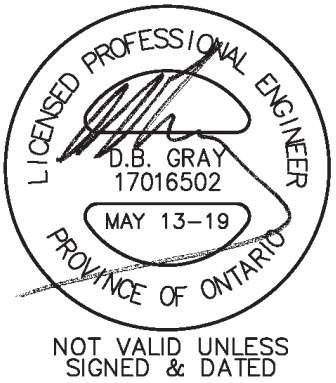
ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES REPORT

3865 Old Richmond Road
Bells Corners, Ottawa, Ontario

Report No. 19022

March 12, 2019
Revised May 13, 2019



NOT VALID UNLESS
SIGNED & DATED

D. B. GRAY ENGINEERING INC.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

613-425-8044
dbgray@rogers.com

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES REPORT

3865 Old Richmond Road
Bells Corners, Ottawa, Ontario

Cahdco is working with the Anglican Diocese and Christ Church Bells Corners (CCBC) on an affordable housing development on about 2,300 sq.m. of land at 3865 Old Richmond Road. Specifically, the proposed development is a four-storey 35-unit affordable housing apartment building with a foodbank, and office and program space for a community resource centre on the ground floor. The site is currently occupied by the former rectory of CCBC, to be demolished, and is adjacent to the church. A Zoning Amendment is required to permit the new uses as the site is currently zoned institutional. This report is a description of the local public services (watermains and sanitary and storm sewers) and an assessment of their adequacy to serve the proposed development. Assessment of Adequacy of Public Services Report is required by the City of Ottawa to support the Zoning Amendment.

WATER SUPPLY FOR FIREFIGHTING:

There is an existing fire hydrant in the municipal road right-of-way located adjacent to the southeast corner of the property. It will be approximately 100m unobstructed distance to the northwest corner of the proposed building. Since fire hydrants are required to be located within 90m of any portion of the building perimeter which is required to face a street (as defined by the Ontario Building Code) an on-site fire hydrant may be required.

The building is proposed to be wood-framed construction with a fire-wall dividing the building in two. A sprinkler system is not proposed. Based on this construction a fire flow of 266.7 l/s (16,000 L/min) is required, as calculated as per the Fire Underwriter Survey "Water Supply For Fire Protection". The calculations were submitted to the City and boundary conditions were requested. The boundary conditions received from the City (based on the city's computer model of the municipal water distribution system) includes the HGL (hydraulic grade line) of 120.0m during the 266.7 l/s fire flow conditions at the subject location which calculates to be 254 kPa (37 psi). Since the pressure is above 138 kPa (20 psi) there is an adequate water supply for firefighting.

(In the event the 266.7 l/s fire flow was not available a second set of calculations were submitted to the City assuming the same construction as above except with a sprinkler system. Based on this construction a fire flow of 183.3 l/s (11,000 L/min) would be required. With a boundary condition HGL of 124.0m the pressure calculates to be 293 kPa (43 psi). However since there is an adequate water supply for firefighting with the above scenario (i.e. with no sprinkler system) these calculations were redundant.)

WATER SERVICE:

The 35 apartment units are comprised of 18 one-bedroom, 12 two-bedroom and 5 three-bedroom units. Based on the City of Ottawa Water Distribution Design Guidelines for residential properties (1.4 person per one-bedroom unit; 2.1 persons per two-bedroom unit and 3.1 persons per three-bedroom unit; and 350 l/person/day) and Ministry of the Environment Design Guidelines for peaking factors the daily average flow is 0.3 l/s with a maximum daily and maximum hourly demand of 2.2 and 3.3 l/s, respectively. It is assumed that the water demand for the ground floor uses are small in comparison to the residential uses and would peak at different times so therefore are excluded at this time.

To determine water pressure under the above demands, boundary conditions, based on the City of Ottawa computer simulation of the water distribution system, at the subject location, are required. In summary, we requested the boundary conditions for the subject area based on the following:

Average Daily Demand: 0.3 l/s.
Maximum Daily Demand: 2.2 l/s.
Maximum Hourly Demand: 3.3 l/s
Fire Flow Demand: 266.7 l/s
Maximum Daily + Fire Flow Demand 268.9 l/s

Based on the boundary conditions received from the City, the minimum HGL (hydraulic grade line) is 127.3m and the maximum is 132.3m. With these HGLs the water pressure at the water meter is calculated to vary from 313 kPa to 362 kPa (45 to 52 psi). This is an acceptable range of pressures for the proposed development, although they are at the low end of the acceptable range. (As per Ministry of the Environment guidelines a normal operating pressure of 50 to 80 psi is acceptable and not less than 40 psi under maximum hourly demand conditions.)

The static pressure on the fourth floor is calculated to range from (31 to 38 psi); therefore, as is common in multi-storey buildings, a booster pump may be required.

Based on the AWWA water flow demand curve, and an estimated water pressure at the meter of 359 kPa (52 psi), the peak demand for the building is expected to be 3.5 l/s (212 L/min / 56 USgpm). The AWWA method calculates the instantaneous demand and is used to size the water service. Based on this peak demand it is expected that a 50mm water service connection will be required. The water service would connect to an existing 406mm ductile iron municipal watermain in Old Richmond Road.

SANITARY SERVICE:

The City typically requires that the sewage load and capacity is analyzed in the first pipe segment of the municipal sanitary sewer downstream of a proposed development. Downstream of the subject property the sanitary sewer pipe segment is 250mm in

diameter, having a pipe slope of approximately 0.50%, which calculates to having a capacity of capacity of 43.9 l/s (the slope is calculated from available information as the slope is not identified in any of the drawings provided by the City).

