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Project No. 2141686A

Stormwater Management Report

Riverside South Elementary School

925 Ralph Hennessy Avenue, Ottawa, Ontario

Prepared for

City of Ottawa
Infrastructure Services and Community Sustainability
110 Laurier Ave. West, 4th floor, Mail Code 01-14
Ottawa, Ontario, K1P 1J1

September 20, 2018

Table of Contents

1 Introduction

Jp2g Consultants Inc. was retained by Pye & Richards Architects Inc. to complete a Stormwater Management Report suitable for City of Ottawa Site Plan Control Application, for the Conseil des écoles catholiques du Centre-Est proposed Riverside South Elementary School construction project located at 925 Ralph Hennessy Avenue, in the southeast end of the City of Ottawa. The total site area is approximately 2.003 ha and the proposed site development area includes the construction of a 4257 m^2 two-storey, slab on grade building with no basement, and associated parking areas and landscaped areas. A Pre-Consultation meeting was held with City of Ottawa staff, on May 18, 2018, to determine the project constraints and requirements. The following report details the stormwater management calculations used for water quantity and quality control in accordance with the City of Ottawa's requirements.

Reference Drawings: Figure 1 – Stormwater Management Sub-Drainage Areas (June 29, 2018), C1 - Site Servicing Plan (June 29, 2018), and C2 - Site Grading and Drainage, Erosion and Sediment Control Plan (June 29, 2018).

2 Objective

The objective of the stormwater management plan is to control post-development peak flows to pre-determined levels, and detain onsite, stormwater up to and including the 100-year storm event with a 20% increase of rainfall intensity (hereby referred to as 100-year* storm event) without affecting adjacent lands, and to provide clean runoff to minimize pollution of the downstream receiving watercourse.

3 Design Parameters

Stormwater management criteria for this site, in terms of quantity control, is based on the approved Riverside South Development Corporation Phase 13 Site Servicing and Stormwater Management Report (June 30, 2017) provided by Stantec Consulting Ltd; see **Appendix A**. The maximum allowable release rate for this site shall not exceed the criteria set for the approved subdivision servicing report. Flows in excess of the allowable release rate up to and including the 100-year* event will be detained onsite.

The Modified Rational Method (Q = 2.78CiA) was chosen to calculate the post-development release rates, and onsite storage requirements for this development. Detailed stormwater management calculations are included in **Appendix B**. All proposed storm sewers were assigned a Manning's coefficient of roughness of 0.013 corresponding to smooth wall pipes. In accordance with City of Ottawa Sewer Design Guidelines (Section 5.4.5.2.1), the coefficients used for calculating the post-development release rate were C = 0.20 for grassed areas and C = 0.90 for hard surfaced areas including rooftops. In addition, 25% was added to the C value for the 100-year storm calculations. The rainfall intensities used in this analysis are based on the IDF curves and equations, as per City of Ottawa Sewer Design Guidelines (Section 5.4.2).

4 Water Quantity Controls

4.1 Pre-development Conditions

The existing site is an undeveloped parcel sloping inward on all sides with a ditch inlet on the north east section. The site has an approximate elevation difference of 1 m over a 90 m length. Currently, there are existing residential properties along the north west corner across from the school property. There are more residential properties under construction along Ralph Hennessy Avenue and Mount Nebo Way across from the school property, and along Memorial Grove and Octave Grove adjacent to the school property.

4.2 Allowable release rate

The stormwater management design criteria for this site is based on the approved subdivision storm drainage plan as noted above. According to section 3.4 of the Riverside South Development Corporation Phase 13 Site Servicing and Stormwater Management Report, the school site has an allowable release rate of **$Q_{allowable}$ = 195 l/s**, see attached **Appendix A**.

4.3 Post-development Conditions

The proposed site development includes a new school building, asphalt parking, hard surface walkways and play areas, landscaped areas, a sports field, an area for portables and a future expansion of the building. Proposed site grading and drainage was designed such that stormwater runoff will be collected by a new storm water collection system which will be connected to the existing 600 mm diameter municipal storm sewer stub on Mount Nebo Way.

The site development area is approximately **2.003 ha** and has a post-development average weighted runoff coefficient of **C=0.50**, and **C=0.57** for the 5-year and 100-year events, respectively, see calculations in section B.1.2 of **Appendix B**. Stormwater management techniques are required to reduce peak flows from the area, given that post-development peak flows will exceed the 5-year allowable release rate of **171.9 L/s**. Overall onsite storage requirements were calculated to be **63m^3** and **318m^3** for the 5-year and 100-year* events, respectively, see calculations in section B.1.3 of **Appendix B**.

4.4 Pipe Design

Pipe diameter sizing was based on the **5-year** storm event, in accordance with City requirements. Under 5-year conditions, the storm sewers are not in surcharged conditions (i.e. flow/capacity <100%).

4.5 Onsite stormwater detention

Post-development peak flows will be controlled in the proposed parking area and in the school yard by installing a flow restrictor, (Tempest MHF, or equivalent approved product), at the outlet of storm structure MHST-3, limiting the outlet discharge for all structures to **151.1 l/s**.

At MHST-3, the restricted flow of **151.1 l/s**, will create a combined parking area, and school yard ponding volume of **53 m^3** and **277 m^3** for the 5-year and 100-year* events, respectively. Based on a ponding depth of 320 mm at CB-1, CB-2, CB-3, and CBMH-1, the combined ponding area measures approximately 2768 m^2, the available storage is approximately **295 m^3**, which is sufficient to accommodate the 100-year* event.

