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STORMWATER MANAGEMENT BRIEF
PARKING LOT

1-3 GRANT STREET
OTTAWA, ONTARIO

Prepared For:
Grant Street Garage 1974 Ltd.
1 Grant Street
Ottawa Ontario
K1Y 2W8

PROJECT #: 210499

City of Ottawa File # D07-05-20-0001

DISTRIBUTION
1 copy – City of Ottawa
1 copy – Grant Street Garage.
1 copy – Kollaard Associates Inc.

Rev 0 – Issued for Demolition and Site Plan Approval May 31, 2021

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF DRAWINGS

- 210499 – SWM – Stormwater Management Plan
- 210499 – GSP – Site Grading and Servicing Plan
- 210499 – ESC – Erosion and Sediment Control Plan

1 INTRODUCTION

Kollaard Associates was retained by Geoff Watson of Grant Street Garage 1074 Ltd to complete the grading and stormwater management design to facilitate the demolition of an existing dwelling in order to construct a parking area on the property commonly known as 3 Grant Street in order to service the existing commercial business (an automotive service repair operation) at 1 Grant Street in the City of Ottawa, Ontario.

1.1 Purpose

This brief will address the stormwater management requirements for the site as well as the necessary stormwater management works required to meet these requirements. The brief will also address the adequacy of the existing municipal storm sewer to hydraulically convey the storm runoff as a result of the proposed parking area development to be located 3 Grant Street, Ottawa, Ontario.

1.2 Proposed Development

The development being proposed by Grant Street Garage is located on the north side of Grant Street approximately 15 metres west of McCormick Street within the City of Ottawa.

The site has a total area of 308 square metres. The property is within Ward 15 – Kitchissippi of the City of Ottawa. The property is legally described as Lot 1 and Part of Lot 2 Registered Plan 109, City of Ottawa. The property known as 3 Grant Street is currently occupied by an existing single family residential dwelling and three gravel surfaced parking spaces used by Grant Street Garage.

The proposed development is to consist of a the demolition of the existing dwelling and the construction of an asphaltic surfaced parking area increasing the number of parking spaces from three to seven. Landscaping features will be added to the site.

1.3 Referenced Documents

The following documents have been referenced during the preparation of this stormwater management brief. These documents are publicly available or have been provided as part of the Site Plan Control Application and are not included with this report.

- Committee of Adjustment For the City of Ottawa Decision Minor Variance File No. D08-02-14/A-00220.

- Review of the Submission for Demolition Control Application - 1-3 Grant Street Letter provided by the City of Ottawa dated June 24, 2020.
- City of Ottawa Sewer Design Guidelines October 2012 as amended by technical bulletins
    - ISDTB-2014-01, PIEDTB-2016-01, ISTB-2018-01, ISTB-2018-04

2 STORMWATER DESIGN

2.1 Stormwater Management Design Criteria

Design of the storm sewer system was completed in conformance with the City of Ottawa Design Guidelines. (October 2012). Section 5 "Storm and Combined Sewer Design" as amended.

The stormwater management criteria was given in the review of submission letter provided by the City of Ottawa. In accordance with the SWM design criteria provided by the City, 100 year post development flow from the proposed development to the storm sewer along Grant Street will be restricted to the 5 year pre-development flow from the site assuming the lesser of the actual pre-development runoff coefficient or a pre-development runoff coefficient of C = 0.5.

A time of concentration is to be calculated and to be no less than 10 minutes. Alternatively a pre-development time of concentration of 20 minutes could be used without calculation or engineered justification.

2.1.1 Minor System Design Criteria

The storm sewers have been designed and sized based on the rational formula and the Manning's Equation under free flow conditions for the 5-year storm using a 10-minute inlet time.

2.1.2 Major System Design Criteria

The major system has been designed to accommodate on-site detention with sufficient capacity to attenuate the runoff generated onsite during a 100-year design storm to 5 year pre-development conditions.

Any storm events greater than 5 year, up to 100 year, and including 100 year storm event must be detained on site.

2.1.3 Quality Control

There is no quality control requirement for the proposed development.

Best management practices will be incorporated at the site to reduce potential suspended solid contamination. Snow and Ice control management practices will be incorporated to reduce contamination from winter snow and ice removal.

2.1.4 Approval Authorities

The approval authorities for the proposed stormwater management facility consist of the Rideau Valley Conservation Authority (RVCA), the City of Ottawa and the Ministry of Environment Conservation and Parks (MECP).

Offsite runoff from a portion of the adjacent lands are currently and will continue to be directed onto the subject property. As such the stormwater management facilities will be designed to serve more than one property, therefore it is considered that an MECP ECA will be required for the proposed stormwater management facility.

2.2 Stormwater Quantity Control

Peak Flow for runoff quantities for the Pre-Development and Post-Development stages of the project were calculated using the rational method. The rational method is a common and straightforward calculation, which assumes that the entire drainage area is subject to uniformly distributed rainfall. The formula is:

$$Q = \frac{CiA}{360}$$

Where
Q is the Peak runoff measured in ***m^3/s***
C is the Runoff Coefficient, **Dimensionless**
A is the runoff area in ***hectares***
i is the storm intensity measure in ***mm/hr***

All values for intensity, i, for this project were derived from IDF curves provided by the City of Ottawa for data collected at the Ottawa International airport. For this project two return periods were considered, 5 and 100-year events. The formulas for each are:

5-Year Event

$$i = \frac{998.071}{(t_c + 6.053)^{0.814}}$$

100-Year Event

$$i = \frac{1735.071}{(t_c + 6.014)^{0.82}}$$

where t_c is time of concentration

For a 10 minute time of concentration the above formula provide the following intensities: 5-year = 104.19; 100 year = 178.56.

2.2.1 Runoff Coefficients

Runoff coefficients for impervious surfaces (roofs, asphalt, and concrete) were taken as 0.90, for gravel surfaces were taken as 0.7 and pervious surfaces (grass) were taken as 0.2.

A 25% increase for the post development 100-year runoff coefficients was used as per City of Ottawa guidelines. Refer to Appendix A for pre-development and post development runoff coefficients.

2.2.2 Time of Concentration

The time of concentration for both pre- and post-development was determined using the City of Ottawa Sewer Design Guidelines Appendix 5 – D. The existing slope across the site is about 1 percent over a length of 25 metres. The runoff coefficient C is 0.85. The use of the chart in Appendix 5 – D indicates a time of concentration of less than 5 minutes for a site with these characteristics.

The minimum time of concentration to be used in accordance with the City of Ottawa Guidelines is 10 minutes. Therefore, a pre-development time of concentration of 10 minutes was used.

2.2.3 Pre-development Site Conditions

As previously indicated, the site is located along the north side of Grant Street within the City of Ottawa. The site has a total area of about 308 square metres and is completely developed. The site is currently occupied by a residential dwelling with a footprint of about 55 square metres and an asphalt surfaced driveway of about 173 square metres and a gravel surfaced parking area of about 78 square metres. The site shares an entrance driveway with the adjacent property at 5 Grant Street adding an additional 30 square metres to the asphalt surfaced area to be considered under pre-development conditions.

The site is adjacent a residential area with residential development immediately north and west of the site. There is commercial development east and south of the site.

There is no existing significant landscaping features on the site. The front approximately three quarters of the site is occupied by the existing dwelling and asphalt surfaces. The remaining portion of the site is occupied by a compacted gravel surface with some grass along the bottom of the fence at the back of the property. There are no trees on the site.

2.2.3.1 Pre-development Runoff Coefficients

The predevelopment runoff coefficient for the site was calculated using weighted average based on the existing ground surface conditions as follows:

$$C = \frac{\left(A_{imp}\ x\ 0.9 + A_{gravel} x\ 0.7 + A_{soft}\ x\ 0.25\right)}{A_{total}}$$

$$C = \frac{(0.0258\ x\ 0.9 + 0.0078 x\ 0.7 + 0.0002\ x\ 0.2)}{0.0338} = 0.85$$

Based on the existing ground cover the pre-development runoff coefficient was calculated to be 0.85. Increasing the runoff coefficient by 25 percent up to a maximum of 1.0 results in a runoff coefficient of 0.9 for the 100 year event.

Based on the stormwater managment criteria, the maximum allowable runoff coefficient of C = 0.5 was used for pre-development conditions.

2.2.3.2 Pre-development Runoff Rate

Using the City of Ottawa IDF curve for a 5-year and 100 year storm events, the storm intensities at a 10 minute time of concentration are 104.19 mm/hr and 178.56 mm/hr respectively. Using the Rational Method with a time of concentration of 10 minutes, and the previously calculated runoff coefficient, the pre-development runoff rate for the 5-year and 100 year design storms for the site are:

5 year = 0.85 x 104.19 x 0.0338 / 360 = 8.3 L/s
100 year = 0.90 x 178.56 x 0.0338 / 360 = 15.1 L/s

Based on the stormwater management conditions, the pre-development runoff rate was re-analysed for the 5 year storm event using a runoff coefficient of C = 0.5 as follows:

5 year = 0.5 x 104.19 x 0.0338 / 360 = 4.9 L/s

2.2.4 Controlled and Uncontrolled Areas

For the purposes of this storm water management design, the site has been divided into uncontrolled and controlled areas as outlined on drawing 210449-POST. The controlled area is defined as area CA1 and uncontrolled area is defined as UA1. CA1 consists of the majority of the asphaltic surfaced parking area and the rear landscaping feature. UA1 consists of the asphaltic surfaced entrance driveway and front landscaping feature.

Runoff from the uncontrolled entrance driveway and the front landscaping feature will be directed by sheet flow to Grant Street. Runoff from the controlled areas will be directed by sheet flow to a catch basin located within the parking area. The catch basin will discharge to the existing storm sewer along Grant Street.

Post-development site conditions are summarized in the following Table 2.1.

Table 2.1 - Post Development Site Conditions

Total Area = 0.0338 (Total Site Area = 0.0308 hectares, Total Offsite Area = 0.0030					
Event Frequency		5 Year Return Period		100 year Return Period	
Surface Covering	Area of surface ha	Runoff Coef. C	C avg.	Runoff Coef. C	C avg.
Controlled Area CA1 – 0.0294hectares					
Landscape	0.0033	0.2	0.82	0.25	0.92
Gravel	0.0	0.9		1.0	
Asphalt	0.0261	0.9		1.0	
Roof	0.0	0.9		1.0	
Uncontrolled Area UA1 – 0.0044 hectares					
Asphalt / Roof	0.0016	0.9	0.45	1.0	0.52
Landscape	0.0028	0.2		0.25	
Gravel	0.0	0.7		0.88	

2.2.5 Uncontrolled Area Runoff

The runoff from the uncontrolled areas was determined using the rational method for a time of concentration of 10 minutes using the above calculated runoff coefficients.