There is only one property upstream of the subject property: Our Lady Peace Elementary School, on 2.87 ha of land, with 460 student and staff; and having no showers and no cafeteria. Based on Appendix 4A of the City of Ottawa Sewer Design Guidelines the daily sewage flow of a school (without showers or cafeteria) is 30 litres per person. Using a daily flow of 13,800 litres (= 460 people x 30 L / person) and a 4.5 peaking factor (1.5 peaking factor x 24 / 8 hours); and a 0.33 l/s/ha infiltration flow (also based on the Sewer Guidelines); and including the flow from the existing rectory (assumed to be a single family house); and including the 0.23 hectare subject lands; the pre-development flow in the first downstream pipe segment is calculated to be 1.78 l/s (which calculates to be 4% of the capacity of the municipal sewer).

Based on the City of Ottawa Sewer Design Guidelines for residential properties (1.4 person per one-bedroom unit; 2.1 persons per two-bedroom unit and 3.1 persons per three-bedroom unit; – 280 l/person/day – 3.2 peaking factor); and including the ground floor uses (assumed to be 14 people at 75 l per person – 4.5 peaking factor (1.5 peaking factor x 24 / 8 hours); and a 0.33 l/s/ha infiltration flow) the post development flow from the subject property is calculated to be 0.70 l/s. Including the upstream properties (i.e. the school), the total post development flow in the first downstream pipe segment of the municipal sewer is calculated to be 2.42 l/s. Therefore post development flow is expected to have an acceptable impact given the post development flows are only 6% of the capacity of the municipal sewer.

Typical of a building of the proposed size and use; the sanitary sewer connection would be 150mm in diameter with a minimum slope of 1%, which calculates to having a capacity of 15.9 l/s. This sanitary sewer service connection would adequately handle the 0.70 l/s post development flow from the subject property (being at only 4% capacity).

It is believed that the proposed apartment building will not have a basement but, given that depth the municipal sanitary sewers in Old Richmond Road are about 3.8m below the expected first floor elevation, if a basement is proposed, any plumbing fixtures located in the basement should be able to drain by gravity.

STORMWATER MANAGEMENT:

Water Quality:

The Rideau Valley Conservation Authority (RVCA) has reviewed the proposed development and has commented: *“On-site water quality protection will be required with a minimum of 80% TSS removal being provided.”* To achieve this criteria a sediment separator manhole (e.g. a Stormceptor) is expected to be required. Such a device is

designed to remove sediment from the runoff entering the manhole and stores the sediment in a chamber for periodic removal.

As is typical in most developments an erosion and sediment control plan will have to be developed to be implemented during construction. Typical measures include: silt fence barriers will be installed around the perimeter of the construction site; sediment capture filter sock inserts to be installed in all existing catch basins adjacent to the site and all new catch basins as they are installed; and geotextile fabric mud mats to be install at all points of egress to public roads.

Water Quantity:

As identified in the "Arbeatha Park Dual Drainage Assessment" (prepared by Parsons) there are areas in Bells Corners where municipal "*storm sewers may surcharge during smaller, more frequent storm events* [that what is considered normal]. *This in turn can result in basement flooding and surface flooding vulnerabilities."* However this study identifies that in the area of the subject property:

The minor system (i.e. storm sewers):

- The hydraulic grade line (HGL) is at an acceptable 2.4m below the road.
- The sewer pipe capacities are greater than the design flow rate.
- The pipe capacities have a 1:100 year level of service (except a segment of a 1500mm storm sewer located in an easement adjacent to the rear lot line of the subject property which has a 5-year level of service – as per the City Design Guidelines in areas with that has a dual system (i.e. both minor and major) a minor system 5-year level of service is acceptable).

The major system (i.e. overland flow):

- The flow depth in the road is less than 150mm which is considered acceptable.
- The surface flow level is at a 1:100 year of service.

The basement flood risk has a 1:100 year level of service.

There are no buildings at flood risk.

Since, as per the Parsons Dual Drainage study, the subject property is in an area that not considered at an abnormally high risk it is expected that the City will require only the normal urban stormwater management criteria for quantity control. Specifically it is expected that the post development peak flows for the 5-year and 100-year storm events will have to be controlled to the peak flow during the 5-year storm event using a pre-development runoff coefficient or runoff coefficient of 0.50, whichever is less; and a calculated time of concentration (but not less than 10 minutes). It is calculated that the pre-development conditions reflect a 5-year runoff coefficient of 0.68 and it is estimated that the time of concentration is 15 minutes. . Therefore using the Rational Method; the pre-development rate is 39.2 l/s. However based on a runoff coefficient of 0.50; the maximum allowable release rate will be 28.8 l/s for all storm events (less than the pre-development rate).

Based on the above criteria and conditions (and increasing the runoff coefficients for the 100-year event by 25% to maximum 1.0) it is calculated that a maximum (temporary)

storage of 57.3 cubic meters will be required to achieve the maximum allowable release rate of 28.8 ls. Stormwater will have to be stored within the development. Based on three flow control roof drains and it is calculated that 33.8 cu.m. could be stored on the roof of the proposed building, leaving 23.4 cu.m. to be stored on the surface of the parking area. To be able to store on the surface of the parking area it is anticipated that at least a part of the area will have to be re-graded to drain to a new catch basin and storm sewer system. If this is not possible (or desirable) to store on the roof a greater portion of the parking area would have to be re-graded. Alternatively, underground storage could be considered, although this method of storage is typically very expensive.

There is an existing 1350mm municipal storm sewer in Old Richmond Road. There is also a 1500mm storm sewer in a 30 ft. easement (that appears to be entirely on the school property) immediately to the south of the subject property. This sewer turns approximately 90 degrees to the north and is located in a 30 ft. easement (that appears to be entirely on the subject property). These are large diameter storm sewers and the City often does not permit connections to sewers of these sizes. If the City does not permit a connection the foundation would have to be pumped and discharged to grade; the roof drains would also have to outlet to the grade.