Flow will also be detained on the school roof by installing parabolic weirs, (Watts Drainage Adjustable Flow Control for Roof Drains, or equivalent approved product), at the 11 proposed roof drains limiting the total flow from the roof to **20.8 L/s**. Each flow control roof drains, complete with a single slot parabolic weir, will restrict flow at 5 GPM (0.32 L/s) per inch (25.4mm) of head to a maximum of 30 GPM (1.89 L/s). The restricted flow will outlet to the school's 250mm diameter storm sewer service and will create rooftop storage of **34 m^3** and **118 m^3** for the 5-year and 100-year* event, respectively. Based on an approximate ponding depth of 130mm on the roof, the total available storage is approximately **121 m^3**, which is sufficient to accommodate the 100-year* event.

Watts roof drain data sheets are included in **Appendix C**, however approved equivalent performing products can also be used.

The ponding limits for the 5-year and the 100-year* event are indicated on **Figure 1**. The ponding elevation for the 100-year* event was calculated for the ponding areas to be 320mm which does not exceed the 350mm maximum allowable ponding depth as per City of Ottawa requirements. In the event the capacity of this system is exceeded, emergency runoff will overflow towards Ralph Hennessy Avenue just west of the parking lot. The grade elevation at the overflow point is **0.48 m** below the school's finished floor elevation.

4.6 Proposed release rates

The proposed release rate for this site during the 100-year* event, including uncontrolled flows (**23.1 l/s**) and controlled flows (**20.8 l/s** + **151.1 l/s** = **171.9 l/s**), was calculated to be **195.0 l/**s (refer to Drainage Area Plan for controlled and uncontrolled areas). Therefore, proposed release rates are within the allowable release rate for this site, determined to be **195.0 l/s** in Section 4.2.

5 Water Quality Control

Based on correspondence with the Rideau Valley Conservation Authority (RVCA), attached in **Appendix E**, no additional stormwater quality control is required for this site.

We understand that the existing 2400 mm diameter for the storm sewer stub on Spratt Road ultimately drains to Riverside Pond 1 as referred to in **Appendix A**. The SWM Pond provides the water quality control for the proposed school development site.

6 Erosion and Sediment Control

In accordance with City of Ottawa requirements, best management practices are to be implemented by the Contractor to provide protection of the area drainage system and the receiving water course, during construction activities. This includes limiting the amount of exposed soil, using filter bag inserts under the grates of catch basins and manholes, installing silt fences and other effective sediment traps, and installing and maintaining mud mats for outgoing construction traffic during construction activities.

7 Conclusion

The proposed site development includes a new school building, a bus lay-by, a car lay-by, asphalt parking, hard surface walkways and play areas, landscaped areas, a sports field, an area for portables and a future expansion of the building. Roof drainage and surface runoff will be collected by a new storm sewer system which will be connected to the existing **600 mm** diameter municipal storm sewer stub located on Mount Nebo Way. Post-development peak flows will be detained on the roof, in the parking area, and in the school yard in order to limit the post-development release rate to allowable levels. There is sufficient onsite storage to accommodate the 100-year* event.

