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FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

FOR

FORMASIAN DEVELOPMENT CORP.
1919 MAPLE GROVE ROAD

CITY OF OTTAWA

PROJECT NO.: 16-861

APRIL 2023 – REV 6

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT
FOR
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1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Formasian Development Corp. to prepare a Functional Servicing and Stormwater Management report in support of the application Plan of Subdivision at 1919 Maple Grove Road.

The subject property is located within the City of Ottawa urban boundary, in the Stittsville ward. As illustrated in ***Figure 1***, the subject property is located north of the Maple Grove Road and Johnwoods Street intersection. Comprised of a single parcel of land, the subject property measures approximately ***6.67 ha*** and is zoned Development Reserve (DR). Block 28 will be dedicated to the future Stittsville Main ROW and Blok 28 will be deposed of to the neighboring property. The subject lands will measure ***6.31 ha*** after the land transfers.

The subject site is within the Kanata West Master Servicing Study (***KWMSS***) and was contemplated as residential lands, as shown by ***FIG. 2.1*** located in ***Drawings/Figures***.

Figure 1: Site Location

The proposed Plan of Subdivision would allow for the development of six 4-storey residential buildings, 26 townhomes, 36 semi-detached homes, 2 detached homes, and the retention of the existing single family home at 1919 Maple Grove Road. A copy of the conceptual site plan and associated site statistics prepared by 110 Architects is included in ***Drawings/Figures***.

The objective of this report is to provide sufficient detail to demonstrate that the proposed subdivision is supported by existing municipal services.

1.1 Existing Conditions

The existing site is predominantly a vacant parcel of land. There is a single detached residence on the South side of the parcel. The elevations range between 106.49 m and 107.31 m with a grade change of 0.82 m from the Northeast to the Southwest corner of the property.

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:

Maple Grove Road:

- 305 mm diameter PVC watermain;

- 200 mm diameter PVC sanitary sewer tributary to the Kanata West Pump Station;
- 375 mm diameter PVC sanitary sewer tributary to the Kanata West Pump Station;
- 375 mm diameter PVC storm sewer tributary to the Kanata West Stormwater Pond 4;
- 2100 mm diameter concrete storm sewer tributary to the Kanata West Stormwater Pond 4.

1.2 Required Permits / Approvals

The contemplated development is subject to the Plan of Subdivision process for creation of the lots, road opening approval process for the municipal streets and site plan control approval process for the multi-unit buildings.

The contemplated development proposes new right-of-ways complete with sanitary and storm sewers and as a result the Ministry of the Environment, Conservation and Parks (MECP) requires an Environment Compliance Application (ECA) to be submitted under the Transfer of Review process.

As indicated by the Geotechnical Investigation (***Geotechnical Report***) prepared by Paterson Group, a temporary MECP permit to take water (PTTW) may be required if more than 400,000 L/day of ground and/or surface water is required to be pumped during construction. A minimum of 4-5 months should be allotted to complete the PTTW process under the MECP's jurisdiction. Further inspection is to be completed at the detailed design stage.

As indicated by the ***Geotechnical Report***, if 50,000 L/day to 400,000 L/day of ground and/or surface water is required to be pumped during construction, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of 2-4 weeks should be allotted to complete the EASR process. Further inspection is to be completed at the detailed design stage.

It is noted that an existing drainage feature crosses the subject site. Based on a previous development along Maple Grove, existing drainage that was previously tributary to the drainage feature has been redirected towards the municipal sewers. The Mississippi Valley Conservation Authority (***MVCA***) has been contacted to confirm that approvals will not be required to decommission the drainage feature, however this coordination is still in progress. Approvals are not anticipated for the following as the swale is not a significant drainage feature for the following reasons:

- Given that the site tributary to the swale located on the 1919 Maple Grove Drive property has been redeveloped and no longer utilizes the swale, the swale no longer conveys flow from multiple parcels.

- The significant drainage feature is located on the adjacent property, 195 Huntmar Drive, North of the 1919 Maple Grove Drive development and as such a headwater study has been included as part of D01-01-16-0015 application.

1.3 Pre-consultation

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

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
  *(**Sewer Design Guidelines**)*

  - Technical Bulletin ISDTB-2014-01
    City of Ottawa, February 5, 2014
    (ITSB-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-2018-04
    City of Ottawa, June 27, 2018
    (ISTB-2018-04)

- **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-2014-2
    City of Ottawa, May 27, 2014.
    (ISDTB-2014-2)
  - Technical Bulletin ISTB-2018-02
    City of Ottawa, March 21, 2018
    (ISTB-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)

- **Kanata West Master Servicing Study,**
  Stantec Consulting Ltd., June 16, 2006.
  (KWMSS)

- **Kanata West Pump Station Flow Development Background,**
  Stantec Consulting Ltd., June 12, 2012.
  (KWPS Memo)

- **Design Brief for Pond 4 Kanata West,**
  DSEL, December 10, 2014.
  (*Pond 4 Design Brief*)

- **Geotechnical Investigation,**
  Paterson Group, July 20, 2018.
  (Geotechnical Report)

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject property lies within the City of Ottawa 3W pressure zone, as shown by the Pressure Zone map included in ***Appendix B***. Based on available City mapping, a 305 mm watermain exists within the Maple Grove Road right-of-way.

The ***KWMSS*** contemplated the site to be serviced via the 305 mm diameter watermain within the Maple Grove Road right-of-way, as shown by the *Watermain Final Concept* drawing (***WM-1***) included in ***Appendix B***.

3.2 Water Supply Servicing Design

It is anticipated that the contemplated development would be serviced from an internal watermain network with a connection to the existing 305 mm watermain within the Maple Grove Road right-of-way. Based on coordination with City staff, the internal watermain network will connect to the 250 mm diameter watermain within future Stittsville Main Street. A conceptual Watermain Servicing Plan (***Drawing 4***) is included in ***Drawings/Figures***.

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***.

Based on the ***Water Supply Guidelines***, 49 single dwelling units on a permanent basis and 75 single dwelling units on a temporary basis are permitted on a dead-end watermain should the Sub-division be constructed in phases. In addition, the looped connection must be provided within two years.

Table 1 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 Townhomes/Semi-Detached	2.7 P/unit
Residential 1 Bedroom Apartment	1.4 P/unit
Residential 2 Bedroom Apartment	2.1 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 *
Minimum Watermain Size	150mm diameter
Minimum Depth of Cover	2.4m from top of watermain to finished grade
During normal operating conditions desired operating pressure is within	350kPa and 480kPa
During normal operating conditions pressure must not drop below	275kPa
During normal operating conditions pressure must not exceed	552kPa
During fire flow operating pressure must not drop below	140kPa

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

Table 2 summarizes the anticipated water supply demand and boundary conditions for the two proposed connection to the 305 mm diameter watermain within Maple Grove Drive, based on the ***Water Supply Guidelines***.

Table 2
Summary of Anticipated Water Demand and Boundary Conditions

Design Parameter	Anticipated Demand[1] (L/min)	Boundary Condition[2] Connection 1 (m H_2O / kPa)	Boundary Condition[2] Connection 2 (m H_2O / kPa)
Average Daily Demand	185.9	53.0 / 519.9	52.9 / 518.9
Max Day + Fire Flow	464.7 + 19,000 = 19,464.7	39.3 / 385.5	39.1 / 383.6
Peak Hour	1022.4	48.7 / 477.7	48.6 / 476.8

1) Water demand calculation per ***Water Supply Guidelines***. See ***Appendix B*** for detailed calculations.
Boundary conditions supplied by the City of Ottawa for the demands indicated in the correspondence; assumed ground elevation 107.9 m at Connection 1 and 108m at Connection 2. 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 assumed:

- Type of construction - Ordinary Construction;
- Occupancy type – Limited Combustibility;
- Sprinkler Protection – Supervised Sprinklered System (Apartment and Retirement Residence) and Non-Sprinklered System (Townhomes).

The above assumptions result in an estimated fire flow of approximately ***19,000 L/min***, noting that actual building materials selected will affect the estimated flow. A certified fire protection system specialist shall be employed to design the building fire suppression system(s) and confirm the actual fire flow demand.

Section 6.5.1 of the ***KWMSS*** summarizes the estimated fire flow requirements used in sizing the trunk infrastructure. Residential and Mixed Use/Commercial development assumed a fire flow requirement of ***6,000 L/min*** and ***13,000 L/min*** respectively, in the design of the future watermain network. Based on the ***KWMSS***, the residual pressure of the Stittsville Tank under a fire flow of ***13,000 L/min*** remains above 45 psi (310 kPa).

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

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

Detailed design of the site watermain infrastructure will ensure that pressures are respected within the City ranges.

3.3 Water Supply Conclusion

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

It is anticipated that the contemplated development would be serviced from an internal watermain network with connections to the existing 305 mm watermain within the Maple Grove Road right-of-way and to the adjacent development. Detailed design of the site watermain infrastructure will ensure that pressures are respected within the City's required ranges.

The proposed water supply design conforms to all relevant City Guidelines and Policies.

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The subject site lies within the Kanata West Pump Station catchment area, as shown by the *Preferred Waste-Water Option* drawing (***S-1***) included in ***Appendix C***. A 375 mm diameter sanitary sewer exists within the Maple Grove Road right-of-way. A 600 mm diameter sanitary sewer is located downstream of the subject site near the Maple Grove Road and Montserrat Street intersection. The Maple Grove sanitary sewer discharges wastewater to the Kanata West P.S..

Sanitary capacity for the site is outlined by the ***KWMSS***. *Section 4.3* of the ***KWMSS*** discusses overall sanitary services for the Kanata West lands, which includes the site. The site falls within the ***20.03 ha*** area 26, as shown by the *Preferred Waste-Water Option* drawing (***S-1***). The ***KWMSS*** sanitary drainage plan and the corresponding Sanitary Sewer Calculation Sheet for the ultimate sanitary sewers are included in ***Appendix C***.

Section 4.4 of the ***KWMSS*** outlines the design criteria used to size the ultimate sanitary infrastructure servicing the site; residential areas assumed a flow rate of ***350 L/Person/Day***. Refer to the extracted from section 4.4 of ***KWMSS*** included in ***Appendix C*** for further information regarding the design criteria utilized.

DSEL designed the Maple Grove sanitary sewer in 2012. Extracted sanitary drainage area plans and calculation sheets are provided in ***Appendix C***. The subject lands are included in the area identified as “External Area 26.” The analysis assumed:

- 350L/p/d,
- 30units/ha,
- 3.4p/unit,
- x3.42 Peaking Factor,
- and .28L/s/ha of extraneous flows.

Therefore, the subject lands were assumed to provide housing to (6.67ha x 30unit/ha x 3.4p/unit) 681 people. ***Table 3*** summarizes the contemplated peak flow contributions from the subject lands.

Table 3
Summary of Existing Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	**2.76**
Estimated Peak Dry Weather Flow	**9.43**
Estimated Peak Wet Weather Flow	**11.30**

4.2 Wastewater Design

It is anticipated that the contemplated development will connect to the existing 375 mm sanitary sewer within the Maple Grove Road right-of-way in the vicinity of the Johnwoods Street and Maple Grove Road intersection. A conceptual Sanitary Servicing Plan (***Drawing 3***) is included in ***Drawings/Figures***.

Table 4 summarizes the ***City Standards*** employed in the design of the preliminary wastewater sewer system. Design criteria for the Maple Grove Trunk Sewer calculation was extracted from section 4.4 of ***KWMSS*** and is included in ***Appendix C***.

Table 4
Wastewater Design Criteria

Design Parameter	Value
Single Family Home (Existing)	3.4 P/unit
Residential Townhomes	2.7 P/unit
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 Correction Factor 0.8
Infiltration and Inflow Allowance	0.33 L/s/ha
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	2.5m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6m/s
Maximum Full Flowing Velocity	3.0m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, October 2012.	

Table 5 demonstrates the anticipated peak flow from the contemplated development. See ***Appendix C*** for associated calculations.

Table 5
Summary of Anticipated Peak Wastewater Flow

Design Parameter	Total Flow (L/s)
Estimated Average Dry Weather Flow	**3.43**
Estimated Peak Dry Weather Flow	**10.40**
Estimated Peak Wet Weather Flow	**12.27**

The estimated peak wet weather sanitary flow, based on the concept plan provided in ***Drawings/Figures,*** is ***12.27 L/s***. As a result, there is a proposed ***0.97 L/s*** increase in

peak wet weather sanitary flow from the contemplated development. See ***Appendix C*** for associated calculations.

As part of the Maple Grove Reconstruction, a sanitary analysis was conducted and is outlined by the *Sanitary Drainage Plan* prepared by David Schaeffer Engineering Ltd. (Project No. 10-451) dated July 2011.

Based on the sanitary analysis, the controlling section of the local sewer system is located at the intersection of Maple Grove Road and Santolina Street (section 105A-106A) with an available residual capacity of ***32.0 L/s***. The Sanitary Drainage Plan and associated calculation sheet are included in ***Appendix C***.

The analysis above indicates that sufficient capacity is available in the local sewers to accommodate the estimated ***0.97 L/s*** increase in peak wet weather sanitary flow from the contemplated development.

4.3 Wastewater Servicing Conclusions

Contemplated by the ***KWPS Memo*** prepared by Stantec Consulting Ltd., the site lies within the Kanata West Pump Station collection area.

Based on the sanitary analysis prepared by David Schaeffer Engineering Ltd. in support of the Maple Grove road reconstruction, sufficient capacity is available in the local sewers to accommodate the anticipated ***12.27 L/s*** peak wet weather flow from the contemplated development.

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

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 Carp River sub-watershed. As such, approvals for proposed development 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 conservation authority. The subject property is located within the Carp River watershed, and is therefore subject to review by the MVCA.

As shown by the storm drainage area plan (DWG 2c) included in ***Appendix D,*** the subject lands were contemplated to be serviced via an existing 2100 mm diameter storm sewer on Maple Grove Road**.** The Maple Grove Road storm sewers convey stormwater to an existing facility "Pond 4" prior to discharging into the Carp River. An interim facility was constructed in 2015. The Pond 4 Environmental Compliance Approval is included in ***Appendix D***. The subject lands were contemplated to have 100-year capture within the site. Drainage from the northern portion of the site, the right-of-way dedication for the future Stittsville Main, was contemplated in the design of the off-site storm sewers. ***Appendix D*** includes the associated drainage plan.

Stormwater release rate requirements and pond design objectives were discussed in the Design Brief for Pond 4, Kanata West – Mattamy Homes, December 2014 (***Pond 4 Design Brief***). JFSA provided supplemental information via email confirming the unit flow rates for the 100-year SCS24hr and 100-year CH3hr design storms are 210.9L/s/ha and 241L/s/ha, respectively. Email excerpt included in ***Appendix D***.

As indicated above, Pond 4 was to be constructed in two stages, interim and ultimate. The interim facility was completed in 2015 and was designed to support the subject lands. Figure 2 from the Pond Design brief is included in ***Appendix D***.

Under interim conditions, Pond 4 was designed to receive 278.3ha at an overall impervious of 37% requiring 14,471m^3 of permanent pool and 11,132m^3 of extended detention. The interim pond was designed to provide 29,736m^3 of permanent pool and 22,288m^3 of extended detention volume. The interim pond was designed to maintain a 100-year elevation of 94.74m per the ***KWMSS***.

The subject lands are identified as having an assumed annual infiltration rate of 104mm/yr. See drawing ST-MJ extracted from the ***KWMSS*** in ***Appendix D***.

5.2 Post-development Stormwater Management Target

Stormwater management requirements for the proposed development were contemplated within the ***Pond 4 Design Brief and KWMSS***, where the proposed development is required to:

- Meet a target release rate of 210.9L/s/ha and 241L/s/ha, during the 100-year SCS24hr and 100-year CH3hr design storms;
- Provide a 2-year level of service for all local roads, ie no ponding during the 2-year event;
- Meet a target infiltration rate of 130 mm/yr;
- On-site quality controls are addressed in the receiving stormwater management facility, Pond 4.

Based on the above, the allowable release rate for the proposed development is ***1,509.6 L/s*** (6.264ha x 241L/s/ha) during a 100-year 3-hour Chicago design storm. The development's area excludes Blocks 28 and 31, where Block 28 is to be sold to the neighboring developer and Block 31 will be dedicated to the future Stittsville Main right-of-way.

5.3 Proposed Stormwater Management System

In accordance with the ***KWMSS*** and ***Pond 4 Design Brief***, the stormwater outlet from the proposed development will be to the 2100 mm diameter storm sewer within Maple Grove Road, as shown by ***ST-MJ*** located in ***Appendix D***. A conceptual Storm Servicing Plan (***Drawing 2***) is included in ***Drawings/Figures***. ***Drawing 5*** illustrates the overall grading and major system drainage patterns.

As described in Section 1.0, the subject lands will consist of apartment buildings, detached homes, semi-detached homes, townhomes, and the retention of the existing home at 1919 Maple Grove Road. DSEL estimated the overall runoff coefficient for the site at 0.70 or 72% impervious. See ***Appendix D*** for calculations.

5.3.1 Minor System Capture

The subject property is expected to be serviced by an internal gravity storm sewer system that is to generally follow the local road network. The drainage will be conveyed within the underground piped sewer system to the existing 2100mm diameter storm sewer on Maple Grove Road.

Street catch basins will collect drainage from the streets and front yards, while rear yard catch basins will capture drainage from backyards. Perforated catch basin leads will be provided in rear yards, except the last segment where it connects to the right-of-way which will be solid pipe, per City standards.

The preliminary rational method design of the minor system captures drainage for storm events up to and including the 2-year (local) and 5-year (collector) event assuming the use of ICDs for all catch basins within the subject property. See Rational Method calculation sheet in ***Appendix D***.

As noted above the subject lands were previously contemplated as having a Rational Method Coefficient of 0.6 and a 100-year capture of 210.9L/s/ha and 241L/s/ha, during the 100-year SCS24hr and 100-year CH3hr design storms. As illustrated on figure 2 from ***The Pond 4 Design Brief*** no storage was anticipated to be required. However, the subject lands have a greater amount of impervious cover than contemplated in the ***Pond 4 Design Brief***. The subject lands, less the mixed used blocks have an average Runoff Coefficient of 0.62. The mixed-use blocks have a runoff coefficient of 0.8. It is proposed to provide a 2-year level of service (170L/s/ha) to all development blocks. As shown on the storage estimate calculations, the predicted peak flow is less than the unitary rate of 170L/s/ha. Therefore, no storage is required during a 2-year event. The site will be required to attenuate 100-year flow rates to 241L/s/ha. The ROW, park, walkways, and residential areas will be required to attenuate 236m^3. The proposed road profile will consist of a saw tooth road pattern. Roughly 400m of the proposed right-of-way will be graded with a high-point to high-point at 0.2% or less. Approximately 145m^3/100m of surface storage can be accommodated within a saw tooth pattern at 0.2%. Therefore, it is anticipated that 580m^3 of sag storage is available within the right-of-way exceeding the storage required. Blocks See figure in ***Appendix D*** for additional information. See ***Appendix D*** for calculations.

Table 6 summarizes the standards that will be employed in the detailed design of the storm sewer network. The preliminary drainage area information can be found in ***Drawing 2*** and rational method design sheets are provided in ***Appendix D***.

Table 6 Storm Sewer Design Criteria

Design Parameter	Value
Minor System Design Return Period	1:2 yr (PIEDTB-2016-01) for local roads, without ponding 1:5 yr for collector roads, without ponding
Major System Design Return Period	1:100 year
Intensity Duration Frequency Curve (IDF) 2-year storm event: A=732.951 | B=6.199 | C=0.810 5-year storm event: A = 998.071 | B = 6.053 | C = 0.814	$i = \frac{A}{(t_c + B)^C}$
Minimum Time of Concentration	10 minutes
Rational Method	$Q = CiA$
Storm sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Runoff coefficient for paved and roof areas	0.9
Runoff coefficient for landscaped areas	0.2
Minimum Sewer Size	250 mm diameter
Minimum Manning's 'n' for pipe flow	0.013
Minimum Depth of Cover	1.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.8 m/s
Maximum Full Flowing Velocity	6.0 m/s
Clearance from 100-Year Hydraulic Grade Line to Building Opening	0.30 m

Max. Allowable Flow Depth on Municipal Roads	35 cm above gutter (PIEDTB-2016-01)
Extent of Major System	Contained within the ROW, or adjacent to the ROW, provided that the water level not touch any part of the building envelope and remains below the lowest building opening during the stress test event (100-year + 20%) and 15cm vertical clearance is maintained between spill elevation on the street and the ground elevation at the building envelope (PIEDTB-2016-01)
Stormwater Management Model	DDSWMM (rel. 2.1), SWMHYMO (v. 5.02) & XPSWMM (v. 10)
Design Parameter	**Value**
Model Parameters	Fo = 76.2 mm/hr, Fc = 13.2 mm/hr, DCAY = 4.14/hr, D.Stor.Imp. = 1.57 mm, D.Stor.Per. = 4.67 mm
Imperviousness	Based on runoff coefficient (C) where Percent Imperviousness = (C - 0.2) / 0.7 x 100%.
Design Storms	Chicago 3-hour Design Storms and 24-hour SCS Type II Design Storms. Max. Intensity averaged over 10 minutes.
Historical Events	July 1st, 1979, August 4th, 1988 and August 8th, 1996
Climate Change Street Test	20% increase in the 100-year, 3-hour Chicago storm
Extracted from City of Ottawa Sewer Design Guidelines, October 2012, and ISSU,	

5.3.2 Pond 4 Impacts

At the time of publication Pond 4 was constructed to receive 278.3ha at an overall impervious of 37% requiring 14,471m^3 of permanent pool and 11,132m^3 of extended detention. The interim pond was designed to provide 29,736m^3 of permanent pool and 22,288m^3 of extended detention volume.

The required permanent pool and extended detention volumes were estimated per the ***SWMP Design Manual,*** where:

- Permanent Pool = 278.288ha x 52m^3/ha = 14,471m^3
- Extended Detention = 278.288 x 40m^3/ha = 11,132m^3

The subject lands were previously contemplated to have an estimated runoff coefficient 0.60 or 57% impervious which required:

- Permanent Pool = 6.73ha x 73m^3/ha = 490m^3
- Extended Detention = 6.73ha x 40m^3/ha = 269m^3

The updated concept plan results in an estimated overall runoff coefficient of 0.70 or 72% imperviousness. As such, the subject lands have an increased volume requirement of:

- Permanent Pool = 6.73ha x 92m^3/ha = 619m^3
- Extended Detention = 6.73ha x 40m^3/ha = 269m^3

Therefore, the change in impervious coverage increases the required permanent pool storage by 129m^3. However, the interim facility was designed with excess permanent pool volume and can accommodate the increased storage required.

There are no changes to the extended detention storage requirements.

5.3.3 Water Budget

The Carp River Watershed / Subwatershed Study (Robinson Consultants, November 2004) proposes infiltration rates of 104mm/yr and 73mm/yr for area of moderate and low recharge. The ***KWMSS*** indicates that post development infiltration rates are to be increased by 25 percent above the predevelopment rates to compensate for those areas (ie roadway corridors) that cannot provide infiltration. The subject lands fall within an area identified as having moderate recharge, therefore the subject site is to meet an annual infiltration target 130 mm/yr.

Table 7 below summarizes the investigated lot level stormwater management practices that were considered for detailed design. This includes methods that are applied at the individual lot level or form part of the conveyance system and can be for either storage or infiltration.

Table 7 Lot Level Treatment Systems

Stormwater Management Practice	Description
Green Roof	Consist of a thin layer of vegetation and growing medium installed on top of a convention flat or sloped roof. Reduces the 'heat' island effect and reduces runoff volume.
Roof Downspout Disconnection	Roof downspouts are disconnected from the weeping tile and are directed to grass areas with options to include amended soils to promote runoff prevention.
Soakaway, infiltration trench or chamber	Rectangular or circular excavations lined with geotextile filter cloth and filled with clear stone designed to promote groundwater infiltration.
Bio-Retention / Bio-Filter	Consists of a filter bed consisting of a mixture of sand, soil, and organic material. Bio-retention facilities are designed to capture small storm events to retain and filter stormwater runoff. Plantings promote evapotranspiration.

Permeable Pavement	An alternative to traditional impervious pavement to allow stormwater to drain through into an aggregate reservoir and infiltrate into the ground water.
Enhanced Grass Swale	Vegetated open channels designed to convey, treat, and attenuate stormwater runoff. Check dams and vegetation in the swale promote attenuation and infiltration.
Dry Swale	A dry swale incorporates an engineered soil medium and a perforated pipe under drain.
Amended Soils	Top soil selection in accordance with the Sustainable Technologies Evaluation Program.

As residential subdivisions typically consist of urban right-of-way cross-sections and residential homes with peaked roofs. As such the following measures were not considered:

- Cisterns – Would increase the cost of each home. Home owner would be responsible for maintaining the cisterns.
- Green Roofs – Not standard practice in residential homes. Would increase the cost of the home. Concerns for maintaining green roofs. Unclear is approvable under Part 9 of the Ontario Building Code.
- Bio-retention / Bio-filter – not part of a typical right-of-way sections. Would increase right of way maintenance. Reduces space for utilities and would increase likelihood of conflicts.
- Permeable Pavement – not standard practice within municipal roads. Concerns with maintenance and pre-treatment of infiltrated water.
- Enhanced Grass Swale – Would have to take place in rear yards. It is anticipated that home owners will remove check dams.

The proposed subdivision may consist of the following:

- Roof Leaders to Grassed Areas with potential for incorporation of amended soils in areas where supplemental infiltration is desirable (i.e. in areas of higher rock elevations).
- Dry Swales.
- Amended Soils

The mixed use blocks were considered to have soak-away pits, where the developer could use an underground storage chamber within the parking lot area.

JFSA prepared an analysis of the potential annual infiltration. See ***Appendix D*** for the complete analysis. The analysis concluded that 144.3mm/yr of annual infiltration is possible by implementing the above low impact development measures.

5.3.4 Hydraulic Grade Line

An HGL analysis will be prepared at detailed design. Neighboring sites have been designed and built with full basements and no sump pumps. The HGL is not expected to be an issue. Bedrock was found at all boreholes 0.6 m to 1.8 m below existing grade. Centerline road grades are expected to be 1.0 m to 1.5 m above existing ground.

5.4 Stormwater Servicing Conclusions

The subject lands are tributary to Pond 4. Pond 4 was designed with in excess of permanent pool and extended detention storage. The subject lands have more impervious cover than previously contemplated, however there is sufficient storage within the pond to accommodate the increased imperviousness.

The subject property was modelled to have a 100-year capture of 210.9L/s/ha and 241L/s/ha, during the 100-year SCS24hr and 100-year CH3hr design storms. The subject lands will provide storage to ensure that the overall objective from the development area is met.

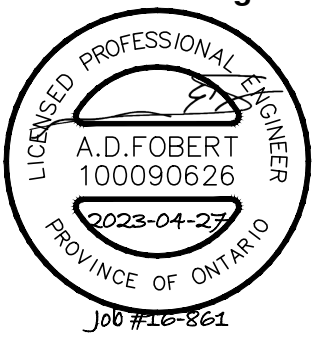
The KWMSS required an annual infiltration target of 130mm/yr. The development will contain low impact development measures that result in an estimated annual infiltration of 144.3mm/yr.

6.0 CONCLUSION AND RECOMMENDATIONS

David Schaeffer Engineering Ltd. (DSEL) has been retained by Formasian Development Corp. to prepare a Functional Servicing and Stormwater Management report in support of the application for Sub-division at 1919 Maple Grove Road. The preceding report outlines the following:

- Based on boundary conditions provided by the City, the existing municipal water infrastructure is capable of providing the contemplated development with water within the City's required pressure range;
- The FUS method for estimating fire flow indicated ***19,000 L/min*** is required for the contemplated development;
- The contemplated development is anticipated to have a peak wet weather flow of ***12.27 L/s***. Based on the sanitary analysis conducted, the existing municipal sewer infrastructure has sufficient capacity to support the development;
- Sufficient storage exist within Pond 4 to accommodate the development;
- The subject property was modelled to have a 100-year capture of 210.9L/s/ha and 241L/s/ha, during the 100-year SCS24hr and 100-year CH3hr design storms. The subject lands will storage to ensure that the overall objective from the development area is met.
- The KWMSS required an annual infiltration target of 130mm/yr. The development will contain low impact development measures that result in an estimated annual infiltration of 144.3mm/yr.
- The Ministry of the Environment, Conservation and Parks (MECP) requires an Environmental Compliance Application (ECA) for new storm and sanitary sewers within the future municipal right-of-ways.

Reviewed by,
David Schaeffer Engineering Ltd.



Per: Adam D. Fobert, P.Eng.

z:\projects\16-861_formasiam-1919_maple_grove\b_design\b3_reports\b3-2_servicing (dsel)\2022-09-27_sub5\aes-2022-11-16_861.docx

APPENDIX A

Pre-Consultation

DEVELOPMENT SERVICING STUDY CHECKLIST

16-861 09/08/2019

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 1.1, 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.	Section 2.1
☒	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	Drawings/Figures

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 3.2
☒	Confirmation of adequate domestic supply and pressure	Section 3.2, 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.	N/A
☐	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.	N/A
☐	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 5.2
☐	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.	N/A
☐	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 5.1
☐	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 7.0
☐	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

Charlotte Kelly

From: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Sent: June 25, 2020 4:37 PM
To: Charlotte Kelly
Cc: Alison Gosling
Subject: RE: 1919 Maple Grove Road - Boundary Condition Request
Attachments: FW: 1919 Maple Grove Road - Boundary Condition Request

Hi Kelly,

Please see attached email for the boundary conditions.

If you have any questions, please let me know.

Thanks,

Santhosh

From: Charlotte Kelly <CKelly@dsel.ca>
Sent: June 19, 2020 9:01 AM
To: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Cc: Alison Gosling <AGosling@dsel.ca>
Subject: 1919 Maple Grove Road - Boundary Condition Request

Good Morning Santhosh,

We would like to kindly request updated boundary conditions for the contemplated development at 1919 Maple Grove Road development using the following anticipated development demands:

1. Location of Service / Street Number: 1919 Maple Grove Road
2. Type of development and the amount of fire flow required for the contemplated development:
   - Type of development: The contemplated development includes 62 townhomes/semi-detached units and 450 residential units.
   - Contemplated Connections:
     - Dual Connection to the 305 mm diameter watermain within Maple Grove Road
   - Fire demand based on Technical Bulletin ISTB-2018-02 has been used to estimate a max fire demand of ***19,000 L/min***. Refer to the attached for detailed calculations.

Demand	L/min	L/s
Avg. Daily	185.9	3.10
Max Day	464.7	7.75
Peak Hour	1022.4	17.04

Please let us know if you have any questions.

Thank-you,

Charlotte Kelly, E.I.T.
Junior Engineering 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

1919 Maple Grove Road
Proposed Site Conditions

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	18	49
Townhouse	2.7	44	119
Apartment			0
Bachelor	1.4		0
1 Bedroom	1.4	225	315
2 Bedroom	2.1	225	473
3 Bedroom	3.1		0
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	956	267.7	185.9	669.2	464.7	1472.2	1022.4

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
Commercial floor space	2.5 $L/m^2/d$		0.00	0.0	0.0	0.0	0.0	0.0
Office	75 $L/9.3m^2/d$		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Light	35,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
Industrial - Heavy	55,000 L/gross ha/d		0.00	0.0	0.0	0.0	0.0	0.0
		Total I/CI Demand	0.0	0.0	0.0	0.0	0.0	0.0
		Total Demand	**267.7**	**185.9**	**669.2**	**464.7**	**1472.2**	**1022.4**

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

SOUTH EAST NW APARTMENT BUILDING

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: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	17052.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	28728.3	L/min
	29000.0	**L/min** *rounded to the nearest 1,000 L/min*

2. Reduction for Occupancy Type

Limited Combustible -15%

Fire Flow	**24650.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised -50%

Reduction	**-12325 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Ordinary - Unprotected Openings	20.1m-30m	31	4	124	10%
S	Ordinary - Unprotected Openings	20.1m-30m	14	3	42	7%
E	Ordinary - Unprotected Openings	20.1m-30m	60	4	240	10%
W	Ordinary - Unprotected Openings	>45m	21	4	84	0%
		% Increase				**27%** *value not to exceed 75%*

Increase	**6655.5 L/min**

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

Total Fire Flow

Fire Flow	18980.5	L/min *fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	19000.0	**L/min** *rounded to the nearest 1,000 L/min*

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

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

NORTH WEST SW APARTMENT BUILDING

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: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	9976.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	21973.6	L/min	
	22000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%
Fire Flow	**18700.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%
Reduction	**-9350 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Ordinary - Unprotected Openings	10.1m-20m	31	4	124	15%
S	Ordinary - Unprotected Openings	20.1m-30m	16	3	48	7%
E	Ordinary - Unprotected Openings	10.1m-20m	150	3	450	15%
W	Ordinary - Unprotected Openings	20.1m-30m	60	4	240	10%
		% Increase				**47%** *value not to exceed 75%*

Increase	**8789.0 L/min**

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

Total Fire Flow

Fire Flow	18139.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	18000.0	**L/min**	*rounded to the nearest 1,000 L/min*

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

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

NORTH WEST CENTRAL APARTMENT BUILDING

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: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	5760.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	16696.8	L/min	
	17000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%	
Fire Flow	**14450.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-7225**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Ordinary - Unprotected Openings	>45m	0	0	0	0%	
S	Ordinary - Unprotected Openings	20.1m-30m	31	4	124	10%	
E	Ordinary - Unprotected Openings	10.1m-20m	90	3	270	15%	
W	Ordinary - Unprotected Openings	20.1m-30m	60	4	240	10%	
		% Increase				**35%**	*value not to exceed 75%*

Increase	**5057.5**	**L/min**

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

Total Fire Flow

Fire Flow	12282.5	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	12000.0	**L/min**	*rounded to the nearest 1,000 L/min*

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

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

SOUTH WEST CENTRAL APARTMENT BUILDING

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: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	4168.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	14203.2	L/min	
	14000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%
Fire Flow	**11900.0 L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%
Reduction	**-5950 L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC
N	Ordinary - Unprotected Openings	>45m	0	0	0	0%
S	Ordinary - Unprotected Openings	20.1m-30m	31	4	124	10%
E	Ordinary - Unprotected Openings	10.1m-20m	90	3	270	15%
W	Ordinary - Unprotected Openings	20.1m-30m	60	4	240	10%
		% Increase				**35%** *value not to exceed 75%*

Increase	**4165.0 L/min**

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

Total Fire Flow

Fire Flow	10115.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	10000.0	**L/min**	*rounded to the nearest 1,000 L/min*

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

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

NORTH EAST CENTRAL APARTMENT BUILDING

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: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	4168.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	14203.2	L/min	
	14000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%	
Fire Flow	**11900.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-5950**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Ordinary - Unprotected Openings	>45m	0	0	0	0%	
S	Ordinary - Unprotected Openings	20.1m-30m	31	4	124	10%	
E	Ordinary - Unprotected Openings	10.1m-20m	90	3	270	15%	
W	Ordinary - Unprotected Openings	20.1m-30m	60	4	240	10%	
		% Increase				**35%**	*value not to exceed 75%*

Increase	**4165.0**	**L/min**

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

Total Fire Flow

Fire Flow	10115.0	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	10000.0	**L/min**	*rounded to the nearest 1,000 L/min*

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

Fire Flow Estimation per Fire Underwriters Survey

Water Supply For Public Fire Protection - 1999

Fire Flow Required

SOUTH EAST CENTRAL APARTMENT BUILDING

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: Ordinary Construction

C	1		*Type of Construction Coefficient per FUS Part II, Section 1*
A	5760.0	m^2	*Total floor area based on FUS Part II section 1*

Fire Flow	16696.8	L/min	
	17000.0	**L/min**	*rounded to the nearest 1,000 L/min*

Adjustments

2. Reduction for Occupancy Type

Limited Combustible	-15%	
Fire Flow	**14450.0**	**L/min**

3. Reduction for Sprinkler Protection

Sprinklered - Supervised	-50%	
Reduction	**-7225**	**L/min**

4. Increase for Separation Distance

	Cons. of Exposed Wall	S.D	Lw	Ha	LH	EC	
N	Ordinary - Unprotected Openings	>45m	0	0	0	0%	
S	Ordinary - Unprotected Openings	20.1m-30m	31	4	124	10%	
E	Ordinary - Unprotected Openings	10.1m-20m	90	3	270	15%	
W	Ordinary - Unprotected Openings	20.1m-30m	60	4	240	10%	
		% Increase				**35%**	*value not to exceed 75%*

Increase	**5057.5**	**L/min**

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

Total Fire Flow

Fire Flow	12282.5	L/min	*fire flow not to exceed 45,000 L/min nor be less than 2,000 L/min per FUS Section 4*
	12000.0	**L/min**	*rounded to the nearest 1,000 L/min*

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

Boundary Conditions Unit Conversion

Connection1:

	Height (m)	Elevation (m	m H_2O	PSI	kPa
Avg. DD	160.9	107.9	53.0	75.4	519.9
Fire Flow	147.2	107.9	39.3	55.9	385.5
Peak Hour	156.6	107.9	48.7	69.3	477.7

Connection 2:

	Height (m)	Elevation (m	m H_2O	PSI	kPa
Avg. DD	160.9	108	52.9	75.3	518.9
Fire Flow	147.1	108	39.1	55.6	383.6
Peak Hour	156.6	108	48.6	69.1	476.8

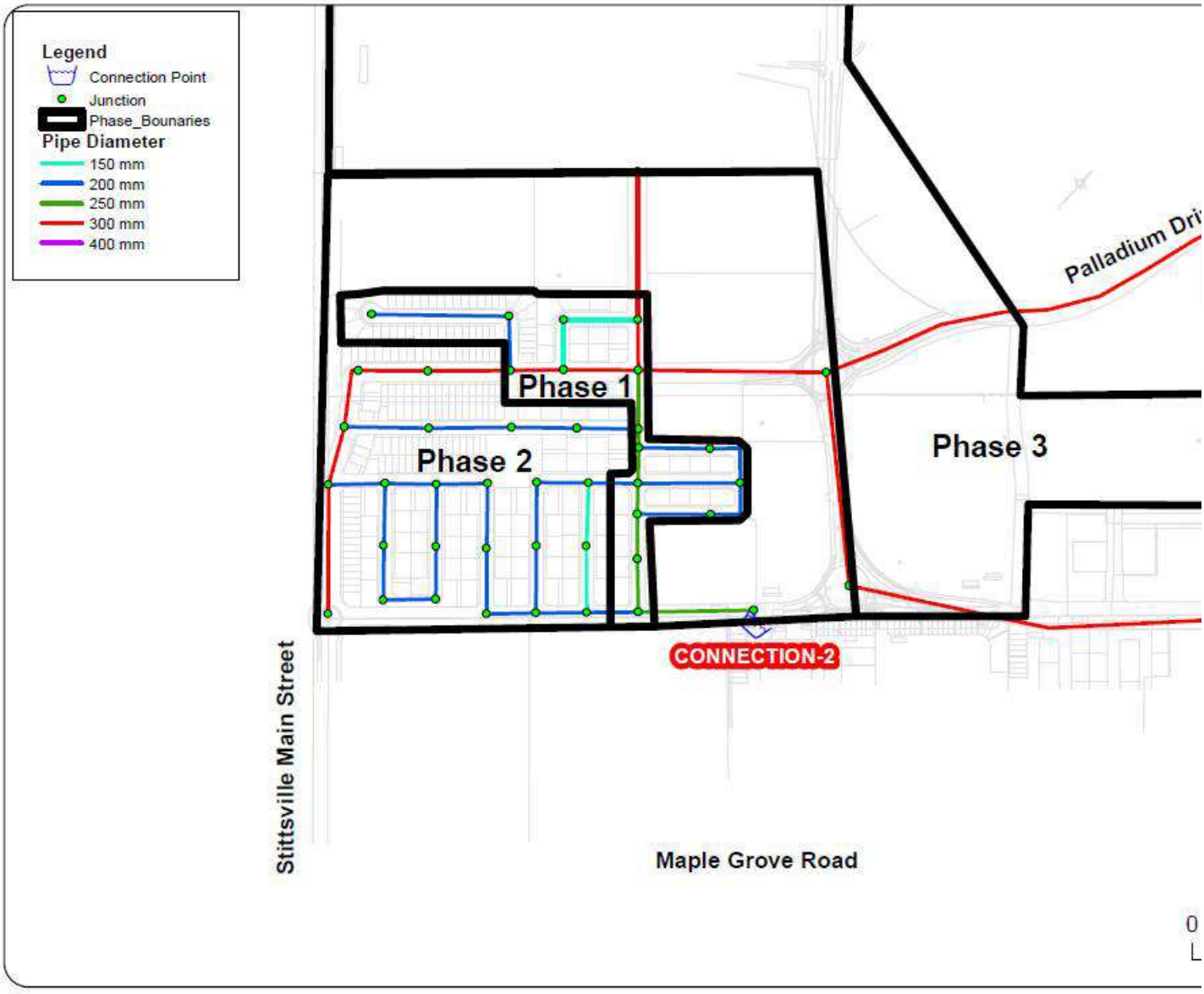
Charlotte Kelly

From: Bougadis, John <John.Bougadis@ottawa.ca>
Sent: June 25, 2020 4:14 PM
To: Kuruvilla, Santhosh
Cc: Simard, Lyndsey
Subject: FW: 1919 Maple Grove Road - Boundary Condition Request
Attachments: 1919 Maple Grove Road_Boundary Conditions_24 June2020.docx

Hi Santhosh,

See attached. Comments:

- The City expects a future third connection from Phase 2 of 195 Huntmar (see below).
- The FUS calc is based on an apartment unit. The email from DSEL below states townhomes and semi-detached units (see highlighted text in email below).
- An isolation valve between connection 1 and 2 is required.



John
x14990

From: Simard, Lyndsey <lyndsey.simard@ottawa.ca>
Sent: June 24, 2020 12:25
To: Bougadis, John <John.Bougadis@ottawa.ca>
Subject: RE: 1919 Maple Grove Road - Boundary Condition Request

Hi John,

Please find the attached boundary conditions.

Cheers,

Lyndsey

From: Bougadis, John <John.Bougadis@ottawa.ca>
Sent: June 19, 2020 10:12
To: Simard, Lyndsey <lyndsey.simard@ottawa.ca>
Subject: FW: 1919 Maple Grove Road - Boundary Condition Request

John
x14990

From: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Sent: June 19, 2020 10:03
To: Bougadis, John <John.Bougadis@ottawa.ca>
Subject: FW: 1919 Maple Grove Road - Boundary Condition Request

Good morning John,

Please provide the boundary conditions for the subject application.

Thanks,

Santhosh

From: Charlotte Kelly <CKelly@dsel.ca>
Sent: June 19, 2020 9:01 AM
To: Kuruvilla, Santhosh <Santhosh.Kuruvilla@ottawa.ca>
Cc: Alison Gosling <AGosling@dsel.ca>
Subject: 1919 Maple Grove Road - Boundary Condition Request

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 Morning Santhosh,

We would like to kindly request updated boundary conditions for the contemplated development at 1919 Maple Grove Road development using the following anticipated development demands:

1. Location of Service / Street Number: 1919 Maple Grove Road
2. Type of development and the amount of fire flow required for the contemplated development:
   - Type of development: The contemplated development includes 62 townhomes/semi-detached units and 450 residential units.
   - Contemplated Connections:
     - Dual Connection to the 305 mm diameter watermain within Maple Grove Road
   - Fire demand based on Technical Bulletin ISTB-2018-02 has been used to estimate a max fire demand of ***19,000 L/min***. Refer to the attached for detailed calculations.

Demand	L/min	L/s
Avg. Daily	185.9	3.10
Max Day	464.7	7.75
Peak Hour	1022.4	17.04

Please let us know if you have any questions.

Thank-you,

Charlotte Kelly, E.I.T.
Junior Engineering 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

Boundary Conditions
1919 Maple Grove Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	186	3.10
Maximum Daily Demand	465	7.75
Peak Hour	1,022	17.04
Fire Flow Demand #1	19,020	317.00

Location

Results

Connection 1 – Maple Grove Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.9	75.4
Peak Hour	156.6	69.2
Max Day plus Fire 1	147.2	55.8

[1] Ground Elevation = 107.9 m

Connection 2 – Maple Grove Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.9	75.2
Peak Hour	156.6	69.0
Max Day plus Fire 1	147.1	55.5

[1] Ground Elevation = 108.0 m

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. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Watermain Final Concept

Kanata West Master Servicing Study

Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa ON Canada
K1Z 7T1
Tel. 613.722.4420
Fax. 613.722.2799
www.stantec.com

Stantec

Legend

- KANATA–WEST CONCEPT PLAN BOUNDARY
- EXISTING WATERMAIN
- EXISTING 610mm WATERMAIN TO BE UPGRADED TO 914mm
- EXISTING 610mm WATERMAIN TO BE UPGRADED TO 762mm
- PROPOSED 610mm DIA. WATERMAIN
- PROPOSED 406mm DIA. WATERMAIN
- PROPOSED 305mm DIA. WATERMAIN
- PROPOSED 203mm DIA. WATERMAIN

Notes

INTERNAL WATERMAIN SIZE ARE EXPECTED TO VARY FROM 152mm TO 305mm.

CCL/IBI

5	REVISED FOR DEC.21/05 SUBMISSION	GBU	SJP	DEC.21/05
4	REVISED AS PER CITY COMMENTS (Sept.16/05)	GBU	MAF	OCT.28/05
3	REVISED WATER DISTRIBUTION NETWORK	GBU	S.J.P.	AUG 09/05
2	REVISED POND 1 AREA	NB	MAF	JUNE 09/05
1	REVISED LOTTING FOR TARTAN AND MATTAMY	BCB	SJP	JAN.18/05
Revision		By	Appd.	Date

File Name:

Dsn. Chkd. Dsgn. Date

Seals

Client/Project

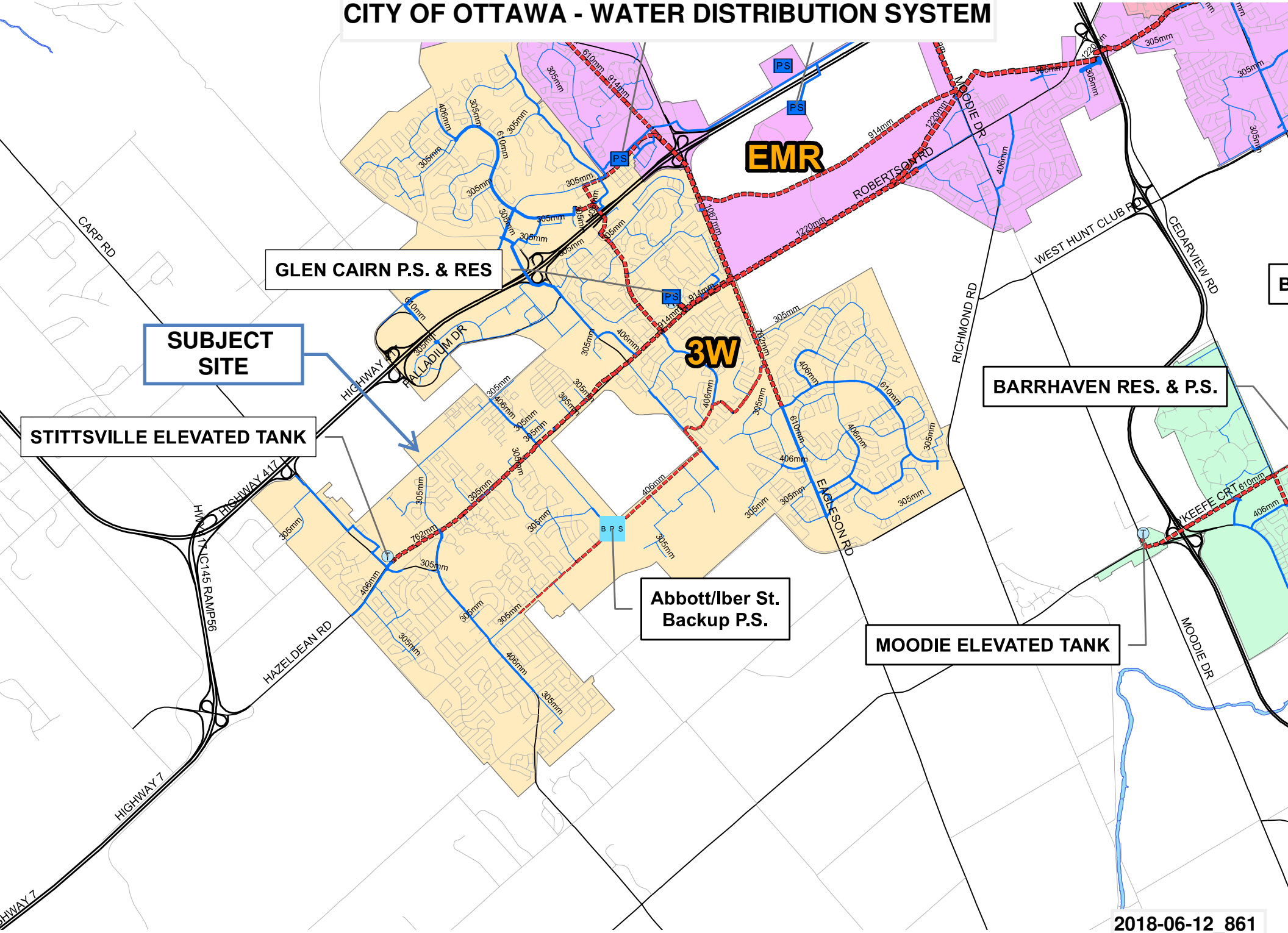
Kanata West Concept Plan
Master Servicing Study

Ottawa, Ontario

Title

Watermain
Final Concept

Project No.	Scale	Sheet	Revision
60400406	1:7500 (0, 75, 225, 375m)	2 of 7	5
Drawing No.			
WM-1			


CITY OF OTTAWA - WATER DISTRICT SYSTEM
EMR
3W
GLEN CAIRN P.S. & RES
SUBJECT SITE
STITTSVILLE ELEVATED TANK
BARRHAVEN RES. & P.S.
Abbott/Iber St. Backup P.S.
MOODIE ELEVATED TANK
ROBERTSON RD
MOODIE DR
WEST HUNT CLUB RD
CEDARVIEW RD
RICHMOND RD
EAGLESON RD
PALLADIUM DR
HIGHWAY 417
HWY 417 IC145 RAMP56
HAZELDEAN RD
HIGHWAY 7
CARP RD
MCKEEFE CRT
PS
2018-06-12_861

APPENDIX C

Wastewater Collection

Formasian Development Corp.
1919 Maple Grove Road
Proposed Site Conditions

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

Site Area 6.670 **ha**

Extraneous Flow Allowances

Infiltration / Inflow (Dry)	**0.33**	**L/s**
Infiltration / Inflow (Wet)	**1.87**	**L/s**
Infiltration / Inflow (Total)	**2.20**	**L/s**

Domestic Contributions

Unit Type	**Unit Rate**	**Units**	**Pop**
Single Family	3.4		0
Semi-detached and duplex	2.7	18	49
Townhouse	2.7	44	119
Stacked Townhouse	2.3		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4	225	315
2 Bedroom	2.1	225	473
3 Bedroom	3.1		0
Average	1.8		0

Total Pop	**956**	
Average Domestic Flow	**3.10**	**L/s**
Peaking Factor	**3.25**	
Peak Domestic Flow	**10.07**	**L/s**

Institutional / Commercial / Industrial Contributions

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

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

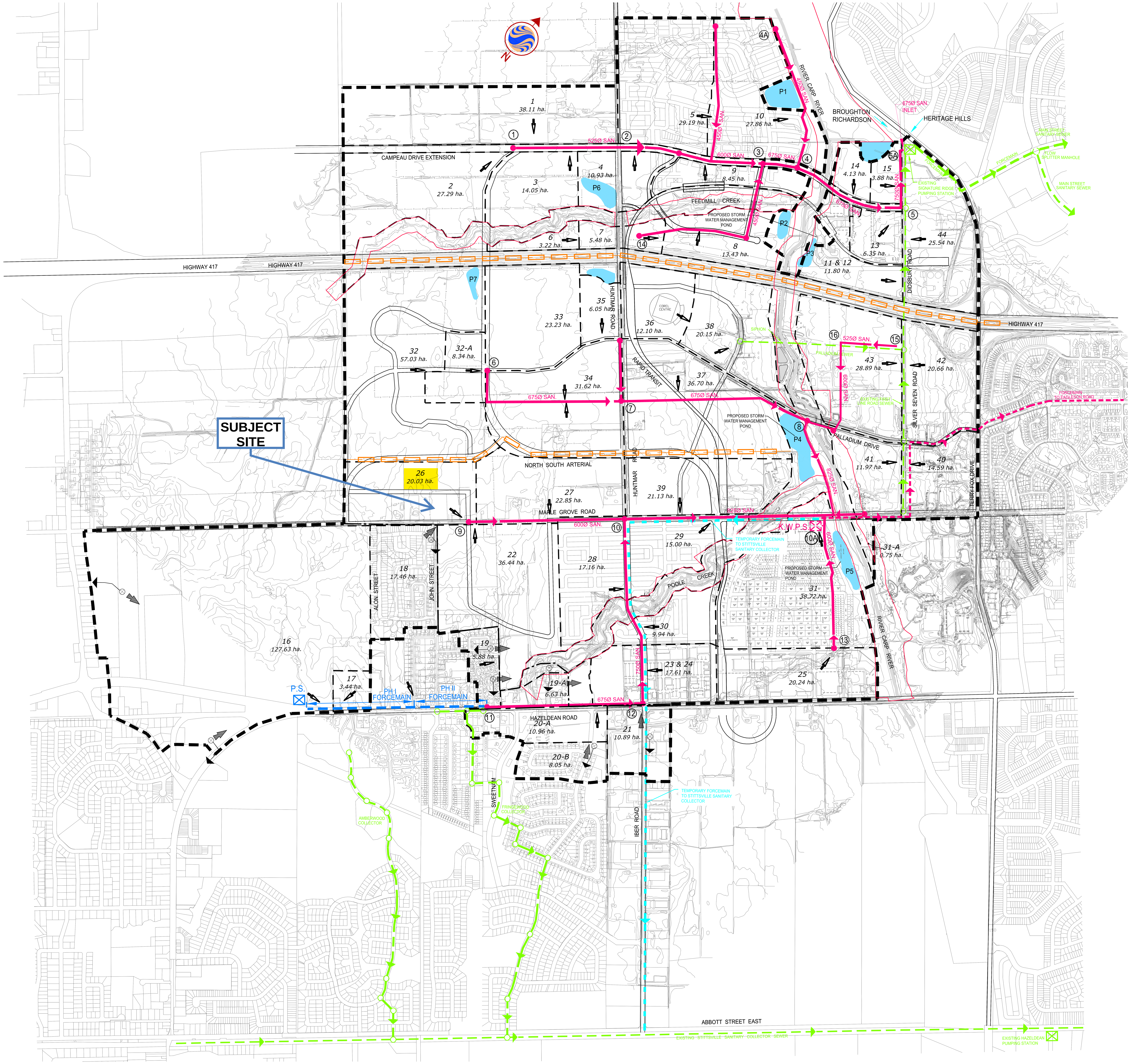
** assuming a 12 hour commercial operation*

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

Total Estimated Average Dry Weather Flow Rate	**3.43**	**L/s**
Total Estimated Peak Dry Weather Flow Rate	**10.40**	**L/s**
Total Estimated Peak Wet Weather Flow Rate	**12.27**	**L/s**

Preferred Waste-Water Master Servicing Study

Kanata West Master Servicing Study



Legend

▬ ▬ ▬	ULTIMATE MAJOR DRAINAGE LIMIT
— — —	SUBCATCHMENT AREAS
———	PROPOSED TRUNK SEWER
- - - -	PROPOSED FORCEMAIN
- - - -	TEMPORARY FORCEMAIN
— — —	PROPOSED STITTSVILLE PUMPING STATION AND FORCEMAIN
— — —	EXISTING TRUNK SEWER
▭▭	MAJOR DRAINAGE SPLIT
(1)	NODES
○——►	EXISTING PUMPING STATION AND FORCEMAIN (TO BE DECOMMISSIONED)
44 25.54 ha.	INPUT POINT AND AREA IN HECTARES
◄	EXISTING PUMPING STATION GRAVITY OUTLET

Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa ON Canada
K1Z 7T1
Tel. 613.722.4420
Fax. 613.722.2799
www.stantec.com

CCL/IBI
Cumming Cockburn Limited

	Revision	By	Appd.	Date
5	REVISED FOR DEC.21/05 SUBMISSION	G.B.U.	S.J.P.	05:12:21
4	REVISED TRUNK SEWER FROM 16 TO KWPS	R.W.W.	R.W.W.	05:10:05
3	ARROWS FOR EXIST. PUMP STATIONS ADDED	R.W.W.	R.W.W.	05:08:09
2	REPORT JUNE 2005	R.W.W.	R.W.W.	05:06:07
1	REPORT APR. 2005	R.W.W.	R.W.W.	05:04:20

File Name: Dwn. Chkd. Dsgn. Date

Seals

Client/Project

Kanata West Concept Plan
Master Servicing Study

Ottawa, Ontario

Title

Preferred Waste-Water Option

Project No. 60400406

Scale 1:7500

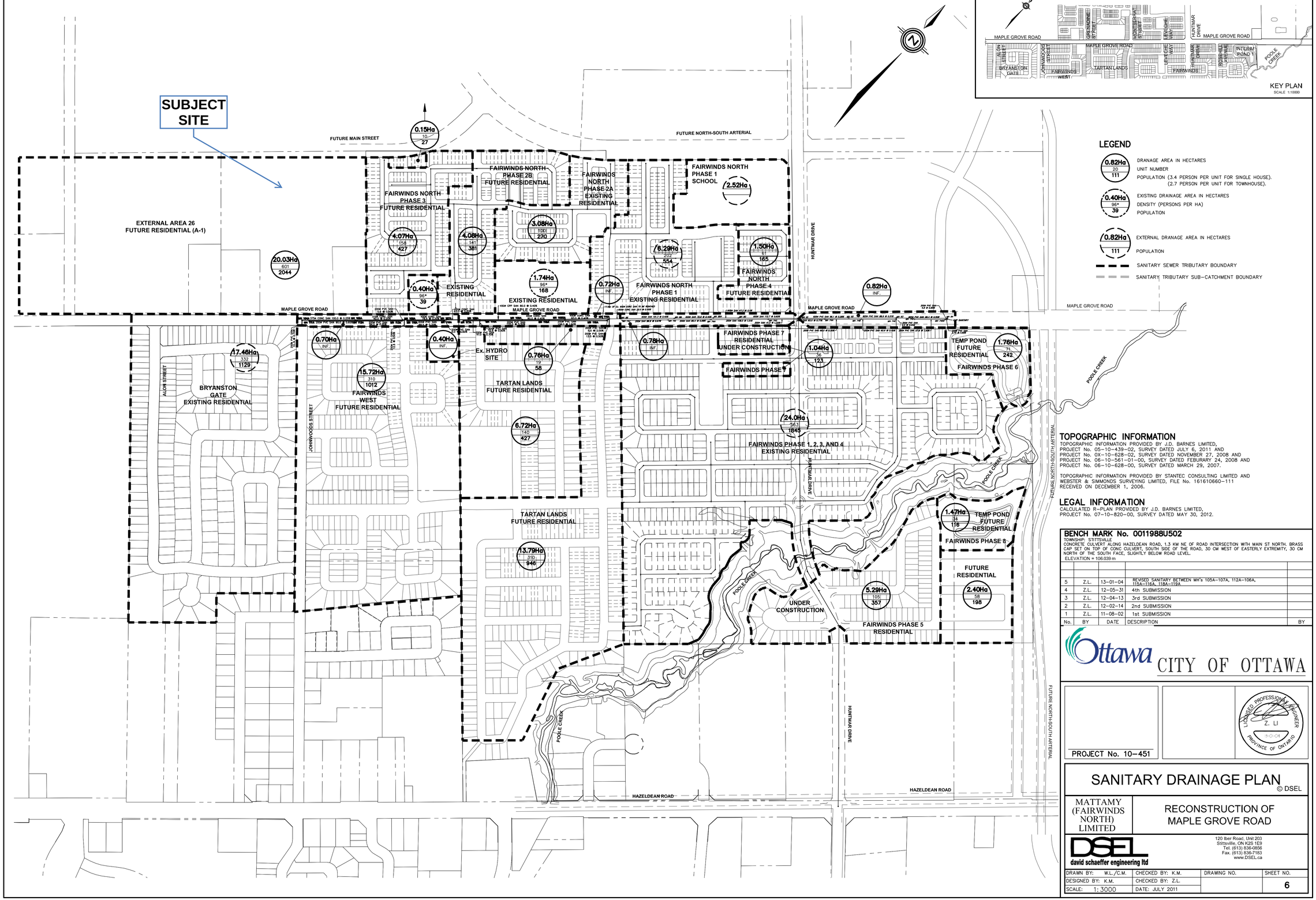
Drawing No. S-I

Sheet 7 of 7

Revision 5

Sanitary Drainage Plan (Project No. 10-451)
Reconstruction of Maple Grove Road

David Schaeffer Engineering



LEGEND

- 0.82Ha / 20 / 111 — DRANAGE AREA IN HECTARES; UNIT NUMBER; POPULATION (3.4 PERSON PER UNIT FOR SINGLE HOUSE). (2.7 PERSON PER UNIT FOR TOWNHOUSE).
- 0.40Ha / 96* / 39 — EXISTING DRAINAGE AREA IN HECTARES; DENSITY (PERSONS PER HA); POPULATION
- 0.82Ha / 111 — EXTERNAL DRANAGE AREA IN HECTARES; POPULATION
- SANITARY SEWER TRIBUTARY BOUNDARY
- SANITARY TRIBUTARY SUB-CATCHMENT BOUNDARY

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 05-10-439-02, SURVEY DATED JULY 6, 2011 AND
PROJECT No. 04-10-628-02, SURVEY DATED NOVEMBER 27, 2008 AND
PROJECT No. 06-10-561-01-00, SURVEY DATED FEBURARY 24, 2008 AND
PROJECT No. 06-10-628-00, SURVEY DATED MARCH 29, 2007.

