONS PROVIDED BY DSEL  
 PROJ. NO. 15-813  
 DATED DECEMBER 2018

**BENCH MARK**  
 TOP OF SPINDLE OF FIRE HYDRANT LOCATED AT THE INTERSECTION OF MAIN STREET AND SPRINGHURST AVENUE  
 ELEV=65.66

No.	BY	YY.MM.DD	DESCRIPTION
4	A.J.G.	18.12.12	REVISED PER SITE PLAN AMENDMENT
3	S.L.M.	16.01.15	UPDATED AS PER CITY COMMENTS/ISSUED MYLAR PRINTING
2	S.L.M.	16.01.14	UPDATED AS PER CITY COMMENTS/ISSUED FOR MUNICIPAL REVIEW
1	S.L.M.	15.11.30	SITE PLAN AMENDMENT/ISSUED FOR MUNICIPAL REVIEW

PROJECT No. 15-813

**STORMWATER MANAGEMENT PLAN**  
**129 MAIN STREET** © DSEL

RODERICK LAHEY ARCHITECT INC.  
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 Ottawa, Ontario, K1S 3J6  
 Tel: (613) 724-9932

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 SMART SUBDIVISIONS™

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 Fax: (613) 836-7183  
 www.DSEL.ca

DRAWN BY: A.J.G.	CHECKED BY: A.D.F.	DRAWING NO: SWM-1	SHEET NO: 1 of 1
DESIGNED BY: A.J.G.	CHECKED BY: A.D.F.	SCALE: 1:100	DATE: DECEMBER 2018





**Estimated Peak Stormwater Flow Rate**  
 City of Ottawa Sewer Design Guidelines, 2012



**Existing Drainage Characteristics From Internal Site**

<b>Area</b>	0.141 ha
<b>C</b>	0.70 Rational Method runoff coefficient
<b>L</b>	47.0 m
<b>Up Elev</b>	65.48 m
<b>Dn Elev</b>	64.26 m
<b>Slope</b>	2.6 %
<b>Tc</b>	6.5 min

1) Time of Concentration per Federal Aviation Administration

$$t_c = \frac{1.8(1.1 - C)L^{0.5}}{S^{0.333}}$$

tc, in minutes

C, rational method coefficient, (-)

L, length in ft

S, average watershed slope in %

**Estimated Peak Flow**

	<b>2-year</b>	<b>5-year</b>	<b>100-year</b>
<b>i</b>	93.7	127.6	219.0 mm/hr
<b>Q</b>	25.9	35.2	75.5 L/s

*Note:*

*C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)*

Stormwater - Proposed Development  
City of Ottawa Sewer Design Guidelines, 2012



Target Flow Rate

Area 0.136 ha  
C 0.50 Rational Method runoff coefficient  
t<sub>c</sub> 10.0 min

5-year

i 104.2 mm/hr  
Q 19.7 L/s

Estimated Post Development Peak Flow from Unattenuated Areas

Area ID U1  
Total Area 0.026 ha  
C 0.69 Rational Method runoff coefficient

t <sub>c</sub> (min)	5-year					100-year				
	i (mm/hr)	Q <sub>actual</sub> (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )	i (mm/hr)	Q <sub>actual</sub> (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )
11.0	99.4	4.9	4.9	0.0	0.0	170.2	10.4	10.4	0.0	0.0

Note:

C value for the 100-year storm is increased by 25%, to a maximum of 1.0 per Ottawa Sewer Design Guidelines (5.4.5.2.1)

Estimated Post Development Peak Flow from Attenuated Areas

Area ID A1

Total Cistern Storage (m<sup>3</sup>) 36.0

Stage Attenuated Areas Storage Summary

	Stage (m)	Surface Storage			Surface and Subsurface Storage			
		Ponding (m <sup>2</sup> )	h <sub>o</sub> (m)	delta d (m)	V* (m <sup>3</sup> )	V <sub>acc</sub> ** (m <sup>3</sup> )	Q <sub>release</sub> † (L/s)	V <sub>drawdown</sub> (hr)
Orifice INV	62.32		0.00			0.0	0	0.00
Cistern INV	62.83		0.51	0.51	18.0	18.0	5.2	0.96
Cistern OBV	63.74		1.42	0.91	18.0	36.0	8.6	1.16
T/L	64.34		2.02	0.60	0.0	36.0	10.3	0.97

