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SITE SERVICING AND STORMWATER MANAGEMENT REPORT

FOR

RICHCRAFT GROUP OF COMPANIES
19 CENTREPOINTE DRIVE

CITY OF OTTAWA

PROJECT NO.: 19-1145
CITY APPLICATION NO.: D07-12-21-0071

FEBRUARY 2023 – REV 6
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SITE SERVICING AND STORMWATER MANAGEMENT REPORT
FOR
19 CENTREPOINTE DRIVE

RICHCRAFT GROUP OF COMPANIES

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FOR
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1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Richcraft Group of Companies to prepare a Site Servicing and Stormwater Management report in support of the application for a Site Plan Control (SPC) at 19 Centrepointe Drive.

The subject property is located within the City of Ottawa urban boundary, in the College Ward. As illustrated in ***Figure 1,*** below, the subject property is located south of the intersection of Centrepointe Drive and Gemini Way. Comprised of a single parcel, the subject property measures approximately ***0.75 ha*** and is zoned Mixed-Use Centre Zone.

Figure 1: Site Location

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The proposed SPC would allow for the development of a residential building with a 21-storey and 23-storey tower, adjoined by a podium fronting onto Centrepointe Drive. The proposed development would include approximately 4,570 m^2 of communal amenity space and underground parking with access from Gemini Way. The residential component is comprised of approximately 424 units. A copy of the Site Plan is included in ***Drawings/Figures***.

The objective of this report is to support the application for Site Plan Control providing sufficient detail to demonstrate that the proposed development is supported by existing municipal servicing infrastructure and that the site design conforms to current City of Ottawa design standards.

1.1 Existing Conditions

The existing site is currently an undeveloped parcel. The elevations range between 82.91 m and 87.24 m, with a grade change of approximately 0.42% from the Southwest to the Northeast corner of the property. The existing site contains a swale that conveys drainage from the eastern property boundary toward a catchbasin connected to the Gemini Way storm sewer. Based on the 1K mapping obtained from the City, it is anticipated that runoff collected from ***0.503 ha*** of the property to the East contributes stormwater to the subject site.

Sewer and watermain mapping collected from the City of Ottawa indicate that the following services exist across the property frontages within the adjacent municipal right-of-ways:

Centrepointe Drive

- 305 mm diameter ductile iron watermain;
- 900 mm concrete storm sewer, tributary to the Pinecrest Creek;
- 250/300 mm diameter PVC sanitary sewer, tributary to the Woodroffe Diversion Trunk via the Woodroffe Diversion Forcemain; and
- 250/300 mm diameter PVC sanitary sewer, tributary to the Lynwood Collector.

Gemini Way

- 203 mm diameter ductile iron watermain;
- 375 mm concrete storm sewer, tributary to the Pinecrest Creek; and
- 300 mm diameter PVC sanitary sewer, tributary to the Woodroffe Diversion Trunk via the Woodroffe Diversion Forcemain.

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1.2 Required Permits / Approvals

The proposed development is subject to the site plan control approval process. The City of Ottawa must approve the engineering design drawings and reports prior to the issuance of site plan control.

The proposed development is a single parcel, is not intended for industrial use, and is within the separated sewer system; thus, the stormwater management system qualifies for an exemption under the OWRA.

1.3 Pre-consultation

Pre-consultation correspondence, along with the servicing guidelines checklist, is located in ***Appendix A***.

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2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following studies were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**,
  City of Ottawa, *SDG002,* October 2012.
  (City Standards)

  - **Technical Bulletin ISDTB-2014-01**
    City of Ottawa, February 5, 2014.
    (*ISDTB-2014-01*)

  - **Technical Bulletin PIEDTB-2016-01**
    City of Ottawa, September 6, 2016.
    (*PIEDTB-2016-01*)

  - **Technical Bulletin ISTB-2018-01**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-01*)

  - **Technical Bulletin ISTB-2018-03**
    City of Ottawa, March 21, 2018.
    (*ISTB-2018-03*)

  - **Technical Bulletin ISTB-2019-01**
    City of Ottawa, January, 2019.
    (*ISTB-2019-01*)

  - **Technical Bulletin ISTB-2019-02**
    City of Ottawa, July 8, 2019.
    (*ISTB-2019-02*)

- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, July 2010.
  (Water Supply Guidelines)

  - **Technical Bulletin ISD-2010-2**
    City of Ottawa, December 15, 2010.
    (*ISD-2010-2*)

  - **Technical Bulletin ISDTB-2014-02**
    City of Ottawa, May 27, 2014.
    (*ISDTB-2014-02*)

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- **Technical Bulletin ISDTB-2018-02**
  City of Ottawa, March 21, 2018.
  (*ISDTB-2018-02*)

- **Technical Bulletin ISTB-2021-03**
  City of Ottawa, August 18, 2021.
  (*ISTB-2021-03*)

- **Design Guidelines for Sewage Works,**
  Ministry of the Environment, 2008.
  (MOE* Design Guidelines*)

- **Stormwater Planning and Design Manual,**
  Ministry of the Environment, March 2003.
  (SWMP Design Manual)

- **Ontario Building Code Compendium**
  Ministry of Municipal Affairs and Housing Building Development Branch,
  January 1, 2010 Update.
  (OBC)

- ***Stormwater Management Guidelines for the Pinecrest Creek/Westboro Area***
  J.F. Sabourin and Associates, Inc., June 2012.
  (PCW SWM)

- **Centrepointe Town Centre Functional Servicing Study**
  Dillon Consulting Ltd., November 2008.
  (DILLON FSS)

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3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 2W2C pressure zone, as shown by the Pressure Zone map in ***Appendix B***. A local 305 mm diameter watermain is available to service the subject property within the Centrepointe Drive right-of-way, as well as, a local 203 mm diameter watermain within the Gemini Way right-of-way. Based on City as-builts, there is an existing 152 mm diameter watermain stub extended towards the subject site.

3.2 Water Supply Servicing Design

In accordance with City of Ottawa technical bulletin ***ISDTB-2014-02***, redundant service connections will be required due to an estimated design flow of greater than 50 m^3/day.

The development is proposed to be serviced by dual 150 mm diameter connections to the existing 203 mm diameter watermain within Gemini Way and to the 305 mm diameter watermain within Centrepointe Drive. Refer to drawing ***SSP-1*** for a detailed servicing layout. Based on as-built drawings provided by the City of Ottawa, there is an existing fire hydrant fronting the property along Gemini Way.

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

Table 1
Water Supply Design Criteria

Design Parameter	Value
Residential 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Residential 2 Bedroom + Den Apartment	2.7 P/unit
Residential Average Daily Demand	280 L/d/P
Residential Maximum Daily Demand	2.5 x Average Daily *
Residential Maximum Hourly	5.5 x Average Daily *
Amenity Space	2.5 L/m^2/d
Commercial Maximum Daily Demand	1.5 x avg. day
Commercial Maximum Hour Demand	1.8 x max. day
Minimum Watermain Size	150 mm diameter
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350 kPa and 480 kPa
During normal operating conditions pressure must not drop below	275 kPa
During normal operating conditions pressure must not exceed	552 kPa
During fire flow operating pressure must not drop below	140 kPa

Daily average based on Appendix 4-A from **Water Supply Guidelines*
*** Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons.*
-Table updated to reflect ISD-2010-2

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Table 2, below, summarizes the estimated water supply demand and boundary conditions for the proposed development based on the ***Water Supply Guidelines***.

Table 2
Water Demand and Boundary Conditions
Proposed Conditions

Design Parameter	Estimated Demand[1] (L/min)	Boundary Condition[2] (m H_2O / kPa) Gemini Way	Boundary Condition[2] (m H_2O / kPa) Centrepointe Drive
Average Daily Demand	231.5	49.4 / 484.5	49.4 / 480.7
Max Day + Fire Flow	571.4 + 20,000 = 20,571.4	16.9 / 165.7	36.4 / 353.2
Peak Hour	1,252.8	42.4 / 415.8	42.4 / 412.0

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.
2) Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation 85.11 and 85.5m respectively. See ***Appendix B.***

Fire flow requirements are to be determined in accordance with City of Ottawa ***Water Supply Guidelines*** and the Ontario Building Code.

Fire flow requirements were estimated per City of Ottawa Technical Bulletin ***ISTB-2018-02***. The following parameters were coordinated with the architect:

- Type of construction – Non-Combustible Construction;
- Occupancy type – Limited Combustibility; and
- Sprinkler Protection – Fully supervised sprinklered System.

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

The City provided both the anticipated minimum and maximum water pressures, as well as, the estimated water pressure during fire flow demand for the demands indicated by the correspondence in ***Appendix B***. As shown by ***Table 2,*** above, the minimum and maximum pressures fall within the required range identified in ***Table 1***.

Table 3, below, summarizes the estimated fire flow demands based on the FUS method and summarizes the available fire hydrants within 75 and 150 meters from each tower. Detailed calculations can be found in ***Appendix B***.

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Table 3
FUS Required Fire Flow Summary

Phase	Required Fire Flow (L/min)	Fire Hydrant(s) within 75 Meters (5,700 L/min)	Fire Hydrant(s) within 150 Meters (3,800 L/min)	Combined Fire Flow Available (L/min)
Tower A	17,000	EX. FH2	EX. FH1, EX. FH3 EX. FH4, EX. FH5	20,900
Tower B + Podium	14,000	EX. FH1, EX. FH2	EX. FH3, EX. FH4, EX. FH5	22,800

See the Conceptual Site Plan located in the **Drawings and Figures section for contemplated tower locations*

The above assumptions result in a maximum fire flow of approximately ***17,000 L/min***. A certified fire protection system specialist will need to be employed to design the building fire suppression system and confirm the actual fire flow demand. A mechanical engineer is required to provide a stamped and sealed letter to verify that requirements for the fully supervised sprinkler system will be met during the detailed design stage.

Based on ***Table 3***, there are a sufficient number of existing fire hydrants to support the development. Hydrant locations are identified on the *Existing Fire Hydrants* figure included in ***Appendix B***.

3.3 Water Supply Conclusion

Estimated water demand under proposed conditions was submitted to the City of Ottawa for establishing boundary conditions. Based on boundary conditions provided by the City the existing municipal water infrastructure is capable of providing the proposed development with water within the City's required pressure range.

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4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The subject site is located on the border between the Woodroffe Diversion Trunk and the Lynwood Collector Trunk, as shown by the City sewer mapping included in ***Appendix C***. An existing 300 mm diameter sanitary sewer within Gemini Way and an existing 250/300 mm diameter sanitary sewer within Centrepointe Drive are available to service the proposed development. The municipal sewer system fronting the subject site is tributary to the Woodroffe Diversion Trunk, which is located approximately 550 m downstream of the site.

Based on City as-builts an existing 200 mm diameter sanitary stub has been extended up to the subject site.

4.2 Wastewater Design

Based on coordination with the development mechanical engineer, a sanitary connection to each tower will be required to service the entire development. The proposed development will be serviced via the existing 250/300mm diameter sanitary sewer within Centrepointe Drive via two 300 mm diameter sanitary services. Refer to drawing ***SSP-1*** for a detailed servicing layout.

Table 4, below***,*** summarizes the ***City Standards*** employed in the design of the proposed wastewater sewer system.

Table 4
Wastewater Design Criteria

Design Parameter	Value
Residential 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 P/unit
Average Daily Demand	280 L/d/per
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0 Harmon's Corrector Factor 0.8
Amenity Floor Space	5 $L/m^2/d$
Infiltration and Inflow Allowance	0.05 L/s/ha (Dry Weather) 0.28 L/s/ha (Wet Weather) 0.33 L/s/ha (Total)
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Minimum Sewer Size	200 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.	

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Table 5, below, demonstrates the estimated peak flow from the proposed development. See ***Appendix C*** for associated calculations.

Table 5
Summary of Estimated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	2.77
Estimated Peak Dry Weather Flow	8.17
Estimated Peak Wet Weather Flow	8.38

The estimated sanitary flow, based on the ***Site Plan*** included in ***Drawings/Figures,*** results in a peak wet weather flow of **8*.3 L/s***; detailed calculations are included in ***Appendix C***.

Dillon Consulting Ltd. prepared a Functional Servicing Study for the Centrepointe Town Centre development in November 2008 ***(DILLON FSS)***. The analysis contemplated that the subject site would be developed to contain two residential towers. The anticipated peak flow rate for the subject site was estimated to be ***5.96 L/s,*** see ***Appendix C*** for associated excerpts.