The uncontrolled runoff from UA1 directed Grant Street is:

5 year = 0.45 x 104.19 x 0.0044 / 360 = 0.6 L/s
100 year = 0.52 x 178.56 x 0.0044 / 360 = 1.1 L/s

2.2.6 Allowable Release Rate to Grant Street

As previously indicated, the stormwater management criteria requires that the maximum runoff rate from the site directed towards Grant Street during a 100 year storm is to be restricted to that of the 5 year pre-development storm conditions using a runoff coefficient equal to the lesser of pre-development conditions or C = 0.5 .

The total allowable runoff rate to be directed to Grant Street from the site was determined to be 4.9L/s based on the 5 year pre-development runoff rate using a runoff coefficient of 0.5.

The allowable release rate from the controlled areas CA1 is equal to the total allowable runoff rate less the runoff rate from the uncontrolled area UA1.

$$Q_{controlled} = Q_{total\ allowable} - Q_{uncontrolled}$$

For the 5-year Storm event
$Q_{controlled}$ = 4.9 – 0.6 = 4.3 L/s

For the 100-year Storm event
$Q_{controlled}$ = 4.9 – 1.1 = 3.8 L/s

Since the allowable release rate during the 100-year storm is more restrictive than the allowable release rate during the 5-year storm event, the allowable release rate for the 100 year storm event is the governing criteria.

2.2.7 Post Development Restricted Flow and Storage

In order to meet the stormwater quantity control restriction, the post development runoff rate cannot exceed the 5 year predevelopment runoff rate using a runoff coefficient of C = 0.5. Runoff generated on site in excess of the allowable release rate will be temporarily stored on on the parking area surface. The stored water will be released at a controlled rate during and following the storm event.

The stormwater runoff originating on the parking area and rear landscaping feature will be directed to the catch basin in the parking area. The parking area surface will be sloped towards the catch basin providing surface storage volume. The landscaping feature will contain shrubs and will be surfaced with washed 2 to 5 inch river stone. The release rate from the catch basin to the existing storm sewer along Grant Street will be controlled by a Hydrovex inlet control device.

The Hydrovex Vertical Flow Regulator can be order using the following specification:

Model	75-SVHV-1
Pipe Outlet	250 mm PVC SDR 35
Discharge	3.6 L/s
Upstream Head	1.6 m
ICD Invert Elevation	63.3 m
Catch Basin Dimensions	0.6 x 0.6 metres
Minimum Clearance	0.6 m

The restriction provided by the Hydrovex Flow regulator in the catch basin will result in the storage requirements on the parking area as summarized the following Table 2.3.

Table 2.3 – Summary of Post-Development Release rates and Storage Requirements.

Return period	Allowable Release Rate	Actual Release rate	Required Storage	Available Storage	Required Storage Depth	Available Storage Depth
(years)	(L/s)	(L/s)	(m^3)	(m^3)	(m)	(m)
Catchment Area CA1 – Parking Surface						
5	4.3	3.4	2.2	15.6	0.12	0.20
100	3.8	3.6	6.6	15.6	0.18	0.20

Since the maximum release rate from the catch basin during a 100 year storm event of 3.6 L/s is less than the maximum allowable release rate of 3.8 L/s, the proposed stormwater management system will meet the quality control design criteria.

2.3 Stormwater Quality Control

As previously indicated there is no quality control requirement for the proposed development.

Best management practices will be incorporated at the site to reduce potential suspended solid contamination. Snow and Ice control management practices which include proper timing of the application of the salt and sand will be incorporated to reduce contamination from winter snow and ice removal.

2.4 Stormwater System Operation and Maintenance

2.4.1 Inlet Control Device (ICD)

The Hydrovex inlet control device (ICD) should be inspected on a semi-annual basis and following major storm events. Any blockages, trash or debris should be removed.

2.4.2 Catch basin

The catchbasin should be cleaned with a hydrovac excavation truck following completion of construction, paving of the asphaltic concrete and establishment of the landscaped areas.

Following the initial cleaning the structure should be inspected on a semi-annual basis and following major storm events. Any blockages, trash or debris should be removed. Once the sediment accumulation in the catch basin has reached a level equal to 0.3 metres below the outlet invert of the structure, or a thickness of 0.3 metres in the sediment traps, the sediment should be removed by hydro excavation.

2.5 Storm Sewer Design

The on-site storm sewers were designed to be in general conformance with the City of Ottawa Sewer Design Guidelines (October 2012). Specifically, storm sewers were sized using Manning's Equation, assuming a roughness coefficient N = 0.013, to accommodate the uncontrolled runoff from the 5-year storm, under 'open-channel' conditions. The uncontrolled runoff was determined using the rational method and the City of Ottawa IDF curve for a 10-minute time of concentration. Refer to Storm Sewer Design Sheets in Appendix A.

2.6 Sufficiency of Existing Storm Sewer

The existing storm sewer along Grant Street consists of a 300 mm diameter PVC pipe with a slope of 0.6 percent. The storm sewer begins at McCormick Street, about 25 metres east of the site and has a capacity of about 75 L/s.

The existing conditions for the site result in a flow rate of 8.3 L/s directed to the existing storm sewer. As a result of the proposed inlet control device to be placed in the proposed catchbasin, the discharge rate from the site will be reduced to 3.4 L/sec.

Since the proposed discharge to the storm sewer is much less than the existing discharge and the proposed discharge is much less than the capacity of the storm sewer, the existing storm sewer will have sufficient capacity for the runoff from the proposed development.

3 SANITARY SEWER DESIGN

The existing residential sanitary service is to be capped at the property line. There is no proposed sanitary sewage use at the site.

4 WATERMAIN DESIGN

The site is currently occupied by a single family dwelling which has a residential water service connected to the water main along Grant Street. This water service must be capped at the water main to the satisfaction of City of Ottawa Staff.

5 EROSION AND SEDIMENT CONTROL

The owner (and/or contractor) agrees to prepare and implement an erosion and sediment control plan at least equal to the stated minimum requirements and to the satisfaction of the City of Ottawa, appropriate to the site conditions, prior to undertaking any site alterations (filling, grading, removal of vegetation, etc.) and during all phases of site preparation and construction in accordance with the current best management practices for erosion and sediment control. It is considered to be the owners and/or contractors responsibility to ensure that the erosion control measures are implemented and maintained.

In order to limit the amount of sediment carried in stormwater runoff from the site during construction, it is recommended to install a silt fence along the property, as shown in Kollaard Associates Inc. Drawing #210499 ESC Erosion and Sediment Control Plan. The silt fence may be polypropylene, nylon, and polyester or ethylene yarn.

If a standard filter fabric is used, it must be backed by a wire fence supported on posts not over 2.0 m apart. Extra strength filter fabric may be used without a wire fence backing if posts are not over 1.0 m apart. Fabric joints should be lapped at least 150 mm (6") and stapled. The bottom edge of the filter fabric should be anchored in a 300 mm (1 ft) deep trench, to prevent flow under the fence. Sections of fence should be cleaned, if blocked with sediment and replaced if torn.

Filter socks should be installed across the proposed catch basin lid immediately after the catch basin is placed. The filter socks should only be removed once the asphaltic concrete is installed and the site is cleaned.

The proposed landscaping works should be completed as soon as possible. The proposed granular and asphaltic concrete surfaced areas should be surfaced as soon as possible.

The silt fences should only be removed once the site is stabilized and landscaping is completed.

These measures will reduce the amount of sediment carried from the site during storm events that may occur during construction.

6 CONCLUSIONS

This report addresses the adequacy of the existing municipal storm sewer system and ervice the proposed development. Based on the analysis provided in this report, the conclusions are as follows:

SWM for the proposed development will be achieved by restricting the 100 year post development flow to Grant Street to the 5 year pre-development flow rate from the site assuming a maximum pre-development runoff coefficient of C = 0.5. This reduces the actual pre-development runoff coefficient from C = 0.85.

There are not sanitary or water demands as a result of the proposed development.

During all construction activities, erosion and sedimentation shall be controlled.

We trust that this report provides sufficient information for your present purposes. If you have any questions concerning this report or if we can be of any further assistance to you on this project, please do not hesitate to contact our office.

Sincerely,
Kollaard Associates, Inc.

_____
Steven deWit, P.Eng.

Appendix A: Storm Design Information

- Sheet 1 – Allowable Release Rate and SWM Summary
- Sheet 2 – Uncontrolled Area Runoff Calculations
- Sheet 3 – Required Storage Vs. Release Rate Calculations
- Sheet 4 – Outlet control Design Sheet
- Sheet 5 – Storm Sewer Design Sheet

APPENDIX A: STORMWATER MANAGEMENT MODEL
SHEET 1 - ALLOWABLE RELEASE RATE AND SWM SUMMARY

Client: Grant Street Garage
Job No.: 210499
Location: 3 Grant Street, Ottawa, Ontario
Date: May 31, 2021

Pre Dev run-off Coefficient "C" 2,5 year 100 year

Area	Surface	Ha	C 2,5 year	C_{avg}	C 100 year	C_{avg}
Total	Gravel	0.0078	0.70	**0.85**	0.88	**0.90**
0.0338	Building	0.0055	0.90		1.00	
	Asphalt	0.0173	0.90		1.00	
	Landscaping	0.0002	0.20		0.25	
	Offsite Areas	0.0030	0.90		0.25	

PRE DEVELOPMENT FLOW

5 Year Event

Pre Dev.	C	Intensity	Area
5 Year	0.85	104.19	0.0338
2.78CIA= 8.32		L/s	

100 Year Event

Pre Dev.	C	Intensity	Area
100 Year	0.90	178.56	0.034
2.78CIA= 15.10		L/s	

**Use a 10 minute time of concentration for pre-development

5 year Event: 8.3 L/s **100 year Event: 15.1 L/s**

Allowable Flow Based on Criteria where C for Pre-Development Conditions = Max 0.5

5 Year Event

Pre Dev.	C	Intensity	Area
5 Year	0.50	104.19	0.0338
2.78CIA= 4.90		L/s	

5 year Event: 4.9 L/s

Pre Dev Time of Concentration "t_c"