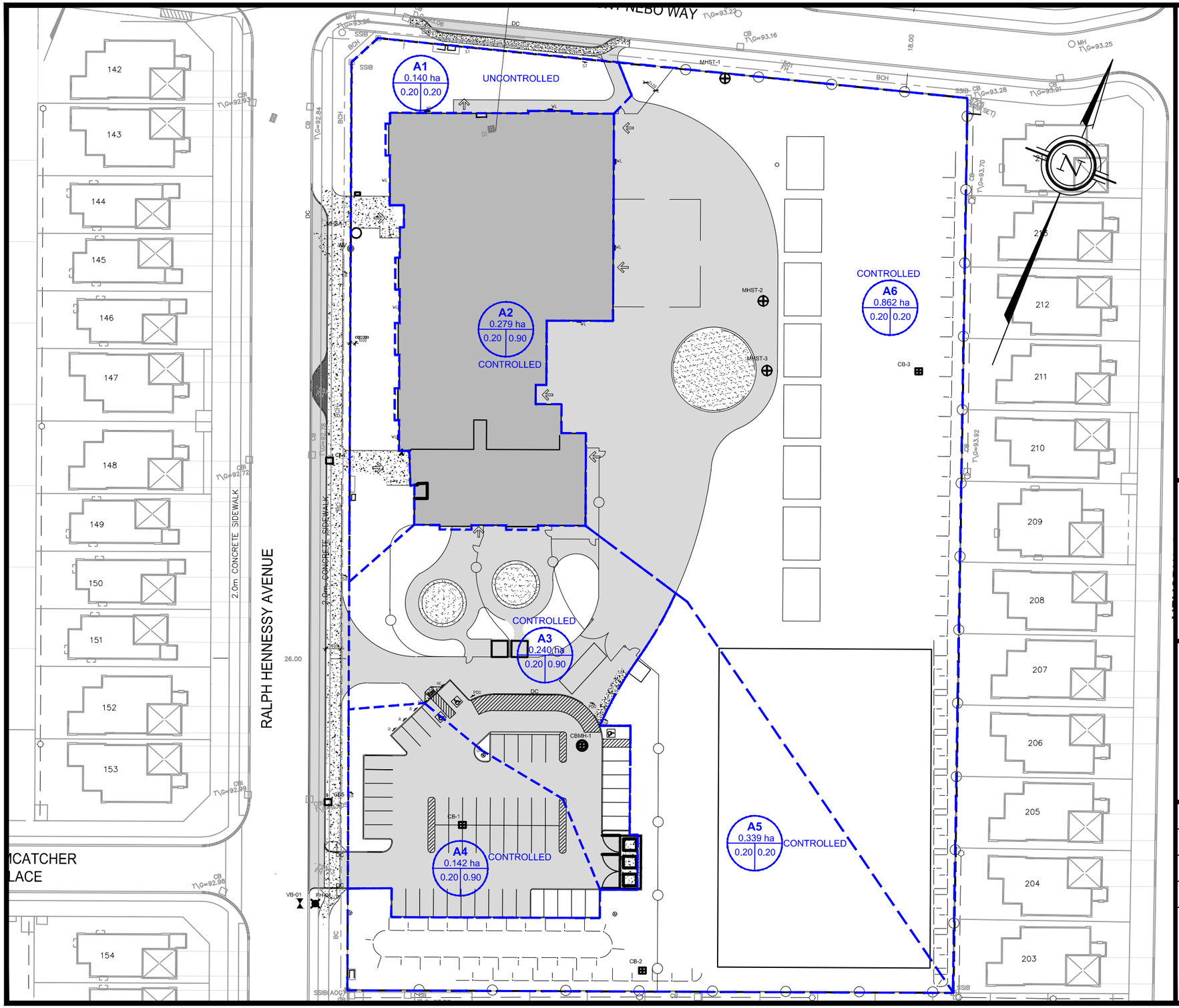
Summary of report

ID	Description	Value/result
01	Allowable release rate	$Q_{allowable}$ = 195.0 L/s
02	Proposed release rate	$Q_{5\text{-yr post}}$ = 171.9 L/s, $Q_{100\text{-yr post}}$ = 195.0 L/s
03	Post-development runoff coefficient	$C_{5\text{-yr post}}$ = 0.50, $C_{100\text{-yr post}}$ = 0.57
04	Post-development onsite storage requirement	Roof: 118m^3, Site: 277m^3
05	Proposed onsite storage provided	Roof: 121m^3, Site: 295m^3
06	Discharge outlet location	600mmϕ storm sewer stub (Mount Nebo Way)
07	Emergency runoff overflow location	At the parking lot entrance on Ralph Hennessy Avenue

END OF REPORT

Prepared by

Roxanne Tubb, P.Eng.
Project Manager – Civil Engineer



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À RIVERSIDE-SUD

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DRAINAGE AREAS

925 RALPH HENNESSY AVENUE, OTTAWA, ONTARIO

CONSEIL DES ÉCOLES CATHOLIQUES DU CENTRE-EST

Le meilleur conseil qu'on puisse vous donner

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DESIGNED: PH		PROJECT No.:	18-25
DRAFTED: PH		REVISION DATE:	2018-09-20
CHECKED: RT	APPROVED: RT	REVISION No.:	1
SCALE: 1:750			

SK-01

DWG NAME: J:\1-MULTIDISCIPLINE\2018\18-1015A - P&R- CECCE NEW RIVERSIDE SOUTH ELEMENTARY SCHOOL\05 DRAWINGS\1 ONGOING\2018_06_28 C1&C2 - SITE SERVICING, GRADING & DRAINAGE PLAN - RIVERSIDE SOUTH ELEMENTARY SCHOOL (SEPT 20, 18).DWG LAYOUT: FIG.1 - DRAINAGE AREAS SAVED ON Thursday, September 20, 2018

Appendix A - Riverside South Development Corporation Phase 13 Site Servicing and Stormwater Management Report

See Attachment

Appendix B - Stormwater Management Calculations

Riverside South Elementary School
925 Ralph Hennessy Avenue, Ottawa

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B.1.1 - Allowable release rate

ID	Description	Type	Areas (m^2) $C_{0.90}$	Areas (m^2) $C_{0.30}$	Total (m^2)	$C_{pre\text{-}5\text{-}yr}$	$C_{pre\text{-}100\text{-}yr}$*
A	Property Area	uncontrolled	0	20028	20028	0.30	0.38

**including 25% increase as per City of Ottawa Sewer Design Guidelines*

Using the data for the site from the Riverside South Development Corporation, Phases 13, Site Servicing and Stormwater Management Report by Stantec Consulting Ltd. (June 30, 2017), the maximum allowable release rate is:

$Q_{allowable\ (5\text{-}year)}$ = 195.0 l/s ①
Total Area, A = 2.003 ha

B.1.2 - Post-development release rate

ID	Description	Type	Areas (m^2) $C_{0.90}$	Areas (m^2) $C_{0.20}$	Total (m^2)	$C_{post\text{-}5\text{-}yr}$	$C_{post\text{-}100\text{-}yr}$*
A1	front and side entrance of building - north west	uncontrolled	155	1240	1395	0.28	0.33
A2	building roof	controlled	2795	0	2795	0.90	1.00
A3	parking lot - north	controlled	1780	610	2390	0.72	0.81
A4	parking lot - south	controlled	1260	160	1420	0.82	0.92
A5	grassed area - south	controlled	0	3405	3405	0.20	0.25
A6	playground - east	controlled	2500	6120	8620	0.40	0.47
			8490	11535	20025	0.50	0.57

**including 25% increase as per City of Ottawa Sewer Design Guidelines*

Calculations for post-development runoff coefficient

$C_{post\text{-}5\text{-}yr\ (col.\ D)}$ =(column A * 0.9 + column B * 0.2) / column C
$C_{post\text{-}100\text{-}yr\ (col.\ E)}$ =(column A * 1.0 + column B * 0.2*1.25) / column C
note: 0.90 x 1.25 = 1.125, use max. 1.0

Calculations for average weighted runoff coefficient

$C_{post\text{-}5\text{-}yr}$ =((8555*0.9)+(11290*0.2))/19845 0.50
$C_{post\text{-}100\text{-}yr}$ =((8555*1.0)+(11290*0.2*1.25))/19845 0.57

Estimated time of concentration, t_c = 10.0 minutes ***As per City of Ottawa Sewer Design Guidelines (Section 5.4.5.2)
Based on Ottawa IDF curve, $i_{5\text{-}years}$ = $998.071/ (t_c+6.053)^{0.814}$
104.2 mm/hr
Based on Ottawa IDF curve, $i_{100\text{-}years}$ = $1735.688/ (t_c+6.014)^{0.820}$
178.6 mm/hr