The rear parking area appears to drain to an existing catch basin manhole on the church property (in the 1500mm storm sewer) and a catch basin on the subject property that may connect to 1500mm storm sewer. The storm sewer that serves this catch basin may have to be modified so that it does not cross the church property (see MECP ECA below). The rear parking lot grading may also have to be modified so that drainage does not drain onto the church property.

Since the stormwater management quantity control restricts the flow to less than pre-development conditions the post development stormwater flows are expect to have a positive impact on the adjacent municipal storm sewers.

MINISTRY OF ENVIRONMENT, CONSERVATION AND PARKS (MECP)
ENVIRONMENTAL COMPLIANCE APPROVAL (ECA):

The subject development is a residential rental project we understand will be located on one property (severed from the church property). It is expected that a MECP ECA will not be required provided all of the services (water, sanitary sewer and storm sewers) for the subject development are located on the property (i.e. does not cross the church property).

CONCLUSIONS:

1. An on-site fire hydrant may be required.
2. There will be an adequate water supply for firefighting.
3. The existing water pressure in the municipal watermain is adequate for the proposed development, although, as is common in multi-storey buildings, a booster pump may be required.
4. A 50mm water service connection will be adequate to serve the development.
5. The pre-development flow calculates to be only 4% of the capacity of the municipal sewer and post development flows it only increases to 6% and therefore is expected to have an acceptable impact on the municipal sanitary sewers.
6. A 150mm sanitary sewer connection with a slope of 1%, would adequately serve the subject development.
7. If the proposed apartment building has a basement any plumbing fixture in the basement should be able to drain by gravity.
8. The RVCA will require a minimum of 80% TSS removal and to achieve this criteria a sediment separator manhole (e.g. a Stormceptor) is expected to be required.
9. An erosion and sediment control plan is expect to be required and be implemented during construction.
10. As per the Parsons Dual Drainage study, the subject property is in an area that not considered at an abnormally high risk of flooding.
11. It is expected that the City will require the normal urban stormwater management criteria for quantity control and the maximum allowable release rate will be about 28.8 l/s for all storm events. It is calculated that a maximum (temporary) storage of 57.3 cubic meters will be required which could be stored on the roof and on the surface of the parking area.
12. There are large diameter municipal storm sewers adjacent to the subject property and it is possible that the City may not permit new connections to these sewers. If the City does not permit a connection the foundation would have to be pumped and discharged to grade; the roof drains would also have to outlet to the grade.
13. The storm sewer that serves the rear parking area catch basin may have to be modified so that it does not cross the church property.
14. The rear parking lot grading may also have to be modified so that drainage does not drain onto the church property.
15. Since the stormwater management will restrict the flow to less than pre-development conditions the post development stormwater flows are expect to have a positive impact on the adjacent municipal storm sewers.
16. It is expected that a MECP ECA will <u>not</u> be required provided all of the services (water, sanitary sewer and storm sewers) for the subject development are located on the property (i.e. does not cross the church property).

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Ottawa, Ontario K1T 4E9

613-425-8044
d.gray@dbgrayengieering.com

22-Feb-19

REVISED 1-Mar-19

3865 Old Richmond Rd
Ottawa, Ontario

Fire Flow Requirements

Fire flow requirement as calculated as per Fire Undewriter Survey "Water Supply For Fire Protection".

F = 220 C $A^{0.5}$ = the required fire flow in litres per minute

C = coefficient related to the type of construction
= 1.5 Wood Frame Construction

A = total floor area (all storeys excluding basements at least 50% below grade)

Proposed 4 storey mixed building:

Ground Floor	557	sq.m.
1st Floor	519	sq.m.
2nd Floor	519	sq.m.
3rd Floor	519	sq.m.
TOTAL FIRE AREA:	2114	

F = 15,173 L/min
= 15,000 L/min (rounded off to the nearest 1,000 L/min)

-15% Change for limited-combustible Ocuppancy

= 12,750 L/min

0% Reduction for Sprinkler System

= - L/min

Increase for Separation Exposed Buildings / Adjacent Building

			Constuction	Length m	Storeys	Length-Height Factor
13%	North	10.1 to 20m	Ordinary	17	2	34
5%	East	30.1 to 45m	Ordinary	16	2	32
0%	South	>45		N/A		
10%	West	N/A		Fire Wall		
28%	Total Increase for Exposure (maximum 75%)					

= 3,570 L/min Increase

= 16,320 L/min
F = 16,000 L/min (rounded off to the nearest 1,000 L/min)
= 266.7 l/s

Elevation at Fire Hydrant	94.10	m ASL	Static Pressure at Fire Hydrant			
267 l/s FIRE FLOW:	120.0	m ASL	37	psi	254	kPa

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F = 220 C $A^{0.5}$ = the required fire flow in litres per minute

C = coefficient related to the type of construction
= 1.5 Wood Frame Construction

A = total floor area (all storeys excluding basements at least 50% below grade)

Proposed 4 storey mixed building:

Ground Floor	376	sq.m.
1st Floor	388	sq.m.
2nd Floor	388	sq.m.
3rd Floor	388	sq.m.
TOTAL FIRE AREA:	1540	

F = 12,950 L/min
= 13,000 L/min (rounded off to the nearest 1,000 L/min)

-15% Change for limited-combustible Ocuppancy

= 11,050 L/min

0% Reduction for Sprinkler System

= - L/min

			Increase for Separation Exposed Buildings	Adjacent Building		Length-Height
			Constuction	Length m	Storeys	Factor
5%	North	30.1 to 45m	Ordinary	9	2	18
10%	East			Fire Wall		
6%	South	20.1 to 30m	Ordinary	15	1	15
0%	West	>45		N/A		
21%	Total Increase for Exposure (maximum 75%)					

= 2,321 L/min Increase

= 13,371 L/min
F = 13,000 L/min (rounded off to the nearest 1,000 L/min)
= 216.7 l/s

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REVISED 1-Mar-19

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Fire Flow Requirements

Fire flow requirement as calculated as per Fire Undewriter Survey "Water Supply For Fire Protection".