From City of Ottawa Sewer Design Guidelines - Appendix 5 - D

Slope of Site = 0.96% Inlet Time = <5 min use min time of 10 min
Distance Across Site = 24
Runoff Coefficient = 0.85

STORMWATER MANAGEMENT SUMMARY

Sub Area I.D.	Sub Area (ha)	5 year C	100 year C	Outlet Location	5 Year Controlled Release (L/s)	Required 5 year Storage (m^3)	100 Year Controlled Release (L/s)	Required 100 year Storage (m^3)
Total Allowable Runoff Rate From Site					**4.9**		**4.9**	
Uncontrolled Runoff Rate from Site								
Uncont.	0.0030	n/a	n/a		0.6		1.1	
Allowable Release Rate To Storm Sewer								
					4.3		*3.8*	
Actual Controlled Release Rate to Storm Sewer								
CA1	*0.0308*				*3.4*	*2.2*	*3.6*	*6.6*
Summary - Total Post-Development Runoff Rate and Storage Requirement								
TOTAL	**0.0338**				**3.4**		**3.6**	

Equations:

Flow Equation

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

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

Runoff Coefficient Equation

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

APPENDIX A: STORMWATER MANAGEMENT MODEL

Sheet 2 - Uncontrolled Area Runoff Rate Calculation

Client: Grant Street Garage
Job No.: 210499
Location: 3 Grant Street, Ottawa, Ontario
Date: May 31, 2021

UNCONTROLLED AREA DISCHARGE

Post Dev run-off Coefficient "C"

			5 Year Event		100 Year Event	
Area	**Surface**	**Ha**	**"C"**	**C_{avg}**	**"C"**	**C_{avg}**
Total	Asphalt/Roof	0.0016	0.90	**0.45**	1.00	**0.52**
0.0044	Landscape	0.0028	0.20		0.25	
	Walkway	0.0000	0.90		1.13	
Impervious Area Ratio		0.36				

Post Dev Free Flow
5 Year Event

	C	Intensity	Area
5 Year	0.45	104.19	0.0044
2.78CIA=	0.57		
0.6 L/S			

100 Year Event

	C	Intensity	Area
100 Year	0.52	178.56	0.0044
2.78CIA=	1.14		
1.1 L/S			

**Use a 10 minute time of concentration

Equations:

Flow Equation

Q = 2.78 x C x I x A

Where:

C is the runoff coefficient

I is the intensity of rainfall, City of Ottawa IDF

A is the total drainage area

Runoff Coefficient Equation

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

APPENDIX A: STORMWATER MANAGEMENT MODEL

Sheet 3: Required Storage Vs. Release Rate - CA1 (Parking Area)

Client: Grant Street Garage
Job No.: 210499
Location: 3 Grant Street, Ottawa, Ontario
Date: May 31, 2021

Controlled Area			2, 5 Year Event		100 Year Event	
Area ha	Surface	Ha	"C"	C_{avg}	"C" 10	C_{avg}
0.0294	Asphalt	0.0261	0.90	**0.82**	1.00	**0.92**
	Gravel	0.0000	0.00		1.00	
	Building Roof	0.0000	0.90		1.00	
	Landscape	0.0033	0.20		0.25	
Impervious Area Ratio		0.89				0

Total Allowable Release Rate 5 year 4.3 L/s
100 year 3.8 L/s

Storage Requirements for Controlled Areas

Area = 0.0294 hectares
5-year Runoff Coefficient = 0.82 post development
100-year Runoff Coefficient = 0.92 post development

Duration Interval (min) = 5
Release Rate Start (L/s) = 0.5
Release Rate Interval (L/s) = 0.5

			Release Rate L/s	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5
Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Storage Required (m^3)												
5 Year	5	141.18	9.46	2.7	2.5	2.4	2.2	2.1	1.9	1.8	1.6	1.5	1.3	1.2	1.0	0.9
	10	104.19	6.98	3.9	3.6	3.3	3.0	2.7	2.4	2.1	1.8	1.5	1.2	0.9	0.6	0.3
	15	83.56	5.60	4.6	4.1	3.7	3.2	2.8	2.3	1.9	1.4	1.0	0.5	0.1	-0.4	-0.8
	20	70.25	4.71	5.0	4.4	3.8	3.2	2.6	2.0	1.4	0.8	0.2	-0.4	-1.0	-1.6	-2.2
	25	60.90	4.08	5.4	4.6	3.9	3.1	2.4	1.6	0.9	0.1	-0.6	-1.4	-2.1	-2.9	-3.6
	30	53.93	3.61	5.6	4.7	3.8	2.9	2.0	1.1	0.2	-0.7	-1.6	-2.5	-3.4	-4.3	-5.2
	35	48.52	3.25	5.8	4.7	3.7	2.6	1.6	0.5	-0.5	-1.6	-2.6	-3.7	-4.7	-5.8	-6.8
	40	44.18	2.96	5.9	4.7	3.5	2.3	1.1	-0.1	-1.3	-2.5	-3.7	-4.9	-6.1	-7.3	-8.5
	45	40.63	2.72	6.0	4.7	3.3	2.0	0.6	-0.7	-2.1	-3.4	-4.8	-6.1	-7.5	-8.8	-10.2
	50	37.65	2.52	6.1	4.6	3.1	1.6	0.1	-1.4	-2.9	-4.4	-5.9	-7.4	-8.9	-10.4	-11.9
	55	35.12	2.35	6.1	4.5	2.8	1.2	-0.5	-2.1	-3.8	-5.4	-7.1	-8.7	-10.4	-12.0	-13.7
	60	32.94	2.21	6.1	4.3	2.5	0.7	-1.1	-2.9	-4.7	-6.5	-8.3	-10.1	-11.9	-13.7	-15.5
	65	31.04	2.08	6.2	4.2	2.3	0.3	-1.6	-3.6	-5.5	-7.5	-9.4	-11.4	-13.3	-15.3	-17.2
	70	29.37	1.97	6.2	4.1	2.0	-0.1	-2.2	-4.3	-6.4	-8.5	-10.6	-12.7	-14.8	-16.9	-19.0
			Maximum 5 year storage rate	6.2	4.7	3.9	3.2	2.8	2.4	2.1	1.8	1.5	1.3	1.2	1.0	0.9

Duration Interval (min) = 5
Release Rate Start (L/s) = 0.5
Release Rate Interval (L/s) = 0.5

			Release Rate L/s	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5
Return Period	Time (min)	Intensity (mm/hr)	Flow Q (L/s)	Storage Required (m^3)												
	5	242.70	18.25	5.3	5.2	5.0	4.9	4.7	4.6	4.4	4.3	4.1	4.0	3.8	3.7	3.5
100 Year	10	178.56	13.43	7.8	7.5	7.2	6.9	6.6	6.3	6.0	5.7	5.4	5.1	4.8	4.5	4.2
	15	142.89	10.74	9.2	8.8	8.3	7.9	7.4	7.0	6.5	6.1	5.6	5.2	4.7	4.3	3.8
	20	119.95	9.02	10.2	9.6	9.0	8.4	7.8	7.2	6.6	6.0	5.4	4.8	4.2	3.6	3.0
	25	103.85	7.81	11.0	10.2	9.5	8.7	8.0	7.2	6.5	5.7	5.0	4.2	3.5	2.7	2.0
	30	91.87	6.91	11.5	10.6	9.7	8.8	7.9	7.0	6.1	5.2	4.3	3.4	2.5	1.6	0.7
	35	82.58	6.21	12.0	10.9	9.9	8.8	7.8	6.7	5.7	4.6	3.6	2.5	1.5	0.4	-0.6
	40	75.15	5.65	12.4	11.2	10.0	8.8	7.6	6.4	5.2	4.0	2.8	1.6	0.4	-0.8	-2.0
	45	69.05	5.19	12.7	11.3	10.0	8.6	7.3	5.9	4.6	3.2	1.9	0.5	-0.8	-2.2	-3.5
	50	63.95	4.81	12.9	11.4	9.9	8.4	6.9	5.4	3.9	2.4	0.9	-0.6	-2.1	-3.6	-5.1
	55	59.62	4.48	13.1	11.5	9.8	8.2	6.5	4.9	3.2	1.6	-0.1	-1.7	-3.4	-5.0	-6.7
	60	55.89	4.20	13.3	11.5	9.7	7.9	6.1	4.3	2.5	0.7	-1.1	-2.9	-4.7	-6.5	-8.3
	65	52.65	3.96	13.5	11.5	9.6	7.6	5.7	3.7	1.8	-0.2	-2.1	-4.1	-6.0	-8.0	-9.9
	70	49.79	3.74	13.6	11.5	9.4	7.3	5.2	3.1	1.0	-1.1	-3.2	-5.3	-7.4	-9.5	-11.6
	75	47.26	3.55	13.7	11.5	9.2	7.0	4.7	2.5	0.2	-2.0	-4.3	-6.5	-8.8	-11.0	-13.3
	80	44.99	3.38	13.8	11.4	9.0	6.6	4.2	1.8	-0.6	-3.0	-5.4	-7.8	-10.2	-12.6	-15.0
	85	42.95	3.23	13.9	11.4	8.8	6.3	3.7	1.2	-1.4	-3.9	-6.5	-9.0	-11.6	-14.1	-16.7
	90	41.11	3.09	14.0	11.3	8.6	5.9	3.2	0.5	-2.2	-4.9	-7.6	-10.3	-13.0	-15.7	-18.4
			Maximum 100 year storage rate	14.0	11.5	10.0	8.8	8.0	7.2	6.6	6.1	5.6	5.2	4.8	4.5	4.2

Kollaard Associates
Engineers
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P.O. Box 189
Kemptville, Ontario K0G 1J0

Civil ●
Geotechnical ●
Hydrogeological ●
Inspection Testing ●
Septic Systems Grading ●
Structural ● Environmental ●

APPENDIX A: STORMWATER MANAGEMENT MODEL

Sheet 4: CA1 - OUTLET CONTROL DESIGN SHEET

Client: Grant Street Garage
Job No.: 210499
Location: 3 Grant Street, Ottawa, Ontario
Date: May 31, 2021

ICD Information	
Outlet Pipe Dia:	0.250
ICD Invert:	63.3
ICD Type	Hydrovex
Model:	75SVHV-1