TOPOGRAPHIC INFORMATION PROVIDED BY STANTEC CONSULTING LIMITED AND WEBSTER & SIMMONDS SURVEYING LIMITED, FILE No. 161610660-111 RECEIVED ON DECEMBER 1, 2006.

LEGAL INFORMATION

CALCULATED R-PLAN PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 07-10-820-00, SURVEY DATED MAY 30, 2012.

BENCH MARK No. 0011988U502

TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
5	Z.L.	13-01-04	REVISED SANITARY BETWEEN MH's 105A-107A, 112A-106A, 115A-116A, 118A-119A	
4	Z.L.	12-05-31	4th SUBMISSION	
3	Z.L.	12-04-13	3rd SUBMISSION	
2	Z.L.	12-02-14	2nd SUBMISSION	
1	Z.L.	11-08-02	1st SUBMISSION	

CITY OF OTTAWA

PROJECT No. 10-451

LICENSED PROFESSIONAL ENGINEER — Z. LI — PROVINCE OF ONTARIO

SANITARY DRAINAGE PLAN

MATTAMY (FAIRWINDS NORTH) LIMITED

RECONSTRUCTION OF MAPLE GROVE ROAD

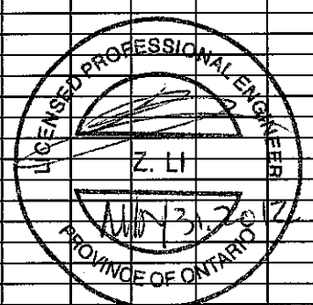
DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: W.L./C.M.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		6
SCALE: 1:3000	DATE: JULY 2011		

SANITARY SEWER CALCULATION SHEET

Manning's n=0.013

LOCATION			RESIDENTIAL AREA AND POPULATION							COMM		INDUST		INSTIT		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL. (FULL) (m/s)	VEL. (ACT.) (m/s)
MAPLE GROVE ROAD																											
			20.03	601	2044	20.03	2044										20.03	20.03									
	104A	105A	17.46	332	1129	37.49	3173	3.42	43.96								17.46	37.49	10.497	54.46	100.0	375	0.25	87.67	0.62	0.79	0.83
	105A	106A	0.70	0	0	38.19	3173	3.42	43.96								0.70	38.19	10.693	54.65	101.0	375	0.25	87.67	0.62	0.79	0.83
			0.40		39	38.59	3212										0.40	38.59									
			0.40	0	0	38.99	3212										0.40	38.99									
	106A	107A	15.72	310	1012	54.71	4224	3.31	56.64								15.72	54.71	15.319	71.96	70.0	450	0.20	127.50	0.56	0.80	0.82
	107A	108A	0.72	0	0	55.43	4224	3.31	56.64								0.72	55.43	15.520	72.16	63.0	450	0.20	127.50	0.57	0.80	0.82
	108A	109A	6.72	140	427	62.15	4651	3.27	61.61								6.72	62.15	17.402	79.01	80.0	450	0.40	180.32	0.44	1.13	1.09
	109A	1090A	1.74		168	63.89	4819	3.26	63.64								1.74	63.89	17.889	81.53	80.0	450	0.40	180.32	0.45	1.13	1.10
	1090A	110A				63.89	4819	3.26	63.64								0.00	63.89	17.889	81.53	83.0	450	0.40	180.32	0.45	1.13	1.10
			0.76	19	58	64.65	4877										0.76	64.65									
	110A	Ex. 88	13.79	310	946	78.44	5823	3.18	75.01								13.79	77.68	21.750	96.76	22.0	600	0.40	388.33	0.25	1.37	1.14
	Ex. 88	Ex. 89	0.78	0	0	79.22	5823	3.18	75.01								0.78	78.46	21.969	96.98	101.3	600	0.40	388.33	0.25	1.37	1.14
			4.07	158	427	83.29	6250										4.07	82.53									
			4.08	141	381	87.37	6631										4.08	86.61									
			3.08	100	270	90.45	6901										3.08	89.69									
			2.52			92.97	6901																				
			6.29	202	554	99.26	7455										6.29	95.98									
	Ex. 89	Ex. 89A	1.50	61	165	100.76	7620	3.07	94.76								1.50	97.48	27.294	122.05	72.8	600	0.40	388.33	0.31	1.37	1.21
	Ex. 89A	Ex. 90				100.76	7620	3.07	94.76								0.00	97.48	27.294	122.05	47.2	600	0.40	388.33	0.31	1.37	1.21
	Ex. 90	Ex. 91				100.76	7620	3.07	94.76								0.00	97.48	27.294	122.05	112.7	600	0.62	483.47	0.25	1.71	1.42
			0.82	0	0	101.58	7620										0.82	98.30									
			1.04	36	123	102.62	7743										1.04	98.52									
			1.76	71	242	104.38	7985										1.76	100.28									
			24.00	563	1845	128.38	9830										24.00	124.28									
			2.40	58	198	130.78	10028										2.40	126.68									
			5.29	105	357	136.07	10385										5.29	131.97									
	Ex. 91	Ex. 92	1.47	34	116	137.54	10501	2.93	124.64								1.47	133.44	37.363	162.00	96.1	825	0.28	759.56	0.21	1.42	1.12
	Ex. 92	Ex. 93				137.54	10501	2.93	124.64								0.00	133.44	37.363	162.00	88.9	825	0.51	1025.11	0.16	1.92	1.39
	Ex. 93	Ex. 94				137.54	10501	2.93	124.64								0.00	133.44	37.363	162.00	96.4	825	0.50	1015.01	0.16	1.90	1.39



DESIGN PARAMETERS

Average Daily Flow =	350	l/p/day	Industrial Peak Factor =	as per MOE Graph	
Commercial/Institution Flow =	50000	L/ha/da	Extraneous Flow =	0.280	L/s/ha
Industrial Flow =	35000	L/ha/da	Minimum Velocity =	0.760	m/s
Max Res. Peak Factor =	4.00		Manning's n =	0.013	
Commercial/Institution peak Factor =	1.50		Townhouse coeff=	2.7	
			Single house coeff=	3.4	

Designed: K.M.	PROJECT: RECONSTRUCTION OF MAPLE GROVE ROAD		
Checked: Z.L.	LOCATION: City of Ottawa		
Dwg. Reference: Sanitary Drainage Plan, Dwg. No. 6	File Ref: 10-451	Date: May, 2012	Sheet No. 1 of 1

Economy (E) 25%

The reconstruction of the Signature Ridge Pumping Station is significantly more than the costs to upgrade the existing station.

Caring and Healthy Community (CHC) 25%

In terms of the impact on the Community, there are no significant differences between the two alternatives.

Natural Environment (NE) 14%

There are no significant differences between the two options with respect to impacts to the natural environment. Both alternatives require the construction of an emergency overflow to the Carp River. Impacts to surface water quality as a result of potential station overflows during an emergency situation are not expected to occur. Should an overflow occur for either alternative, the impacts would be mitigated by a SWM pond. Increases in CO_2 emissions as a result of the use of diesel generators during power failures or maintenance procedures will be negligible and are similar in both alternatives.

4.2.6.3 Selection of Preferred Signature Ridge Pumping Station Alternative

Based on the above evaluation, the Signature Ridge Pumping Station Alternative I, station upgrade, is selected as the preferred alternative. This alternative maximizes the use of existing infrastructure and offers the most flexibility in phasing of the works with the least amount of capital expenditure or impacts.

4.2.6.4 Summary

The preferred alternatives selected for the wastewater outlet, the internal servicing system, the temporary forcemain, the trunk sewer alignment, and the Signature Ridge Pumping Station have been used to develop a comprehensive wastewater servicing plan for the KWCP. This servicing plan is discussed in future detail in the following section of this report.

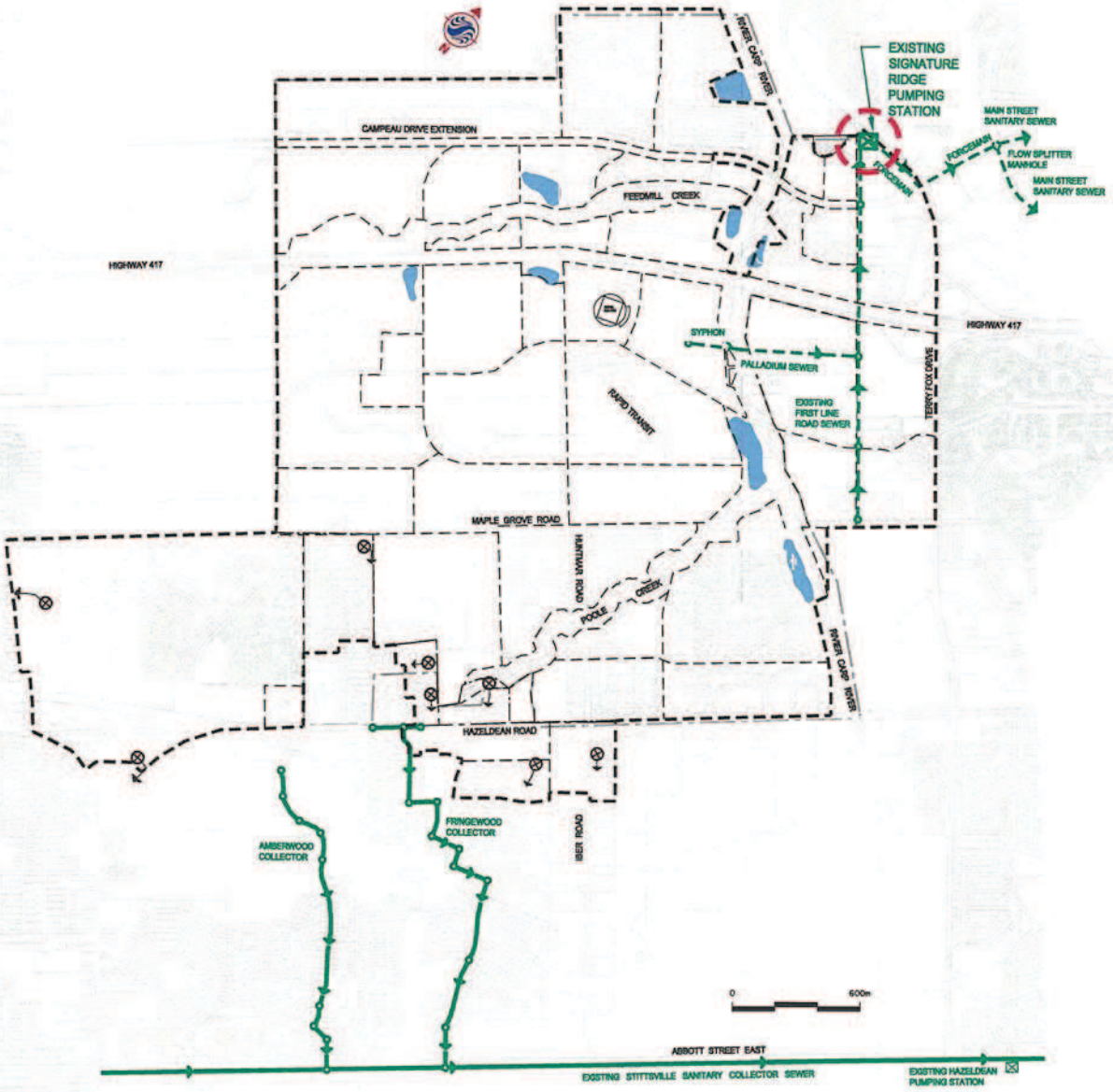
4.3 Preferred Sanitary Sewer Servicing Plan

Section 4.2 has detailed the selection of preferred alternatives for the major infrastructure required to provide sanitary sewer service to the KWCP. These preferred alternatives have been used to develop a Master Sanitary Servicing Plan for the area. This plan is illustrated on **Drawing S-1** (appended to this report). The major features of this plan are:

(i.) An upgraded Signature Ridge Pumping Station (SRPS) to service all the KWCP lands north of the Queensway, the existing urban area north of the Queensway currently proposed to drain to the SRPS, and the Broughton/Richardson Interstitial lands. A spreadsheet detailing the exact areas and flows tributary to the SRPS is included in **Figure 4.2-1**.

The 400 l/sec peak flow capacity identified in **Figure 4.2-1** for the upgraded SRPS, is consistent with the findings of the R.V. Anderson Report titled "Signature Ridge Pumping Station Upgrades Feasibility Study".

SIGNATURE RIDGE PUMPING STATION LOCATION



Legend:

- Ultimate Drainage Limit
- Existing Stittsville Sewer
- Existing Trunk Sewer
- Existing Pumping Station and Forcemain (To be Decommissioned)

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MAY 2006

FIG. 4.1-9

TABLE 4.1-6

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Kanata West Wastewater - Temporary Forcemain/Trunk Sewer/Signature Ridge Alternatives

Criteria		Indicators	Weighting	Rationale for Relative Weights	Signature Ridge PS Alternative	
					Upgrade	Rebuild
CONSTRUCTABILITY/FUNCTIONALITY			**36%**		24	16
CO1.1	Geotechnical Issues and Construction Risks	Potential for encountering poor soils and/or elevated groundwater conditions.	7%	Alt. II requires reconstruction of the pumping station in very soft clays where Alt. I does not require reconstruction of the wet well.	3	1
CO1.2	Infrastructure Requirements	Extent of works required.	7%	Alt. I only requires upgrading of hardware within the existing pumping station.	4	1
CO1.3	Operational Impacts	Amount of maintenance intensive infrastructure required.	6%		3	3
CO1.4	Construction Scheduling	Impact of construction on development timing.	4%	Alt. I can be phased to suit development timing where Alt. II requires a lengthy total reconstruction program.	4	2
CO1.5	Property Acquisition	Ease of property acquisition. (Depends on status of lands and adjacent lands, i.e. vacant, leased or owner occupied.)	2%	Alt. II requires property acquisition for a new station because existing station will have to remain in service during construction.	5	2
CO1.6	System Reliability	Proximity of a storm sewer, SWM or other surface water for emergency overflow	6%		3	3
CO1.7	Servicing Flexibility	Ease of accommodating potential changes in servicing plans.	5%	Alt. II can be built to accommodate changes where Alt. I is designed to the maximum.	2	4
ECONOMY			**25%**		19	12
E1	Potential to Use Combined Service Corridor	Length and area of combined service corridor.	6%		3	3
E2	Efficiency of Use of Existing Infrastructure	Use of exisitng capacity	5%	Alt. I maximizes the use of the existing station.	5	2
E3	Energy Consumption	Pumping requirements	4%		3	3
E5	Impact on Agriculture	Agriculture area likely to be affected by infrastructure.	2%		3	3
E9	Capital Cost	Estimated cost of construction.	8%	Alt. II is significantly more expensive to construct.	5	1
CARING AND HEALTHY COMMUNITIES			**25%**		12	9
C3	Displacement of Residents, Community/Recreation Features and Institutions.	Affects areas of residence, institutions or businesses.	6%		4	4
C4	Disruption to Existing Community	Extent of works affecting existing residences and businesses and visibility of additional infrastructure.	11%	Alt. 1 requires only internal up-grades and will have minimal construction traffic or related impacts.	4	3
C9	Consistency with Planned Land Use and Infrastructure	Compatibility with City land use, design guidelines and infrastructure servicing corridor planning (Kanata West Roadwork Environmental Study Report and Storm Sewer and Watermain Needs).	8%	Alt. I maximizes use of currently planned infrastructure by upgrading existing station to its maximum potential.	4	2
NATURAL ENVIRONMENT			**14%**		14	14
N1	Impact on Significant Natural Features	Loss of natural area due to installation of works.	3%		3	3
N3	Impact on Aquatic Systems	Potential impact on fish habitat due to installation of works.	3%		3	3
N4	Impact on Quality and Quantity of Surface Water and Groundwater	Potential impact on water quality in the Carp River resulting from rare emergency overflows to the SWM pond due to pump station failure.	3%		3	3
N5	Impact on Global Warming	Difference in carbon dioxide emissions resulting from occasional use of diesel generator.	1%		2	2
N6	Effects on Urban Greenspace, Open Space and Vegetation (i.e.trees,shrubs,etc.)	Disruption to greenspace and trees.	5%		3	3
Total Score			**100%**		3.60	2.48
Ranking					1	2
Estimated Capital Cost (in $million)					1	4

Description of Alternatives
Signature Ridge PS Alternative 1 - Rebuild
Signature Ridge PS Alternative II - Upgrade

Evaluation Ranking
1 -2 High or Negative Impact
3 Moderate or No Impact
4-5 Low or Positive Impact

The Signature Ridge Pumping Station is currently not equipped with catastrophic failure protection in the form of a gravity overflow. A hydraulic analysis of the proposed sewer system was therefore completed to evaluate the potential for providing a gravity overflow. This analysis demonstrates that catastrophic protection can be provided by gravity. The analysis is included in **Appendix 4.2** and demonstrates that overflows to the existing stormwater management pond on First Line Road and to Pond I can provide the necessary level of protection.

(ii.) A single new pumping station and forcemain located south of Maple Grove Road and west of the Carp River.

This new pumping station ultimately services all the KWCP south of Highway 417, the lands south of the 417 originally tributary to the SRPS, and the lands in the Village of Stittsville, along Hazeldean Road which are currently unserviceable by gravity to the Stittsville Sanitary Sewer System. This new pumping station has also been designed to accommodate the decommissioning of up to eight small public and private pumping stations along Hazeldean Road without deepening the Kanata West system. **Figure 4.2-1** details the exact areas and flows from Stittsville which will ultimately be tributary to the new pumping station. The areas are also illustrated on **Drawing S-1**.

Figures 4.2-3 and 4.2-4 illustrate a conceptual layout and cross-section for the new pumping station and **Appendix 4.3** details the conceptual design of the pumping station.

The new pumping station will temporarily outlet to the Stittsville Collector Sewer via a temporary forcemain in Huntmar Road and Iber Road. This temporary forcemain is designed to accommodate a flow of 190 l/sec (approximately 3,000 units). The temporary outlet will be located entirely within a public right-of-way. The single 405 mm diameter forcemain used for the initial outlet can be kept in service for long-term use as an emergency back up outlet. Rationale on the availability of capacity in the Stittsville Collector Sewer is attached as **Appendix 4.1**.

The permanent outlet for the new pumping station consists of a forcemain leading from the pumping station to the Glen Cairn Collector Sewer east of Eagleson Road. The preferred route for this forcemain in along Maple Grove Road to Silver Seven Road; along the east side of Silver Seven Road, in an easement, in the undeveloped lands between Maple Grove Road and Palladium Drive; easterly along Palladium Drive to Katimavik Road; and easterly along the north side of Katimavik Road, in the corridor for the unbuilt westbound lanes of Katimavik Road, to Eagleson Road and the Glen Cairn Collector Sewer. The location of the new pumping station is in close proximity to Stormwater Management Ponds 4 and 5. This provides catastrophic failure protection to the new pumping station in the form of a gravity overflow. The hydraulic analysis of this overflow system is attached as **Appendix 4.2**.

The preferred sanitary sewer system also includes a gravity sewer, which collects flow from several minor internal sanitary sewers and directs this flow to the new pumping station location. As illustrated on **Drawing S-1** this minor collector sewer runs parallel to the west side of the Carp River corridor between Maple Grove Road and Palladium Drive, crossing under the Carp River by boring beneath the river. The sewer extends northerly to intercept flows from Silver Seven Road and diverts them from the Signature Ridge Pumping Station. The inclusion of this north south sewer is a key element in eliminating the need for double pumping within Kanata

SANITARY SEWER DESIGN SHEET
PROJECT : Kanata West Servicibility Study
LOCATION : CITY OF OTTAWA

PROJECT: 3598-LD-03
DATE: April 2005
DESIGN: JM
FILE: 3598LD.sewers.XLS

MODEL 1 ULTIMATE (population based criteria..ICI simultaneous peaking)

LOCATION				TOTAL AREA	RESIDENTIAL							EMPLOYMENT/RETAIL/BUSINESS PARK/OPEN SPACES							INFILTRATION			TOTAL FLOW	PROPOSED SEWER						HARMON PF	ACTUAL q/Q	va/Vf	ACTUAL VELOCITY
																PEAK FLOW			AREA (Ha)		PEAK FLOW										
STREET	FROM MH	TO MH			APPLIC AREA	UNIT/Ha	TOTAL UNITS	POPULATION INDIV	POPULATION ACCUM	PEAK FACTOR	PEAK FLOW	APPLIC AREA	ACCUM AREA	TOTAL AREA	FLOW RATE	INDIV	ACCUM	TOTAL	INDIV	TOTAL CUMUL			CAPACITY	VELOCITY (full)	LGTH.	PIPE	GRADE	AVAIL. CAP.				
				(Ha)	(Ha)						(l/s)	(Ha)	(Ha)	(Ha)	(l/Ha/d)	(l/s)	(l/s)	(l/s)	CUMUL		(l/s)	(l/s)	l/s	m/s	(m)	(mm)	%	(%)				(m/s)
Campeau Drive Trunk Sewer	1	2	Area 1 (PBP)	38.11								38.11	38.11		35000	23.16	23.16		38.11	38.11												
			Area 2 (PBP)	27.29								27.29	65.40		35000	16.58	39.74		27.29	65.40												
			Area 3 Ext Employment	14.05								14.05	79.45		50000	12.20	51.94		14.05	79.45												
			Area 4 HP Employment	10.93								10.93	90.38	90.38	50000	9.49	61.42	61.42	10.93	90.38	90.38	25.31	86.73	283.79	1.27	525.0	525	0.40	69.44%		0.306	0.730	0.927
	2	3	Area 5 Residential	29.19	29.19	19	555	1664	1664	3.65	24.58			90.38				61.42	29.19	29.19									3.85			
			Area 9 Ext Employment	8.45							24.58	8.45	8.45	98.83	50000	7.34	7.34	68.76	8.45	128.02	128.02	35.85	129.18	286.61	0.98	700.0	600	0.20	54.93%		0.451	0.830	0.815
	14	3	Area 6/8 Ext Employment	16.65								16.65	16.65		50000	14.45	14.45		16.65	16.65												
			Area 7 HP Employment	5.48								5.48	22.13	22.13	50000	4.76	19.21	19.21	5.48	22.13	22.13	6.20	25.41	148.74	0.91	910.0	450	0.25	82.92%		0.171	0.630	0.571
	3	4							1664	3.65	24.58	0.00	0.00	120.96		0.00	0.00	87.97	0.00	0.00	150.15	42.04	154.59	392.29	1.06	300.0	675	0.20	60.59%	3.65	0.394	0.790	0.839
	4A	4	Area 10 Residential	27.86	27.86	19	529	1588	1588	3.66	23.55								27.86	27.86	27.86	7.80	31.36	148.74	0.91	750.0	450	0.25	78.92%	3.66	0.211	0.660	0.598
	4	5	14 Mixed Use	4.13	1.76	50	88	263	3515	3.38	48.17	2.37	2.37	123.33	35000	1.44	1.44	89.41	4.13	4.13	182.14	51.00	188.58	392.29	1.06	450.0	675	0.20	51.93%	3.38	0.481	0.840	0.892
	Queenswa	5	Area 13 Community Retail	6.35								6.35	6.35	6.35	35000	3.86	3.86	3.86	6.35													
			Area 11/12 Mixed Use	11.80	5.02	50	251	752	752	3.88	11.81	6.79	13.14	13.14	35000	4.12	7.98	7.98	11.80	18.15	18.15	5.08	24.88	43.88	0.87	420.0	250	0.50	43.31%	3.88	0.567	0.860	0.762
	5	5A	Area 15 Community Retail	3.88			0	4267	4267	3.31	57.19	3.88			35000	2.36			3.88											3.31			
First Line Road Sewer			Area 44	25.54							57.19	25.54	29.42	165.89	35000	15.52	17.88	115.27	25.54	29.42	229.71	64.32	236.77	519.43	1.14	300.0	750	*0.20*	54.42%		0.456	0.830	0.945
				229.71							57.19							115.27				64.32	236.77						3.23			
Signature Ridge		5A	Area 100 Residential	90.20	90.20	19	1714	5141	5141	3.23	67.35	0.00											65.00										
Signature Ridge		5A	Area 100 Non-Residential	4.88							67.35	4.88	4.88	4.88	50000	4.24	4.24	4.24	95.08	95.08	95.08	26.62	98.21										
Intersticial Lands & Broughton/Richardson		5A																														
Total To SRPS	**5A**	**SRPS**		**324.79**	**154.02**		**3136**		**9409**		**124.54**	**170.77**						**119.51**			**324.79**	**90.94**	**399.98**	**580.53**	**1.27**	**30.0**	**750**	**0.25**	**31.10%**	2.98	0.689	0.940	1.197
Palladium Drive Trunk Sewer	6	7	Area 32 (PBP)	57.03								57.03	57.03		50000	49.51	49.51		57.03	57.03													
			Area 32A Park	8.34								8.34	65.37		0	0.00	49.51		8.34	65.37													
			Area 33/34 Ext Employment	54.85								54.85	120.22	120.22	50000	47.61	97.12	97.12	54.85	120.22	120.22													
	7	8	Area 37 Mixed Use	36.70	15.60	50	780	2340	2340	3.53	33.47	21.10	21.10	141.32	50000	18.32	18.32	115.44	36.70	36.70	156.92	43.94	192.85	455.83	1.23	925.0	675	0.27	57.69%	3.53	0.423	0.810	1.000
				156.92	15.60		780		2340		33.47	141.32						115.44	156.92		156.92	43.94	192.85							3.53			
Corel Centre Etc. (Existing Sewer) *		16	Area 35 HP Employment	6.05								6.05	6.05		30000	3.15	3.15		6.05													
		16	Area 36 (Corel Centre)																			30.00										
		16	Area 38 Exten Employment	20.15								20.15	26.20	26.20	14400	5.04	8.19	8.19	20.15	26.20	26.20	7.34	45.52				*Existing*						
First Line Road Sewer	15	16	Area 40 Employment	14.59								14.59	14.59		35000	8.87	8.87		14.59	14.59													
			Area 41 Employment	11.97								11.97	26.56		35000	7.27	16.14		11.97	26.56													
			Area 42 Employment	20.66								20.66	47.22		35000	12.55	28.69		20.66	47.22													
			Area 43 Employment	28.89								28.89	76.11	76.11	35000	17.55	46.25	46.25	28.89	76.11	76.11	21.31	67.56	224.35	1.00	525.0	525	0.25	69.89%		0.301	0.730	0.733
Carp River Trunk	16	8	Nothing To Add	102.31	15.60		780		2340	3.53	33.47	102.31	102.31	102.31	0	0.00	54.44	54.44	0.00	102.31	102.31	28.65	113.08	286.61	0.98	400.0	600	0.20	60.54%	3.53	0.395	0.790	0.776
Carp River Trunk	8	10A	Nothing To Add	259.23	15.60		780		2340		33.47	0.00	0.00	243.63		0.00	0.00	169.87	0.00	139.01	259.23	109.92	305.93	579.95	1.05	550.0	825	0.15	47.25%	3.53	0.528	0.860	0.904
																														3.72			
Marie Grove Road Trunk Sewer	9	10	Area 18/19 Exist. Residential	23.34	23.34	19	443	1330	1330										23.34	23.34									3.03	0.327	0.740	1.027
			Area 22/26/27 Residential	79.32	79.32	30	2380	7139	8469	3.03	103.82								79.32	102.66	102.66	28.74	132.56	405.11	1.39	775.0	600	0.40	67.28%				
																														3.20			
Hazeldean/Huntmar Trunk Sewer	11	12	Area 16/20 Residential	99.01	99.01	19	1881	5644	5644	3.20	73.06								99.01	99.01													
			Area 16/20 Commercial	33.50								33.50	33.50	33.50	50000	29.08	29.08	29.08	33.50	132.51													
			Area 16/20 Open Space	14.13								14.13							14.13	146.64													
			Area 17 Ex. Commercial	3.44							73.06	3.44	36.94	36.94	35000	2.09	31.17	31.17	3.44	150.08	150.08	42.02	146.26	554.82	1.50	775.0	675	0.40	73.64%		0.264	0.700	1.051
	12	10	Area 21 Exist. Employment	10.89								10.89	10.89	10.89	50000	9.45	9.45		10.89	10.89													
			Area 19A Exist Residential	6.63	6.63	19	126	378									9.45		6.63	17.52													
			Area 23/24 Community Retail	17.61								17.61	28.50	28.50	35000	10.70	20.15	51.32	17.61	35.13													
			Area 28/30 Residential	27.10	27.10	30	813	2439	8460	3.03	103.72	0.00	0.00	65.44				51.32	27.10	62.23	212.31	59.45	214.49	519.43	1.14	950.0	750	0.20	58.71%	3.03	0.413	0.800	0.911
Marie Grove Road Trunk Sewer	10	10A	Area 39 Mixed Use	21.13	8.98	50	449	1347				12.15	12.15	77.59	35000	7.38	7.38	58.71	21.13														
			Area 29 Residential	15.00	15.00	30	450	1350	19627	2.66	211.54							58.71	15.00	36.13	351.10	98.31	368.56	669.89	1.21	1000.0	825	0.20	44.98%	2.66	0.550	0.870	1.056
Carp River Trunk Sewer	13	10A	Area 25 Community Retail	20.24								20.24	20.24	20.24	35000	12.30	12.30	12.30	20.24														
			Area 31 residential	38.72	38.72	30	1162	3485	3485	3.39	47.80							12.30	38.72	58.96	58.96	16.51	76.61	320.17	1.10	1000.0	600	0.25	76.07%	3.39	0.239	0.680	0.746
		10A	Area 31A (PBP)	0.75								0.75	0.75	0.75	50000	0.65	0.65	0.65	0.75	0.75	0.75	0.21	0.86	36.69	0.72	100.0	250	0.35	97.65%		0.023	0.340	0.246
Pumping Station 2 to KWPS	**10A**	**KWPS**		**670.04**	**313.70**		**8484**		**25451**		**292.82**	**356.34**						**241.53**			**670.04**	**224.95**	**759.29**	**1273.71**	**1.43**	**30.0**	**1050**	**0.20**	**40.39%**	2.55	0.598	0.900	1.283
																														2.41			
STUDY TOTALS				994.83	467.72		11620		34860			527.11																				

Average Daily Per capita Flow Rate =	350 l/cap/d
Infiltration Allowance Flow Rate =	0.28 l/sec/Ha
Residential Peaking Factor = 1+(14/(4+(P^0.5))), P=Pop. in 1000's, Max of 4	
Population density per unit =	3.00
Ratio Of Employment/Retail/Business Park =	1.50

Mixed Uses Assumes: 15% Community Retail, 42.5% Business Park and 42.5% Residential

Revision No. 1: April 01, 2005
Revision No. 2: April 11, 2005
Revision No. 3: April 21, 2005
Revision No. 4: June 07, 2005
Revision No. 5: August 10, 2005
Revision No. 6: Oct. 14, 2005
Revision No. 7: Nov. 10, 2005
Revision No. 8: Nov. 11, 2005
Revision No. 9: Apr. 19, 2006

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FIG. 4.2-1

SANITARY SEWER DESIGN SHEET
PROJECT : Kanata West Servicibility Stury
LOCATION : CITY OF OTTAWA

PAGE 1 OF 1
PROJECT: 3598-LD-03
DATE: Apr 2005
DESIGN: JIM
FILE: 3598LD.sewers.XLS

PHASE 1 SIGNATURE RIDGE (population based criteria..ICI simultaneous peaking)

LOCATION				TOTAL AREA	RESIDENTIAL								EMPLOYMENT/RETAIL/BUSINESS PARK/OPEN SPACES							INFILTRATION				TOTAL FLOW	PROPOSED SEWER					
STREET	FROM MH	TO MH			APPLIC AREA	UNIT/Ha	TOTAL UNITS	POPULATION INDIV	POPULATION ACCUM	PEAK FACTOR	PEAK FLOW	APPLIC AREA	ACCUM AREA	TOTAL AREA	FLOW RATE	PEAK FLOW INDIV	PEAK FLOW ACCUM	PEAK FLOW TOTAL	AREA (Ha) INDIV	AREA (Ha) CUMUL	AREA (Ha) TOTAL CUMUL	PEAK FLOW		CAPACITY	VELOCITY (full)	LGTH.	PIPE	GRADE	AVAIL. CAP.
				(Ha)	(Ha)						(l/s)	(Ha)	(Ha)	(Ha)	(l/Ha/d)	(l/s)	(l/s)	(l/s)					(l/s)	l/s	m/s	(m)	(mm)	%	(%)
Campeau Drive Trunk Sewer	1	2	Area 1 (PBP)	0.00								0.00	0.00		35000	0.00	0.00		0.00	0.00								
			Area 2 (PBP)	0.00								0.00	0.00		35000	0.00	0.00		0.00	0.00								
			Area 3 Ext Employment	0.00								0.00	0.00		50000	0.00	0.00		0.00	0.00								
			Area 4 HP Employment	0.00								0.00	0.00	0.00	50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	283.79	1.27	500.0	525	0.40	100.00%
	2	3	Area 5 Residential	29.19	29.19	19	555	1664	1664	3.65	24.58			0.00				0.00	29.19	29.19								
			Area 9 Ext Employment	0.00							24.58	0.00	0.00		50000	0.00	0.00	0.00	0.00	0.00	29.19	8.17	32.75	286.61	0.98	700.0	600	0.20	88.57%
	14	3	Area 6/8 Ext Employment	0.00								0.00	0.00	0.00	50000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
			Area 7 HP Employment	0.00								0.00	0.00	0.00	50000	0.00	0.00	0.00	0.00	0.00				148.74	0.91	920.0	450	0.25	100.00%
	3	4							1664	3.65	24.58	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	29.19	8.17	32.75	200.67	0.90	150.0	675	0.20	83.68%
	4A	4	Area 10 Residential	27.86	27.86	19	529	1588	1588	3.66	23.55								27.86	27.86	27.86	7.80	31.36	34.00	0.67	750.0	450	0.25	7.76%
	4	5	14 Mixed Use	4.13	1.76	50	88	263	3515	3.38	48.17	2.37	2.37	123.33	35000	1.44	1.44	1.44	4.13	4.13	61.18	17.13	66.74	200.67	0.90	600.0	750	0.20	66.74%
Corel Centre Etc. (Existing Sewer)		15	Area 35 HP Employment	6.05								6.05	6.05		30000	3.15	3.15		6.05										
			Area 36 (Corel Centre)																			30.00							
			Area 38 Exten Employment	20.15								20.15	26.20	26.20	14400	5.04	8.19	8.19	20.15	26.20	26.20	7.34	45.52				*Existing*		
First Line Road Sewer		15	Area 40 Employment	14.59								14.59	14.59		35000	8.87	8.87		14.59	14.59									
			Area 41 Employment	11.97								11.97	26.56		35000	7.27	16.14		11.97	26.56									
			Area 42 Employment	20.66								20.66	47.22		35000	12.55	28.69		20.66	47.22									
			Area 43 Employment	28.89								28.89	76.11	76.11	35000	17.55	46.25	46.25	28.89	76.11	76.11	21.31	67.56	*100.21*	*0.88*	*694.0*	*375*	*0.30*	*32.59%*
Totals South Of Queensway To SRPS	15	5A		102.31	0.00		0		0		0.00	102.31						54.44	102.31		102.31	58.65	113.08	203.90	1.24	230.0	450	0.47	44.54%
	Queensway	5	Area 13 Community Retail	6.35								6.35	108.66		35000	3.86	58.29		6.35	6.35									
			Area 11/12 Mixed Use	11.80	5.02	50	251	752	752	3.88	11.81	6.79	115.45	115.45	35000	4.12	62.42	62.42	11.80	18.15	120.46	63.73	137.96	*203.90*	*1.24*	*420.0*	*450*	*0.47*	*32.34%*
	5	5A	Area 15 Community Retail	3.88								3.88	119.33		35000	2.36	64.77		3.88	124.34									
			Area 44	25.54							59.98	25.54	144.87	268.20	35000	15.52	81.73	81.73	25.54	149.88	211.06	89.10	230.81	*319.43*	*1.14*	*300.0*	*750*	*0.20*	*55.56%*
				149.88																		63.73	63.73						
Heritage Hills		5A	Area 100 Residential	90.20	90.20	19	1714	5141	5141	3.23	67.35	0.00							90.20										
Heritage Hills		5A	Area 100 Non-Residential	4.88							67.35	4.88	4.88	4.88	50000	4.24	4.24	4.24	4.88	95.08	95.08	26.62	98.21						
Broughton-Richardson / Interstitial		5A																					65.00						
Total To SRPS	**5A**	**SRPS**		**306.14**	**154.03**		**3136**		**9409**		**127.33**	**152.12**						**85.97**			**306.14**	**115.72**	**394.02**	**625.68**	**1.37**	**30.0**	**750**	**0.29**	**37.03%**

Average Daily Per capita Flow Rate =	350 l/cap/d
Infiltration Allowance Flow Rate =	0.28 l/sec/Ha

Residential Peaking Factor = 1+(14/(4+(P^0.5))), P=Pop. in 1000's, Max of 4

Population density per unit =	3.00
P. F. For Employment/Retail/Business Park =	1.50

Mixed Uses Assumes: 15% Community Retail, 42.5% Business Park and 42.5% Residential

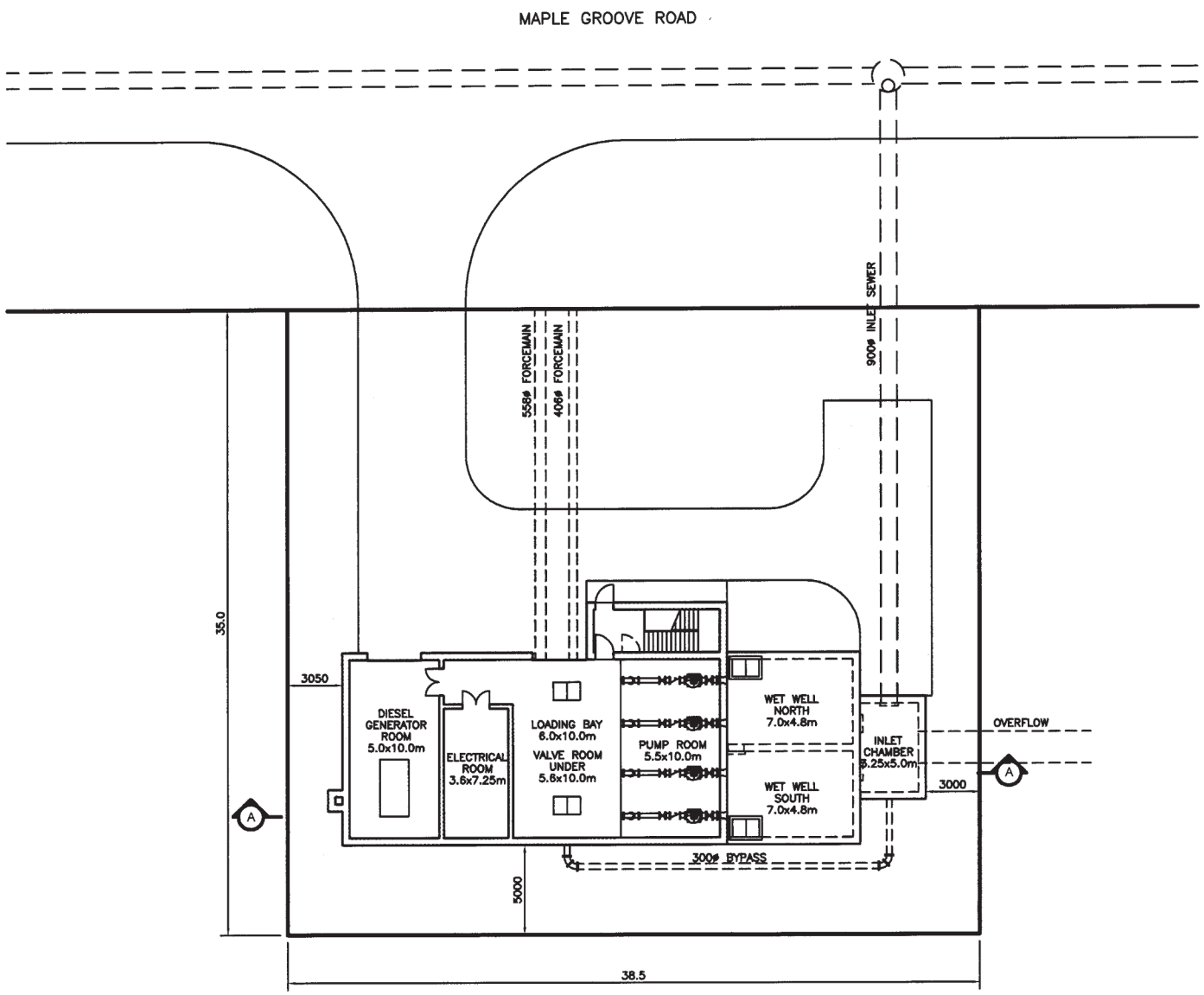
Note: Sewer from node 5 to SRPS is existing and is to be replaced.

Revision No. 1: April 11, 2005
Revision No. 2: April 20, 2005
Revision No. 3: June 07, 2005
Revision No. 4: Oct. 14, 2005
Revision No. 5: Feb. 15, 2006

Stantec RCCL/IBI

FIG. 4.2-2

CONCEPTUAL PUMPING STATION SITE PLAN



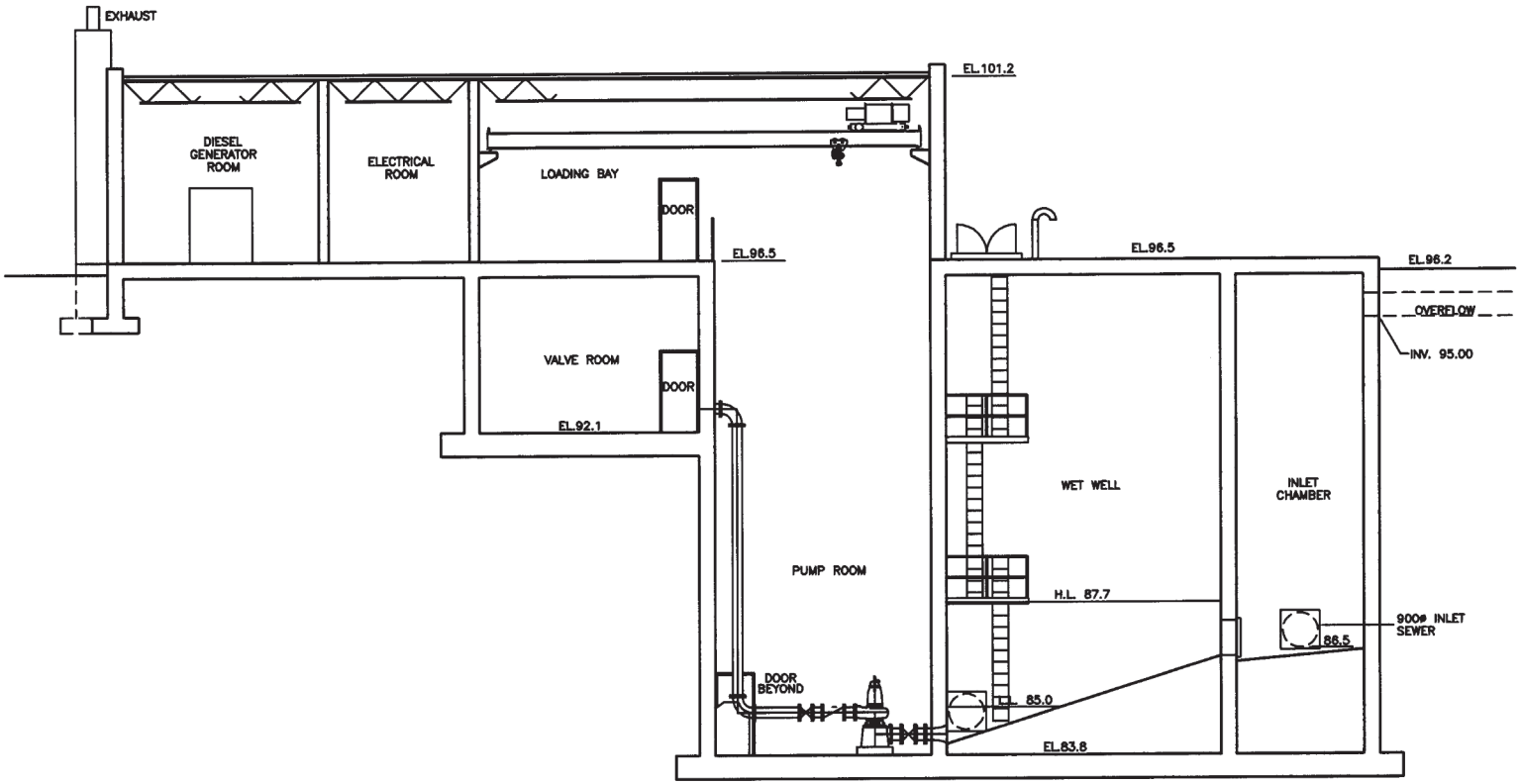
Stantec

CCL/IBI

MAY 2006

FIG. 4.2-3

CONCEPTUAL PUMPING STATION SECTION



Stantec

CCL/IBI

MAY 2006

FIG. 4.2-4

West. The alignment of this minor collector sewer in a north-south direct along the east limit of the development area also allows the internal sanitary sewer system to parallel the storm sewer system throughout the development area. This is a critical element in providing a coordinated and cost effective servicing scheme, which can accommodate the phased development of the KWCP over several years. The location of this sewer also facilitates the decommissioning of the Palladium Siphon and avoids placing this sewer in an area of significant fill. It also places the sewer in a designated corridor that can be graded to provide a minimum of 1.5 meters of freeboard between the 1:100 year flood level of the Carp River and the top of the covers in the access chambers. All pond outlets to the Carp River are above the 1:100 year flood plain, as well as the water elevations associated with the historical storm events analyzed in the Flood Characterization and Flood Level Analysis, prepared on CH2MHill. A designated corridor width of 20 meters is recommended for this sewer between Maple Grove Road and Palladium Drive.

Drawing S-1 also illustrates the overall major sanitary sewer system for the entire KWCP including tributary areas, pipe sizes, external pumping stations, which are to be decommissioned, and the proposed outlet location for these existing systems.

A profile of the trunk sanitary sewer system is included in the appendices of this report. These profiles illustrate the proposed elevation of the sanitary sewers relative to the storm sewers demonstrating the coordinated design of these two systems.

4.4 Design Criteria

The following City of Ottawa design guidelines were used in the preparation of the sanitary sewer analysis provided in this report:

Residential Average Daily Flow Rate	350 L/P Day
Residential Peak Factor	Modified Harmon Formula
Business Park Flow Rates	35,000 L/Ha/Day
Employment Area Flow Rate	50,000 L/Ha/Day
Business Park / Employment Peak Factor	1.5
Infiltration Rate	0.28 L/Sec/Day

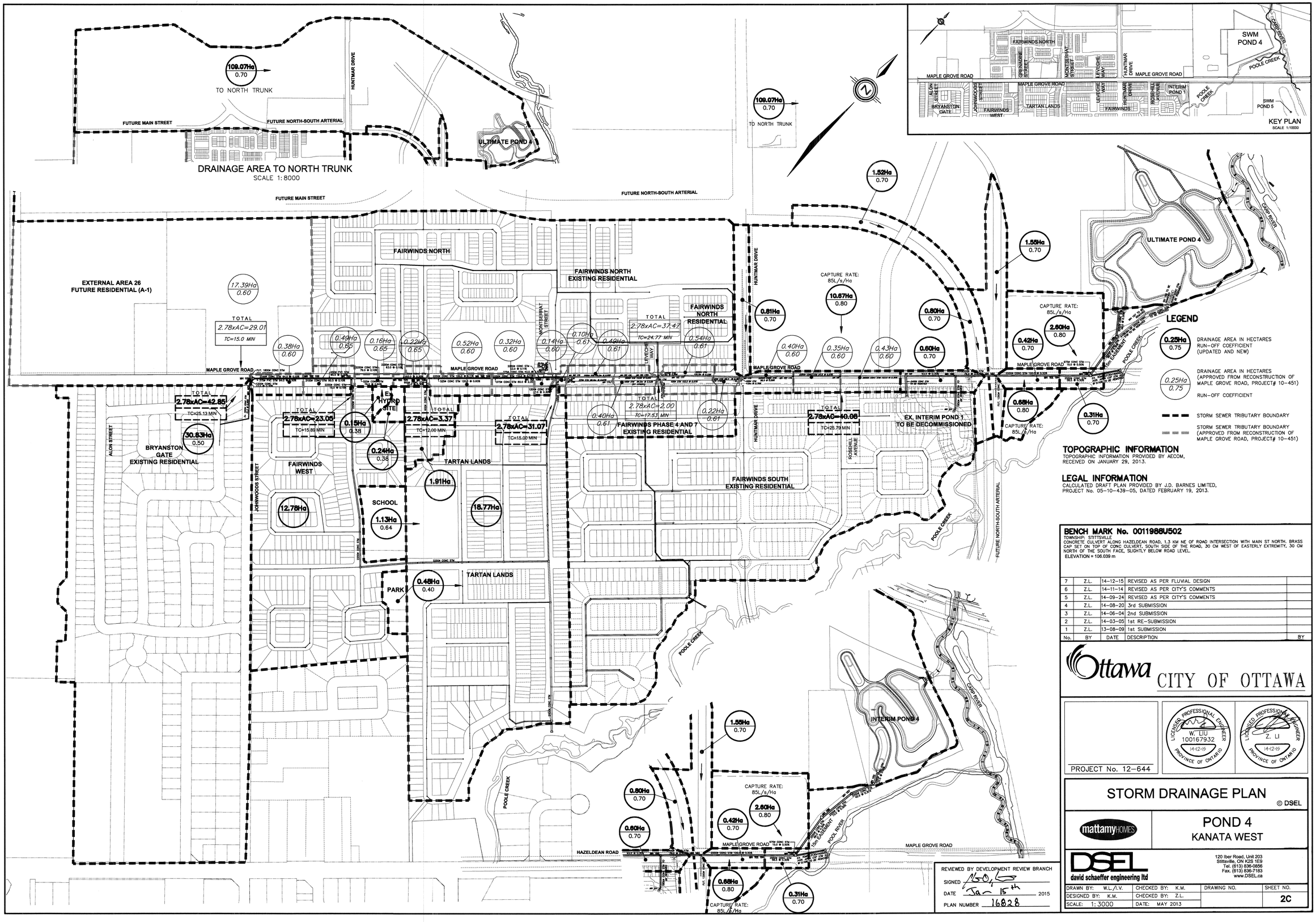
4.5 Construction Phasing

It is anticipated that the build out of the KWCP will take many years. The high capital cost of the associated infrastructure dictates that a phased construction approach will be required. Servicing studies completed previously for the area have provided the framework for the phased construction of the wastewater system, which included the use of residual capacity in the existing sanitary sewer system in Stittsville. The following is a brief description of the proposed construction phasing plan, which builds on previous studies, incorporates recent construction proposals for the developers group, and incorporates additional, detailed analysis of the existing Stittsville sanitary system.