B.1.2.1 - uncontrolled flow

Total uncontrolled area, A1 & A3 = 0.140 ha
5-year Runoff coefficient, C = 0.28
100-year Runoff coefficient, C = 0.33
Estimated time of concentration, t_c = 10.0 minutes

$Q_{uncontrolled\ 5\text{-}year}$ = 11.2 l/s ②
$Q_{net\text{-}allowable\ 5\text{-}year}$ = 183.8 l/s ③ = ①-②
$Q_{uncontrolled\ 100\text{-}year}$ = 23.1 l/s ④
$Q_{net\text{-}allowable\ 100\text{-}year}$ = 171.9 l/s ⑤ = ①-④

B.1.3 - Post-development onsite storage

B.1.3.1 - Overall onsite storage requirements

Total controlled area, A2 to A9	1.863	ha	
5-year Runoff coefficient, C	0.51		
100-year Runoff coefficient, C	0.59		
net-allowable 5-year release rate	171.9	l/s	⑤

Table 1.3.1a - 5-year onsite storage requirements

	Time (minutes)	$i_{5\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
peak Vstored --->	10	104.2	276.9	171.9	105.0	63.0
	15	83.6	222.1	171.9	50.2	45.1
	20	70.3	186.7	171.9	14.8	17.8
	25	60.9	161.9	171.9	-10.1	-15.1
	30	53.9	143.3	171.9	-28.6	-51.5
	35	48.5	129.0	171.9	-43.0	-90.2
	40	44.2	117.4	171.9	-54.5	-130.8
	45	40.6	108.0	171.9	-63.9	-172.6
	50	37.7	100.1	171.9	-71.8	-215.5
	55	35.1	93.4	171.9	-78.6	-259.3
	60	32.9	87.6	171.9	-84.4	-303.7

Therefore 63 m^3 of onsite storage required during 5-year event

Table 1.3.1b - 100-year onsite storage requirements

	Time (min)	$i_{100\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
	10	178.6	541.5	171.9	369.6	221.8
peak V_{stored} --->	15	142.9	433.3	171.9	261.4	235.3
	20	120.0	363.8	171.9	191.8	230.2
	25	103.8	314.9	171.9	143.0	214.5
	30	91.9	278.6	171.9	106.7	192.0
	35	82.6	250.4	171.9	78.5	164.9
	40	75.1	227.9	171.9	56.0	134.3
	45	69.1	209.4	171.9	37.5	101.2
	50	64.0	193.9	171.9	22.0	66.1
	55	59.6	180.8	171.9	8.9	29.4
	60	55.9	169.5	171.9	-2.4	-8.7

Therefore 235 m^3 of onsite storage required during 100-year event

Table 1.3.1c - 100-year (+ 20%) onsite storage requirements

	Time (min)	$i_{100\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
	10	214.3	649.8	171.9	477.9	286.7
	15	171.5	520.0	171.9	348.1	313.3
peak V_{stored} --->	20	143.9	436.5	171.9	264.6	317.5
	25	124.6	377.9	171.9	206.0	309.0
	30	110.2	334.3	171.9	162.4	292.3
	35	99.1	300.5	171.9	128.6	270.1
	40	90.2	273.5	171.9	101.5	243.7
	45	82.9	251.3	171.9	79.4	214.3
	50	76.7	232.7	171.9	60.8	182.5
	55	71.5	217.0	171.9	45.1	148.7
	60	67.1	203.4	171.9	31.5	113.4

Therefore 318 m^3 of storage required during 100-year event + 20%

B.1.3.2 - Estimated detention created by installing roof weirs

Total roof area, A4	0.280	ha
5-year Runoff coefficient, C	0.90	
100-year Runoff coefficient, C	1.00	
Install weirs at each of the 11 roof drains	20.8	l/s

Watts Drainage Adjustable Flow Control for Roof Drains, or approved equivalent

Table 1.3.2a - 5-year estimated detention on new roof

	Time (minutes)	$i_{5\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
	10	104.2	72.9	20.8	52.1	31.2
	15	83.6	58.4	20.8	37.6	33.9
peak V_{stored} --->	20	70.3	49.1	20.8	28.3	34.0
	25	60.9	42.6	20.8	21.8	32.7
	30	53.9	37.7	20.8	16.9	30.4
	35	48.5	33.9	20.8	13.1	27.6
	40	44.2	30.9	20.8	10.1	24.2
	45	40.6	28.4	20.8	7.6	20.6
	50	37.7	26.3	20.8	5.5	16.6
	55	35.1	24.6	20.8	3.8	12.4
	60	32.9	23.0	20.8	2.2	8.1

Therefore 34 m^3 estimated roof detention

Table 1.3.2b - 100-year estimated detention on new roof

	Time (min)	$i_{100\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
	10	178.6	138.7	20.8	117.9	70.8
	15	142.9	111.0	20.8	90.2	81.2
	20	120.0	93.2	20.8	72.4	86.9
	25	103.8	80.7	20.8	59.9	89.8
	30	91.9	71.4	20.8	50.6	91.0
peak V_{stored} --->	35	82.6	64.2	20.8	43.4	91.1
	40	75.1	58.4	20.8	37.6	90.2
	45	69.1	53.7	20.8	32.9	88.7
	50	64.0	49.7	20.8	28.9	86.7
	55	59.6	46.3	20.8	25.5	84.2
	60	55.9	43.4	20.8	22.6	81.5

Therefore 91 m^3 estimated roof detention

Table 1.3.2b - 100-year (+ 20%) estimated detention on new roof

Time (min)	$i_{100\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
10	214.3	166.5	20.8	145.7	87.4