The ***Dillon FSS*** reviewed the existing sanitary sewers from the subject site to the Woodroffe Diversion Trunk. ***Dillon FSS***'s analysis suggested that the critical leg of sewer is between MHID's 16927 and 18693, with the remaining sewers to be upgraded to allow for the Centrepointe Town Centre to be developed. According to City as-built drawings, the critical leg is a 300 mm diameter sanitary sewer situated at a 0.20% slope with an available capacity of ***43.2 L/s***. Based on the ***DILLON FSS***, approximately ***32.07 L/s*** of wastewater flow is estimated to be conveyed by the critical leg of sanitary sewer. Therefore, the residual capacity is ***11.13 L/s***. Note that the Dillon analysis considered a residential flow rate of 350 L/person/day, consistent with City Standards in 2008. Updated City of Ottawa technical bulletins assign smaller flow rates; therefore, the capacity of the sanitary sewer is expected to be greater than ***11.13 L/s***.

As per the ***Dillon FSS***, the anticipated peak flow rate for the contemplated development was ***5.96 L/s***. Based on the site stats prepared by Roderick Lahey Architect Inc., the estimate peak wet weather flow rate for the development is ***8.38 L/s***, resulting in an increase of approximately ***2.75 L/s***. Based on the ***DILLON FSS***, the residual capacity of the receiving sewer is ***11.13 L/s***, therefore the existing sewer system has sufficient capacity to support the development.

4.3 Wastewater Servicing Conclusions

The site is tributary to the Woodroffe Diversion Trunk sanitary sewer. An existing 250/300 mm diameter sanitary sewer within Centrepointe Drive is available to service the proposed development.

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Based on the ***Dillon FSS***, sufficient capacity is available to accommodate the estimated ***8.33 L/s*** peak wet weather flow from the proposed development.

The proposed wastewater design conforms to all relevant ***City Standards***.

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5.0 STORMWATER MANAGEMENT

5.1 Existing Stormwater Services

Stormwater runoff from the subject property is tributary to the City of Ottawa sewer system and is located within the Ottawa Central sub-watershed. As such, approvals for proposed development within this area are under the approval authority of the City of Ottawa.

Flows that influence the watershed in which the subject property is located are further reviewed by the principal authority. The subject property is located within the Pinecrest Creek sub-watershed, and is therefore subject to review by the Rideau Valley Conservation Authority (RVCA).

Based on City as-builts, an existing 375 mm diameter storm service stub, connecting to the existing storm sewer within Gemini Way, has been extended towards the subject site.

It was assumed that the subject site contained no stormwater management controls for flow attenuation. The estimated pre-development peak flows for the 2, 5, and 100-year events from the ***0.7548 ha*** drainage area are summarized in ***Table 6,*** below:

Table 6
Summary of Existing Peak Storm Flow Rates

City of Ottawa Design Storm	Estimated Peak Flow Rate (L/s)
2-year	15.7
5-year	21.1
100-year	44.9

Based on the 1K mapping obtained from the City, it is anticipated that runoff collected from ***0.503 ha*** of the property to the East contributes stormwater to the subject site. Any external drainage determined to enter the site will be conveyed through cut-off swales to maintain existing drainage patterns.

5.2 Post-development Stormwater Management Target

Stormwater management requirements for the proposed development were reviewed with the City of Ottawa, where the proposed development is required to:

- Meet an established release rate of ***33.5 L/s/ha***, based on the ***PCW SWM***;
- Attenuate all storms up to and including the City of Ottawa 100-year design event on site; and
- Provide quality controls to an enhanced level of treatment due to the site's distance from the outlet; correspondence with the RVCA is included in ***Appendix A***.

Based on the above the allowable release rate for the development is ***25.3 L/s***.

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Further, as the site is within the Pinecrest Creek Sub-Watershed, additional Low Impact Development (LIDs) strategies are required. As outlined in ***PCW SWM:***

- Direction/re-direction of downspouts/roof drainage to landscaped areas to minimize runoff.
- Amended topsoil, or a depth of topsoil up to 300 mm to provide runoff volume reduction benefits as a best practice for soft landscaped surfaces.
- A minimum on-site retention of the 10 mm design storm. Green rooves, rain harvesting measures and/or a combination of detention/retention measures to provide further runoff volume reduction.

Based on the requirement to retain the 10 mm design storm onsite, it is estimated approximately ***76.0 m^3*** of storage will be required.

5.3 Proposed Stormwater Management System

To meet the stormwater objectives the proposed development will contain an internal cistern. The development proposes to connect to the existing 375 mm diameter storm sewer within Gemini Way via a 200 mm diameter service. Refer to drawing ***SSP-1*** for a detailed servicing layout.

Stormwater runoff collected from the roof area and from the surface drains will be directed to an internal stormwater cistern with a minimum storage capacity of ***280.7m^3*** via the internal plumbing system. Given the size of the site, a holding tank will be required to capture runoff from a portion of the site (690 m^2) which will then be routed to the main cistern. The holding tank will discharge to the main cistern at a maximum flowrate of ***0.5 L/s.*** The pumped flow from the main cistern will outlet to the Gemini Way storm sewer at a maximum release rate of **14*.6 L/s***, as shown by drawing ***SSP-1***. Foundation drains are to be connected downstream of any cistern controls.

Table 7, below, summarizes post-development flow rates. Uncontrolled areas will be compensated for in areas with flow attenuation controls.

Table 7
Stormwater Flow Rate Summary

Control Area	5-Year Release Rate	5-Year Storage	100-Year Release Rate	100-Year Storage
	(L/s)	(m^3)	(L/s)	(m^3)
Unattenuated Areas	5.0	0.0	10.7	0.0
Attenuated Areas	14.6	127.6	14.6	366.1
Total	**19.6**	**127.6**	**25.3**	**366.1**

It is calculated that approximately **366.1** ***m^3*** of storage will be required on site consisting of a minimum of ***280.7m^3*** from the cistern, ***42.9 m^3*** from a holding tank and ***42.6m^3*** from the rooftops to attenuate flow to the established release rate of ***25.3 L/s***; storage calculations are contained within ***Appendix D***.

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Refer to drawing ***SWM-1*** for an illustration of existing drainage conditions within the site. As discussed in Section 5.1, it is anticipated that runoff collected from ***0.503 ha*** of the property to the East (drainage area EX-1) contributes stormwater into the existing swale within the subject site. Stormwater from the site and this external area (drainage areas EX-1 and EX-2) is conveyed towards an existing catch basin located at the northeast corner of the property. In order to maintain existing drainage patterns and flow rates, site runoff will be controlled to pre-development release rates, and the external drainage (EX-1) will be conveyed via a cut-off swale to a proposed catchbasin connected to the site service to the Gemini Way storm sewer, to maintain pre-development flow conditions.

It is expected that the 10 mm design event will be met through the use of an internal tank used solely for irrigation purposes. Detailed design of the irrigation system to be designed by an irrigation specialist.

Enhanced quality controls are proposed to be provided via an oil grit separator that has been sized to provide 80% TSS removal (refer to ***Appendix D***). Stormwater will be collected and conveyed to the internal cistern via the plumbing system, where it will then be pumped to the outlet. Mechanical engineer to provide cistern details. The RVCA has been contacted to review quality controls measures, however a response was not provided at the time of publication.

5.4 Stormwater Servicing Conclusions

Post development stormwater runoff will be required to be restricted to the allowable target release rate for storm events up to and including the 100-year storm in accordance with ***PCW SWM***. The post-development allowable release rate was calculated as ***25.3 L/s***. It is estimated that ***366.1 m^3*** of storage will be required to meet this release rate.

It is estimated that ***76.0 m^3*** of storage will be provided to meet the ***PCW SWM*** LID requirement to retain the 10 mm design storm onsite. LID requirements are proposed to be provided via an irrigation system.

Based on consultation with the RVCA, stormwater enhanced quality controls are required due to the distance to the outlet. Enhanced quality controls are anticipated to be provided through the use of an oil grit separator.

The proposed stormwater design conforms to all relevant ***City Standards*** and Policies for approval.

6.0 UTILITIES

Gas and Hydro services currently exist within the Gemini Way and Centrepointe Drive rights-of-way. Utility servicing will be coordinated with the individual utility companies prior to site development.

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There is an existing Bell utility building located East of the subject site. Locations of existing Bell infrastructure are to be coordinated with Bell.

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7.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate and topography. During construction the extent of erosion losses is exaggerated due to the removal of vegetation and the top layer of soil becoming agitated.

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

Silt fence will be installed around the perimeter of the site and will be cleaned and maintained throughout construction. Silt fence will remain in place until the working areas have been stabilized and re-vegetated.

Catch basins will have SILTSACKs or an approved equivalent installed under the grate during construction to protect from silt entering the storm sewer system.

A mud mat will be installed at the construction access in order to prevent mud tracking onto adjacent roads.

Erosion and sediment controls must be in place during construction. The following recommendations to the contractor will be included in contract documents:

- Limit extent of exposed soils at any given time;
- Re-vegetate exposed areas as soon as possible;
- Minimize the area to be cleared and grubbed;
- Protect exposed slopes with plastic or synthetic mulches;
- Install silt fence to prevent sediment from entering existing ditches;
- No refueling or cleaning of equipment near existing watercourses;
- Provide sediment traps and basins during dewatering;
- Install filter cloth between catch basins and frames;
- Plan construction at proper time to avoid flooding; and
- Establish material stockpiles away from watercourses, so that barriers and filters may be installed.

The contractor will, at every rainfall, complete inspections and guarantee proper performance. The inspection is to include:

- Verification that water is not flowing under silt barriers; and
- Clean and change filter cloth at catch basins.

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8.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by Richcraft Group of Companies to prepare a Site Servicing and Stormwater Management Report in support of the application for a Site Plan Control (SPC) at 19 Centrepointe Drive. The preceding report outlines the following:

- Based on boundary conditions provided by the City the existing municipal water infrastructure is capable of providing the proposed development with water within the City's required pressure range;
- The FUS method for estimating fire flow indicated ***17,000 L/min*** is required for the proposed development;
- The proposed development is estimated to have a peak wet weather flow of ***8.38 L/s***; Based on the ***DILLON FSS*** the existing municipal sewer infrastructure has sufficient capacity to support the development;
- Based on ***PCW SWM,*** the development will be required to attenuate post development flows to an equivalent release rate of ***33.5 L/s/ha*** for all storms up to and including the 100-year storm event;
- Stormwater objectives will be met through storm water retention via an internal cistern. It is estimated that ***366 m^3*** of onsite storage will be required to attenuate flow to the established release rate.
- It is estimated that ***76.0 m^3*** of storage will be provided to meet the ***PCW SWM*** LID requirement to retain the 10 mm design storm onsite; and
- Based on consultation with the RVCA, enhanced stormwater quality controls are required due to the distance to the outlet.

Prepared by,
David Schaeffer Engineering Ltd.

Per: Alexandre Tourigny, P.Eng.

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APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

19-1145 11/05/2021

4.1 General Content

☐	Executive Summary (for larger reports only).	N/A
☒	Date and revision number of the report.	Report Cover Sheet
☒	Location map and plan showing municipal address, boundary, and layout of proposed development.	Drawings/Figures
☒	Plan showing the site and location of all existing services.	Figure 1
☒	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 1.0
☒	Summary of Pre-consultation Meetings with City and other approval agencies.	Section 1.3
☒	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Section 2.1
☒	Statement of objectives and servicing criteria.	Section 1.0
☒	Identification of existing and proposed infrastructure available in the immediate area.	Sections 3.1, 4.1, 5.1
☐	Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
☐	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	N/A
☐	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
☐	Proposed phasing of the development, if applicable.	N/A
☐	Reference to geotechnical studies and recommendations concerning servicing.	N/A
☐	All preliminary and formal site plan submissions should have the following information: -Metric scale -North arrow (including construction North) -Key plan -Name and contact information of applicant and property owner -Property limits including bearings and dimensions -Existing and proposed structures and parking areas -Easements, road widening and rights-of-way -Adjacent street names	SP-1

4.2 Development Servicing Report: Water

☐	Confirm consistency with Master Servicing Study, if available	N/A
☒	Availability of public infrastructure to service proposed development	Section 3.1
☒	Identification of system constraints	Section 3.1
☒	Identify boundary conditions	Section 3.1, 3.2
☒	Confirmation of adequate domestic supply and pressure	Section 3.3

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 3.2
☐	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	N/A
☐	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design	N/A
☐	Address reliability requirements such as appropriate location of shut-off valves	N/A
☐	Check on the necessity of a pressure zone boundary modification	N/A
☒	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range	Section 3.2, 3.3
☒	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Section 3.2, SSP-1
☐	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.	N/A
☒	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 3.2
☐	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	N/A