Stage, WSE Elev (m)	Comments	Layer Thickness (m)	Front Section			Total Quality Storage (m3)	Total Quantity Storage (m3)	Total Quantity Storage (ha*m)	ICD Flow		
			Top Layer Area (m^2)	Bottom Layer Area (m^2)	Layer Volume (m^3)				Head on ICD (m)		Orifice Flow* (m^3/sec)
64.95		0.050	153	124.0	6.9	0.0	15.6	0.0016	1.65		0.0038
64.90		0.050	124	68.0	4.7	0.0	8.7	0.0009	1.60		0.0036
64.85		0.050	68	33.0	2.5	0.0	4.0	0.0004	1.55		0.0035
64.80		0.050	33	15.0	1.2	0.0	1.5	0.0001	1.50		0.0034
64.75		0.050	15	0.6	0.3	0.0	0.3	0.0000	1.45		0.0033
64.70	Bottom of Parking Area	0.000	0.6	0.0	0.0	0.0	0.0	0.0000	1.40		0.0032

APPENDIX A: STORMWATER MANAGEMENT MODEL

Sheet 5 - Storm Sewer Design Sheet

Client: Grant Street Garage
Job No.: 210499
Location: 3 Grant Street, Ottawa, Ontario
Date: May 31, 2021

Storm Sewer Design Sheet (5-yr storm)

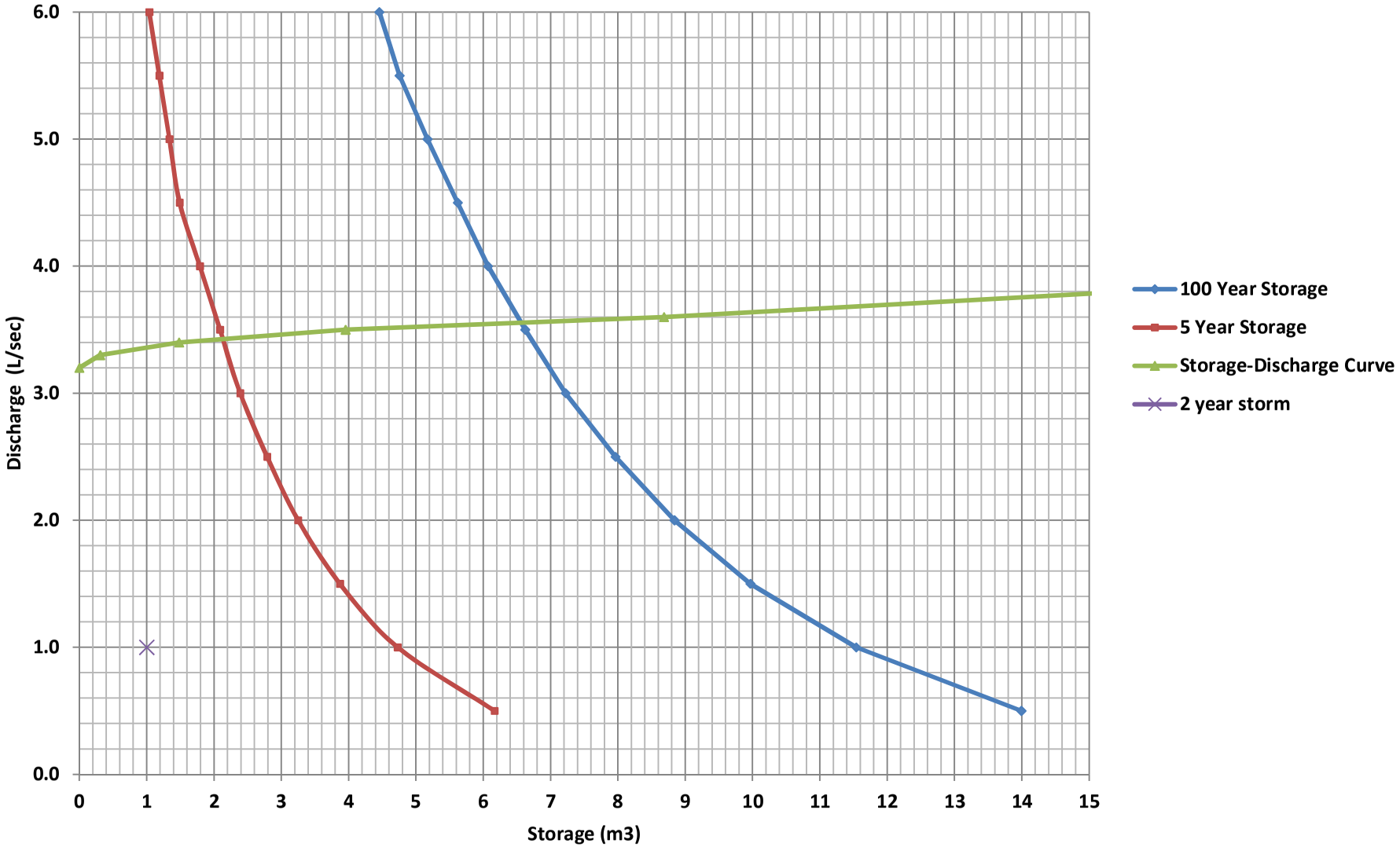
LOCATION									TIME	RAINFALL	PEAK
FROM	TO	Total Area (ha)	C 0.25	C 0.50	C 0.90	Actual R ('C')	INDIV 2.78 AR	ACCUM 2.78 AR	OF CONC.	INTENSITY I	FLOW Q (l/s)
Site CB	Grant	0.0338	0.0061	0.0000	0.0277	0.78	0.07	0.07	10.00	104.19	7.66

PROPOSED SEWER									Controlled /Uncontrolled	Controlled Flow	ICD
TYPE OF PIPE	PIPE SIZE (mm)	PIPE SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	TIME OF FLOW (min.)	EXCESS CAPACITY (l/s)	Q/Qfull		(L/s)	
PVC	250.00	1.00	13.0	59.53	1.21	0.18	51.86	0.13	Controlled	3.4	Hydrovex
											75-SVHV-1

Rainfall Intensity = $998.071/(T+6.053)^{\wedge -0.814}$ T= time in minutes
(City of Ottawa, 5 year storm)

Client: Grant Street Garage
Job No.: 210499
Location: 3 Grant Street, Ottawa
Date: May 31, 2021