Figure 4.2-5 illustrates the area identified as Phase I in terms of wastewater servicing. Area "A" includes the area, which will be tributary to the Signature Ridge Pumping Station in the short term. This drainage area ultimately requires the expansion of the Signature Ridge Pumping Station to 400 l/sec, assumes that the lands south of Highway 417 currently draining to this pumping station will continue to do so in the short term, and that these lands will build out. This scheme also accommodates build out of the Broughton/Richardson and Interstitial Lands as part of Phase I (see **Figure 4.2-2** for details of this analysis). A regular flow monitoring program

APPENDIX D

Stormwater Management



BENCH MARK No. 0011988U502

TOWNSHIP: STITTSVILLE
CONCRETE CULVERT ALONG HAZELDEAN ROAD, 1.3 KM NE OF ROAD INTERSECTION WITH MAIN ST NORTH. BRASS CAP SET ON TOP OF CONC CULVERT, SOUTH SIDE OF THE ROAD, 30 CM WEST OF EASTERLY EXTREMITY, 30 CM NORTH OF THE SOUTH FACE, SLIGHTLY BELOW ROAD LEVEL.
ELEVATION = 106.039 m

No.	BY	DATE	DESCRIPTION	BY
7	Z.L.	14-12-15	REVISED AS PER FLUVIAL DESIGN	
6	Z.L.	14-11-14	REVISED AS PER CITY'S COMMENTS	
5	Z.L.	14-09-24	REVISED AS PER CITY'S COMMENTS	
4	Z.L.	14-08-20	3rd SUBMISSION	
3	Z.L.	14-06-04	2nd SUBMISSION	
2	Z.L.	14-03-05	1st RE-SUBMISSION	
1	Z.L.	13-08-09	1st SUBMISSION	

CITY OF OTTAWA

REVIEWED BY DEVELOPMENT REVIEW BRANCH
SIGNED
DATE Jan 15th 2015
PLAN NUMBER 16828

PROJECT No. 12-644

W. LIU 100167932 14-12-15 PROVINCE OF ONTARIO

Z. LI 14-12-15 PROVINCE OF ONTARIO

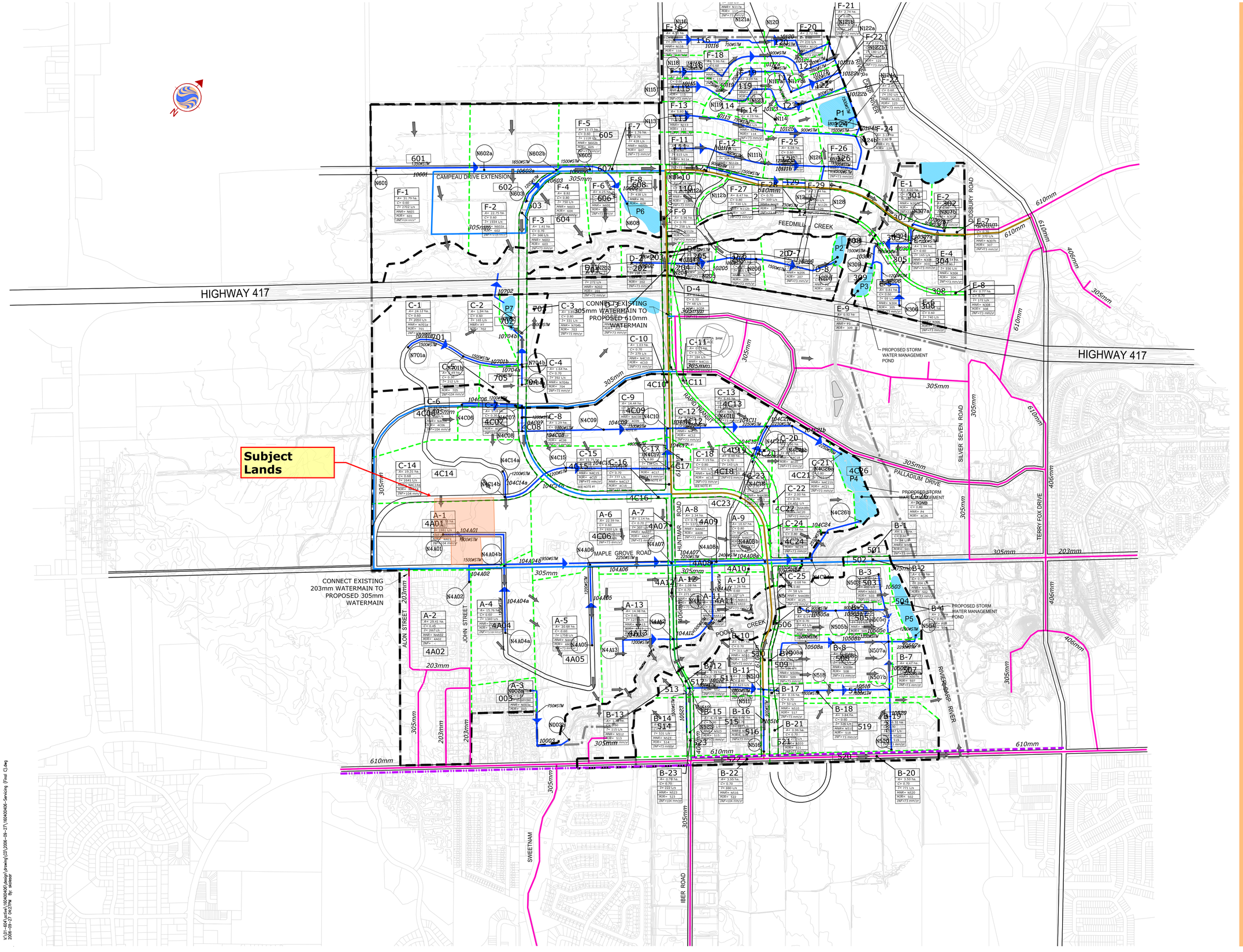
STORM DRAINAGE PLAN

mattamyHOMES

POND 4
KANATA WEST

DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: W.L./I.V.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		2C
SCALE: 1:3000	DATE: MAY 2013		



Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa ON Canada
K1Z 7T1
Tel. 613.722.4420
Fax. 613.722.2799
www.stantec.com

Legend

- KANATA–WEST CONCEPT PLAN BOUNDARY
- POND DRAINAGE BOUNDARY
- STORM SEWER DRAINAGE LIMIT
- OVERLAND FLOW DIRECTION
- 207 — OVERLAND FLOW SEGMENT NUMBER

2	REVISED FOR DEC.21/05 SUBMISSION	GBU	SJP	DEC.21/05
1	REVISED AS PER CITY COMMENTS (Sept.16/05)	GBU	MAF	OCT.28/05
Revision		By	Appd.	Date

File Name: 160400406	LTM	MAF	MAF	AUG./05
	Dwn.	Chkd.	Dsgn.	Date

Seals

Client/Project

Kanata West Concept Plan
Master Servicing Study

Ottawa, Ontario

Title

MODEL SCHEMATIC
STORM DRAINAGE MAJOR SYSTEM

Project No.	Scale	
60400406	1:7500	0 75 225 375m
Drawing No.	Sheet	Revision
ST-MJ	5 of 7	2

Adam Fobert

From: Jonathon Burnett <jburnett@jfsa.com>
Sent: June 6, 2022 3:15 PM
To: Adam Fobert
Subject: FW: 1927 Maple Grove - Design Criteria - Maple Grove Trunk Storm Sewer
Attachments: Figure 3.pdf

As discussed, please see below my email to the city and others (IBI, Stantec & JLR) about the assumed release rates for area A1 to Pond 4

Regards,

Jono Burnett, B.Eng., P.Eng **(he/him)**
Water Resources Engineer

JFSA
52 Springbrook Drive, Ottawa ON, K2S 1B9
Tel.: 613-322-1253 | Email: jburnett@jfsa.com | Website: www.jfsa.com
Ottawa-Paris(ON)-Gatineau-Montréal-Québec

From: Jonathon Burnett
Sent: Wednesday, 6 April 2022 1:49 PM
To: Karla Ferrey <kferrey@jlrichards.ca>; Terry Brule <tbrule@IBIGroup.com>; Santhosh Kuruvilla <santhosh.kuruvilla@ottawa.ca>; Guy Forget <gforget@jlrichards.ca>; Bobby Pettigrew <bpettigrew@jlrichards.ca>; Warnock, Charles <Charles.Warnock@ottawa.ca>; Peter Deir <PDeir@IBIGroup.com>; JF Sabourin <jfsabourin@jfsa.com>
Cc: Raad Akrawi <rakrawi@groupeheafey.com>; vincent.denomme@claridgehomes.com; Nick Sutherland <sutherland@fotenn.com>
Subject: RE: 1927 Maple Grove - Design Criteria - Maple Grove Trunk Storm Sewer

Hi All,

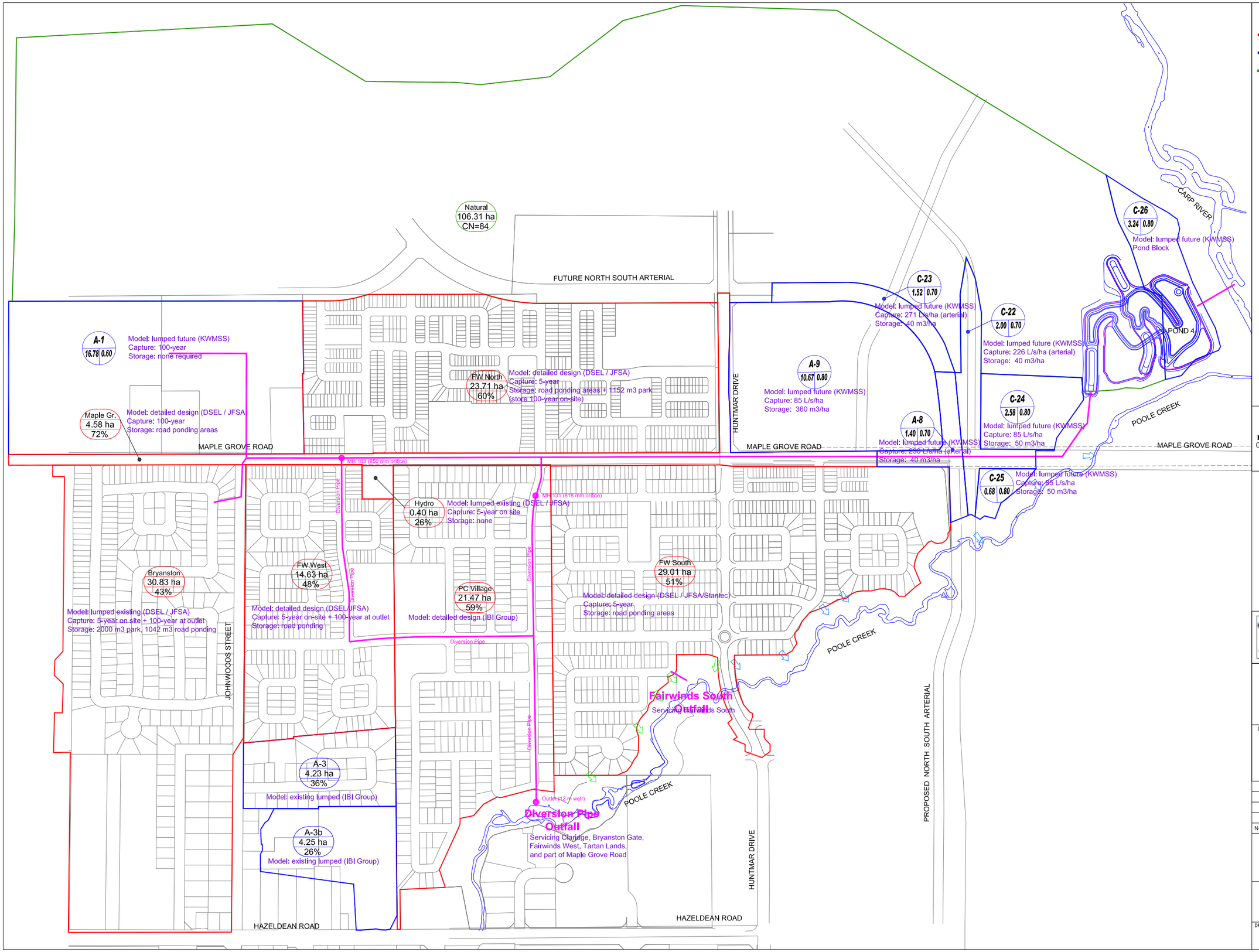
After coordinating with Peter Deir, I can confirm that the hydrology for the subject area (A-1) has not changed since the Dec 2014 JFSA Pond 4 PDB.
Based on the modelling this area has a total drainage area of 16.78 ha at 57% impervious (Rc=0.6) – Per the attached figure from 2014 PDB.

- The 100 year SCS 24Hr peak flow is 3,539 L/s (210.9L/s/ha)
- The 100 Year CHI 3Hr peak flow is 4,046 L/s (241.1 L/s/ha)

Please feel free to reach out if you require the modelling files (from Dec 2014) to check that your detailed modelling work does not have any adverse impacts on the previous analysis.

Regards,

Jono Burnett, B.Eng., P.Eng **(he/him)**
Water Resources Engineer



J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
OTTAWA (613) 836-3884
GATINEAU (819) 243-6858

CLIENT :

DSEL
david schaeffer engineering ltd
120 IBER ROAD, SUITE 203
OTTAWA, ONTARIO K2S 1E9
(613) 836-0856

PROJECT :

Kanata West Community Pond 4

No.	BY	DATE	DESCRIPTION	BY

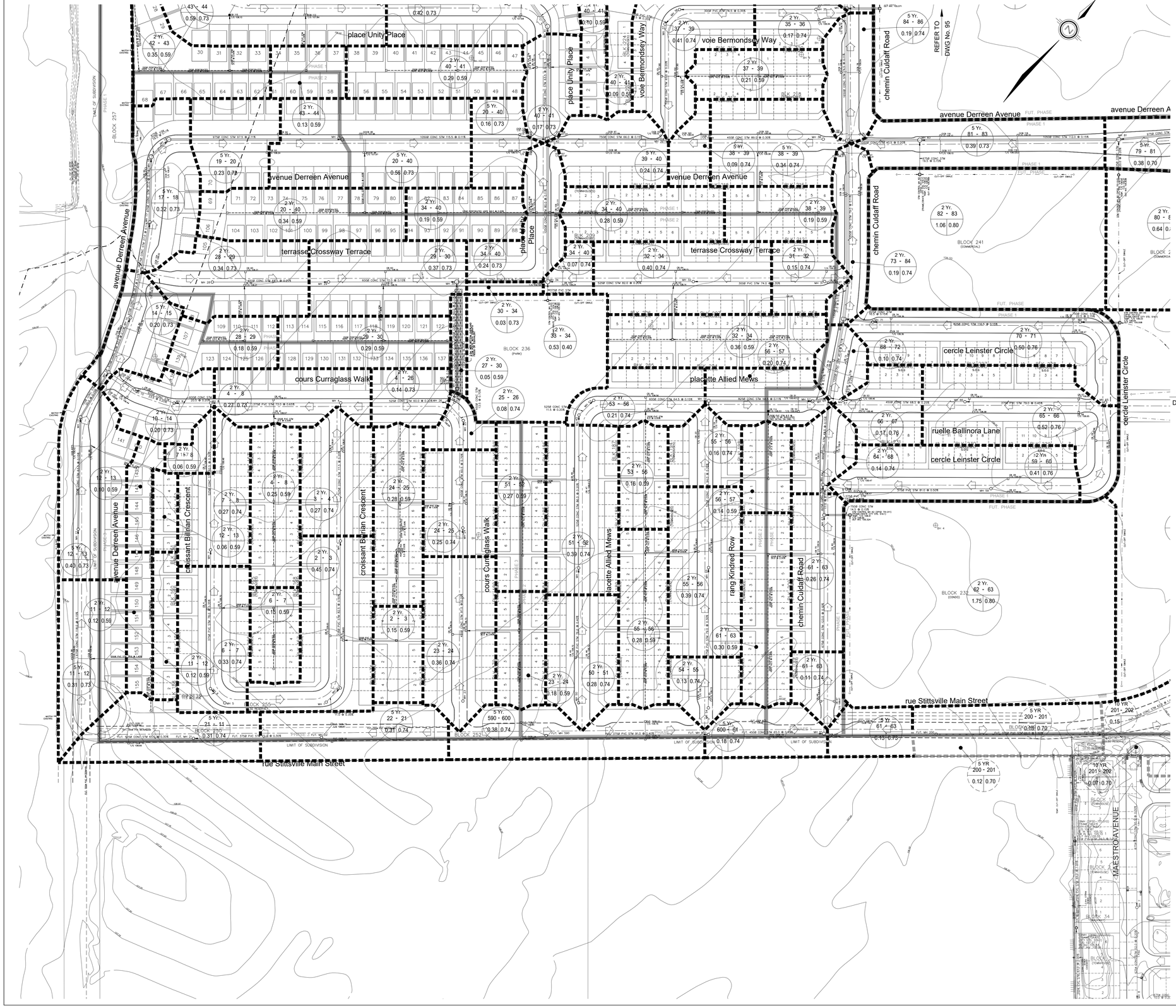
Proposed Interim Conditions Drainage Area to SWM Facility

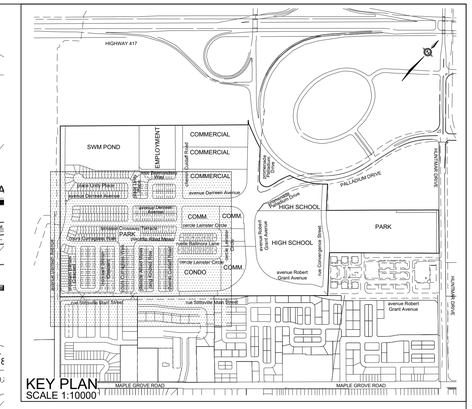
FIGURE 2

DESIGNED:
DRAWN: LP
VERIFIED: JFS
APPROVED: JFS

DRAWING REF.
631-07\Design\Pond Exp\201412\
CAD\JFSA Fairwinds Global.dwg

DATE: Dec/14
PROJECT No.: 631-07





LEGEND

- STORM DRAINAGE BOUNDARY
- SUB-DRAINAGE BOUNDARY
- STORM DRAINAGE BOUNDARY (OTHER PHASES)
- STORM FREQUENCY
- UPSTREAM MH TO DOWNSTREAM MH — e.g. 2Yr 43 - 44
- AREA IN HECTARES — e.g. 0.37 0.51
- RUNOFF COEFFICIENT
- EXTERNAL 2.78AC = — e.g. 2.78AC=14.40
- EXTERNAL TIME OF CONCENTRATION — e.g. TC=14.5 MIN
- EXTERNAL BLENDED RUNOFF COEFFICIENT — e.g. C= 0.70
- EXTERNAL STORM FREQUENCY — e.g. 2YR
- UPSTREAM MH TO DOWNSTREAM MH — e.g. 21 - 23
- AREA IN OTHER PHASES IN HECTARES — e.g. 0.28 0.78
- RUNOFF COEFFICIENT
- STREET CATCHBASIN & LEAD
- STREET CATCHBASIN WITH CLOSED LID & LEAD
- MAINTENANCE HOLE — e.g. MH202
- CURB INLET CATCHBASIN & LEAD
- CATCHBASIN/ MAINTENANCE HOLE — e.g. CBMH201
- INTERCONNECTED CATCH BASIN & LEADS
- CAP
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION — E

TOPOGRAPHIC INFORMATION

CITY OF OTTAWA 1K MAPPING, RECEIVED ON OCTOBER 4, 2016. FEEDMILL CREEK TOPOGRAPHIC SURVEY (JULY 26, 2019) AND PALLADIUM DRIVE TOPOGRAPHIC SURVEY (JUNE 23, 2020) PROVIDED BY STANTEC (PROJECT No. 161613545-111)

LEGAL INFORMATION

M-PLAN PROVIDED BY STANTEC GEOMATICS LTD., PROJECT No. 16-16-135-45 (195 HUNTMAR ROAD), RECEIVED ON MAY 17, 2021.

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD-1928:1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK MONUMENT: OTTAWA

ELEVATION = 95.205m

No.	BY	DATE	DESCRIPTION
9	W.L.	21-05-20	REVISED AS PER MPLAN CHANGE
8	W.L.	21-04-20	REVISED AS PER MPLAN CHANGE
7	W.L.	21-04-08	REVISED AS PER NEW N/S ARTERIAL ROAD DESIGN
6	W.L.	21-03-18	REVISED AS PER CITY COMMENTS
5	W.L.	21-03-05	REVISED AS PER CITY COMMENTS
4	W.L.	20-11-09	4th SUBMISSION
3	W.L.	20-07-09	3rd SUBMISSION
2	W.L.	20-04-03	2nd SUBMISSION
1	W.L.	19-12-23	1st SUBMISSION

CITY OF OTTAWA

PROJECT No. 12-624

LICENSED PROFESSIONAL ENGINEER — W. LIU — 100167932 — 21-05-20 — PROVINCE OF ONTARIO

STORM DRAINAGE PLAN

2325483 ONTARIO LTD.

195 HUNTMAR DRIVE

DSEL david schaeffer engineering ltd
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: R.A./A.K.	CHECKED BY: W.L.	SHEET NO.	
DESIGNED BY: W.L.	CHECKED BY: C.M.	97	
SCALE: 1:1000	DATE: DECEMBER 2019		

CITY FILE No. D07-16-16-0011 CITY PLAN No. 18059

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 4298-9Q6HQ3
Issue Date: October 31, 2014

Mattamy (Fairwinds West) Limited
50 Hines Road, Suite 100
City of Ottawa, Ontario
K2K 2M5

Site Location: Part of Lot 1, Concession 1 (March)
Kanata West Development Area
City of Ottawa

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

an amendment of the stormwater management Works for the collection, treatment and disposal of stormwater run-off from a number of subdivision developments located along Maple Grove Road in the vicinity of Johnwoods Street and Huntmar Drive, serving a major part of the Kanata West Community located north of Hazeldean Road, south of Palladium Drive, west of the Carp River and Poole Creek in the City of Ottawa, providing Normal Level water quality control and erosion protection and attenuating post-development peak flows to pre-development levels for all storm events up to and including the 10-year storm event, to consolidate previous approvals and to modify the stormwater management facilities and outfalls to Poole Creek and the Carp River, consisting of the following:

Proposed Works:

storm sewer: - modification of the outfall of the storm sewer on Maple Grove Road by extending the 2550 mm diameter storm sewer on Maple Grove Road from the existing manhole (MH 185) approximately 228 m in a northerly direction, discharging to Interim Pond 4, identified below, and removing the outlet storm sewer from approximately 60 m west of Poole Creek (MH 185) to Poole Creek;

stormwater management facility (Interim Pond 4 - catchment area 278.3 hectares): - one (1) wet pond with two (2) sediment forebays and one (1) inlet pipe, located north of Maple Grove Road, south of Palladium Drive west of the Carp River, having a permanent pool volume of 29,736 m^3, an extended detention volume of 22,288 m^3, and a total storage volume of approximately 62,820 m^3, including the permanent pool volume, at a total depth of approximately 3.9 m, discharging eastward through an outlet structure to the Carp River, and ultimately to the Ottawa River;

stormwater management facility (Interim Pond 1): - decommissioning and removal of the wet pond located on the south side of Maple Grove Road, east of Huntmar Drive upon completion of construction of Interim Pond 4;

Previous Works:

Under Approval 6206-8X7JWX, issued August 16, 2012:

storm and sanitary sewers on Maple Grove Road, consisting of the following:
- trunk and local storm sewer on Maple Grove Road from Johnwoods Street (MH 401) to Montserrat Street (MH 107), from approximately 120 m east of Rosehill Avenue (existing MH 181) to approximately 60 m west of Poole Creek (MH 185), and an outlet storm sewer from approximately 60 m west of Poole Creek (MH 185) to Poole Creek;
- trunk sanitary sewer on Maple Grove Road from Johnwoods Street (MH 104A) to Montserrat Street (MH 110A), and from approximately 245 m east of Rosehill Avenue (existing MH 96) to approximately 50 m west of Poole Creek (MH 98);
- local sanitary sewers along the Maple Grove Road frontage of Fairwinds West subdivision and Poole Creek Village (Tartan) subdivision connecting to the trunk sanitary sewer from MH 118A to MH 107A and from MH 117A to MH 110A;

Under Approval 1716-9CHP4Z, issued November 4, 2013:

oil and grit separator at the inlet to Interim Pond 1; (Note: This oil and grit separator was approved but never constructed.)

stormwater management facility (Interim Pond 1 - catchment area 125.47 hectares): - a wet pond with a sediment forebay, located on the south side of Maple Grove Road, east of Huntmar Drive, providing Enhanced Level water quality control and erosion protection and attenuating post-development peak flows to pre-development levels for all storm events up to and including the 100-year storm event, discharging to Poole Creek;

temporary stormwater diversion ditch: - a temporary storm conveyance ditch to divert flows from the Bryanston Gate subdivision to an existing storm sewer on Maple Grove Road to allow for deep service construction west on Maple Grove Road from its current termination at Montserrat Street to Johnwoods Street, ultimately discharging to the Interim Pond 1; (Note: The temporary diversion ditch was removed upon completion of construction of the trunk storm sewer on Maple Grove Road under 6206-8X7JWX.)

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted supporting documents listed in Schedule "A" forming part of this Approval.

For the purpose of this environmental compliance approval, the following definitions apply:

"Approval" means this entire document including the application and any supporting documents listed in any schedules in this Approval;

"Director" means a person appointed by the Minister pursuant to section 5 of the Environmental Protection Act for the purposes of Part II.1 of the Environmental Protection Act;

"District Manager" means the District Manager of the Ottawa office of the Ministry;

"Ministry" means the ministry of the government of Ontario responsible for the Environmental Protection Act and the Ontario Water Resources Act and includes all officials, employees or other persons acting on its behalf;

"Owner" means the Mattamy (Fairwinds West) Limited and includes their successors and assignees;

"Previous Works" means those portions of the sewage Works previously approved under an Approval;

"Water Supervisor" means the Water Supervisor of the Ottawa-Cornwall office of the Ministry;

"Works" means the sewage works described in the Owner's application(s) and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

(1) The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the Conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) The designation of The City of Ottawa as the operating authority of the site on the application for approval of the Works does not relieve the Owner from the responsibility of complying with any and all of the Conditions of this Approval.

(3) Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

(4) Where there is a conflict between a provision of any submitted document referred to in this Approval and the Conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

(5) Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(6) The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such Condition to other circumstances and the remainder of this Approval shall not be affected thereby.

(7) The issuance of, and compliance with the Conditions of this Approval does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including, but not limited to, the obligation to obtain approval from the local conservation authority necessary to construct or operate the sewage Works; or

(b) limit in any way the authority of the Ministry to require certain steps be taken to require the Owner to furnish any further information related to compliance with this Approval.

(8) This Approval includes the treatment and disposal of stormwater run-off from a catchment area of 278.3 hectares draining to Interim Pond 4, assuming an average imperviousness of 37%. Any future development changes within the total drainage area that might increase the required storage volumes or increase the flows to or from Interim Pond 4 or any structural/physical changes to Interim Pond 4, including the inlets or outlets, will require an amendment to this Approval.

2. EXPIRY OF APPROVAL

(1) This Approval will cease to apply to those parts of the proposed Works which have not been constructed within **five (5) years** of the date of this Approval.

3. CHANGE OF OWNER

(1) The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within **thirty (30) days** of the change occurring:

(a) change of Owner;

(b) change of address of the Owner;

(c) change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c. B17 shall be included in the notification to the District Manager;

(d) change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.

(2) In the event of any change in ownership of the Works, other than a change in ownership to the

municipal, i.e. assumption of the Works, the Owner shall notify the succeeding owner in writing of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

(3) Notwithstanding any other requirements in this Approval, upon transfer of the ownership of the Works to a municipality, if applicable, any reference to the "District Manager" within the Terms and Conditions of this Approval shall be replaced with "Water Supervisor".

4. OPERATION AND MAINTENANCE

The Owner shall, upon issuance of this Approval, carry out the following operation and maintenance program:

(1) The Owner shall undertake routine visual inspections of the Works over the lifetime of the Works including inspection of the facility after each large event (15 mm or greater in the previous 24 hours as required by the City of Ottawa's Kanata West Overall Monitoring Plan) to ensure proper functioning of the facility including confirming adequacy of the general site conditions (erosion / landscaping etc.), depth of sediment accumulation, proper functioning of the monitoring equipment, and Works' inlet and outlet controls. As required the Owner shall clean and maintain the Works to to ensure proper functioning of the facility and to prevent excessive build up of sediments and/or vegetation within Interim Pond 4.

(2) The Owner shall ensure that the design minimum liquid retention volume (permanent pool) is maintained within the main cell, and that the water levels are monitored to determine draw down characteristics of the facility (typically 24 – 48 hours). Flow monitoring is not proposed in this program.

(3) The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the Owner's local office for inspection by the Ministry.The logbook shall include the following:

(a) the name of the Works; and

(b) the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed.

(4) The Owner shall prepare an operations manual within **three (3) months** of the issuance of this Approval, that includes, but is not limited to, the following information:

(a) operating procedures for routine operation of the Works;

(b) inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the Works; and

(d) procedures for the inspection and calibration of monitoring equipment.

(5) The Owner shall maintain the operations manual current and retain a copy at the Owner's local office for the operational life of the Works and upon request make the manual available to the staff of the Ministry as well as the City of Ottawa.

5. MONITORING AND RECORDING

(1) The Owner shall carry out a monitoring program for the inspection and maintenance of the Works as per the standardized SWM monitoring program specified by the City of Ottawa for the Kanata West Area and the requirements of the Mississippi Valley Conservation Authority.

(2) The Owner shall copy the District Manager/Water Supervisor on any and all reports submitted to the City of Ottawa and/or the Mississippi Valley Conservation Authority related to the operation and maintenance of the Works.

(3) A minimum of **two (2) years** after 90% of the homes in the residential subdivisions within the drainage catchment area of Interim Pond 4 have been occupied and the monitoring program for the maintenance and inspection of the Works has been rigorously followed, the requirement to copy the District Manager in Subsection (2), above, may be modified by the District Manager in writing from time to time.

6. TEMPORARY EROSION AND SEDIMENT CONTROL

(1) The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every **two (2) weeks** and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

(2) The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

7. RECORD KEEPING

The Owner shall retain for a minimum of **five (5) years** from the date of their creation, all records and information related to or resulting from the operation and maintenance activities required by this Approval.

Schedule "A"

1. Application from Mattamy (Fairwinds North) Limited, dated April 12, 2012, including final plans and specifications prepared by David Schaeffer Engineering Ltd.;

2. Application for Environmental Compliance Approval, dated September 10, 2014 and received on September 23, 2014, submitted by David Schaeffer Engineering Ltd.;

3. Design Brief for Pond 4 Kanata West, dated August 25, 2014, prepared by J.F. Sabourin and Associates Inc. and David Schaeffer Engineering Ltd.;

4. Set of Engineering Drawings (22 drawings) dated August 20, 2014, prepared by David Schaeffer Engineering Ltd.;

5. Geotechnical Review, Proposed Stormwater Management Pond (SWMP) Design - Pond 4, dated September 18, 2014, prepared by Paterson Group Inc,;

6. Pipe Data Form and Storm Sewer Design Sheet, prepared by David Schaeffer Engineering Ltd.;

7. Copy of a letter from John Price of the Mississippi Valley Conservation Authority to David Schaeffer Engineering Ltd., dated August 29, 2014;

8. Copy of a Memorandum from Greenland International Consulting Ltd. to City of Ottawa, dated September 4, 2014;

9. Three (3) e-mails from Jennifer Ailey of David Schaeffer Engineering Ltd. to the Ministry, dated October 23, 2014; and

10. Two (2) e-mails from Jennifer Ailey of David Schaeffer Engineering Ltd. to the Ministry, dated October 31, 2014.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This Condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment..

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to approved Works and to ensure that any subsequent Owner of the Works is made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included to require that the Works be properly operated and maintained such that the environment is protected.

5. Condition 5 is included to enable the Owner to evaluate and demonstrate the performance of the Works, on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives specified in the Approval and that the Works do not cause any impairment to the receiving watercourse.

6. Condition 6 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction, until they are no longer required.

7. Condition 7 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 6206-8X7JWX, and 1716-9CHP4Z issued on August 16, 2012 and November 4, 2013, respectively.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are

substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca**

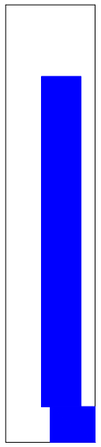
The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 31st day of October, 2014

Edgardo Tovilla
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

DC/
c: District Manager, MOE Ottawa office
Water Supervisor, MOE Ottawa-Cornwall office
Jennifer Ailey, David Schaeffer Engineering Ltd. (DSEL)

DETACHED



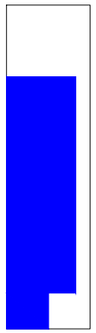
Total area = 275m2

Imp area = 102.56m2

% Imp = 37.29%

RC = 0.46

SEMI-DETACHED



Total area = 190m2

Imp area = 115.71m2

% Imp = 60.90%

RC = 0.63

TOWNHOUSE

Total area = 150m2

Imp area = 105.00m2

% Imp = 70.00%

RC = 0.69

REAR LANE TOWNHOUSE

Total area = 110m2

Imp area = 100.98m2

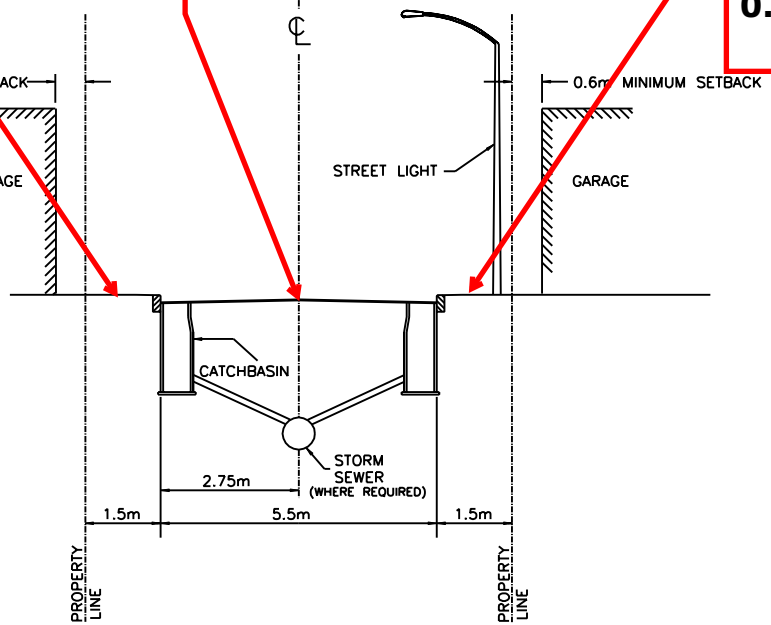
% Imp = 91.80%

RC = 0.84

DRIVEWAY
IMP 0.5mx1.5m=0.75m²
PER
0.5mx1.5=0.75m²

PAVEMENT
IMP
5.5x1m=5.5m²

DRIVEWAY
IMP 0.5mx1.5m=0.75m²
PER
0.5mx1.5=0.75m²



SECTION

0.75+0.75+5.5=7.00m² IMP
C=0.78

NOTES:

1. REFERENCE STANDARD NOTES ROAD ALLOWANCE (DGN:ROW-NOTES).
2. LENGTH OF LANE SHOULD BE MINIMIZED TO ALLOW DRAINAGE TO STORM SEWER SYSTEM ON ADJACENT STREETS WHERE POSSIBLE.
3. STREET LIGHT POLES SHALL BE INSTALLED AT LANEWAY ENTRANCES WHERE REQUIRED.
4. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE. CATCH BASIN TYPE WILL SUIT CURB DESIGN. SEE SEWER DESIGN GUIDELINES FOR CATCH BASIN PREFERENCE.

Ottawa

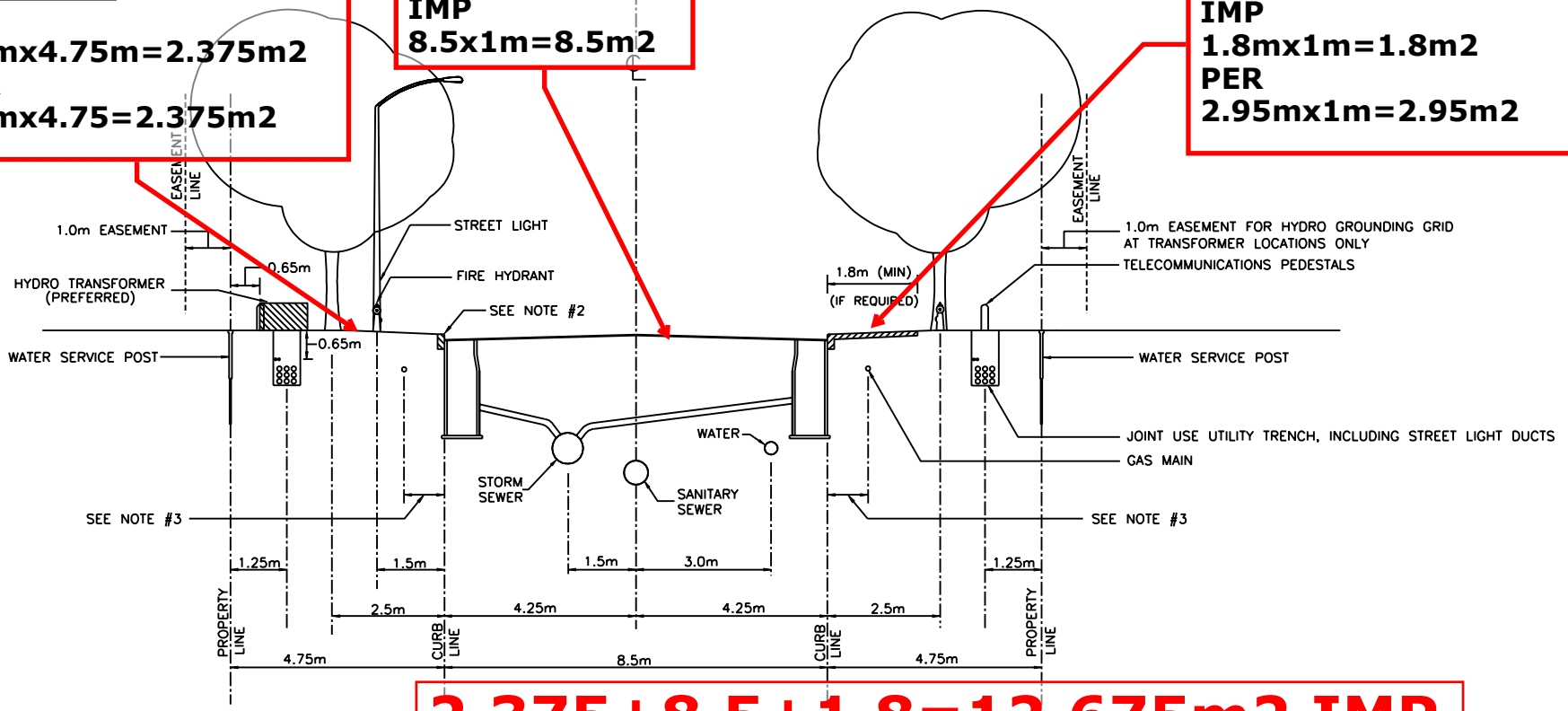
RESIDENTIAL ROAD
8.5m ROAD ALLOWANCE

DATE: -
REV. DATE: MARCH 2009
DWG. No.: ROW-8.5

DRIVEWAY
IMP
0.5mx4.75m=2.375m2
PER
0.5mx4.75=2.375m2

PAVEMENT
IMP
8.5x1m=8.5m2

SIDEWALK
IMP
1.8mx1m=1.8m2
PER
2.95mx1m=2.95m2



2.375+8.5+1.8=12.675m2 IMP
C=0.69

SECTION

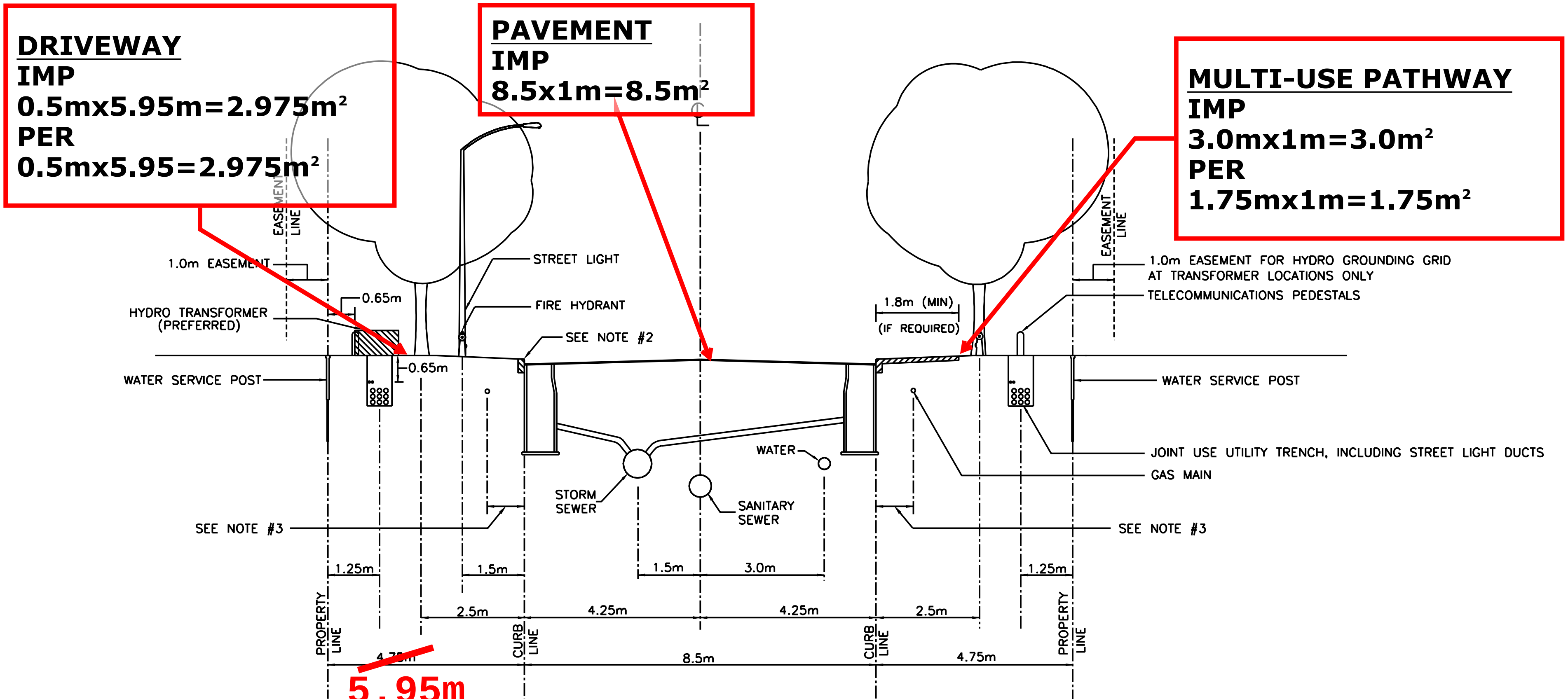
NOTES:

1. REFERENCE STANDARD NOTES ROAD ALLOWANCE (DGN:ROW-NOTES)
2. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE, CATCH BASIN TYPE WILL SUIT CURB DESIGN. SEE SEWER DESIGN GUIDELINES FOR CATCH BASIN PREFERENCE.
3. AT CATCH BASIN AND HYDRANT LOCATIONS THE GAS MAIN SHALL HAVE A MINIMUM 0.6m CLEARANCE FROM STRUCTURES.
4. HYDRO TRANSFORMERS AND SIDEWALKS ARE TO BE LOCATED ON OPPOSITE SIDE OF THE ROW WHENEVER POSSIBLE. REQUIREMENT FOR PROTECTIVE BOLLARDS AT TRANSFORMERS SHALL BE DETERMINED BY HYDRO ON A CASE BY CASE BASIS.
5. STREET LIGHTS AND SIDEWALKS ARE TO BE LOCATED ON OPPOSITE SIDES OF THE ROW.

Ottawa

RESIDENTIAL ROAD
18.0m ROAD ALLOWANCE
SIDEWALK OPTIONS

DATE:	-
REV. DATE:	MARCH 2009
DWG. No.:	ROW-18A



2.975+8.5+3.0=14.475m² IMP

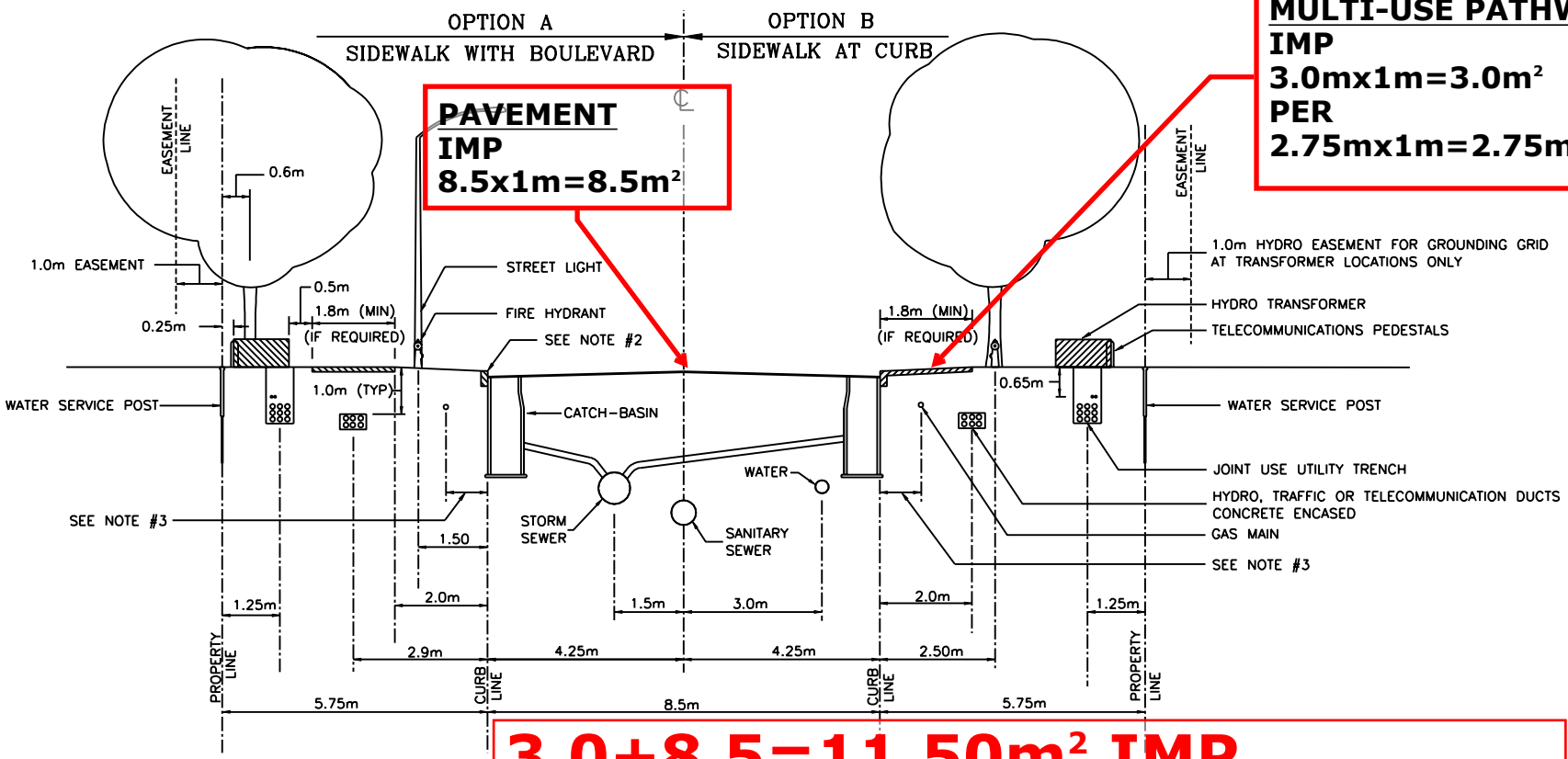
C=0.73

SECTION

NOTES:

1. REFERENCE STANDARD NOTES ROAD ALLOWANCE (DGN:ROW-NOTES)
2. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE. CATCH BASIN TYPE WILL SUIT CURB DESIGN. SEE SEWER DESIGN GUIDELINES FOR CATCH BASIN PREFERENCE.
3. AT CATCH BASIN AND HYDRANT LOCATIONS THE GAS MAIN SHALL HAVE A MINIMUM 0.6m CLEARANCE FROM STRUCTURES.
4. HYDRO TRANSFORMERS AND SIDEWALKS ARE TO BE LOCATED ON OPPOSITE SIDE OF THE ROW WHENEVER POSSIBLE. REQUIREMENT FOR PROTECTIVE BOLLARDS AT TRANSFORMERS SHALL BE DETERMINED BY HYDRO ON A CASE BY CASE BASIS.
5. STREET LIGHTS AND SIDEWALKS ARE TO BE LOCATED ON OPPOSITE SIDES OF THE ROW.

Ottawa	19.2m RESIDENTIAL ROAD ~~18.0m~~ ROAD ALLOWANCE SIDEWALK OPTIONS	DATE: - REV. DATE: MARCH 2009 DWG. No.: ROW-18A



3.0+8.5=11.50m² IMP

C=0.60

SECTION

NOTES:

1. REFERENCE STANDARD NOTES ROAD ALLOWANCE (DGN:ROW-NOTES).
2. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE, CATCH BASIN TYPE WILL SUIT CURB DESIGN. SEE SEWER DESIGN GUIDELINES FOR CATCH BASIN PREFERENCE.
3. AT CATCH BASIN AND HYDRANT LOCATIONS THE GAS MAIN SHALL HAVE A MINIMUM 0.6m CLEARANCE FROM STRUCTURES.
4. HYDRO TRANSFORMERS AND SIDEWALKS ARE TO BE LOCATED ON OPPOSITE SIDE OF THE ROW WHENEVER POSSIBLE.
5. PRIMARY HYDRO DUCTS & COMMUNICATION DUCTS (ENCASED) TYPICALLY REQUIRED ON ONE SIDE OF ROW ONLY. PROVIDE 1.0m COVER ON ALL CONCRETE ENCASED DUCTS.
6. STREET LIGHTS AND SIDEWALKS ARE TO BE LOCATED ON OPPOSITE SIDES OF THE ROW FOR THE OPTION WITH SIDEWALK AT CURB.

Ottawa

RESIDENTIAL ROAD
20.0m ROAD ALLOWANCE
SIDEWALK OPTIONS

DATE:	-
REV. DATE:	MARCH 2009
DWG. No.:	ROW-20A

Entire site

Area ID	C	Area (ha)	AxC
18m ROW	0.66	0.742	0.490
19.2m ROW	0.76	0.253	0.192
20m ROW	0.6	0.289	0.173
8.5m ROW	0.78	0.109	0.085
Detached SFH	0.46	0.029	0.014
Detached SFH	0.46	0.029	0.014
Existing Property to be retained	0.6	0.631	0.379
Park	0.4	0.358	0.143
Pathway	0.55	0.017	0.009
Pathway	0.55	0.016	0.009
Block 25	0.8	1.449	1.159
Block 26	0.8	1.142	0.914
Rear Lane Townhome	0.84	0.065	0.055
Rear Lane Townhome	0.84	0.187	0.157
Semidetached	0.63	0.177	0.111
Semidetached	0.63	0.262	0.165
Semidetached	0.63	0.355	0.224
Townhome	0.69	0.076	0.053
Townhome	0.69	0.076	0.053
	Total	**6.264**	**4.397**
	Average C		**0.70**
	% IMP		**0.72**

Less apartment blocks

Area ID	C	Area (ha)	AxC
18m ROW	0.66	0.742	0.490
19.2m ROW	0.76	0.253	0.192
20m ROW	0.6	0.289	0.173
8.5m ROW	0.78	0.109	0.085
Detached SFH	0.46	0.029	0.014
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Semidetached	0.63	0.262	0.165
Semidetached	0.63	0.355	0.224
Townhome	0.69	0.076	0.053
Townhome	0.69	0.076	0.053
	Total	**3.673**	**2.325**
	Average C		**0.63**
	% IMP		**0.62**

Average RC Less Park, Apartments

Area ID	C	Area (ha)	AxC
18m ROW	0.66	0.742	0.490
19.2m ROW	0.76	0.253	0.192
20m ROW	0.6	0.289	0.173
8.5m ROW	0.78	0.109	0.085
Detached SFH	0.46	0.029	0.014
Detached SFH	0.46	0.029	0.014
Pathway	0.55	0.017	0.009
Pathway	0.55	0.016	0.009
Rear Lane Townhome	0.84	0.065	0.055
Rear Lane Townhome	0.84	0.187	0.157
Semidetached	0.63	0.177	0.111
Semidetached	0.63	0.262	0.165
Semidetached	0.63	0.355	0.224
Townhome	0.69	0.076	0.053
Townhome	0.69	0.076	0.053
	Total	**2.683**	**1.803**
	Average C		**0.67**
	% IMP		**0.67**

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

Target Flow Rate

Area	6.26	ha
Unit Flow Rate	241	L/s/ha (CHI 3hr)
Q	1509.6	L/s

Estimated Post Development Peak Flow from Attenuated Areas

ROWs, Park, Walkways, Residential

Total Area	3.66	ha
C	0.63	Rational Method runoff coefficient

	2-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)
15	61.8	396.1	622.9	0.0	0.0	142.9	1145.3	883.0	262.3	236.0

Block 25

Total Area	1.45	ha
C	0.80	Rational Method runoff coefficient

	2-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)
15	61.8	199.0	246.5	0.0	0.0	142.9	575.5	349.5	226.1	203.5

Block 26

Total Area	1.15	ha
C	0.80	Rational Method runoff coefficient

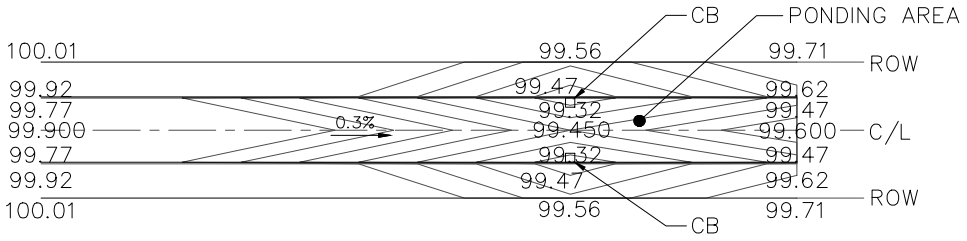
	2-year					100-year				
t_c (min)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)	i (mm/hr)	Q_{actual} (L/s)	$Q_{release}$ (L/s)	Q_{stored} (L/s)	V_{stored} (m^3)
15	61.8	157.9	195.5	0.0	0.0	142.9	456.5	277.2	179.3	161.4

100-year Total **1509.6** **L/s**

										Sewer Data								
Area ID	**Up**	**Down**	**Area**	**C**	**Indiv AxC**	**Acc AxC**	**T_C**	**I**	**Q**	**DIA**	**Slope**	**Length**	**$A_{hydraulic}$**	**R**	**Velocity**	**Qcap**	**Time Flow**	**Q / Q full**
			(ha)	**(-)**			**(min)**	**(mm/hr)**	**(L/s)**	**(mm)**	**(%)**	**(m)**	**(m^2)**	**(m)**	**(m/s)**	**(L/s)**	**(min)**	**(-)**
	MH 8	MH 9	0.560	0.50	0.28	0.28	10.0	76.8	59.7	450	0.25	69.5	0.159	0.113	0.90	142.6	1.3	0.42
	MH 9	MH 10	0.290	0.68	0.20	0.48	11.3	72.2	95.7	525	0.20	69.5	0.216	0.131	0.89	192.3	1.3	0.50
							12.6											
	MH 6	MH 7	0.150	0.60	0.09	0.09	10.0	76.8	19.2	375	0.50	74.5	0.110	0.094	1.12	124.0	1.1	0.15
	MH 7	MH10	1.590	0.782	1.24	1.33	11.1	72.8	269.8	600	0.50	74.5	0.283	0.150	1.54	434.2	0.8	0.62
							11.9											
	MH10	MH11	0.060	0.680	0.04	1.85	12.6	68.1	350.3	675	0.50	35.0	0.358	0.169	1.66	594.4	0.4	0.59
							12.9											
	MH 1	MH 2	0.330	0.68	0.22	0.22	10.0	76.8	47.9	450	0.25	71.0	0.159	0.113	0.90	142.6	1.3	0.34
	MH 2	MH 3	1.470	0.773	1.14	1.36	11.3	72.1	272.5	675	0.30	71.5	0.358	0.169	1.29	460.4	0.9	0.59
	MH 3	MH 4	0.120	0.680	0.08	1.44	12.2	69.1	277.0	675	0.30	10.5	0.358	0.169	1.29	460.4	0.1	0.60
	MH 4	MH 5	0.050	0.680	0.03	1.48	12.4	68.7	281.9	750	0.20	24.5	0.442	0.188	1.13	497.9	0.4	0.57
	MH 5	MH 11	0.050	0.680	0.03	1.51	12.7	67.7	283.9	750	0.20	27.0	0.442	0.188	1.13	497.9	0.4	0.57
							13.1											
	MH 11	MH 14	0.480	0.680	0.33	3.69	13.1	66.5	681.7	900	0.40	113.0	0.636	0.225	1.80	1144.9	1.0	0.60
							14.2											
	MH 12	MH 13	0.290	0.68	0.20	0.20	10.0	76.8	42.1	300	0.50	99.5	0.071	0.075	0.97	68.4	1.7	0.62
	MH 13	MH 14	0.030	0.68	0.02	0.22	11.7	70.8	42.8	375	0.35	27.0	0.110	0.094	0.94	103.7	0.5	0.41
							12.2											
	MH 14	MH 15	0.290	0.680	0.20	4.10	14.2	63.7	726.6	900	1.10	38.0	0.636	0.225	2.98	1898.7	0.2	0.38
							14.4											

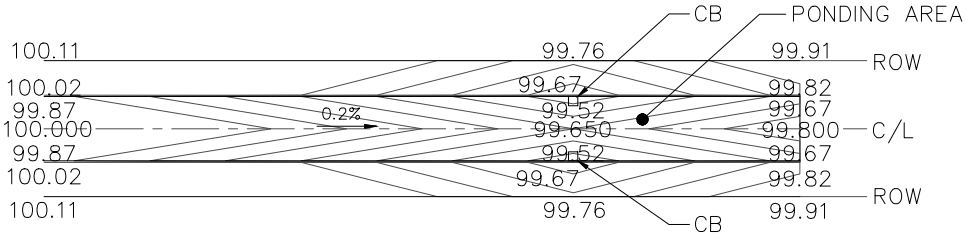
0.3% HIGH POINT TO HIGH POINT ROAD PONDING

STAGE (m)	AREA (m2)
99.32	0.72
99.35	10.88
99.4	77.42
99.45	204.46
99.5	372.54
99.55	592.2
99.6	838.95
99.65	1060.96



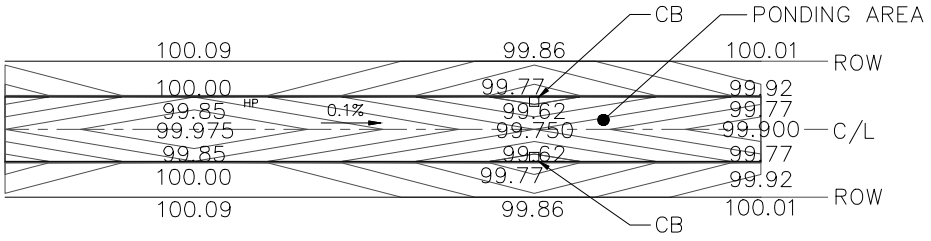
0.2% HIGH POINT TO HIGH POINT ROAD PONDING

STAGE (m)	AREA (m2)
99.52	0.72
99.55	12.24
99.6	87.08
99.65	229.33
99.7	419.77
99.75	671.5
99.8	957.94
99.85	1219.86



0.1% HIGH POINT TO HIGH POINT ROAD PONDING

STAGE (m)	AREA (m2)
99.62	0.36
99.65	12.12
99.7	86.14
99.75	233.37
99.8	457.52
99.85	776.36
99.9	1122.94
99.95	1427.83



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CITY OF OTTAWA

ROAD SAG PONDING DEPTH / AREA FIGURE

SCALE: 1:1000	PROJECT No.:
DATE:	FIGURE:

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November 14, 2022 Project Number: 2392

David Schaeffer Engineering Ltd
120 Iber Road, Unit 103
Ottawa, Ontario
K2S 1E9

Attention: **Adam Fobert, P.Eng**

Subject: **1919 Maple Grove Road: LID Analysis**

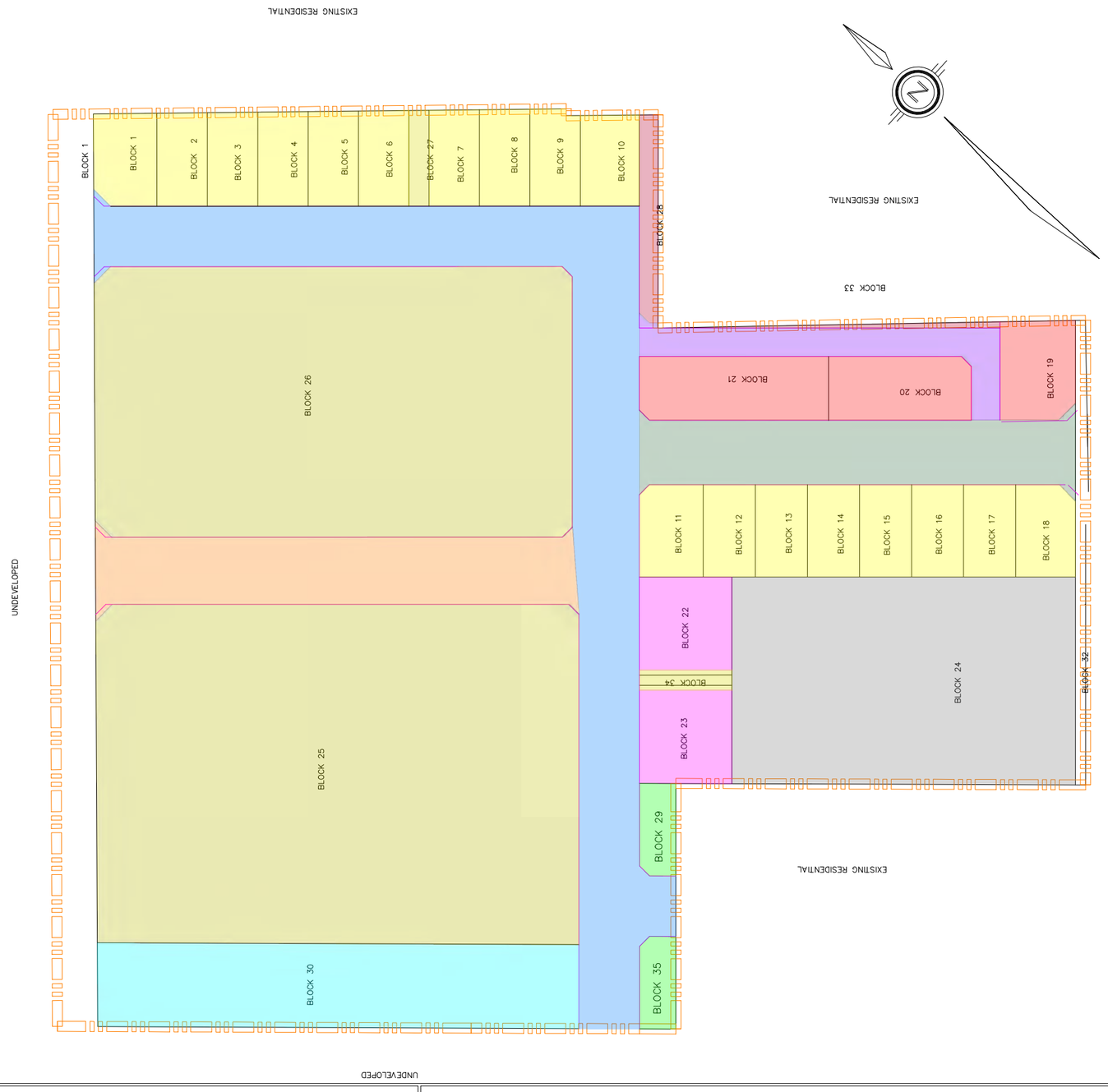
J.F Sabourin and Associated Inc. (JFSA) were commissioned by David Schaeffer Engineering Ltd (DSEL) to complete a conceptual LID analysis for a **6.28 ha** mixed-use site at 1919 Maple Grove Road, within the City of Ottawa. The following memo outlines a conceptual analysis of the proposed LID measures to be implemented within the site and quantifies their benefits with respect to the site's annual water budget. **Table 1** Provides a full breakdown of the various land use application proposed for this site and their associated runoff coefficients/Percent imperviousness. **Figure 1** outlines the exact locations each of these land use types will be applied throughout the site, **Figure 2** outlines the location and extent of areas with rear yards. Based on this analysis the site has a total drainage area of **6.28 ha** with **70%** impervious.