\* V=Incremental storage volume

\*\*V<sub>acc</sub>=Total surface and sub-surface

† Q<sub>release</sub> = Release rate calculated from Tempest Flow Curve

Orifice Location **STMMH102** Dia LMF90

Total Area 0.111 ha

C 0.85 Rational Method runoff coefficient *Note: Rational Method Coefficient "C" increased by 25% for 100-year calculations*

t <sub>c</sub> (min)	5-year					100-year				
	i (mm/hr)	Q <sub>actual</sub> ‡ (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )	i (mm/hr)	Q <sub>actual</sub> ‡ (L/s)	Q <sub>release</sub> (L/s)	Q <sub>stored</sub> (L/s)	V <sub>stored</sub> (m <sup>3</sup> )
10	104.2	27.1	4.8	22.3	13.4	178.6	55.0	8.5	46.5	27.9
15	83.6	21.8	4.8	17.0	15.3	142.9	44.0	8.5	35.5	31.9
20	70.3	18.3	4.8	13.5	16.2	120.0	36.9	8.5	28.4	34.1
25	60.9	15.9	4.8	11.1	16.6	103.8	32.0	8.5	23.5	35.2
30	53.9	14.0	4.8	9.2	16.6	91.9	28.3	8.5	19.8	35.6
35	48.5	12.6	4.8	7.8	16.5	82.6	25.4	8.5	16.9	35.5
40	44.2	11.5	4.8	6.7	16.1	75.1	23.1	8.5	14.6	35.1
45	40.6	10.6	4.8	5.8	15.6	69.1	21.3	8.5	12.7	34.4
50	37.7	9.8	4.8	5.0	15.0	64.0	19.7	8.5	11.2	33.5
55	35.1	9.2	4.8	4.3	14.3	59.6	18.4	8.5	9.8	32.5
60	32.9	8.6	4.8	3.8	13.6	55.9	17.2	8.5	8.7	31.3
65	31.0	8.1	4.8	3.3	12.8	52.6	16.2	8.5	7.7	30.0
70	29.4	7.7	4.8	2.8	12.0	49.8	15.3	8.5	6.8	28.6
75	27.9	7.3	4.8	2.5	11.1	47.3	14.5	8.5	6.0	27.1
80	26.6	6.9	4.8	2.1	10.1	45.0	13.9	8.5	5.3	25.6
85	25.4	6.6	4.8	1.8	9.2	43.0	13.2	8.5	4.7	24.0
90	24.3	6.3	4.8	1.5	8.2	41.1	12.7	8.5	4.1	22.3
95	23.3	6.1	4.8	1.3	7.2	39.4	12.1	8.5	3.6	20.6
100	22.4	5.8	4.8	1.0	6.2	37.9	11.7	8.5	3.1	18.9
105	21.6	5.6	4.8	0.8	5.1	36.5	11.2	8.5	2.7	17.1
110	20.8	5.4	4.8	0.6	4.1	35.2	10.8	8.5	2.3	15.3

<b>5-year Q<sub>attenuated</sub></b>	<b>4.81 L/s</b>	<b>100-year Q<sub>attenuated</sub></b>	<b>8.52 L/s</b>
<b>5-year Max. Storage Required</b>	<b>16.6 m<sup>3</sup></b>	<b>100-year Max. Storage Required</b>	<b>35.6 m<sup>3</sup></b>
<b>Est. 5-year Storage Elevation</b>	<b>62.79 m</b>	<b>Est. 100-year Storage Elevation</b>	<b>63.72 m</b>