4.3 Development Servicing Report: Wastewater

☒	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 4.2
☒	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Section 4.2
☐	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.	N/A
☒	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 4.1
☒	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 4.2
☒	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix 'C') format.	Section 4.2, Appendix C
☒	Description of proposed sewer network including sewers, pumping stations, and forcemains.	Section 4.2
☐	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

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

4.4 Development Servicing Report: Stormwater Checklist

☒	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 5.1
☒	Analysis of available capacity in existing public infrastructure.	Section 5.1, Appendix D
☒	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Drawings/Figures
☒	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	Section 5.2
☒	Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 5.2
☒	Description of the stormwater management concept with facility locations and descriptions with references and supporting information	Section 5.3
☐	Set-back from private sewage disposal systems.	N/A
☐	Watercourse and hazard lands setbacks.	N/A
☒	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Appendix A
☐	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	N/A
☒	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 5.3
☐	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
☒	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Section 5.1, 5.3
☐	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
☐	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	N/A
☐	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
☐	Identification of potential impacts to receiving watercourses	N/A
☐	Identification of municipal drains and related approval requirements.	N/A

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

☒	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Section 5.3
☐	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	N/A
☐	Inclusion of hydraulic analysis including hydraulic grade line elevations.	N/A
☒	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 6.0
☐	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
☐	Identification of fill constraints related to floodplain and geotechnical investigation.	N/A

4.5 Approval and Permit Requirements: Checklist

☒	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement ct. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Section 1.2
☐	Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.	N/A
☐	Changes to Municipal Drains.	N/A
☐	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	N/A

4.6 Conclusion Checklist

☒	Clearly stated conclusions and recommendations	Section 8.0
☐	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	
☐	All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario	

*Extracted from the City of Ottawa-Servicing Study Guidelines for Development Applications

19 Centrepointe Drive
Pre-Consultation Meeting Follow Up

Location: Room 4103E, City Hall
Date: September 17, 3pm – 4pm

Attendee	Role	Organization
Mary Dickinson	Planner	City of Ottawa
Ahmed Elsayed	Project Manager (Engineer)	
Josiane Gervais	Project Manager (Transportation)	
Randolph Wang	Urban Designer	
Samantha Gatchene	Planning Assistant	
Brian Casagrande	Planner	Fotenn
Nick Sutherland	Planner	
Kevin Reid	Architect	Roderick Lahey Architects
Kevin Yemm	Owner's Representative	Richcraft
Tim Lee	Owner's Representative	

Information Provided by the Applicant

1. The applicant is proposing three residential high rise apartment buildings at 22, 24 and 28 storeys in total building height at 19 Centrepointe Drive. The towers would be built above a 4-storey podium that would also be residential in nature.
2. Vehicle access is proposed via one access off Gemini Way. Parking will be provided in an underground parking garage.
3. In January 2012, a previous Zoning By-law Amendment application was approved to change the zoning to allow for three (3) fifteen-storey residential towers with an underground parking garage containing 467 parking spaces.
4. A new development concept is being proposed based on the site's location close to future LRT station at Baseline Road / Woodroffe Avenue.

Planning Comments

1. This is a pre-consultation for a Zoning By-law Amendment Application and Official Plan Amendment. Application form, timeline and fees can be found here.
2. Staff have concerns with the height and density being proposed given the area context and the location of the property on the edge of the potential intensification zone around Baseline Station. The site is adjacent to a stable low-

rise residential neighbourhood that will likely not be identified for further intensification.

3. Staff have concerns that the proposed design and height does not adequately transition from the stable low rise residential neighbourhood to the west of the subject site, and heights in the range of 22 to 28 storeys at the edge of the intensification area leads to a question of how the area surrounding Baseline Station will transition up to the highest densities and heights closest to the station.

4. Staff have concerns that tower separations are not adequately being met between the towers and the property lines.

5. Further details are requested on the site layout, including drive aisles, access to underground parking garage, number of levels of underground parking and parking rate proposed for the building. Please note that this area remains under Area C parking requirements.

6. As discussed at the meeting, it remains our expectation that Fotenn will provide the city with a memo outlining the desired approach regarding the Secondary Plan. At this time, staff suggest that an OPA would be required as part of a request to permit heights and densities in the range of what is being proposed. Once the memo is provided, further direction can be given on how to structure the OPA. If the approach ends up being a request for a site specific amendment to the secondary plan policies, this request would need to be supported through a full analysis of the appropriateness of the proposal given the area context. In addition a proposed increase in height and density at the magnitude proposed will need to demonstrate clear conformance to the relevant High Rise Design Guidelines and zoning standards relating to tower separation etc.

7. It is suggested that you reach out to the Councillor's Office to discuss the proposal. As Councillor Chiarelli is technically on leave, please contact Councillor Chiarelli, Councillor Moffatt and Councillor Hubley.

8. It is suggested that you reach out to the Centrepointe Community Association to discuss the proposal in advance of an application being filed.

9. A zoning request to vary the development standards will be categorized as a Minor Rezoning. Please select this category in the application form if you file.

10. Current requirements relating to Section 37 and parkland dedication are in flux as a result of Bill 108. As more information becomes available, it will be shared in a subsequent email.

Engineering Comments

General

- Local Conservation Authority (RVCA) clearance is required.
- Please note that servicing and site works shall be in accordance with the following documents:
    - Ottawa Sewer Design Guidelines (October 2012)
    - Ottawa Design Guidelines-Water Distribution (July 2010)
    - Stormwater Management Planning and Design Manual, Ministry of the Environment, March 2003
    - Technical Bulletin PIEDTB-2016-01
    - Technical Bulletins ISTB-2018-01, ISTB-2018-02 and ISTB-2018-03.
    - Ottawa Design Guidelines – Water Distribution (2010)
    - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
    - City of Ottawa Accessibility Design Standards (2012)
    - Ottawa Standard Tender Documents (latest version)
    - Ontario Provincial Standards for Roads & Public Works (2013)

Stormwater Management Criteria:

- The project area is located with the Pinecrest Creek watershed. Any new development or redevelopment projects within the Pinecrest Creek Watershed are required to implement stormwater management measure that meet the criteria outlined in the *Stormwater Management Guidelines for the Pinecrest Creek/Westboro Area, JFSA, dated June 2012.*
- The drainage and stormwater management system shall be in accordance with the attached ***Stormwater Management Guidelines for the Pinecrest Creek/Westboro Area, JFSA, dated June 2012*** as the project is located with the Pinecrest Creek Watershed. These guidelines provide direction for the implementation of stormwater management measures (water quality, peak flow and volume control criteria) for redevelopment within the Pinecrest Creek/Westboro Area. Excerpts from this report are anticipated to be provided as supporting documentation.
- On site removal of 80% of TSS is required to be achieved and lot level /source control measures are required to be implemented in accordance with *Stormwater Management Guidelines for the Pinecrest Creek/Westboro Area, JFSA, dated June 2012.*
- As per *Technical Bulletin PIEDTB-2016-01 section 8.3.11.1 (p.12 of 14)* **there shall be no surface ponding on private parking areas during the 2-year storm rainfall event**. Depending on the SWM strategy proposed underground or additional underground storage may be required to satisfy this requirement.

- When using the modified rational method to calculate the storage requirements for the site any underground storage (pipe storage etc.) should not be included in the overall available storage. The modified rational method assumes that the restricted flow rate is constant throughout the storm which underestimates the storage requirement prior to the 1:100 year head elevation being
  reached. Please note that if you wish to utilize any underground storage as available storage, the $Q_{(release)}$ must be modified to compensate for the lack of head on the orifice. An assumed average release rate equal to 50% of the peak allowable rate shall be applied. Otherwise, disregard the underground storage as available storage or provide modeling to support SWM strategy.
- Please note that the minimum orifice dia. for a plug style ICD is 83mm and the minimum flow rate from a vortex ICD is 6 L/s in order to reduce the likelihood of plugging.
- Please provide a **Pre-Development Drainage Area Plan** as part of the engineering drawing set to define the pre-development drainage area(s)/patterns.
- A stress-test (100-year plus 20%) of the stormwater management system shall be preformed as per Section 8.3.12 of the City's sewer design guidelines. Drainage systems shall be stress tested using design storms calculated on the basis of a 20% increase in the City's IDF curves rainfall values.
- A stormwater summary table shall be provided in the report.

Sanitary:

- Analysis and demonstration that there is sufficient/adequate residual capacity to accommodate any increase in wastewater flows in the receiving and downstream wastewater systems are required to be provided.
- Please review the wastewater design flow parameters *in Technical Bulletin PIEDTB-2018-01.*

Water:

- The maximum fire flow capacity of a fire hydrant shall be reviewed and documented to ensure a sufficient number of fire hydrants are available to service the proposed development. Please review Technical Bulletin ISTB-2018-
  0. A **fire hydrant coverage plan** shall be provided.
- Please provide the following information to the City of Ottawa via email to request water distribution network boundary conditions for the subject site. Please note that once this information has been provided to the City of Ottawa it takes approximately 5-10 business days to receive boundary conditions.
  - Type of Development
  - Site Address

- A plan showing the proposed water service connection location(s).
- **Average Daily Demand** (L/s)
- **Maximum Daily Demand** (L/s)
- **Peak Hour Demand** (L/s)
- **Fire Flow** (L/min)

  [*Fire flow demand requirements shall be based on Fire Underwriters Survey (FUS) Water Supply for Public Fire Protection 1999*]

- **FUS Fire Flow Calculations**

Geotechnical Investigation:

- A Geotechnical Study shall be prepared in support of this development proposal.
- Soil infiltration rates are to be provided to support proposed SWM infiltration measures.

Please note that these comments are considered preliminary based on the conceptual information provided to date and therefore maybe amended as additional details become available and presented to the City.

Transportation Comments

1. Follow Traffic Impact Assessment Guidelines:
   - Traffic Impact Assessment will be required.
   - Start this process asap.
   - Applicant advised that their application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
   - Request base mapping asap if RMA is required. Contact Engineering Services (https://ottawa.ca/en/city-hall/planning-and-development/engineering-services)
2. Corner triangles as per OP Annex 1 - Road Classification and Rights-of-Way at the following locations on the final plan will be required (measure on the property line/ROW protected line; no structure above or below this triangle):
   - Collector Road to Collector Road: 5 m x 5 m
3. Sight triangle as per Zoning by-law is 6 m x 6 m measure on the curb line.
4. Noise Impact Study required for the following:
   - Road (within 100m from major collector)
   - Stationary, if there will be any exposed mechanical equipment due to the proximity to neighboring noise sensitive land uses
5. Minimum clear throat requirements, which are dependent on the number of units, should be met (TAC Table 8.9.3)

A few additional notes for the site plan:

6. Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
7. Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all accesses (entering and exiting and going in both directions).
8. Show all curb radii measurements; ensure that all curb radii are reduced as much as possible.
9. Show lane/aisle widths.
10. Sidewalk is to be continuous across access as per City Specification 7.1.
11. Grey out any area that will not be impacted by this application.

Urban Design Comments

1. Provide a thorough urban design analysis of the existing and planned context to demonstrate:
    a. how does the proposed design respect and respond to the existing urban fabric?
    b. how does the proposed design achieve the objectives of the Official Plan and the relevant design guidelines such as those for high-rise buildings and TODs, including those policies and guidelines with respect to the approach to transit-oriented development, transition, and compatibility?
2. Explore and illustrate possible built form design options that suite the proposed uses and functions. It will be useful to include a comparison with the previously approved design.
3. The project will be subject to UDRP formal review. Given the magnitude of change an addition visit to the UDRP for preconsultation is highly recommended. At the preconsultation, the focus should be on the options for site plan and built form design (rather than architecture details), including building placement, height and massing, relationship with the surroundings including transition, and site circulation.
4. The sketches circulated at the meeting were very draft. Therefore it is probably premature to provide any comment. A few points of caution:
    a. The placement of the towers appears to create a rather imposing situation along Centrepointe Drive;
    b. The tower separations barely meet the minimum requirements in the forth-coming new zoning. The City's expectation is to achieve a minimum separation of 23m and responsibilities for providing tower separations should be equally distributed amongst neighbouring properties.
    c. The proposed heights including their distribution appear to be arbitrary.

Please refer to the links to "Guide to preparing studies and plans" and fees for general information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits

may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-con comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Please contact me at mary.dickinson@ottawa.ca or at 613-580-2424 extension 13923 if you have any questions.

Sincerely,

Mary Dickinson MCIP RPP
Planner II
Development Review - West

Charlotte Kelly

From: Eric Lalande <eric.lalande@rvca.ca>
Sent: November 20, 2019 10:30 AM
To: Charlotte Kelly; Jamie Batchelor
Cc: Alison Gosling; Jamie Batchelor
Subject: RE: Quality Control Requirements - 19 Centrepointe Drive

Hi Charlotte,

The RVCA will require enhanced water quality protection (Min. 80% TSS removal) for the proposed development. Opportunities to integrate best management practices and low impact design are encouraged. Please address how water quality will be achieved for this project within the Stormwater management report for this project.