Table 1:Development Summary

Land Use	Total Area (ha)	Runoff Coefficient	Imperviousness[1] (%)	Imp Area (ha)
Apartment Block	2.59	0.80	90%	2.33
Semi-Detached	0.79	0.63	65%	0.51
Rear Lane Townhouse	0.25	0.84	95%	0.24
Townhouse	0.15	0.69	70%	0.11
Detached Drainage	0.06	0.46	40%	0.02
Existing 2-Story Dwelling	0.63	0.27	10%	0.06
Walkway	0.03	0.55	50%	0.02
Park	0.36	0.40	30%	0.11
18m ROW	0.74	0.69	70%	0.52
20m ROW	0.29	0.60	60%	0.17
19.2 ROW	0.25	0.73	80%	0.20
8.5m ROW	0.11	0.78	85%	0.09
Future Development	0.03	0.67	70%	0.02
Total	**6.28**	**0.70**	**70%**	**4.40**

[1]Imperviousness values rounded up to the nearest 5% to be conservative and to closely correspond with values presented in Table 3

Throughout the site the following LID/BMP are contemplated to be implemented; rooftop disconnects, soakaway pits, amened soils and grass channels. Rooftop disconnects and soil amendments were contemplated within the residential portion of the development area. The benefit of grassed channels was considered in residential areas with rear yard drainage. Soakaway pits were only considered within the mixed-use blocks. **Table 2** provides a summary of the runoff volume reduction and pollutant removal expected for each of these LIDs based on a 25mm event.



LEGEND

PROPERTY LIMIT

- APARTMENT BLOCK DRAINAGE AREA
  RC = 0.80 TOTAL AREA = 2.59 ha
- SEMI-DETACHED DRAINAGE AREA
  RC = 0.63 TOTAL AREA = 0.79 ha
- REAR LANE TOWNHOUSE DRAINAGE AREA
  RC = 0.84 TOTAL AREA = 0.25 ha
- TOWNHOUSE DRAINAGE AREA
  RC = 0.69 TOTAL AREA = 0.15 ha
- DETACHED DRAINAGE AREA
  RC = 0.46 TOTAL AREA =0.06 ha
- EXISTING 2 STOREY DWELLING DRAINAGE AREA
  RC = 0.27 TOTAL AREA = 0.63 ha
- WALKWAY DRAINAGE AREA
  RC = 0.55 TOTAL AREA =0.03 ha
- PARK DRAINAGE AREA
  RC = 0.40 TOTAL AREA = 0.36 ha
- 18.0m ROW DRAINAGE AREA
  RC = 0.69 TOTAL AREA = 0.74 ha
- 20.0m ROW DRAINAGE AREA
  RC = 0.60 TOTAL AREA = 0.29ha
- 19.2m ROW DRAINAGE AREA
  RC = 0.73 TOTAL AREA = 0.25 ha
- 8.5m ROW DRAINAGE AREA
  RC = 0.78 TOTAL AREA = 0.11ha
- FUTURE DEVELOPMENT DRAINAGE AREA
  RC = 0.67 TOTAL AREA = 0.03ha

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FORMASIAM MAPLE GROVE

CITY OF OTTAWA

861 LID AREA HATCH
FIGURE 1

SCALE:	1:1500	PROJECT No.:	16-861
DATE:	OCTOBER 2022	FIGURE:	1 of 2

The values presented in this table come from *Table 3.3 Performance Comparison of Selected LID Practices* from the 2008 Draft Low Impact Development Stormwater Management Manual (full table provided in **Attachment A**), note that the lower runoff volume reduction percentages have been assumed for all LIDs in this analysis. Note that as the LID runoff reduction values set out in this table are based on the 25mm event, the 25mm event has been adopted as the key design event for this water budget analysis. It is acknowledged that the actual runoff volume reduction for each LID measure is dependent on the magnitude and extent of the given LID's application, but the values presented in **Table 2** can serve as a conceptual guide for the magnitude of reduction in runoff volume when the various measures are typically applied.

Table 2: Assumed LID Runoff Volume and Pollutant Removal (25 mm event)

Measure	Runoff Volume Reduction [1] (%)	Pollutant Removal
Rooftop Disconnects	25%	Low
Soakaway Pits	90%	High
Soil Amendments	50%	Low-Moderate
Grass Channels	10%	Low

[1] Values based on Table 3.3 Performance Comparison of Selected LID Practices - Draft Low Impact Development Stormwater Management Manual, 2008

A series of SWMHYMO models with various degrees of % imperviousness has been run using the 25mm rainfall event to determine the approximate runoff volume for the associated % imperviousness. Note as seen below in **Table 3**, even for a 100% impervious area the runoff volume is not 25mm due to wetting (initial abstraction) losses that would occur at the beginning of any event. A full summary table of the results for the SWMHYMO modelling has been provided in Attachment A.

Table 3: Runoff Volume Generated by a 25 mm Event

Total Imperviousness (%)	Runoff Volume[1] (mm)
100%	23.44
95%	22.29
90%	21.16
85%	20.02
80%	18.88
75%	17.75
70%	16.61
65%	15.47
60%	14.33
55%	13.2
50%	12.06
45%	10.92
40%	9.79

[1] Runoff volumes determined from detailed SWMHMYO model simulations of the 25mm Event

By cross-referencing the proposed development areas and associated imperviousness (**Table 1**) against the runoff volumes provided in **Table 3,** it is possible to approximate the total runoff volume for the 25mm event from the development without any additional detailed hydrologic modelling. **Table 4** below outlines the runoff volumes for the development based on the 25mm event and the various assumed drainage areas and imperviousness. Wetting losses for the site were applied as a weighted average based on imperviousness, with an initial abstraction of 1.57 mm for impervious areas and 4.67 mm for pervious areas (as per City guidelines), the remaining volume is assumed to be infiltration within the pervious areas. As seen in **Table 4** the site will produce **17.45 mm** of runoff volume for the 25mm event**,** which equates to a cumulative runoff coefficient of **0.70** for the site.

As mentioned above this site will implement disconnected roof leads, grass swales, soakaway pits and amended soils to help reduce runoff volumes and increase infiltration across the site where possible. Note that in some locations (such as Right of Ways) none of the above LIDs are a suitable option and thus have not been applied and have been reflected simply as "-". **Table 5** takes the runoff volume produced by the site for the 25mm event (**Table 4**) and applied the runoff volume reductions expected for each of the LID options (**Table 2**). Note that when a treatment train approach is proposed (LIDs in series) the runoff volume reductions are also applied sequentially and are not simply an addition of all LID reduction percentages. These reductions are then applied to each of the runoff volumes to determine the volume infiltrated by the various LID measure. From **Table 5**, it is seen that the proposed LIDs for this site will reduce the total runoff volume for the 25 mm event by **10.05 mm**, from **17.45 mm** (runoff coefficient **0.7**) to **7.4 mm** (runoff coefficient **0.3**). This analysis also shows that if the soakaway pit for the commercial land is required to treat 90% of the runoff for the 25 mm event, it will need a total active storage volume of approximately **493 m³** (548 m³ x 90%).

Table 4: Development Runoff Volume without any LID measures

Land Use	Area		Precipitation		Wetting Losses		Surface Infiltration		Surface Runoff	
	(ha)	Imperviousness(%)	(mm)	(m^3)	(mm)	(m^3)	(mm)	(m^3)	(mm)	(m^3)
Apartment Block	2.59	90%	25	648	1.9	49	2.0	51	21.2	548
Semi Detatched	0.79	65%	25	198	2.7	21	6.9	54	15.5	122
Rear Lane Townhouse	0.25	95%	25	63	1.7	4	1.0	2	22.3	56
Townhouse	0.15	70%	25	38	2.5	4	5.9	9	16.6	25
Detached Drainage	0.06	40%	25	15	3.4	2	11.8	7	9.8	6
Existing 2 story Dwelling	0.63	10%	25	158	4.4	27	10.8	68	9.8	62
Walkway	0.03	50%	25	8	3.1	1	9.8	3	12.1	4
Park	0.36	30%	25	90	3.7	13	11.5	41	9.8	35
18m ROW	0.74	70%	25	185	2.5	19	5.9	44	16.6	123
20m ROW	0.29	60%	25	73	2.8	8	7.9	23	14.3	42
19.2 ROW	0.25	80%	25	63	2.2	5	3.9	10	18.9	47
8.5m ROW	0.11	85%	25	28	2.0	2	2.9	3	20.0	22
Future Development	0.03	70%	25	8	2.5	1	5.9	2	16.6	5
Total	**6.28**	**76%**	**25**	**1,570**	**2.50**	**157**	**5.05**	**317**	**17.45**	**1,096**

Table 5: Development Runoff Volume With LID measures

Land Use	Area (ha)	Imperviousness (%)	Surface Runoff (mm)	Surface Runoff (m^3)	Development Runoff Reduction with LIDs: Disconnect Roof Leads Reduction (%)	Grass Swales Reduction (%)	Soakaway Pit Reduction (%)	Amended Soils Reduction (%)	Total LID Reduction (%)	LID Runoff Volume (mm)	LID Runoff Volume (m^3)
Apartment Block	2.59	90%	21.2	548	—	—	90%	—	90%	2.1	55
Semi Detatched	0.79	65%	15.5	122	25%	10%	—	50%	66%	5.2	41
Rear Lane Townhouse	0.25	95%	22.3	56	25%	—	—	50%	63%	8.4	21
Townhouse	0.15	70%	16.6	25	25%	10%	—	50%	66%	5.6	8
Detached Drainage	0.06	40%	9.8	6	25%	10%	—	50%	66%	3.3	2
Existing 2 story Dwelling	0.63	10%	9.8	62	—	—	—	—	0%	9.8	62
Walkway	0.03	50%	12.1	4	—	—	—	50%	50%	6.0	2
Park	0.36	30%	9.8	35	—	—	—	—	0%	9.8	35
18m ROW	0.74	70%	16.6	123	—	—	—	—	0%	16.6	123
20m ROW	0.29	60%	14.3	42	—	—	—	—	0%	14.3	42
19.2 ROW	0.25	80%	18.9	47	—	—	—	—	0%	18.9	47
8.5m ROW	0.11	85%	20.0	22	—	—	—	—	0%	20.0	22
Future Development	0.03	70%	16.6	5	—	—	—	—	0%	16.6	5
Total	**6.28**	**76%**	**17.45**	**1,096**	**-**	**-**		**-**	**58%**	**7.40**	**465**

Table 6: Development Water Budget Summary

Units	[1] Rainfall	[2] Surface Evaporation	[3] Surface Infiltration	[4] Surface Runoff	[5] [4]-[6] LID Infiltration	[6] LID Runoff	[7] [3]+[5] Total Infiltration	[8] [7] x 50% Deep Aquifer Recharge	[9] [2]+([7] x 50%) Total Evaporation
mm	25.0	2.5	5.1	17.5	10.1	7.4	15.1	7.6	10.0
m^3	1570	157	317	1096	631	465	948	474	631.0
%	100%	10%	20%	70%	40%	**30%**	60%	**30%**	**40%**

From Table 6 above it is seen that the site will result in **60%** of the rainfall infiltrating into the topsoil of pervious surfaces and LIDs. Note that the evaporation portion of this water budget only considers wetting losses and provides no consideration of evapotranspiration that may occur once the runoff reaches the vegetation root system. To conservatively simplify this analysis it can be assumed that **50%** of the runoff volume that is infiltrated into the upper layers of the soil is returned to the atmosphere as evapotranspiration, with the remaining **50%** returning as deep aquifer recharge. Based on this analysis the annual water budget for this site is **30% runoff**, **30% deep aquifer recharge** and **40% evapotranspiration/wetting losses**.

JFSA has completed a detailed statistical analysis of individual rainfall events that have occurred at the Ottawa International Airport from 1967 – 2007, from April 1 to Nov 1 using a 12-hour inter-event time (all parameters are in line with that used in the draft MOECC LID manual). Based on this analysis, events less than or equal to the 25mm event equate to **63%** of the annual rainfall volume. Note that this statistical analysis differs from the 90th percentile analysis outlined in the MOECC LID manual, which simply looks at the frequency of various rainfall events on an annual basis, but gives no consideration to the percentage of annual rainfall volume that each of these events provides annually. To provide some context, the MOECC manual identifies a 27mm event to be the 90th percentile rainfall event in Ottawa (e.g. only 10% of all annual rainfall events have a rainfall volume larger than this event), but this analysis provides no consideration to the total volume of rainfall that these events provide relative to the annual rainfall. The statistical rainfall study completed by JFSA determined that all the annual rainfall events less than or equal to the 27mm event equates to 67% of the annual rainfall, with 10% of annual storms (events with a volume greater than 27mm) making up the remain 33% of the annual rainfall volume. From this analysis, it was found that rainfall events with a volume of 25mm or less on average make up **63%** of the annual rainfall volume, with events larger than 25 mm making up the remaining **37%** of the annual rainfall volume. The full summary of the statistical analysis has been provided in **Attachment B**.

Note that in this statistical analysis the annual rainfall analysis was completed from April 1st to November 1st (**517 mm/yr**.), which is notably lower than the annual rainfall presented in the Environment Canada Climate Norms for the year (**758.2mm/yr**.). Although when rainfall volumes from November-March are discounted from the Environment Canada Normal data the annual rainfall from April – November is **585 mm/yr.**, which is close to that observed in the JFSA statistical analysis, the slight discrepancy is likely due to a difference in the numbers of years used in the averaging analysis. As such it is proposed that the statistical analysis completed by JFSA is prorated to provide the precipitation for the full year.

Knowing that **63%** of the annual rainfall volume is made up of events less than 25 mm and that for events equal to and less than 25mm **30**% of the rainfall will infiltrate into the deep aquifer, it can be assumed that of the **758.2 mm/yr.** annual rainfall **144.3 mm/yr.** will infiltrate into the deep aquifer. Based on the Kanata West Master Servicing study, this site should have an annual infiltration target of **130 mm/yr**. As shown above, the site will exceed this annual target by **14.3 mm/yr**.

Table 7:Development Annual Infiltration Rate

Annual Average Rainfall (mm/Year)	Design Storm	Annual percentage of Rainfall less than Design Event (mm)	Annual Rainfall Volume Less than Design Event (mm/Yr.)	Site Annual Deep Infiltration (mm/Yr)
758.2	25mm Event	63%	478	144.3

A LID analysis has been completed from the **6.28 ha** proposed development at 1919 Maple Grove Road which will consist of a combination of rooftop disconnects, soakaway pits, amened soils and grass channels. Without these LIDs implemented the site has a runoff coefficient of **0.7** for the 25mm event, with the LIDs in place the site has a runoff coefficient of **0.3**. Extrapolating the results of this analysis it was determined that the site's water budget is **30%** runoff, **30%** deep aquifer recharge and **40%** evapotranspiration/wetting losses. Applying this water budget on an annual basis using Environment Canada's annual rainfall norms, results in an annual infiltration rate of **144.3** mm/yr. which exceeds exceed this annual infiltration target set out in the Kanata West Master Servicing study by **14.3 mm/yr**.

Yours truly,
J.F Sabourin and Associates Inc.

Jonathon Burnett, B.Eng, P.Eng
Water Resource Engineer

cc: J.F Sabourin, M.Eng, P.Eng
Director of Water Resources Projects

Figures
Figure 1: LID Area Hatch

Tables
Table 1: Development Summary
Table 2: Assumed LID Runoff Volume and Pollutant Removal (25 mm event)
Table 3: Runoff Volume Generated by a 25 mm Event
Table 4 Development Runoff Volume without any LID measures
Table 5 Development Runoff Volume with LID measures
Table 6 Development Water Budget Summary
Table 7 Development Annual Infiltration Rate

Attachments
Attachment A: Background Documents
Attachment B: Ottawa International Airport Historical Rainfall – Statistical Analysis

JFSA
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS

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Attachment A

Background Documents

Table 3.3 Performance Comparison of Selected LID Practices

LID Practice	Runoff Volume Reduction [1]	Pollutant Removal [2]	Cold Weather Case Studies [3]	Installation Cost [4]	Maintenance[5]
Rain Barrels	40%	High	No[6]	Medium	Medium
Cisterns	40%	High	No[6]	Medium	Medium
Green Rooftops	45% to 55%	Low to Moderate	Yes	Very high	Medium
Rooftop Disconnect	25% to 50%	Low	Yes	Low	Low
Soakaway Pits	90%	High	Yes	Medium	Medium
SWM Planters	15%	Moderate	No[6]	High	High
Soil Amendments	50% to 90%	Low to Moderate	Yes	Medium	Low
Tree Clusters	Varies	Unknown	Yes	Low	Low
Filter Strips	25% to 50%	Low	Yes	Low	Low
Permeable Pavers	45% to 90%	Low to Moderate	Yes	Medium	Low
Bio-retention	40% to 80%	Moderate to High	Yes	Medium	Medium
Grass Channels	10% to 20%	Low	Yes	Low	Low
Dry Swales	40% to 60%	Moderate to High	Yes	Medium	Low
Tree Pits	15%	Unknown	Yes	High	Medium
Curb Extensions	20% to 30%	Unknown	No[6]	High	Medium

Notes:
1 Percent volume runoff reduction achieved from the contributing drainage area to the LID practice for up to a 25 mm rainfall event.
2 Demonstrated ability to reduce event mean pollutant concentrations through the LID as reported in monitoring studies
3 Yes: LID practice has been demonstrated in cold-climate region and found to perform adequately with proper design. No: no reported installations in cold climate regions,
4. Installation Cost per cubic foot of runoff treated Low: ($1 to 5) Medium: ($5 to 25), High ($26 to 70) and Very High ($71 to 250)
5. Maintenance burden, above routine mowing and landscape management
6 May need to locate some design elements indoors, underground, or beneath the frost line

TIMP vs Runoff Volume Summary Tables

Runoff Volume (mm) Generated for 5 mm event

TIMP	XIMP = % of TIMP										
	1.00	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10	0.01
95.0%	3.26	2.93	2.63	2.50	2.42	2.39	2.39	2.43	2.48	2.54	2.62
90.0%	3.09	2.78	2.47	2.16	1.86	1.69	1.60	1.51	1.43	1.38	1.36
85.0%	2.91	2.62	2.33	2.04	1.75	1.46	1.17	0.97	0.82	0.73	0.66
80.0%	2.74	2.47	2.19	1.92	1.65	1.37	1.10	0.82	0.55	0.30	0.15
75.0%	2.57	2.31	2.06	1.80	1.54	1.29	1.03	0.77	0.51	0.26	0.03
70.0%	2.40	2.16	1.92	1.68	1.44	1.20	0.96	0.72	0.48	0.24	0.02
65.0%	2.23	2.01	1.78	1.56	1.34	1.11	0.89	0.67	0.45	0.22	0.02
60.0%	2.06	1.85	1.65	1.44	1.23	1.03	0.82	0.62	0.41	0.21	0.02
55.0%	1.89	1.70	1.51	1.32	1.13	0.94	0.75	0.57	0.38	0.19	0.02
50.0%	1.71	1.54	1.37	1.20	1.03	0.86	0.69	0.51	0.34	0.17	0.02
45.0%	1.54	1.39	1.23	1.08	0.93	0.77	0.62	0.46	0.31	0.15	0.02
40.0%	1.37	1.23	1.10	0.96	0.82	0.69	0.55	0.41	0.27	0.14	0.01

Runoff Volume (mm) Generated for 22 mm event

TIMP	XIMP = % of TIMP										
	1.00	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10	0.01
95.0%	19.41	18.62	18.40	18.36	18.41	18.52	18.63	18.75	18.87	19.00	19.12
90.0%	18.39	17.40	16.86	16.55	16.39	16.32	16.29	16.30	16.34	16.43	16.53
85.0%	17.37	16.35	15.63	15.15	14.81	14.56	14.41	14.32	14.26	14.23	14.22
80.0%	16.34	15.33	14.53	13.94	13.47	13.12	12.84	12.62	12.47	12.35	12.29
75.0%	15.32	14.30	13.55	12.86	12.32	11.87	11.51	11.21	10.95	10.73	10.58
70.0%	14.30	13.27	12.58	11.89	11.26	10.76	10.32	9.95	9.64	9.37	9.14
65.0%	13.28	12.30	11.60	10.95	10.31	9.75	9.27	8.85	8.48	8.14	7.88
60.0%	12.26	11.34	10.62	10.03	9.43	8.84	8.31	7.84	7.46	7.08	6.78
55.0%	11.24	10.38	9.64	9.10	8.55	8.01	7.46	6.96	6.53	6.13	5.81
50.0%	10.21	9.42	8.72	8.17	7.68	7.18	6.68	6.19	5.69	5.29	4.93
45.0%	9.19	8.46	7.83	7.24	6.79	6.34	5.90	5.45	5.02	4.56	4.16
40.0%	8.17	7.50	6.93	6.38	5.91	5.52	5.13	4.73	4.33	3.93	3.58

Runoff Volume (mm) Generated for 10 mm event

TIMP	XIMP = % of TIMP										
	1.00	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10	0.01
95.0%	8.01	7.32	7.02	6.88	6.83	6.85	6.90	6.97	7.06	7.16	7.28
90.0%	7.59	6.83	6.24	5.92	5.65	5.48	5.36	5.29	5.24	5.24	5.25
85.0%	7.17	6.45	5.73	5.20	4.90	4.58	4.34	4.15	3.99	3.88	3.80
80.0%	6.74	6.07	5.39	4.72	4.24	3.91	3.62	3.33	3.08	2.87	2.72
75.0%	6.32	5.69	5.06	4.43	3.79	3.33	2.96	2.69	2.42	2.15	1.90
70.0%	5.90	5.31	4.72	4.13	3.54	2.95	2.48	2.09	1.80	1.54	1.32
65.0%	5.48	4.93	4.38	3.84	3.29	2.74	2.19	1.68	1.32	0.96	0.73
60.0%	5.06	4.55	4.05	3.54	3.03	2.53	2.02	1.52	1.01	0.61	0.31
55.0%	4.64	4.17	3.71	3.25	2.78	2.32	1.85	1.39	0.93	0.46	0.05
50.0%	4.21	3.79	3.37	2.95	2.53	2.11	1.69	1.26	0.84	0.42	0.04
45.0%	3.79	3.41	3.03	2.66	2.28	1.90	1.52	1.14	0.76	0.38	0.04
40.0%	3.37	3.03	2.70	2.36	2.02	1.69	1.35	1.01	0.67	0.34	0.03

Runoff Volume (mm) Generated for 25 mm event

TIMP	XIMP = % of TIMP										
	1.00	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10	0.01
95.0%	22.29	21.52	21.32	21.30	21.38	21.49	21.60	21.72	21.85	21.98	22.10
90.0%	21.16	20.17	19.65	19.37	19.23	19.18	19.16	19.19	19.28	19.39	19.48
85.0%	20.02	18.99	18.29	17.83	17.50	17.29	17.17	17.09	17.05	17.03	17.04
80.0%	18.88	17.89	17.07	16.49	16.05	15.72	15.45	15.26	15.14	15.04	14.98
75.0%	17.75	16.79	15.94	15.29	14.75	14.33	13.99	13.69	13.45	13.27	13.14
70.0%	16.61	15.69	14.89	14.16	13.58	13.08	12.67	12.31	12.01	11.75	11.53
65.0%	15.47	14.59	13.84	13.10	12.48	11.95	11.47	11.07	10.70	10.41	10.16
60.0%	14.33	13.49	12.81	12.12	11.44	10.89	10.40	9.95	9.55	9.19	8.89
55.0%	13.20	12.40	11.77	11.14	10.50	9.89	9.40	8.91	8.51	8.11	7.79
50.0%	12.06	11.29	10.72	10.16	9.58	9.00	8.45	7.98	7.52	7.14	6.79
45.0%	10.92	10.20	9.68	9.17	8.65	8.13	7.62	7.10	6.67	6.26	5.88
40.0%	9.79	9.13	8.64	8.18	7.72	7.27	6.81	6.34	5.88	5.45	5.11

Runoff Volume (mm) Generated for 15 mm event

TIMP	XIMP = % of TIMP										
	1.00	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10	0.01
95.0%	12.76	11.96	11.67	11.58	11.58	11.62	11.71	11.83	11.95	12.08	12.19
90.0%	12.09	11.08	10.54	10.18	9.96	9.81	9.74	9.72	9.72	9.75	9.78
85.0%	11.42	10.31	9.68	9.16	8.78	8.49	8.28	8.12	8.00	7.93	7.88
80.0%	10.74	9.67	8.85	8.35	7.85	7.44	7.14	6.87	6.66	6.49	6.36
75.0%	10.07	9.06	8.16	7.54	7.08	6.61	6.20	5.85	5.56	5.30	5.11
70.0%	9.40	8.46	7.52	6.83	6.31	5.87	5.43	5.00	4.65	4.33	4.08
65.0%	8.73	7.86	6.98	6.18	5.59	5.13	4.72	4.32	3.91	3.52	3.22
60.0%	8.06	7.25	6.45	5.64	4.99	4.44	4.01	3.64	3.27	2.89	2.55
55.0%	7.39	6.65	5.91	5.17	4.43	3.89	3.39	2.97	2.62	2.28	1.97
50.0%	6.71	6.04	5.37	4.70	4.03	3.36	2.88	2.43	1.97	1.66	1.38
45.0%	6.04	5.44	4.83	4.23	3.63	3.02	2.42	1.97	1.55	1.15	0.79
40.0%	5.37	4.83	4.30	3.76	3.22	2.69	2.15	1.61	1.14	0.78	0.45

Runoff Volume (mm) Generated for 30 mm event

TIMP	XIMP = % of TIMP										
	1.00	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10	0.01
95.0%	27.14	26.38	26.22	26.24	26.34	26.45	26.57	26.69	26.82	26.95	27.08
90.0%	25.86	24.85	24.36	24.14	24.03	23.99	24.03	24.12	24.21	24.31	24.39
85.0%	24.57	23.49	22.82	22.39	22.12	21.96	21.86	21.80	21.77	21.79	21.85
80.0%	23.28	22.20	21.43	20.87	20.47	20.16	19.95	19.81	19.70	19.63	19.58
75.0%	22.00	20.94	20.12	19.48	18.98	18.59	18.26	18.02	17.83	17.70	17.59
70.0%	20.71	19.73	18.86	18.19	17.62	17.16	16.77	16.43	16.14	15.93	15.77
65.0%	19.42	18.51	17.64	16.94	16.34	15.82	15.39	15.02	14.67	14.38	14.14
60.0%	18.14	17.29	16.45	15.74	15.14	14.59	14.11	13.70	13.31	13.01	12.71
55.0%	16.85	16.08	15.30	14.58	13.96	13.43	12.92	12.48	12.06	11.72	11.41
50.0%	15.56	14.86	14.16	13.45	12.86	12.29	11.81	11.36	10.94	10.53	10.21
45.0%	14.28	13.64	13.01	12.39	11.74	11.24	10.73	10.29	9.87	9.45	9.12
40.0%	12.99	12.44	11.88	11.31	10.74	10.20	9.75	9.29	8.87	8.49	8.14

Runoff Volume (mm) Generated for 20 mm event

TIMP	XIMP = % of TIMP										
	1.00	0.90	0.80	0.70	0.60	0.50	0.40	0.30	0.20	0.10	0.01
95.0%	17.51	16.70	16.46	16.41	16.44	16.53	16.65	16.76	16.89	17.02	17.14
90.0%	16.59	15.58	15.02	14.70	14.51	14.43	14.39	14.40	14.42	14.48	14.57
85.0%	15.67	14.60	13.89	13.39	13.04	12.79	12.60	12.49	12.43	12.39	12.37
80.0%	14.74	13.62	12.91	12.28	11.81	11.44	11.16	10.92	10.73	10.60	10.51
75.0%	13.82	12.68	11.98	11.31	10.74	10.30	9.91	9.59	9.35	9.11	8.93
70.0%	12.90	11.79	11.04	10.42	9.80	9.28	8.84	8.44	8.11	7.83	7.61
65.0%	11.98	10.89	10.10	9.52	8.95	8.37	7.87	7.44	7.06	6.72	6.44
60.0%	11.06	9.99	9.24	8.63	8.10	7.57	7.03	6.55	6.13	5.75	5.44
55.0%	10.14	9.12	8.40	7.74	7.25	6.76	6.28	5.79	5.30	4.91	4.56
50.0%	9.21	8.29	7.57	6.94	6.40	5.96	5.52	5.08	4.63	4.19	3.79
45.0%	8.29	7.46	6.73	6.17	5.60	5.15	4.76	4.36	3.97	3.57	3.21
40.0%	7.37	6.63	5.90	5.40	4.89	4.38	3.99	3.65	3.29	2.94	2.62

JFSA
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

Attachment B

Ottawa International Airport Historical Rainfall Statistical Analysis

Individual Rainfall Events as Percentage of Annual Rainfall Volume
(Ottawa Airport 1967 - 2007)

Rainfall Volume (mm)	Minimum (%)	Maximum (%)	Average (%)
2	1	5	**3**
5	4	17	**10**
10	14	36	**25**
15	22	55	**39**
20	35	79	**52**
25	41	92	**63**
27	41	100	**67**
30	41	100	**71**
35	41	100	**77**
40	41	100	**82**
45	41	100	**88**
50	41	100	**90**
55	41	100	**92**
60	55	100	**94**
65	55	100	**96**
70	55	100	**97**
75	55	100	**97**
80	74	100	**98**
85	74	100	**98**
90	74	100	**98**
95	74	100	**98**
100	74	100	**98**
105	74	100	**98**
110	76	100	**99**
115	76	100	**99**
120	76	100	**99**
125	76	100	**99**
130	76	100	**99**
135	76	100	**99**
140	98	100	**100**

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1967	1967-07-22 14:00:00	1967-07-22 15:00:00	1	3.8	3.8	1.2
1967	1967-07-24 20:00:00	1967-07-25 02:00:00	6	17.3	23.2	7.3
1967	1967-08-03 14:00:00	1967-08-03 15:00:00	1	1.3	1.3	0.4
1967	1967-08-04 09:00:00	1967-08-04 15:00:00	6	0.5	1.1	0.3
1967	1967-08-09 05:00:00	1967-08-09 23:00:00	18	1.5	3.1	1.0
1967	1967-08-16 14:00:00	1967-08-16 18:00:00	4	0.5	0.8	0.3
1967	1967-08-18 05:00:00	1967-08-18 21:00:00	16	4.3	14.2	4.4
1967	1967-08-20 06:00:00	1967-08-20 11:00:00	5	4.8	9	2.8
1967	1967-08-21 21:00:00	1967-08-22 09:00:00	12	3.3	9.4	2.9
1967	1967-08-27 22:00:00	1967-08-28 08:00:00	10	8.1	17.1	5.3
1967	1967-08-30 04:00:00	1967-08-30 18:00:00	14	3.3	10.6	3.3
1967	1967-09-03 01:00:00	1967-09-03 04:00:00	3	2	2.6	0.8
1967	1967-09-09 15:00:00	1967-09-09 19:00:00	4	16.8	17.3	5.4
1967	1967-09-21 06:00:00	1967-09-23 04:00:00	22	24.6	63.2	19.8
1967	1967-09-24 04:00:00	1967-09-24 13:00:00	9	1	4.2	1.3
1967	1967-09-27 18:00:00	1967-09-29 18:00:00	0	5.3	48.8	15.3
1967	1967-10-09 01:00:00	1967-10-09 11:00:00	10	2	4.2	1.3
1967	1967-10-14 21:00:00	1967-10-14 23:00:00	2	0.3	0.6	0.2
1967	1967-10-15 22:00:00	1967-10-19 07:00:00	9	9.4	63.7	19.9
1967	1967-10-21 01:00:00	1967-10-21 18:00:00	17	1.8	6	1.9
1967	1967-10-25 17:00:00	1967-10-26 01:00:00	8	4.3	14.4	4.5
1967	1967-10-27 15:00:00	1967-10-27 21:00:00	6	0.3	0.6	0.2
1968	1968-04-01 00:00:00	1968-04-01 03:00:00	3	1.5	2.8	0.6
1968	1968-04-04 03:00:00	1968-04-04 23:00:00	20	3	11.8	2.4
1968	1968-04-08 09:00:00	1968-04-08 10:00:00	1	0.3	0.3	0.1
1968	1968-04-09 18:00:00	1968-04-09 19:00:00	1	0.3	0.3	0.1
1968	1968-04-15 09:00:00	1968-04-15 10:00:00	1	0.3	0.3	0.1
1968	1968-04-22 16:00:00	1968-04-22 19:00:00	3	3.3	4.9	1.0
1968	1968-04-24 05:00:00	1968-04-24 22:00:00	17	2.8	6.9	1.4
1968	1968-04-30 11:00:00	1968-04-30 23:00:00	12	1.8	10.8	2.2
1968	1968-05-01 17:00:00	1968-05-01 18:00:00	1	0.3	0.3	0.1
1968	1968-05-09 12:00:00	1968-05-09 16:00:00	4	3.3	7.1	1.4
1968	1968-05-16 17:00:00	1968-05-17 15:00:00	22	3.6	5.6	1.1
1968	1968-05-18 18:00:00	1968-05-19 02:00:00	8	1	3.7	0.7
1968	1968-05-20 10:00:00	1968-05-20 20:00:00	10	1.5	3.4	0.7
1968	1968-05-21 13:00:00	1968-05-21 14:00:00	1	1	1	0.2
1968	1968-05-29 07:00:00	1968-05-29 20:00:00	13	4.8	24.5	4.9
1968	1968-05-31 03:00:00	1968-05-31 12:00:00	9	0.5	2.8	0.6
1968	1968-06-02 01:00:00	1968-06-02 13:00:00	12	0.3	0.6	0.1
1968	1968-06-03 20:00:00	1968-06-03 21:00:00	1	0.5	0.5	0.1
1968	1968-06-09 19:00:00	1968-06-09 20:00:00	1	4.6	4.6	0.9
1968	1968-06-11 23:00:00	1968-06-12 04:00:00	5	4.6	8.3	1.7
1968	1968-06-12 19:00:00	1968-06-13 06:00:00	11	3.8	8.3	1.7
1968	1968-06-19 05:00:00	1968-06-19 21:00:00	16	3.3	8.7	1.7
1968	1968-06-22 02:00:00	1968-06-23 00:00:00	22	7.6	25.1	5.0

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1968	1968-06-24 03:00:00	1968-06-24 07:00:00	4	2	4.8	1.0
1968	1968-06-25 14:00:00	1968-06-25 15:00:00	1	0.3	0.3	0.1
1968	1968-06-27 10:00:00	1968-06-28 16:00:00	6	3.8	35.2	7.1
1968	1968-06-30 12:00:00	1968-06-30 18:00:00	6	10.4	11.5	2.3
1968	1968-07-01 12:00:00	1968-07-01 14:00:00	2	1.8	2.1	0.4
1968	1968-07-05 13:00:00	1968-07-06 03:00:00	14	3.3	11.3	2.3
1968	1968-07-07 05:00:00	1968-07-07 08:00:00	3	0.8	1.6	0.3
1968	1968-07-08 08:00:00	1968-07-08 09:00:00	1	0.5	0.5	0.1
1968	1968-07-09 14:00:00	1968-07-10 02:00:00	12	6.4	20.8	4.2
1968	1968-07-13 13:00:00	1968-07-13 14:00:00	1	0.3	0.3	0.1
1968	1968-07-19 08:00:00	1968-07-19 10:00:00	2	3.3	4.1	0.8
1968	1968-07-24 14:00:00	1968-07-24 15:00:00	1	1.3	1.3	0.3
1968	1968-07-27 18:00:00	1968-07-27 19:00:00	1	0.3	0.3	0.1
1968	1968-07-31 20:00:00	1968-08-01 03:00:00	7	8.6	18.8	3.8
1968	1968-08-06 03:00:00	1968-08-06 05:00:00	2	1	2	0.4
1968	1968-08-07 05:00:00	1968-08-07 12:00:00	7	2.5	3.4	0.7
1968	1968-08-08 15:00:00	1968-08-08 22:00:00	7	18	42	8.4
1968	1968-08-09 15:00:00	1968-08-09 16:00:00	1	2	2	0.4
1968	1968-08-10 16:00:00	1968-08-10 17:00:00	1	0.3	0.3	0.1
1968	1968-08-16 10:00:00	1968-08-16 11:00:00	1	0.5	0.5	0.1
1968	1968-08-17 03:00:00	1968-08-17 15:00:00	12	33.3	44.9	9.0
1968	1968-08-20 04:00:00	1968-08-20 07:00:00	3	6.1	8.9	1.8
1968	1968-08-26 02:00:00	1968-08-26 11:00:00	9	0.5	1.1	0.2
1968	1968-09-02 16:00:00	1968-09-02 22:00:00	6	2.5	6.9	1.4
1968	1968-09-06 01:00:00	1968-09-06 11:00:00	10	11.2	34.9	7.0
1968	1968-09-10 16:00:00	1968-09-12 01:00:00	9	6.4	39.8	8.0
1968	1968-09-24 22:00:00	1968-09-25 01:00:00	3	0.8	1.1	0.2
1968	1968-09-27 12:00:00	1968-09-27 17:00:00	5	2.5	2.8	0.6
1968	1968-10-02 18:00:00	1968-10-03 12:00:00	18	5.1	9.5	1.9
1968	1968-10-04 13:00:00	1968-10-04 19:00:00	6	0.3	0.9	0.2
1968	1968-10-06 17:00:00	1968-10-07 09:00:00	16	1	6.7	1.3
1968	1968-10-07 23:00:00	1968-10-08 00:00:00	1	0.3	0.3	0.1
1968	1968-10-10 15:00:00	1968-10-11 00:00:00	9	3.3	5.9	1.2
1968	1968-10-19 01:00:00	1968-10-19 15:00:00	14	4.6	18.2	3.6
1968	1968-10-24 20:00:00	1968-10-25 12:00:00	16	1.8	11.5	2.3
1969	1969-04-05 00:00:00	1969-04-05 23:00:00	23	1	8.9	2.1
1969	1969-04-10 00:00:00	1969-04-10 15:00:00	15	1.5	5.4	1.3
1969	1969-04-16 00:00:00	1969-04-16 15:00:00	15	2.3	3.5	0.8
1969	1969-04-17 23:00:00	1969-04-18 07:00:00	8	4.6	21.5	5.1
1969	1969-04-22 03:00:00	1969-04-23 18:00:00	15	2.5	27.7	6.6
1969	1969-04-27 02:00:00	1969-04-28 20:00:00	18	3.6	28.5	6.8
1969	1969-05-02 21:00:00	1969-05-03 00:00:00	3	1	1.8	0.4
1969	1969-05-07 09:00:00	1969-05-07 10:00:00	1	0.3	0.3	0.1
1969	1969-05-08 11:00:00	1969-05-08 17:00:00	6	2.5	7.4	1.8
1969	1969-05-09 18:00:00	1969-05-11 18:00:00	0	3	12.7	3.0

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1969	1969-05-12 12:00:00	1969-05-12 15:00:00	3	0.5	0.8	0.2
1969	1969-05-13 09:00:00	1969-05-13 15:00:00	6	3	4.3	1.0
1969	1969-05-17 12:00:00	1969-05-19 08:00:00	20	5.8	37.7	9.0
1969	1969-05-20 17:00:00	1969-05-20 19:00:00	2	0.5	1	0.2
1969	1969-05-25 02:00:00	1969-05-25 06:00:00	4	2.5	4.4	1.1
1969	1969-05-28 00:00:00	1969-05-28 01:00:00	1	0.3	0.3	0.1
1969	1969-05-29 16:00:00	1969-05-29 20:00:00	4	1.5	2.8	0.7
1969	1969-06-02 23:00:00	1969-06-03 04:00:00	5	1.5	3.1	0.7
1969	1969-06-03 17:00:00	1969-06-03 19:00:00	2	0.3	0.6	0.1
1969	1969-06-05 16:00:00	1969-06-05 17:00:00	1	0.8	0.8	0.2
1969	1969-06-13 03:00:00	1969-06-13 13:00:00	10	0.3	0.6	0.1
1969	1969-06-15 02:00:00	1969-06-16 03:00:00	1	2.5	18.5	4.4
1969	1969-06-17 22:00:00	1969-06-18 01:00:00	3	1.5	2.1	0.5
1969	1969-06-18 20:00:00	1969-06-18 22:00:00	2	0.5	1	0.2
1969	1969-06-23 06:00:00	1969-06-24 04:00:00	22	3.3	32.7	7.8
1969	1969-06-26 10:00:00	1969-06-26 12:00:00	2	1.3	2.3	0.6
1969	1969-06-27 20:00:00	1969-06-27 22:00:00	2	0.5	0.8	0.2
1969	1969-06-30 08:00:00	1969-06-30 20:00:00	12	13.2	26.5	6.3
1969	1969-07-04 19:00:00	1969-07-05 02:00:00	7	5.1	9.2	2.2
1969	1969-07-10 05:00:00	1969-07-10 09:00:00	4	2.3	5.4	1.3
1969	1969-07-11 14:00:00	1969-07-11 18:00:00	4	1.3	2.8	0.7
1969	1969-07-24 16:00:00	1969-07-24 17:00:00	1	0.3	0.3	0.1
1969	1969-08-02 01:00:00	1969-08-02 02:00:00	1	2	2	0.5
1969	1969-08-02 18:00:00	1969-08-02 19:00:00	1	8.4	8.4	2.0
1969	1969-08-07 07:00:00	1969-08-07 10:00:00	3	2.5	3	0.7
1969	1969-08-08 03:00:00	1969-08-08 04:00:00	1	1.5	1.5	0.4
1969	1969-08-09 12:00:00	1969-08-09 17:00:00	5	1.5	2.5	0.6
1969	1969-08-16 22:00:00	1969-08-17 06:00:00	8	0.8	3.7	0.9
1969	1969-08-18 03:00:00	1969-08-18 07:00:00	4	2.5	3.1	0.7
1969	1969-08-18 20:00:00	1969-08-19 03:00:00	7	21.1	47.2	11.3
1969	1969-08-29 04:00:00	1969-08-29 07:00:00	3	1.8	2.3	0.6
1969	1969-09-01 17:00:00	1969-09-01 20:00:00	3	8.9	10.4	2.5
1969	1969-09-06 21:00:00	1969-09-06 23:00:00	2	2.3	2.8	0.7
1969	1969-09-07 13:00:00	1969-09-07 14:00:00	1	0.5	0.5	0.1
1969	1969-09-16 10:00:00	1969-09-16 15:00:00	5	9.1	10.4	2.5
1969	1969-09-17 03:00:00	1969-09-17 08:00:00	5	0.8	2.2	0.5
1969	1969-09-24 07:00:00	1969-09-24 14:00:00	7	0.8	2.2	0.5
1969	1969-09-27 04:00:00	1969-09-27 16:00:00	12	2.3	3.6	0.9
1969	1969-09-30 06:00:00	1969-09-30 07:00:00	1	0.3	0.3	0.1
1969	1969-10-02 14:00:00	1969-10-03 00:00:00	10	0.5	2	0.5
1969	1969-10-08 14:00:00	1969-10-08 15:00:00	1	0.3	0.3	0.1
1969	1969-10-13 10:00:00	1969-10-14 03:00:00	17	1	3.7	0.9
1969	1969-10-16 12:00:00	1969-10-17 18:00:00	6	3.6	6.8	1.6
1969	1969-10-19 22:00:00	1969-10-20 17:00:00	19	2	13.1	3.1
1969	1969-10-24 11:00:00	1969-10-24 12:00:00	1	0.3	0.3	0.1

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1969	1969-10-25 07:00:00	1969-10-26 11:00:00	4	0.8	6.3	1.5
1969	1969-10-26 23:00:00	1969-10-27 02:00:00	3	1.5	3.5	0.8
1970	1970-04-02 14:00:00	1970-04-02 15:00:00	1	4.1	4.1	0.9
1970	1970-04-17 15:00:00	1970-04-17 17:00:00	2	0.8	1.3	0.3
1970	1970-04-20 09:00:00	1970-04-20 19:00:00	10	0.3	0.6	0.1
1970	1970-04-21 11:00:00	1970-04-21 17:00:00	6	0.8	1.4	0.3
1970	1970-04-22 07:00:00	1970-04-22 08:00:00	1	0.3	0.3	0.1
1970	1970-04-23 08:00:00	1970-04-23 12:00:00	4	0.3	0.6	0.1
1970	1970-04-24 09:00:00	1970-04-25 03:00:00	18	2.3	13.2	2.8
1970	1970-05-01 23:00:00	1970-05-02 14:00:00	15	2	3.1	0.6
1970	1970-05-05 17:00:00	1970-05-05 22:00:00	5	2.3	2.9	0.6
1970	1970-05-08 19:00:00	1970-05-08 20:00:00	1	1	1	0.2
1970	1970-05-09 16:00:00	1970-05-09 23:00:00	7	3	6.2	1.3
1970	1970-05-10 17:00:00	1970-05-11 01:00:00	8	13.5	20.7	4.3
1970	1970-05-11 16:00:00	1970-05-11 17:00:00	1	0.3	0.3	0.1
1970	1970-05-15 15:00:00	1970-05-17 02:00:00	11	2	16.5	3.5
1970	1970-05-25 09:00:00	1970-05-26 00:00:00	15	2.5	6.5	1.4
1970	1970-05-26 17:00:00	1970-05-26 20:00:00	3	4.6	4.9	1.0
1970	1970-05-31 19:00:00	1970-06-01 07:00:00	12	1.3	5.5	1.2
1970	1970-06-03 00:00:00	1970-06-03 02:00:00	2	0.5	0.8	0.2
1970	1970-06-17 10:00:00	1970-06-17 12:00:00	2	1.8	2.3	0.5
1970	1970-06-24 19:00:00	1970-06-24 22:00:00	3	7.6	9.7	2.0
1970	1970-06-27 02:00:00	1970-06-27 10:00:00	8	2.8	9.3	1.9
1970	1970-06-29 12:00:00	1970-06-29 18:00:00	6	1.8	3.2	0.7
1970	1970-07-01 15:00:00	1970-07-01 19:00:00	4	0.5	1.6	0.3
1970	1970-07-04 02:00:00	1970-07-04 18:00:00	16	2.3	4.9	1.0
1970	1970-07-05 11:00:00	1970-07-05 12:00:00	1	1	1	0.2
1970	1970-07-10 21:00:00	1970-07-11 14:00:00	17	7.1	18.8	3.9
1970	1970-07-14 18:00:00	1970-07-14 20:00:00	2	2.5	3	0.6
1970	1970-07-16 09:00:00	1970-07-16 14:00:00	5	3.8	5.1	1.1
1970	1970-07-17 21:00:00	1970-07-17 23:00:00	2	0.5	0.8	0.2
1970	1970-07-19 20:00:00	1970-07-20 23:00:00	3	12.7	37.3	7.8
1970	1970-07-26 14:00:00	1970-07-26 16:00:00	2	1	1.3	0.3
1970	1970-07-28 06:00:00	1970-07-28 13:00:00	7	12.7	13.5	2.8
1970	1970-07-30 22:00:00	1970-07-31 16:00:00	18	0.5	2.5	0.5
1970	1970-08-07 15:00:00	1970-08-07 17:00:00	2	0.8	1.3	0.3
1970	1970-08-11 17:00:00	1970-08-11 18:00:00	1	0.5	0.5	0.1
1970	1970-08-16 13:00:00	1970-08-16 21:00:00	8	27.7	43.5	9.1
1970	1970-08-20 03:00:00	1970-08-20 16:00:00	13	5.1	6.4	1.3
1970	1970-08-25 16:00:00	1970-08-25 20:00:00	4	1	1.8	0.4
1970	1970-08-26 13:00:00	1970-08-26 15:00:00	2	7.1	7.4	1.5
1970	1970-08-28 11:00:00	1970-08-28 12:00:00	1	0.5	0.5	0.1
1970	1970-08-30 13:00:00	1970-08-30 20:00:00	7	5.6	9.2	1.9
1970	1970-09-03 10:00:00	1970-09-04 22:00:00	12	5.6	25.4	5.3
1970	1970-09-08 19:00:00	1970-09-08 21:00:00	2	2.3	3.3	0.7

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1970	1970-09-10 12:00:00	1970-09-10 17:00:00	5	5.1	6.9	1.4
1970	1970-09-13 05:00:00	1970-09-13 09:00:00	4	0.8	1.4	0.3
1970	1970-09-15 17:00:00	1970-09-16 01:00:00	8	3.3	5.6	1.2
1970	1970-09-17 18:00:00	1970-09-17 19:00:00	1	0.3	0.3	0.1
1970	1970-09-21 12:00:00	1970-09-21 14:00:00	2	1	1.3	0.3
1970	1970-09-22 15:00:00	1970-09-22 17:00:00	2	4.1	4.4	0.9
1970	1970-09-24 21:00:00	1970-09-25 03:00:00	6	23.4	34.6	7.2
1970	1970-09-26 20:00:00	1970-09-26 22:00:00	2	35.3	36.6	7.7
1970	1970-09-29 00:00:00	1970-09-29 03:00:00	3	0.8	1.6	0.3
1970	1970-09-30 06:00:00	1970-09-30 18:00:00	12	3	13.8	2.9
1970	1970-10-02 15:00:00	1970-10-03 20:00:00	5	5.1	22.3	4.7
1970	1970-10-10 17:00:00	1970-10-11 06:00:00	13	1.5	3.6	0.8
1970	1970-10-12 04:00:00	1970-10-12 10:00:00	6	4.1	8	1.7
1970	1970-10-13 21:00:00	1970-10-14 05:00:00	8	5.1	8.2	1.7
1970	1970-10-21 19:00:00	1970-10-23 03:00:00	8	5.1	25.4	5.3
1971	1971-04-01 21:00:00	1971-04-02 10:00:00	13	1.5	10.4	2.2
1971	1971-04-09 21:00:00	1971-04-09 22:00:00	1	0.3	0.3	0.1
1971	1971-04-13 05:00:00	1971-04-14 00:00:00	19	1.3	7.6	1.6
1971	1971-04-21 00:00:00	1971-04-21 23:00:00	23	1	6.8	1.4
1971	1971-04-22 20:00:00	1971-04-23 01:00:00	5	0.3	0.9	0.2
1971	1971-04-24 14:00:00	1971-04-25 12:00:00	22	2	7.6	1.6
1971	1971-04-26 12:00:00	1971-04-26 14:00:00	2	0.5	1	0.2
1971	1971-04-28 14:00:00	1971-04-29 19:00:00	5	2.5	11.5	2.4
1971	1971-05-03 04:00:00	1971-05-04 16:00:00	12	3.6	17.4	3.6
1971	1971-05-08 17:00:00	1971-05-09 00:00:00	7	1.3	2.7	0.6
1971	1971-05-12 09:00:00	1971-05-12 16:00:00	7	0.8	1.7	0.4
1971	1971-05-13 23:00:00	1971-05-14 01:00:00	2	0.5	0.8	0.2
1971	1971-05-16 21:00:00	1971-05-17 01:00:00	4	2	3.6	0.7
1971	1971-05-20 14:00:00	1971-05-20 17:00:00	3	1.5	3	0.6
1971	1971-05-24 20:00:00	1971-05-25 11:00:00	15	1.5	6.7	1.4
1971	1971-05-26 08:00:00	1971-05-27 12:00:00	4	2.5	10.6	2.2
1971	1971-06-02 13:00:00	1971-06-02 20:00:00	7	1.3	6	1.2
1971	1971-06-07 17:00:00	1971-06-08 13:00:00	20	15.5	26.5	5.5
1971	1971-06-12 16:00:00	1971-06-12 17:00:00	1	0.8	0.8	0.2
1971	1971-06-20 17:00:00	1971-06-21 06:00:00	13	7.6	10.8	2.2
1971	1971-06-24 08:00:00	1971-06-24 09:00:00	1	0.3	0.3	0.1
1971	1971-06-25 08:00:00	1971-06-25 20:00:00	12	3.3	10.5	2.2
1971	1971-07-01 07:00:00	1971-07-01 08:00:00	1	0.5	0.5	0.1
1971	1971-07-05 21:00:00	1971-07-06 12:00:00	15	4.1	11.9	2.5
1971	1971-07-13 09:00:00	1971-07-13 15:00:00	6	6.1	9.5	2.0
1971	1971-07-14 11:00:00	1971-07-15 05:00:00	18	2.8	4.3	0.9
1971	1971-07-16 21:00:00	1971-07-17 08:00:00	11	13.7	34.4	7.2
1971	1971-07-19 13:00:00	1971-07-19 14:00:00	1	0.8	0.8	0.2
1971	1971-07-20 21:00:00	1971-07-20 23:00:00	2	1.5	2	0.4
1971	1971-07-23 05:00:00	1971-07-24 18:00:00	13	13.7	20.4	4.2