F = 220 C $A^{0.5}$ = the required fire flow in litres per minute

C = coefficient related to the type of construction
= 1.5 Wood Frame Construction

A = total floor area (all storeys excluding basements at least 50% below grade)

Proposed 4 storey mixed building:

Ground Floor	557	sq.m.
1st Floor	519	sq.m.
2nd Floor	519	sq.m.
3rd Floor	519	sq.m.
TOTAL FIRE AREA:	2114	

F = 15,173 L/min
= 15,000 L/min (rounded off to the nearest 1,000 L/min)

-15% Change for limited-combustible Ocuppancy

= 12,750 L/min

40% Reduction for Sprinkler System

= 5,100 L/min

			Increase for Separation Exposed Buildings	Adjacent Building		Length-Height
			Constuction	Length m	Storeys	Factor
11%	North	10.1 to 20m	Ordinary	17	2	34
5%	East	30.1 to 45m	Ordinary	16	2	32
0%	South	>45		N/A		
10%	West	N/A		Fire Wall		
26%	Total Increase for Exposure (maximum 75%)					

= 3,315 L/min Increase

= 10,965 L/min
F = 11,000 L/min (rounded off to the nearest 1,000 L/min)
= 183.3 l/s

Elevation at Fire Hydrant	94.10	m ASL	Static Pressure at Fire Hydrant			
183 l/s FIRE FLOW:	124.0	m ASL	4310	psi	293	kPa

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22-Feb-19

3865 Old Richmond Rd
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Fire Flow Requirements

Fire flow requirement as calculated as per Fire Undewriter Survey "Water Supply For Fire Protection".

F = 220 C $A^{0.5}$ = the required fire flow in litres per minute

C = coefficient related to the type of construction
= 1.5 Wood Frame Construction

A = total floor area (all storeys excluding basements at least 50% below grade)

Proposed 4 storey mixed building:

Ground Floor	376	sq.m.
1st Floor	388	sq.m.
2nd Floor	388	sq.m.
3rd Floor	388	sq.m.
TOTAL FIRE AREA:	1540	

F = 12,950 L/min
= 13,000 L/min (rounded off to the nearest 1,000 L/min)

-15% Change for limited-combustible Ocuppancy

= 11,050 L/min

40% Reduction for Sprinkler System

= 4,420 L/min

		Increase for Separation Exposed Buildings		Adjacent Building		Length-Height Factor
			Constuction	Length m	Storeys	
5%	North	30.1 to 45m	Ordinary	9	2	18
10%	East			Fire Wall		
6%	South	20.1 to 30m	Ordinary	15	1	15
0%	West	>45		N/A		
21%	Total Increase for Exposure (maximum 75%)					

= 2,321 L/min Increase

= 8,951 L/min
F = 9,000 L/min (rounded off to the nearest 1,000 L/min)
= 150.0 l/s

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22-Feb-19
REVISED 1-Mar-19

3865 Old Richmond Road
35-Unit Four-Storey Apartment Building
Ottawa, Ontario

Water Demand

	Number of Units	Persons Per Unit	Population
UNIT TYPE:			
Single Family:	0	3.4	0
Semi- detached:	0	2.7	0
Duplex:	0	2.3	0
Townhouse:	0	2.7	0
APARTMENTS:			
1 Bedroom:	18	1.4	25
2 Bedroom:	12	2.1	25
3 Bedroom:	5	3.1	16
Average Aptarment:	0	1.8	0
TOTAL:	35		66

DAILY AVERAGE

350 litres / person / day

16.0 l/min | 0.3 l/s | 4 USgpm

MAXIMUM DAILY DEMAND 8.1 (Peaking Factor for a population of 66: Table 3-3 MOE Design Guidelines for Drinking-Water Systems)

130.1 l/min | 2.2 l/s | 34 USgpm

MAXIMUM HOURLY DEMAND 12.2 (Peaking Factor for a population of 66: Table 3-3 MOE Design Guidelines for Drinking-Water Systems)

196.0 l/min | 3.3 l/s | 52 USgpm

Approx. Elevation of Water Meter: 95.40 m ASL
Approximate First Floor Elevation: 94.50 m ASL

			Static Pressure at Water Meter		
MINIMUM HGL:	127.3	m ASL	45	psi	313 kPa
MAXIMUM HGL:	132.3	m ASL	52	psi	362 kPa

1-Mar-19

3865 Old Richmond Road
35-Unit Four-Storey Apartment Building
Ottawa, Ontario

Peak Water Demand

WATER FIXTURE VALUE
(AWWA Manual M22 - Sizing Water Service Lines and Meters)

	No.	F.V.	Total		
Bathtub	28	8	224	35	Units
Tiolet - tank	43	6	258		
Tiolet - flush valve	0	24	0		
Lavs.	43	1.5	64.5		
Bidet	0	2	0		
Urinal - wall flush valve	2	10	20		
Shower	7	2.5	17.5		
K. Sink	35	1.8	63		
Dishwasher	35	1.3	45.5		
Clothes Washer	3	6	18		
Commercial Sink	2	4	8		
J. Sink	1	4	4		
Commercial Dishwasher	1	4	4		
Commercial Washer	0	4	0		
Hose 1/2 in	0	5	0		
Hose 3/4 in	0	12	0		
			726.5		