Thank you,

Eric Lalande, MCIP, RPP
Planner, Rideau Valley Conservation Authority
613-692-3571 x1137

From: Charlotte Kelly <CKelly@dsel.ca>
Sent: Tuesday, November 19, 2019 5:07 PM
To: Jamie Batchelor <jamie.batchelor@rvca.ca>; Eric Lalande <eric.lalande@rvca.ca>
Cc: Alison Gosling <AGosling@dsel.ca>
Subject: Quality Control Requirements - 19 Centrepointe Drive

Good Afternoon Jamie and Eric,

We wanted to touch base with you regarding a development at 19 Centrepointe Drive

The existing site conditions consist of a grassed and treed lot as demonstrated in ***Figure 1,*** below.

The development involves the construction of three 24-storey residential buildings including an access drive aisle, as shown in the contemplated site plan attached. Based on the information available, the development will discharge stormwater to the 375 mm diameter storm sewer within Gemini Way and will travel approximately ***690 m*** to an outlet within the Pinecrest Creek as shown by ***Figure 2*** below.

We anticipate that quality controls will be required as the development proposes to convert existing grassed area to buildings and a drive aisle and is located within the Pinecrest Creek sub-watershed. Can you please review and provide recommendations?

Please feel free to contact me to discuss.

Figure 1: Existing Site Limits

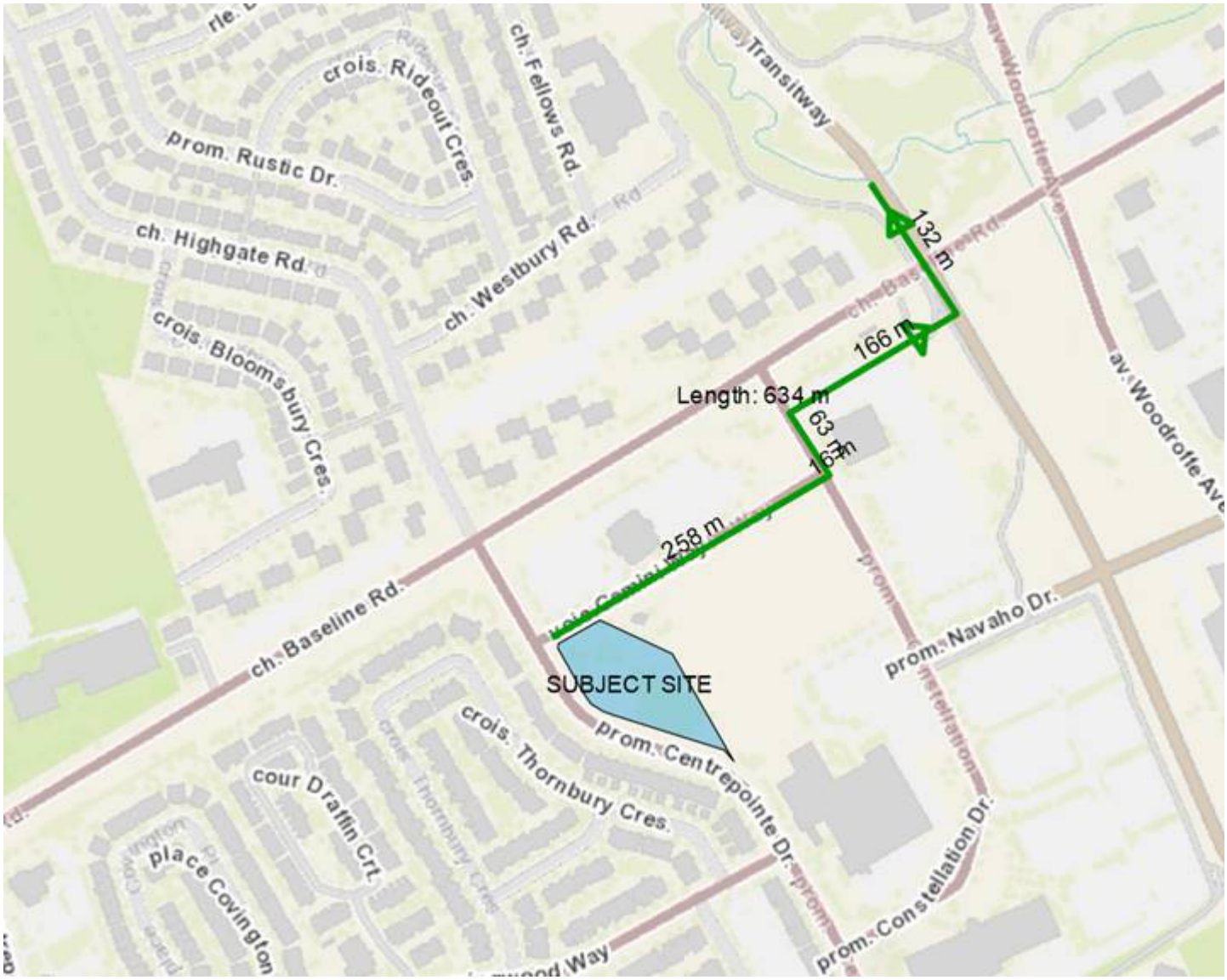

Figure 2: Distance to Outlet

Thank-you,

Charlotte Kelly, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.511
email: ckelly@dsel.ca

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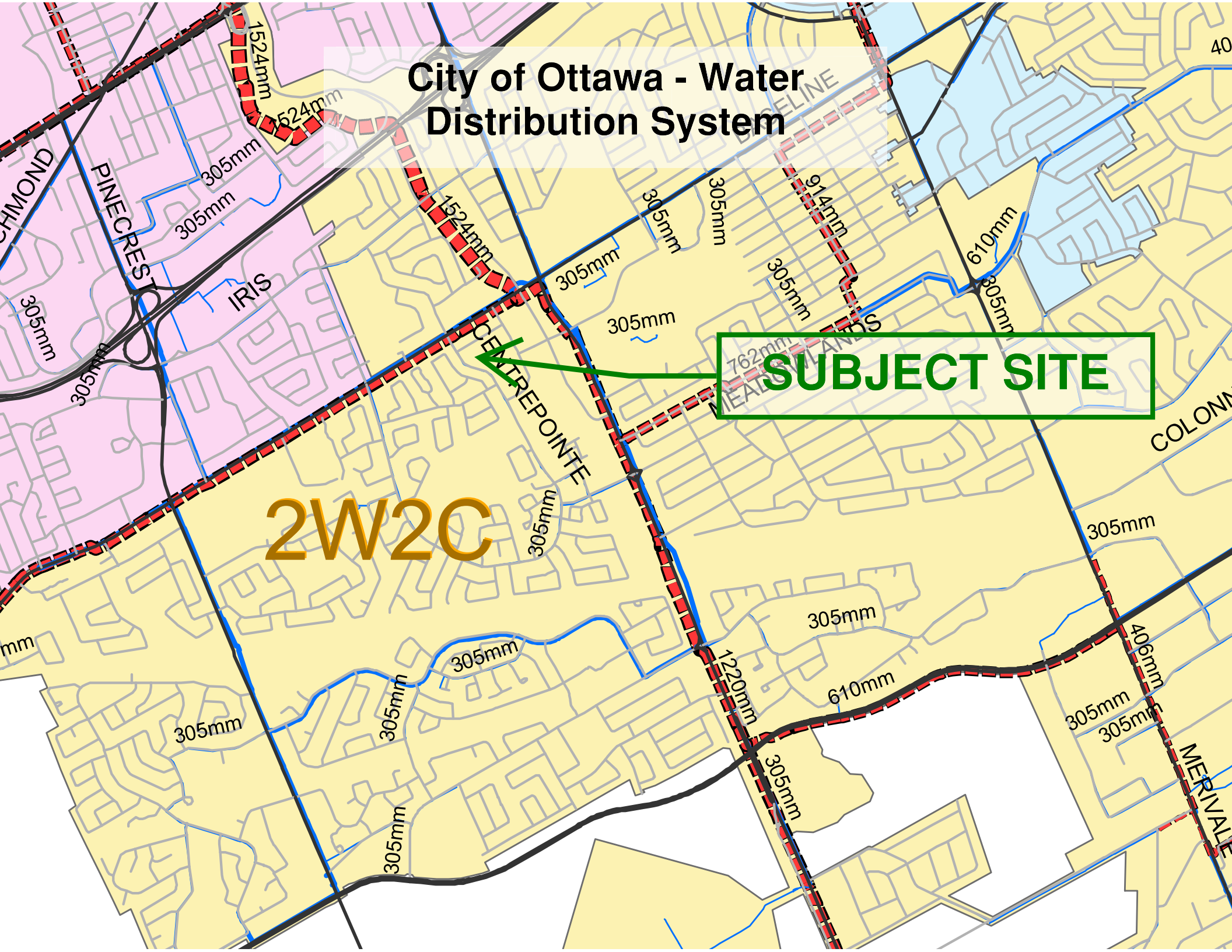
APPENDIX B

Water Supply


City of Ottawa - Water Distribution System
SUBJECT SITE
2W2C
1524mm
1524mm
1524mm
914mm
762mm
610mm
610mm
406mm
1220mm
305mm
PINECREST
IRIS
CENTREPOINTE
BASELINE
MERIVALE

19 CENTREPOINTE DRIVE
EXISTING FIRE HYDRANT FIGURE

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

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4	-	0
Semi-detached	2.7	-	0
Townhouse	2.7	-	0
Apartment			0
Bachelor	1.4	2	3
1 Bedroom	1.4	249	349
2 Bedroom	2.1	168	353
3 Bedroom	3.1	5	16
Average	1.8	-	0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	721	201.9	140.2	504.7	350.5	1110.3	771.1

Institutional / Commercial / Industrial Demand

Property Type	Unit Rate	Units	Avg. Daily m^3/d	Avg. Daily L/min	Max Day m^3/d	Max Day L/min	Peak Hour m^3/d	Peak Hour L/min
Amenity floor space	2.5 $L/m^2/d$	3,250	8.13	5.6	12.2	8.5	21.9	15.2
Commercial	2.5 $L/m^2/d$	164	0.41	0.3	0.6	0.4	1.1	0.8
Total I/CI Demand			8.5	5.9	12.8	8.9	23.0	16.0
Total Demand			**210.4**	**146.1**	**517.5**	**359.4**	**1133.4**	**787.1**

Richcraft Group of Companies
19 Centrepointe Drive
Proposed Site Conditions
Tower A

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$ L/min

*Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Non-Combustible Construction

C	0.8		*Type of Construction Coefficient per FUS Part II, Section 1*
A	17668.3	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	23394.3	L/min
	23000.0	**L/min** *rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%
Fire Flow	**19550.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%
Reduction	**-9775 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Wood Frame	>45m	0	0	0	0%	
S	Non-Combustible	3.1m-10m	30	24	720	20%	
E	Wood Frame	10.1m-20m	11	1	11	12%	
W	Wood Frame	30.1m-45m	37.45	2	75	5%	
		% Increase				**37%**	*value not to exceed 75%*

Increase	**7233.5 L/min**

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	17008.5	L/min *fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section*
	17000.0	**L/min** *rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by RLA.
-Calculations based on Fire Underwriters Survey - Part II

Richcraft Group of Companies
19 Centrepointe Drive
Proposed Site Conditions
Tower B + Podium

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

1. Base Requirement

$$F = 220C\sqrt{A}$$ L/min *Where **F** is the fire flow, **C** is the Type of construction and **A** is the Total floor area*

Type of Construction: Non-Combustible Construction

C	0.8		*Type of Construction Coefficient per FUS Part II, Section 1*
A	19253.2	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	24421.0	L/min
	24000.0	**L/min** *rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%	
Fire Flow	**20400.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-10200**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Non-Combustible	10.1m-20m	30	24	720	15%	
S	Non-Combustible	>45m	0	0	0	0%	
E	Wood Frame	>45m	0	0	0	0%	
W	Wood Frame	30.1m-45m	72	2	144	5%	
		% Increase				**20%**	*value not to exceed 75%*

Increase	**4080.0**	**L/min**
		44187.0

Lw = Length of the Exposed Wall
Ha = number of storeys of the adjacent structure. Max 5 stories
LH = Length-height factor of exposed wall. Value rounded up.
EC = Exposure Charge

Total Fire Flow

Fire Flow	14280.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	14000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Notes:
-Type of construction, Occupancy Type and Sprinkler Protection information provided by RLA.
-Calculations based on Fire Underwriters Survey - Part II

Charlotte Kelly

From: Alison Gosling
Sent: November 12, 2019 2:19 PM
To: Charlotte Kelly
Subject: FW: Boundary Condition Request - 19 Centrepoint Drive (19-1045)
Attachments: 19 Centrepointe Nov 2019.pdf

FYI

Alison Gosling, E.I.T.
Junior Project Manager

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.542
cell: (343) 542-9218
email: agosling@dsel.ca
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From: Elsayed, Ahmed <ahmed.elsayed@ottawa.ca>
Sent: November 12, 2019 1:53 PM
To: Alison Gosling <AGosling@dsel.ca>
Subject: FW: Boundary Condition Request - 19 Centrepoint Drive (19-1045)

Hi Alison,

Attached is the boundary condition as requested.