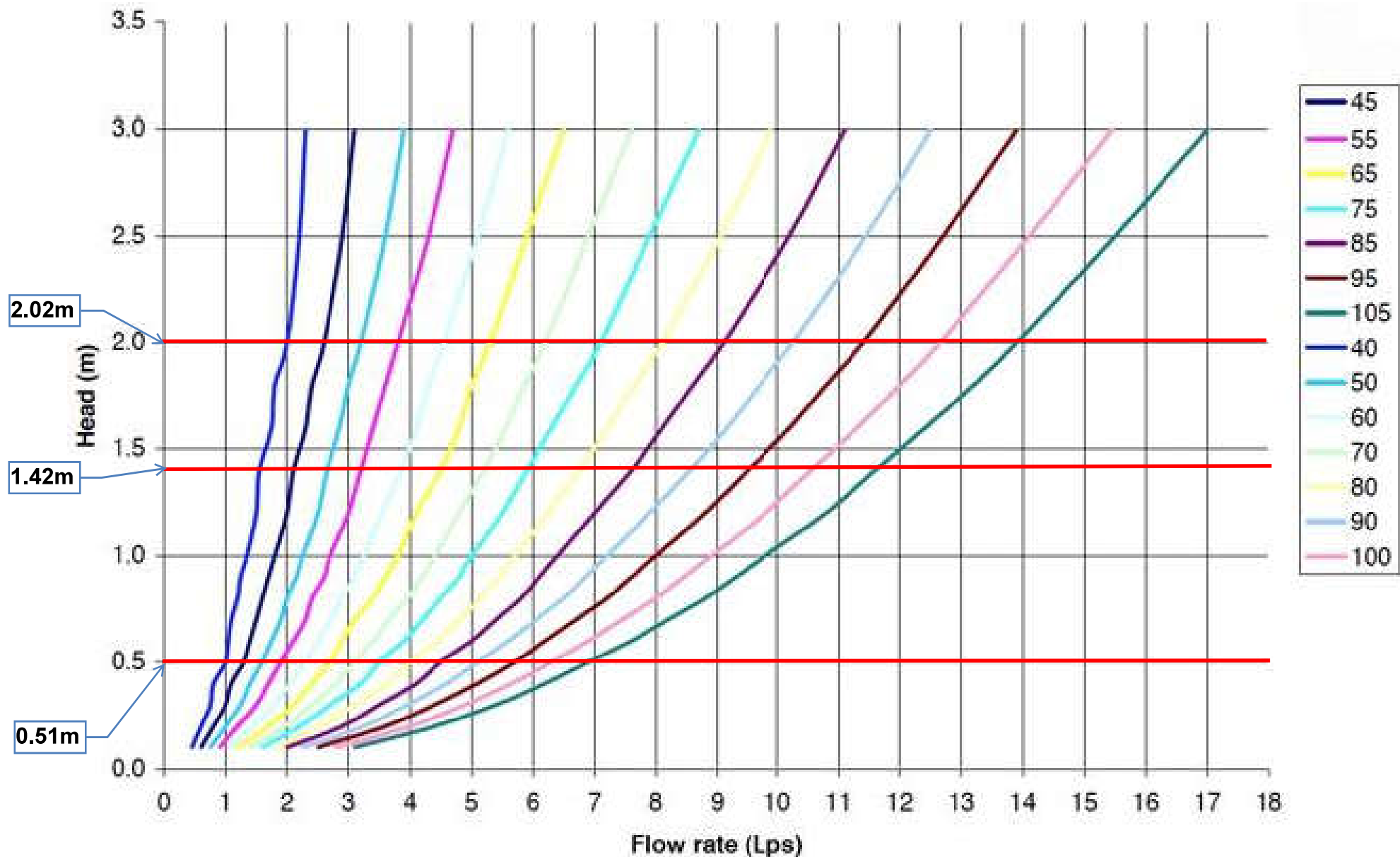
Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Required Storage (m <sup>3</sup> )	100-Year Release Rate (L/s)	100-Year Required Storage (m <sup>3</sup> )	100-Year Available Storage (m <sup>3</sup> )
Unattenuated Areas	4.9	0.0	10.4	0.0	0.0
Attenuated Areas	4.8	16.6	8.5	35.6	36.0
<b>Total</b>	<b>9.7</b>	<b>16.6</b>	<b>19.0</b>	<b>35.6</b>	<b>36.0</b>

Area ID	Up	Down	Area (ha)	C (-)	Indiv AxC	Acc AxC	T <sub>c</sub> (min)	I (mm/hr)	Q (L/s)	Sewer Data									
										DIA (mm)	Slope (%)	Length (m)	A <sub>hydraulic</sub> (m <sup>2</sup> )	R (m)	Velocity (m/s)	Qcap (L/s)	Time Flow (min)	Q / Q full (-)	
A1	CB'L'104	CB103	0.022	0.83	0.02	0.02	10.0	104.2	5.3	250	0.50	11.1	0.049	0.063	0.86	42.0	0.2	0.13	
	CB103	STMMH102			0.00	0.02	10.2	103.1	5.3	250	1.00	7.3	0.049	0.063	1.21	59.5	0.1	0.09	
								10.3											
BLDG	ROOF	STMMH102	0.089	0.83	0.07	0.07	10.0	104.2	21.3	200	1.00	3.5	0.031	0.050	1.04	32.8	0.1	0.65	
								10.1											
	STMMH102	STMMH101			0.00	0.09	10.3	102.6	26.2	250	0.50	29.6	0.049	0.063	0.86	42.0	0.6	0.62	
	STMMH101	EX. STM			0.00	0.09	10.9	99.7	25.5	250	1.00	5	0.049	0.063	1.21	59.5	0.1	0.43	
							11.0												



TEMPEST LMF flow curves







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## Site Calculator

- [System Builder](#)
- [Field Diagram](#)
- [Summary](#)

## Parameters

Units:    
 Storage Volume:  Cu. M  
 Chamber Selection:    
 Header Row Position:    
 Fill Over Embedment Stone:  cm

### Embedment Stone:

Over:   
 Under:   
 Porosity:

### Controlled By (in M):

### Accessories:

Dumpsters:    
 Bins:    
 Floors:

### Double Stacked

Double Stacked?:   
 Lower Chamber:    
 Stone Between:

Note: After making an input change you must hit recalculate to update the Field Diagram and Project Results.