Peak Demand (fig 4-2 or 4-3 AWWA M22)			55	USgpm		
Pressure @ Meter	359	kPa	52	psi		
Pressure Factor (table 4-1 AWWA M22)			0.92			
Peak Demand			51	USgpm		
Irrigation - hose 1/2 in	1		6	USgpm (includes pressure factor)		
TOTAL PEAK DEMAND	212	l/min	56	USgpm	3.5	l/s
		Nominal Size	2.0	in	50	mm
			5.9	ft/s	1.8	m/s

Gmail by Google

Douglas Gray <d.gray@dbgrayengineering.com>

FW: Christ Church Bells Corners, 3865 Old Richmond Rd - Boundary Condition Request

1 message

Surprenant, Eric <Eric.Surprenant@ottawa.ca> Fri, Mar 1, 2019 at 9:34 AM
To: "c.kennedy@dbgrayengineering.com" <c.kennedy@dbgrayengineering.com>, "d.gray@dbgrayengineering.com" <d.gray@dbgrayengineering.com>
Cc: "Dickinson, Mary" <mary.dickinson@ottawa.ca>, "Anna.Froehlich@ccochousing.org" <Anna.Froehlich@ccochousing.org>

Please find as follows the boundary conditions for the above noted site.

Thanks

Eric Surprenant, C.E.T. / 613 580-2424 ext.:27794
Project Manager, Infrastructure Approvals

Development Review Suburban Services Branch

Planning, Infrastructure and Economic Development Dept.

Gestionaire de projets, Approbation de l'infrastructure

Examen des demandes d'aménagement (Services Suburbains Ouest)

Services de la planification, de l'infrastructure et du développement économique

City of Ottawa | Ville d'Ottawa

613.580.2424 ext./poste 27794

ottawa.ca/planning / ottawa.ca/urbanisme

The following are boundary conditions, HGL, for hydraulic analysis at 3865 Old Richmond Rd (zone 2W) assumed to be connected to the 406mm on Old Richmond Rd (see attached PDF for location).

Minimum HGL = 127.3m

Maximum HGL = 132.3m

MaxDay + Fireflow (183 L/s) = 124.0m

MaxDay + Fireflow (267 L/s) = 120.0m

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.

From: Douglas Gray <d.gray@dbgrayengineering.com>
Sent: Friday, February 22, 2019 5:12 PM
To: Dickinson, Mary <mary.dickinson@ottawa.ca>
Cc: Caoimhin Kennedy <c.kennedy@dbgrayengineering.com>; Anna Froehlich <Anna.Froehlich@ccochousing.org>
Subject: Christ Church Bells Corners, 3865 Old Richmond Rd - Boundary Condition Request

Hi Mary

I understand that you were at the pre-consultation meeting last August concerning a proposed mixed use / affordable apartment building at Christ Church Bells Corners, 3865 Old Richmond Rd .

Please forward the information below to the appropriate person in Infrastructure Approvals or let us know who we should send it to.

Thanks, Doug

Please provide the boundary conditions at 3865 Old Richmond Rd. We have calculated the following expected demands for the based on a 35-unit four-storey apartment building:

Average daily demand: 0.3 l/s.

Maximum daily demand: 2.2 l/s.

Maximum hourly daily demand: 3.3 l/s

Fire Flow demand: 266.7 l/s

Fire Flow + Max Day: 268.9 l/s

We are looking at alternative designs so please also provide the boundary conditions for a fire flow demand of 183.3 l/s.

Average daily demand: 0.3 l/s.

Maximum daily demand: 2.2 l/s.

Maximum hourly daily demand: 3.3 l/s

Fire Flow demand: 183.3 l/s

Fire Flow + Max Day: 185.5 l/s

Our calculations are attached. Also attached are preliminary drawings.