Regards,

Ahmed Elsayed, P. Eng.
Project Manager, Infrastructure Approvals

Planning, Infrastructure and Economic Development Dept.

City of Ottawa
613.580.2400 ext. 21206

From: Khawam, Walid <Walid.Khawam@ottawa.ca>
Sent: November 12, 2019 1:04 PM
To: Elsayed, Ahmed <ahmed.elsayed@ottawa.ca>
Subject: RE: Boundary Condition Request - 19 Centrepoint Drive (19-1045)

The following are boundary conditions, HGL, for hydraulic analysis at 19 Centrepointe Drive (zone 2W) assumed to be connected to the 305mm on Centrepointe and 203mm on Gemini Way (see attached PDF for location).

Minimum HGL = 127.5m

Maximum HGL = 134.5m

MaxDay + FireFlow (333L/s) = 102.0m at Gemini connection

MaxDay + FireFlow (333L/s) = 121.5m at Centrepointe connection

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.

Walid Khawam, P.Eng.
Water Resources Engineer
Planning and Infrastructure Portfolio
City of Ottawa
P: 613-580-2424 Ext. 16658

From: Tousignant, Eric <Eric.Tousignant@ottawa.ca>
Sent: 2019/11/08 9:48 AM
To: Khawam, Walid <Walid.Khawam@ottawa.ca>
Cc: Elsayed, Ahmed <ahmed.elsayed@ottawa.ca>
Subject: FW: Boundary Condition Request - 19 Centrepoint Drive (19-1045)

Hi Walid

Can you provide the water boundary conditions noted below?

Thanks
Eric

From: Elsayed, Ahmed <ahmed.elsayed@ottawa.ca>
Sent: November 08, 2019 9:45 AM
To: Tousignant, Eric <Eric.Tousignant@ottawa.ca>
Subject: FW: Boundary Condition Request - 19 Centrepoint Drive (19-1045)

Good morning Eric,

For hereunder, can you please provide me with the boundary condition?

Also if you have any other concerns about the project please let me know.

Regards,

Ahmed Elsayed, P. Eng.
Project Manager, Infrastructure Approvals

Planning, Infrastructure and Economic Development Dept.

City of Ottawa
613.580.2400 ext. 21206

From: Charlotte Kelly <CKelly@dsel.ca>
Sent: November 06, 2019 5:50 PM
To: Elsayed, Ahmed <ahmed.elsayed@ottawa.ca>
Cc: Alison Gosling <AGosling@dsel.ca>
Subject: Boundary Condition Request - 19 Centrepoint Drive (19-1045)

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Good Afternoon Ahmed,

We would like to request water boundary conditions for 19 Centrepointe Drive using the following contemplated development demands:

1. Location of Service / Street Number: Gemini Way / Centrepointe Drive

2. Type of development and the amount of fire flow required for the proposed development:

   - The development would include approximately ***2001 m²*** of amenity space ***667 units*** divided between ***three*** 24-storey residential condominium / rental buildings.
   - It is anticipated that the development will have a dual connection to be serviced from the existing 203mm diameter watermain within Gemini Way and the existing 305mm diameter watermain within Centrepointe Drive, as shown by the attached map.
   - Fire demand based on Technical Bulletin ISTB-2018-02 has been used to calculate an estimate the max fire demand of ***20,000 L/min***. Refer to the attached for detailed calculations.

Demand	L/min	L/s
Avg. Daily	231.4	3.86
Max Day	574.9	9.58
Peak Hour	1262.8	21.05

If you have any questions, please feel free to contact me.

Boundary Conditions Unit Conversion

Connection 1 (Gemini Way)
Grnd Elev 85.1

	Height	m H_2O	PSI	kPa	
Avg. Day	**134.5**	**49.39**	70.3	484.5	
Peak Hour	**127.5**	**42.39**	60.3	415.8	
Max Day + FF	**102**	**16.89**	24.0	165.7	*Fire Flow (333 L/s)*

Connection 1 (Centrepoint Drive)
Grnd Elev 85.5

	Height	m H_2O	PSI	kPa	
Avg. Day	**134.5**	**49.39**	69.7	480.7	
Peak Hour	**127.5**	**42.39**	59.8	412.0	
Max Day + FF	**121.5**	**36.39**	51.2	353.2	*Fire Flow (333 L/s)*

Thank you,

Charlotte Kelly, E.I.T.
Project Coordinator / Junior Designer

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: (613) 836-0856 ext.511
email: ckelly@dsel.ca

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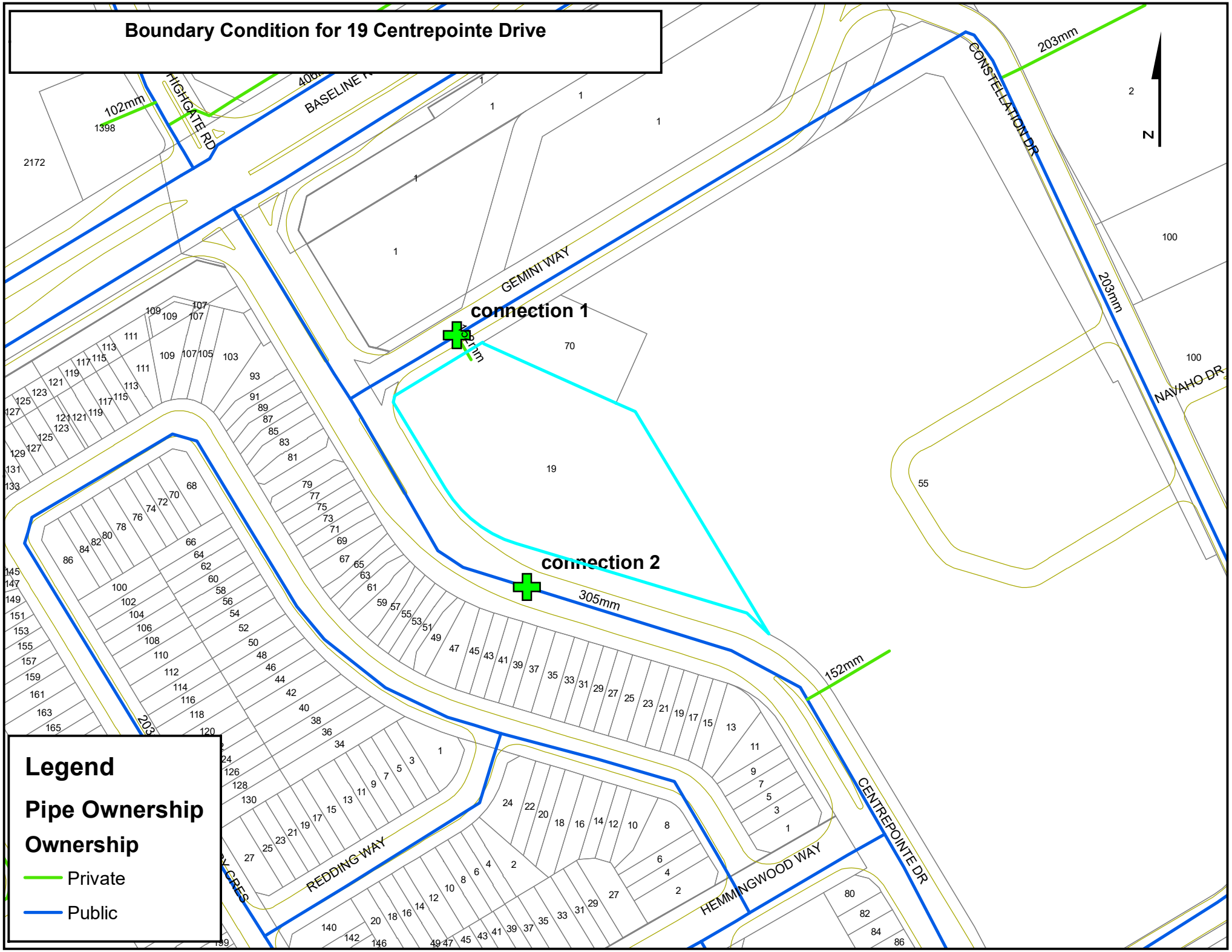
'

Boundary Condition for 19 Centrepointe Drive



Ex. FH 5

142 m

TOWER B

FFE=86.30

LIMIT OF U/G PARKING

EXISTING CB LEAD TO BE REMOVED

EXISTING CATCH BASIN TO BE REMOVED

Ex. FH 1

75 m

SIR GUY CARLETON HIGH SCHOOL ATHLETIC FIELDS

EX. VC

EX. WV

EX. 350mmø WATERMAIN

GEMINI WAY

TOWER A

FFE=85.55

84 m

Ex. FH 4

119 m

CENTREPOINTE DRIVE

115 m

96 m

55 m

137 m

EX. 300mmø WATERMAIN

Ex. FH 2

Ex. FH 3

z:\projects\19-1145_richcraft_19-centrepointe-dr\b_design\b2_drawings\b2-2_main (dsel)\spa_sub5\cad\2022-02-25_1145_spa.dwg

SCALE 1:300

APPENDIX C

Wastewater Collection

Richcraft Group of Companies
19 Centrepointe Drive
Proposed Site Conditions

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

Site Area	0.755	**ha**

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	**0.04**	**L/s**
Infiltration / Inflow (Wet)	**0.21**	**L/s**
Infiltration / Inflow (Total)	**0.25**	**L/s**

Domestic Contributions

Unit Type	**Unit Rate**	**Units**	**Pop**
Apartment			
Bachelor	1.4	2	3
1 Bedroom	1.4	249	349
2 Bedroom	2.1	168	353
3 Bedroom	3.1	5	16
		Total Pop	**721**

Average Domestic Flow	**2.34**	**L/s**
Peaking Factor	**3.31**	
Peak Domestic Flow	**7.73**	**L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**		**No. of Units**	**Avg Wastewater (L/s)**
Amenity Space*	5	$L/m^2/d$	3,250	0.38
Commercial	5	$L/m^2/d$	164	0.02
School	70	L/student/d		0.00
Industrial - Light**	35,000	L/gross ha/d		0.00
Industrial - Heavy**	55,000	L/gross ha/d		0.00
			Average I/C/I Flow	**0.40**

Peak Institutional / Commercial Flow	0.40
Peak Industrial Flow**	0.00
Peak I/C/I Flow	**0.40**

** assuming a 12 hour commercial operation*

Total Estimated Average Dry Weather Flow Rate	**2.77**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**8.17**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**8.38**	**L/s**