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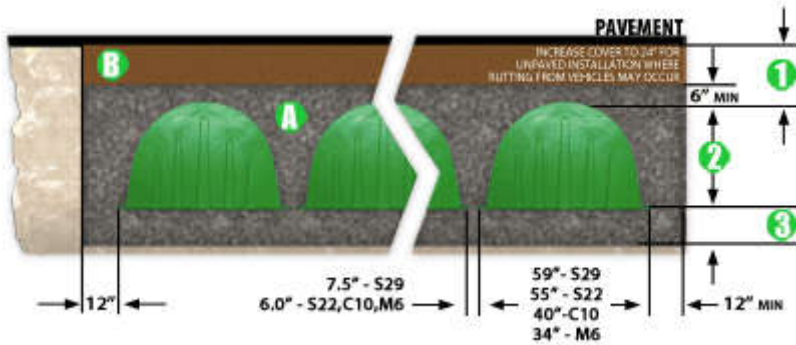
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purposes. Please contact Triton for more information.  
 or need engineering ready calculations? Triton chambers are available for modeling in HydroCAD by clicking on the HydroCAD banner to the left.

Need to model out a full system,

## Project Results



- ① Total Cover Over Chambers: 45.72 cm
- ② Height of Chamber: 91.44 cm
- ③ Embedment Stone Under Chambers: 15.24 cm
- A Volume of Embedment Stone Required: 14 Cu. M
- B Volume of Fill Material Required: 5 Cu. M

Total Storage Provided:	13.8 Cu. M
Type of Distribution Chambers:	S-29
# of Distribution Chambers Required:	0
# of end caps required:	2
Type of header row chambers required:	S-29
# of header row chambers required:	10
Floors:	0
Bins:	0
Dumpsters:	0
Required Bed Size:	18.69 Sq. M
Volume of Embedment Stone Required:	14.99 Cu. M
Volume of Fill Material Required:	5.7 Cu. M
Volume of Excavation:	28.48 Cu. M
Area of Filter Fabric:	45.44 Sq. M
# of Chambers long:	0
# of rows:	5
Actual Trench Length:	2.108 M
Actual Trench Width:	8.865 M

## Field Diagram



**WIRE DIAGRAM**

**Chamber Type**



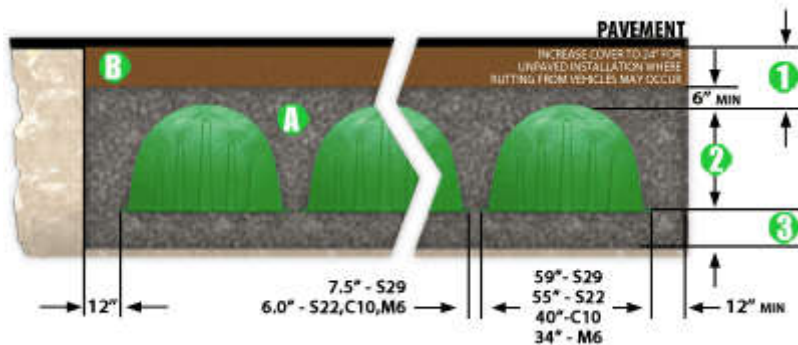
**Dimensions** 59" x 36" x 35" (WxHxL)

1498.6mm x 914.4mm x 889mm

**Weight** 32 lbs / 14.5 kg

**Bare Chamber Storage** 29 ft<sup>3</sup> / 0.82 m<sup>3</sup>

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**Triton Stormwater Solutions, LLC**

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## Site Calculator

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## Parameters

Units:  ▾

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Header Row Position:  ▾

Fill Over Embedment Stone:  cm

### Embedment Stone:

Over:

Under:

Porosity:

### Controlled By (in M):

Width ▾

### Accessories:

Dumpsters:  ▾

Bins:  ▾

Floors:

### Double Stacked

Double Stacked?:

Lower Chamber:  ▾

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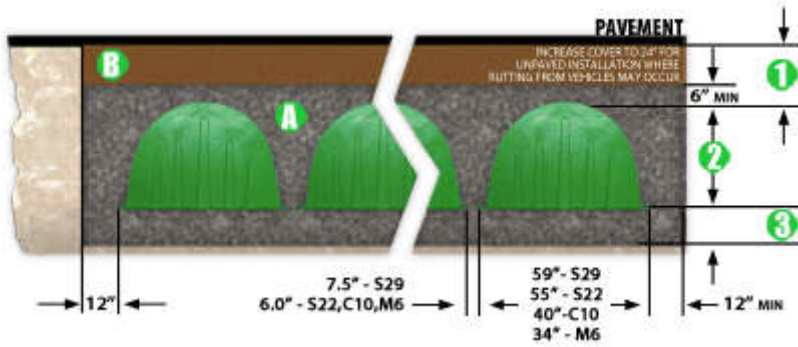
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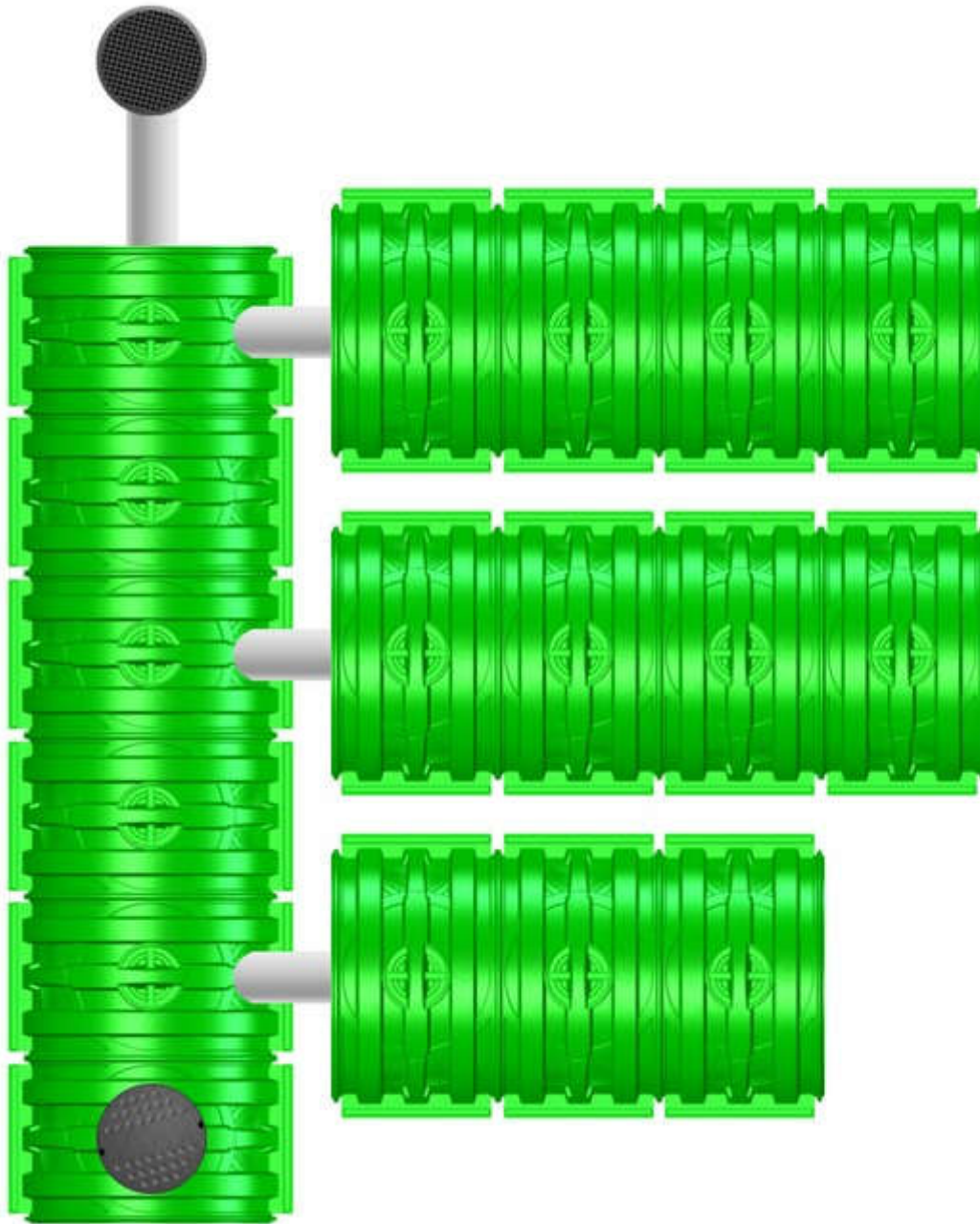
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Type of Distribution Chambers:	S-29
# of Distribution Chambers Required:	11
# of end caps required:	8
Type of header row chambers required:	S-29
# of header row chambers required:	6
Floors:	0
Bins:	0
Dumpsters:	0
Required Bed Size:	31.48 Sq. M
Volume of Embedment Stone Required:	25.03 Cu. M
Volume of Fill Material Required:	9.6 Cu. M
Volume of Excavation:	47.98 Cu. M
Area of Filter Fabric:	58.85 Sq. M
# of Chambers long:	4
# of rows:	3
Actual Trench Length:	5.738 M
Actual Trench Width:	5.486 M