D. B. G R A Y E N G I N E E R I N G I N C.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

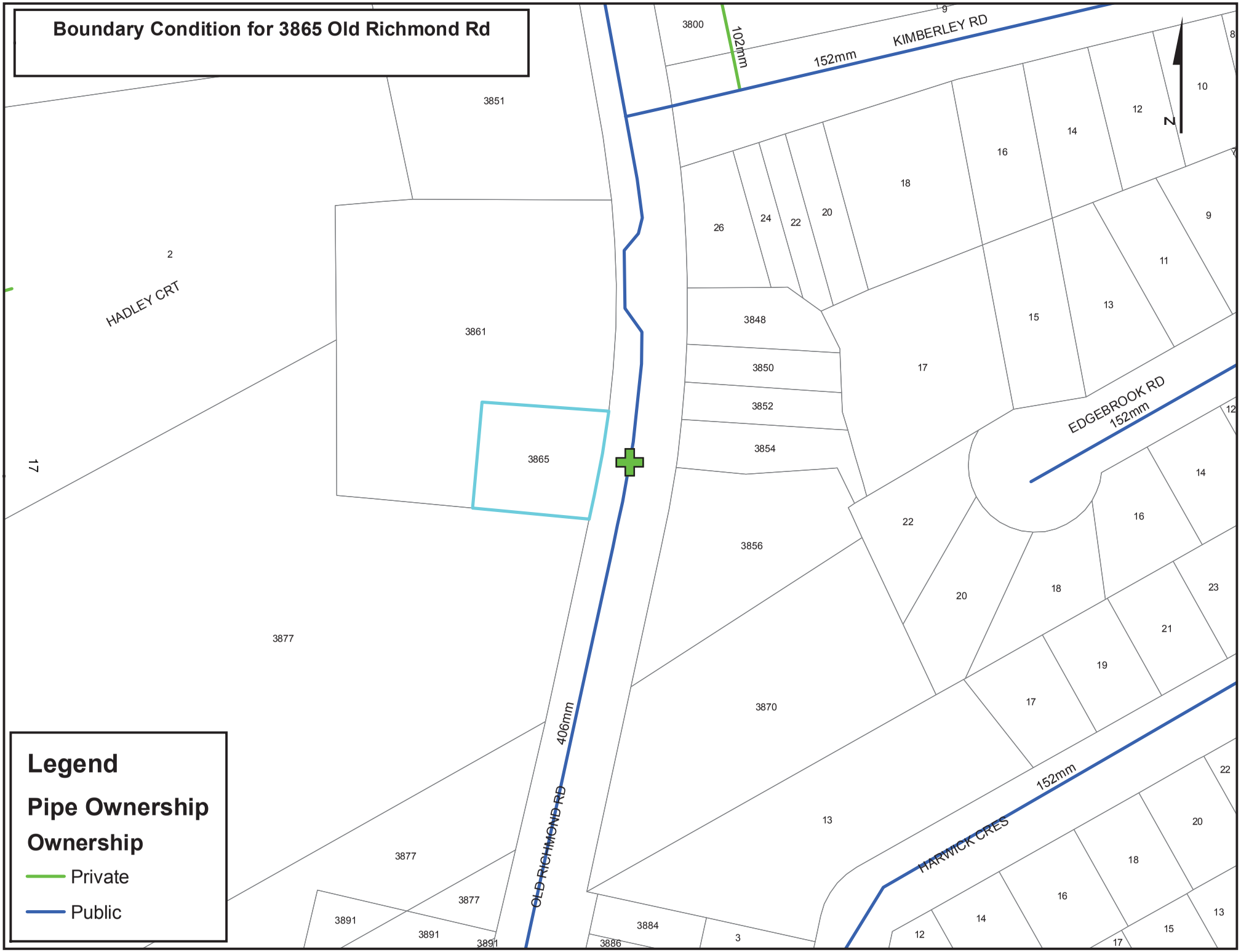
700 Long Point Circle Tel: 613-425-8044

Ottawa, Ontario K1T 4E9 d.gray@dbgrayengineering.com

'

'

3865 Old richmond Feb 2019.pdf
105K


Boundary Condition for 3865 Old Richmond Rd
3800
102mm
152mm
KIMBERLEY RD
N
3851
HADLEY CRT
2
3861
3865
3848
3850
3852
3854
3856
3870
3877
17
406mm
OLD RICHMOND RD
EDGEBROOK RD
152mm
HARWICK CRES
3884
3886
3891
Legend
Pipe Ownership
Ownership
Private
Public

D.B. GRAY ENGINEERING INC.

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SANITARY SEWER DESIGN FORM

Average Daily Flows:

Residential:	280	l / capita / day
Commercial:	28,000	l / ha / day
Institutional:	28,000	l / ha / day
Light Industrial:	35,000	l / ha / day
Heavy Industrial:	55,000	l / ha / day

Infiltration Allowance: 0.33 l / s / ha

Peaking Factor:
Residential (Harmon Equation): $P.F. = 1 + \frac{14}{4 + P^{0.5}}$
P = Population / 1000
Harmon Correction Factor 0.8
Commercial & Institutional: 1.5 If contrinbution > 20%
Commercial & Institutional: 1.0 If contrinbution < 20%
Industrial: As per Ottawa Guidelines Appendix 4-B

PROJECT: 3865 Old Richmond Road

Designed By: DBG

1-Mar-19

LOCATION			Section								Cumulative Residential		Section Non-Residential			Cumulative					SEWER DATA								COMMENTS
			Single Family	Semi/Town house	Duplex / Triplex	Apartments (average)	Apartments (1 Bed.)	Apartments (2 Bed.)	Apartments (3 Bed.)	Resid-ential Area																			
																					n =	0.013							
STREET	FROM	TO	ppu = 3.4	ppu = 2.7	ppu = 2.3	ppu = 1.8	ppu = 1.4	ppu = 2.1	ppu = 3.1		Pop.	Peaking Factor	Area	Flow	Peaking Factor	Flow	Area	Sewage Flow	Infil-tration Flow	Total Flow	Type of Pipe	Dia. Actual	Dia. Nom.	Slope	Length	Capacity	Velocity	Ratio	
			No. of Units	No. of Units	No. of Units	No. of Units	No. of Units	No. of Units	No. of Units	ha			ha	l/ha/day		l/s	ha	l/s	l/s	l/s		(mm)	(mm)	(%)	(m)	(l/s)	(m/s)	Q/Qfull	
PRE-DEVELOPMENT CONDITIONS																													
	1st pipe segment downstream of proposed development										Our Lady Peace Elementary School: 460 students/staff x 30 L per person (as per Ottawa Sewer Guideline Appendix 4A) / 2.87 ha Peaking Factor = 4.5 (= 1.5 / 8 hrs x 24hrs)										1st pipe segment downstream of proposed development							
			Rectory																										
Old Richmond Rd	SAN MH 14557	SAN MH 14558	1							0.23	3	3.2	2.87	4808	4.5	0.7	3.10	0.75	1.02	1.78		254.0	250	0.50		43.9	0.87	0.04	
POST DEVELOPMENT CONDITIONS																													
	1st pipe segment downstream of proposed development										Our Lady Peace Elementary School: 460 students/staff x 30 L per person (as per Ottawa Sewer Guideline Appendix 4A) / 2.87 ha PLUS 14 people x 75 L per person in ground floor of the proposed building Peaking Factor = 4.5 (= 1.5 / 8 hrs x 24hrs)										1st pipe segment downstream of proposed development							
Old Richmond Rd	SAN MH 14557	SAN MH 14558				18	12	5		0.23	60	3.2	2.87	5174	4.5	0.8	3.10	1.39	1.02	2.42		254.0	250	0.50		43.9	0.87	0.06	
Proposed Sanitary Sewer Connection																													
											14 people x 75 L per person in ground floor of the proposed building / 0.23 ha Peaking Factor = 4.5 (= 1.5 / 8 hrs x 24hrs)										Proposed Sanitary Sewer Connection							
						18	12	5		0.23	60	3.2		4565	4.5	0.0	0.23	0.62	0.08	0.70		152.4	150	1.00		15.9	0.87	0.04	