	15	171.5	133.2	20.8	112.4	101.2
	20	143.9	111.8	20.8	91.0	109.3
	25	124.6	96.8	20.8	76.0	114.0
	30	110.2	85.7	20.8	64.9	116.7
peak V_{stored} --->	35	99.1	77.0	20.8	56.2	118.0
	40	90.2	70.1	20.8	49.3	118.2
	45	82.9	64.4	20.8	43.6	117.7
	50	76.7	59.6	20.8	38.8	116.5
	55	71.5	55.6	20.8	34.8	114.8
	60	67.1	52.1	20.8	31.3	112.7

Therefore 118 m^3 estimated roof detention

B.1.3.3 - Estimated detention created by installing flow restrictor at MHST-3 outlet

Total design area, A3 to A8	1.863	ha	
5-year Runoff coefficient, C	0.44		
100-year Runoff coefficient, C	0.51		
Install flow control at MHST-3 outlet	151.1	l/s	*Hydrovex 150VHV-2, or approved equivalent, ~3.21m head*

Table 1.3.3a - 5-year estimated detention in parking area

	Time (minutes)	$i_{5\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
peak V_{stored} --->	10	104.2	240.1	151.1	89.0	53.4
	15	83.6	192.5	151.1	41.4	37.3
	20	70.3	161.9	151.1	10.8	12.9
	25	60.9	140.3	151.1	-10.8	-16.2
	30	53.9	124.3	151.1	-26.8	-48.3
	35	48.5	111.8	151.1	-39.3	-82.5
	40	44.2	101.8	151.1	-49.3	-118.3
	45	40.6	93.6	151.1	-57.5	-155.2
	50	37.7	86.8	151.1	-64.3	-193.0
	55	35.1	80.9	151.1	-70.2	-231.6
	60	32.9	75.9	151.1	-75.2	-270.7

Therefore 53 m^3 estimated yard detention

Table 1.3.3b - 100-year estimated detention in parking area

	Time (min)	$i_{100\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
	10	178.6	473.9	151.1	322.8	193.7
peak V_{stored} --->	15	142.9	379.2	151.1	228.1	205.3
	20	120.0	318.3	151.1	167.2	200.7
	25	103.8	275.6	151.1	124.5	186.7
	30	91.9	243.8	151.1	92.7	166.9
	35	82.6	219.1	151.1	68.0	142.9
	40	75.1	199.4	151.1	48.3	116.0
	45	69.1	183.2	151.1	32.1	86.8
	50	64.0	169.7	151.1	18.6	55.9
	55	59.6	158.2	151.1	7.1	23.5
	60	55.9	148.3	151.1	-2.8	-10.0

Therefore 205 m^3 estimated yard detention

Table 1.3.3c - 100-year (+ 20%) estimated detention in parking area

	Time (min)	$i_{100\text{-years}}$x120% (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
	10	214.3	568.6	151.1	417.5	250.5
	15	171.5	455.0	151.1	303.9	273.6
peak V_{stored} --->	20	143.9	382.0	151.1	230.9	277.1
	25	124.6	330.7	151.1	179.6	269.4
	30	110.2	292.6	151.1	141.5	254.6
	35	99.1	263.0	151.1	111.9	234.9

40	90.2	239.3	151.1	88.2	211.7
45	82.9	219.9	151.1	68.8	185.7
50	76.7	203.7	151.1	52.6	157.7
55	71.5	189.9	151.1	38.8	127.9
60	67.1	178.0	151.1	26.9	96.8

Therefore 277 m^3 estimated yard detention

B.1.4 - Site storage

	5-year event	100-year event	100-year +20% event		
overall storage requirements	63	235	318	m^3	*Table A.1.3.1*
estimated roof detention requirements	34	91	118	m^3	*Table A.1.3.2*
roof actual ponding depth	0.04	0.10	0.13	m	*maximum allowable: 0.15m*
estimated roof ponding volume	37	93	121	m^3	*pyramid equation (V=roof area*ponding depth/3)*
estimated parking and open field area detention requirements	53	205	277	m^3	*Table A.1.3.3*
parking and open field area actual ponding depth	0.18	0.24	0.32	m	*maximum allowable: 0.35m*
estimated parking and open field area ponding volume	59	221	295	m^3	*pyramid equation (V=roof area*ponding depth/3)*
Total available roof storage	37	93	121	m^3	
Total available on-site storage	59	221	295	m^3	
Total available onsite storage > overall storage requirements	OK	OK	OK		
Total available onsite storage > estimated detention	OK	OK	OK		

B.1.5 - Release rate for site

Release rate		
Allowable release rate (5-yr)	195.0	*Section B.1.1*
Uncontrolled release rate for (100-yr)	23.1	*Section B.1.2.1*
Controlled release rate at roof drain (100-yr)	20.8	*Section B.1.3.2*
Controlled release rate at MHST-3 (100-yr)	151.1	*Section B.1.3.3*
Total release rate (100-yr)	195.0	
Total release rate (100-yr) < Allowable release rate (5-yr)	OK	

Appendix C - IPEX Tempest MHF - Data Sheet

PRODUCT TECHNICAL SPECIFICATION

General

Inlet control devices (ICD's) are designed to provide flow control at a specified rate for a given water head level and also provide odour and floatable control. All ICD's will be IPEX Tempest or approved equal.

All devices shall be removable from a universal mounting plate. An operator from street level using only a T-bar with a hook will be able to retrieve the device while leaving the universal mounting plate secured to the catch basin wall face. The removal of the TEMPEST devices listed above must not require any unbolting or special manipulation or any special tools.

High Flow (HF) Sump devices will consist of a removable threaded cap which can be accessible from street level with out entry into the catchbasin (CB). The removal of the threaded cap shall not require any special tools other than the operator's hand.

ICD's shall have no moving parts.

Materials

ICD's are to be manufactured from Polyvinyl Chloride (PVC) or Polyurethane material, designed to be durable enough to withstand multiple freeze-thaw cycles and exposure to harsh elements.