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1971	1971-07-26 15:00:00	1971-07-27 01:00:00	10	12.7	17.6	3.7
1971	1971-07-29 05:00:00	1971-07-29 11:00:00	6	0.8	1.9	0.4
1971	1971-07-31 05:00:00	1971-07-31 13:00:00	8	5.1	11.1	2.3
1971	1971-08-10 03:00:00	1971-08-10 16:00:00	13	24.6	37.4	7.8
1971	1971-08-11 05:00:00	1971-08-11 09:00:00	4	0.3	0.6	0.1
1971	1971-08-13 02:00:00	1971-08-13 05:00:00	3	0.3	0.6	0.1
1971	1971-08-14 14:00:00	1971-08-14 20:00:00	6	12.7	27.7	5.8
1971	1971-08-20 03:00:00	1971-08-20 06:00:00	3	0.8	1.6	0.3
1971	1971-08-21 07:00:00	1971-08-21 12:00:00	5	0.8	1.7	0.4
1971	1971-08-22 13:00:00	1971-08-23 03:00:00	14	3.8	13.5	2.8
1971	1971-08-27 11:00:00	1971-08-28 19:00:00	8	4.8	33.4	6.9
1971	1971-08-30 10:00:00	1971-08-30 13:00:00	3	2.5	5.8	1.2
1971	1971-09-03 15:00:00	1971-09-03 16:00:00	1	1	1	0.2
1971	1971-09-07 03:00:00	1971-09-07 08:00:00	5	1.8	2.1	0.4
1971	1971-09-11 15:00:00	1971-09-12 03:00:00	12	1.8	4.6	1.0
1971	1971-09-13 04:00:00	1971-09-13 12:00:00	8	9.9	21	4.4
1971	1971-09-14 00:00:00	1971-09-14 07:00:00	7	2	6.2	1.3
1971	1971-09-17 06:00:00	1971-09-17 16:00:00	10	0.5	0.8	0.2
1971	1971-09-19 15:00:00	1971-09-20 19:00:00	4	3	13.9	2.9
1971	1971-09-21 09:00:00	1971-09-21 10:00:00	1	0.3	0.3	0.1
1971	1971-09-23 14:00:00	1971-09-23 21:00:00	7	1.3	1.9	0.4
1971	1971-10-04 12:00:00	1971-10-04 14:00:00	2	1.8	3.1	0.6
1971	1971-10-06 04:00:00	1971-10-07 10:00:00	6	2.3	9.5	2.0
1971	1971-10-08 21:00:00	1971-10-08 22:00:00	1	0.3	0.3	0.1
1971	1971-10-09 14:00:00	1971-10-10 04:00:00	14	2.3	12.8	2.7
1971	1971-10-11 05:00:00	1971-10-11 17:00:00	12	0.8	2.2	0.5
1971	1971-10-13 22:00:00	1971-10-14 05:00:00	7	3.3	6.7	1.4
1971	1971-10-23 07:00:00	1971-10-23 08:00:00	1	1	1	0.2
1971	1971-10-24 21:00:00	1971-10-25 20:00:00	23	1.8	9.3	1.9
1972	1972-04-13 07:00:00	1972-04-13 23:00:00	16	4.1	18.4	2.5
1972	1972-04-15 08:00:00	1972-04-15 16:00:00	8	1.8	7	1.0
1972	1972-04-18 10:00:00	1972-04-19 17:00:00	7	2.5	13.9	1.9
1972	1972-04-22 21:00:00	1972-04-23 10:00:00	13	0.8	3.7	0.5
1972	1972-05-02 04:00:00	1972-05-02 10:00:00	6	1.5	2.7	0.4
1972	1972-05-02 22:00:00	1972-05-03 06:00:00	8	2	5.4	0.7
1972	1972-05-04 16:00:00	1972-05-05 05:00:00	13	1.8	11.6	1.6
1972	1972-05-06 13:00:00	1972-05-06 20:00:00	7	2.8	6.3	0.9
1972	1972-05-11 08:00:00	1972-05-11 11:00:00	3	1	1.8	0.2
1972	1972-05-14 04:00:00	1972-05-14 07:00:00	3	0.5	1.3	0.2
1972	1972-05-16 05:00:00	1972-05-16 11:00:00	6	1.8	6.9	1.0
1972	1972-05-30 14:00:00	1972-05-31 00:00:00	10	4.6	17.4	2.4
1972	1972-06-01 04:00:00	1972-06-01 20:00:00	16	2.8	16.3	2.3
1972	1972-06-02 14:00:00	1972-06-02 16:00:00	2	1.5	2	0.3
1972	1972-06-06 16:00:00	1972-06-06 21:00:00	5	0.8	1.6	0.2
1972	1972-06-08 03:00:00	1972-06-08 04:00:00	1	0.8	0.8	0.1

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1972	1972-06-08 23:00:00	1972-06-09 17:00:00	18	9.4	20.4	2.8
1972	1972-06-15 13:00:00	1972-06-15 15:00:00	2	4.6	7.6	1.1
1972	1972-06-21 02:00:00	1972-06-22 07:00:00	5	9.1	55.4	7.7
1972	1972-06-22 19:00:00	1972-06-23 01:00:00	6	2.5	3.4	0.5
1972	1972-06-23 14:00:00	1972-06-24 14:00:00	0	3.8	14.2	2.0
1972	1972-06-25 20:00:00	1972-06-26 18:00:00	22	2.8	11.5	1.6
1972	1972-06-27 18:00:00	1972-06-27 19:00:00	1	0.8	0.8	0.1
1972	1972-07-02 16:00:00	1972-07-02 17:00:00	1	0.3	0.3	0.0
1972	1972-07-03 08:00:00	1972-07-03 14:00:00	6	1.8	5.5	0.8
1972	1972-07-07 09:00:00	1972-07-07 10:00:00	1	0.3	0.3	0.0
1972	1972-07-10 01:00:00	1972-07-10 18:00:00	17	6.4	16.2	2.2
1972	1972-07-12 03:00:00	1972-07-12 05:00:00	2	37.3	38.3	5.3
1972	1972-07-13 13:00:00	1972-07-13 18:00:00	5	33.3	43.9	6.1
1972	1972-07-14 16:00:00	1972-07-14 17:00:00	1	2	2	0.3
1972	1972-07-15 12:00:00	1972-07-16 18:00:00	6	11.7	35.2	4.9
1972	1972-07-19 04:00:00	1972-07-19 06:00:00	2	5.6	6.6	0.9
1972	1972-07-20 17:00:00	1972-07-20 18:00:00	1	0.5	0.5	0.1
1972	1972-07-22 18:00:00	1972-07-22 23:00:00	5	13.7	26.9	3.7
1972	1972-07-23 14:00:00	1972-07-23 17:00:00	3	3.3	6.4	0.9
1972	1972-07-24 21:00:00	1972-07-24 22:00:00	1	0.8	0.8	0.1
1972	1972-07-25 15:00:00	1972-07-25 21:00:00	6	1.8	3.4	0.5
1972	1972-07-26 13:00:00	1972-07-26 14:00:00	1	0.3	0.3	0.0
1972	1972-07-27 18:00:00	1972-07-27 22:00:00	4	0.3	0.9	0.1
1972	1972-08-01 03:00:00	1972-08-01 05:00:00	2	2.3	3.3	0.5
1972	1972-08-02 14:00:00	1972-08-03 14:00:00	0	13.2	34.2	4.7
1972	1972-08-06 22:00:00	1972-08-08 10:00:00	12	25.9	63.6	8.8
1972	1972-08-09 02:00:00	1972-08-10 00:00:00	22	3	8	1.1
1972	1972-08-12 22:00:00	1972-08-13 00:00:00	2	5.8	6.1	0.8
1972	1972-08-14 01:00:00	1972-08-14 06:00:00	5	1.3	4.2	0.6
1972	1972-08-16 16:00:00	1972-08-16 17:00:00	1	0.5	0.5	0.1
1972	1972-08-18 05:00:00	1972-08-18 15:00:00	10	6.9	7.5	1.0
1972	1972-08-22 15:00:00	1972-08-22 18:00:00	3	1.5	1.8	0.2
1972	1972-08-23 08:00:00	1972-08-23 16:00:00	8	2.3	4.7	0.7
1972	1972-08-27 15:00:00	1972-08-28 09:00:00	18	8.1	11.2	1.6
1972	1972-09-03 04:00:00	1972-09-03 12:00:00	8	1.8	6.3	0.9
1972	1972-09-07 18:00:00	1972-09-08 05:00:00	11	1.3	5.2	0.7
1972	1972-09-11 22:00:00	1972-09-11 23:00:00	1	0.5	0.5	0.1
1972	1972-09-13 14:00:00	1972-09-13 21:00:00	7	2	5.2	0.7
1972	1972-09-17 06:00:00	1972-09-17 07:00:00	1	1.5	1.5	0.2
1972	1972-09-18 16:00:00	1972-09-18 17:00:00	1	9.9	9.9	1.4
1972	1972-09-24 08:00:00	1972-09-24 15:00:00	7	0.3	0.9	0.1
1972	1972-09-25 05:00:00	1972-09-25 06:00:00	1	0.5	0.5	0.1
1972	1972-09-26 01:00:00	1972-09-26 10:00:00	9	2	4.4	0.6
1972	1972-09-29 14:00:00	1972-09-30 12:00:00	22	5.3	38.5	5.3
1972	1972-10-02 01:00:00	1972-10-02 11:00:00	10	0.3	1.2	0.2

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1972	1972-10-06 16:00:00	1972-10-07 16:00:00	0	2.3	20.1	2.8
1972	1972-10-08 08:00:00	1972-10-08 13:00:00	5	0.8	1.6	0.2
1972	1972-10-12 01:00:00	1972-10-12 02:00:00	1	0.3	0.3	0.0
1972	1972-10-14 15:00:00	1972-10-14 20:00:00	5	2.5	4.1	0.6
1972	1972-10-16 22:00:00	1972-10-17 00:00:00	2	3	5.8	0.8
1972	1972-10-21 17:00:00	1972-10-25 01:00:00	8	2.5	39.9	5.5
1972	1972-10-28 06:00:00	1972-10-29 07:00:00	1	2.5	13.2	1.8
1973	1973-04-01 12:00:00	1973-04-02 23:00:00	11	3.3	22.2	3.6
1973	1973-04-04 01:00:00	1973-04-04 04:00:00	3	0.5	1.5	0.2
1973	1973-04-04 16:00:00	1973-04-05 01:00:00	9	2	10	1.6
1973	1973-04-16 22:00:00	1973-04-16 23:00:00	1	0.3	0.3	0.0
1973	1973-04-22 14:00:00	1973-04-22 20:00:00	6	0.3	0.6	0.1
1973	1973-04-27 14:00:00	1973-04-29 05:00:00	15	6.4	33.8	5.5
1973	1973-05-01 15:00:00	1973-05-04 19:00:00	4	2.8	19.8	3.2
1973	1973-05-05 12:00:00	1973-05-05 13:00:00	1	0.3	0.3	0.0
1973	1973-05-08 19:00:00	1973-05-09 21:00:00	2	1	5.1	0.8
1973	1973-05-10 20:00:00	1973-05-11 21:00:00	1	1.3	6.5	1.1
1973	1973-05-12 11:00:00	1973-05-12 16:00:00	5	1	2.1	0.3
1973	1973-05-17 01:00:00	1973-05-19 23:00:00	22	5.1	44.1	7.1
1973	1973-05-21 02:00:00	1973-05-21 03:00:00	1	0.3	0.3	0.0
1973	1973-05-28 03:00:00	1973-05-29 10:00:00	7	3.8	21	3.4
1973	1973-05-31 05:00:00	1973-05-31 12:00:00	7	6.1	7.2	1.2
1973	1973-06-04 04:00:00	1973-06-04 07:00:00	3	4.8	8.1	1.3
1973	1973-06-05 11:00:00	1973-06-05 12:00:00	1	0.5	0.5	0.1
1973	1973-06-06 09:00:00	1973-06-06 10:00:00	1	0.3	0.3	0.0
1973	1973-06-07 01:00:00	1973-06-07 07:00:00	6	4.3	9.6	1.6
1973	1973-06-09 04:00:00	1973-06-09 07:00:00	3	0.8	1.4	0.2
1973	1973-06-10 15:00:00	1973-06-10 21:00:00	6	2.3	3.9	0.6
1973	1973-06-11 16:00:00	1973-06-11 18:00:00	2	30	30.3	4.9
1973	1973-06-15 10:00:00	1973-06-16 17:00:00	7	6.4	46	7.4
1973	1973-06-18 07:00:00	1973-06-18 08:00:00	1	0.3	0.3	0.0
1973	1973-06-22 15:00:00	1973-06-23 18:00:00	3	3.6	11.6	1.9
1973	1973-06-24 13:00:00	1973-06-24 16:00:00	3	3.6	4.4	0.7
1973	1973-06-28 10:00:00	1973-06-28 15:00:00	5	0.8	1.9	0.3
1973	1973-06-29 06:00:00	1973-06-29 19:00:00	13	1.3	2.9	0.5
1973	1973-07-01 15:00:00	1973-07-01 17:00:00	2	1.8	2.6	0.4
1973	1973-07-03 14:00:00	1973-07-03 15:00:00	1	2.5	2.5	0.4
1973	1973-07-10 12:00:00	1973-07-11 01:00:00	13	10.2	16.4	2.7
1973	1973-07-20 00:00:00	1973-07-20 06:00:00	6	0.5	0.8	0.1
1973	1973-07-27 02:00:00	1973-07-27 23:00:00	21	3.3	10.7	1.7
1973	1973-07-31 18:00:00	1973-08-02 04:00:00	10	7.6	30.7	5.0
1973	1973-08-06 03:00:00	1973-08-06 19:00:00	16	0.5	1.6	0.3
1973	1973-08-07 18:00:00	1973-08-07 19:00:00	1	0.3	0.3	0.0
1973	1973-08-08 14:00:00	1973-08-08 21:00:00	7	25.9	43.6	7.0
1973	1973-08-09 23:00:00	1973-08-10 00:00:00	1	0.3	0.3	0.0

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1973	1973-08-14 13:00:00	1973-08-14 14:00:00	1	0.8	0.8	0.1
1973	1973-08-18 20:00:00	1973-08-18 22:00:00	2	13.7	20.1	3.2
1973	1973-08-21 17:00:00	1973-08-22 00:00:00	7	5.3	13.6	2.2
1973	1973-08-26 09:00:00	1973-08-26 20:00:00	11	1.3	2.1	0.3
1973	1973-09-03 19:00:00	1973-09-03 21:00:00	2	0.5	0.8	0.1
1973	1973-09-05 14:00:00	1973-09-06 15:00:00	1	19.1	34.2	5.5
1973	1973-09-11 01:00:00	1973-09-11 12:00:00	11	0.5	1.1	0.2
1973	1973-09-15 23:00:00	1973-09-16 00:00:00	1	0.3	0.3	0.0
1973	1973-09-17 21:00:00	1973-09-18 08:00:00	11	3.3	16.7	2.7
1973	1973-09-20 03:00:00	1973-09-20 11:00:00	8	0.8	2.7	0.4
1973	1973-09-22 07:00:00	1973-09-22 17:00:00	10	4.3	17.3	2.8
1973	1973-09-23 12:00:00	1973-09-23 15:00:00	3	0.5	1.1	0.2
1973	1973-09-27 16:00:00	1973-09-27 18:00:00	2	2	2.5	0.4
1973	1973-10-02 08:00:00	1973-10-03 10:00:00	2	6.1	32.3	5.2
1973	1973-10-05 01:00:00	1973-10-05 10:00:00	9	24.1	37.2	6.0
1973	1973-10-13 03:00:00	1973-10-13 04:00:00	1	0.3	0.3	0.0
1973	1973-10-13 18:00:00	1973-10-14 01:00:00	7	2.5	7.7	1.2
1973	1973-10-16 03:00:00	1973-10-16 04:00:00	1	0.5	0.5	0.1
1973	1973-10-19 07:00:00	1973-10-20 08:00:00	1	1	4.1	0.7
1973	1973-10-30 03:00:00	1973-10-30 18:00:00	15	3.8	17.6	2.8
1974	1974-04-02 15:00:00	1974-04-02 20:00:00	5	1.5	4.8	1.4
1974	1974-04-04 00:00:00	1974-04-05 00:00:00	0	3.8	15	4.5
1974	1974-04-07 04:00:00	1974-04-07 05:00:00	1	0.3	0.3	0.1
1974	1974-04-12 21:00:00	1974-04-13 12:00:00	15	1	2.6	0.8
1974	1974-04-14 18:00:00	1974-04-15 04:00:00	10	5.1	8.2	2.5
1974	1974-04-22 01:00:00	1974-04-22 08:00:00	7	6.1	6.9	2.1
1974	1974-04-23 03:00:00	1974-04-24 02:00:00	23	1	5.1	1.5
1974	1974-04-29 07:00:00	1974-04-30 06:00:00	23	3.3	11.1	3.3
1974	1974-04-30 22:00:00	1974-05-01 03:00:00	5	2.5	5.1	1.5
1974	1974-05-03 10:00:00	1974-05-03 23:00:00	13	2.8	11.3	3.4
1974	1974-05-06 04:00:00	1974-05-06 15:00:00	11	1.5	4.1	1.2
1974	1974-05-07 05:00:00	1974-05-07 22:00:00	17	1	3	0.9
1974	1974-05-09 03:00:00	1974-05-10 03:00:00	0	2.5	23.9	7.2
1974	1974-05-12 04:00:00	1974-05-12 23:00:00	19	4.8	22.3	6.7
1974	1974-05-15 11:00:00	1974-05-15 13:00:00	2	1.8	2.3	0.7
1974	1974-05-16 23:00:00	1974-05-17 00:00:00	1	0.3	0.3	0.1
1974	1974-05-22 14:00:00	1974-05-25 16:00:00	2	5.1	28	8.4
1974	1974-05-26 05:00:00	1974-05-27 05:00:00	0	0.5	2.2	0.7
1974	1974-05-28 22:00:00	1974-05-29 08:00:00	10	1	2.4	0.7
1974	1974-05-31 17:00:00	1974-05-31 22:00:00	5	7.9	10.9	3.3
1974	1974-06-02 23:00:00	1974-06-03 00:00:00	1	0.5	0.5	0.2
1974	1974-06-12 11:00:00	1974-06-12 12:00:00	1	0.3	0.3	0.1
1974	1974-06-13 12:00:00	1974-06-13 15:00:00	3	8.1	12.2	3.7
1974	1974-06-14 16:00:00	1974-06-14 17:00:00	1	0.3	0.3	0.1
1974	1974-06-15 12:00:00	1974-06-15 13:00:00	1	1.3	1.3	0.4

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1974	1974-06-16 03:00:00	1974-06-17 08:00:00	5	3.6	18.2	5.5
1974	1974-06-18 16:00:00	1974-06-18 19:00:00	3	0.5	0.8	0.2
1974	1974-06-20 14:00:00	1974-06-20 19:00:00	5	4.1	5.2	1.6
1974	1974-06-21 11:00:00	1974-06-21 16:00:00	5	1.5	3.2	1.0
1974	1974-06-24 14:00:00	1974-06-24 15:00:00	1	0.3	0.3	0.1
1974	1974-06-30 06:00:00	1974-06-30 11:00:00	5	0.5	1.1	0.3
1974	1974-07-01 11:00:00	1974-07-01 12:00:00	1	0.5	0.5	0.2
1974	1974-07-02 02:00:00	1974-07-02 04:00:00	2	1.8	3.1	0.9
1974	1974-07-02 16:00:00	1974-07-02 17:00:00	1	3	3	0.9
1974	1974-07-04 02:00:00	1974-07-04 04:00:00	2	3.8	5.6	1.7
1974	1974-07-04 18:00:00	1974-07-04 20:00:00	2	0.5	0.8	0.2
1974	1974-07-09 16:00:00	1974-07-09 21:00:00	5	4.3	6.7	2.0
1974	1974-07-18 22:00:00	1974-07-19 14:00:00	16	20.6	32.4	9.8
1974	1974-07-23 18:00:00	1974-07-24 13:00:00	19	3	16.1	4.8
1974	1974-07-26 14:00:00	1974-07-26 15:00:00	1	0.3	0.3	0.1
1974	1974-07-27 18:00:00	1974-07-27 19:00:00	1	1.3	1.3	0.4
1974	1974-07-29 11:00:00	1974-07-29 17:00:00	6	0.8	1.1	0.3
1974	1974-07-30 07:00:00	1974-07-30 08:00:00	1	0.3	0.3	0.1
1974	1974-07-31 10:00:00	1974-07-31 21:00:00	11	1.8	4.1	1.2
1974	1974-08-02 07:00:00	1974-08-02 14:00:00	7	3	8.9	2.7
1974	1974-08-03 10:00:00	1974-08-03 13:00:00	3	7.9	11.5	3.5
1974	1974-08-04 07:00:00	1974-08-04 11:00:00	4	0.5	0.8	0.2
1974	1974-08-08 14:00:00	1974-08-08 15:00:00	1	0.8	0.8	0.2
1974	1974-08-12 17:00:00	1974-08-12 19:00:00	2	0.8	1.3	0.4
1974	1974-08-17 09:00:00	1974-08-17 11:00:00	2	0.3	0.6	0.2
1974	1974-08-19 01:00:00	1974-08-19 06:00:00	5	2.3	5.5	1.7
1974	1974-08-23 17:00:00	1974-08-23 19:00:00	2	0.5	0.8	0.2
1974	1974-08-27 03:00:00	1974-08-27 13:00:00	10	0.8	3.3	1.0
1974	1974-08-31 10:00:00	1974-08-31 12:00:00	2	0.5	0.8	0.2
1974	1974-09-02 21:00:00	1974-09-03 13:00:00	16	2	9.3	2.8
1975	1975-06-01 04:00:00	1975-06-01 09:00:00	5	1	2.1	0.5
1975	1975-06-05 16:00:00	1975-06-07 19:00:00	3	9.1	33.8	7.9
1975	1975-06-08 16:00:00	1975-06-08 20:00:00	4	1.5	3.4	0.8
1975	1975-06-12 03:00:00	1975-06-12 14:00:00	11	1.3	5.4	1.3
1975	1975-06-13 02:00:00	1975-06-13 10:00:00	8	0.8	1.1	0.3
1975	1975-06-16 03:00:00	1975-06-16 06:00:00	3	2	2.8	0.7
1975	1975-06-19 18:00:00	1975-06-19 19:00:00	1	0.3	0.3	0.1
1975	1975-07-02 15:00:00	1975-07-03 00:00:00	9	5.6	8.2	1.9
1975	1975-07-08 16:00:00	1975-07-08 18:00:00	2	34.8	35.1	8.2
1975	1975-07-10 22:00:00	1975-07-11 18:00:00	20	2.8	8.8	2.0
1975	1975-07-19 15:00:00	1975-07-19 16:00:00	1	0.3	0.3	0.1
1975	1975-07-20 14:00:00	1975-07-21 09:00:00	19	24.6	41.5	9.7
1975	1975-07-22 22:00:00	1975-07-22 23:00:00	1	0.3	0.3	0.1
1975	1975-07-24 08:00:00	1975-07-24 17:00:00	9	17.3	36.1	8.4
1975	1975-07-27 13:00:00	1975-07-27 20:00:00	7	3	8.1	1.9

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1975	1975-07-28 12:00:00	1975-07-28 14:00:00	2	11.9	12.2	2.8
1975	1975-07-30 01:00:00	1975-07-30 03:00:00	2	0.5	0.8	0.2
1975	1975-08-03 23:00:00	1975-08-04 00:00:00	1	1.3	1.3	0.3
1975	1975-08-04 12:00:00	1975-08-04 14:00:00	2	1.3	2.1	0.5
1975	1975-08-11 07:00:00	1975-08-11 08:00:00	1	0.5	0.5	0.1
1975	1975-08-13 12:00:00	1975-08-13 16:00:00	4	2.8	5.6	1.3
1975	1975-08-21 21:00:00	1975-08-22 06:00:00	9	0.3	0.9	0.2
1975	1975-08-24 16:00:00	1975-08-25 00:00:00	8	4.6	4.9	1.1
1975	1975-08-26 18:00:00	1975-08-26 19:00:00	1	0.3	0.3	0.1
1975	1975-08-29 04:00:00	1975-08-29 23:00:00	19	5.3	15.6	3.6
1975	1975-09-01 08:00:00	1975-09-01 13:00:00	5	0.8	1.1	0.3
1975	1975-09-02 06:00:00	1975-09-02 11:00:00	5	5.3	9.5	2.2
1975	1975-09-06 10:00:00	1975-09-06 17:00:00	7	1.3	2.8	0.7
1975	1975-09-08 02:00:00	1975-09-08 08:00:00	6	1	1.6	0.4
1975	1975-09-11 18:00:00	1975-09-12 05:00:00	11	12.7	32	7.5
1975	1975-09-13 00:00:00	1975-09-13 01:00:00	1	0.3	0.3	0.1
1975	1975-09-13 15:00:00	1975-09-14 01:00:00	10	1.5	3.9	0.9
1975	1975-09-17 01:00:00	1975-09-17 03:00:00	2	0.3	0.6	0.1
1975	1975-09-18 16:00:00	1975-09-19 21:00:00	5	1	11.4	2.7
1975	1975-09-20 11:00:00	1975-09-20 16:00:00	5	8.6	17	4.0
1975	1975-09-21 05:00:00	1975-09-21 20:00:00	15	0.5	1.4	0.3
1975	1975-09-22 20:00:00	1975-09-22 21:00:00	1	0.3	0.3	0.1
1975	1975-09-24 05:00:00	1975-09-24 09:00:00	4	1.3	3.1	0.7
1975	1975-09-25 15:00:00	1975-09-28 02:00:00	11	6.4	44.4	10.3
1975	1975-10-01 14:00:00	1975-10-02 03:00:00	13	3.8	11.3	2.6
1975	1975-10-10 09:00:00	1975-10-10 18:00:00	9	1.3	2.4	0.6
1975	1975-10-11 13:00:00	1975-10-12 07:00:00	18	2.8	13.6	3.2
1975	1975-10-13 11:00:00	1975-10-13 18:00:00	7	3.8	12	2.8
1975	1975-10-14 20:00:00	1975-10-16 02:00:00	6	2.8	10.2	2.4
1975	1975-10-18 00:00:00	1975-10-18 09:00:00	9	1.5	5.6	1.3
1975	1975-10-19 14:00:00	1975-10-20 11:00:00	21	3.3	11.7	2.7
1975	1975-10-25 17:00:00	1975-10-25 19:00:00	2	1.5	1.8	0.4
1976	1976-04-01 00:00:00	1976-04-01 16:00:00	16	3	18.3	3.9
1976	1976-04-02 07:00:00	1976-04-02 09:00:00	2	0.3	0.6	0.1
1976	1976-04-15 09:00:00	1976-04-15 10:00:00	1	0.3	0.3	0.1
1976	1976-04-21 19:00:00	1976-04-22 13:00:00	18	3.6	16.2	3.5
1976	1976-04-23 01:00:00	1976-04-23 06:00:00	5	2.8	7.1	1.5
1976	1976-04-26 10:00:00	1976-04-27 18:00:00	8	1	6.1	1.3
1976	1976-05-01 20:00:00	1976-05-02 03:00:00	7	3	9.4	2.0
1976	1976-05-03 14:00:00	1976-05-03 16:00:00	2	0.5	0.8	0.2
1976	1976-05-06 01:00:00	1976-05-06 06:00:00	5	1.3	3.9	0.8
1976	1976-05-07 02:00:00	1976-05-07 23:00:00	21	2.8	7.8	1.7
1976	1976-05-11 02:00:00	1976-05-12 08:00:00	6	3.3	11.1	2.4
1976	1976-05-14 11:00:00	1976-05-14 12:00:00	1	0.3	0.3	0.1
1976	1976-05-16 19:00:00	1976-05-16 21:00:00	2	0.5	0.8	0.2

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1976	1976-05-17 18:00:00	1976-05-20 08:00:00	14	4.3	49.5	10.6
1976	1976-05-21 09:00:00	1976-05-22 09:00:00	0	0.8	2.6	0.6
1976	1976-05-26 15:00:00	1976-05-26 16:00:00	1	0.3	0.3	0.1
1976	1976-05-31 15:00:00	1976-05-31 19:00:00	4	2.5	5.6	1.2
1976	1976-06-07 14:00:00	1976-06-07 15:00:00	1	0.3	0.3	0.1
1976	1976-06-08 16:00:00	1976-06-08 18:00:00	2	13.7	14.2	3.1
1976	1976-06-11 05:00:00	1976-06-11 18:00:00	13	6.1	13.9	3.0
1976	1976-06-13 14:00:00	1976-06-13 16:00:00	2	1	1.8	0.4
1976	1976-06-14 18:00:00	1976-06-14 21:00:00	3	3.3	5.6	1.2
1976	1976-06-16 13:00:00	1976-06-16 15:00:00	2	13	13.8	3.0
1976	1976-06-19 15:00:00	1976-06-20 10:00:00	19	3.3	6	1.3
1976	1976-06-22 03:00:00	1976-06-22 12:00:00	9	1	2.1	0.5
1976	1976-06-24 15:00:00	1976-06-25 06:00:00	15	1.3	7.6	1.6
1976	1976-06-26 14:00:00	1976-06-27 02:00:00	12	2.5	4.9	1.1
1976	1976-06-28 04:00:00	1976-06-28 05:00:00	1	2.5	2.5	0.5
1976	1976-06-29 08:00:00	1976-06-29 09:00:00	1	0.3	0.3	0.1
1976	1976-06-30 16:00:00	1976-06-30 20:00:00	4	1.8	2.4	0.5
1976	1976-07-01 23:00:00	1976-07-02 00:00:00	1	0.5	0.5	0.1
1976	1976-07-03 03:00:00	1976-07-03 04:00:00	1	0.3	0.3	0.1
1976	1976-07-11 14:00:00	1976-07-12 00:00:00	10	3.6	4.5	1.0
1976	1976-07-12 18:00:00	1976-07-14 05:00:00	11	3.3	11.2	2.4
1976	1976-07-16 09:00:00	1976-07-16 22:00:00	13	5.8	9.9	2.1
1976	1976-07-17 11:00:00	1976-07-17 13:00:00	2	0.5	0.8	0.2
1976	1976-07-20 13:00:00	1976-07-20 22:00:00	9	0.5	0.8	0.2
1976	1976-07-29 14:00:00	1976-07-29 16:00:00	2	0.3	0.6	0.1
1976	1976-07-31 13:00:00	1976-07-31 20:00:00	7	1	1.3	0.3
1976	1976-08-05 17:00:00	1976-08-06 01:00:00	8	4.6	11.5	2.5
1976	1976-08-08 01:00:00	1976-08-08 19:00:00	18	3	11.2	2.4
1976	1976-08-12 13:00:00	1976-08-12 20:00:00	7	3.6	8.2	1.8
1976	1976-08-13 08:00:00	1976-08-13 19:00:00	11	3	10.5	2.3
1976	1976-08-15 10:00:00	1976-08-15 18:00:00	8	2.8	3.1	0.7
1976	1976-08-28 04:00:00	1976-08-28 23:00:00	19	14	29.2	6.3
1976	1976-08-31 21:00:00	1976-09-01 19:00:00	22	2.8	17.7	3.8
1976	1976-09-04 06:00:00	1976-09-04 10:00:00	4	1	1.3	0.3
1976	1976-09-05 16:00:00	1976-09-05 17:00:00	1	0.3	0.3	0.1
1976	1976-09-10 06:00:00	1976-09-10 09:00:00	3	4.8	8.6	1.8
1976	1976-09-11 10:00:00	1976-09-11 11:00:00	1	0.3	0.3	0.1
1976	1976-09-18 01:00:00	1976-09-18 16:00:00	15	6.9	24.2	5.2
1976	1976-09-20 00:00:00	1976-09-20 19:00:00	19	4.8	33.3	7.2
1976	1976-09-22 05:00:00	1976-09-22 14:00:00	9	0.3	1.5	0.3
1976	1976-09-23 08:00:00	1976-09-23 14:00:00	6	1.5	4.1	0.9
1976	1976-09-26 14:00:00	1976-09-26 23:00:00	9	2.8	10.3	2.2
1976	1976-09-28 00:00:00	1976-09-28 04:00:00	4	0.3	0.6	0.1
1976	1976-10-07 00:00:00	1976-10-07 09:00:00	9	1.5	4.1	0.9
1976	1976-10-09 03:00:00	1976-10-09 19:00:00	16	3.8	22.9	4.9

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1976	1976-10-12 22:00:00	1976-10-12 23:00:00	1	0.5	0.5	0.1
1976	1976-10-14 04:00:00	1976-10-14 05:00:00	1	0.3	0.3	0.1
1976	1976-10-20 22:00:00	1976-10-21 19:00:00	21	0.8	2.7	0.6
1976	1976-10-30 23:00:00	1976-10-31 13:00:00	14	2	12.6	2.7
1977	1977-04-02 07:00:00	1977-04-03 01:00:00	18	5.3	13.5	2.5
1977	1977-04-05 03:00:00	1977-04-05 12:00:00	9	1.3	5.2	1.0
1977	1977-04-13 13:00:00	1977-04-13 20:00:00	7	2.3	5.7	1.1
1977	1977-04-21 23:00:00	1977-04-22 20:00:00	21	2.8	9.2	1.7
1977	1977-04-24 13:00:00	1977-04-25 16:00:00	3	3.8	24.6	4.6
1977	1977-04-28 01:00:00	1977-04-28 03:00:00	2	0.3	0.6	0.1
1977	1977-05-01 23:00:00	1977-05-02 07:00:00	8	2.8	10.5	2.0
1977	1977-05-05 20:00:00	1977-05-05 22:00:00	2	0.8	1.1	0.2
1977	1977-05-08 14:00:00	1977-05-08 18:00:00	4	0.8	1.9	0.4
1977	1977-05-23 16:00:00	1977-05-23 17:00:00	1	19.1	19.1	3.6
1977	1977-05-28 05:00:00	1977-05-28 18:00:00	13	5.6	19.9	3.7
1977	1977-06-01 05:00:00	1977-06-01 19:00:00	14	1.3	1.9	0.4
1977	1977-06-02 08:00:00	1977-06-02 19:00:00	11	4.6	12.6	2.4
1977	1977-06-07 05:00:00	1977-06-08 09:00:00	4	0.8	3.4	0.6
1977	1977-06-17 03:00:00	1977-06-17 09:00:00	6	7.6	10	1.9
1977	1977-06-18 13:00:00	1977-06-18 21:00:00	8	4.3	12.8	2.4
1977	1977-06-19 12:00:00	1977-06-19 15:00:00	3	0.8	1.1	0.2
1977	1977-06-20 20:00:00	1977-06-20 23:00:00	3	2.8	4.8	0.9
1977	1977-06-25 11:00:00	1977-06-25 15:00:00	4	4.3	6.9	1.3
1977	1977-06-26 03:00:00	1977-06-26 04:00:00	1	0.3	0.3	0.1
1977	1977-06-28 23:00:00	1977-06-29 22:00:00	23	1.8	9.4	1.8
1977	1977-07-01 01:00:00	1977-07-02 05:00:00	4	2	7.5	1.4
1977	1977-07-03 23:00:00	1977-07-04 04:00:00	5	1	1.6	0.3
1977	1977-07-05 05:00:00	1977-07-05 11:00:00	6	1	1.5	0.3
1977	1977-07-13 10:00:00	1977-07-13 12:00:00	2	8.6	9.4	1.8
1977	1977-07-15 14:00:00	1977-07-15 17:00:00	3	13.2	20.4	3.8
1977	1977-07-17 14:00:00	1977-07-17 18:00:00	4	21.3	32	6.0
1977	1977-07-25 04:00:00	1977-07-25 10:00:00	6	0.8	2.4	0.5
1977	1977-07-29 15:00:00	1977-07-30 07:00:00	16	5.3	14.6	2.7
1977	1977-07-31 20:00:00	1977-07-31 21:00:00	1	4.1	4.1	0.8
1977	1977-08-03 12:00:00	1977-08-03 13:00:00	1	0.8	0.8	0.2
1977	1977-08-05 05:00:00	1977-08-06 03:00:00	22	13.3	26.5	5.0
1977	1977-08-08 01:00:00	1977-08-08 02:00:00	1	0.2	0.2	0.0
1977	1977-08-08 18:00:00	1977-08-08 19:00:00	1	0.8	0.8	0.2
1977	1977-08-11 20:00:00	1977-08-11 21:00:00	1	0.4	0.4	0.1
1977	1977-08-24 04:00:00	1977-08-24 07:00:00	3	1.3	2.6	0.5
1977	1977-08-29 15:00:00	1977-08-29 16:00:00	1	2.8	2.8	0.5
1977	1977-08-31 12:00:00	1977-08-31 13:00:00	1	0.2	0.2	0.0
1977	1977-09-01 16:00:00	1977-09-01 23:00:00	7	18.9	39.6	7.4
1977	1977-09-05 02:00:00	1977-09-05 03:00:00	1	0.2	0.2	0.0
1977	1977-09-10 00:00:00	1977-09-10 05:00:00	5	0.6	1.2	0.2

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1977	1977-09-10 18:00:00	1977-09-10 19:00:00	1	0.7	0.7	0.1
1977	1977-09-12 18:00:00	1977-09-13 09:00:00	15	5.5	18.8	3.5
1977	1977-09-13 22:00:00	1977-09-14 10:00:00	12	6.2	12.9	2.4
1977	1977-09-16 06:00:00	1977-09-16 18:00:00	12	1.8	4.4	0.8
1977	1977-09-17 13:00:00	1977-09-18 03:00:00	14	6	7.3	1.4
1977	1977-09-20 06:00:00	1977-09-21 19:00:00	13	1.8	13.4	2.5
1977	1977-09-25 06:00:00	1977-09-27 10:00:00	4	7.2	30.4	5.7
1977	1977-09-28 11:00:00	1977-09-28 14:00:00	3	2	2.8	0.5
1977	1977-09-30 02:00:00	1977-09-30 18:00:00	16	2.5	10.7	2.0
1977	1977-10-01 09:00:00	1977-10-03 12:00:00	3	3.4	44.3	8.3
1977	1977-10-06 01:00:00	1977-10-06 02:00:00	1	0.2	0.2	0.0
1977	1977-10-08 13:00:00	1977-10-09 15:00:00	2	4	24.6	4.6
1977	1977-10-11 22:00:00	1977-10-11 23:00:00	1	0.6	0.6	0.1
1977	1977-10-12 16:00:00	1977-10-12 17:00:00	1	0.4	0.4	0.1
1977	1977-10-16 09:00:00	1977-10-17 16:00:00	7	1.7	10.7	2.0
1977	1977-10-22 03:00:00	1977-10-22 11:00:00	8	2.6	6.6	1.2
1978	1978-04-01 10:00:00	1978-04-01 22:00:00	12	2.6	2.8	0.5
1978	1978-04-04 23:00:00	1978-04-05 04:00:00	5	0.2	0.6	0.1
1978	1978-04-07 18:00:00	1978-04-07 21:00:00	3	0.5	1	0.2
1978	1978-04-10 16:00:00	1978-04-11 19:00:00	3	5.9	40.6	7.9
1978	1978-04-12 23:00:00	1978-04-13 00:00:00	1	0.2	0.2	0.0
1978	1978-04-19 12:00:00	1978-04-21 14:00:00	2	2.6	25.9	5.1
1978	1978-05-08 00:00:00	1978-05-08 01:00:00	1	3.8	3.8	0.7
1978	1978-05-08 22:00:00	1978-05-10 05:00:00	7	2.9	10.2	2.0
1978	1978-05-12 00:00:00	1978-05-12 01:00:00	1	0.2	0.2	0.0
1978	1978-05-12 16:00:00	1978-05-13 07:00:00	15	1.1	3.4	0.7
1978	1978-05-13 21:00:00	1978-05-13 23:00:00	2	0.3	0.6	0.1
1978	1978-05-15 01:00:00	1978-05-16 01:00:00	0	1.9	9.4	1.8
1978	1978-05-17 00:00:00	1978-05-17 03:00:00	3	0.4	0.6	0.1
1978	1978-05-17 15:00:00	1978-05-17 21:00:00	6	9.1	15.6	3.1
1978	1978-05-20 17:00:00	1978-05-21 04:00:00	11	4.6	12.8	2.5
1978	1978-05-31 13:00:00	1978-05-31 16:00:00	3	13.3	16.5	3.2
1978	1978-06-02 06:00:00	1978-06-02 15:00:00	9	1.8	2.3	0.5
1978	1978-06-05 01:00:00	1978-06-05 14:00:00	13	3	9.4	1.8
1978	1978-06-07 19:00:00	1978-06-08 09:00:00	14	0.8	3.4	0.7
1978	1978-06-09 15:00:00	1978-06-09 16:00:00	1	3	3	0.6
1978	1978-06-12 20:00:00	1978-06-13 21:00:00	1	5.6	24.5	4.8
1978	1978-06-14 20:00:00	1978-06-15 01:00:00	5	3.7	6.6	1.3
1978	1978-06-18 01:00:00	1978-06-18 03:00:00	2	1.8	2.1	0.4
1978	1978-06-18 16:00:00	1978-06-19 18:00:00	2	36	39.5	7.7
1978	1978-06-23 04:00:00	1978-06-23 05:00:00	1	0.4	0.4	0.1
1978	1978-06-26 12:00:00	1978-06-27 17:00:00	5	3.4	6.6	1.3
1978	1978-07-08 01:00:00	1978-07-08 12:00:00	11	18.1	19	3.7
1978	1978-07-10 07:00:00	1978-07-10 09:00:00	2	0.9	1.2	0.2
1978	1978-07-13 17:00:00	1978-07-13 23:00:00	6	3.7	6.7	1.3

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1978	1978-07-19 04:00:00	1978-07-19 08:00:00	4	0.3	0.8	0.2
1978	1978-07-19 21:00:00	1978-07-20 08:00:00	11	3.2	3.4	0.7
1978	1978-07-21 13:00:00	1978-07-21 15:00:00	2	0.5	0.8	0.2
1978	1978-07-22 17:00:00	1978-07-23 03:00:00	10	2.4	4	0.8
1978	1978-07-27 00:00:00	1978-07-27 17:00:00	17	3.5	6.2	1.2
1978	1978-07-29 11:00:00	1978-07-29 19:00:00	8	4.9	12.6	2.5
1978	1978-07-31 20:00:00	1978-07-31 22:00:00	2	0.2	0.4	0.1
1978	1978-08-03 03:00:00	1978-08-03 19:00:00	16	11.2	21.4	4.2
1978	1978-08-08 07:00:00	1978-08-08 14:00:00	7	12.6	15.6	3.1
1978	1978-08-09 04:00:00	1978-08-09 06:00:00	2	4.8	5	1.0
1978	1978-08-12 19:00:00	1978-08-12 21:00:00	2	0.8	1	0.2
1978	1978-08-16 12:00:00	1978-08-16 20:00:00	8	10.6	18.6	3.6
1978	1978-08-19 07:00:00	1978-08-19 21:00:00	14	12.3	17.6	3.4
1978	1978-08-23 21:00:00	1978-08-24 09:00:00	12	4.1	24	4.7
1978	1978-08-28 05:00:00	1978-08-28 15:00:00	10	3.6	12.8	2.5
1978	1978-09-03 06:00:00	1978-09-03 10:00:00	4	4.8	6	1.2
1978	1978-09-06 04:00:00	1978-09-06 21:00:00	17	4.6	5.2	1.0
1978	1978-09-11 05:00:00	1978-09-12 04:00:00	23	3.1	10.3	2.0
1978	1978-09-15 00:00:00	1978-09-15 02:00:00	2	1	1.8	0.4
1978	1978-09-15 23:00:00	1978-09-16 00:00:00	1	0.4	0.4	0.1
1978	1978-09-18 16:00:00	1978-09-18 22:00:00	6	0.6	1.4	0.3
1978	1978-09-20 13:00:00	1978-09-21 17:00:00	4	3.7	8	1.6
1978	1978-09-27 23:00:00	1978-09-28 01:00:00	2	2.7	3.8	0.7
1978	1978-10-01 01:00:00	1978-10-01 09:00:00	8	3.4	11.6	2.3
1978	1978-10-04 07:00:00	1978-10-04 19:00:00	12	2.5	3.9	0.8
1978	1978-10-06 02:00:00	1978-10-06 08:00:00	6	1	2	0.4
1978	1978-10-07 05:00:00	1978-10-08 02:00:00	21	1.3	1.9	0.4
1978	1978-10-12 14:00:00	1978-10-13 05:00:00	15	3.4	7.6	1.5
1978	1978-10-14 06:00:00	1978-10-14 20:00:00	14	3.1	15.4	3.0
1978	1978-10-18 18:00:00	1978-10-18 21:00:00	3	1.1	2.2	0.4
1978	1978-10-23 04:00:00	1978-10-23 06:00:00	2	1.7	2	0.4
1978	1978-10-25 18:00:00	1978-10-26 23:00:00	5	2.6	13.8	2.7
1978	1978-10-27 18:00:00	1978-10-28 03:00:00	9	0.3	0.7	0.1
1979	1979-04-02 04:00:00	1979-04-02 21:00:00	17	3.7	26.6	4.0
1979	1979-04-14 03:00:00	1979-04-14 16:00:00	13	5.4	14.2	2.1
1979	1979-04-15 23:00:00	1979-04-16 08:00:00	9	1.4	5.8	0.9
1979	1979-04-26 15:00:00	1979-04-27 21:00:00	6	3.3	29	4.3
1979	1979-04-28 14:00:00	1979-04-28 15:00:00	1	0.2	0.2	0.0
1979	1979-04-30 22:00:00	1979-04-30 23:00:00	1	1	1	0.1
1979	1979-05-01 13:00:00	1979-05-01 14:00:00	1	0.8	0.8	0.1
1979	1979-05-03 12:00:00	1979-05-03 23:00:00	11	5.8	14.6	2.2
1979	1979-05-05 01:00:00	1979-05-05 02:00:00	1	0.2	0.2	0.0
1979	1979-05-12 08:00:00	1979-05-13 07:00:00	23	8.3	18.4	2.7
1979	1979-05-15 15:00:00	1979-05-15 16:00:00	1	2	2	0.3
1979	1979-05-19 15:00:00	1979-05-19 17:00:00	2	2.5	3	0.4

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1979	1979-05-20 21:00:00	1979-05-21 22:00:00	1	8.9	29.4	4.4
1979	1979-05-25 09:00:00	1979-05-25 20:00:00	11	3.4	12.4	1.9
1979	1979-05-26 12:00:00	1979-05-26 20:00:00	8	3.8	6.4	1.0
1979	1979-05-27 17:00:00	1979-05-28 06:00:00	13	0.6	2.8	0.4
1979	1979-05-30 03:00:00	1979-05-30 17:00:00	14	5.1	12.4	1.9
1979	1979-06-05 12:00:00	1979-06-05 14:00:00	2	1.2	1.4	0.2
1979	1979-06-08 05:00:00	1979-06-08 14:00:00	9	0.7	2.4	0.4
1979	1979-06-11 01:00:00	1979-06-12 15:00:00	14	5.5	19.9	3.0
1979	1979-06-16 12:00:00	1979-06-17 01:00:00	13	34.9	44.1	6.6
1979	1979-06-18 00:00:00	1979-06-18 01:00:00	1	1	1	0.1
1979	1979-06-22 03:00:00	1979-06-22 07:00:00	4	1.4	2.6	0.4
1979	1979-06-22 21:00:00	1979-06-23 07:00:00	10	13.9	39.5	5.9
1979	1979-06-30 01:00:00	1979-07-02 18:00:00	17	20.6	54.7	8.2
1979	1979-07-11 01:00:00	1979-07-11 02:00:00	1	0.6	0.6	0.1
1979	1979-07-25 11:00:00	1979-07-25 12:00:00	1	0.8	0.8	0.1
1979	1979-07-26 03:00:00	1979-07-26 15:00:00	12	2.4	7.8	1.2
1979	1979-07-31 20:00:00	1979-08-01 00:00:00	4	21.2	24.8	3.7
1979	1979-08-02 08:00:00	1979-08-02 15:00:00	7	14.8	34.4	5.1
1979	1979-08-04 16:00:00	1979-08-04 17:00:00	1	1.4	1.4	0.2
1979	1979-08-05 08:00:00	1979-08-05 20:00:00	12	6	9.6	1.4
1979	1979-08-07 01:00:00	1979-08-07 02:00:00	1	0.2	0.2	0.0
1979	1979-08-10 03:00:00	1979-08-10 21:00:00	18	4	15	2.2
1979	1979-08-13 21:00:00	1979-08-13 23:00:00	2	0.7	1	0.1
1979	1979-08-14 12:00:00	1979-08-14 13:00:00	1	1.6	1.6	0.2
1979	1979-08-17 22:00:00	1979-08-19 02:00:00	4	1.5	5	0.7
1979	1979-08-23 13:00:00	1979-08-23 16:00:00	3	10.8	15.8	2.4
1979	1979-08-24 04:00:00	1979-08-24 08:00:00	4	3.4	8.6	1.3
1979	1979-08-25 03:00:00	1979-08-25 04:00:00	1	0.4	0.4	0.1
1979	1979-08-27 03:00:00	1979-08-27 09:00:00	6	1.2	2.8	0.4
1979	1979-08-29 02:00:00	1979-08-29 08:00:00	6	21.5	28.3	4.2
1979	1979-08-30 14:00:00	1979-08-30 15:00:00	1	0.6	0.6	0.1
1979	1979-09-02 17:00:00	1979-09-03 00:00:00	7	0.7	1	0.1
1979	1979-09-06 05:00:00	1979-09-06 20:00:00	15	9.9	10.6	1.6
1979	1979-09-10 12:00:00	1979-09-10 17:00:00	5	1.5	4.2	0.6
1979	1979-09-14 03:00:00	1979-09-14 16:00:00	13	9.5	63	9.4
1979	1979-09-18 16:00:00	1979-09-18 18:00:00	2	5.9	7	1.0
1979	1979-09-20 15:00:00	1979-09-20 16:00:00	1	0.4	0.4	0.1
1979	1979-09-21 13:00:00	1979-09-21 14:00:00	1	0.6	0.6	0.1
1979	1979-10-03 16:00:00	1979-10-03 18:00:00	2	1.7	2	0.3
1979	1979-10-04 15:00:00	1979-10-04 16:00:00	1	0.2	0.2	0.0
1979	1979-10-05 07:00:00	1979-10-06 06:00:00	23	3.8	18	2.7
1979	1979-10-06 21:00:00	1979-10-07 22:00:00	1	3.4	9.2	1.4
1979	1979-10-12 07:00:00	1979-10-13 15:00:00	8	3.6	21.2	3.2
1979	1979-10-15 09:00:00	1979-10-15 18:00:00	9	0.3	0.5	0.1
1979	1979-10-17 13:00:00	1979-10-17 14:00:00	1	0.2	0.2	0.0

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1979	1979-10-19 22:00:00	1979-10-20 02:00:00	4	1	1.4	0.2
1979	1979-10-20 19:00:00	1979-10-21 04:00:00	9	9.5	22	3.3
1979	1979-10-23 20:00:00	1979-10-24 02:00:00	6	0.5	1.4	0.2
1979	1979-10-24 17:00:00	1979-10-24 21:00:00	4	0.2	0.4	0.1
1979	1979-10-28 10:00:00	1979-10-28 21:00:00	11	0.5	3.2	0.5
1980	1980-04-04 07:00:00	1980-04-05 00:00:00	17	1.7	6.6	1.2
1980	1980-04-08 04:00:00	1980-04-08 07:00:00	3	0.2	0.4	0.1
1980	1980-04-09 00:00:00	1980-04-10 01:00:00	1	5.2	32.4	6.0
1980	1980-04-10 23:00:00	1980-04-11 00:00:00	1	0.8	0.8	0.1
1980	1980-04-12 08:00:00	1980-04-13 00:00:00	16	3.2	12.6	2.3
1980	1980-04-14 15:00:00	1980-04-15 01:00:00	10	3.9	13.4	2.5
1980	1980-04-16 08:00:00	1980-04-16 09:00:00	1	0.2	0.2	0.0
1980	1980-04-25 01:00:00	1980-04-25 19:00:00	18	3.6	16.2	3.0
1980	1980-04-28 04:00:00	1980-04-28 05:00:00	1	0.2	0.2	0.0
1980	1980-04-28 18:00:00	1980-04-29 23:00:00	5	1.4	10.8	2.0
1980	1980-05-07 11:00:00	1980-05-07 16:00:00	5	1.1	3.2	0.6
1980	1980-05-09 05:00:00	1980-05-09 07:00:00	2	0.3	0.6	0.1
1980	1980-05-11 09:00:00	1980-05-11 12:00:00	3	0.8	1.4	0.3
1980	1980-05-14 02:00:00	1980-05-14 04:00:00	2	1.5	2	0.4
1980	1980-05-15 09:00:00	1980-05-15 10:00:00	1	0.2	0.2	0.0
1980	1980-05-18 03:00:00	1980-05-18 21:00:00	18	4.2	24.5	4.5
1980	1980-05-30 12:00:00	1980-05-31 01:00:00	13	6.2	12.8	2.4
1980	1980-05-31 18:00:00	1980-05-31 21:00:00	3	0.3	0.6	0.1
1980	1980-06-03 19:00:00	1980-06-03 20:00:00	1	0.4	0.4	0.1
1980	1980-06-08 01:00:00	1980-06-08 02:00:00	1	0.2	0.2	0.0
1980	1980-06-18 11:00:00	1980-06-18 18:00:00	7	1.3	3	0.6
1980	1980-06-20 04:00:00	1980-06-20 14:00:00	10	6.9	13.4	2.5
1980	1980-06-23 20:00:00	1980-06-23 21:00:00	1	2.2	2.2	0.4
1980	1980-06-26 06:00:00	1980-06-26 21:00:00	15	4	8.4	1.6
1980	1980-06-29 21:00:00	1980-06-30 09:00:00	12	13.3	22	4.1
1980	1980-07-02 02:00:00	1980-07-02 08:00:00	6	1.8	3.2	0.6
1980	1980-07-08 04:00:00	1980-07-08 19:00:00	15	7.5	20.2	3.7
1980	1980-07-11 00:00:00	1980-07-11 13:00:00	13	2.8	4	0.7
1980	1980-07-15 04:00:00	1980-07-15 18:00:00	14	5.4	8.4	1.6
1980	1980-07-17 00:00:00	1980-07-17 16:00:00	16	1.6	4.8	0.9
1980	1980-07-19 09:00:00	1980-07-19 10:00:00	1	0.2	0.2	0.0
1980	1980-07-20 12:00:00	1980-07-21 09:00:00	21	6.1	21.6	4.0
1980	1980-07-21 21:00:00	1980-07-21 22:00:00	1	0.2	0.2	0.0
1980	1980-07-22 13:00:00	1980-07-22 19:00:00	6	0.8	1.8	0.3
1980	1980-07-23 10:00:00	1980-07-23 18:00:00	8	0.6	1	0.2
1980	1980-07-25 20:00:00	1980-07-25 22:00:00	2	2.4	3	0.6
1980	1980-07-26 23:00:00	1980-07-27 05:00:00	6	1.1	2.8	0.5
1980	1980-07-28 01:00:00	1980-07-28 05:00:00	4	1.2	2.2	0.4
1980	1980-07-28 21:00:00	1980-07-29 19:00:00	22	5.4	22.9	4.2
1980	1980-08-01 12:00:00	1980-08-01 13:00:00	1	0.2	0.2	0.0