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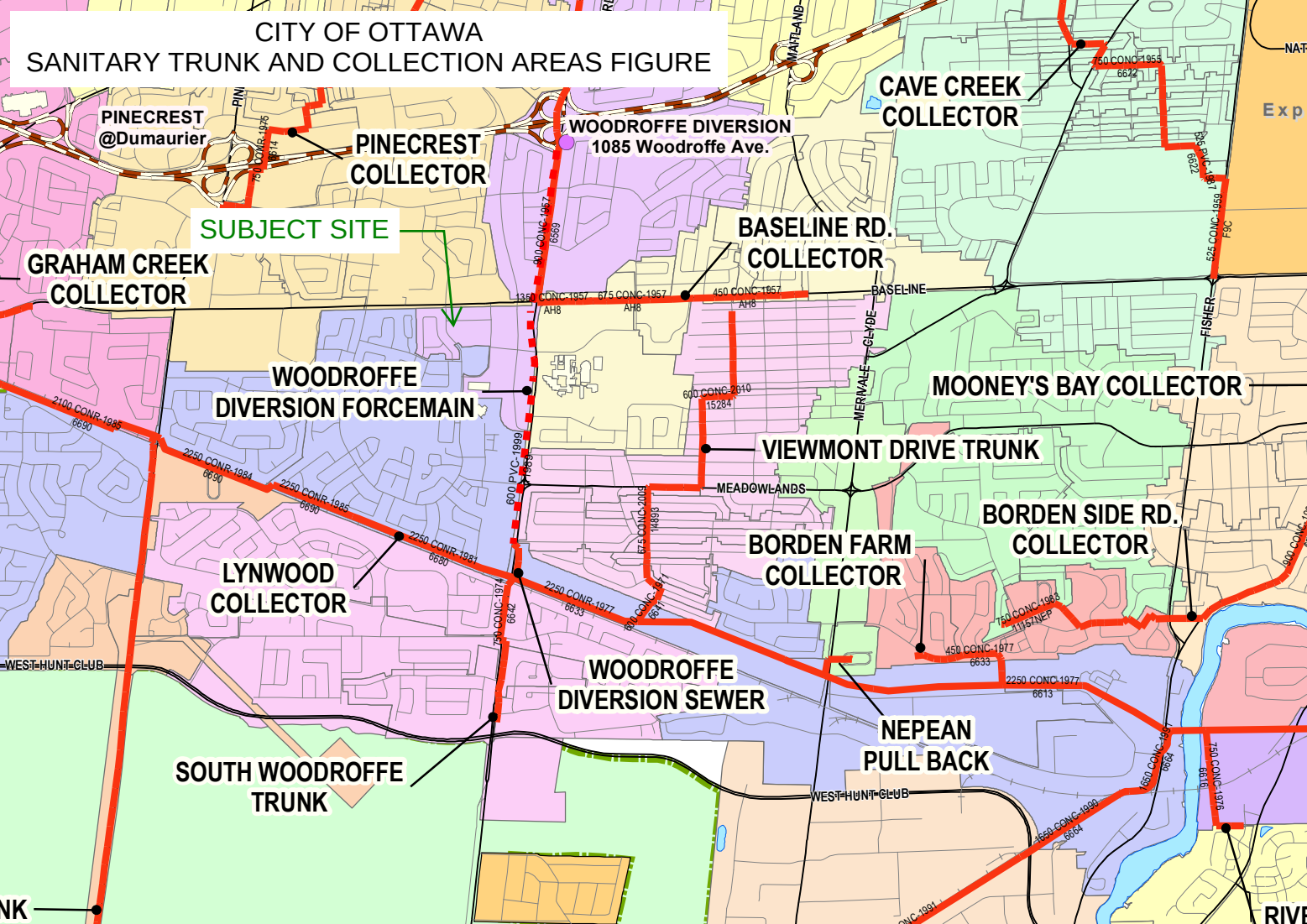
CITY OF OTTAWA
SANITARY TRUNK AND COLLECTION AREAS FIGURE



Centrepointe Town Centre Functional Servicing Study
Excerpts

Dillon Consulting Ltd., November 2008.
(DILLON FSS)

Centrepointe Town Centre
Functional Servicing Study Future Scenario 2031
SANITARY SEWER DESIGN SHEET (Based Upon Metered Flows and Projected Future Population)

Project Name: CTC Functional Servicing Study
Project No: 08-9557

The Peaking Factor was derived:
Using Harmon Formula= Y (Y or N)
From a Table= N
Value from table=

Office Bldg Average Daily Flow= 75 L/Cap/Day
Institutional Average Daily Flow= 90 L/Cap/Day
Residential Average Daily Flow= 350 L/Cap/Day
Peak Extraneous Flow= 0.280 L/ha/S

Outlet Invert Elevation= 0.000
Mannings 'n'= 0.013
184.700
or
Total Area= -

City of Ottawa

Location			Flow Characteristics																		Sewer Design/Profile									Cover
ROAD/STN	LOCATION		INDIVIDUAL						CUMULATIVE						PEAKING FACTOR (RES) M	PEAKING FACTOR INS/COM	POP FLOW Q(p) (L/s)	PEAK EXTR. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	CAPACITY (L/s)	% Capacity	LENGTH (m)	PIPE DIA. (mm)	SLOPE (%)	UPPER INVERT (m)	LOWER INVERT (m)	FALL (m)	VELOCITY (m/s)	COVER UPPER MH (m)
	FROM MH	TO MH	POP (RES)	POP (COM)	POP (INS)	METERED FLOW(L/s) (COM)	METERED FLOW(L/s) (INS)	AREA (ha.)	POP (RES)	POP (COM)	POP (INS)	METERED FLOW(L/s) (COM)	METERED FLOW(L/s) (INS)	AREA (ha.)															
Centrepointe	16468	16467	750			0.00	0.00	7.155	750	0	0	0.00	0.00	7.15	3.877		11.779	2.003	**13.78**	**58.02**	**23.75**	18.00	300	0.36	82.541	82.476	0.065	0.82	3.46
Constellation E/W	16467	16928	190			0.00	0.00	0.684	940	0	0	0.00	0.00	7.84	3.817		14.535	2.195	**16.73**	**38.68**	**43.25**	51.00	300	0.16	82.476	82.395	0.082	0.55	3.52
Constellation E/W	16928	16929				0.81	0.00	1.223	940	0	0	0.81	0.00	9.06	3.817		15.345	2.537	**17.88**	**43.25**	**41.35**	72.00	300	0.20	82.395	82.251	0.144	0.81	3.61
Constellation E/W	16929	16930	480			0.00	0.00	1.554	1420	0	0	0.81	0.00	10.62	3.697		22.074	2.972	**25.05**	**42.15**	**59.42**	80.10	300	0.19	82.251	82.098	0.152	0.60	4.32
Constellation E/W	16930	16931				0.00	0.00	0.114	1420	0	0	0.81	0.00	10.73	3.697		22.074	3.004	**25.08**	**49.31**	**50.86**	54.40	300	0.26	82.098	81.957	0.141	0.70	4.31
Constellation N/S	16931	16927				0.00	0.00	0.034	1420	0	0	0.81	0.00	10.76	3.697		22.074	3.014	**25.09**	**53.84**	**46.60**	15.80	300	0.31	81.957	81.908	0.049	0.76	4.32
Constellation N/S	16921	16922				0.00	0.00	0.619	0	0	0	0.00	0.00	0.62			0.000	0.173	**0.17**	**0.00**	**0.00**	61.50	250	0.00	83.400	83.400	0.000	0.00	2.93
Constellation N/S	16922	16923				0.00	0.00	0.999	0	0	0	0.00	0.00	1.62			0.000	0.453	**0.45**	**19.72**	**2.30**	116.50	250	0.11	83.190	83.062	0.128	0.40	3.15
Constellation N/S	16923	16924				0.00	0.00	1.564	0	0	0	0.00	0.00	3.18			0.000	0.891	**0.89**	**5.95**	**14.98**	102.00	250	0.01	82.740	82.730	0.010	0.12	3.60
Constellation N/S	16924	NMH1				0.00	0.00	0.440	0	0	0	0.00	0.00	3.62	4.500		0.000	1.014	**1.01**	**11.89**	**8.52**	30.96	250	0.04	82.730	82.717	0.012	0.24	3.61
Navaho	NMH1	NMH5	1440			0.00	0.00	0.233	1440	0	0	0.00	0.00	3.85	3.692		21.538	1.079	**22.62**	**26.59**	**85.05**	94.77	250	0.2	82.717	82.528	0.190	0.54	3.61
Main Street	NMH2	NMH3		702	651	0.00	0.00	0.960	0	702	651	0.00	0.00	0.96		1.500	1.931	0.269	**2.20**	**42.05**	**5.23**	83.29	250	0.5	84.310	83.894	0.416	0.86	2.02
Main Street	NMH3	NMH4				0.00	0.00	0.946	0	702	651	0.00	0.00	1.91		1.500	1.931	0.534	**2.46**	**42.05**	**5.86**	77.06	250	0.5	83.894	83.508	0.385	0.86	2.44
Main Street	NMH4	NMH5		1664		0.00	0.00	0.958	0	2366	651	0.00	0.00	2.86		1.500	4.098	0.802	**4.90**	**42.05**	**11.65**	93.28	250	0.5	83.508	83.042	0.466	0.86	2.82
Main Street	NMH5	NMH6				0.00	0.00	0.685	1440	2366	651	0.00	0.00	7.40	3.692	1.500	25.636	2.073	**27.71**	**46.06**	**60.15**	80.16	250	0.6	82.528	82.047	0.481	0.94	3.80
Main Street	NMH6	NMH7		1740		0.00	0.00	0.758	1440	4106	651	0.00	0.00	8.16	3.692	1.500	27.902	2.285	**30.19**	**46.06**	**65.53**	79.81	250	0.6	82.047	81.568	0.479	0.94	4.28
Main Street	NMH7	NMH8				0.00	0.00	0.394	1440	4106	651	0.00	0.00	8.55	3.692	1.500	27.902	2.395	**30.30**	**46.06**	**65.77**	75.28	250	0.6	81.568	81.117	0.452	0.94	4.76
Constellation N/S	NMH1	16925				0.00	0.00	0.464	0	0	0	0.00	0.00	3.65			0.000	1.021	**1.02**	**11.89**	**8.58**	67.84	250	0.04	82.717	82.690	0.027	0.24	3.62
Constellation N/S	16925	16926				0.86	0.00	0.946	0	0	0	0.86	0.00	4.59			0.860	1.286	**2.15**	**11.89**	**18.04**	98.50	250	0.04	82.14	82.101	0.039	0.24	4.20
Constellation N/S	16926	16927				0.00	0.00	1.132	0	0	0	0.86	0.00	5.72			0.860	1.603	**2.46**	**10.30**	**23.91**	68.70	250	0.03	81.9	81.879	0.021	0.21	4.43
Arnon	16927	18693				0.00	0.00	0.255	1420	0	0	1.67	0.00	16.74	3.697		22.934	4.688	**27.62**	**32.07**	**86.12**	56.00	300	0.11	81.810	81.748	0.062	0.45	4.47
Arnon	18693	18694				0.00	0.00	0.459	1420	0	0	1.67	0.00	17.20	3.697		22.934	4.816	**27.75**	**41.33**	**67.15**	54.00	375	0.06	81.600	81.570	0.030	0.37	4.20
Arnon	18694	NMH9				0.00	0.00	0.227	1420	0	0	1.67	0.00	17.43	3.697		22.934	4.880	**27.81**	**299.09**	**9.30**	37.46	375	2.91	81.570	80.480	1.090	2.71	4.23
Arnon	NMH9	18695				0.00	0.00	0.188	2860	4106	651	1.67	0.00	26.17	3.460	1.500	48.119	7.327	**55.45**	**299.09**	**18.54**	49.57	375	2.91	80.480	78.660	1.442	2.71	5.32
Transitway	18695	18696				0.00	0.00	0.476	2860	4106	651	1.67	0.00	26.64	3.460	1.500	48.119	7.461	**55.58**	**75.62**	**73.50**	118.00	375	0.19	78.400	N/A	-	0.68	7.40

Note:

1) Population data for residential area estimated from number of existing houses upstream of MH16468 and future residential population.
2) Commercial flows for 1 Centrepointe Dr, 2 Constellation Cres. are based on water consumption meter readings provided by the City.
3) Daily sewage flow rates obtained from Appendix 4-A of the City of Ottawa Sewer Design Guidelines, November 2004.
4) Pipe inverts for sanitary maintenance hole 18696 were not available. Minimum slope was used to estimate capacity and velocity.
5) Pipe Segments highlighted in yellow upsized to accommodate existing and future flows

NO.	REVISIONS	BY	D-M-Y
1	ISSUED FOR REVIEW	PJL	07-11-08

NOTE:
The location of the utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned.
The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

CENTREPOINTE TOWN CENTRE FUNCTIONAL SERVICING PLAN

2031 FUTURE SANITARY DRAINAGE AREA PLAN

W. R. NEWELL, P. ENG.
Director Infrastructure Services

B. MASON, P. ENG.
Manager Construction Services West

Dwn: LDM | Chkd: GSH | Des: WJD | Chkd: GSH

Ottawa

CONTRACT NO. ISB08-XXXX

DWG. NO. 08-9557-08

SHEET 01 OF 01

Date OCTOBER 2008

Scale: 1:1250

DILLON CONSULTING

APPENDIX D

Stormwater Management

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

Existing Drainage Charateristics From Internal Site

Area	0.7548	ha
C	0.20	Rational Method runoff coefficient
L	169	m
Up Elev	86.06	m
Dn Elev	83.5	m
Slope	1.5	%
Tc	33.2	min

1) Time of Concentration per Federal Aviation Administration

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

tc, in minutes
C, rational method coefficient, (-)
L, length in ft
S, average watershed slope in %

Estimated Peak Flow

	2-year	5-year	100-year	
i	37.4	50.3	85.6	mm/hr
Q	15.7	21.1	44.9	L/s

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

DSEL©

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

Target Flow Rate

Site Allowable Release Rate	0.755	ha	
Q	33.5	L/s/ha	
Q	25.3	L/s	* Release rate as established by Stormwater Management Guidelines for the Pinecrest Creek/Westboro Area