APPENDIX A - STORMWATER MANAGEMENT MODEL
FIGURE 1 - PARKING AREA - STORAGE DISCHARGE CURVES



Appendix B: Product Information

- Hydrovex Selection Chart

HYDROVEX®

SVHV Vertical Vortex Flow Regulator

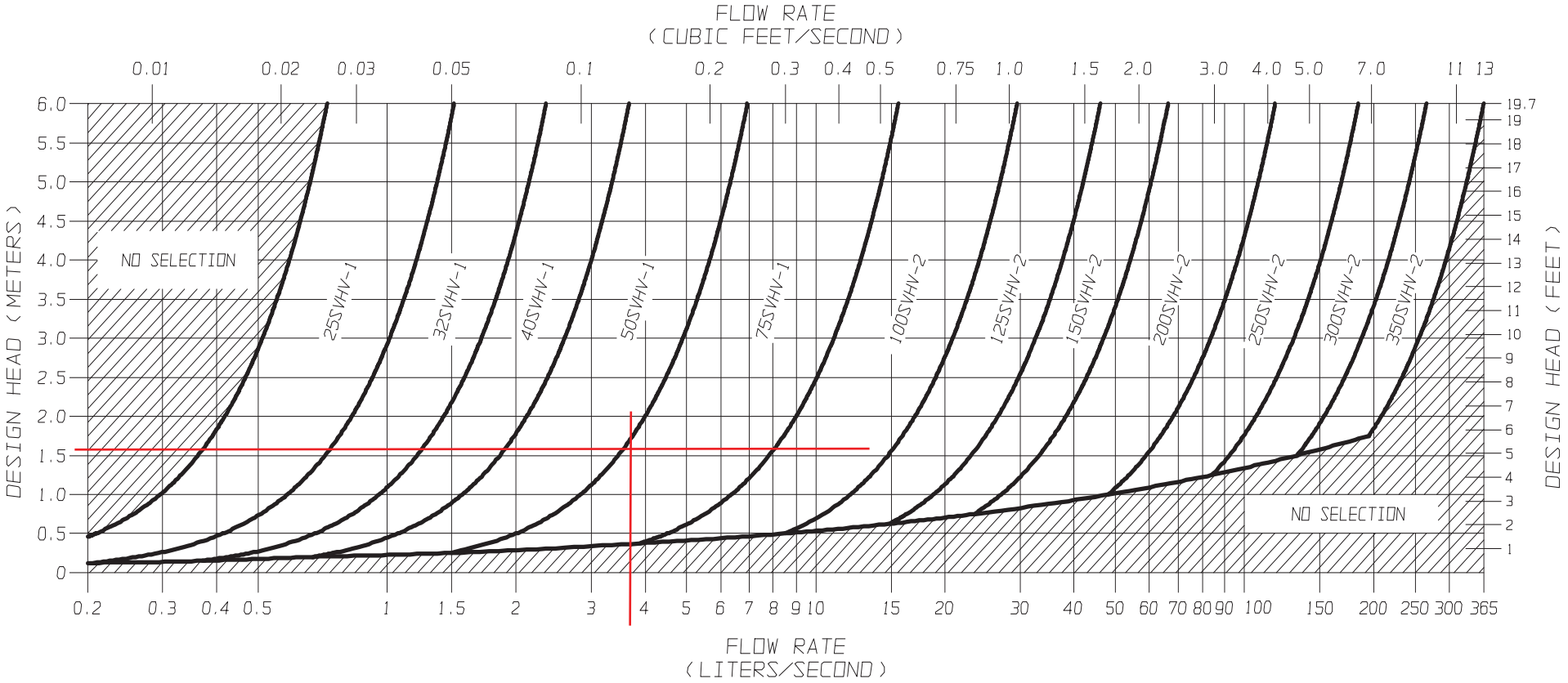


FIGURE 3 - SVHV

JOHN MEUNIER

Appendix C: Drawings

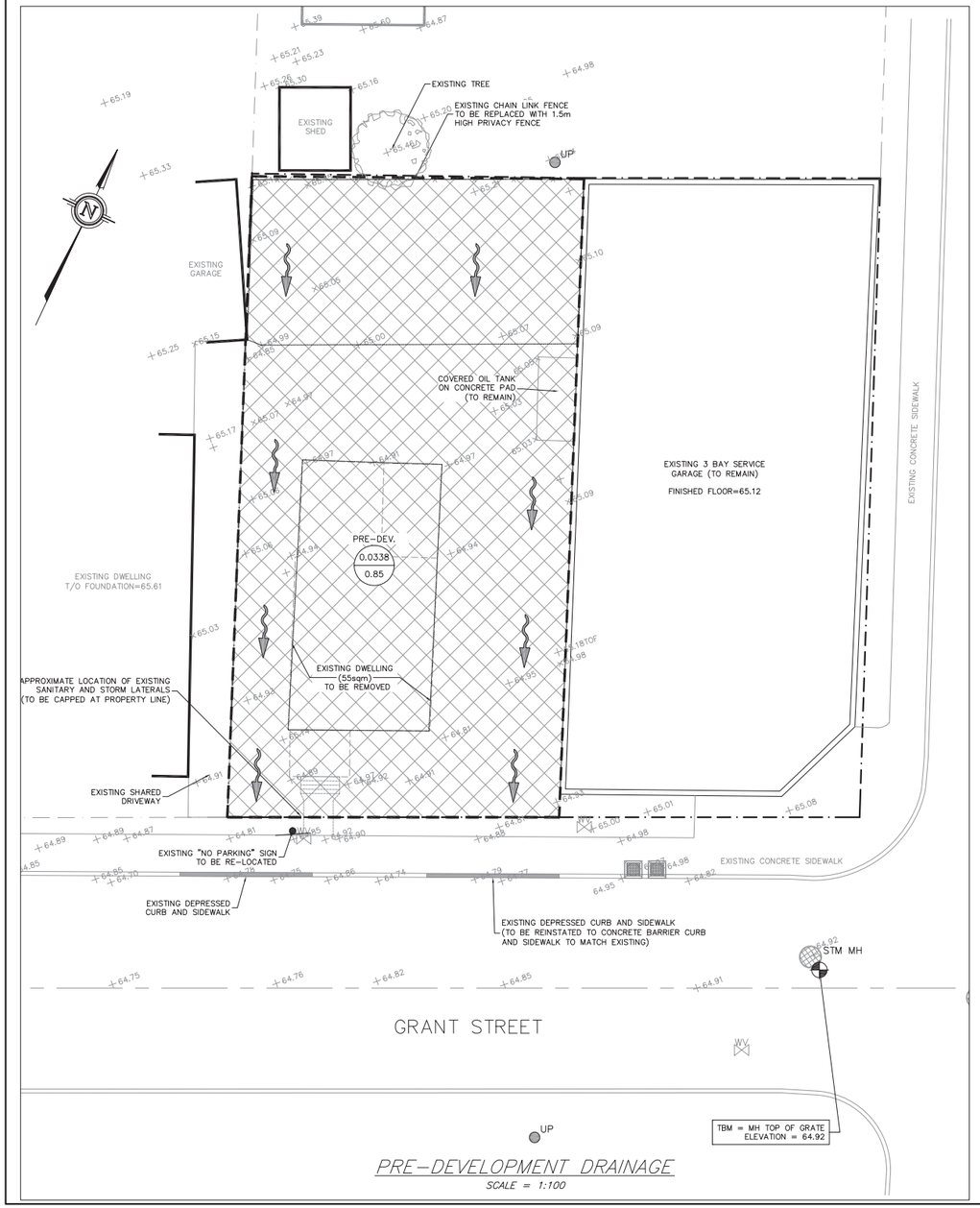
- 210499 – SWM – Stormwater Management Plan
- 210499 – GSP – Site Grading and Servicing Plan
- 210499 – ESC – Erosion and Sediment Control Plan

LEGEND

68.75 / 68.63 / 68.75 — EXISTING ELEVATION	EXISTING SIGNAGE
PROPOSED/EXISTING ELEVATIONS	UP — EXISTING UTILITY POLE
PROPOSED CURB ELEVATION	EXISTING HYDRO GUY WIRE ANCHOR
0.0% / 0.0% — DRAINAGE SLOPE	FH — EXISTING FIRE HYDRANT
EXISTING DRAINAGE	EXISTING WATER VALVE
W — WATERMAIN	SAN MH — EXISTING STORM MANHOLE
STM — STORM SEWER	STM MH — EXISTING SANITARY MANHOLE
SAN — SANITARY SEWER	EXISTING CURB INLET CATCH BASIN
PROPERTY LINE	EXISTING CATCH BASIN
SILT FENCE	CB — PROPOSED CATCH BASIN
OHW — OVERHEAD WIRE	TEMPORARY BENCHMARK
OVERLAND FLOW ROUTE	ITEM TO BE REMOVED

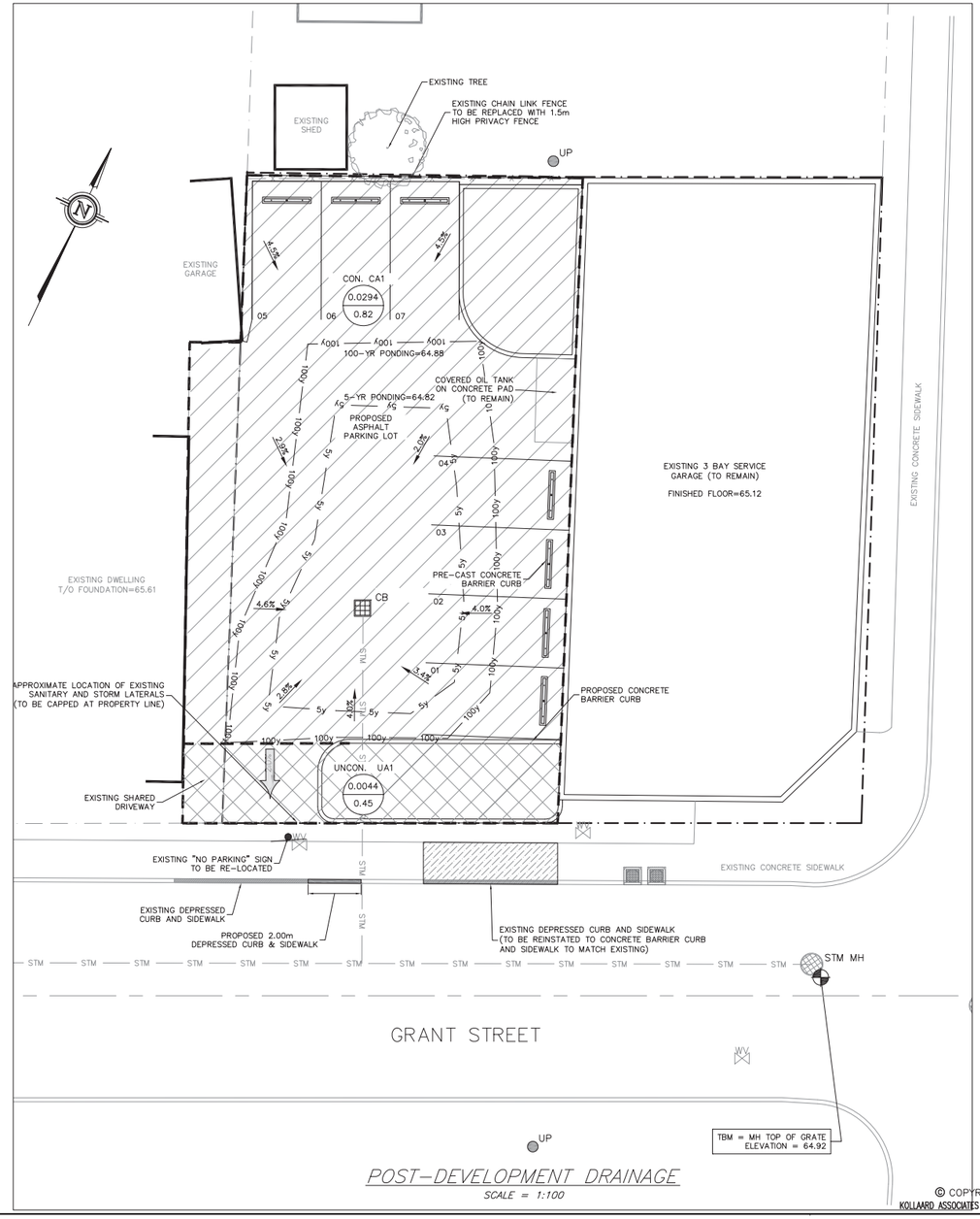
LEGEND (STORM WATER MANAGEMENT)

CONTROLLED	CATCHMENT LABEL
0.0358	CATCHMENT AREA (HECTARES)
0.85	RUNOFF COEFFICENT
	CATCHMENT AREA BOUNDARY
	PROPERTY LINE
	PRE-DEVELOPMENT DRAINAGE PATTERN
	CONTROLLED AREA
	UNCONTROLLED AREA



PRE-DEVELOPMENT DRAINAGE

SCALE = 1:100



POST-DEVELOPMENT DRAINAGE

SCALE = 1:100

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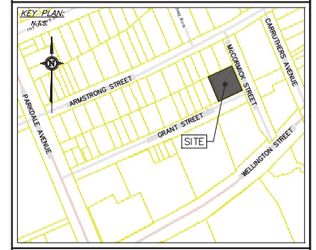
DRAWING NUMBER: 210499-SWM

KEY PLAN:



SCALE: 0 1 2 3 4 5 10 METRES 1:100

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES; ALL ELEVATIONS ARE IN METRES AND ARE GEODETIC.
2. TBM = TOP OF GRATE (T/G) OF STORM MANHOLE. ELEVATION = 64.92.
3. THIS IS NOT A LEGAL SURVEY. BOUNDARY INFORMATION WAS DERIVED FROM FAIRHALL MOFFATT & WOODLAND REF NO. 7-109.
4. CONTRACTOR IS RESPONSIBLE FOR LOCATION AND PROTECTION OF UTILITIES.
5. ALL DIMENSIONS TO BE VERIFIED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION.
6. ANY CHANGES MADE TO THIS PLAN MUST BE VERIFIED AND APPROVED BY KOLLAARD ASSOCIATES INC.
7. CLIENT IS RESPONSIBLE FOR ACQUIRING ALL NECESSARY PERMITS. THIS DRAWING IS NOT FOR CONSTRUCTION UNTIL A BUILDING PERMIT HAS BEEN GRANTED.
8. THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA, APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL SUCH AS, AND NOT LIMITED TO INSTALLING FILTER CLOTHS ACROSS MANHOLE/CATCHBASIN LIDS TO PREVENT SEDIMENTS FROM ENTERING STRUCTURES AND INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.
9. ALL MATERIALS AND CONSTRUCTION TO BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS; SEWER AND WATERMAIN MATERIAL TYPES; DISINFECTION, PROVIDE MINIMUM 2.4 METRES OF COVER FOR WATER SERVICES, CATHODIC PROTECTION, CITY OF OTTAWA INSULATION SPECIFICATIONS FOR WATERMAIN, PIPE BEDDING, REINSTATEMENT OF DISTURBED AREAS AND LEAKAGE TESTING.
10. REFERENCE TO KOLLAARD FILE NO. 210499 FOR STORM WATER MANAGEMENT DESIGN.