## Field Diagram



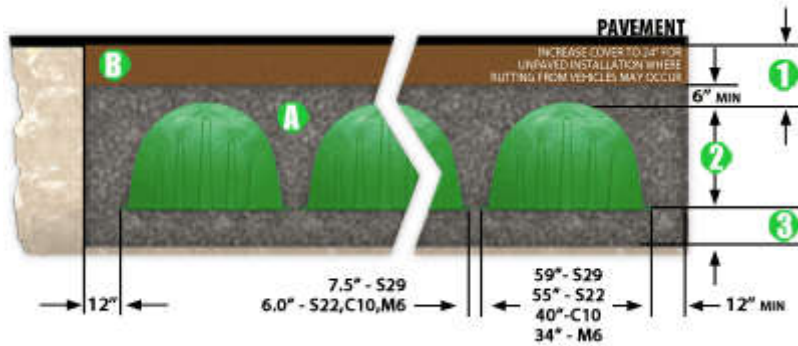
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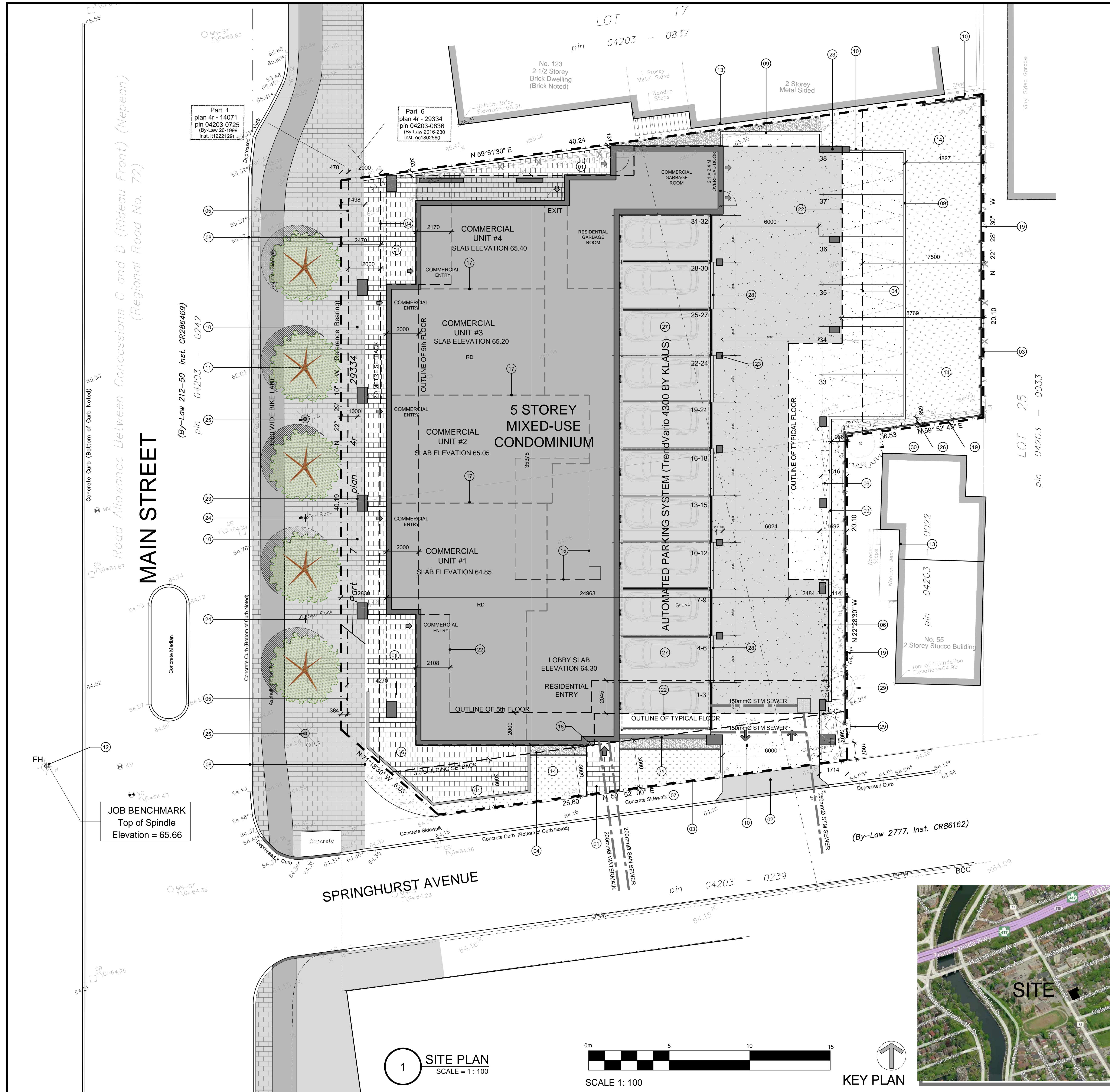
***DRAWINGS / FIGURES***