The inner ring seal will be manufactured using a Buna or Nitrile material with hardness between Duro 50 and Duro 70.

The wall seal is to be comprised of a 3/8" thick Neoprene Closed Cell Sponge gasket which is attached to the back of the wall plate.

All hardware will be made from 304 stainless steel.

Dimensioning

The Low Medium Flow (LMF), High Flow (HF) and the High Flow (HF) Sump shall allow for a minimum outlet pipe diameter of 200mm with a 600mm deep Catch Basin sump.

Installation

Contractor shall be responsible for securing, supporting and connecting the ICD's to the existing influent pipe and catchbasin/manhole structure as specified and designed by the Engineer.

PRODUCT INFORMATION: TEMPEST HF & MHF ICD

Product Description

Our HF, HF Sump and MHF ICD's are designed to accommodate catch basins or manholes with sewer outlet pipes 6" in diameter or larger. Any storm sewer larger than 12" may require custom modification. However, IPEX can custom build a TEMPEST device to accommodate virtually any storm sewer size.

Available in 5 preset flow curves, these ICDs have the ability to provide constant flow rates: 9lps (143 gpm) and greater

Product Function

TEMPEST HF (High Flow): designed to manage moderate to higher flows 15 L/s (240 gpm) or greater and prevent the propagation of odour and floatables. With this device, the cross-sectional area of the device is larger than the orifice diameter and has been designed to limit head losses. The HF ICD can also be ordered without flow control when only odour and floatable control is required.

TEMPEST HF (High Flow) Sump: The height of a sewer outlet pipe in a catch basin is not always conveniently located. At times it may be located very close to the catch basin floor, not providing enough sump for one of the other TEMPEST ICDs with universal back plate to be installed. In these applications, the HF Sump is offered. The HF Sump offers the same features and benefits as the HF ICD; however, is designed to raise the outlet in a square or round catch basin structure. When installed, the HF sump is fixed in place and not easily removed. Any required service to the device is performed through a clean-out located in the top of the device which can be often accessed from ground level.

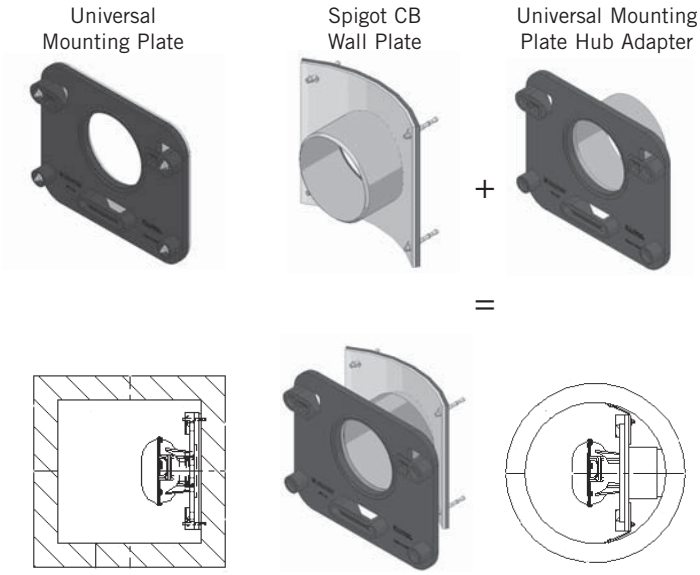
TEMPEST MHF (Medium to High Flow):
The MHF plate or plug is designed to control flow rates 9 L/s (143 gpm) or greater. It is not designed to prevent the propagation of odour and floatables.

Product Construction

The HF, HF Sump and MHF ICDs are built to be light weight at a maximum weight of 6.8 Kg (14.6 lbs).

Product Applications

The HF and MHF ICD's are available to accommodate both square and round applications:



The HF Sump is available to accommodate low to no sump applications in both square and round catch basins:

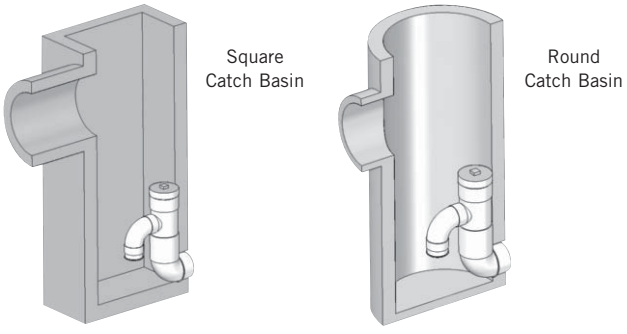
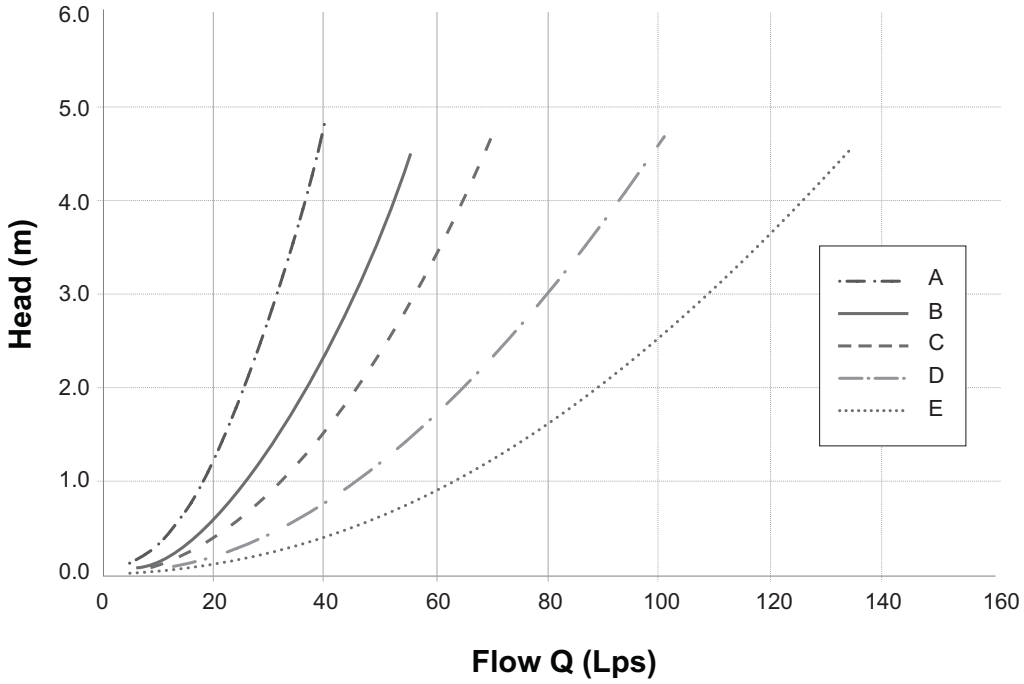