Gmail by Google

Douglas Gray <d.gray@dbgrayengineering.com>

RE: 3865 Old Richmond Rd

1 message

Eric Lalande <eric.lalande@rvca.ca> Tue, Feb 19, 2019 at 3:33 PM
To: Douglas Gray <d.gray@dbgrayengineering.com>
Cc: Caoimhin Kennedy <c.kennedy@dbgrayengineering.com>, Jamie Batchelor <jamie.batchelor@rvca.ca>

Hi Doug,

Do you have a draft Site Plan I could look at?

Further, I would like to know where the site is outletting. There appears to be a storm sewer outletting to a swale behind the property, with no discernable outlet. Alternatively there is what appears to be the main storm sewer along Old Richmond Road. In either case, on-site water quality protection will be required with a minimum of 80% TSS removal being provided. Alternative requirements may be considered based on more detailed plans of the proposed apartment building (i.e. layout of building, surface parking etc.)

Thanks,

Eric Lalande, MCIP, RPP

Planner, Rideau Valley Conservation Authority

613-692-3571 x1137

From: Jamie Batchelor
Sent: Tuesday, February 19, 2019 3:17 PM
To: 'Douglas Gray' <d.gray@dbgrayengineering.com>
Cc: Caoimhin Kennedy <c.kennedy@dbgrayengineering.com>; Eric Lalande <eric.lalande@rvca.ca>
Subject: RE: 3865 Old Richmond Rd

Hi Doug,

I've forwarded your inquiry to Eric Lalande as it would be in his area.

Jamie Batchelor, MCIP,RPP

Planner, ext. 1191

jamie.batchelor@rvca.ca

Rideau Valley Conservation Authority
3889 Rideau Valley Drive
PO Box 599, Manotick ON K4M 1A5
T 613-692-3571 | 1-800-267-3504 F 613-692-0831 | www.rvca.ca

From: Douglas Gray <d.gray@dbgrayengineering.com>
Sent: Tuesday, February 19, 2019 2:44 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>
Cc: Caoimhin Kennedy <c.kennedy@dbgrayengineering.com>
Subject: 3865 Old Richmond Rd

Hi Jamie

We are working on a proposed four-storey 35-unit affordable housing apartment building with ground floor offices at 3865 Old Richmond Rd in Ottawa.

Attached are preliminary drawings.

Please comment concerning the stormwater management for this site.

Regards, Doug

D. B. GRAY ENGINEERING INC.

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle Tel: 613-425-8044

Ottawa, Ontario K1T 4E9 d.gray@dbgrayengineering.com

Gmail by Google

Douglas Gray <d.gray@dbgrayengineering.com>

RE: 3865 Old Richmond Rd

1 message

Eric Lalande <eric.lalande@rvca.ca> Tue, Feb 19, 2019 at 3:51 PM
To: Douglas Gray <d.gray@dbgrayengineering.com>
Cc: Caoimhin Kennedy <c.kennedy@dbgrayengineering.com>

Hi Doug,

Jamie passed along the Site Plan, my previous comment will apply. On-site water quality protection will be required with a minimum of 80% TSS removal being provided.

Thanks,

Eric Lalande, MCIP, RPP

Planner, Rideau Valley Conservation Authority

613-692-3571 x1137

From: Jamie Batchelor
Sent: Tuesday, February 19, 2019 3:17 PM
To: 'Douglas Gray' <d.gray@dbgrayengineering.com>
Cc: Caoimhin Kennedy <c.kennedy@dbgrayengineering.com>; Eric Lalande <eric.lalande@rvca.ca>
Subject: RE: 3865 Old Richmond Rd

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Jamie Batchelor, MCIP,RPP

Planner, ext. 1191

jamie.batchelor@rvca.ca

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Ottawa, Ontario K1T 4E9 d.gray@dbgrayengineering.com

Summary Table

ONE HUNDRED YEAR EVENT				
Drainage Area	Pre-development Rate (L/s)	Maximum Allowable Release Rate (L/s)	Maximum Release Rate (L/s)	Maximum Volume Required (cu.m)
AREA I (Uncontrolled Flow Off Site)	-	-	9.1	-
AREA II	-	-	5.0	33.8
AREA III	-	-	14.7	23.4
TOTAL	39.2	28.8	28.8	57.3

3865 Old Richmond Road
Ottawa, Ontario

STORM WATER MANAGEMENT CALCULATIONS
Rational Method

FIVE-YEAR EVENT

Pre-Development Conditions

			C
Roof Area:	210	sq.m	0.90
Asphalt/Concrete Area:	1490	sq.m	0.90
Gravel Area:	0	sq.m	0.70
Landscaped Area:	780	sq.m	0.20
Total Catchment Area:	2480	sq.m	0.68

Area (A):	2480	sq.m
Time of Concentration:	15.0	min
Rainfall Intensity (i):	83.6	mm/hr (5 year event)
Runoff Coeficient (C):	0.68	
Pre-Development 5-Year Flow Rate (2.78AiC):	39.2	L/s