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**DRAWING NOTES:**

- 1 PRECAST CONCRETE UNIT PAVERS ON GRANULAR SUB-BASE OR BUILT UP ROOF DECK. SEE LANDSCAPE PLAN FOR PATTERN AND TYPE
- 2 DEPRESSED CURB AND SIDEWALK TO CITY STANDARDS
- 3 PROPERTY LINE
- 4 BUILDING SETBACK
- 5 APPROVED ROAD WIDENING, 0.387 TO 0.47 METRE
- 6 PROPOSED BICYCLE SPACE 600 x 1800mm
- 7 CONCRETE BARRIER CURB AND SIDEWALK
- 8 CITY BOULEVARD INSTALLED IN 2017
- 9 150mm HT. BARRIER CURB
- 10 BALCONY ABOVE
- 11 EXISTING STREET TREES PLANTED 2017
- 12 EXISTING FIRE HYDRANT
- 13 OUTLINE OF EXISTING 2 STOREY BUILDING
- 14 SOFT LANDSCAPING, SEE LANDSCAPE PLAN
- 15 OUTLINE OF MECHANICAL PENTHOUSE
- 16 COMMERCIAL PATIO AT GROUND FLOOR
- 17 OUTLINE OF COMMERCIAL UNITS ON GROUND FLOOR
- 18 SIAMESE CONNECTION
- 19 1800mm HT. PRIVACY FENCE
- 20 150mm WIDE CONCRETE EDGER, HEIGHT VARIES. SEE LANDSCAPE PLAN
- 21 PROPOSED CISTERN WITH ACCESS COVER
- 22 OUTLINE OF BUILDING ABOVE
- 23 BUILDING COLUMNS FOR BUILDING ABOVE
- 24 EXISTING CITY BOLLARD STYLE BIKE RACKS
- 25 EXISTING CITY BOULEVARD LIGHTS
- 26 EXISTING WOOD PRIVACY FENCE TO BE REPLACED
- 27 AUTOMATED PARKING SYSTEM, 3 LEVELS: 1 AT GRADE, 1 UP AND 1 DOWN
- 28 SAFETY GATES OR ROLL UP DOORS
- 29 EXISTING TREE TO BE REMOVED
- 30 EXISTING TREE TO REMAIN
- 31 PRIVACY SCREEN WALL

**SITE PLAN SYMBOLS:**

- CONCRETE UNIT PAVERS SURFACE
- SOFT LANDSCAPING
- DRIVING AREA
- NEW CITY UNIT PAVES SIDEWALK (INSTALLED 2017)
- NEW CITY BICYCLE LANE (INSTALLED 2017)
- WALL MOUNTED LIGHT
- TWO WAY VEHICLE CIRCULATION
- MAIN ENTRANCE
- COMMERCIAL ENTRANCE OR FIRE EXIT
- NEW CITY BOLLARD STYLE BIKE RACK
- EXISTING GRADE
- ROOF DRAIN

**PROJECT INFORMATION**

ZONING	Zoning By-law 2008-250	TM7 (1839)
SITE AREA	1,414.63 sq. m. (15,227 sq. ft.)	
BUILDING HEIGHT	20 m.	
AMENITY SPACE REQUIRED 46 UNITS x 6.0m	276 sq. m.	

**PROJECT STATISTICS**

BUILDING HEIGHT	5 Storeys - 19.2 M	
AMENITY SPACE	PRIVATE PATIOS =	550 sq. m.
	COMMUNAL EXTERIOR AT GRADE =	116 sq. m.
	COMMUNAL EXTERIOR ROOF TOP =	134 sq. m.
	<b>TOTAL =</b>	<b>800 sq. m.</b>

**BUILDING STATISTICS**

<b>GROSS BUILDING - AREAS</b>		
CITY OF OTTAWA'S DEFINITION		
BASEMENT LEVEL	0.0 sq. m.	0 sq. ft.
GROUND FLOOR	300.0 sq. m.	3,225 sq. ft.
TYPICAL FLOORS (2 - 4)	3 x 779.4 sq. m.	2,338.0 sq. m.
	3 x 8,389 sq. ft.	26,167 sq. ft.
5th FLOOR	664.6 sq. m.	7,154 sq. ft.
<b>TOTAL AREA ABOVE GRADE</b>	<b>3,546.6 sq. m.</b>	<b>38,546 sq. ft.</b>

**CAR PARKING**

<b>REQUIRED</b>		
RESIDENCE	- 0.5 PER UNIT AFTER 12 UNITS	17
VISITOR	- 0.1 PER UNIT AFTER 12 UNITS	3
COMMERCIAL RETAIL	- ALL UNITS UNDER 350 sq. m.	0
<b>TOTAL</b>		<b>20</b>

**PROVIDED**

RESIDENCE	35
VISITOR	3
COMMERCIAL RETAIL	0
<b>TOTAL</b>	<b>38</b>

**BICYCLE PARKING**

<b>REQUIRED</b>	
RESIDENCE	- 0.5 PER UNIT (46 UNITS)
COMMERCIAL	- 1 per 250 m <sup>2</sup> of gfa
<b>TOTAL</b>	<b>25</b>