Estimated Post Development Peak Flow from Unattenuated Areas

Area ID U1
Total Area 0.027 ha
C 0.65 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
13.5	88.7	4.3	4.3	0.0	0.0	151.8	9.3	9.3	0.0	0.0

Area ID U2
Total Area 0.014 ha
C 0.20 Rational Method runoff coefficient

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
13.5	88.7	0.7	0.7	0.0	0.0	151.8	1.5	1.5	0.0	0.0

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Estimated Post Development Peak Flow from Roof 1

Area ID West Tower (Tower A-Overall Roof)
Total Area 0.040 ha
C 0.90 Rational Method runoff coefficient
Roor Drains Number 4
Release Rate 0.31545 (5gpm)
Flow Restriction 1.2618

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	10.4	1.262	9.2	5.5	178.6	18.848	1.262	17.6	10.6
20	70.3	7.0	1.262	5.8	6.9	120.0	12.661	1.262	11.4	13.7
30	53.9	5.4	1.262	4.1	7.4	91.9	9.697	1.262	8.4	15.2
40	44.2	4.4	1.262	3.2	7.6	75.1	7.932	1.262	6.7	16.0
50	37.7	3.8	1.262	2.5	7.5	64.0	6.751	1.262	5.5	16.5
60	32.9	3.3	1.262	2.0	7.3	55.9	5.900	1.262	4.6	16.7
70	29.4	2.9	1.262	1.7	7.0	49.8	5.256	1.262	4.0	16.8
80	26.6	2.7	1.262	1.4	6.7	45.0	4.749	1.262	3.5	16.7
90	24.3	2.4	1.262	1.2	6.3	41.1	4.339	1.262	3.1	16.6
100	22.4	2.2	1.262	1.0	5.9	37.9	4.001	1.262	2.7	16.4
110	20.8	2.1	1.262	0.8	5.4	35.2	3.716	1.262	2.5	16.2
120	19.5	1.9	1.262	0.7	4.9	32.9	3.472	1.262	2.2	15.9
130	18.3	1.8	1.262	0.6	4.4	30.9	3.261	1.262	2.0	15.6
140	17.3	1.7	1.262	0.5	3.9	29.2	3.077	1.262	1.8	15.2
150	16.4	1.6	1.262	0.4	3.4	27.6	2.914	1.262	1.7	14.9
160	15.6	1.6	1.262	0.3	2.8	26.2	2.770	1.262	1.5	14.5

5-year $Q_{attenuated}$ 1.26 L/s — **100-year $Q_{attenuated}$ 1.26 L/s**
5-year Max. Storage Required 7.6 m^3 — **100-year Max. Storage Required 16.8 m^3**

Total Roof Area 400.000 **m2**
85% usable Area 340 **m2**
Max Ponding 0.05 **m**

Area ID West Tower (Tower A- 22nd Mech Pent Roof)
Total Area 0.019 ha
C 0.90 Rational Method runoff coefficient
Roor Drains Number 6
Release Rate 0.31545
Flow Restriction 1.8927

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	4.9	1.893	3.1	1.8	178.6	10.6	1.893	8.7	5.2
20	70.3	3.3	1.893	1.4	1.7	120.0	7.1	1.893	5.2	6.3
30	53.9	2.6	1.893	0.7	1.2	91.9	5.5	1.893	3.6	6.4
40	44.2	2.1	1.893	0.2	0.5	75.1	4.5	1.893	2.6	6.2
50	37.7	1.8	1.893	0.0	0.0	64.0	3.8	1.893	1.9	5.7
60	32.9	1.6	1.893	0.0	0.0	55.9	3.3	1.893	1.4	5.1
70	29.4	1.4	1.893	0.0	0.0	49.8	3.0	1.893	1.1	4.5
80	26.6	1.3	1.893	0.0	0.0	45.0	2.7	1.893	0.8	3.7
90	24.3	1.2	1.893	0.0	0.0	41.1	2.4	1.893	0.5	3.0

5-year $Q_{attenuated}$ 1.89 L/s — **100-year $Q_{attenuated}$ 1.89 L/s**
5-year Max. Storage Required 1.8 m^3 — **100-year Max. Storage Required 6.4 m^3**

Total Roof Area 190.0 **m2**
85% usable Area 161.5
Max Ponding 0.04

Area ID East Tower (Tower B - 24th Mech Pent Roof)
Total Area 0.0200 ha
C 0.90 Rational Method runoff coefficient
Roor Drains Number 6
Release Rate 0.31545
Flow Restriction 1.8927

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	5.21	1.89	3.3	2.0	178.6	11.16	1.89	9.3	5.6
20	70.3	3.51	1.89	1.6	1.9	120.0	7.50	1.89	5.6	6.7
30	53.9	2.70	1.89	0.8	1.4	91.9	5.74	1.89	3.8	6.9
40	44.2	2.21	1.89	0.3	0.8	75.1	4.70	1.89	2.8	6.7
50	37.7	1.88	1.89	0.0	0.0	64.0	4.00	1.89	2.1	6.3
60	32.9	1.65	1.89	0.0	0.0	55.9	3.49	1.89	1.6	5.8
70	29.4	1.47	1.89	0.0	0.0	49.8	3.11	1.89	1.2	5.1
80	26.6	1.33	1.89	0.0	0.0	45.0	2.81	1.89	0.9	4.4
90	24.3	1.21	1.89	0.0	0.0	41.1	2.57	1.89	0.7	3.7

5-year $Q_{attenuated}$ 1.89 L/s
5-year Max. Storage Required 2.0 m^3

100-year $Q_{attenuated}$ 1.89 L/s
100-year Max. Storage Required 6.9 m^3

Total Roof Area 200.0 **m2**
85% usable Area 170.0
Max Ponding 0.04

Area ID East Tower (Tower B - 26th Overall Roof)
Total Area 0.032 ha
C 0.90 Rational Method runoff coefficient
Roor Drains Number 4
Release Rate 0.31545
Flow Restriction 1.2618

	5-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	8.3	1.26	7.1	4.2	178.6	15.1	1.26	13.8	8.3
20	70.3	5.6	1.26	4.4	5.2	120.0	10.1	1.26	8.9	10.6
30	53.9	4.3	1.26	3.1	5.5	91.9	7.8	1.26	6.5	11.7
40	44.2	3.5	1.26	2.3	5.5	75.1	6.3	1.26	5.1	12.2
50	37.7	3.0	1.26	1.8	5.3	64.0	5.4	1.26	4.1	12.4
60	32.9	2.6	1.26	1.4	4.9	55.9	4.7	1.26	3.5	12.4
70	29.4	2.3	1.26	1.1	4.6	49.8	4.2	1.26	2.9	12.4
80	26.6	2.1	1.26	0.9	4.1	45.0	3.8	1.26	2.5	12.2
90	24.3	1.9	1.26	0.7	3.7	41.1	3.5	1.26	2.2	11.9
100	22.4	1.8	1.26	0.5	3.2	37.9	3.2	1.26	1.9	11.6
110	20.8	1.7	1.26	0.4	2.7	35.2	3.0	1.26	1.7	11.3
120	19.5	1.6	1.26	0.3	2.1	32.9	2.8	1.26	1.5	10.9
130	18.3	1.5	1.26	0.2	1.6	30.9	2.6	1.26	1.3	10.5
140	17.3	1.4	1.26	0.1	1.0	29.2	2.5	1.26	1.2	10.1
150	16.4	1.3	1.26	0.0	0.4	27.6	2.3	1.26	1.1	9.6
160	15.6	1.2	1.26	0.0	0.0	26.2	2.2	1.26	1.0	9.2
170	14.8	1.2	1.26	0.0	0.0	25.0	2.1	1.26	0.9	8.7

5-year $Q_{attenuated}$ 1.26 L/s
5-year Max. Storage Required 5.5 m^3

100-year $Q_{attenuated}$ 1.26 L/s
100-year Max. Storage Required 12.4 m^3

Total Roof Area 320.0 **m2**
85% usable Area 272.0
Max Ponding 0.05

Holding tank

Area ID A101
Total Area 0.069 ha
C 0.85 Rational Method runoff coefficient

	5-year						100-year					
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	Q_{roofs} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	Q_{roofs} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	16.9	0.00	0.50	16.4	9.8	178.6	32.3	0.00	0.50	31.8	19.1
20	70.3	11.4	0.00	0.50	10.9	13.1	120.0	21.7	0.00	0.50	21.2	25.5
30	53.9	8.7	0.00	0.50	8.2	14.8	91.9	16.6	0.00	0.50	16.1	29.0
40	44.2	7.2	0.00	0.50	6.7	16.0	75.1	13.6	0.00	0.50	13.1	31.4
50	37.7	6.1	0.00	0.50	5.6	16.8	64.0	11.6	0.00	0.50	11.1	33.2
60	32.9	5.3	0.00	0.50	4.8	17.4	55.9	10.1	0.00	0.50	9.6	34.6
70	29.4	4.8	0.00	0.50	4.3	17.9	49.8	9.0	0.00	0.50	8.5	35.8
80	26.6	4.3	0.00	0.50	3.8	18.3	45.0	8.1	0.00	0.50	7.6	36.7
90	24.3	3.9	0.00	0.50	3.4	18.5	41.1	7.4	0.00	0.50	6.9	37.5
100	22.4	3.6	0.00	0.50	3.1	18.8	37.9	6.9	0.00	0.50	6.4	38.2
110	20.8	3.4	0.00	0.50	2.9	19.0	35.2	6.4	0.00	0.50	5.9	38.8
120	19.5	3.2	0.00	0.50	2.7	19.1	32.9	6.0	0.00	0.50	5.5	39.3
130	18.3	3.0	0.00	0.50	2.5	19.2	30.9	5.6	0.00	0.50	5.1	39.7
140	17.3	2.8	0.00	0.50	2.3	19.3	29.2	5.3	0.00	0.50	4.8	40.1
150	16.4	2.7	0.00	0.50	2.2	19.4	27.6	5.0	0.00	0.50	4.5	40.5
160	15.6	2.5	0.00	0.50	2.0	19.4	26.2	4.8	0.00	0.50	4.3	40.8
170	14.8	2.4	0.00	0.50	1.9	19.4	25.0	4.5	0.00	0.50	4.0	41.1
180	14.2	2.3	0.00	0.50	1.8	19.4	23.9	4.3	0.00	0.50	3.8	41.3
190	13.6	2.2	0.00	0.50	1.7	19.4	22.9	4.1	0.00	0.50	3.6	41.6
200	13.0	2.1	0.00	0.50	1.6	19.4	22.0	4.0	0.00	0.50	3.5	41.8
210	12.6	2.0	0.00	0.50	1.5	19.3	21.1	3.8	0.00	0.50	3.3	41.9
220	12.1	2.0	0.00	0.50	1.5	19.3	20.4	3.7	0.00	0.50	3.2	42.1
230	11.7	1.9	0.00	0.50	1.4	19.2	19.7	3.6	0.00	0.50	3.1	42.2
240	11.3	1.8	0.00	0.50	1.3	19.1	19.0	3.4	0.00	0.50	2.9	42.3
250	10.9	1.8	0.00	0.50	1.3	19.1	18.4	3.3	0.00	0.50	2.8	42.4
260	10.6	1.7	0.00	0.50	1.2	19.0	17.8	3.2	0.00	0.50	2.7	42.5
270	10.3	1.7	0.00	0.50	1.2	18.9	17.3	3.1	0.00	0.50	2.6	42.6
280	10.0	1.6	0.00	0.50	1.1	18.8	16.8	3.0	0.00	0.50	2.5	42.7
290	9.7	1.6	0.00	0.50	1.1	18.7	16.3	3.0	0.00	0.50	2.5	42.7
300	9.5	1.5	0.00	0.50	1.0	18.6	15.9	2.9	0.00	0.50	2.4	42.8
310	9.2	1.5	0.00	0.50	1.0	18.5	15.5	2.8	0.00	0.50	2.3	42.8
320	9.0	1.5	0.00	0.50	1.0	18.3	15.1	2.7	0.00	0.50	2.2	42.8
330	8.8	1.4	0.00	0.50	0.9	18.2	14.7	2.7	0.00	0.50	2.2	42.9
340	8.6	1.4	0.00	0.50	0.9	18.1	14.4	2.6	0.00	0.50	2.1	42.9
350	8.4	1.4	0.00	0.50	0.9	17.9	14.0	2.5	0.00	0.50	2.0	42.9
360	8.2	1.3	0.00	0.50	0.8	17.8	13.7	2.5	0.00	0.50	2.0	42.9
370	8.0	1.3	0.00	0.50	0.8	17.7	13.4	2.4	0.00	0.50	1.9	42.8