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1980	1980-08-03 03:00:00	1980-08-03 20:00:00	17	3.5	6.8	1.3
1980	1980-08-06 08:00:00	1980-08-06 09:00:00	1	0.6	0.6	0.1
1980	1980-08-08 14:00:00	1980-08-08 15:00:00	1	1.4	1.4	0.3
1980	1980-08-12 02:00:00	1980-08-12 06:00:00	4	3.3	7.8	1.4
1980	1980-08-14 11:00:00	1980-08-14 21:00:00	10	4.1	6	1.1
1980	1980-08-16 01:00:00	1980-08-16 02:00:00	1	1	1	0.2
1980	1980-08-19 16:00:00	1980-08-19 17:00:00	1	0.2	0.2	0.0
1980	1980-08-26 11:00:00	1980-08-26 14:00:00	3	0.3	0.8	0.1
1980	1980-08-27 06:00:00	1980-08-27 08:00:00	2	0.6	1	0.2
1980	1980-08-27 20:00:00	1980-08-28 00:00:00	4	9.3	11.8	2.2
1980	1980-08-30 13:00:00	1980-08-30 15:00:00	2	15	18.4	3.4
1980	1980-08-31 09:00:00	1980-09-01 22:00:00	13	12.7	43.6	8.1
1980	1980-09-02 14:00:00	1980-09-02 18:00:00	4	6.8	8	1.5
1980	1980-09-09 15:00:00	1980-09-09 18:00:00	3	3.4	7.2	1.3
1980	1980-09-13 17:00:00	1980-09-14 10:00:00	17	3.5	17.6	3.3
1980	1980-09-17 13:00:00	1980-09-17 15:00:00	2	2.9	3.2	0.6
1980	1980-09-20 13:00:00	1980-09-20 15:00:00	2	0.5	1	0.2
1980	1980-09-21 18:00:00	1980-09-21 20:00:00	2	6.6	6.8	1.3
1980	1980-09-22 20:00:00	1980-09-23 04:00:00	8	8.6	16.8	3.1
1980	1980-09-25 13:00:00	1980-09-26 13:00:00	0	4.3	13.6	2.5
1980	1980-09-27 16:00:00	1980-09-27 22:00:00	6	0.3	0.6	0.1
1980	1980-10-02 06:00:00	1980-10-02 11:00:00	5	1.8	5	0.9
1980	1980-10-03 22:00:00	1980-10-04 20:00:00	22	7	17.2	3.2
1980	1980-10-05 16:00:00	1980-10-05 17:00:00	1	0.2	0.2	0.0
1980	1980-10-12 08:00:00	1980-10-12 09:00:00	1	0.3	0.3	0.1
1980	1980-10-17 21:00:00	1980-10-18 05:00:00	8	2.5	9.2	1.7
1980	1980-10-21 06:00:00	1980-10-21 19:00:00	13	0.5	0.9	0.2
1980	1980-10-25 12:00:00	1980-10-26 20:00:00	8	8.9	48.6	9.0
1981	1981-04-01 14:00:00	1981-04-01 18:00:00	4	2.9	6	0.7
1981	1981-04-04 01:00:00	1981-04-05 04:00:00	3	3.6	13.2	1.6
1981	1981-04-08 21:00:00	1981-04-09 13:00:00	16	2.5	5.2	0.6
1981	1981-04-10 23:00:00	1981-04-11 07:00:00	8	1.2	1.4	0.2
1981	1981-04-14 08:00:00	1981-04-14 12:00:00	4	2.2	6	0.7
1981	1981-04-17 09:00:00	1981-04-18 05:00:00	20	2.1	6.2	0.8
1981	1981-04-23 11:00:00	1981-04-25 07:00:00	20	4.8	12.6	1.5
1981	1981-04-29 01:00:00	1981-04-29 08:00:00	7	1.9	7.6	0.9
1981	1981-05-06 02:00:00	1981-05-06 06:00:00	4	0.5	1.2	0.1
1981	1981-05-10 21:00:00	1981-05-13 03:00:00	6	4.4	45.4	5.6
1981	1981-05-15 15:00:00	1981-05-16 18:00:00	3	7.1	24	2.9
1981	1981-05-25 06:00:00	1981-05-25 15:00:00	9	1.3	2.8	0.3
1981	1981-05-26 12:00:00	1981-05-28 14:00:00	2	6.2	50.8	6.2
1981	1981-05-29 08:00:00	1981-05-29 11:00:00	3	0.8	1	0.1
1981	1981-05-30 06:00:00	1981-05-30 12:00:00	6	2.8	8.4	1.0
1981	1981-06-03 15:00:00	1981-06-04 07:00:00	16	5.8	8.4	1.0
1981	1981-06-06 02:00:00	1981-06-06 07:00:00	5	4.9	12.2	1.5

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1981	1981-06-06 20:00:00	1981-06-07 01:00:00	5	2.4	3.2	0.4
1981	1981-06-08 21:00:00	1981-06-09 04:00:00	7	3.9	8	1.0
1981	1981-06-12 13:00:00	1981-06-12 20:00:00	7	3.7	10.2	1.2
1981	1981-06-14 19:00:00	1981-06-14 21:00:00	2	1.9	2.2	0.3
1981	1981-06-15 10:00:00	1981-06-16 04:00:00	18	26.8	32.3	3.9
1981	1981-06-16 18:00:00	1981-06-17 12:00:00	18	9.6	19.4	2.4
1981	1981-06-19 12:00:00	1981-06-19 18:00:00	6	0.4	0.6	0.1
1981	1981-06-22 03:00:00	1981-06-22 16:00:00	13	17.3	49.8	6.1
1981	1981-06-24 17:00:00	1981-06-24 18:00:00	1	0.2	0.2	0.0
1981	1981-06-25 14:00:00	1981-06-26 11:00:00	21	0.5	1.5	0.2
1981	1981-06-30 12:00:00	1981-06-30 14:00:00	2	5.5	6.8	0.8
1981	1981-07-01 05:00:00	1981-07-01 09:00:00	4	1.2	2.6	0.3
1981	1981-07-02 19:00:00	1981-07-02 21:00:00	2	2.7	4.8	0.6
1981	1981-07-04 11:00:00	1981-07-04 15:00:00	4	3.1	7.1	0.9
1981	1981-07-09 15:00:00	1981-07-09 17:00:00	2	4.2	5.2	0.6
1981	1981-07-13 18:00:00	1981-07-13 20:00:00	2	11	11.2	1.4
1981	1981-07-18 00:00:00	1981-07-18 07:00:00	7	4.3	13.4	1.6
1981	1981-07-19 08:00:00	1981-07-19 09:00:00	1	0.2	0.2	0.0
1981	1981-07-20 13:00:00	1981-07-21 05:00:00	16	0.8	4.4	0.5
1981	1981-07-26 18:00:00	1981-07-26 22:00:00	4	1.1	2	0.2
1981	1981-07-28 14:00:00	1981-07-28 23:00:00	9	2.5	7	0.9
1981	1981-08-02 18:00:00	1981-08-02 20:00:00	2	0.5	0.8	0.1
1981	1981-08-04 16:00:00	1981-08-05 16:00:00	0	35.3	115.9	14.2
1981	1981-08-08 09:00:00	1981-08-08 10:00:00	1	0.2	0.2	0.0
1981	1981-08-09 00:00:00	1981-08-09 17:00:00	17	3.8	7.8	1.0
1981	1981-08-10 20:00:00	1981-08-11 12:00:00	16	2.2	7.2	0.9
1981	1981-08-15 03:00:00	1981-08-16 23:00:00	20	5.3	26.6	3.3
1981	1981-08-23 21:00:00	1981-08-24 16:00:00	19	4.2	9.2	1.1
1981	1981-08-29 06:00:00	1981-08-29 10:00:00	4	0.2	0.6	0.1
1981	1981-08-30 16:00:00	1981-08-31 10:00:00	18	5.2	12.2	1.5
1981	1981-09-02 07:00:00	1981-09-02 11:00:00	4	1.4	3	0.4
1981	1981-09-03 04:00:00	1981-09-03 05:00:00	1	0.4	0.4	0.0
1981	1981-09-04 17:00:00	1981-09-05 07:00:00	14	2.3	7.2	0.9
1981	1981-09-07 23:00:00	1981-09-08 00:00:00	1	2.6	2.6	0.3
1981	1981-09-08 13:00:00	1981-09-08 20:00:00	7	18.7	42.8	5.2
1981	1981-09-10 03:00:00	1981-09-10 19:00:00	16	5.1	29.8	3.6
1981	1981-09-12 01:00:00	1981-09-12 04:00:00	3	4.9	6.6	0.8
1981	1981-09-14 17:00:00	1981-09-14 18:00:00	1	0.8	0.8	0.1
1981	1981-09-17 13:00:00	1981-09-17 20:00:00	7	1.4	3.2	0.4
1981	1981-09-19 19:00:00	1981-09-19 21:00:00	2	3	3.6	0.4
1981	1981-09-22 05:00:00	1981-09-23 20:00:00	15	2.7	29	3.5
1981	1981-09-26 17:00:00	1981-09-27 10:00:00	17	4.9	14.6	1.8
1981	1981-10-01 14:00:00	1981-10-03 15:00:00	1	0.8	6	0.7
1981	1981-10-06 10:00:00	1981-10-08 02:00:00	16	5.7	19.2	2.3
1981	1981-10-15 20:00:00	1981-10-16 02:00:00	6	1.6	3.4	0.4

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1981	1981-10-18 07:00:00	1981-10-18 15:00:00	8	3.4	9.4	1.1
1981	1981-10-19 07:00:00	1981-10-19 08:00:00	1	0.2	0.2	0.0
1981	1981-10-23 01:00:00	1981-10-23 08:00:00	7	2.2	9.8	1.2
1981	1981-10-26 04:00:00	1981-10-26 16:00:00	12	2.9	12.8	1.6
1981	1981-10-27 04:00:00	1981-10-28 02:00:00	22	3.5	28.4	3.5
1982	1982-04-03 10:00:00	1982-04-03 22:00:00	12	3.2	13.2	2.9
1982	1982-04-13 04:00:00	1982-04-13 17:00:00	13	1.7	9.3	2.0
1982	1982-04-17 11:00:00	1982-04-17 20:00:00	9	1.1	3.5	0.8
1982	1982-04-20 10:00:00	1982-04-21 00:00:00	14	5.4	26.8	5.8
1982	1982-04-27 08:00:00	1982-04-27 09:00:00	1	0.8	0.8	0.2
1982	1982-05-02 14:00:00	1982-05-02 16:00:00	2	0.8	1	0.2
1982	1982-05-07 23:00:00	1982-05-09 09:00:00	10	2	21.8	4.7
1982	1982-05-19 11:00:00	1982-05-19 12:00:00	1	6.4	6.4	1.4
1982	1982-05-24 00:00:00	1982-05-24 09:00:00	9	1.1	3.1	0.7
1982	1982-05-28 05:00:00	1982-05-28 21:00:00	16	7.6	11.4	2.5
1982	1982-05-31 02:00:00	1982-05-31 07:00:00	5	1.9	4.8	1.0
1982	1982-06-01 15:00:00	1982-06-01 22:00:00	7	4	8.6	1.9
1982	1982-06-11 00:00:00	1982-06-11 06:00:00	6	6.1	11.8	2.6
1982	1982-06-15 17:00:00	1982-06-16 02:00:00	9	5.3	19.5	4.2
1982	1982-06-19 04:00:00	1982-06-19 21:00:00	17	3.5	8.8	1.9
1982	1982-06-21 02:00:00	1982-06-21 10:00:00	8	4.9	17	3.7
1982	1982-06-22 13:00:00	1982-06-22 15:00:00	2	1.2	2.1	0.5
1982	1982-06-23 06:00:00	1982-06-23 12:00:00	6	1	2	0.4
1982	1982-06-25 00:00:00	1982-06-25 23:00:00	23	1.3	8.5	1.8
1982	1982-06-29 13:00:00	1982-06-29 15:00:00	2	5.7	7.6	1.6
1982	1982-07-02 16:00:00	1982-07-02 19:00:00	3	2.8	5.6	1.2
1982	1982-07-11 15:00:00	1982-07-12 01:00:00	10	5.5	13.2	2.9
1982	1982-07-17 18:00:00	1982-07-17 19:00:00	1	1	1	0.2
1982	1982-07-18 19:00:00	1982-07-18 21:00:00	2	12.7	15	3.3
1982	1982-07-25 13:00:00	1982-07-25 14:00:00	1	1.7	1.7	0.4
1982	1982-07-28 13:00:00	1982-07-29 01:00:00	12	2.7	10.7	2.3
1982	1982-07-31 03:00:00	1982-07-31 18:00:00	15	6.1	7.5	1.6
1982	1982-08-01 18:00:00	1982-08-02 01:00:00	7	19.8	21.6	4.7
1982	1982-08-08 17:00:00	1982-08-08 20:00:00	3	1.4	2	0.4
1982	1982-08-19 14:00:00	1982-08-19 15:00:00	1	0.3	0.3	0.1
1982	1982-08-22 17:00:00	1982-08-23 17:00:00	0	5.7	17	3.7
1982	1982-08-25 04:00:00	1982-08-25 15:00:00	11	9.5	40.3	8.7
1982	1982-08-27 13:00:00	1982-08-27 15:00:00	2	2	2.6	0.6
1982	1982-08-30 17:00:00	1982-08-30 18:00:00	1	0.4	0.4	0.1
1982	1982-09-01 20:00:00	1982-09-02 07:00:00	11	11.9	22.3	4.8
1982	1982-09-03 11:00:00	1982-09-03 22:00:00	11	2.3	4.8	1.0
1982	1982-09-06 02:00:00	1982-09-06 14:00:00	12	4.2	18.2	3.9
1982	1982-09-14 13:00:00	1982-09-15 05:00:00	16	3.8	6.4	1.4
1982	1982-09-15 19:00:00	1982-09-15 20:00:00	1	0.2	0.2	0.0
1982	1982-09-16 11:00:00	1982-09-16 14:00:00	3	0.6	1.4	0.3

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1982	1982-09-18 01:00:00	1982-09-18 16:00:00	15	3.7	15.7	3.4
1982	1982-09-21 00:00:00	1982-09-21 07:00:00	7	0.7	1.8	0.4
1982	1982-09-23 05:00:00	1982-09-23 08:00:00	3	4.3	7.5	1.6
1982	1982-09-27 02:00:00	1982-09-28 06:00:00	4	3.5	18.6	4.0
1982	1982-10-01 09:00:00	1982-10-01 14:00:00	5	5.8	9.3	2.0
1982	1982-10-07 17:00:00	1982-10-09 01:00:00	8	5.1	14	3.0
1982	1982-10-12 06:00:00	1982-10-12 10:00:00	4	3.8	5.2	1.1
1982	1982-10-13 21:00:00	1982-10-14 01:00:00	4	0.5	1.2	0.3
1982	1982-10-14 14:00:00	1982-10-15 15:00:00	1	1.2	5.6	1.2
1982	1982-10-20 17:00:00	1982-10-20 21:00:00	4	1.1	1.4	0.3
1982	1982-10-21 10:00:00	1982-10-21 11:00:00	1	0.2	0.2	0.0
1983	1983-04-04 04:00:00	1983-04-04 09:00:00	5	1.4	3.8	0.8
1983	1983-04-05 07:00:00	1983-04-05 08:00:00	1	0.2	0.2	0.0
1983	1983-04-10 06:00:00	1983-04-10 19:00:00	13	3.5	14.7	2.9
1983	1983-04-15 02:00:00	1983-04-16 13:00:00	11	1.2	11.2	2.2
1983	1983-04-20 08:00:00	1983-04-20 09:00:00	1	0.4	0.4	0.1
1983	1983-04-26 03:00:00	1983-04-26 04:00:00	1	0.4	0.4	0.1
1983	1983-04-30 13:00:00	1983-04-30 19:00:00	6	1.5	4.6	0.9
1983	1983-05-02 03:00:00	1983-05-03 00:00:00	21	5.3	25.2	5.0
1983	1983-05-03 16:00:00	1983-05-04 00:00:00	8	6.5	13.8	2.8
1983	1983-05-06 23:00:00	1983-05-08 18:00:00	19	2.9	24.3	4.8
1983	1983-05-09 17:00:00	1983-05-11 02:00:00	9	3.2	11.8	2.4
1983	1983-05-15 00:00:00	1983-05-15 04:00:00	4	10.2	13.4	2.7
1983	1983-05-19 17:00:00	1983-05-20 03:00:00	10	1.9	6.8	1.4
1983	1983-05-22 21:00:00	1983-05-23 04:00:00	7	3.4	5.2	1.0
1983	1983-05-25 20:00:00	1983-05-26 04:00:00	8	1.6	6.4	1.3
1983	1983-05-27 09:00:00	1983-05-27 11:00:00	2	0.9	1.2	0.2
1983	1983-05-29 23:00:00	1983-05-31 01:00:00	2	4.3	22.6	4.5
1983	1983-06-01 17:00:00	1983-06-01 18:00:00	1	1.2	1.2	0.2
1983	1983-06-05 08:00:00	1983-06-05 10:00:00	2	0.9	1.6	0.3
1983	1983-06-06 09:00:00	1983-06-06 15:00:00	6	2.7	6.8	1.4
1983	1983-06-07 11:00:00	1983-06-07 12:00:00	1	2.4	2.4	0.5
1983	1983-06-17 13:00:00	1983-06-17 17:00:00	4	7.5	8.2	1.6
1983	1983-06-24 19:00:00	1983-06-24 21:00:00	2	1.7	2	0.4
1983	1983-06-26 05:00:00	1983-06-27 07:00:00	2	9.9	30.6	6.1
1983	1983-07-01 16:00:00	1983-07-01 18:00:00	2	4.1	6	1.2
1983	1983-07-03 14:00:00	1983-07-03 15:00:00	1	0.2	0.2	0.0
1983	1983-07-04 22:00:00	1983-07-05 01:00:00	3	6.5	7.6	1.5
1983	1983-07-05 13:00:00	1983-07-05 19:00:00	6	9.2	9.8	2.0
1983	1983-07-08 21:00:00	1983-07-08 23:00:00	2	2.1	2.5	0.5
1983	1983-07-11 12:00:00	1983-07-11 13:00:00	1	1.4	1.4	0.3
1983	1983-07-14 21:00:00	1983-07-14 23:00:00	2	4.8	5.7	1.1
1983	1983-07-21 11:00:00	1983-07-21 16:00:00	5	7.9	13	2.6
1983	1983-07-29 19:00:00	1983-07-29 21:00:00	2	8.1	8.3	1.7
1983	1983-07-31 10:00:00	1983-08-01 08:00:00	22	1.2	4.1	0.8

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1983	1983-08-08 05:00:00	1983-08-08 18:00:00	13	6.2	12.9	2.6
1983	1983-08-17 17:00:00	1983-08-18 00:00:00	7	0.8	1.3	0.3
1983	1983-08-22 02:00:00	1983-08-22 10:00:00	8	2.2	6.6	1.3
1983	1983-08-26 19:00:00	1983-08-26 22:00:00	3	5	8.6	1.7
1983	1983-09-06 13:00:00	1983-09-06 14:00:00	1	2.6	2.6	0.5
1983	1983-09-07 10:00:00	1983-09-07 11:00:00	1	3	3	0.6
1983	1983-09-09 18:00:00	1983-09-09 19:00:00	1	0.8	0.8	0.2
1983	1983-09-10 07:00:00	1983-09-11 06:00:00	23	2.8	4	0.8
1983	1983-09-16 17:00:00	1983-09-17 18:00:00	1	1.8	11.4	2.3
1983	1983-09-21 08:00:00	1983-09-21 17:00:00	9	10	32.8	6.5
1983	1983-09-22 15:00:00	1983-09-22 16:00:00	1	0.4	0.4	0.1
1983	1983-09-23 13:00:00	1983-09-23 15:00:00	2	0.8	1	0.2
1983	1983-09-26 01:00:00	1983-09-26 04:00:00	3	0.6	1.2	0.2
1983	1983-10-03 18:00:00	1983-10-06 14:00:00	20	10.4	65	13.0
1983	1983-10-07 22:00:00	1983-10-08 16:00:00	18	3	26.8	5.3
1983	1983-10-12 05:00:00	1983-10-13 08:00:00	3	2.3	10.2	2.0
1983	1983-10-13 21:00:00	1983-10-14 10:00:00	13	4.3	8.7	1.7
1983	1983-10-16 23:00:00	1983-10-17 02:00:00	3	1.4	2.8	0.6
1983	1983-10-18 20:00:00	1983-10-18 21:00:00	1	0.2	0.2	0.0
1983	1983-10-23 09:00:00	1983-10-23 23:00:00	14	1.7	8.8	1.8
1983	1983-10-26 02:00:00	1983-10-27 06:00:00	4	1.1	12.4	2.5
1983	1983-10-27 23:00:00	1983-10-28 00:00:00	1	0.8	0.8	0.2
1983	1983-10-28 19:00:00	1983-10-29 03:00:00	8	1.3	1.8	0.4
1984	1984-06-03 21:00:00	1984-06-03 23:00:00	2	0.3	0.6	0.2
1984	1984-06-06 05:00:00	1984-06-06 07:00:00	2	1.3	2	0.6
1984	1984-06-07 06:00:00	1984-06-07 07:00:00	1	0.6	0.6	0.2
1984	1984-06-13 02:00:00	1984-06-13 03:00:00	1	0.6	0.6	0.2
1984	1984-06-18 09:00:00	1984-06-18 17:00:00	8	11.5	17.8	5.1
1984	1984-06-24 06:00:00	1984-06-24 17:00:00	11	6	25	7.2
1984	1984-06-27 15:00:00	1984-06-27 21:00:00	6	2.9	10	2.9
1984	1984-07-04 07:00:00	1984-07-04 09:00:00	2	1.8	2	0.6
1984	1984-07-06 15:00:00	1984-07-06 20:00:00	5	0.3	0.6	0.2
1984	1984-07-11 07:00:00	1984-07-11 12:00:00	5	6.2	15	4.3
1984	1984-07-14 03:00:00	1984-07-14 04:00:00	1	1.2	1.2	0.3
1984	1984-07-15 22:00:00	1984-07-15 23:00:00	1	0.6	0.6	0.2
1984	1984-07-17 23:00:00	1984-07-18 04:00:00	5	2.9	10.7	3.1
1984	1984-07-18 16:00:00	1984-07-18 17:00:00	1	0.5	0.5	0.1
1984	1984-07-20 15:00:00	1984-07-20 17:00:00	2	2.6	4.6	1.3
1984	1984-07-26 14:00:00	1984-07-27 12:00:00	22	5.6	17.6	5.0
1984	1984-07-30 20:00:00	1984-07-30 21:00:00	1	0.4	0.4	0.1
1984	1984-08-01 05:00:00	1984-08-01 06:00:00	1	0.6	0.6	0.2
1984	1984-08-06 16:00:00	1984-08-06 23:00:00	7	10.2	29	8.3
1984	1984-08-07 13:00:00	1984-08-07 14:00:00	1	5.8	5.8	1.7
1984	1984-08-10 12:00:00	1984-08-10 18:00:00	6	6.9	15.2	4.4
1984	1984-08-12 01:00:00	1984-08-13 11:00:00	10	17.8	57	16.3

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1984	1984-08-14 05:00:00	1984-08-15 02:00:00	21	4.4	13.8	4.0
1984	1984-08-19 09:00:00	1984-08-19 10:00:00	1	0.2	0.2	0.1
1984	1984-08-22 21:00:00	1984-08-23 22:00:00	1	8.8	32.1	9.2
1984	1984-08-29 01:00:00	1984-08-29 02:00:00	1	0.5	0.5	0.1
1984	1984-08-29 21:00:00	1984-08-30 16:00:00	19	9.4	17.7	5.1
1984	1984-09-03 02:00:00	1984-09-03 05:00:00	3	1.3	3	0.9
1984	1984-09-10 05:00:00	1984-09-10 11:00:00	6	1.8	3.2	0.9
1984	1984-09-11 11:00:00	1984-09-11 13:00:00	2	0.5	1	0.3
1984	1984-09-13 06:00:00	1984-09-13 09:00:00	3	1.6	2.2	0.6
1984	1984-09-15 04:00:00	1984-09-15 06:00:00	2	0.7	1.2	0.3
1984	1984-09-16 16:00:00	1984-09-16 18:00:00	2	0.2	0.4	0.1
1984	1984-09-23 08:00:00	1984-09-23 10:00:00	2	0.8	1	0.3
1984	1984-09-24 19:00:00	1984-09-25 03:00:00	8	0.8	1.1	0.3
1984	1984-09-25 23:00:00	1984-09-26 03:00:00	4	0.9	2.3	0.7
1984	1984-10-03 05:00:00	1984-10-03 16:00:00	11	9.9	21.8	6.2
1984	1984-10-04 19:00:00	1984-10-04 22:00:00	3	0.8	1.2	0.3
1984	1984-10-08 01:00:00	1984-10-09 03:00:00	2	2.5	15.4	4.4
1984	1984-10-19 15:00:00	1984-10-19 18:00:00	3	0.7	1.4	0.4
1984	1984-10-21 08:00:00	1984-10-21 12:00:00	4	1.4	2.8	0.8
1984	1984-10-25 18:00:00	1984-10-26 01:00:00	7	2	8	2.3
1984	1984-10-27 15:00:00	1984-10-27 18:00:00	3	1	1.6	0.5
1985	1985-04-15 10:00:00	1985-04-15 11:00:00	1	0.4	0.4	0.1
1985	1985-04-18 13:00:00	1985-04-18 19:00:00	6	4.7	13.4	2.9
1985	1985-04-26 18:00:00	1985-04-26 19:00:00	1	0.6	0.6	0.1
1985	1985-04-28 07:00:00	1985-04-28 13:00:00	6	0.8	3.2	0.7
1985	1985-05-05 02:00:00	1985-05-05 17:00:00	15	4.1	24.6	5.4
1985	1985-05-06 22:00:00	1985-05-07 00:00:00	2	2	2.8	0.6
1985	1985-05-07 18:00:00	1985-05-07 20:00:00	2	0.7	1.2	0.3
1985	1985-05-10 08:00:00	1985-05-10 11:00:00	3	0.3	0.5	0.1
1985	1985-05-12 16:00:00	1985-05-12 18:00:00	2	0.2	0.4	0.1
1985	1985-05-16 01:00:00	1985-05-16 03:00:00	2	0.9	1.5	0.3
1985	1985-05-19 16:00:00	1985-05-19 17:00:00	1	0.6	0.6	0.1
1985	1985-05-20 14:00:00	1985-05-20 22:00:00	8	1.8	5.2	1.1
1985	1985-05-26 01:00:00	1985-05-26 02:00:00	1	0.4	0.4	0.1
1985	1985-05-27 02:00:00	1985-05-27 13:00:00	11	6.5	14.6	3.2
1985	1985-05-31 15:00:00	1985-05-31 22:00:00	7	14.4	16.2	3.6
1985	1985-06-05 11:00:00	1985-06-06 06:00:00	19	6.2	14	3.1
1985	1985-06-08 04:00:00	1985-06-08 07:00:00	3	0.5	1.1	0.2
1985	1985-06-08 20:00:00	1985-06-09 00:00:00	4	1.7	2.3	0.5
1985	1985-06-09 13:00:00	1985-06-09 16:00:00	3	1	1.4	0.3
1985	1985-06-12 02:00:00	1985-06-12 09:00:00	7	1.5	4.6	1.0
1985	1985-06-13 06:00:00	1985-06-13 17:00:00	11	1.7	5.2	1.1
1985	1985-06-14 08:00:00	1985-06-14 09:00:00	1	0.3	0.3	0.1
1985	1985-06-16 06:00:00	1985-06-16 15:00:00	9	1	2	0.4
1985	1985-06-17 21:00:00	1985-06-18 02:00:00	5	14.7	39.6	8.7

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1985	1985-06-22 20:00:00	1985-06-23 00:00:00	4	1.4	2.8	0.6
1985	1985-06-23 16:00:00	1985-06-24 01:00:00	9	8.8	20	4.4
1985	1985-06-28 13:00:00	1985-06-29 03:00:00	14	0.4	0.8	0.2
1985	1985-07-03 06:00:00	1985-07-03 08:00:00	2	1.5	2.2	0.5
1985	1985-07-06 05:00:00	1985-07-06 08:00:00	3	0.5	1.2	0.3
1985	1985-07-11 06:00:00	1985-07-11 07:00:00	1	1	1	0.2
1985	1985-07-14 06:00:00	1985-07-14 08:00:00	2	12.1	13	2.9
1985	1985-07-15 13:00:00	1985-07-15 17:00:00	4	2.4	5	1.1
1985	1985-07-16 11:00:00	1985-07-16 15:00:00	4	19	20	4.4
1985	1985-07-22 17:00:00	1985-07-22 19:00:00	2	0.5	1	0.2
1985	1985-07-26 09:00:00	1985-07-26 11:00:00	2	1.1	1.4	0.3
1985	1985-07-27 04:00:00	1985-07-27 05:00:00	1	0.6	0.6	0.1
1985	1985-07-29 03:00:00	1985-07-29 20:00:00	17	5.5	21.4	4.7
1985	1985-08-07 13:00:00	1985-08-07 21:00:00	8	0.4	0.8	0.2
1985	1985-08-15 07:00:00	1985-08-15 15:00:00	8	5.1	8.2	1.8
1985	1985-08-19 03:00:00	1985-08-19 13:00:00	10	6.3	14.4	3.2
1985	1985-08-22 18:00:00	1985-08-22 19:00:00	1	0.5	0.5	0.1
1985	1985-08-24 21:00:00	1985-08-25 21:00:00	0	6.2	23	5.0
1985	1985-08-26 21:00:00	1985-08-27 00:00:00	3	16.7	20.4	4.5
1985	1985-08-29 17:00:00	1985-08-30 06:00:00	13	1	3.8	0.8
1985	1985-09-01 22:00:00	1985-09-02 01:00:00	3	1.8	2.4	0.5
1985	1985-09-03 08:00:00	1985-09-03 12:00:00	4	1.3	2.4	0.5
1985	1985-09-04 01:00:00	1985-09-04 03:00:00	2	3	3.6	0.8
1985	1985-09-05 16:00:00	1985-09-06 03:00:00	11	2.2	6.4	1.4
1985	1985-09-09 18:00:00	1985-09-09 20:00:00	2	0.7	1	0.2
1985	1985-09-12 15:00:00	1985-09-12 16:00:00	1	0.2	0.2	0.0
1985	1985-09-24 11:00:00	1985-09-24 15:00:00	4	1.3	2.2	0.5
1985	1985-09-27 01:00:00	1985-09-27 19:00:00	18	3.4	27.8	6.1
1985	1985-10-01 01:00:00	1985-10-01 13:00:00	12	4.1	19.8	4.3
1985	1985-10-05 03:00:00	1985-10-05 12:00:00	9	2.3	5.4	1.2
1985	1985-10-09 01:00:00	1985-10-09 09:00:00	8	0.9	3.8	0.8
1985	1985-10-10 04:00:00	1985-10-10 13:00:00	9	3.6	16.8	3.7
1985	1985-10-13 00:00:00	1985-10-13 14:00:00	14	7	20.1	4.4
1985	1985-10-15 07:00:00	1985-10-15 10:00:00	3	1.7	3.6	0.8
1985	1985-10-18 17:00:00	1985-10-19 01:00:00	8	1.1	5.5	1.2
1985	1985-10-24 15:00:00	1985-10-25 00:00:00	9	10.7	17.4	3.8
1986	1986-04-01 22:00:00	1986-04-02 03:00:00	5	0.4	0.6	0.1
1986	1986-04-06 06:00:00	1986-04-07 08:00:00	2	1.8	8.5	1.1
1986	1986-04-07 21:00:00	1986-04-09 07:00:00	10	1.4	9.4	1.2
1986	1986-04-09 19:00:00	1986-04-09 22:00:00	3	1.3	2.1	0.3
1986	1986-04-20 05:00:00	1986-04-20 08:00:00	3	0.8	1.2	0.2
1986	1986-04-20 20:00:00	1986-04-21 16:00:00	20	3	9.8	1.2
1986	1986-05-01 13:00:00	1986-05-01 16:00:00	3	4.9	9	1.1
1986	1986-05-04 18:00:00	1986-05-04 23:00:00	5	0.7	2.4	0.3
1986	1986-05-05 12:00:00	1986-05-06 04:00:00	16	3.2	9	1.1

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1986	1986-05-07 07:00:00	1986-05-07 08:00:00	1	1.6	1.6	0.2
1986	1986-05-08 09:00:00	1986-05-08 10:00:00	1	0.8	0.8	0.1
1986	1986-05-15 06:00:00	1986-05-15 08:00:00	2	0.6	1	0.1
1986	1986-05-16 03:00:00	1986-05-16 22:00:00	19	5	17.4	2.2
1986	1986-05-18 10:00:00	1986-05-21 12:00:00	2	10.6	76.5	9.7
1986	1986-05-22 16:00:00	1986-05-23 15:00:00	23	6.8	38.2	4.8
1986	1986-05-24 08:00:00	1986-05-24 14:00:00	6	0.2	0.4	0.1
1986	1986-05-27 17:00:00	1986-05-27 18:00:00	1	7.8	7.8	1.0
1986	1986-06-01 06:00:00	1986-06-01 16:00:00	10	5.1	10.6	1.3
1986	1986-06-05 05:00:00	1986-06-05 08:00:00	3	0.6	1.4	0.2
1986	1986-06-07 15:00:00	1986-06-08 00:00:00	9	3.4	5	0.6
1986	1986-06-11 02:00:00	1986-06-11 06:00:00	4	2.2	4.8	0.6
1986	1986-06-12 11:00:00	1986-06-13 11:00:00	0	7.3	27.2	3.4
1986	1986-06-16 15:00:00	1986-06-16 20:00:00	5	2.8	5.6	0.7
1986	1986-06-19 18:00:00	1986-06-19 22:00:00	4	1.7	4	0.5
1986	1986-06-23 03:00:00	1986-06-23 04:00:00	1	1	1	0.1
1986	1986-06-24 03:00:00	1986-06-24 16:00:00	13	6.1	27.2	3.4
1986	1986-06-27 02:00:00	1986-06-27 15:00:00	13	5.3	19.6	2.5
1986	1986-06-29 19:00:00	1986-06-29 20:00:00	1	0.2	0.2	0.0
1986	1986-07-02 22:00:00	1986-07-03 06:00:00	8	7.1	24.8	3.1
1986	1986-07-04 17:00:00	1986-07-05 09:00:00	16	10.6	21	2.7
1986	1986-07-05 22:00:00	1986-07-06 00:00:00	2	1.2	1.4	0.2
1986	1986-07-13 11:00:00	1986-07-14 02:00:00	15	7.4	11	1.4
1986	1986-07-20 07:00:00	1986-07-20 15:00:00	8	2.6	6.2	0.8
1986	1986-07-25 19:00:00	1986-07-26 10:00:00	15	6.4	35.2	4.5
1986	1986-07-29 12:00:00	1986-07-30 18:00:00	6	18.3	44.8	5.7
1986	1986-08-01 05:00:00	1986-08-01 14:00:00	9	0.2	0.6	0.1
1986	1986-08-02 12:00:00	1986-08-02 19:00:00	7	9.1	10.8	1.4
1986	1986-08-05 12:00:00	1986-08-05 13:00:00	1	0.4	0.4	0.1
1986	1986-08-06 10:00:00	1986-08-06 18:00:00	8	3.8	4	0.5
1986	1986-08-07 09:00:00	1986-08-07 13:00:00	4	0.5	1.2	0.2
1986	1986-08-08 08:00:00	1986-08-08 12:00:00	4	1.8	2.8	0.4
1986	1986-08-09 03:00:00	1986-08-09 11:00:00	8	5.7	11	1.4
1986	1986-08-15 00:00:00	1986-08-15 02:00:00	2	1	2	0.3
1986	1986-08-18 04:00:00	1986-08-18 08:00:00	4	11.4	14.2	1.8
1986	1986-08-21 10:00:00	1986-08-21 16:00:00	6	5.1	15.6	2.0
1986	1986-08-23 11:00:00	1986-08-23 18:00:00	7	2.1	6.6	0.8
1986	1986-08-24 08:00:00	1986-08-24 11:00:00	3	0.4	0.8	0.1
1986	1986-08-26 22:00:00	1986-08-27 05:00:00	7	10	28	3.5
1986	1986-08-28 13:00:00	1986-08-28 16:00:00	3	0.5	0.8	0.1
1986	1986-09-02 10:00:00	1986-09-02 11:00:00	1	0.4	0.4	0.1
1986	1986-09-04 16:00:00	1986-09-05 14:00:00	22	3.7	7.7	1.0
1986	1986-09-10 08:00:00	1986-09-10 09:00:00	1	0.2	0.2	0.0
1986	1986-09-10 21:00:00	1986-09-12 12:00:00	15	10.7	88.6	11.2
1986	1986-09-13 14:00:00	1986-09-13 15:00:00	1	5.8	5.8	0.7

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1986	1986-09-15 18:00:00	1986-09-16 12:00:00	18	3.1	10.4	1.3
1986	1986-09-20 06:00:00	1986-09-20 15:00:00	9	0.3	0.8	0.1
1986	1986-09-23 02:00:00	1986-09-23 09:00:00	7	3.7	13	1.6
1986	1986-09-28 23:00:00	1986-09-30 09:00:00	10	12	40.6	5.1
1986	1986-10-02 01:00:00	1986-10-02 02:00:00	1	0.4	0.4	0.1
1986	1986-10-03 02:00:00	1986-10-03 23:00:00	21	2.9	7.8	1.0
1986	1986-10-04 13:00:00	1986-10-04 23:00:00	10	3.2	7.8	1.0
1986	1986-10-05 21:00:00	1986-10-06 08:00:00	11	3.4	6.4	0.8
1986	1986-10-08 13:00:00	1986-10-09 04:00:00	15	1	2.2	0.3
1986	1986-10-13 02:00:00	1986-10-14 10:00:00	8	4.3	19.4	2.5
1986	1986-10-16 22:00:00	1986-10-17 18:00:00	20	0.5	1.8	0.2
1986	1986-10-21 04:00:00	1986-10-21 07:00:00	3	3.3	5.8	0.7
1986	1986-10-23 05:00:00	1986-10-23 06:00:00	1	1	1	0.1
1986	1986-10-26 22:00:00	1986-10-28 00:00:00	2	3.5	12.2	1.5
1986	1986-10-29 14:00:00	1986-10-29 22:00:00	8	2.4	13	1.6
1987	1987-04-04 06:00:00	1987-04-06 00:00:00	18	5.2	39.3	7.0
1987	1987-04-06 17:00:00	1987-04-07 02:00:00	9	0.6	0.8	0.1
1987	1987-04-08 01:00:00	1987-04-08 02:00:00	1	0.7	0.7	0.1
1987	1987-04-21 16:00:00	1987-04-21 17:00:00	1	0.2	0.2	0.0
1987	1987-04-23 12:00:00	1987-04-24 00:00:00	12	1.5	6.6	1.2
1987	1987-04-28 01:00:00	1987-04-28 21:00:00	20	2.6	15.6	2.8
1987	1987-04-29 12:00:00	1987-04-30 05:00:00	17	1.8	6.6	1.2
1987	1987-05-09 06:00:00	1987-05-09 09:00:00	3	0.8	1.8	0.3
1987	1987-05-11 06:00:00	1987-05-12 03:00:00	21	3.3	10	1.8
1987	1987-05-14 19:00:00	1987-05-15 03:00:00	8	5	15.2	2.7
1987	1987-05-17 04:00:00	1987-05-18 12:00:00	8	1.4	5	0.9
1987	1987-05-22 05:00:00	1987-05-22 14:00:00	9	2	6.2	1.1
1987	1987-05-23 04:00:00	1987-05-24 00:00:00	20	3.4	7.6	1.3
1987	1987-05-26 04:00:00	1987-05-26 05:00:00	1	0.2	0.2	0.0
1987	1987-05-26 21:00:00	1987-05-27 09:00:00	12	5.8	8	1.4
1987	1987-05-28 14:00:00	1987-05-28 23:00:00	9	1	1.2	0.2
1987	1987-05-29 14:00:00	1987-05-29 19:00:00	5	6.1	7.4	1.3
1987	1987-05-31 10:00:00	1987-05-31 15:00:00	5	2.2	4.8	0.9
1987	1987-06-02 05:00:00	1987-06-02 06:00:00	1	0.4	0.4	0.1
1987	1987-06-03 09:00:00	1987-06-03 19:00:00	10	2.4	5.4	1.0
1987	1987-06-04 15:00:00	1987-06-04 16:00:00	1	0.2	0.2	0.0
1987	1987-06-05 15:00:00	1987-06-05 16:00:00	1	0.4	0.4	0.1
1987	1987-06-07 22:00:00	1987-06-08 22:00:00	0	4.6	18.8	3.3
1987	1987-06-09 10:00:00	1987-06-09 13:00:00	3	1.1	2.6	0.5
1987	1987-06-11 20:00:00	1987-06-12 04:00:00	8	4.6	13.3	2.4
1987	1987-06-12 23:00:00	1987-06-13 11:00:00	12	0.7	1.5	0.3
1987	1987-06-16 11:00:00	1987-06-16 12:00:00	1	0.4	0.4	0.1
1987	1987-06-26 10:00:00	1987-06-26 18:00:00	8	1.2	3.8	0.7
1987	1987-06-27 13:00:00	1987-06-28 17:00:00	4	9.4	21.8	3.9
1987	1987-06-29 08:00:00	1987-06-29 20:00:00	12	7.6	21.8	3.9

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1987	1987-07-02 21:00:00	1987-07-03 08:00:00	11	0.4	1.2	0.2
1987	1987-07-03 20:00:00	1987-07-03 21:00:00	1	8	8	1.4
1987	1987-07-04 11:00:00	1987-07-04 13:00:00	2	0.6	1	0.2
1987	1987-07-08 08:00:00	1987-07-08 09:00:00	1	0.6	0.6	0.1
1987	1987-07-10 15:00:00	1987-07-10 17:00:00	2	1.3	1.5	0.3
1987	1987-07-11 15:00:00	1987-07-11 16:00:00	1	1.2	1.2	0.2
1987	1987-07-14 10:00:00	1987-07-14 17:00:00	7	14.1	33	5.8
1987	1987-07-18 17:00:00	1987-07-18 18:00:00	1	1	1	0.2
1987	1987-07-20 16:00:00	1987-07-20 17:00:00	1	2.6	2.6	0.5
1987	1987-07-24 07:00:00	1987-07-25 00:00:00	17	20	59	10.5
1987	1987-07-25 22:00:00	1987-07-26 00:00:00	2	5.2	8	1.4
1987	1987-08-02 15:00:00	1987-08-02 23:00:00	8	4.2	11.2	2.0
1987	1987-08-04 12:00:00	1987-08-04 17:00:00	5	0.2	0.4	0.1
1987	1987-08-10 17:00:00	1987-08-10 18:00:00	1	0.2	0.2	0.0
1987	1987-08-14 07:00:00	1987-08-14 21:00:00	14	0.2	0.6	0.1
1987	1987-08-16 09:00:00	1987-08-16 17:00:00	8	0.9	1.2	0.2
1987	1987-08-17 19:00:00	1987-08-17 20:00:00	1	8.6	8.6	1.5
1987	1987-08-29 04:00:00	1987-08-29 08:00:00	4	2.2	6.2	1.1
1987	1987-08-31 12:00:00	1987-09-01 00:00:00	12	3.4	7.6	1.3
1987	1987-09-08 11:00:00	1987-09-09 06:00:00	19	9	28.6	5.1
1987	1987-09-12 01:00:00	1987-09-13 12:00:00	11	10.4	52.4	9.3
1987	1987-09-19 12:00:00	1987-09-21 16:00:00	4	3.4	15.4	2.7
1987	1987-09-23 19:00:00	1987-09-23 21:00:00	2	1.2	2.2	0.4
1987	1987-09-28 07:00:00	1987-09-28 10:00:00	3	2.5	4	0.7
1987	1987-09-29 19:00:00	1987-09-30 22:00:00	3	7.1	19	3.4
1987	1987-10-02 00:00:00	1987-10-02 17:00:00	17	1.1	3.8	0.7
1987	1987-10-06 21:00:00	1987-10-08 15:00:00	18	4.4	22.2	3.9
1987	1987-10-09 21:00:00	1987-10-09 22:00:00	1	0.8	0.8	0.1
1987	1987-10-17 21:00:00	1987-10-18 00:00:00	3	1	1.8	0.3
1987	1987-10-19 23:00:00	1987-10-20 00:00:00	1	0.2	0.2	0.0
1987	1987-10-20 17:00:00	1987-10-20 22:00:00	5	2.4	6	1.1
1987	1987-10-23 07:00:00	1987-10-23 21:00:00	14	1.2	2.6	0.5
1987	1987-10-24 15:00:00	1987-10-25 07:00:00	16	2.4	12.2	2.2
1987	1987-10-27 17:00:00	1987-10-28 08:00:00	15	1.3	6.4	1.1
1987	1987-10-30 10:00:00	1987-10-30 22:00:00	12	1.6	6.2	1.1
1988	1988-04-03 03:00:00	1988-04-04 16:00:00	13	3.6	19.2	3.5
1988	1988-04-08 03:00:00	1988-04-08 09:00:00	6	1.6	4.2	0.8
1988	1988-04-13 14:00:00	1988-04-13 16:00:00	2	1	1.6	0.3
1988	1988-04-14 11:00:00	1988-04-15 15:00:00	4	1.8	8.2	1.5
1988	1988-04-18 00:00:00	1988-04-18 07:00:00	7	0.6	1.6	0.3
1988	1988-04-23 15:00:00	1988-04-24 21:00:00	6	1	8.4	1.5
1988	1988-04-26 08:00:00	1988-04-26 17:00:00	9	2	3.8	0.7
1988	1988-04-27 22:00:00	1988-04-29 14:00:00	16	2.9	39.6	7.1
1988	1988-04-30 07:00:00	1988-04-30 08:00:00	1	0.2	0.2	0.0
1988	1988-04-30 21:00:00	1988-04-30 23:00:00	2	0.3	0.6	0.1

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1988	1988-05-13 06:00:00	1988-05-13 14:00:00	8	1.5	3.8	0.7
1988	1988-05-15 22:00:00	1988-05-16 14:00:00	16	2.4	8.6	1.5
1988	1988-05-19 14:00:00	1988-05-20 22:00:00	8	3.4	9.8	1.8
1988	1988-05-30 00:00:00	1988-05-30 04:00:00	4	4	6	1.1
1988	1988-05-30 17:00:00	1988-05-30 20:00:00	3	3.3	4.2	0.8
1988	1988-06-20 09:00:00	1988-06-20 10:00:00	1	0.6	0.6	0.1
1988	1988-06-22 09:00:00	1988-06-22 21:00:00	12	16.4	25.8	4.6
1988	1988-06-25 00:00:00	1988-06-25 19:00:00	19	18.8	45.8	8.2
1988	1988-06-28 11:00:00	1988-06-28 15:00:00	4	3.2	5.8	1.0
1988	1988-06-29 19:00:00	1988-06-30 23:00:00	4	3.8	16	2.9
1988	1988-07-11 04:00:00	1988-07-11 12:00:00	8	1	3	0.5
1988	1988-07-14 02:00:00	1988-07-14 14:00:00	12	4.6	9.6	1.7
1988	1988-07-19 05:00:00	1988-07-19 08:00:00	3	1.2	2.1	0.4
1988	1988-07-19 20:00:00	1988-07-19 21:00:00	1	0.3	0.3	0.1
1988	1988-07-24 04:00:00	1988-07-24 09:00:00	5	13	20.3	3.7
1988	1988-07-24 23:00:00	1988-07-25 12:00:00	13	1.6	5.7	1.0
1988	1988-07-26 05:00:00	1988-07-26 14:00:00	9	25.3	37.2	6.7
1988	1988-08-02 21:00:00	1988-08-02 23:00:00	2	5.8	6.2	1.1
1988	1988-08-04 13:00:00	1988-08-05 04:00:00	15	11.7	28.8	5.2
1988	1988-08-06 08:00:00	1988-08-06 13:00:00	5	4	4.2	0.8
1988	1988-08-09 14:00:00	1988-08-09 23:00:00	9	1.3	4	0.7
1988	1988-08-13 16:00:00	1988-08-13 20:00:00	4	0.8	1.8	0.3
1988	1988-08-14 15:00:00	1988-08-15 00:00:00	9	4.3	5.8	1.0
1988	1988-08-20 14:00:00	1988-08-21 03:00:00	13	5.4	15.6	2.8
1988	1988-08-23 22:00:00	1988-08-26 05:00:00	7	4	41.2	7.4
1988	1988-08-28 00:00:00	1988-08-28 16:00:00	16	7.1	13.6	2.4
1988	1988-09-04 00:00:00	1988-09-05 06:00:00	6	2.5	11.6	2.1
1988	1988-09-06 19:00:00	1988-09-06 20:00:00	1	0.2	0.2	0.0
1988	1988-09-13 00:00:00	1988-09-13 01:00:00	1	0.2	0.2	0.0
1988	1988-09-14 07:00:00	1988-09-14 13:00:00	6	2.1	4.6	0.8
1988	1988-09-17 10:00:00	1988-09-17 21:00:00	11	25.5	28.8	5.2
1988	1988-09-20 05:00:00	1988-09-20 12:00:00	7	7.3	10	1.8
1988	1988-09-23 03:00:00	1988-09-23 09:00:00	6	2.8	7	1.3
1988	1988-09-27 14:00:00	1988-09-27 20:00:00	6	1.6	3.6	0.6
1988	1988-09-30 02:00:00	1988-09-30 09:00:00	7	0.7	2	0.4
1988	1988-10-02 03:00:00	1988-10-02 21:00:00	18	4.6	23.6	4.2
1988	1988-10-05 03:00:00	1988-10-05 22:00:00	19	1.5	12.2	2.2
1988	1988-10-08 18:00:00	1988-10-09 00:00:00	6	1	2.4	0.4
1988	1988-10-10 14:00:00	1988-10-11 06:00:00	16	2.5	10	1.8
1988	1988-10-17 17:00:00	1988-10-18 09:00:00	16	1.6	6.8	1.2
1988	1988-10-23 23:00:00	1988-10-24 17:00:00	18	2.9	13.2	2.4
1988	1988-10-25 14:00:00	1988-10-25 17:00:00	3	0.3	0.8	0.1
1988	1988-10-28 07:00:00	1988-10-28 13:00:00	6	3.2	5.2	0.9
1989	1989-04-02 17:00:00	1989-04-03 18:00:00	1	1	4	0.9
1989	1989-04-04 07:00:00	1989-04-04 14:00:00	7	2.7	9.6	2.1

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1989	1989-04-15 05:00:00	1989-04-15 11:00:00	6	0.3	1.4	0.3
1989	1989-04-17 17:00:00	1989-04-18 00:00:00	7	1	2.8	0.6
1989	1989-04-30 00:00:00	1989-04-30 03:00:00	3	1.1	1.8	0.4
1989	1989-05-02 03:00:00	1989-05-03 09:00:00	6	1.6	21.8	4.8
1989	1989-05-05 10:00:00	1989-05-06 11:00:00	1	2	9.8	2.1
1989	1989-05-07 01:00:00	1989-05-07 10:00:00	9	5	23.4	5.1
1989	1989-05-08 21:00:00	1989-05-09 00:00:00	3	0.8	1.6	0.3
1989	1989-05-11 07:00:00	1989-05-13 06:00:00	23	9.1	19.9	4.3
1989	1989-05-13 21:00:00	1989-05-14 15:00:00	18	2.8	6.3	1.4
1989	1989-05-20 23:00:00	1989-05-22 13:00:00	14	0.9	5	1.1
1989	1989-05-26 08:00:00	1989-05-26 15:00:00	7	1.8	4	0.9
1989	1989-05-27 11:00:00	1989-05-27 16:00:00	5	1	2	0.4
1989	1989-05-30 03:00:00	1989-05-30 14:00:00	11	1.5	3.8	0.8
1989	1989-05-31 07:00:00	1989-05-31 09:00:00	2	0.5	0.7	0.2
1989	1989-05-31 23:00:00	1989-06-01 00:00:00	1	0.3	0.3	0.1
1989	1989-06-02 06:00:00	1989-06-02 14:00:00	8	1.3	3.4	0.7
1989	1989-06-03 23:00:00	1989-06-04 07:00:00	8	3.9	13.8	3.0
1989	1989-06-08 18:00:00	1989-06-08 20:00:00	2	4.5	5.2	1.1
1989	1989-06-09 09:00:00	1989-06-11 00:00:00	15	5.8	25.4	5.5
1989	1989-06-11 17:00:00	1989-06-11 18:00:00	1	0.2	0.2	0.0
1989	1989-06-17 01:00:00	1989-06-17 09:00:00	8	5.8	14.8	3.2
1989	1989-06-18 05:00:00	1989-06-18 18:00:00	13	1.9	5.8	1.3
1989	1989-06-20 11:00:00	1989-06-20 13:00:00	2	0.8	1	0.2
1989	1989-07-01 05:00:00	1989-07-01 13:00:00	8	0.4	0.6	0.1
1989	1989-07-07 05:00:00	1989-07-07 06:00:00	1	2.2	2.2	0.5
1989	1989-07-09 02:00:00	1989-07-09 04:00:00	2	0.6	0.8	0.2
1989	1989-07-10 01:00:00	1989-07-10 12:00:00	11	8.5	27	5.9
1989	1989-07-27 10:00:00	1989-07-27 23:00:00	13	22.7	36.5	8.0
1989	1989-08-02 11:00:00	1989-08-02 17:00:00	6	2.8	10.8	2.4
1989	1989-08-03 20:00:00	1989-08-04 21:00:00	1	3.9	7.6	1.7
1989	1989-08-06 12:00:00	1989-08-06 19:00:00	7	6.5	9.6	2.1
1989	1989-08-13 12:00:00	1989-08-13 13:00:00	1	0.8	0.8	0.2
1989	1989-08-15 14:00:00	1989-08-15 18:00:00	4	1.9	3	0.7
1989	1989-08-20 00:00:00	1989-08-21 20:00:00	20	3.6	19.6	4.3
1989	1989-08-22 21:00:00	1989-08-23 00:00:00	3	0.6	1.2	0.3
1989	1989-08-27 20:00:00	1989-08-27 21:00:00	1	0.2	0.2	0.0
1989	1989-08-29 08:00:00	1989-08-29 11:00:00	3	0.2	0.4	0.1
1989	1989-09-01 04:00:00	1989-09-01 20:00:00	16	12.5	29	6.3
1989	1989-09-09 08:00:00	1989-09-09 10:00:00	2	1.8	3.4	0.7
1989	1989-09-14 01:00:00	1989-09-14 03:00:00	2	0.8	1	0.2
1989	1989-09-14 20:00:00	1989-09-15 01:00:00	5	1.7	4.6	1.0
1989	1989-09-16 17:00:00	1989-09-17 13:00:00	20	0.8	3.2	0.7
1989	1989-09-22 15:00:00	1989-09-23 03:00:00	12	5.8	17.6	3.8
1989	1989-09-26 12:00:00	1989-09-26 17:00:00	5	1.5	2.4	0.5
1989	1989-10-02 07:00:00	1989-10-02 17:00:00	10	4.4	10.2	2.2