Maximum Allowable Release Rate

			C
Area (A):	2480	sq.m	
Time of Concentration:	15.0	min	
Rainfall Intensity (i):	83.6	mm/hr (5 year event)	
Runoff Coeficient (C):	0.50		
Pre-Development 5 Year Flow Rate (2.78AiC):	28.8	L/s	

DRAINAGE AREA I (Uncontrolled Flow Off Site)

(ONE HUNDRED YEAR EVENT)

Roof Area:	0	sq.m	1.00
Asphalt/Concrete Area:	95	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Landscaped Area:	350	sq.m	0.25
Total Catchment Area:	445	sq.m	0.41
Area (A):	445	sq.m	
Time of Concentration:	10	min	
Rainfall Intensity (i):	179	mm/hr (100 year event)	
Runoff Coeficient (C):	0.41		
Flow Rate (2.78AiC):	9.1	L/s	

DRAINAGE AREA II (Roof)

(ONE HUNDRED YEAR EVENT)

Roof Area:	914	sq.m	1.00
Asphalt/Concrete Area:	0	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Landscaped Area:	0	sq.m	0.25
Total Catchment Area:	914	sq.m	1.00

No. of Roof Drains: 3

Slots per Wier: 1 0.0124 l/s/mm/slot (5 USgpm/in/slot)

Depth at Roof Drain: 135 mm

Maximum Release Rate: 5.0 L/s

Pond Area: 752 sq.m

Achieved Vol: 33.8 cu.m

Max. Vol. Required: 33.8 cu.m

Time	i	2.78AiC	Release Rate	Stored Rate	Stored Volume
min.	mm/hr	L/s	L/s	L/s	cu.m
5	243	61.7	5.0	56.6	17.0
10	179	45.4	5.0	40.4	24.2
15	143	36.3	5.0	31.3	28.2
20	120	30.5	5.0	25.5	30.6
25	104	26.4	5.0	21.4	32.1
30	92	23.3	5.0	18.3	33.0
35	83	21.0	5.0	16.0	33.5
40	75	19.1	5.0	14.1	33.8
45	69	17.5	5.0	12.5	33.8
50	64	16.3	5.0	11.2	33.7
55	60	15.1	5.0	10.1	33.4
60	56	14.2	5.0	9.2	33.1
65	53	13.4	5.0	8.4	32.6
70	50	12.7	5.0	7.6	32.1
75	47	12.0	5.0	7.0	31.4
80	45	11.4	5.0	6.4	30.8
85	43	10.9	5.0	5.9	30.1
90	41	10.4	5.0	5.4	29.3
95	39	10.0	5.0	5.0	28.5
100	38	9.6	5.0	4.6	27.7
105	36	9.3	5.0	4.3	26.8
110	35	8.9	5.0	3.9	25.9
115	34	8.6	5.0	3.6	25.0
120	33	8.4	5.0	3.3	24.0
125	32	8.1	5.0	3.1	23.1
130	31	7.9	5.0	2.8	22.1
135	30	7.6	5.0	2.6	21.1
140	29	7.4	5.0	2.4	20.1
145	28	7.2	5.0	2.2	19.0
150	28	7.0	5.0	2.0	18.0
180	24	6.1	5.0	1.1	11.4
210	21	5.4	5.0	0.4	4.4
240	19	4.8	4.8	0.0	0.0
270	17	4.4	4.4	0.0	0.0
300	16	4.0	4.0	0.0	0.0

DRAINAGE AREA III

(ONE HUNDRED YEAR EVENT)

Roof Area:	0	sq.m	1.00
Asphalt/Concrete Area:	995	sq.m	1.00
Gravel Area:	0	sq.m	0.875
Landscaped Area:	126	sq.m	0.25
Total Catchment Area:	1121	sq.m	0.92

Maximum Release Rate: 14.7 L/s

Maximum Volume Required: 23.4 cu.m

Time (min)	i (mm/hr)	2.78AiC (L/s)	Release Rate (L/s)	Stored Rate (L/s)	Stored Volume (cu.m)
5	243	69.3	14.7	54.5	16.4
10	179	51.0	14.7	36.2	21.7
15	143	40.8	14.7	26.1	23.4
20	120	34.2	14.7	19.5	23.4
25	104	29.6	14.7	14.9	22.4
30	92	26.2	14.7	11.5	20.7
35	83	23.6	14.7	8.8	18.6
40	75	21.4	14.7	6.7	16.1
45	69	19.7	14.7	5.0	13.4
50	64	18.3	14.7	3.5	10.6
55	60	17.0	14.7	2.3	7.6
60	56	16.0	14.7	1.2	4.4
65	53	15.0	14.7	0.3	1.2
70	50	14.2	14.2	0.0	0.0
75	47	13.5	13.5	0.0	0.0
80	45	12.8	12.8	0.0	0.0
85	43	12.3	12.3	0.0	0.0
90	41	11.7	11.7	0.0	0.0
95	39	11.3	11.3	0.0	0.0
100	38	10.8	10.8	0.0	0.0
105	36	10.4	10.4	0.0	0.0
110	35	10.0	10.0	0.0	0.0
115	34	9.7	9.7	0.0	0.0
120	33	9.4	9.4	0.0	0.0
125	32	9.1	9.1	0.0	0.0
130	31	8.8	8.8	0.0	0.0
135	30	8.6	8.6	0.0	0.0
140	29	8.3	8.3	0.0	0.0
145	28	8.1	8.1	0.0	0.0
150	28	7.9	7.9	0.0	0.0
180	24	6.8	6.8	0.0	0.0
210	21	6.0	6.0	0.0	0.0
240	19	5.4	5.4	0.0	0.0
270	17	4.9	4.9	0.0	0.0
300	16	4.5	4.5	0.0	0.0