Chart 3: HF & MHF Preset Flow Curves



Appendix D - Watts Drainage Adjustable Flow Control for Roof Drains - Data Sheet

RD-100

Tag: _____

Large Capacity Roof Drain

Components:

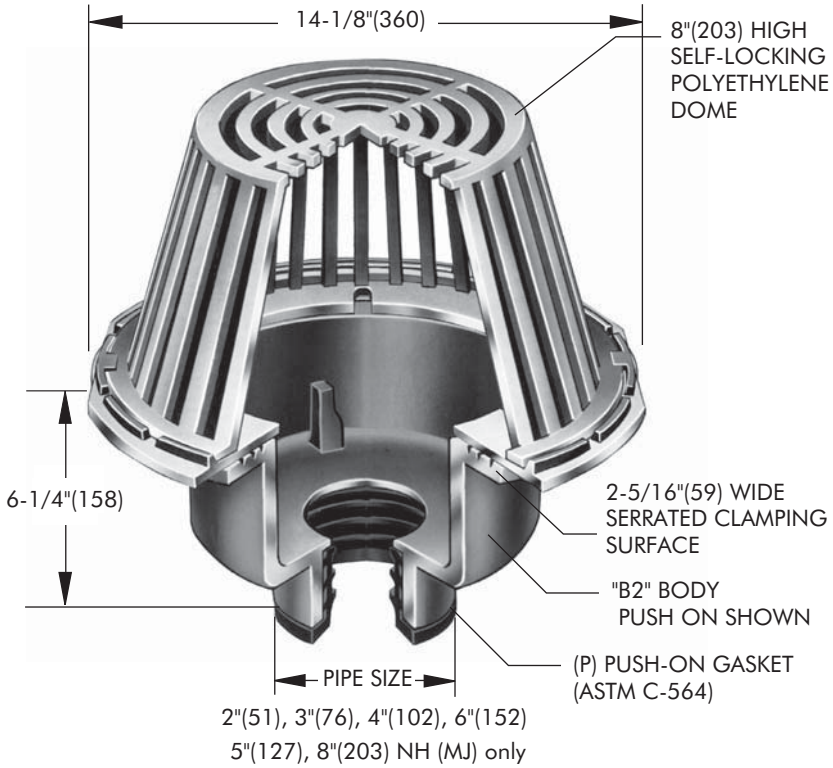

B2


B2-DM


B2-FLG


FC-2

SPECIFICATION: Watts Drainage Products RD-100 epoxy coated cast iron roof drain with deep sump, wide serrated flashing flange, flashing clamp device with integral gravel stop and self-locking polyethylene (standard) dome strainer.



Free Area Sq. In.
137

Deck opening 10" (254) with sump receiver 13-1/4" (337)

** Side Outlet (-SO) option only available in 2"(51), 3"(76), 4"(102) pipe sizes. Underdeck Clamp (-BED and -D options) are not available when -SO is selected.

Order Code: RD-10☐☐-☐-☐

Ex. RD-102P-K

Pipe Sizing (Select One)

Suffix	Description	
2	2"(51) Pipe Size	☐
3	3"(76) Pipe Size	☐
4	4"(102) Pipe Size	☐
5	5"(127) Pipe Size	☐
6	6"(152) Pipe Size	☐
8	8"(203) Pipe Size	☐

Outlet Type (Select One)

Suffix	Description	
NH	No Hub (MJ)	☐
P	Push On	☐
T	Threaded Outlet	☐
X	Inside Caulk	☐

Options (Select One or More)

Suffix	Description	
-A	Accutrol weir (specify # 1-6 slots)	☐
-B	Sump Receiver Flange	☐
-BED	Sump Receiver, Adj Ext., Deck Clamp	☐
-C	Secondary Membrane Clamp	☐
-D	Underdeck Clamp	☐
-E	Adjustable Extension	☐
-GSS	Stainless Steel Ballast Guard	☐
-H	Adj. to 6" IRMA Ballast Guard	☐
-K	Ductile Iron Dome	☐
-K80	Aluminum Dome	☐
-L	Vandal Proof Dome	☐
-R	2" High External Water Dam	☐
-SO	Side Outlet**	☐
-V	Fixed Extension (1-1/2",2",3",4")	☐
-W	Adj. Water Level Regulator	☐
-W-1	Waterproofing Flange	☐
-Z	Extended Integral Wide Flange	☐
-5	Sediment Bucket	☐
-12	Galvanized Dome	☐
-13	All Galvanized	☐
-83	Mesh Covered Dome	☐
-113M	Special Epoxy from 3M Range	☐

Optional Body Material (NH Only)

Suffix	Description	
-60	PVC Body w/Socket Outlet	☐
-61	ABS Body w/Socket Outlet	☐