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1989	1989-10-05 21:00:00	1989-10-06 05:00:00	8	3.2	8.4	1.8
1989	1989-10-07 02:00:00	1989-10-07 05:00:00	3	1.2	1.4	0.3
1989	1989-10-10 23:00:00	1989-10-11 09:00:00	10	0.7	2.1	0.5
1989	1989-10-12 11:00:00	1989-10-12 13:00:00	2	1.4	2.3	0.5
1989	1989-10-16 00:00:00	1989-10-16 03:00:00	3	5	8.4	1.8
1989	1989-10-16 16:00:00	1989-10-16 19:00:00	3	3.8	6.7	1.5
1989	1989-10-19 22:00:00	1989-10-20 21:00:00	23	11.5	40.6	8.8
1989	1989-10-21 09:00:00	1989-10-22 04:00:00	19	0.8	1.9	0.4
1990	1990-04-01 21:00:00	1990-04-02 07:00:00	10	0.4	0.8	0.1
1990	1990-04-03 01:00:00	1990-04-05 01:00:00	0	2.5	33.3	5.5
1990	1990-04-09 15:00:00	1990-04-10 16:00:00	1	1.9	11.2	1.9
1990	1990-04-14 16:00:00	1990-04-15 02:00:00	10	2.1	6.7	1.1
1990	1990-04-15 19:00:00	1990-04-15 21:00:00	2	0.9	1.1	0.2
1990	1990-04-17 03:00:00	1990-04-17 06:00:00	3	0.8	2	0.3
1990	1990-04-20 11:00:00	1990-04-21 02:00:00	15	1.8	8.6	1.4
1990	1990-04-25 02:00:00	1990-04-25 14:00:00	12	0.3	0.6	0.1
1990	1990-04-28 23:00:00	1990-04-29 00:00:00	1	0.4	0.4	0.1
1990	1990-05-05 07:00:00	1990-05-05 18:00:00	11	1.5	2.8	0.5
1990	1990-05-08 09:00:00	1990-05-08 14:00:00	5	2.1	4.2	0.7
1990	1990-05-09 08:00:00	1990-05-10 18:00:00	10	3.7	11.4	1.9
1990	1990-05-11 06:00:00	1990-05-11 14:00:00	8	0.8	1.2	0.2
1990	1990-05-13 01:00:00	1990-05-13 05:00:00	4	0.2	0.6	0.1
1990	1990-05-15 06:00:00	1990-05-15 09:00:00	3	0.4	1.2	0.2
1990	1990-05-17 03:00:00	1990-05-19 05:00:00	2	7.6	18.8	3.1
1990	1990-05-20 12:00:00	1990-05-21 01:00:00	13	2.2	12.6	2.1
1990	1990-05-24 13:00:00	1990-05-24 15:00:00	2	0.4	0.6	0.1
1990	1990-06-02 07:00:00	1990-06-02 08:00:00	1	0.3	0.3	0.0
1990	1990-06-03 06:00:00	1990-06-04 06:00:00	0	2.4	7.8	1.3
1990	1990-06-06 06:00:00	1990-06-06 07:00:00	1	0.6	0.6	0.1
1990	1990-06-09 17:00:00	1990-06-09 18:00:00	1	1.3	1.3	0.2
1990	1990-06-10 10:00:00	1990-06-10 20:00:00	10	1	2.4	0.4
1990	1990-06-14 16:00:00	1990-06-14 19:00:00	3	0.2	0.4	0.1
1990	1990-06-15 15:00:00	1990-06-15 16:00:00	1	0.4	0.4	0.1
1990	1990-06-19 21:00:00	1990-06-19 23:00:00	2	0.4	0.6	0.1
1990	1990-06-21 11:00:00	1990-06-21 15:00:00	4	3.2	7.4	1.2
1990	1990-06-23 02:00:00	1990-06-24 05:00:00	3	6.7	11	1.8
1990	1990-06-27 02:00:00	1990-06-27 04:00:00	2	1.2	1.8	0.3
1990	1990-06-29 09:00:00	1990-06-29 18:00:00	9	1.6	3.2	0.5
1990	1990-06-30 17:00:00	1990-07-01 22:00:00	5	1.1	2.8	0.5
1990	1990-07-04 09:00:00	1990-07-04 23:00:00	14	0.3	0.7	0.1
1990	1990-07-08 17:00:00	1990-07-08 23:00:00	6	3	7.6	1.3
1990	1990-07-15 10:00:00	1990-07-16 02:00:00	16	4.2	7.5	1.2
1990	1990-07-20 01:00:00	1990-07-20 14:00:00	13	20.6	54	9.0
1990	1990-07-21 18:00:00	1990-07-22 00:00:00	6	1.8	5	0.8
1990	1990-07-22 23:00:00	1990-07-23 13:00:00	14	9	25	4.1

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1990	1990-07-30 22:00:00	1990-07-31 06:00:00	8	5.7	12.6	2.1
1990	1990-08-05 06:00:00	1990-08-07 00:00:00	18	9.2	50.4	8.4
1990	1990-08-13 03:00:00	1990-08-13 16:00:00	13	2	19.6	3.2
1990	1990-08-15 12:00:00	1990-08-16 04:00:00	16	2.2	3	0.5
1990	1990-08-18 14:00:00	1990-08-18 17:00:00	3	11.1	22.5	3.7
1990	1990-08-27 07:00:00	1990-08-27 12:00:00	5	1.2	1.8	0.3
1990	1990-08-28 17:00:00	1990-08-29 03:00:00	10	14.6	37.6	6.2
1990	1990-09-04 19:00:00	1990-09-05 10:00:00	15	0.6	1.8	0.3
1990	1990-09-06 22:00:00	1990-09-07 10:00:00	12	1.4	2.2	0.4
1990	1990-09-10 08:00:00	1990-09-10 23:00:00	15	4.6	9.2	1.5
1990	1990-09-15 00:00:00	1990-09-15 14:00:00	14	2.7	5	0.8
1990	1990-09-19 14:00:00	1990-09-20 06:00:00	16	2.2	6.6	1.1
1990	1990-09-21 22:00:00	1990-09-22 22:00:00	0	3.2	17	2.8
1990	1990-09-23 13:00:00	1990-09-23 22:00:00	9	1.9	5.6	0.9
1990	1990-09-24 14:00:00	1990-09-25 11:00:00	21	0.7	3.2	0.5
1990	1990-09-26 00:00:00	1990-09-26 10:00:00	10	0.6	1.2	0.2
1990	1990-09-29 03:00:00	1990-09-29 14:00:00	11	6.2	16.2	2.7
1990	1990-09-30 04:00:00	1990-09-30 16:00:00	12	8.3	35.2	5.8
1990	1990-10-01 16:00:00	1990-10-02 06:00:00	14	1.3	4.9	0.8
1990	1990-10-04 07:00:00	1990-10-04 15:00:00	8	3.5	7.2	1.2
1990	1990-10-05 04:00:00	1990-10-05 05:00:00	1	0.2	0.2	0.0
1990	1990-10-05 18:00:00	1990-10-05 19:00:00	1	0.2	0.2	0.0
1990	1990-10-08 02:00:00	1990-10-08 05:00:00	3	0.2	0.4	0.1
1990	1990-10-09 05:00:00	1990-10-10 10:00:00	5	3.3	22.8	3.8
1990	1990-10-11 04:00:00	1990-10-11 20:00:00	16	3	9.2	1.5
1990	1990-10-12 14:00:00	1990-10-13 15:00:00	1	2.6	17.2	2.9
1990	1990-10-15 04:00:00	1990-10-15 12:00:00	8	1.2	1.4	0.2
1990	1990-10-17 08:00:00	1990-10-17 12:00:00	4	2.6	3.4	0.6
1990	1990-10-18 11:00:00	1990-10-19 05:00:00	18	3.6	14.4	2.4
1990	1990-10-25 07:00:00	1990-10-25 16:00:00	9	0.6	2	0.3
1990	1990-10-28 02:00:00	1990-10-28 19:00:00	17	2.6	11.2	1.9
1991	1991-04-05 04:00:00	1991-04-05 12:00:00	8	0.6	2.3	0.5
1991	1991-04-06 00:00:00	1991-04-06 16:00:00	16	0.4	1.6	0.3
1991	1991-04-08 07:00:00	1991-04-10 07:00:00	0	11.3	51.6	10.7
1991	1991-04-15 03:00:00	1991-04-16 06:00:00	3	3	15.6	3.2
1991	1991-04-17 14:00:00	1991-04-17 21:00:00	7	0.3	0.7	0.1
1991	1991-04-20 02:00:00	1991-04-20 22:00:00	20	1.6	13.8	2.9
1991	1991-04-21 13:00:00	1991-04-23 05:00:00	16	4.8	43.4	9.0
1991	1991-04-30 04:00:00	1991-04-30 11:00:00	7	0.4	1.4	0.3
1991	1991-05-01 17:00:00	1991-05-01 21:00:00	4	6	7.6	1.6
1991	1991-05-02 10:00:00	1991-05-03 01:00:00	15	0.5	1.1	0.2
1991	1991-05-06 04:00:00	1991-05-07 15:00:00	11	2.3	8.6	1.8
1991	1991-05-17 02:00:00	1991-05-17 17:00:00	15	5.6	28	5.8
1991	1991-05-24 18:00:00	1991-05-24 20:00:00	2	3.3	4.4	0.9
1991	1991-05-25 08:00:00	1991-05-25 09:00:00	1	0.6	0.6	0.1

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1991	1991-05-26 11:00:00	1991-05-27 08:00:00	21	4.6	19.4	4.0
1991	1991-05-30 10:00:00	1991-05-30 11:00:00	1	0.8	0.8	0.2
1991	1991-05-31 09:00:00	1991-05-31 11:00:00	2	0.5	1	0.2
1991	1991-06-04 12:00:00	1991-06-04 13:00:00	1	0.4	0.4	0.1
1991	1991-06-05 13:00:00	1991-06-05 18:00:00	5	0.4	0.8	0.2
1991	1991-06-12 08:00:00	1991-06-12 13:00:00	5	0.3	0.6	0.1
1991	1991-06-15 09:00:00	1991-06-15 10:00:00	1	0.6	0.6	0.1
1991	1991-06-16 03:00:00	1991-06-17 00:00:00	21	3.7	10	2.1
1991	1991-06-29 10:00:00	1991-06-29 12:00:00	2	1.2	1.4	0.3
1991	1991-07-04 21:00:00	1991-07-05 19:00:00	22	4.3	11.8	2.4
1991	1991-07-08 05:00:00	1991-07-08 09:00:00	4	3.3	6.8	1.4
1991	1991-07-13 15:00:00	1991-07-13 19:00:00	4	0.6	1.4	0.3
1991	1991-07-17 13:00:00	1991-07-17 16:00:00	3	4.1	5.5	1.1
1991	1991-07-21 04:00:00	1991-07-21 08:00:00	4	3.4	7	1.5
1991	1991-07-22 21:00:00	1991-07-23 01:00:00	4	6.6	12.6	2.6
1991	1991-07-25 12:00:00	1991-07-25 16:00:00	4	1.8	2.8	0.6
1991	1991-07-30 21:00:00	1991-07-31 00:00:00	3	0.8	1	0.2
1991	1991-08-01 01:00:00	1991-08-01 03:00:00	2	0.3	0.6	0.1
1991	1991-08-04 03:00:00	1991-08-05 03:00:00	0	5.8	24.4	5.1
1991	1991-08-05 23:00:00	1991-08-06 00:00:00	1	0.4	0.4	0.1
1991	1991-08-09 13:00:00	1991-08-10 08:00:00	19	1.9	9	1.9
1991	1991-08-11 16:00:00	1991-08-11 17:00:00	1	0.6	0.6	0.1
1991	1991-08-16 14:00:00	1991-08-16 23:00:00	9	1.4	3.8	0.8
1991	1991-08-17 20:00:00	1991-08-18 01:00:00	5	4.4	8.2	1.7
1991	1991-08-21 08:00:00	1991-08-22 18:00:00	10	3.6	9.6	2.0
1991	1991-08-30 16:00:00	1991-08-30 22:00:00	6	5.8	7	1.5
1991	1991-09-04 00:00:00	1991-09-04 05:00:00	5	2.8	7	1.5
1991	1991-09-10 06:00:00	1991-09-10 20:00:00	14	4.8	10	2.1
1991	1991-09-13 21:00:00	1991-09-14 01:00:00	4	0.8	1.8	0.4
1991	1991-09-15 04:00:00	1991-09-15 13:00:00	9	3.6	11.6	2.4
1991	1991-09-16 19:00:00	1991-09-16 20:00:00	1	2	2	0.4
1991	1991-09-19 00:00:00	1991-09-19 01:00:00	1	0.2	0.2	0.0
1991	1991-09-23 02:00:00	1991-09-23 13:00:00	11	3	4.6	1.0
1991	1991-09-25 00:00:00	1991-09-25 13:00:00	13	1.6	8.6	1.8
1991	1991-09-26 06:00:00	1991-09-26 17:00:00	11	4.1	6.4	1.3
1991	1991-09-27 11:00:00	1991-09-28 05:00:00	18	1.2	2.8	0.6
1991	1991-09-29 04:00:00	1991-09-29 09:00:00	5	2.2	5.8	1.2
1991	1991-09-30 21:00:00	1991-10-01 06:00:00	9	2.2	4.6	1.0
1991	1991-10-02 02:00:00	1991-10-03 15:00:00	13	3.8	18.4	3.8
1991	1991-10-04 19:00:00	1991-10-05 03:00:00	8	1.3	3.6	0.7
1991	1991-10-05 18:00:00	1991-10-06 15:00:00	21	3.4	8.4	1.7
1991	1991-10-08 07:00:00	1991-10-08 08:00:00	1	0.5	0.5	0.1
1991	1991-10-10 07:00:00	1991-10-10 14:00:00	7	3.3	12.6	2.6
1991	1991-10-15 05:00:00	1991-10-16 02:00:00	21	4.3	30.6	6.3
1991	1991-10-19 06:00:00	1991-10-19 13:00:00	7	2.7	6.4	1.3

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Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1991	1991-10-21 15:00:00	1991-10-21 23:00:00	8	0.3	0.9	0.2
1991	1991-10-24 22:00:00	1991-10-25 00:00:00	2	2.4	3.6	0.7
1991	1991-10-25 18:00:00	1991-10-26 01:00:00	7	1.2	2.4	0.5
1991	1991-10-26 21:00:00	1991-10-26 23:00:00	2	0.4	0.6	0.1
1991	1991-10-27 12:00:00	1991-10-27 14:00:00	2	0.4	0.6	0.1
1992	1992-04-01 11:00:00	1992-04-01 14:00:00	3	0.6	1	0.2
1992	1992-04-07 03:00:00	1992-04-07 13:00:00	10	1.1	2.4	0.4
1992	1992-04-08 03:00:00	1992-04-08 04:00:00	1	0.2	0.2	0.0
1992	1992-04-16 16:00:00	1992-04-17 00:00:00	8	1.9	6.8	1.2
1992	1992-04-20 19:00:00	1992-04-20 20:00:00	1	0.2	0.2	0.0
1992	1992-04-21 17:00:00	1992-04-22 05:00:00	12	1.5	8	1.4
1992	1992-04-23 01:00:00	1992-04-23 07:00:00	6	0.2	0.4	0.1
1992	1992-04-30 06:00:00	1992-04-30 12:00:00	6	1.4	3.4	0.6
1992	1992-05-01 16:00:00	1992-05-01 23:00:00	7	4.7	10	1.8
1992	1992-05-02 13:00:00	1992-05-02 23:00:00	10	1.8	4.6	0.8
1992	1992-05-03 15:00:00	1992-05-03 16:00:00	1	0.2	0.2	0.0
1992	1992-05-05 12:00:00	1992-05-05 14:00:00	2	0.2	0.4	0.1
1992	1992-05-09 07:00:00	1992-05-09 08:00:00	1	1.6	1.6	0.3
1992	1992-05-13 13:00:00	1992-05-13 17:00:00	4	2	2.8	0.5
1992	1992-05-16 00:00:00	1992-05-16 01:00:00	1	0.2	0.2	0.0
1992	1992-05-17 18:00:00	1992-05-17 22:00:00	4	12.9	18.6	3.4
1992	1992-05-23 14:00:00	1992-05-23 23:00:00	9	3.8	8	1.4
1992	1992-05-27 15:00:00	1992-05-27 16:00:00	1	0.2	0.2	0.0
1992	1992-05-30 23:00:00	1992-06-01 15:00:00	16	4.2	19.2	3.5
1992	1992-06-05 14:00:00	1992-06-06 20:00:00	6	1.7	10.6	1.9
1992	1992-06-07 14:00:00	1992-06-07 15:00:00	1	0.8	0.8	0.1
1992	1992-06-13 03:00:00	1992-06-13 08:00:00	5	6.2	7.4	1.3
1992	1992-06-19 15:00:00	1992-06-20 05:00:00	14	4.1	19.4	3.5
1992	1992-06-21 14:00:00	1992-06-22 04:00:00	14	0.9	3.8	0.7
1992	1992-06-24 09:00:00	1992-06-24 19:00:00	10	1.1	3.8	0.7
1992	1992-06-29 21:00:00	1992-06-30 07:00:00	10	3.7	9.6	1.7
1992	1992-07-03 08:00:00	1992-07-04 05:00:00	21	7.2	24.7	4.5
1992	1992-07-04 23:00:00	1992-07-05 20:00:00	21	2	6.6	1.2
1992	1992-07-06 14:00:00	1992-07-06 17:00:00	3	0.6	1.4	0.3
1992	1992-07-08 18:00:00	1992-07-09 03:00:00	9	8.4	19.4	3.5
1992	1992-07-10 18:00:00	1992-07-10 21:00:00	3	0.6	1	0.2
1992	1992-07-12 16:00:00	1992-07-13 04:00:00	12	6.5	27.6	5.0
1992	1992-07-14 05:00:00	1992-07-14 13:00:00	8	1.4	2.2	0.4
1992	1992-07-17 03:00:00	1992-07-17 21:00:00	18	23.6	54.2	9.8
1992	1992-07-19 02:00:00	1992-07-19 07:00:00	5	12.4	19.4	3.5
1992	1992-07-20 08:00:00	1992-07-20 11:00:00	3	1	1.6	0.3
1992	1992-07-31 12:00:00	1992-08-01 07:00:00	19	8.4	29	5.3
1992	1992-08-01 22:00:00	1992-08-02 23:00:00	1	2.8	7.6	1.4
1992	1992-08-04 09:00:00	1992-08-04 21:00:00	12	31.5	46.5	8.4
1992	1992-08-08 18:00:00	1992-08-09 11:00:00	17	3.7	7.9	1.4

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Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1992	1992-08-10 20:00:00	1992-08-11 00:00:00	4	1	2.8	0.5
1992	1992-08-16 22:00:00	1992-08-16 23:00:00	1	0.6	0.6	0.1
1992	1992-08-19 00:00:00	1992-08-19 16:00:00	16	0.4	0.8	0.1
1992	1992-08-26 16:00:00	1992-08-27 05:00:00	13	2.4	3.5	0.6
1992	1992-08-27 18:00:00	1992-08-29 15:00:00	21	6.1	27	4.9
1992	1992-08-30 08:00:00	1992-08-30 21:00:00	13	2.4	4.2	0.8
1992	1992-09-03 07:00:00	1992-09-03 14:00:00	7	10.8	16.4	3.0
1992	1992-09-04 02:00:00	1992-09-04 03:00:00	1	0.2	0.2	0.0
1992	1992-09-08 13:00:00	1992-09-08 17:00:00	4	5	7.2	1.3
1992	1992-09-10 05:00:00	1992-09-10 16:00:00	11	0.2	0.4	0.1
1992	1992-09-17 10:00:00	1992-09-17 13:00:00	3	0.7	1.4	0.3
1992	1992-09-18 02:00:00	1992-09-18 03:00:00	1	0.4	0.4	0.1
1992	1992-09-18 16:00:00	1992-09-18 22:00:00	6	5.9	15.8	2.9
1992	1992-09-21 14:00:00	1992-09-22 15:00:00	1	12.3	28.6	5.2
1992	1992-09-26 16:00:00	1992-09-27 14:00:00	22	1	5.6	1.0
1992	1992-09-29 10:00:00	1992-09-29 11:00:00	1	0.4	0.4	0.1
1992	1992-10-01 00:00:00	1992-10-01 01:00:00	1	0.2	0.2	0.0
1992	1992-10-09 10:00:00	1992-10-09 17:00:00	7	1.4	4.2	0.8
1992	1992-10-11 01:00:00	1992-10-13 01:00:00	0	5.2	13.8	2.5
1992	1992-10-16 10:00:00	1992-10-16 19:00:00	9	3.9	12	2.2
1992	1992-10-19 03:00:00	1992-10-19 18:00:00	15	0.7	5.8	1.1
1992	1992-10-23 05:00:00	1992-10-23 06:00:00	1	0.2	0.2	0.0
1992	1992-10-23 19:00:00	1992-10-24 05:00:00	10	2.6	7.2	1.3
1992	1992-10-26 15:00:00	1992-10-26 17:00:00	2	0.3	0.6	0.1
1993	1993-04-10 05:00:00	1993-04-11 05:00:00	0	3.2	29.2	5.2
1993	1993-04-16 08:00:00	1993-04-16 12:00:00	4	0.4	0.8	0.1
1993	1993-04-17 04:00:00	1993-04-17 23:00:00	19	2.1	8.6	1.5
1993	1993-04-19 02:00:00	1993-04-19 19:00:00	17	0.5	1.4	0.3
1993	1993-04-20 23:00:00	1993-04-21 13:00:00	14	0.9	3.2	0.6
1993	1993-04-22 10:00:00	1993-04-22 15:00:00	5	2.5	7.6	1.4
1993	1993-04-24 21:00:00	1993-04-25 16:00:00	19	5.9	17	3.1
1993	1993-04-28 07:00:00	1993-04-28 12:00:00	5	2.6	2.8	0.5
1993	1993-04-30 03:00:00	1993-04-30 15:00:00	12	0.6	1.4	0.3
1993	1993-05-05 18:00:00	1993-05-06 00:00:00	6	3.1	6.9	1.2
1993	1993-05-06 13:00:00	1993-05-06 15:00:00	2	3.4	4.6	0.8
1993	1993-05-12 18:00:00	1993-05-12 20:00:00	2	0.6	0.8	0.1
1993	1993-05-14 19:00:00	1993-05-15 06:00:00	11	2	4.6	0.8
1993	1993-05-15 20:00:00	1993-05-15 21:00:00	1	1	1	0.2
1993	1993-05-19 03:00:00	1993-05-19 15:00:00	12	1	1.8	0.3
1993	1993-05-21 14:00:00	1993-05-21 16:00:00	2	1	1.2	0.2
1993	1993-05-24 03:00:00	1993-05-24 11:00:00	8	3.8	22	4.0
1993	1993-05-24 23:00:00	1993-05-26 03:00:00	4	2.8	5	0.9
1993	1993-05-26 18:00:00	1993-05-26 20:00:00	2	0.2	0.4	0.1
1993	1993-05-28 03:00:00	1993-05-28 10:00:00	7	1.4	4.6	0.8
1993	1993-05-29 04:00:00	1993-05-29 05:00:00	1	0.2	0.2	0.0

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1993	1993-05-31 08:00:00	1993-06-01 18:00:00	10	5.8	36.6	6.6
1993	1993-06-05 16:00:00	1993-06-06 09:00:00	17	1.1	6.4	1.1
1993	1993-06-09 20:00:00	1993-06-10 01:00:00	5	8.6	9	1.6
1993	1993-06-15 04:00:00	1993-06-15 20:00:00	16	5.7	24.2	4.3
1993	1993-06-18 09:00:00	1993-06-19 02:00:00	17	2.1	8.6	1.5
1993	1993-06-20 13:00:00	1993-06-21 17:00:00	4	9.6	24	4.3
1993	1993-06-22 06:00:00	1993-06-22 08:00:00	2	3.2	5.2	0.9
1993	1993-06-26 03:00:00	1993-06-26 08:00:00	5	3.6	8.2	1.5
1993	1993-06-27 17:00:00	1993-06-27 21:00:00	4	2.3	3.1	0.6
1993	1993-07-03 08:00:00	1993-07-03 10:00:00	2	12.6	13.2	2.4
1993	1993-07-06 18:00:00	1993-07-06 20:00:00	2	4.8	5.2	0.9
1993	1993-07-08 07:00:00	1993-07-08 17:00:00	10	5.7	8.4	1.5
1993	1993-07-10 00:00:00	1993-07-10 01:00:00	1	3.2	3.2	0.6
1993	1993-07-12 02:00:00	1993-07-12 04:00:00	2	3	3.2	0.6
1993	1993-07-14 13:00:00	1993-07-14 14:00:00	1	0.2	0.2	0.0
1993	1993-07-15 19:00:00	1993-07-15 20:00:00	1	0.2	0.2	0.0
1993	1993-07-20 16:00:00	1993-07-20 17:00:00	1	3.7	3.7	0.7
1993	1993-07-21 06:00:00	1993-07-21 07:00:00	1	0.4	0.4	0.1
1993	1993-07-26 11:00:00	1993-07-27 15:00:00	4	6.1	25.7	4.6
1993	1993-07-29 01:00:00	1993-07-29 05:00:00	4	1.7	2.1	0.4
1993	1993-07-30 01:00:00	1993-07-30 02:00:00	1	0.2	0.2	0.0
1993	1993-08-02 03:00:00	1993-08-02 04:00:00	1	3.6	3.6	0.6
1993	1993-08-02 17:00:00	1993-08-02 18:00:00	1	5	5	0.9
1993	1993-08-04 02:00:00	1993-08-04 06:00:00	4	1.9	4.4	0.8
1993	1993-08-08 18:00:00	1993-08-08 20:00:00	2	0.6	0.8	0.1
1993	1993-08-10 14:00:00	1993-08-10 15:00:00	1	0.2	0.2	0.0
1993	1993-08-11 22:00:00	1993-08-12 01:00:00	3	1.4	2.2	0.4
1993	1993-08-12 20:00:00	1993-08-12 21:00:00	1	1.2	1.2	0.2
1993	1993-08-14 16:00:00	1993-08-14 17:00:00	1	0.4	0.4	0.1
1993	1993-08-16 16:00:00	1993-08-16 17:00:00	1	0.4	0.4	0.1
1993	1993-08-20 08:00:00	1993-08-20 20:00:00	12	2.3	6.2	1.1
1993	1993-08-24 02:00:00	1993-08-24 14:00:00	12	4.4	11.2	2.0
1993	1993-08-27 15:00:00	1993-08-28 03:00:00	12	3.9	12.2	2.2
1993	1993-08-31 05:00:00	1993-08-31 19:00:00	14	0.8	2.2	0.4
1993	1993-09-02 19:00:00	1993-09-03 23:00:00	4	8.7	25.6	4.6
1993	1993-09-06 12:00:00	1993-09-06 19:00:00	7	0.9	3.4	0.6
1993	1993-09-08 18:00:00	1993-09-08 22:00:00	4	3.6	4.4	0.8
1993	1993-09-09 11:00:00	1993-09-10 17:00:00	6	3.1	10.2	1.8
1993	1993-09-15 07:00:00	1993-09-15 12:00:00	5	1.6	3.7	0.7
1993	1993-09-17 08:00:00	1993-09-17 22:00:00	14	1.1	4.2	0.8
1993	1993-09-23 06:00:00	1993-09-23 11:00:00	5	4.5	13.3	2.4
1993	1993-09-26 04:00:00	1993-09-26 17:00:00	13	4.1	9.9	1.8
1993	1993-09-27 14:00:00	1993-09-28 06:00:00	16	5.1	16.2	2.9
1993	1993-09-29 01:00:00	1993-09-29 03:00:00	2	0.4	0.6	0.1
1993	1993-10-01 21:00:00	1993-10-02 16:00:00	19	2.8	12.8	2.3

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1993	1993-10-03 19:00:00	1993-10-04 10:00:00	15	3.2	10.8	1.9
1993	1993-10-07 18:00:00	1993-10-08 18:00:00	0	2.9	7.8	1.4
1993	1993-10-09 09:00:00	1993-10-09 14:00:00	5	2.2	7.9	1.4
1993	1993-10-12 18:00:00	1993-10-12 20:00:00	2	1.6	2.8	0.5
1993	1993-10-16 15:00:00	1993-10-18 02:00:00	11	2.6	32.4	5.8
1993	1993-10-20 23:00:00	1993-10-21 07:00:00	8	5	21.8	3.9
1993	1993-10-27 08:00:00	1993-10-27 17:00:00	9	0.6	2	0.4
1993	1993-10-29 00:00:00	1993-10-29 01:00:00	1	0.2	0.2	0.0
1993	1993-10-29 14:00:00	1993-10-29 15:00:00	1	0.6	0.6	0.1
1994	1994-04-02 20:00:00	1994-04-02 23:00:00	3	3.8	5.6	1.1
1994	1994-04-05 04:00:00	1994-04-05 06:00:00	2	0.6	1.2	0.2
1994	1994-04-13 01:00:00	1994-04-14 02:00:00	1	4.3	20.8	4.0
1994	1994-04-16 04:00:00	1994-04-16 09:00:00	5	6.1	16.7	3.2
1994	1994-04-16 21:00:00	1994-04-16 22:00:00	1	0.2	0.2	0.0
1994	1994-04-19 00:00:00	1994-04-19 01:00:00	1	0.2	0.2	0.0
1994	1994-04-25 15:00:00	1994-04-27 15:00:00	0	5.3	17.9	3.5
1994	1994-04-30 22:00:00	1994-05-01 14:00:00	16	1.8	8.5	1.7
1994	1994-05-06 06:00:00	1994-05-06 15:00:00	9	0.7	1.9	0.4
1994	1994-05-09 12:00:00	1994-05-09 14:00:00	2	0.8	1.2	0.2
1994	1994-05-10 15:00:00	1994-05-10 16:00:00	1	0.2	0.2	0.0
1994	1994-05-11 14:00:00	1994-05-12 06:00:00	16	1.6	5	1.0
1994	1994-05-15 13:00:00	1994-05-16 07:00:00	18	8.7	18	3.5
1994	1994-05-16 21:00:00	1994-05-17 06:00:00	9	0.8	3.6	0.7
1994	1994-05-18 01:00:00	1994-05-18 03:00:00	2	0.4	0.6	0.1
1994	1994-05-18 17:00:00	1994-05-18 22:00:00	5	0.4	1.2	0.2
1994	1994-05-24 23:00:00	1994-05-26 22:00:00	23	7.2	25.1	4.9
1994	1994-05-28 07:00:00	1994-05-28 17:00:00	10	1.8	2.9	0.6
1994	1994-05-29 17:00:00	1994-05-30 09:00:00	16	2	6.1	1.2
1994	1994-05-31 15:00:00	1994-05-31 17:00:00	2	5.6	7.8	1.5
1994	1994-06-01 10:00:00	1994-06-01 11:00:00	1	0.6	0.6	0.1
1994	1994-06-02 02:00:00	1994-06-02 06:00:00	4	1.6	2.7	0.5
1994	1994-06-06 14:00:00	1994-06-07 02:00:00	12	8.7	33.3	6.5
1994	1994-06-07 17:00:00	1994-06-07 18:00:00	1	1.1	1.1	0.2
1994	1994-06-12 13:00:00	1994-06-12 18:00:00	5	2.8	3.4	0.7
1994	1994-06-13 16:00:00	1994-06-14 02:00:00	10	3.2	7	1.4
1994	1994-06-22 18:00:00	1994-06-22 21:00:00	3	4	5	1.0
1994	1994-06-24 23:00:00	1994-06-25 17:00:00	18	13.5	42.9	8.3
1994	1994-06-27 05:00:00	1994-06-28 07:00:00	2	9.9	42.7	8.3
1994	1994-06-29 12:00:00	1994-06-29 14:00:00	2	22.6	23.8	4.6
1994	1994-06-30 14:00:00	1994-06-30 15:00:00	1	2.8	2.8	0.5
1994	1994-07-02 08:00:00	1994-07-02 12:00:00	4	14.1	26.1	5.1
1994	1994-07-05 10:00:00	1994-07-05 11:00:00	1	0.6	0.6	0.1
1994	1994-07-08 23:00:00	1994-07-09 01:00:00	2	8.2	11.2	2.2
1994	1994-07-10 11:00:00	1994-07-10 12:00:00	1	1.8	1.8	0.3
1994	1994-07-12 07:00:00	1994-07-12 09:00:00	2	0.8	1	0.2

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1994	1994-07-15 23:00:00	1994-07-16 01:00:00	2	3.1	4	0.8
1994	1994-07-21 15:00:00	1994-07-21 16:00:00	1	0.2	0.2	0.0
1994	1994-07-22 08:00:00	1994-07-22 15:00:00	7	3.1	6.6	1.3
1994	1994-08-04 14:00:00	1994-08-04 21:00:00	7	11.4	24.4	4.7
1994	1994-08-13 13:00:00	1994-08-13 14:00:00	1	0.2	0.2	0.0
1994	1994-08-14 16:00:00	1994-08-14 18:00:00	2	1.2	1.4	0.3
1994	1994-08-20 08:00:00	1994-08-20 09:00:00	1	1.5	1.5	0.3
1994	1994-08-20 23:00:00	1994-08-21 15:00:00	16	14.3	24.4	4.7
1994	1994-08-25 03:00:00	1994-08-25 07:00:00	4	5.4	5.8	1.1
1994	1994-08-26 20:00:00	1994-08-26 22:00:00	2	3.2	6	1.2
1994	1994-08-28 05:00:00	1994-08-28 16:00:00	11	19.2	23.8	4.6
1994	1994-08-31 01:00:00	1994-09-01 04:00:00	3	1.9	12	2.3
1994	1994-09-07 08:00:00	1994-09-07 15:00:00	7	0.6	0.8	0.2
1994	1994-09-13 14:00:00	1994-09-13 22:00:00	8	2.8	10.3	2.0
1994	1994-09-16 03:00:00	1994-09-16 06:00:00	3	1.6	2.4	0.5
1994	1994-09-16 23:00:00	1994-09-17 14:00:00	15	3.1	6.9	1.3
1994	1994-09-18 09:00:00	1994-09-18 19:00:00	10	0.4	0.6	0.1
1994	1994-09-25 12:00:00	1994-09-25 13:00:00	1	0.4	0.4	0.1
1994	1994-09-26 06:00:00	1994-09-29 20:00:00	14	7.3	32.1	6.2
1995	1995-04-03 16:00:00	1995-04-03 20:00:00	4	1.9	3.8	0.9
1995	1995-04-04 08:00:00	1995-04-04 13:00:00	5	2.1	2.9	0.7
1995	1995-04-12 11:00:00	1995-04-12 23:00:00	12	2.7	14.6	3.5
1995	1995-04-13 12:00:00	1995-04-13 13:00:00	1	0.2	0.2	0.0
1995	1995-04-19 01:00:00	1995-04-19 05:00:00	4	0.9	2.5	0.6
1995	1995-04-21 13:00:00	1995-04-22 01:00:00	12	3	6.8	1.6
1995	1995-04-27 13:00:00	1995-04-28 01:00:00	12	2.2	6.5	1.6
1995	1995-04-29 20:00:00	1995-04-29 21:00:00	1	0.2	0.2	0.0
1995	1995-05-05 22:00:00	1995-05-06 00:00:00	2	0.4	0.6	0.1
1995	1995-05-10 08:00:00	1995-05-10 09:00:00	1	0.6	0.6	0.1
1995	1995-05-11 03:00:00	1995-05-11 20:00:00	17	2.3	17.1	4.1
1995	1995-05-12 19:00:00	1995-05-12 20:00:00	1	1	1	0.2
1995	1995-05-14 13:00:00	1995-05-15 05:00:00	16	5.2	14.3	3.4
1995	1995-05-17 07:00:00	1995-05-17 16:00:00	9	4	10.8	2.6
1995	1995-05-21 00:00:00	1995-05-21 01:00:00	1	0.2	0.2	0.0
1995	1995-05-21 16:00:00	1995-05-21 17:00:00	1	0.4	0.4	0.1
1995	1995-05-23 19:00:00	1995-05-24 04:00:00	9	1.4	5	1.2
1995	1995-05-28 14:00:00	1995-05-29 14:00:00	0	4.5	23.4	5.6
1995	1995-06-02 20:00:00	1995-06-03 17:00:00	21	16.9	79.4	19.1
1995	1995-06-07 16:00:00	1995-06-08 04:00:00	12	11.7	14.1	3.4
1995	1995-06-10 23:00:00	1995-06-11 04:00:00	5	5.4	8.4	2.0
1995	1995-07-01 14:00:00	1995-07-01 16:00:00	2	2	2.8	0.7
1995	1995-07-06 13:00:00	1995-07-07 04:00:00	15	1.8	2.8	0.7
1995	1995-07-08 05:00:00	1995-07-08 07:00:00	2	1.1	1.6	0.4
1995	1995-07-09 11:00:00	1995-07-09 18:00:00	7	1	2	0.5
1995	1995-07-10 21:00:00	1995-07-11 02:00:00	5	3.6	4.7	1.1

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Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1995	1995-10-03 23:00:00	1995-10-04 03:00:00	4	1.8	3.6	0.9
1995	1995-10-05 21:00:00	1995-10-07 07:00:00	10	13.8	106.2	25.6
1995	1995-10-10 23:00:00	1995-10-11 01:00:00	2	1.6	1.8	0.4
1995	1995-10-14 13:00:00	1995-10-15 00:00:00	11	3	10.9	2.6
1995	1995-10-16 03:00:00	1995-10-16 04:00:00	1	0.8	0.8	0.2
1995	1995-10-21 02:00:00	1995-10-21 23:00:00	21	9.3	58.9	14.2
1995	1995-10-24 12:00:00	1995-10-24 15:00:00	3	3.3	4.2	1.0
1995	1995-10-27 13:00:00	1995-10-27 17:00:00	4	0.5	1.5	0.4
1995	1995-10-29 00:00:00	1995-10-29 01:00:00	1	0.2	0.2	0.0
1996	1996-04-12 01:00:00	1996-04-12 05:00:00	4	0.6	1.4	0.3
1996	1996-04-15 19:00:00	1996-04-17 07:00:00	12	2.1	14.5	3.4
1996	1996-04-19 13:00:00	1996-04-19 16:00:00	3	1	1.4	0.3
1996	1996-04-20 07:00:00	1996-04-20 22:00:00	15	12.6	23.8	5.6
1996	1996-04-22 14:00:00	1996-04-22 21:00:00	7	4.3	9.4	2.2
1996	1996-04-23 14:00:00	1996-04-23 22:00:00	8	1.4	6.8	1.6
1996	1996-04-25 13:00:00	1996-04-25 20:00:00	7	2	8.6	2.0
1996	1996-04-30 11:00:00	1996-04-30 18:00:00	7	2.5	6.3	1.5
1996	1996-05-01 12:00:00	1996-05-02 01:00:00	13	0.6	2.4	0.6
1996	1996-05-02 20:00:00	1996-05-02 21:00:00	1	0.2	0.2	0.0
1996	1996-05-09 08:00:00	1996-05-09 10:00:00	2	0.4	0.8	0.2
1996	1996-05-18 17:00:00	1996-05-18 19:00:00	2	6.2	9	2.1
1996	1996-05-20 00:00:00	1996-05-20 02:00:00	2	4.4	7.4	1.7
1996	1996-05-20 15:00:00	1996-05-20 16:00:00	1	1.6	1.6	0.4
1996	1996-05-28 18:00:00	1996-05-28 19:00:00	1	0.2	0.2	0.0
1996	1996-06-05 02:00:00	1996-06-05 18:00:00	16	2.1	5.6	1.3
1996	1996-06-07 00:00:00	1996-06-07 15:00:00	15	4.6	13.6	3.2
1996	1996-06-08 11:00:00	1996-06-08 12:00:00	1	1	1	0.2
1996	1996-06-09 22:00:00	1996-06-10 09:00:00	11	9.2	10	2.3
1996	1996-06-13 12:00:00	1996-06-13 14:00:00	2	6	6.4	1.5
1996	1996-06-22 06:00:00	1996-06-22 21:00:00	15	4.2	11.4	2.7
1996	1996-06-25 01:00:00	1996-06-25 18:00:00	17	1.7	4.8	1.1
1996	1996-06-27 10:00:00	1996-06-27 14:00:00	4	3	5.6	1.3
1996	1996-06-28 20:00:00	1996-06-28 21:00:00	1	0.2	0.2	0.0
1996	1996-06-29 15:00:00	1996-06-30 09:00:00	18	3.8	8.9	2.1
1996	1996-07-03 16:00:00	1996-07-03 17:00:00	1	0.3	0.3	0.1
1996	1996-07-07 19:00:00	1996-07-07 23:00:00	4	0.3	0.9	0.2
1996	1996-07-08 23:00:00	1996-07-09 01:00:00	2	0.6	1	0.2
1996	1996-07-13 00:00:00	1996-07-13 01:00:00	1	1.6	1.6	0.4
1996	1996-07-14 05:00:00	1996-07-14 07:00:00	2	2.6	2.8	0.7
1996	1996-07-15 07:00:00	1996-07-15 15:00:00	8	2.3	5.7	1.3
1996	1996-07-16 11:00:00	1996-07-16 15:00:00	4	7.3	11.6	2.7
1996	1996-07-19 02:00:00	1996-07-19 13:00:00	11	6.7	16.7	3.9
1996	1996-07-23 15:00:00	1996-07-23 19:00:00	4	3.9	6.9	1.6
1996	1996-07-25 13:00:00	1996-07-25 19:00:00	6	7.2	11.7	2.7
1996	1996-07-30 07:00:00	1996-07-31 23:00:00	16	18.5	47.5	11.1

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Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1996	1996-08-01 12:00:00	1996-08-01 18:00:00	6	1	2.8	0.7
1996	1996-08-08 14:00:00	1996-08-08 19:00:00	5	13.9	24.6	5.8
1996	1996-08-16 02:00:00	1996-08-16 05:00:00	3	4.8	7.5	1.8
1996	1996-08-16 19:00:00	1996-08-16 20:00:00	1	0.8	0.8	0.2
1996	1996-08-20 15:00:00	1996-08-20 20:00:00	5	1.6	3.7	0.9
1996	1996-08-23 06:00:00	1996-08-23 14:00:00	8	0.3	0.6	0.1
1996	1996-08-26 07:00:00	1996-08-26 16:00:00	9	0.8	2	0.5
1996	1996-09-07 18:00:00	1996-09-09 00:00:00	6	11.6	36.9	8.7
1996	1996-09-09 20:00:00	1996-09-09 23:00:00	3	0.2	0.4	0.1
1996	1996-09-11 23:00:00	1996-09-14 04:00:00	5	4.7	37.2	8.7
1996	1996-09-14 18:00:00	1996-09-14 20:00:00	2	2.7	4.7	1.1
1996	1996-09-15 12:00:00	1996-09-16 03:00:00	15	1.6	3.3	0.8
1996	1996-09-24 14:00:00	1996-09-24 23:00:00	9	1.2	5	1.2
1996	1996-09-25 13:00:00	1996-09-25 14:00:00	1	0.4	0.4	0.1
1996	1996-09-27 05:00:00	1996-09-28 19:00:00	14	4.6	23.8	5.6
1996	1996-09-29 18:00:00	1996-09-29 20:00:00	2	4.6	4.8	1.1
1997	1997-04-03 16:00:00	1997-04-03 17:00:00	1	0.2	0.2	0.1
1997	1997-04-05 19:00:00	1997-04-06 09:00:00	14	2.2	11.9	3.6
1997	1997-04-07 06:00:00	1997-04-07 07:00:00	1	0.2	0.2	0.1
1997	1997-04-13 10:00:00	1997-04-13 18:00:00	8	0.2	1.2	0.4
1997	1997-04-16 19:00:00	1997-04-16 21:00:00	2	1	1.6	0.5
1997	1997-04-18 12:00:00	1997-04-19 08:00:00	20	1.6	7.9	2.4
1997	1997-04-22 11:00:00	1997-04-22 13:00:00	2	3.6	4	1.2
1997	1997-04-28 01:00:00	1997-04-28 16:00:00	15	2.9	15.9	4.8
1997	1997-05-01 06:00:00	1997-05-01 21:00:00	15	2.3	3.1	0.9
1997	1997-05-03 07:00:00	1997-05-04 00:00:00	17	5.2	22	6.6
1997	1997-05-06 02:00:00	1997-05-06 16:00:00	14	3.5	18.3	5.5
1997	1997-05-09 02:00:00	1997-05-10 08:00:00	6	2	9.4	2.8
1997	1997-05-12 04:00:00	1997-05-12 20:00:00	16	3.9	13.1	3.9
1997	1997-05-15 08:00:00	1997-05-15 14:00:00	6	2.1	5.2	1.6
1997	1997-05-17 20:00:00	1997-05-17 21:00:00	1	0.2	0.2	0.1
1997	1997-05-19 01:00:00	1997-05-19 05:00:00	4	0.3	0.6	0.2
1997	1997-05-20 16:00:00	1997-05-20 17:00:00	1	0.2	0.2	0.1
1997	1997-05-21 12:00:00	1997-05-21 19:00:00	7	0.9	2.7	0.8
1997	1997-05-24 22:00:00	1997-05-25 00:00:00	2	0.8	1	0.3
1997	1997-05-30 11:00:00	1997-05-30 21:00:00	10	1.8	2.4	0.7
1997	1997-06-06 01:00:00	1997-06-06 02:00:00	1	0.2	0.2	0.1
1997	1997-06-12 13:00:00	1997-06-12 19:00:00	6	7.5	10.3	3.1
1997	1997-06-16 18:00:00	1997-06-17 07:00:00	13	6.1	15.9	4.8
1997	1997-06-18 11:00:00	1997-06-18 19:00:00	8	2.8	6	1.8
1997	1997-06-21 09:00:00	1997-06-21 10:00:00	1	4.6	4.6	1.4
1997	1997-06-21 22:00:00	1997-06-22 05:00:00	7	12.5	18.2	5.5
1997	1997-08-02 21:00:00	1997-08-02 22:00:00	1	0.4	0.4	0.1
1997	1997-08-11 05:00:00	1997-08-11 11:00:00	6	0.4	0.8	0.2
1997	1997-08-13 02:00:00	1997-08-13 12:00:00	10	3.1	12.9	3.9

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1997	1997-08-15 19:00:00	1997-08-16 01:00:00	6	3.6	6.8	2.0
1997	1997-08-21 02:00:00	1997-08-22 08:00:00	6	5.3	25	7.5
1997	1997-08-23 08:00:00	1997-08-23 12:00:00	4	2.5	4	1.2
1997	1997-08-27 18:00:00	1997-08-27 21:00:00	3	8	13.4	4.0
1997	1997-09-02 14:00:00	1997-09-02 16:00:00	2	8.2	10.2	3.1
1997	1997-09-06 17:00:00	1997-09-07 00:00:00	7	0.8	1	0.3
1997	1997-09-10 22:00:00	1997-09-12 07:00:00	9	3.1	17.2	5.2
1997	1997-09-13 02:00:00	1997-09-13 03:00:00	1	0.2	0.2	0.1
1997	1997-09-17 15:00:00	1997-09-17 19:00:00	4	5.5	9.5	2.9
1997	1997-09-19 18:00:00	1997-09-20 13:00:00	19	5.5	20.7	6.2
1997	1997-09-23 03:00:00	1997-09-23 08:00:00	5	1.8	3.7	1.1
1997	1997-09-25 13:00:00	1997-09-25 20:00:00	7	0.9	2	0.6
1997	1997-09-29 04:00:00	1997-09-29 22:00:00	18	5	19.1	5.7
1997	1997-09-30 12:00:00	1997-09-30 23:00:00	11	0.7	2.1	0.6
1997	1997-10-03 05:00:00	1997-10-03 09:00:00	4	0.6	1.4	0.4
1997	1997-10-04 19:00:00	1997-10-05 00:00:00	5	1	2.4	0.7
1997	1997-10-09 22:00:00	1997-10-09 23:00:00	1	0.3	0.3	0.1
1997	1997-10-14 12:00:00	1997-10-14 13:00:00	1	0.8	0.8	0.2
1997	1997-10-20 11:00:00	1997-10-20 12:00:00	1	0.3	0.3	0.1
1997	1997-10-29 05:00:00	1997-10-29 09:00:00	4	0.4	1.2	0.4
1998	1998-04-24 16:00:00	1998-04-24 23:00:00	7	5.9	10.7	2.4
1998	1998-05-02 04:00:00	1998-05-03 04:00:00	0	5	11.1	2.5
1998	1998-05-04 03:00:00	1998-05-05 04:00:00	1	1.6	2.4	0.5
1998	1998-05-05 17:00:00	1998-05-06 07:00:00	14	0.8	1.4	0.3
1998	1998-05-09 21:00:00	1998-05-09 22:00:00	1	0.2	0.2	0.0
1998	1998-05-10 20:00:00	1998-05-10 23:00:00	3	0.6	1	0.2
1998	1998-05-16 22:00:00	1998-05-16 23:00:00	1	0.2	0.2	0.0
1998	1998-05-28 20:00:00	1998-05-28 21:00:00	1	0.2	0.2	0.0
1998	1998-05-29 09:00:00	1998-05-29 14:00:00	5	1.6	2.5	0.6
1998	1998-05-31 07:00:00	1998-05-31 11:00:00	4	6	14.4	3.3
1998	1998-06-02 12:00:00	1998-06-02 20:00:00	8	3.7	4.2	1.0
1998	1998-06-03 11:00:00	1998-06-03 12:00:00	1	2.4	2.4	0.5
1998	1998-06-07 23:00:00	1998-06-08 01:00:00	2	0.4	0.6	0.1
1998	1998-06-08 15:00:00	1998-06-08 16:00:00	1	0.2	0.2	0.0
1998	1998-06-10 19:00:00	1998-06-10 22:00:00	3	3.5	4.9	1.1
1998	1998-06-12 08:00:00	1998-06-12 15:00:00	7	1.8	7.8	1.8
1998	1998-06-13 04:00:00	1998-06-13 09:00:00	5	7.1	21.8	5.0
1998	1998-06-14 13:00:00	1998-06-15 09:00:00	20	4.7	25	5.7
1998	1998-06-16 11:00:00	1998-06-16 21:00:00	10	1.4	1.8	0.4
1998	1998-06-17 15:00:00	1998-06-18 07:00:00	16	9.5	14.8	3.4
1998	1998-06-25 04:00:00	1998-06-25 17:00:00	13	2.5	4.1	0.9
1998	1998-06-26 08:00:00	1998-06-27 08:00:00	0	15.8	22.7	5.2
1998	1998-06-27 20:00:00	1998-06-27 21:00:00	1	6.9	6.9	1.6
1998	1998-06-28 09:00:00	1998-06-28 10:00:00	1	0.4	0.4	0.1
1998	1998-06-29 23:00:00	1998-06-30 06:00:00	7	0.5	0.7	0.2

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1998	1998-06-30 22:00:00	1998-07-01 12:00:00	14	2	8.6	2.0
1998	1998-07-04 03:00:00	1998-07-04 14:00:00	11	1.8	5.5	1.2
1998	1998-07-09 21:00:00	1998-07-10 13:00:00	16	9.1	16.2	3.7
1998	1998-07-13 05:00:00	1998-07-13 10:00:00	5	1.7	2.6	0.6
1998	1998-07-16 14:00:00	1998-07-17 17:00:00	3	15.8	27.2	6.2
1998	1998-07-23 09:00:00	1998-07-23 21:00:00	12	2.7	5.1	1.2
1998	1998-07-27 15:00:00	1998-07-27 19:00:00	4	2.4	2.6	0.6
1998	1998-07-28 18:00:00	1998-07-29 01:00:00	7	8.7	11.4	2.6
1998	1998-07-30 14:00:00	1998-07-30 17:00:00	3	5.1	5.7	1.3
1998	1998-08-04 06:00:00	1998-08-04 07:00:00	1	0.8	0.8	0.2
1998	1998-08-06 11:00:00	1998-08-06 12:00:00	1	0.3	0.3	0.1
1998	1998-08-07 04:00:00	1998-08-07 14:00:00	10	0.9	2	0.5
1998	1998-08-10 10:00:00	1998-08-10 12:00:00	2	1.5	2.2	0.5
1998	1998-08-11 03:00:00	1998-08-11 04:00:00	1	0.6	0.6	0.1
1998	1998-08-15 17:00:00	1998-08-15 23:00:00	6	2.5	3.2	0.7
1998	1998-08-20 18:00:00	1998-08-21 00:00:00	6	3.7	5	1.1
1998	1998-08-22 02:00:00	1998-08-22 03:00:00	1	1.6	1.6	0.4
1998	1998-08-23 15:00:00	1998-08-24 01:00:00	10	9.4	18.8	4.3
1998	1998-08-24 14:00:00	1998-08-24 17:00:00	3	1.1	1.6	0.4
1998	1998-08-25 10:00:00	1998-08-25 15:00:00	5	7.1	10.6	2.4
1998	1998-08-26 11:00:00	1998-08-26 12:00:00	1	0.2	0.2	0.0
1998	1998-08-29 06:00:00	1998-08-29 19:00:00	13	0.9	3	0.7
1998	1998-08-30 18:00:00	1998-08-30 19:00:00	1	0.4	0.4	0.1
1998	1998-09-02 12:00:00	1998-09-02 16:00:00	4	3.5	5.2	1.2
1998	1998-09-03 20:00:00	1998-09-04 19:00:00	23	1.6	1.8	0.4
1998	1998-09-07 16:00:00	1998-09-07 17:00:00	1	2	2	0.5
1998	1998-09-08 16:00:00	1998-09-09 01:00:00	9	1.4	3.7	0.8
1998	1998-09-14 11:00:00	1998-09-15 15:00:00	4	2.4	7	1.6
1998	1998-09-22 07:00:00	1998-09-22 10:00:00	3	1.1	2	0.5
1998	1998-09-24 13:00:00	1998-09-24 14:00:00	1	0.2	0.2	0.0
1998	1998-09-26 17:00:00	1998-09-27 21:00:00	4	14.1	45.8	10.4
1998	1998-09-29 20:00:00	1998-09-30 01:00:00	5	1.1	2.6	0.6
1998	1998-09-30 23:00:00	1998-10-01 09:00:00	10	3.1	9.8	2.2
1998	1998-10-07 10:00:00	1998-10-08 07:00:00	21	6.9	30	6.8
1998	1998-10-14 00:00:00	1998-10-15 00:00:00	0	3.2	16.6	3.8
1998	1998-10-20 00:00:00	1998-10-20 01:00:00	1	0.4	0.4	0.1
1998	1998-10-28 05:00:00	1998-10-28 12:00:00	7	4.4	15.6	3.5
1999	1999-05-07 19:00:00	1999-05-08 18:00:00	23	2.7	8.3	2.0
1999	1999-05-09 07:00:00	1999-05-09 16:00:00	9	1.4	2.9	0.7
1999	1999-05-19 09:00:00	1999-05-19 16:00:00	7	1.5	2.4	0.6
1999	1999-05-24 12:00:00	1999-05-25 02:00:00	14	6.3	19	4.5
1999	1999-05-25 19:00:00	1999-05-26 01:00:00	6	1	2.4	0.6
1999	1999-06-01 06:00:00	1999-06-01 11:00:00	5	1.9	6.1	1.4
1999	1999-06-02 19:00:00	1999-06-03 03:00:00	8	6.7	21.6	5.1
1999	1999-06-09 02:00:00	1999-06-09 07:00:00	5	1.2	2.5	0.6

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1999	1999-06-14 18:00:00	1999-06-14 19:00:00	1	8.8	8.8	2.1
1999	1999-06-18 16:00:00	1999-06-18 18:00:00	2	0.3	0.6	0.1
1999	1999-06-20 15:00:00	1999-06-20 18:00:00	3	10	18	4.2
1999	1999-06-25 05:00:00	1999-06-25 16:00:00	11	5.8	6.4	1.5
1999	1999-06-27 21:00:00	1999-06-28 06:00:00	9	3.4	8.7	2.0
1999	1999-06-29 08:00:00	1999-06-29 14:00:00	6	1	2.2	0.5
1999	1999-07-01 19:00:00	1999-07-01 22:00:00	3	11.9	20.6	4.9
1999	1999-07-03 22:00:00	1999-07-04 02:00:00	4	0.3	0.9	0.2
1999	1999-07-05 00:00:00	1999-07-05 01:00:00	1	0.3	0.3	0.1
1999	1999-07-05 19:00:00	1999-07-06 10:00:00	15	10.2	17.2	4.1
1999	1999-07-07 17:00:00	1999-07-07 18:00:00	1	13.2	13.2	3.1
1999	1999-07-08 19:00:00	1999-07-08 20:00:00	1	0.6	0.6	0.1
1999	1999-07-09 14:00:00	1999-07-10 08:00:00	18	6.1	17.5	4.1
1999	1999-07-17 13:00:00	1999-07-17 16:00:00	3	17.5	20.4	4.8
1999	1999-07-23 05:00:00	1999-07-24 05:00:00	0	4.2	16.6	3.9
1999	1999-07-24 21:00:00	1999-07-25 03:00:00	6	16.2	20.9	4.9
1999	1999-07-25 16:00:00	1999-07-25 17:00:00	1	3.6	3.6	0.8
1999	1999-07-31 17:00:00	1999-07-31 19:00:00	2	0.9	1.4	0.3
1999	1999-08-03 22:00:00	1999-08-04 00:00:00	2	3.2	3.4	0.8
1999	1999-08-04 15:00:00	1999-08-04 17:00:00	2	10.8	11	2.6
1999	1999-08-06 11:00:00	1999-08-06 13:00:00	2	6.2	9	2.1
1999	1999-08-07 23:00:00	1999-08-08 01:00:00	2	0.8	1	0.2
1999	1999-08-17 04:00:00	1999-08-17 06:00:00	2	1.7	3.2	0.8
1999	1999-09-06 03:00:00	1999-09-06 11:00:00	8	11	39.7	9.4
1999	1999-09-07 10:00:00	1999-09-08 20:00:00	10	4.6	29.8	7.0
1999	1999-09-09 14:00:00	1999-09-10 07:00:00	17	4.7	19.3	4.5
1999	1999-09-13 20:00:00	1999-09-14 04:00:00	8	2.8	6.5	1.5
1999	1999-09-16 21:00:00	1999-09-17 01:00:00	4	3.9	7.8	1.8
1999	1999-09-23 17:00:00	1999-09-23 18:00:00	1	0.4	0.4	0.1
1999	1999-09-24 10:00:00	1999-09-24 17:00:00	7	0.6	1.4	0.3
1999	1999-09-29 10:00:00	1999-09-30 12:00:00	2	6.8	18.6	4.4
1999	1999-10-01 09:00:00	1999-10-01 10:00:00	1	0.4	0.4	0.1
1999	1999-10-02 12:00:00	1999-10-02 20:00:00	8	2.4	8.2	1.9
1999	1999-10-03 18:00:00	1999-10-03 19:00:00	1	0.2	0.2	0.0
1999	1999-10-06 03:00:00	1999-10-06 07:00:00	4	1.2	1.8	0.4
1999	1999-10-08 22:00:00	1999-10-09 01:00:00	3	0.3	0.6	0.1
1999	1999-10-10 12:00:00	1999-10-10 23:00:00	11	0.7	1.1	0.3
1999	1999-10-12 23:00:00	1999-10-13 01:00:00	2	1.8	2	0.5
1999	1999-10-13 19:00:00	1999-10-13 20:00:00	1	0.2	0.2	0.0
1999	1999-10-16 19:00:00	1999-10-16 21:00:00	2	0.9	1.4	0.3
1999	1999-10-17 11:00:00	1999-10-18 01:00:00	14	0.7	1.6	0.4
1999	1999-10-20 06:00:00	1999-10-20 08:00:00	2	0.5	1	0.2
1999	1999-10-20 23:00:00	1999-10-21 00:00:00	1	0.2	0.2	0.0
1999	1999-10-22 08:00:00	1999-10-22 17:00:00	9	0.6	1.5	0.4
1999	1999-10-23 12:00:00	1999-10-23 23:00:00	11	1.6	6.6	1.6