5-year $Q_{attenuated}$ **0.50 L/s**
5-year Max. Storage Required **19.4 m^3**

100-year $Q_{attenuated}$ **0.50 L/s**
100-year Max. Storage Required **42.9 m^3**

DSEL©

Cistern Sizing

Area ID A101
Total Area 0.534 ha
C 0.85 Rational Method runoff coefficient

	5-year						100-year						
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	Q_{roofs} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	Q_{roofs} (L/s)	Qtank, (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
10	104.2	131.4	6.31	4.10	127.3	76.4	178.6	251.7	6.31	0.50	14.56	243.97	146.4
20	70.3	88.6	6.31	14.56	74.1	88.9	120.0	169.1	6.31	0.50	14.56	161.35	193.6
30	53.9	68.0	6.31	14.56	53.5	96.2	91.9	129.5	6.31	0.50	14.56	121.76	219.2
40	44.2	55.7	6.31	14.56	41.2	98.8	75.1	105.9	6.31	0.50	14.56	98.18	235.6
50	37.7	47.5	6.31	14.56	32.9	98.8	64.0	90.2	6.31	0.50	14.56	82.41	247.2
60	32.9	41.6	6.31	14.56	27.0	97.2	55.9	78.8	6.31	0.50	14.56	71.05	255.8
70	29.4	37.0	6.31	14.56	22.5	94.5	49.8	70.2	6.31	0.50	14.56	62.44	262.2
80	26.6	33.5	6.31	14.56	18.9	90.9	45.0	63.4	6.31	0.50	14.56	55.68	267.2
90	24.3	30.6	6.31	14.56	16.1	86.8	41.1	58.0	6.31	0.50	14.56	50.21	271.1
100	22.4	28.3	6.31	14.56	13.7	82.2	37.9	53.4	6.31	0.50	14.56	45.68	274.1
110	20.8	26.3	6.31	14.56	11.7	77.3	35.2	49.6	6.31	0.50	14.56	41.88	276.4
120	19.5	24.6	6.31	14.56	10.0	72.0	32.9	46.4	6.31	0.50	14.56	38.62	278.1
130	18.3	23.1	6.31	14.56	8.5	66.4	30.9	43.6	6.31	0.50	14.56	35.81	279.3
140	17.3	21.8	6.31	14.56	7.2	60.7	29.2	41.1	6.31	0.50	14.56	33.35	280.1
150	16.4	20.6	6.31	14.56	6.1	54.7	27.6	38.9	6.31	0.50	14.56	31.17	280.6
160	15.6	19.6	6.31	14.56	5.1	48.6	26.2	37.0	6.31	0.50	14.56	29.24	280.7
170	14.8	18.7	6.31	14.56	4.2	42.3	25.0	35.3	6.31	0.50	14.56	27.51	280.6
180	14.2	17.9	6.31	14.56	3.3	35.9	23.9	33.7	6.31	0.50	14.56	25.95	280.2
190	13.6	17.1	6.31	14.56	2.6	29.4	22.9	32.3	6.31	0.50	14.56	24.53	279.7
200	13.0	16.5	6.31	14.56	1.9	22.8	22.0	31.0	6.31	0.50	14.56	23.24	278.9

5-year $Q_{attenuated}$ **14.56 L/s**
5-year Max. Storage Required **98.8 m^3**

100-year $Q_{attenuated}$ **14.56 L/s**
100-year Max. Storage Required **280.7 m^3**

Summary of Release Rates and Storage Volumes

Control Area	5-Year Release Rate (L/s)	5-Year Storage (m^3)	100-Year Release Rate (L/s)	100-Year Storage (m^3)	Area (Ha.)
Unattenuated Areas	**5.0**	0.0	**10.7**	0.0	0.041
East Tower Roof	3.2	7.6	3.2	19.4	0.052
West Tower Roof	3.2	1.8	3.2	23.2	0.059
Holding tank	0.5	19.4	0.5	42.9	0.069
Cistern	**14.6**	98.8	**14.6**	280.7	0.534
Total	**19.6**	**127.6**	**25.3**	**366.1**	**0.755**

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

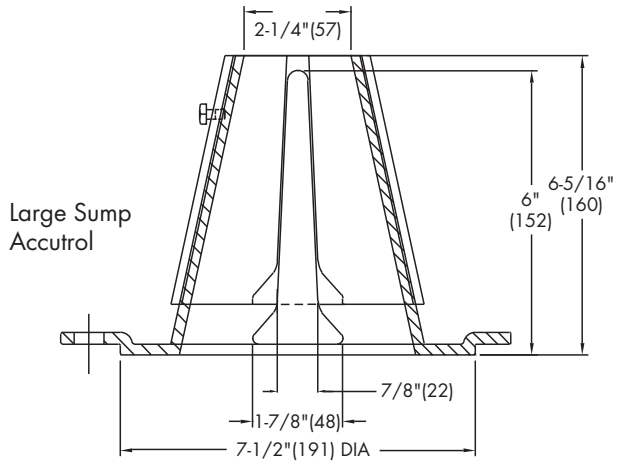
ADJUSTABLE ACCUTROL (for Large Sump Roof Drains only)

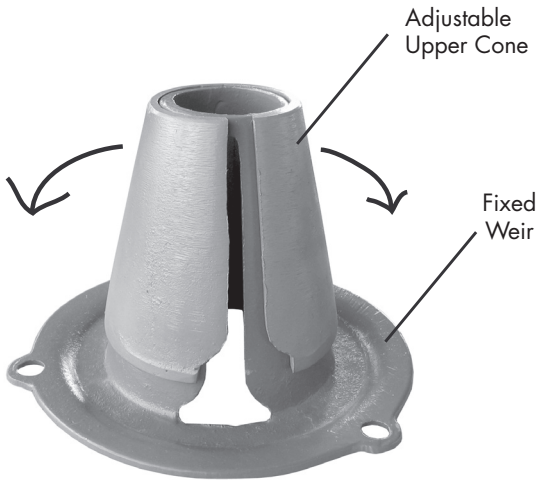
For more flexibility in controlling flow with heads deeper than 2", Watts Drainage offers the Adjustable Accutrol. The Adjustable Accutrol Weir is designed with a single parabolic opening that can be covered to restrict flow above 2" of head to less than 5 gpm per inch, up to 6" of head. To adjust the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

EXAMPLE:

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

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





1/2 Weir Opening Exposed Shown Above

TABLE 1. Adjustable Accutrol Flow Rate Settings

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

Job Name _____ Contractor _____

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

Engineer _____ Representative _____

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Alex Tourigny

From: Colleen McKeracher <cmckeracher@rlaarchitecture.ca>
Sent: February 7, 2023 9:24 AM
To: Alex Tourigny
Cc: Kevin Yemm; Nico Church
Subject: RE: 19 Centrepointe - Civil Coordination

EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Hi Alex,

The roof storage information sent in October is still accurate. Can you clarify what levels you are looking for? We updated a check set of the architectural drawings and I sent you a message that should link to it on Procore, although I'll pull out any particular drawings you need and send directly.

Colleen McKeracher *M.Arch, OAA*
Architect
RLA/ Architecture
Tel: 613.724.9932 x 316

From: Alex Tourigny <ATourigny@dsel.ca>
Sent: February 7, 2023 9:03 AM
To: Colleen McKeracher <cmckeracher@rlaarchitecture.ca>
Cc: Kevin Yemm <kyemm@richcraft.com>; Nico Church <church@fotenn.com>
Subject: RE: 19 Centrepointe - Civil Coordination

Hi Colleen,

Wrapping up our servicing report updates. Our latest drawings/tank sizing was based on the information below.

Can you please confirm the drain layout is still accurate? Can you let us know what the updated levels are?

Thanks,

Alex Tourigny, P.Eng.

DSEL
david schaeffer engineering ltd.

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9

phone: 613-845-2106 (NEW NUMBER)
cell: (343) 542-8847
e-mail: atourigny@dsel.ca

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From: Colleen McKeracher <cmckeracher@rlaarchitecture.ca>
Sent: October 17, 2022 5:44 PM
To: Jon Barclay <jbarclay@recl.ca>; Alex Tourigny <ATourigny@dsel.ca>
Cc: Ron Derouin <rderouin@recl.ca>; Mouayad Mahasen <mmahasen@recl.ca>; Scott Read <sread@recl.ca>; Igor Boruchok <iboruchok@richcraft.com>; Kevin Yemm <kyemm@richcraft.com>; Vadim Skliar <vskliar@richcraft.com>
Subject: RE: 19 Centrepointe - Civil Coordination

EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

HI Alex,

We can confirm the number of drains and the area (ha.) is accurate. I'm not sure what the other columns are for, what is the difference between area and available area?

Colleen McKeracher *M.Arch, OAA*
Architect
RLA/ Architecture
Tel: 613.724.9932 x 316

From: Jon Barclay <jbarclay@recl.ca>
Sent: October 17, 2022 3:36 PM
To: Alex Tourigny <ATourigny@dsel.ca>; Colleen McKeracher <cmckeracher@rlaarchitecture.ca>
Cc: Colleen McKeracher <cmckeracher@rlaarchitecture.ca>; Ron Derouin <rderouin@recl.ca>; Mouayad Mahasen <mmahasen@recl.ca>; Scott Read <sread@recl.ca>; Igor Boruchok <iboruchok@richcraft.com>; Kevin Yemm <kyemm@richcraft.com>; Vadim Skliar <vskliar@richcraft.com>
Subject: RE: 19 Centrepointe - Civil Coordination

Thanks, Alex

Is it possible to get the updated CAD files as well? Do you have an issue if we provide them to the shoring and excavations trades we have onsite?

Thanks,

Jon Barclay
Project Manager
Ron Eastern Construction Ltd.
1801 Woodward Drive, Ottawa, Ontario K2C 0R3
P: (613) 727-4019 C: (613) 620-0271

From: Alex Tourigny <ATourigny@dsel.ca>
Sent: October 17, 2022 2:21 PM
To: Jon Barclay <jbarclay@recl.ca>; Colleen McKeracher <cmckeracher@rlaarchitecture.ca>
Cc: Colleen McKeracher <cmckeracher@rlaarchitecture.ca>; Ron Derouin <rderouin@recl.ca>; Mouayad Mahasen <mmahasen@recl.ca>; Scott Read <sread@recl.ca>; Igor Boruchok <iboruchok@richcraft.com>; Kevin Yemm <kyemm@richcraft.com>; Vadim Skliar <vskliar@richcraft.com>
Subject: RE: 19 Centrepointe - Civil Coordination

Hi Jon,

Civil Set as requested.

As previously discussed, RECL/Richcraft may want to provide some flexibility in the future and oversize the cistern a little bit. Minimum cistern sizing (per the attached) based on the current grading/drainage is set to 283m3. The previous drainage configuration, which had more uncontrolled flow had the cistern at 361m3.

Colleen,
Hoping you can re-confirm the roof area and number of drains as this affects the cistern.

Roof Storage								
Roof Location**	Level	Area (Ha.)	Numbre of Drains	Max Flow Rate (L/s)*	Total Release rate (L/s)	Max Ponding (m)	Storage Volume required (m^3)	Avail Area (m
Tower A (West Tower)	24th (Overall Roof)	0.04	4	0.31545	1.2618	0.06	16.7	346.
	22nd (Mech Pent Roof)	0.019	6	0.31545	1.8927	0.05	13.9	310.
Tower B (East Tower)	24th (Mech Pent Roof)	0.02	6	0.31545	1.8927	0.03	2.5	93.5
	26th (Overall Roof)	0.032	4	0.31545	1.2618	0.06	15.5	314.

*Roof drains to be Watts Accutrol Weir Adjustable Flow Control on closed setting
**Roof drain location shown are schematic only and are to be confirmed with Mechanical/Architectural Drawing sets
***Provided by RLA Architecture

Thanks,

Alex Tourigny, P.Eng.

DSEL
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From: Jon Barclay <jbarclay@recl.ca>
Sent: October 17, 2022 10:30 AM
To: Alex Tourigny <ATourigny@dsel.ca>
Cc: Colleen McKeracher <cmckeracher@rlaarchitecture.ca>; Ron Derouin <rderouin@recl.ca>; Mouayad Mahasen <mmahasen@recl.ca>; Scott Read <sread@recl.ca>
Subject: RE: 19 Centrepointe - Civil Coordination

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Alex,

Thanks for updating the grading and site services drawings. Now that we have them finalized, can you please provide us with a complete updated set of all civil drawings for 19 Centrepointe?

Thanks,

Jon Barclay