No.	REVISION	DATE	BY
0	ISSUED FOR SPC APPLICATION	MAY 31, 2021	ML
#	REVISION ITEM / DESCRIPTION	REV. DATE	INT.

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(613) 860-0923
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P.O. BOX 189, 210 PRESCOTT ST.
KEMPTVILLE, ONTARIO
K0G 1J0 FAX (613) 258-0475
http://www.kollaard.ca

CLIENT: GRANT STREET GARAGE (GEOFF WATSON)

PROJECT: PROPOSED PARKING LOT

LOCATION: 1-3 GRANT STREET, CITY OF OTTAWA, ON

LICENSED PROFESSIONAL ENGINEER — MAY 31, 2021 — S.E. deWit — 100079612 — PROVINCE OF ONTARIO

DESIGNED BY:	CHECKED BY:
SD	SD
DRAWN BY:	APPROVED BY:
ML	SD

DATE: MAY 15, 2021

KOLLAARD FILE NUMBER: 210499

DRAWING NUMBER: 210499-SWM

DRAWING NAME: STORMWATER MANAGEMENT PLAN

ARCH D

LEGEND

68.75 / 68.75 / 68.75 — EXISTING ELEVATION	EXISTING SIGNAGE
PROPOSED/EXISTING ELEVATIONS	EXISTING UTILITY POLE
PROPOSED CURB ELEVATION	EXISTING HYDRO GUY WIRE ANCHOR
0.0% — DRAINAGE SLOPE	EXISTING FIRE HYDRANT
0.0% — EXISTING DRAINAGE	EXISTING WATER VALVE
W — WATERMAIN	EXISTING STORM MANHOLE
STM — STORM SEWER	EXISTING SANITARY MANHOLE
SAN — SANITARY SEWER	EXISTING CURB INLET CATCH BASIN
PROPERTY LINE	EXISTING CATCH BASIN
SILT FENCE	PROPOSED CATCH BASIN
OHW — OVERHEAD WIRE	TEMPORARY BENCHMARK
OVERLAND FLOW ROUTE	ITEM TO BE REMOVED

SEWER NOTES:

1. SUPPLY AND CONSTRUCT ALL SEWERS AND APPURTENANCES IN ACCORDANCE WITH THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS AND ONTARIO PROVINCIAL STANDARDS FOR ROADS AND PUBLIC WORKS.

2. SPECIFICATIONS:

ITEM	SPEC. No.	CITY STD DWG No.
CATCH BASIN (600mm x 600mm)	OPSD 705.010	S2
SEWER SERVICE CONNECTION		S11 & S11.1
SANITARY BENCHING	OPSD 701.021	
CATCH BASIN & MANHOLE ADJUSTMENTS	OPSD 704.010	
CATCH BASIN FRAME & COVER	OPSD 400.020	S19, S22 & S23
SEWER TRENCH		S6 & S7

   SEWER TRENCH:
   SITE SERVICES EXCAVATION, BEDDING & BACKFILL AS PER THE RECOMMENDATIONS OF THE GEOTECHNICAL INVESTIGATION REPORT.

3. INSULATE ALL STORM PIPES THAT HAVE LESS THAN 2.0m COVER AND ALL SANITARY PIPES THAT HAVE LESS THAN 2.1m COVER WITH THERMAL INSULATION. PROVIDE 150mm CLEARANCE BETWEEN PIPE AND INSULATION.

4. PIPE BEDDING, COVER AND BACKFILL ARE TO BE COMPACTED TO AT LEAST 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY.

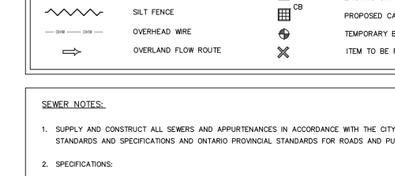
5. FLEXIBLE CONNECTIONS ARE REQUIRED FOR CONNECTION PIPES TO MANHOLES (FOR EXAMPLE KOR-N-SEAL, PSX: POSITIVE SEAL AND DURASEAL). SANITARY RUBBER GASKET TYPE JOINTS SHALL CONFORM TO CSA (B-182.2,3,4).

6. THE OWNER SHALL REQUIRE THAT THE SITE SERVICING CONTRACTOR PERFORM FIELD TESTS FOR QUALITY CONTROL OF ALL SANITARY SEWERS. LEAKAGE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 410.07.16, 410.07.16.04 AND 407.07.24. DYE TESTING IS TO BE COMPLETED ON ALL SANITARY SERVICES TO CONFIRM PROPER CONNECTION TO THE SANITARY SEWER MAIN. THE FIELD TESTS SHALL BE PERFORMED IN THE PRESENCE OF A CERTIFIED PROFESSIONAL ENGINEER WHO SHALL SUBMIT A CERTIFIED COPY OF THE TEST RESULTS.

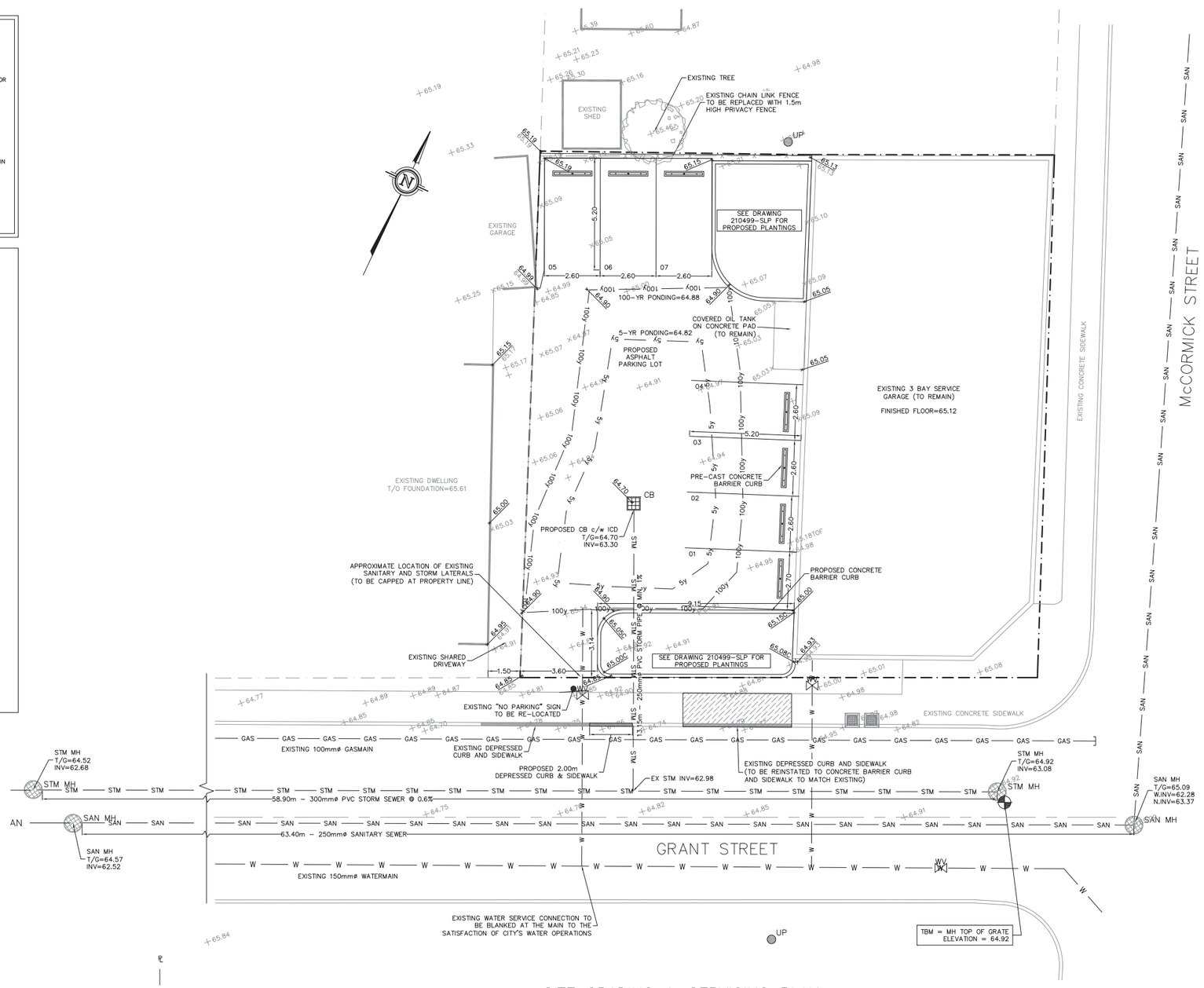
7. BUILDING CONTRACTOR TO PROVIDE TEMPORARY ADDITIONAL GRANULAR BACKFILL ABOVE SHALLOW CULVERTS AND STORM SEWERS TO SUPPORT HEAVY CONSTRUCTION EQUIPMENT.

8. CONTRACTOR TO TELEVISE (CCTV) ALL PROPOSED SEWERS, 200mmø OR GREATER PRIOR TO BASE COURSE ASPHALT. UPON COMPLETION OF CONTRACT, THE CONTRACTOR IS RESPONSIBLE TO FLUSH AND CLEAN ALL SEWERS & APPURTENANCES TO MUNICIPAL SATISFACTION.