Job Name _____ Contractor _____

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

Engineer _____ Representative _____

CANADA: 5435 North Service Road, Burlington, ON, L7L 5H7 TEL: 905-332-6718 TOLL-FREE: 1-888-208-8927 Website: www.wattsdrainage.ca

Accutrol Weirs

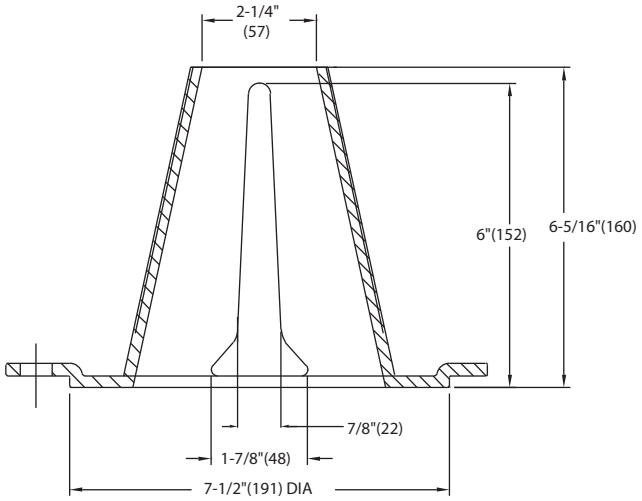
Tag: _____

Flow Control for Roof Drains

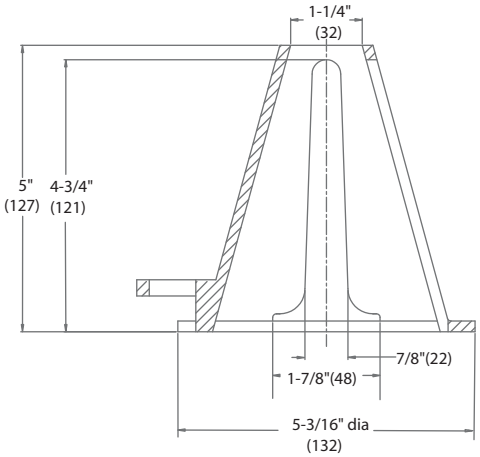
ACCUTROL WEIR FLOW CONTROL

SPECIFICATION: Watts Drainage Products epoxy coated cast iron Accutrol Weir is designed with parabolic openings which limit the flow of rain water off a roof. Each weir slot controls flow to 5 gpm per inch of head to a maximum of 30 gpm at 6" head(for large sump), 25 gpm at 5" head(for small sump) . The Accutrol Weir is secured to the flashing clamp of the roof drain. The Accutrol Weir is available with 1 to 4 slots for the large sump drain and up to 3 slots for the small sump drain.

For Large Sump Roof Drains Specify the "-A" option and number of slots required. (ie. "RD-100-A2" for two slot weir)
For Small Sump Roof Drains Specify the "-A" option and number of slots required. (ie. "RD-200-A1" for one slot weir)



LARGE SUMP ACCUTROL WEIR



SMALL SUMP ACCUTROL WEIR

Job Name _____ Contractor _____

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

Engineer _____ Representative _____

CANADA: 5435 North Service Road, Burlington, ON, L7L 5H7 TEL: 905-332-6718 TOLL-FREE: 1-888-208-8927 Website: www.wattsdrainage.ca

Appendix E – RVCA Correspondence

Patrick Ha

From: Jamie Batchelor <jamie.batchelor@rvca.ca>
Sent: Monday, June 4, 2018 1:33 PM
To: Patrick Ha
Cc: Roxanne Tubb
Subject: RE: New Riverside South Elementary School Site Plan Control Application

Good Afternoon Patrick,

The proposed school is within an area which is subject to the Riverside South Master Servicing Study and ISSU. As per the MSS and ISSU, Flows from this site will ultimately outlet to a stormwater management pond downstream which provides water quality treatment. Therefore no additional onsite water quality measures are required save and except best management practices. Please note that these comments are based on the assumption that the stormwater pond as per the MSS and ISSU for this catchment area has been constructed and is functional. If this is not the case then an understanding of the interim solution would be required for water quality (80% TSS removal) and quantity.

Jamie Batchelor, MCIP, RPP
Planner
Rideau Valley Conservation Authority
3889 Rideau Valley Drive
613-692-3571 ext 1191
jamie.batchelor@rvca.ca

From: Patrick Ha [mailto:patrickh@jp2g.com]
Sent: Monday, June 04, 2018 12:52 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Roxanne Tubb <RoxanneT@jp2g.com>
Subject: New Riverside South Elementary School Site Plan Control Application

Hi Jamie,

We are currently providing Civil Engineering services for the construction of a new two-storey Riverside South Elementary School located at the corner of Ralph Hennessy Avenue and Mount Nebo Way, Ottawa located in phase 13 of a new housing subdivision in Riverside South, as shown on the attached map. The hard surface will consist of the roof of the proposed school, proposed asphalt fire route/yard around the school and asphalt in the proposed parking lot to accommodate 53 parking spaces, as shown on the attached site plan. As part of the Site Plan Control Application, the city has asked that we contact the RVCA to enquire about whether there are any quality control issues to consider in the storm water management component of the application.

The roof drainage from the proposed school will be directed to the storm sewer system on site. Please advise whether there are any further matters we need to consider in preparing the Storm Water Management Report for the Site Plan Application.

Thanks,

Patrick Ha, B. Eng., EIT
Civil Engineering Intern
Jp2g Consultants Inc.

Email: patrickh@jp2g.com | Web: www.jp2g.com
T: 613.828.7800 x244 | C: 807.355.5366 | F: 613.828.2600
1150 Morrison Drive, Suite 410, Ottawa, Ontario, K2H 8S9

Jp2g Consultants Inc.
ENGINEERS • PLANNERS • PROJECT MANAGERS