**LOT COVERAGE**

PAVED SURFACE =	553.6 sq. m.	39.1%
BUILDING FOOTPRINT =	495.5 sq. m.	35.0%
LANDSCAPE OPEN SPACE =	365.5 sq. m.	25.9%
<b>TOTAL =</b>	<b>1,414.63 sq. m.</b>	<b>100.0%</b>

**LEGAL DESCRIPTION**

TOPOGRAPHICAL SKETCH OF  
**LOT 18 AND PART OF LOT 19**  
**REGISTERED PLAN 28**  
**CITY OF OTTAWA**

Prepared by Annis, O'Sullivan, Vollebek Ltd.  
 Field Work Completed May 14, 2018

**PROJECT DEVELOPER**

**129 MAIN STREET Ltd.**  
 236 Metcalfe Street,  
 Ottawa, Canada K2P 1R3  
 Tel: 613.237.2425  
 Fax: 613.237.7300

**SURVEYOR**

Annis O'Sullivan Vollebek Ltd.  
 Ontario Land Surveyors  
 56 Beech Street, Ottawa, Ontario K1S 3J6  
 1.613.724.9932 1.613.724.1209 www.rodericklahey.ca

**NOTATION SYMBOLS:**

- INDICATES DRAWING NOTES, LISTED ON EACH SHEET.
- INDICATES PARTITION TYPE, REFER TO WALL TYPE SCHEDULE.
- INDICATES WINDOW TYPE, REFER TO WINDOW ELEVATIONS AND DETAILS ON A900 SERIES.
- INDICATES DOOR TYPE, REFER TO DOOR SCHEDULE AND DETAILS ON A900 SERIES.
- DETAIL NUMBER
- TITLE
- DETAIL REFERENCE PAGE
- DETAIL CROSS REFERENCE PAGE

**GENERAL NOTES:**

- A REFER TO TYPICAL ASSEMBLY LEGEND FOR WALL, PARTITION, ROOF & FLOOR TYPES.
- B FOR DOOR TYPES AND HARDWARE REQUIREMENTS REFER TO DOOR SCHEDULE ON A900 SERIES.
- C ALL INTERIOR DIMENSIONS ARE TAKEN FROM THE FACE OF THE DRYWALL.
- D ALL EXTERIOR WALLS ARE TO BE TYPE 'W1' UNLESS NOTED OTHERWISE.
- E ALL INTERIOR PARTITIONS ARE TO BE TYPE 'P1' UNLESS NOTED OTHERWISE.

13	ISSUED FOR SITE PLAN CONTROL REVISION	Sept. 24, 18
12	REVISED BUILDING DESIGN	April 03, 18
11	REVISED BUILDING DESIGN	July 13, 17
10	ISSUED FOR UPDATED SITE PLAN CONTROL	Jan. 18, 16
9	REVISED BUILDING DESIGN	Sept. 22, 15
8	ISSUED FOR SITE PLAN AGREEMENT - M/LARS	Feb. 11, 14
7	REVISED AS PER CITY PROPOSED STREET DESIGN	Feb. 04, 14
6	REVISED BUILDING DESIGN	OCT. 23, 13
5	REVISED AS PER SITE PLAN COMMENTS	OCT. 7, 11
4	REVISED AS PER SITE PLAN COMMENTS	APRIL 27, 11
3	ISSUED FOR PRELIMINARY PRICING	APRIL 04, 11
2	ISSUED FOR SITE PLAN CONTROL	JULY 27, 10
1	ISSUED FOR MINOR VARIANCE	JULY 11, 07

No.	DESCRIPTION	DATE
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REVISIONS:

ARCHITECT SEAL	NORTH ARROW
SEAL DATE: STAMP DATE	DATE

**THE PROPERTIES GROUP**

236 Metcalfe Street, Ottawa, Ontario K2P 1R3

**RODERICK LAHEY ARCHITECT INC**

56 Beech Street, Ottawa, Ontario K1S 3J6  
 1.613.724.9932 1.613.724.1209 www.rodericklahey.ca

PROJECT TITLE:  
**129 MAIN STREET**

OTTAWA ONTARIO

SHEET TITLE:  
**SITE PLAN**

**CIVIL ENGINEER**

David Schaeffer Engineering Ltd.  
 120 Iber Road, Unit 203  
 Stittsville, ON K2S 1E9  
 Tel: (613) 836-0856  
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**LANDSCAPE ARCHITECT**

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 E-Mail: kallaladesign@xplonnet.com

DRAWN: R. VERCH	CHECKED: RLA
SCALE: 1:100	SHEET No.:
PROJECT No. 0622	<b>SP-1</b>