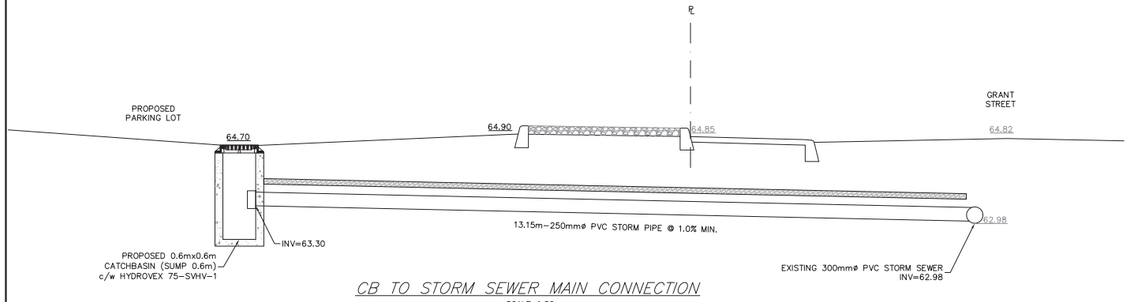
9. WHERE THE SANITARY SEWER CROSSES ABOVE THE WATERMAIN, THE CONTRACTOR IS TO PROVIDE A MINIMUM OF 0.50m VERTICAL SEPARATION, ADEQUATE STRUCTURAL SUPPORT OF THE SEWER TO PREVENT SETTLING AND EXCESSIVE JOINT DEFLECTION AND ENSURE THAT THE LENGTH OF THE WATER PIPE BE CENTERED AT THE POINT OF CROSSING SO THAT THE JOINTS ARE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.



THERMAL INSULATION
NOT TO SCALE



SITE GRADING & SERVICING PLAN
SCALE = 1:100



CB TO STORM SEWER MAIN CONNECTION
SCALE 1:50

INLET CONTROL DEVICE TABLE	
STRUCTURE	CB
MODEL	HYDROVEX 75-SVHV-1
PIPE OUTLET	250 mm PVC SDR 35
DISCHARGE	3.6 L/s
UPSTREAM HEAD	1.6m
ICD INVERT ELEVATION	63.30m
STRUCTURE SIZE	0.6m x 0.6m
MINIMUM CLEARANCE	0.6m

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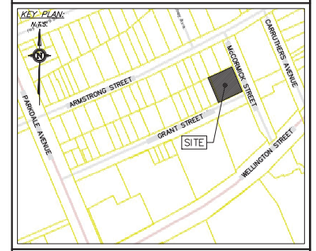
KOLLAARD ASSOCIATES INCORPORATED

DRAWING NUMBER: 210499-GSP

KEY PLAN:



SCALE: 0 1 2 3 4 5 10
1:100 METRES

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6. ANY CHANGES MADE TO THIS PLAN MUST BE VERIFIED AND APPROVED BY KOLLAARD ASSOCIATES INC.
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10. REFERENCE TO KOLLAARD FILE NO. 210499 FOR STORM WATER MANAGEMENT DESIGN.

No.	REVISION	DATE	BY
0	ISSUED FOR SPC APPLICATION	MAY 31, 2021	ML
#	REVISION ITEM / DESCRIPTION	REV. DATE	INT.

Kollaard Associates
Engineers
(613) 860-0923
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P.O. BOX 189, 210 PRESCOTT ST.
KEMPTVILLE, ONTARIO
K0G 1J0 FAX (613) 258-0475
http://www.kollaard.ca

CLIENT:
GRANT STREET GARAGE
(GEOFF WATSON)

PROJECT:
PROPOSED PARKING LOT

LOCATION:
1-3 GRANT STREET,
CITY OF OTTAWA, ON

LICENSED PROFESSIONAL ENGINEER — MAY 31, 2021 — S. E. deWit — 100079612 — PROVINCE OF ONTARIO

DESIGNED BY:	CHECKED BY:
ML	SD
DRAWN BY:	APPROVED BY:
ML	SD

DATE: MAY 15, 2021
KOLLAARD FILE NUMBER: 210499

DRAWING NUMBER: 210499-GSP
DRAWING NAME: SITE GRADING & SERVICING PLAN

ARCH D

LEGEND

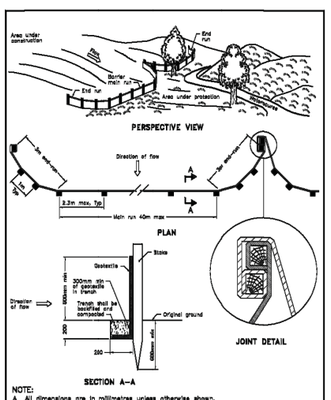
68.75 / 68.45 / 68.75	EXISTING ELEVATION		EXISTING SIGNAGE
	PROPOSED/EXISTING ELEVATIONS	UP	EXISTING UTILITY POLE
	PROPOSED CURB ELEVATION		EXISTING HYDRO GUY WIRE ANCHOR
0.0%	DRAINAGE SLOPE	FH	EXISTING FIRE HYDRANT
0.0%	EXISTING DRAINAGE	WV	EXISTING WATER VALVE
W	WATERMAIN	SAN MH	EXISTING STORM MANHOLE
STM STM	STORM SEWER	STM MH	EXISTING SANITARY MANHOLE
SAN SAN	SANITARY SEWER		EXISTING CURB INLET CATCH BASIN
	PROPERTY LINE		EXISTING CATCH BASIN
	SILT FENCE	CB	PROPOSED CATCH BASIN
OHW OHW	OVERHEAD WIRE		TEMPORARY BENCHMARK
	OVERLAND FLOW ROUTE		ITEM TO BE REMOVED

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. THE OWNER (AND/OR CONTRACTOR) AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN AT LEAST EQUAL TO THE STATED MINIMUM REQUIREMENTS AND TO THE SATISFACTION OF THE TOWNSHIP OF NORTH DUNDAS, APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL.
3. THE CONTRACTOR IS TO ENSURE THAT THE SITE ACCESS POINTS AND ADJACENT STREETS TO THE ACCESS POINTS ARE MAINTAINED AND KEPT CLEAN OF CONSTRUCTION MATERIALS SUCH AS, BUT NOT LIMITED TO MUD, DIRT, CLAY AND GRANULARS ON A DAILY BASIS OR AS NECESSARY, TO THE SATISFACTION OF THE TOWNSHIP OF NORTH DUNDAS.
4. EVERY EFFORT WILL BE MADE TO ENSURE THAT ALL DISTURBED AREAS ARE TOPSOILED AND SEEDED AS SOON AS REASONABLY POSSIBLE.
5. THE SEDIMENT AND EROSION CONTROL PLAN IS A LIVING DOCUMENT WHICH MAY BE AMENDED BY ONSITE REQUIREMENTS AT THE APPROVAL OF THE TOWNSHIP AND THE CONSERVATION AUTHORITY.

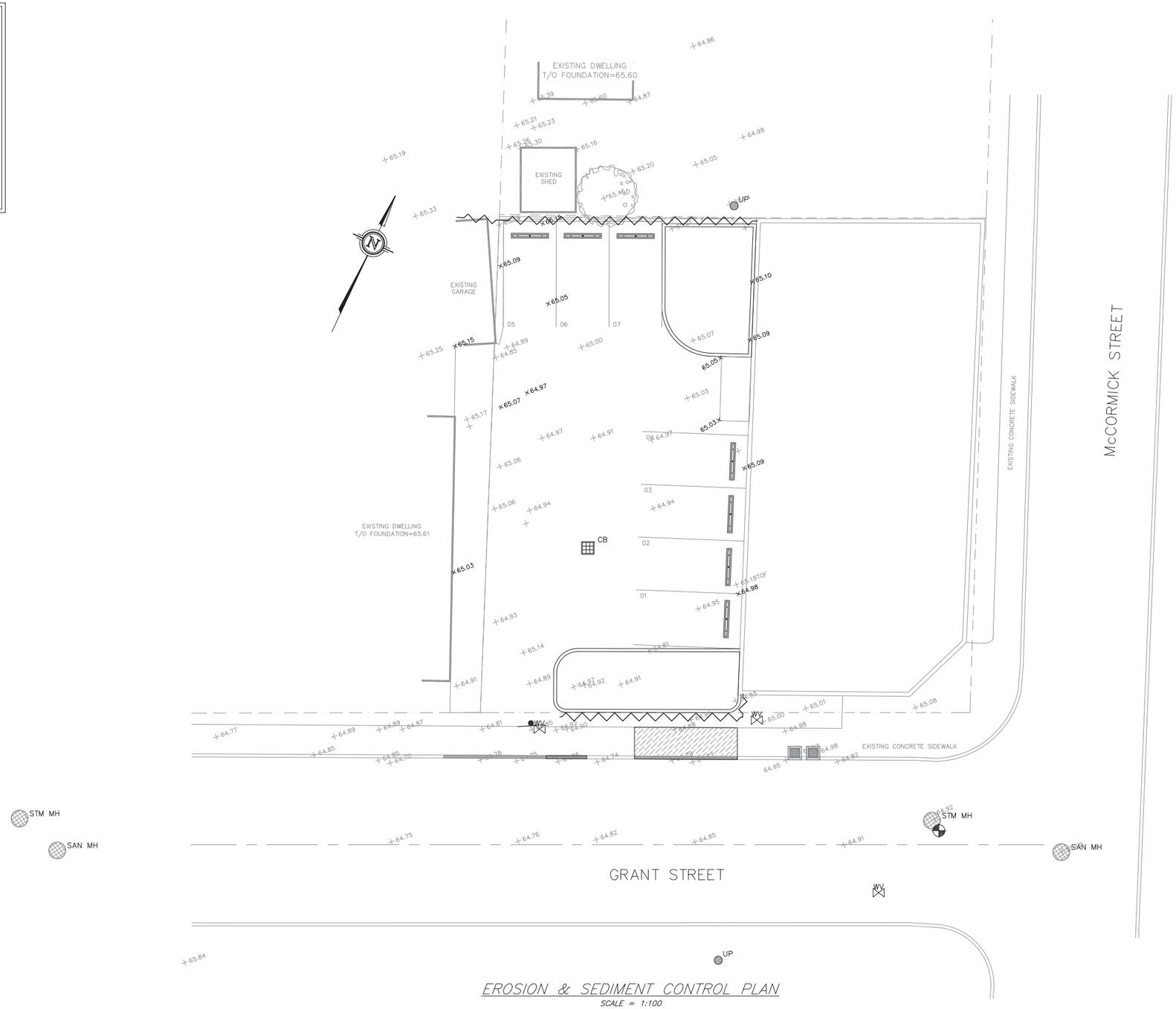
MINIMUM EROSION AND SEDIMENT CONTROL PLAN REQUIREMENTS:

- TIME THE DEMOLITION AND EXCAVATION ACTIVITIES SO THAT THEY OCCUR NO SOONER THAN IS NECESSARY FOR SUBSEQUENT CONSTRUCTION ACTIVITIES.
- LANDSCAPE THE SITE AS SOON AS PRACTICALLY POSSIBLE.
- USE SILT FENCES AROUND ANY STOCKPILES OF SOIL.
- PRIOR TO CONSTRUCTION, SILT FENCE BARRIERS (OPSD 219.110) WILL BE PLACED ALONG THE PROPERTY LINES AS ON THE DRAWING.
- THE SILT FENCE SHOULD BE REMOVED ONLY WHEN THE SITE IS STABILIZED.
- INSTALL FILTER SOCK ACROSS ALL EXISTING AND PROPOSED CATCH BASINS AND CATCH BASIN MANHOLES PRIOR TO CONSTRUCTION.



ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2015 | Rev 2

LIGHT-DUTY SILT FENCE BARRIER | OPSD 219.110



EROSION & SEDIMENT CONTROL PLAN

SCALE = 1:100

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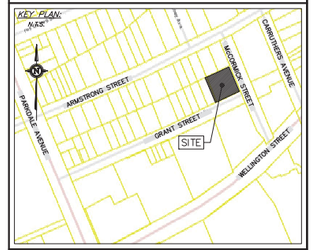
KOLLAARD ASSOCIATES INCORPORATED

DRAWING NUMBER: 210499-ESC

KEY PLAN:



SCALE: 0 1 2 3 4 5 10 METRES 1:100

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES; ALL ELEVATIONS ARE IN METRES AND ARE GEODETIC.
2. TBM = TOP OF GRATE (T/G) OF STORM MANHOLE. ELEVATION = 64.92.
3. THIS IS NOT A LEGAL SURVEY. BOUNDARY INFORMATION WAS DERIVED FROM FAIRHALL MOFFATT & WOODLAND REF NO. 7-109.
4. CONTRACTOR IS RESPONSIBLE FOR LOCATION AND PROTECTION OF UTILITIES.
5. ALL DIMENSIONS TO BE VERIFIED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION.
6. ANY CHANGES MADE TO THIS PLAN MUST BE VERIFIED AND APPROVED BY KOLLAARD ASSOCIATES INC.
7. CLIENT IS RESPONSIBLE FOR ACQUIRING ALL NECESSARY PERMITS. THIS DRAWING IS NOT FOR CONSTRUCTION UNTIL A BUILDING PERMIT HAS BEEN GRANTED.
8. THE OWNER AGREES TO PREPARE AND IMPLEMENT AN EROSION AND SEDIMENT CONTROL PLAN TO THE SATISFACTION OF THE CITY OF OTTAWA, APPROPRIATE TO THE SITE CONDITIONS, PRIOR TO UNDERTAKING ANY SITE ALTERATIONS (FILLING, GRADING, REMOVAL OF VEGETATION, ETC.) AND DURING ALL PHASES OF SITE PREPARATION AND CONSTRUCTION IN ACCORDANCE WITH THE CURRENT BEST MANAGEMENT PRACTICES FOR EROSION AND SEDIMENT CONTROL SUCH AS, AND NOT LIMITED TO INSTALLING FILTER CLOTHS ACROSS MANHOLE/CATCHBASIN LIDS TO PREVENT SEDIMENTS FROM ENTERING STRUCTURES AND INSTALL AND MAINTAIN A LIGHT DUTY SILT FENCE BARRIER AS REQUIRED.
9. ALL MATERIALS AND CONSTRUCTION TO BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS; SEWER AND WATERMAIN MATERIAL TYPES; DISINFECTION, PROVIDE MINIMUM 2.4 METRES OF COVER FOR WATER SERVICES, CATHODIC PROTECTION, CITY OF OTTAWA INSULATION SPECIFICATIONS FOR WATERMAIN, PIPE BEDDING, REINSTATEMENT OF DISTURBED AREAS AND LEAKAGE TESTING.
10. REFERENCE TO KOLLAARD FILE NO. 210499 FOR STORM WATER MANAGEMENT DESIGN.

No.	REVISION	DATE	BY
0	ISSUED FOR SPC APPLICATION	MAY 31, 2021	ML
#	REVISION ITEM / DESCRIPTION	REV. DATE	INT.

Kollaard Associates
Engineers
(613) 860-0923
info@kollaard.ca
P.O. BOX 189, 210 PRESCOTT ST.
KEMPTVILLE, ONTARIO
K0G 1J0 FAX (613) 258-0475
http://www.kollaard.ca

CLIENT: GRANT STREET GARAGE (GEOFF WATSON)

PROJECT: PROPOSED PARKING LOT

LOCATION: 1-3 GRANT STREET, CITY OF OTTAWA, ON

LICENSED PROFESSIONAL ENGINEER — MAY 31, 2021 — S.E. deWit — 100079612 — PROVINCE OF ONTARIO

DESIGNED BY:	CHECKED BY:
ML	SD
DRAWN BY:	APPROVED BY:
ML	SD

DATE: MAY 15, 2021

KOLLAARD FILE NUMBER: 210499

DRAWING NUMBER: 210499-ESC

DRAWING NAME: EROSION & SEDIMENT CONTROL PLAN

ARCH D

Appendix D: Correspondence

File No. D07-05-20-0001

June 24, 2020

Patrick Kennedy
8 Pretty Street
Ottawa, ON
K2S 1N3

Via email

Dear: Mr. Kennedy,

Subject: Demolition Control Application- 1-3 Grant Street

A review of the submission concerning the above noted demolition control application has been undertaken by internal and external contacts. Please find below the comments on your application.

Planning

1. It is recommended that some additional plants or trees be added at the rear of the subject site (near the three existing parking spaces), if possible.
2. Please provide a Landscape Plan, showing any existing vegetation on site (and anything being retained/removed) as well as proposed vegetation. Please include a list of proposed species on the Landscape Plan.
3. Please confirm the size of the dwelling, in square feet or square metres.

Forestry

4. Please confirm if there are currently trees on site, and if so, the size of the tree. If there is a tree on site greater than 50cm in diameter, and the tree is to be removed, a Distinctive Tree Permit will be required.

Engineering

5. The demolition/site plan should depict the location of the existing dwelling (and any accessory structures) to be demolished and the location of the municipal services to be abandoned. The water services must include a note stating the services will be blanked at the watermain. The locations of the existing sanitary and storm laterals (if applicable) must be shown and include a note stating the services will be capped at the property line. Existing location of laterals can be confirmed via lateral locates. The limits of asphalt reinstatement are also required.
6. The proposed curb depression is extended further beyond the entrance than can be practically used. Please decrease the extent of the curb/sidewalk depression to the limits of what will be usable considering the extent of the proposed landscaping.

7. In order to proceed with the proposed catchbasin (CB), the following will be required for review. Note that the requirements listed below are not comprehensive and revisions of the submitted material may be requested after initial review.

i) Grading Plan

A grading plan is required to depict the proposed changes to lot surface grading resulting from the demolition of the existing building and conversion to parking lot and landscape area. The grading plan must show existing and proposed grades, all landscape areas and existing/proposed trees (including trees shared with neighbouring properties) and must clearly demonstrate that existing drainage patterns are not altered and excess drainage is not directed towards neighboring properties. The plan must also show how the site will be graded to direct surface water towards the proposed catchbasin. Limits of proposed curb and sidewalk changes must be included on this plan, referenced to the applicable City Standard Drawing. The plan must be prepared and stamped by a relevant professional (Professional Engineer, Certified Engineering Technologist, Ontario Land Surveyor).

ii) Servicing Plan

A servicing plan is required to demonstrate any proposed servicing changes for the proposed development. This includes details of the proposed catchbasin system. This also includes the location of existing service laterals to be blanked/capped. Note that it is not advisable to place trees directly atop infrastructure in the event future maintenance of the lateral must be performed and due to root infiltration. Please amend either the location of the tree or proposed storm lateral. The required area of asphalt overlay is also required on the plan. The plan must be prepared and stamped by a relevant professional (Professional Engineer, Certified Engineering Technologist, Ontario Land Surveyor).

iii) Stormwater Management Brief

Must be prepared and stamped by a Professional Engineer. Detail existing stormwater surface drainage on site and how this will change post-development.

Demonstrate that post-development runoff after parking lot development is less than or equal to pre-development runoff. If required to meet stormwater management criteria, ICD may be required in the proposed catchbasin.

Stormwater Criteria:

a. Control to 5-year storm event
b. Coefficient (C) of runoff will need to be determined **as per existing conditions** but in no case more than 0.5
c. TC = 20 minutes or can be calculated (TC should be not be less than 10 minutes, since IDF curves become unrealistic at less than 10 min.
d. Any storm events greater than 5 year, up to 100 year, and including 100 year storm event must be detained on site).

Include details of proposed stormwater infrastructure (ie, size of lateral lead and connection location to City system). Show any proposed surface

ponding and refer to City of Ottawa Sewer Design Guidelines for surface ponding restrictions.

Note that if the proposed CB will capture stormwater runoff from multiple properties, an Environmental Compliance Approval from the Ministry of Environment, Conservation, and Parks will be required. Details of this procedure will be given if this situation arises.

Relevant Guidelines & Standards:

Servicing & site works shall be in accordance with the following documents:

- Ottawa Sewer Design Guidelines (2012)
- Ottawa Design Guidelines – Water Distribution (2010)
- Ottawa Standard Tender Documents (2015)
- Ontario Provincial Standards for Roads & Public Works (2015)
- Site Alteration Bylaw (2018-164)
- Record drawings and utility plans can be purchased from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).

Please provide a resubmission which addresses each of the comments or issues listed above. Please include 2 copies of revised drawings and 2 copies of revised reports. A cover letter must also be included that states how each provided comment was addressed in the resubmission. Please co-ordinate the numbering of each resubmission comment, or issue, with the above noted comment number. All addenda or revisions to any studies, or plans, must be accompanied by a *.pdf copy (either by CD or e-mail).

If you have any questions, please let me know or if you would like to meet to discuss the comments, please do not hesitate to contact me.

Regards,

Seana Turkington
Planner
Development Review
Urbaniste
Examen des demandes d'aménagement
City of Ottawa | Ville d'Ottawa
☎ 613.580.2424 ext/poste. 27790
ottawa.ca/planning / ottawa.ca/urbanisme

cc. Jessica Valic, Infrastructure Project Manager
Mark Richardson, Forester

Appendix E: Additional Material

Aerial Photograph Obtained from geoOttawa showing pre-development condition of site for documentation purposes to aid in the understanding of the context of the site prior to development.