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
1999	1999-10-26 13:00:00	1999-10-26 15:00:00	2	1.2	1.8	0.4
1999	1999-10-31 06:00:00	1999-10-31 08:00:00	2	1.3	1.6	0.4
2000	2000-04-19 23:00:00	2000-04-20 00:00:00	1	0.4	0.4	0.1
2000	2000-04-20 20:00:00	2000-04-23 02:00:00	6	3.6	29.2	5.4
2000	2000-05-01 16:00:00	2000-05-01 17:00:00	1	0.4	0.4	0.1
2000	2000-05-04 20:00:00	2000-05-05 02:00:00	6	2.4	4.4	0.8
2000	2000-05-05 22:00:00	2000-05-05 23:00:00	1	1.3	1.3	0.2
2000	2000-05-07 11:00:00	2000-05-11 01:00:00	14	8.5	64.2	12.0
2000	2000-05-12 00:00:00	2000-05-12 04:00:00	4	0.2	0.8	0.1
2000	2000-05-12 23:00:00	2000-05-13 00:00:00	1	0.1	0.1	0.0
2000	2000-05-13 14:00:00	2000-05-13 18:00:00	4	1.3	1.6	0.3
2000	2000-05-18 03:00:00	2000-05-18 10:00:00	7	5.8	22.8	4.3
2000	2000-05-22 22:00:00	2000-05-23 07:00:00	9	1.1	3.4	0.6
2000	2000-05-23 20:00:00	2000-05-24 04:00:00	8	1.6	8.4	1.6
2000	2000-05-24 16:00:00	2000-05-25 06:00:00	14	4.2	13.6	2.5
2000	2000-05-25 23:00:00	2000-05-26 02:00:00	3	0.2	0.4	0.1
2000	2000-06-02 05:00:00	2000-06-02 06:00:00	1	1.4	1.4	0.3
2000	2000-06-02 23:00:00	2000-06-03 00:00:00	1	0.2	0.2	0.0
2000	2000-06-04 11:00:00	2000-06-04 17:00:00	6	1.8	2.2	0.4
2000	2000-06-05 23:00:00	2000-06-06 06:00:00	7	1.2	3	0.6
2000	2000-06-08 10:00:00	2000-06-10 00:00:00	14	5.9	9.3	1.7
2000	2000-06-10 19:00:00	2000-06-11 05:00:00	10	7.5	26.1	4.9
2000	2000-06-13 23:00:00	2000-06-14 05:00:00	6	0.4	1	0.2
2000	2000-06-14 19:00:00	2000-06-15 03:00:00	8	2.4	5.7	1.1
2000	2000-06-16 22:00:00	2000-06-16 23:00:00	1	0.4	0.4	0.1
2000	2000-06-18 10:00:00	2000-06-18 13:00:00	3	1.5	3.2	0.6
2000	2000-06-19 05:00:00	2000-06-19 06:00:00	1	0.2	0.2	0.0
2000	2000-06-19 19:00:00	2000-06-19 20:00:00	1	2.2	2.2	0.4
2000	2000-06-21 05:00:00	2000-06-21 20:00:00	15	8.3	16.4	3.1
2000	2000-06-22 12:00:00	2000-06-22 18:00:00	6	3.6	6.2	1.2
2000	2000-06-25 00:00:00	2000-06-25 11:00:00	11	14.7	46.7	8.7
2000	2000-06-26 04:00:00	2000-06-26 05:00:00	1	0.1	0.1	0.0
2000	2000-06-27 00:00:00	2000-06-27 03:00:00	3	3.2	4.5	0.8
2000	2000-06-29 17:00:00	2000-06-30 02:00:00	9	0.8	2.2	0.4
2000	2000-07-01 17:00:00	2000-07-01 18:00:00	1	2.6	2.6	0.5
2000	2000-07-02 16:00:00	2000-07-02 21:00:00	5	6.2	16.8	3.1
2000	2000-07-08 22:00:00	2000-07-10 01:00:00	3	5	10.2	1.9
2000	2000-07-14 16:00:00	2000-07-16 22:00:00	6	2.8	16.3	3.0
2000	2000-07-20 05:00:00	2000-07-20 10:00:00	5	1.8	2.6	0.5
2000	2000-07-21 11:00:00	2000-07-22 13:00:00	2	4	16.2	3.0
2000	2000-07-29 12:00:00	2000-07-29 15:00:00	3	2.5	3.7	0.7
2000	2000-07-31 23:00:00	2000-08-02 11:00:00	12	3.3	10.3	1.9
2000	2000-08-03 02:00:00	2000-08-03 09:00:00	7	1.4	2.2	0.4
2000	2000-08-07 00:00:00	2000-08-07 01:00:00	1	0.2	0.2	0.0
2000	2000-08-07 14:00:00	2000-08-08 01:00:00	11	9.1	14	2.6

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
2000	2000-08-09 01:00:00	2000-08-09 18:00:00	17	9	19.8	3.7
2000	2000-08-11 19:00:00	2000-08-12 03:00:00	8	5.2	12.2	2.3
2000	2000-08-15 21:00:00	2000-08-15 22:00:00	1	2	2	0.4
2000	2000-08-16 13:00:00	2000-08-16 15:00:00	2	1	1.2	0.2
2000	2000-08-23 04:00:00	2000-08-23 12:00:00	8	3.6	16.2	3.0
2000	2000-09-02 04:00:00	2000-09-02 11:00:00	7	8.7	10.9	2.0
2000	2000-09-03 17:00:00	2000-09-04 07:00:00	14	0.6	2.9	0.5
2000	2000-09-11 01:00:00	2000-09-11 14:00:00	13	4.6	14.7	2.7
2000	2000-09-14 08:00:00	2000-09-15 10:00:00	2	5.9	35.1	6.5
2000	2000-09-16 12:00:00	2000-09-16 13:00:00	1	0.6	0.6	0.1
2000	2000-09-17 13:00:00	2000-09-17 14:00:00	1	0.2	0.2	0.0
2000	2000-09-21 02:00:00	2000-09-21 18:00:00	16	4	6.4	1.2
2000	2000-09-23 08:00:00	2000-09-23 22:00:00	14	2.3	8.5	1.6
2000	2000-09-27 12:00:00	2000-09-27 14:00:00	2	0.3	0.6	0.1
2000	2000-10-02 19:00:00	2000-10-02 21:00:00	2	1.2	1.6	0.3
2000	2000-10-04 08:00:00	2000-10-04 12:00:00	4	0.7	1.4	0.3
2000	2000-10-05 19:00:00	2000-10-06 08:00:00	13	1	5.5	1.0
2000	2000-10-10 08:00:00	2000-10-10 12:00:00	4	1.1	1.7	0.3
2000	2000-10-13 19:00:00	2000-10-14 09:00:00	14	1.1	5.5	1.0
2000	2000-10-17 19:00:00	2000-10-18 10:00:00	15	1.8	7.4	1.4
2000	2000-10-19 03:00:00	2000-10-19 05:00:00	2	0.4	0.8	0.1
2000	2000-10-26 02:00:00	2000-10-26 03:00:00	1	0.2	0.2	0.0
2000	2000-10-27 08:00:00	2000-10-27 20:00:00	12	1.9	3.4	0.6
2002	2002-04-12 17:00:00	2002-04-13 03:00:00	10	2.6	7	1.3
2002	2002-04-13 20:00:00	2002-04-13 23:00:00	3	3.6	5.4	1.0
2002	2002-04-15 01:00:00	2002-04-15 05:00:00	4	0.4	1	0.2
2002	2002-04-25 09:00:00	2002-04-25 14:00:00	5	3.5	9.7	1.8
2002	2002-04-30 13:00:00	2002-04-30 23:00:00	10	1.8	7.3	1.3
2002	2002-05-02 05:00:00	2002-05-03 04:00:00	23	3.4	13.4	2.4
2002	2002-05-09 13:00:00	2002-05-09 19:00:00	6	6.3	11.3	2.1
2002	2002-05-13 15:00:00	2002-05-14 19:00:00	4	3.3	23.2	4.2
2002	2002-05-16 06:00:00	2002-05-16 12:00:00	6	2.6	11	2.0
2002	2002-05-20 05:00:00	2002-05-20 18:00:00	13	0.2	0.4	0.1
2002	2002-05-26 02:00:00	2002-05-26 06:00:00	4	0.2	0.4	0.1
2002	2002-05-30 01:00:00	2002-05-30 13:00:00	12	1.4	2.2	0.4
2002	2002-05-31 03:00:00	2002-05-31 20:00:00	17	3.7	13.5	2.5
2002	2002-06-05 00:00:00	2002-06-05 17:00:00	17	5.4	8.4	1.5
2002	2002-06-10 23:00:00	2002-06-12 11:00:00	12	8.8	64.3	11.7
2002	2002-06-14 21:00:00	2002-06-17 22:00:00	1	9.6	65.2	11.8
2002	2002-06-23 16:00:00	2002-06-23 18:00:00	2	11.8	12	2.2
2002	2002-06-26 11:00:00	2002-06-26 22:00:00	11	7.2	18	3.3
2002	2002-06-27 12:00:00	2002-06-27 16:00:00	4	45	56.9	10.3
2002	2002-07-08 15:00:00	2002-07-09 05:00:00	14	12.6	21.8	4.0
2002	2002-07-15 03:00:00	2002-07-15 04:00:00	1	1	1	0.2
2002	2002-07-17 21:00:00	2002-07-17 23:00:00	2	1.7	2.4	0.4

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
2002	2002-07-22 05:00:00	2002-07-22 06:00:00	1	0.2	0.2	0.0
2002	2002-07-23 00:00:00	2002-07-23 07:00:00	7	2.8	7.8	1.4
2002	2002-07-26 07:00:00	2002-07-26 22:00:00	15	4.7	13.8	2.5
2002	2002-07-30 00:00:00	2002-07-30 03:00:00	3	0.4	0.8	0.1
2002	2002-08-02 03:00:00	2002-08-02 10:00:00	7	4.1	6.1	1.1
2002	2002-08-04 18:00:00	2002-08-04 19:00:00	1	0.2	0.2	0.0
2002	2002-08-15 03:00:00	2002-08-15 14:00:00	11	0.9	2.6	0.5
2002	2002-08-16 14:00:00	2002-08-16 15:00:00	1	1.2	1.2	0.2
2002	2002-08-19 15:00:00	2002-08-19 17:00:00	2	1.2	1.8	0.3
2002	2002-08-22 06:00:00	2002-08-22 22:00:00	16	10.3	27.7	5.0
2002	2002-09-10 19:00:00	2002-09-11 08:00:00	13	10.7	28.4	5.2
2002	2002-09-14 23:00:00	2002-09-15 07:00:00	8	5.9	10.2	1.9
2002	2002-09-27 11:00:00	2002-09-27 19:00:00	8	4.7	21.7	3.9
2002	2002-09-30 03:00:00	2002-09-30 15:00:00	12	3.7	11.4	2.1
2002	2002-10-03 02:00:00	2002-10-03 04:00:00	2	0.5	0.8	0.1
2002	2002-10-04 23:00:00	2002-10-05 02:00:00	3	0.8	1.8	0.3
2002	2002-10-07 05:00:00	2002-10-07 06:00:00	1	1.2	1.2	0.2
2002	2002-10-09 05:00:00	2002-10-09 10:00:00	5	0.5	1	0.2
2002	2002-10-12 15:00:00	2002-10-13 14:00:00	23	2.6	6.4	1.2
2002	2002-10-16 07:00:00	2002-10-17 03:00:00	20	3.7	27.4	5.0
2002	2002-10-18 06:00:00	2002-10-18 07:00:00	1	0.2	0.2	0.0
2002	2002-10-18 22:00:00	2002-10-19 20:00:00	22	3.3	20.6	3.7
2002	2002-10-20 19:00:00	2002-10-20 21:00:00	2	0.8	1	0.2
2002	2002-10-27 06:00:00	2002-10-27 08:00:00	2	0.2	0.4	0.1
2003	2003-05-01 01:00:00	2003-05-01 15:00:00	14	3.6	15.2	2.7
2003	2003-05-02 06:00:00	2003-05-02 11:00:00	5	2.1	4	0.7
2003	2003-05-06 05:00:00	2003-05-07 06:00:00	1	3.8	14.6	2.6
2003	2003-05-08 19:00:00	2003-05-08 20:00:00	1	0.8	0.8	0.1
2003	2003-05-11 13:00:00	2003-05-12 14:00:00	1	7.9	17	3.1
2003	2003-05-13 08:00:00	2003-05-14 04:00:00	20	1.1	3	0.5
2003	2003-05-14 21:00:00	2003-05-14 22:00:00	1	0.2	0.2	0.0
2003	2003-05-20 18:00:00	2003-05-21 01:00:00	7	3.4	7.3	1.3
2003	2003-05-24 08:00:00	2003-05-27 01:00:00	17	4.6	58.3	10.5
2003	2003-05-28 11:00:00	2003-05-28 12:00:00	1	0.2	0.2	0.0
2003	2003-05-29 01:00:00	2003-05-30 01:00:00	0	1.3	7.5	1.4
2003	2003-05-31 22:00:00	2003-06-01 14:00:00	16	0.3	1	0.2
2003	2003-06-05 06:00:00	2003-06-05 15:00:00	9	1.4	3.6	0.6
2003	2003-06-06 20:00:00	2003-06-07 09:00:00	13	3.2	3.4	0.6
2003	2003-06-09 02:00:00	2003-06-09 20:00:00	18	1.9	4.7	0.8
2003	2003-06-11 01:00:00	2003-06-11 17:00:00	16	6.2	8.7	1.6
2003	2003-06-13 14:00:00	2003-06-14 03:00:00	13	8.3	28.4	5.1
2003	2003-06-14 20:00:00	2003-06-14 21:00:00	1	0.1	0.1	0.0
2003	2003-06-18 21:00:00	2003-06-19 07:00:00	10	0.8	1.8	0.3
2003	2003-06-28 16:00:00	2003-06-28 17:00:00	1	0.8	0.8	0.1
2003	2003-06-29 14:00:00	2003-06-30 01:00:00	11	1.7	5.1	0.9

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Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
2003	2003-07-01 18:00:00	2003-07-01 19:00:00	1	0.4	0.4	0.1
2003	2003-07-03 16:00:00	2003-07-03 17:00:00	1	0.4	0.4	0.1
2003	2003-07-04 06:00:00	2003-07-04 10:00:00	4	0.3	0.7	0.1
2003	2003-07-05 04:00:00	2003-07-05 05:00:00	1	10.8	10.8	1.9
2003	2003-07-11 00:00:00	2003-07-11 17:00:00	17	15.1	42.5	7.7
2003	2003-07-12 11:00:00	2003-07-12 21:00:00	10	0.7	2.5	0.5
2003	2003-07-15 22:00:00	2003-07-16 03:00:00	5	1.2	3.2	0.6
2003	2003-07-17 15:00:00	2003-07-17 21:00:00	6	7.4	10.1	1.8
2003	2003-07-19 21:00:00	2003-07-19 22:00:00	1	2.8	2.8	0.5
2003	2003-07-20 15:00:00	2003-07-21 14:00:00	23	2.3	6.5	1.2
2003	2003-07-24 08:00:00	2003-07-24 23:00:00	15	2.6	9	1.6
2003	2003-07-26 15:00:00	2003-07-27 06:00:00	15	0.4	1.4	0.3
2003	2003-07-29 16:00:00	2003-07-29 18:00:00	2	1.8	3.4	0.6
2003	2003-08-01 07:00:00	2003-08-01 17:00:00	10	0.1	0.2	0.0
2003	2003-08-03 22:00:00	2003-08-04 04:00:00	6	4.1	9.9	1.8
2003	2003-08-05 23:00:00	2003-08-07 11:00:00	12	3.9	10.1	1.8
2003	2003-08-09 20:00:00	2003-08-09 23:00:00	3	2	2.6	0.5
2003	2003-08-10 13:00:00	2003-08-11 20:00:00	7	11.4	17	3.1
2003	2003-08-21 23:00:00	2003-08-22 00:00:00	1	1.8	1.8	0.3
2003	2003-08-25 00:00:00	2003-08-25 03:00:00	3	1.1	3	0.5
2003	2003-08-26 19:00:00	2003-08-26 20:00:00	1	4.8	4.8	0.9
2003	2003-08-29 09:00:00	2003-08-29 15:00:00	6	5.6	14.6	2.6
2003	2003-09-13 23:00:00	2003-09-14 01:00:00	2	0.4	0.6	0.1
2003	2003-09-15 22:00:00	2003-09-16 01:00:00	3	2.2	4.6	0.8
2003	2003-09-19 07:00:00	2003-09-20 00:00:00	17	3.6	8.8	1.6
2003	2003-09-22 22:00:00	2003-09-23 03:00:00	5	5.1	8	1.4
2003	2003-09-23 16:00:00	2003-09-23 18:00:00	2	1.2	2.2	0.4
2003	2003-09-25 06:00:00	2003-09-25 10:00:00	4	10.1	13.8	2.5
2003	2003-09-26 06:00:00	2003-09-26 07:00:00	1	0.2	0.2	0.0
2003	2003-09-27 03:00:00	2003-09-27 04:00:00	1	0.2	0.2	0.0
2003	2003-09-27 19:00:00	2003-09-29 04:00:00	9	5.1	20.9	3.8
2003	2003-09-29 19:00:00	2003-09-29 22:00:00	3	1.2	2.2	0.4
2003	2003-09-30 16:00:00	2003-09-30 19:00:00	3	1.7	3	0.5
2003	2003-10-01 20:00:00	2003-10-02 18:00:00	22	0.8	3.7	0.7
2003	2003-10-04 01:00:00	2003-10-05 13:00:00	12	1.2	5.1	0.9
2003	2003-10-12 15:00:00	2003-10-12 18:00:00	3	0.5	0.9	0.2
2003	2003-10-14 18:00:00	2003-10-15 19:00:00	1	6.4	44.8	8.1
2003	2003-10-20 16:00:00	2003-10-21 11:00:00	19	6.8	44.1	8.0
2003	2003-10-25 07:00:00	2003-10-25 14:00:00	7	0.9	2.7	0.5
2003	2003-10-26 04:00:00	2003-10-26 19:00:00	15	3.6	20.4	3.7
2003	2003-10-27 08:00:00	2003-10-28 01:00:00	17	1.2	7.6	1.4
2003	2003-10-29 08:00:00	2003-10-29 23:00:00	15	2.6	17.2	3.1
2004	2004-04-13 14:00:00	2004-04-14 05:00:00	15	4.9	22.4	3.9
2004	2004-04-17 10:00:00	2004-04-17 12:00:00	2	1.7	2.6	0.5
2004	2004-04-19 10:00:00	2004-04-19 18:00:00	8	2.8	4.6	0.8

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Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
2004	2004-04-21 15:00:00	2004-04-22 04:00:00	13	4.5	11.4	2.0
2004	2004-04-24 01:00:00	2004-04-24 02:00:00	1	1	1	0.2
2004	2004-04-25 14:00:00	2004-04-26 03:00:00	13	1.6	4.6	0.8
2004	2004-04-27 02:00:00	2004-04-27 10:00:00	8	2.1	3.1	0.5
2004	2004-04-28 22:00:00	2004-04-29 02:00:00	4	0.5	1.4	0.2
2004	2004-05-01 04:00:00	2004-05-01 06:00:00	2	0.6	0.8	0.1
2004	2004-05-02 00:00:00	2004-05-03 08:00:00	8	6.6	25.3	4.4
2004	2004-05-05 02:00:00	2004-05-05 10:00:00	8	1.4	5.7	1.0
2004	2004-05-06 15:00:00	2004-05-06 16:00:00	1	0.2	0.2	0.0
2004	2004-05-10 07:00:00	2004-05-10 09:00:00	2	0.4	0.6	0.1
2004	2004-05-18 04:00:00	2004-05-18 17:00:00	13	2.4	7.7	1.3
2004	2004-05-20 13:00:00	2004-05-20 20:00:00	7	0.9	2.2	0.4
2004	2004-05-22 21:00:00	2004-05-23 02:00:00	5	0.4	0.6	0.1
2004	2004-05-23 19:00:00	2004-05-25 09:00:00	14	8.1	23.8	4.2
2004	2004-05-26 16:00:00	2004-05-26 18:00:00	2	0.3	0.6	0.1
2004	2004-05-28 00:00:00	2004-05-28 06:00:00	6	3	4.2	0.7
2004	2004-06-01 00:00:00	2004-06-02 00:00:00	0	20.2	30.8	5.4
2004	2004-06-06 22:00:00	2004-06-07 02:00:00	4	1.4	2.1	0.4
2004	2004-06-09 12:00:00	2004-06-09 16:00:00	4	1.7	3.4	0.6
2004	2004-06-14 03:00:00	2004-06-15 06:00:00	3	2.5	8.6	1.5
2004	2004-06-21 23:00:00	2004-06-22 21:00:00	22	3.7	11.7	2.0
2004	2004-06-24 07:00:00	2004-06-24 23:00:00	16	1.4	4.7	0.8
2004	2004-06-26 12:00:00	2004-06-26 14:00:00	2	2.8	3.6	0.6
2004	2004-06-27 14:00:00	2004-06-27 15:00:00	1	0.4	0.4	0.1
2004	2004-06-29 11:00:00	2004-06-29 19:00:00	8	3.4	11.2	2.0
2004	2004-07-01 05:00:00	2004-07-01 15:00:00	10	2.9	5.8	1.0
2004	2004-07-05 02:00:00	2004-07-05 03:00:00	1	0.4	0.4	0.1
2004	2004-07-07 19:00:00	2004-07-08 06:00:00	11	1.7	3.6	0.6
2004	2004-07-08 22:00:00	2004-07-08 23:00:00	1	0.6	0.6	0.1
2004	2004-07-10 14:00:00	2004-07-10 15:00:00	1	0.4	0.4	0.1
2004	2004-07-12 17:00:00	2004-07-12 18:00:00	1	3.6	3.6	0.6
2004	2004-07-14 13:00:00	2004-07-15 09:00:00	20	5.3	16.7	2.9
2004	2004-07-16 02:00:00	2004-07-16 08:00:00	6	3.3	5.3	0.9
2004	2004-07-20 18:00:00	2004-07-20 19:00:00	1	1.2	1.2	0.2
2004	2004-07-27 20:00:00	2004-07-28 04:00:00	8	3.8	7.8	1.4
2004	2004-07-30 17:00:00	2004-07-31 21:00:00	4	4.8	19.9	3.5
2004	2004-08-03 03:00:00	2004-08-03 14:00:00	11	3	6.3	1.1
2004	2004-08-04 03:00:00	2004-08-04 07:00:00	4	1.1	1.8	0.3
2004	2004-08-10 09:00:00	2004-08-10 22:00:00	13	27.2	67	11.7
2004	2004-08-11 17:00:00	2004-08-11 19:00:00	2	2.1	2.4	0.4
2004	2004-08-12 23:00:00	2004-08-13 21:00:00	22	1	6.4	1.1
2004	2004-08-18 23:00:00	2004-08-19 09:00:00	10	4.4	9	1.6
2004	2004-08-26 19:00:00	2004-08-27 05:00:00	10	0.7	2.8	0.5
2004	2004-08-29 01:00:00	2004-08-29 16:00:00	15	9.7	15	2.6
2004	2004-09-07 13:00:00	2004-09-07 18:00:00	5	3.9	5.7	1.0

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Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
2004	2004-09-09 00:00:00	2004-09-10 00:00:00	0	30.3	136.6	23.8
2004	2004-10-02 06:00:00	2004-10-02 17:00:00	11	6.5	11	1.9
2004	2004-10-04 10:00:00	2004-10-04 13:00:00	3	1.2	2.4	0.4
2004	2004-10-09 08:00:00	2004-10-09 09:00:00	1	1.6	1.6	0.3
2004	2004-10-15 19:00:00	2004-10-16 02:00:00	7	11.4	22.3	3.9
2004	2004-10-21 01:00:00	2004-10-21 06:00:00	5	1.7	3.4	0.6
2004	2004-10-30 11:00:00	2004-10-30 18:00:00	7	4.5	12.2	2.1
2006	2006-04-07 05:00:00	2006-04-07 17:00:00	12	0.9	5.4	0.7
2006	2006-04-12 17:00:00	2006-04-13 08:00:00	15	1.9	5.5	0.8
2006	2006-04-22 09:00:00	2006-04-23 08:00:00	23	2	19.7	2.7
2006	2006-04-24 05:00:00	2006-04-24 16:00:00	11	2	9.3	1.3
2006	2006-04-25 04:00:00	2006-04-25 08:00:00	4	1.8	4.2	0.6
2006	2006-04-26 16:00:00	2006-04-26 19:00:00	3	1	2.2	0.3
2006	2006-05-04 14:00:00	2006-05-04 17:00:00	3	2.4	4.8	0.7
2006	2006-05-06 05:00:00	2006-05-06 16:00:00	11	2.3	8	1.1
2006	2006-05-12 04:00:00	2006-05-13 06:00:00	2	7.3	42.6	5.9
2006	2006-05-14 10:00:00	2006-05-15 05:00:00	19	1.5	7.8	1.1
2006	2006-05-15 23:00:00	2006-05-16 02:00:00	3	0.8	1	0.1
2006	2006-05-17 00:00:00	2006-05-18 03:00:00	3	5.1	17.4	2.4
2006	2006-05-18 17:00:00	2006-05-19 02:00:00	9	7.2	10.5	1.5
2006	2006-05-19 19:00:00	2006-05-20 15:00:00	20	1.6	8.7	1.2
2006	2006-05-21 05:00:00	2006-05-21 13:00:00	8	1.5	3.9	0.5
2006	2006-05-26 18:00:00	2006-05-26 19:00:00	1	0.4	0.4	0.1
2006	2006-05-29 00:00:00	2006-05-29 03:00:00	3	2.8	5.4	0.7
2006	2006-05-29 23:00:00	2006-05-30 00:00:00	1	0.3	0.3	0.0
2006	2006-05-31 18:00:00	2006-06-01 08:00:00	14	3.9	12.7	1.8
2006	2006-06-02 17:00:00	2006-06-04 01:00:00	8	4.9	15.9	2.2
2006	2006-06-08 13:00:00	2006-06-10 00:00:00	11	1.6	15.3	2.1
2006	2006-06-10 20:00:00	2006-06-11 04:00:00	8	1.7	5.7	0.8
2006	2006-06-16 22:00:00	2006-06-17 05:00:00	7	7.7	13	1.8
2006	2006-06-19 10:00:00	2006-06-20 03:00:00	17	8.2	12	1.7
2006	2006-06-22 03:00:00	2006-06-22 06:00:00	3	2.3	3.8	0.5
2006	2006-06-26 22:00:00	2006-06-27 20:00:00	22	12.8	33.2	4.6
2006	2006-06-29 15:00:00	2006-06-30 05:00:00	14	2.4	4.4	0.6
2006	2006-07-01 14:00:00	2006-07-02 03:00:00	13	8.1	18.8	2.6
2006	2006-07-03 16:00:00	2006-07-03 18:00:00	2	2	2.2	0.3
2006	2006-07-10 21:00:00	2006-07-10 22:00:00	1	0.8	0.8	0.1
2006	2006-07-12 08:00:00	2006-07-12 14:00:00	6	0.2	0.4	0.1
2006	2006-07-15 13:00:00	2006-07-15 14:00:00	1	13.2	13.2	1.8
2006	2006-07-17 22:00:00	2006-07-18 03:00:00	5	12.8	13.2	1.8
2006	2006-07-24 23:00:00	2006-07-25 18:00:00	19	11.6	32	4.4
2006	2006-07-27 06:00:00	2006-07-27 07:00:00	1	1	1	0.1
2006	2006-07-31 19:00:00	2006-08-01 03:00:00	8	16.9	40.4	5.6
2006	2006-08-02 18:00:00	2006-08-03 02:00:00	8	10.5	33.8	4.7
2006	2006-08-19 16:00:00	2006-08-19 17:00:00	1	4.4	4.4	0.6

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Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
2006	2006-08-20 05:00:00	2006-08-20 22:00:00	17	4.9	7.5	1.0
2006	2006-08-27 03:00:00	2006-08-27 13:00:00	10	2.1	5.1	0.7
2006	2006-09-02 16:00:00	2006-09-04 01:00:00	9	10.9	53.6	7.4
2006	2006-09-08 16:00:00	2006-09-09 01:00:00	9	9.7	12.7	1.8
2006	2006-09-13 07:00:00	2006-09-14 13:00:00	6	3.8	28.7	4.0
2006	2006-09-18 22:00:00	2006-09-19 10:00:00	12	4.3	20.4	2.8
2006	2006-09-20 11:00:00	2006-09-20 14:00:00	3	0.5	1	0.1
2006	2006-09-23 04:00:00	2006-09-24 04:00:00	0	5.9	13.7	1.9
2006	2006-09-25 17:00:00	2006-09-25 20:00:00	3	3.6	4	0.6
2006	2006-09-28 10:00:00	2006-09-29 03:00:00	17	3.2	20	2.8
2006	2006-10-01 03:00:00	2006-10-01 11:00:00	8	2.8	9.1	1.3
2006	2006-10-03 04:00:00	2006-10-03 13:00:00	9	1.2	1.8	0.2
2006	2006-10-04 09:00:00	2006-10-04 18:00:00	9	2	3.8	0.5
2006	2006-10-11 04:00:00	2006-10-12 07:00:00	3	5.5	22.2	3.1
2006	2006-10-13 19:00:00	2006-10-14 10:00:00	15	1.7	5.8	0.8
2006	2006-10-17 10:00:00	2006-10-18 03:00:00	17	4.5	29.2	4.0
2006	2006-10-19 08:00:00	2006-10-19 18:00:00	10	0.5	0.9	0.1
2006	2006-10-20 11:00:00	2006-10-20 18:00:00	7	3.7	12.3	1.7
2006	2006-10-22 12:00:00	2006-10-23 11:00:00	23	1.8	13	1.8
2006	2006-10-24 07:00:00	2006-10-24 18:00:00	11	0.8	1.2	0.2
2006	2006-10-27 14:00:00	2006-10-28 19:00:00	5	3.4	24.1	3.3
2007	2007-04-01 17:00:00	2007-04-02 21:00:00	4	1.4	5	0.9
2007	2007-04-03 19:00:00	2007-04-04 17:00:00	22	4.2	31.6	5.7
2007	2007-04-12 14:00:00	2007-04-12 21:00:00	7	0.7	2	0.4
2007	2007-04-15 04:00:00	2007-04-17 12:00:00	8	3	23.7	4.3
2007	2007-04-23 18:00:00	2007-04-23 23:00:00	5	1.4	2.6	0.5
2007	2007-04-26 22:00:00	2007-04-27 12:00:00	14	1.1	3.6	0.7
2007	2007-04-28 00:00:00	2007-04-29 10:00:00	10	0.8	8	1.5
2007	2007-04-29 23:00:00	2007-04-30 01:00:00	2	0.6	0.8	0.1
2007	2007-05-14 21:00:00	2007-05-16 19:00:00	22	2.9	24.6	4.5
2007	2007-05-20 11:00:00	2007-05-20 17:00:00	6	0.7	1.5	0.3
2007	2007-05-27 09:00:00	2007-05-27 23:00:00	14	6.6	12.1	2.2
2007	2007-05-30 22:00:00	2007-05-31 05:00:00	7	3.1	6.6	1.2
2007	2007-05-31 21:00:00	2007-06-01 01:00:00	4	3.9	5.5	1.0
2007	2007-06-01 21:00:00	2007-06-02 04:00:00	7	2.8	5.4	1.0
2007	2007-06-03 18:00:00	2007-06-05 21:00:00	3	6.5	22.1	4.0
2007	2007-06-07 10:00:00	2007-06-07 13:00:00	3	0.4	0.8	0.1
2007	2007-06-08 18:00:00	2007-06-08 22:00:00	4	6.4	6.8	1.2
2007	2007-06-13 03:00:00	2007-06-13 04:00:00	1	0.2	0.2	0.0
2007	2007-06-17 02:00:00	2007-06-17 03:00:00	1	0.2	0.2	0.0
2007	2007-06-19 10:00:00	2007-06-19 20:00:00	10	5.9	6.3	1.1
2007	2007-06-21 07:00:00	2007-06-22 04:00:00	21	0.5	2.1	0.4
2007	2007-06-22 17:00:00	2007-06-22 18:00:00	1	0.3	0.3	0.1
2007	2007-06-24 21:00:00	2007-06-25 07:00:00	10	0.4	0.8	0.1
2007	2007-06-27 23:00:00	2007-06-28 00:00:00	1	0.4	0.4	0.1

Ottawa Airport Rainfall Event Summary - (1967 - 2007)

Year	Start Date	End Date	Duration (hrs)	Max Intensity (mm/hr)	Total Volume (mm)	Percentage of Annual Rainfall (%)
2007	2007-06-29 17:00:00	2007-06-29 19:00:00	2	1.2	1.4	0.3
2007	2007-06-30 13:00:00	2007-06-30 19:00:00	6	1.1	2.2	0.4
2007	2007-07-02 15:00:00	2007-07-02 16:00:00	1	4.6	4.6	0.8
2007	2007-07-04 14:00:00	2007-07-04 18:00:00	4	1	2.1	0.4
2007	2007-07-06 15:00:00	2007-07-06 16:00:00	1	3.6	3.6	0.7
2007	2007-07-07 23:00:00	2007-07-08 10:00:00	11	4.4	13.2	2.4
2007	2007-07-09 02:00:00	2007-07-09 09:00:00	7	10.4	22.5	4.1
2007	2007-07-10 11:00:00	2007-07-10 12:00:00	1	0.6	0.6	0.1
2007	2007-07-11 12:00:00	2007-07-11 14:00:00	2	1.5	2.6	0.5
2007	2007-07-12 16:00:00	2007-07-12 17:00:00	1	1	1	0.2
2007	2007-07-13 05:00:00	2007-07-13 14:00:00	9	2.9	3.9	0.7
2007	2007-07-14 18:00:00	2007-07-14 23:00:00	5	1.8	4	0.7
2007	2007-07-19 00:00:00	2007-07-19 13:00:00	13	1.3	2.1	0.4
2007	2007-07-20 02:00:00	2007-07-20 15:00:00	13	9	67.7	12.3
2007	2007-07-28 08:00:00	2007-07-28 15:00:00	7	9	11	2.0
2007	2007-08-03 04:00:00	2007-08-03 05:00:00	1	2.6	2.6	0.5
2007	2007-08-06 02:00:00	2007-08-06 10:00:00	8	6.2	10.1	1.8
2007	2007-08-12 17:00:00	2007-08-12 19:00:00	2	2.6	2.8	0.5
2007	2007-08-14 22:00:00	2007-08-15 02:00:00	4	2	4.2	0.8
2007	2007-08-16 08:00:00	2007-08-16 14:00:00	6	13.8	15.8	2.9
2007	2007-08-17 15:00:00	2007-08-18 00:00:00	9	0.6	0.8	0.1
2007	2007-08-23 15:00:00	2007-08-24 13:00:00	22	9.5	17.4	3.2
2007	2007-08-25 01:00:00	2007-08-25 04:00:00	3	15.1	16.1	2.9
2007	2007-08-25 17:00:00	2007-08-25 23:00:00	6	6.1	13.2	2.4
2007	2007-08-29 17:00:00	2007-08-30 05:00:00	12	23.2	24.8	4.5
2007	2007-09-06 01:00:00	2007-09-06 02:00:00	1	0.8	0.8	0.1
2007	2007-09-10 23:00:00	2007-09-12 07:00:00	8	4.7	19.2	3.5
2007	2007-09-14 20:00:00	2007-09-15 14:00:00	18	3.2	8.6	1.6
2007	2007-09-26 02:00:00	2007-09-26 12:00:00	10	4.2	8.8	1.6
2007	2007-09-27 06:00:00	2007-09-28 00:00:00	18	0.9	3.4	0.6
2007	2007-10-06 06:00:00	2007-10-06 14:00:00	8	6.1	7.7	1.4
2007	2007-10-07 21:00:00	2007-10-08 02:00:00	5	0.9	2	0.4
2007	2007-10-09 11:00:00	2007-10-09 18:00:00	7	1.8	3.2	0.6
2007	2007-10-10 20:00:00	2007-10-12 04:00:00	8	1.3	11.5	2.1
2007	2007-10-13 09:00:00	2007-10-13 16:00:00	7	0.9	3	0.5
2007	2007-10-19 12:00:00	2007-10-19 18:00:00	6	6.5	20.4	3.7
2007	2007-10-23 01:00:00	2007-10-24 01:00:00	0	3.8	18.1	3.3
2007	2007-10-24 23:00:00	2007-10-25 02:00:00	3	1.5	2.4	0.4
2007	2007-10-26 22:00:00	2007-10-27 22:00:00	0	3.3	18.3	3.3

DRAWINGS / FIGURES

PALLADIUM DR

CHEMIN CULDAFF ROAD

AVENUE ROBERT GRANT AVENUE

AVENUE DERREEN AVENUE

AVENUE DERREEN AVENUE

TERRASSE CROSSWAY TERRACE

RUE CONVERGENCE STREET

CHEMIN CULDAFF ROAD

(FUTURE RESIDENTIAL DEVELOPMENT) REFER TO DSEL JOB # 624

RUE STITTSVILLE MAIN STREET

(FUTURE RESIDENTIAL DEVELOPMENT)

REFER TO ANNIS, O'SULLIVAN, VOLLEBEKK LTD. SURVEY JOB NO. - CLARIDGE 14202-13 PT LT 1 C1 HU DPS N D4

MALOJA WAY

MALOJA WAY

LIMNOS LANE

MALOJA WAY

CAYMAN RD

(EXISTING RESIDENTIAL DEVELOPMENT) REFER TO DSEL JOB #309

MESSOR CRES

MESSOR CRES

CAMPOBELLO DR

MONTSERRAT ST

#1939 MAPLE GROVE ROAD

#1927 MAPLE GROVE ROAD

MAPLE GROVE ROAD

ALON STREET

FORMER JOHNWOODS STREET

MAPLE GROVE ROAD

LEGEND

SITE BOUNDARY

FUTURE/EXISTING RESIDENTIAL DEVELOPMENT SITE BOUNDARY

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www.DSEL.ca

FORMASIAM 1919 MAPLE GROVE
CITY OF OTTAWA

KEY PLAN

SCALE:	1:4000	PROJECT No.:	16-861
DATE:	AUGUST 2020	FIGURE:	1

(FUTURE RESIDENTIAL DEVELOPMENT) D07-16-16-0011

CHEMIN CULDAFF ROAD

RUE STITTSVILLE MAIN STREET

FUT STM (BY OTHERS D07-16-0011)

(FUTURE RESIDENTIAL DEVELOPMENT) D07-16-18-0010

MALOJA WAY

MALOJA WAY

LIMNOS LANE

(EXISTING RESIDENTIAL DEVELOPMENT) D07-16-06-0014

MALOJA WAY

CAYMAN RD

CAMPOBELLO DR

BLOCK 25:
2-YEAR ALLOWABLE = 170 L/s/ha
100-YEAR ALLOWABLE = 241 L/s/ha
100-YEAR STORAGE ~ 204 m³

BLOCK 26:
2-YEAR ALLOWABLE = 170 L/s/ha
100-YEAR ALLOWABLE = 241 L/s/ha
100-YEAR STORAGE ~ 162 m³

#1939 MAPLE GROVE ROAD

#1927 MAPLE GROVE ROAD

OUTLET TO FUT STM ON MAPLE GROVE ROAD

FUT STM (BY OTHERS D07-16-0010)

EX. STM CULVERT

EX. STM CULVERT

MAPLE GROVE ROAD

ALON STREET

FORMER JOHNWOODS STREET

EXISTING ASBUILT STORM SEWER INFORMATION FROM DSEL JOB #451 GENERAL PLAN SHEET no. 2 & 4

LEGEND

- SUBJECT LANDS
- STORM TRUNK
- EXISTING STORM SEWER
- FUTURE STORM SEWER
- STORM DRAINAGE AREA
- EXISTING STORM DRAINAGE AREA
- OVERLAND FLOW ROUTE
- PROPOSED STORM MANHOLE
- 101.87 T/G 94.522 OBV — TOP OF GRATE / PROPOSED STORM OBVERT
- EXISTING STORM MANHOLE
- FUTURE STORM MANHOLE
- 6.07Ha / 0.55 / MH 150 / MH 153 — STORM DRAINAGE AREA / RUN-OFF COEFFICIENT / UPSTREAM MH / DOWNSTREAM MH
- 5-YEAR — STORM FREQUENCY

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FORMASIAM 1919
MAPLE GROVE

CITY OF OTTAWA

STORM SERVICING PLAN

SCALE:	1:1000	PROJECT No.:	16-861
DATE:	APRIL 2023	DRAWING:	2

(FUTURE RESIDENTIAL DEVELOPMENT) D07-16-16-0011

CHEMIN CULDAFF ROAD

RUE STITTSVILLE MAIN STREET

(FUTURE RESIDENTIAL DEVELOPMENT) D07-16-18-0010

MALOJA WAY

MALOJA WAY

LIMNOS LANE

(EXISTING RESIDENTIAL DEVELOPMENT) D07-16-06-0014

MALOJA WAY

CAYMAN RD

CAMPOBELLO DR

#1939 MAPLE GROVE ROAD

#1927 MAPLE GROVE ROAD

MAPLE GROVE ROAD

ALON STREET

FORMER JOHNWOODS STREET

FUT SAN (BY OTHERS D07-16-0010)

EX.SAN INV=104.48±

EX.SAN INV=103.13±

OUTLET TO FUT SAN ON MAPLE GROVE ROAD

EX.SAN INV=101.72±

EX.SAN INV=103.88±

EX. 375Ø SAN 142.1 @ 1.4%±

EX. 200Ø SAN 127.9 @ 1.2%±

EX. SAN MH

EX. SAN MH

EXISTING RESIDENTIAL

LEGEND

- SUBJECT LANDS
- SANITARY TRUNK
- EXISTING SANITARY SEWER
- FUTURE SANITARY SEWER
- SANITARY DRAINAGE AREA
- EXTERNAL SANITARY DRAINAGE AREA
- SANITARY MANHOLE
- FUTURE SANITARY MANHOLE
- POPULATION PER UNIT
- SANITARY DRAINAGE AREA
- NUMBER OF UNITS
- TOTAL POPULATION
- UPSTREAM MANHOLE
- DOWNSTREAM MANHOLE
- TRIB TYPE
- TOP OF GRATE
- PROPOSED SANITARY OBVERT

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FORMASIAM 1919
MAPLE GROVE

CITY OF OTTAWA

SANITARY SERVICING PLAN

SCALE:	1:1000	PROJECT No.:	16-861
DATE:	AUGUST 2020	DRAWING:	3

(FUTURE RESIDENTIAL DEVELOPMENT)
D07-16-16-0011

CHEMIN CULDAFF ROAD

RUE STITTSVILLE MAIN STREET

MALOJA WAY

MALOJA WAY

LIMNOS LANE

MALOJA WAY

CAYMAN RD

(EXISTING RESIDENTIAL DEVELOPMENT)
D07-16-06-0014

CAMPOBELLO DR

(FUTURE RESIDENTIAL DEVELOPMENT)
D07-16-18-0010

BLOCK 30

BLOCK 25

BLOCK 26

CONNECTION TO
EX. 250mmØ WATERMAIN WITHIN
STITTSVILLE MAIN STREET

BLOCK 1

BLOCK 2

BLOCK 3

BLOCK 4

BLOCK 5

BLOCK 6

BLOCK 27

BLOCK 7

BLOCK 8

BLOCK 9

BLOCK 10

BLOCK 28

BLOCK 35

BLOCK 29

BLOCK 23

BLOCK 34

BLOCK 22

BLOCK 11

BLOCK 12

BLOCK 13

BLOCK 14

BLOCK 15

BLOCK 16

BLOCK 17

BLOCK 18

BLOCK 21

BLOCK 20

BLOCK 19

BLOCK 33

EXISTING RESIDENTIAL

#1939 MAPLE GROVE ROAD

#1927 MAPLE GROVE ROAD

BLOCK 24

BLOCK 31

EX. VB

EX. 305Ø WATERMAIN

CONNECTION TO
EX. 305mmØ WATERMAIN

EX. FH

MAPLE GROVE ROAD

ALON STREET

FORMER JOHNWOODS STREET

LEGEND

- SUBJECT LANDS
- PROPOSED LOCAL WATERMAIN
- EXISTING WATERMAIN
- FUTURE WATERMAIN BY OTHERS
- PLUG

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FORMASIAM 1919
MAPLE GROVE

CITY OF OTTAWA

WATERMAIN SERVICING PLAN

SCALE:	1:1000	PROJECT No.:	16-861
DATE:	AUGUST 2020	DRAWING:	4

(FUTURE RESIDENTIAL DEVELOPMENT)
D07-16-16-0011

CHEMIN CULDAFF ROAD

RUE STITTSVILLE MAIN STREET

(FUTURE RESIDENTIAL DEVELOPMENT)
D07-16-18-0010

MALOJA WAY

MALOJA WAY

LIMNOS LANE

(EXISTING RESIDENTIAL DEVELOPMENT)
D07-16-06-0014

MALOJA WAY

GAYMAN RD

CAMPOBELL DR

#1939 MAPLE GROVE ROAD

#1927 MAPLE GROVE ROAD

MAPLE GROVE ROAD

ALON STREET

FORMER JOHNWOODS STREET

EXISTING RESIDENTIAL

BLOCK 1 BLOCK 2 BLOCK 3 BLOCK 4 BLOCK 5 BLOCK 6 BLOCK 7 BLOCK 8 BLOCK 9 BLOCK 10 BLOCK 11 BLOCK 12 BLOCK 13 BLOCK 14 BLOCK 15 BLOCK 16 BLOCK 17 BLOCK 18 BLOCK 19 BLOCK 20 BLOCK 21 BLOCK 22 BLOCK 23 BLOCK 24 BLOCK 25 BLOCK 26 BLOCK 27 BLOCK 28 BLOCK 29 BLOCK 30 BLOCK 31 BLOCK 32 BLOCK 33 BLOCK 34 BLOCK 35

LEGEND

- SUBJECT LANDS
- STORM OVERLAND FLOW ARROW
- PROPOSED CENTERLINE ELEVATION 192.85
- PROPOSED ELEVATION 193.50
- EXISTING ELEVATION 193.50
- EXISTING CONTOUR ELEVATION 244.50
- FUTURE CENTERLINE ELEVATION [192.85]

CUT-FILL DEPTH ALONG CENTER LINE:

CUT DEPTH (m)		FILL DEPTH (m)
0 - 0.5	2.5 - 3.0	0 - 0.5
0.5 - 1.0	3.0 - 3.5	0.5 - 1.0
1.0 - 1.5	3.5 - 4.0	1.0 - 1.5
1.5 - 2.0	4.0 - 4.5	1.5 - 2.0
2.0 - 2.5	> 4.5	2.0 - 2.5

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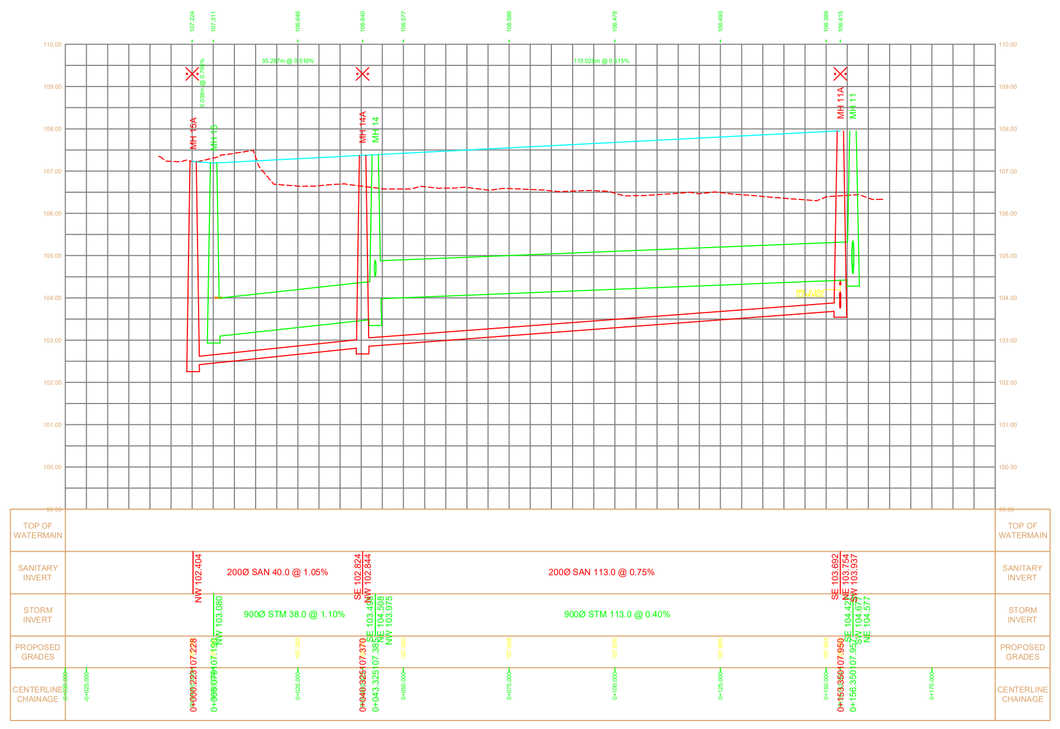
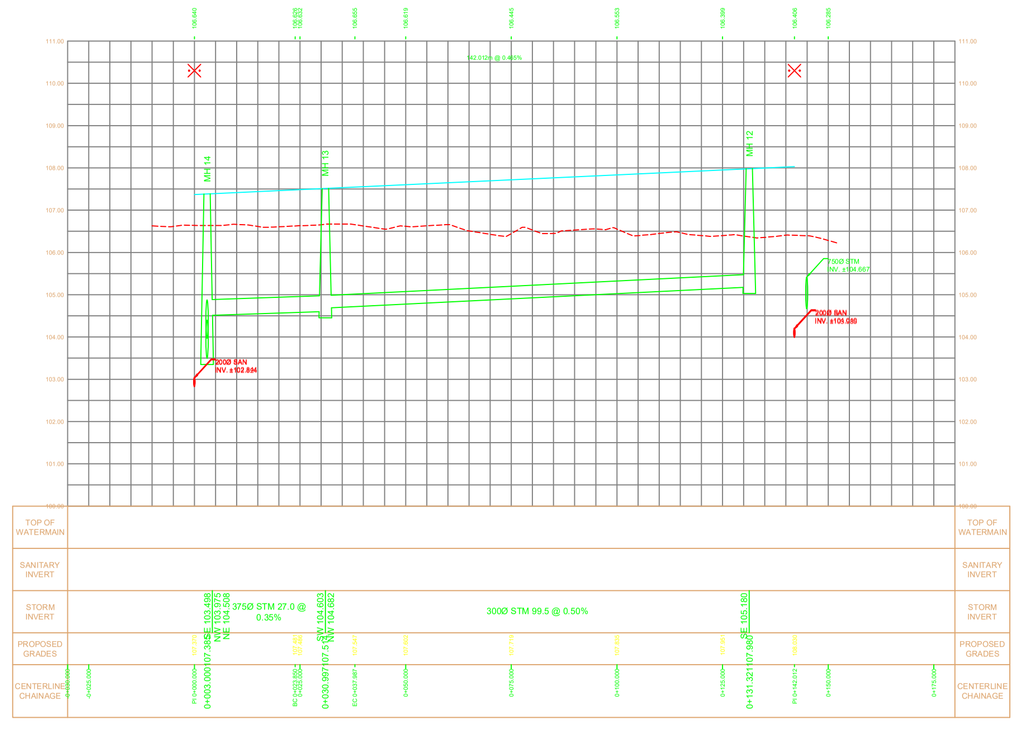
FORMASIAM 1919
MAPLE GROVE

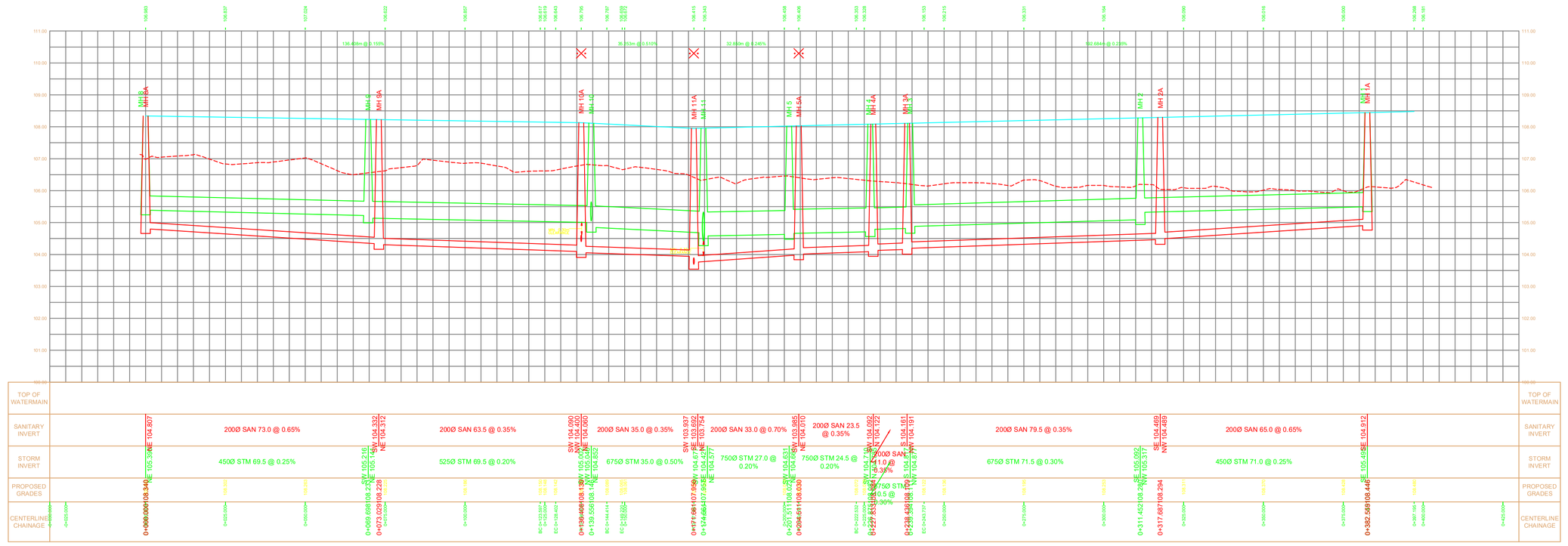
CITY OF OTTAWA

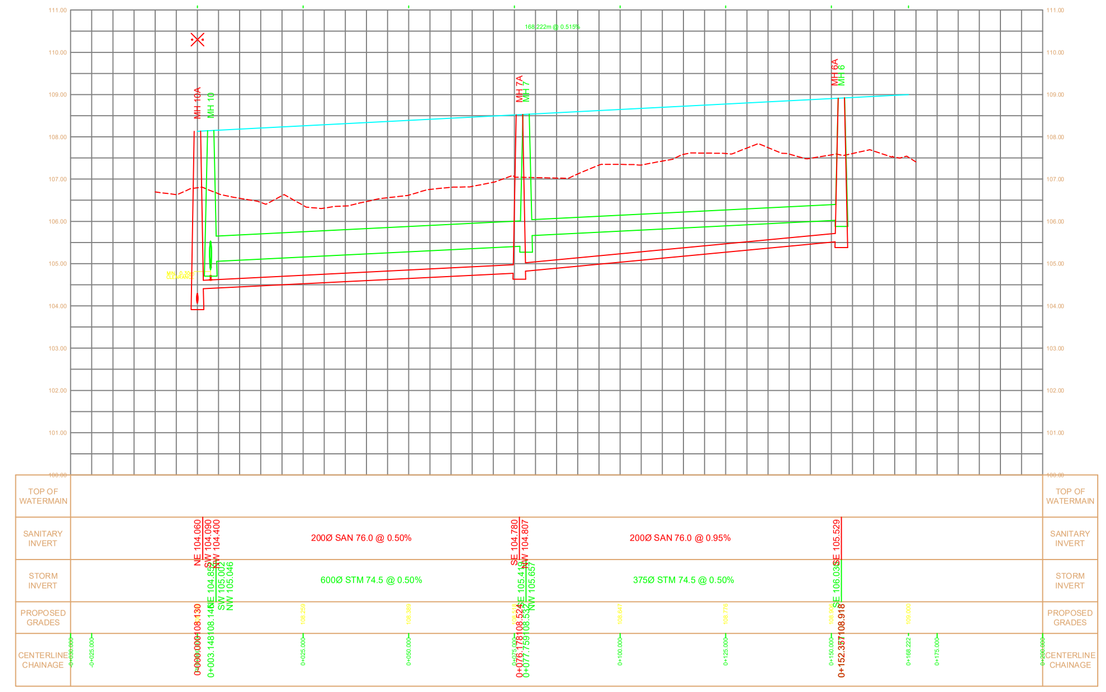
GRADING PLAN

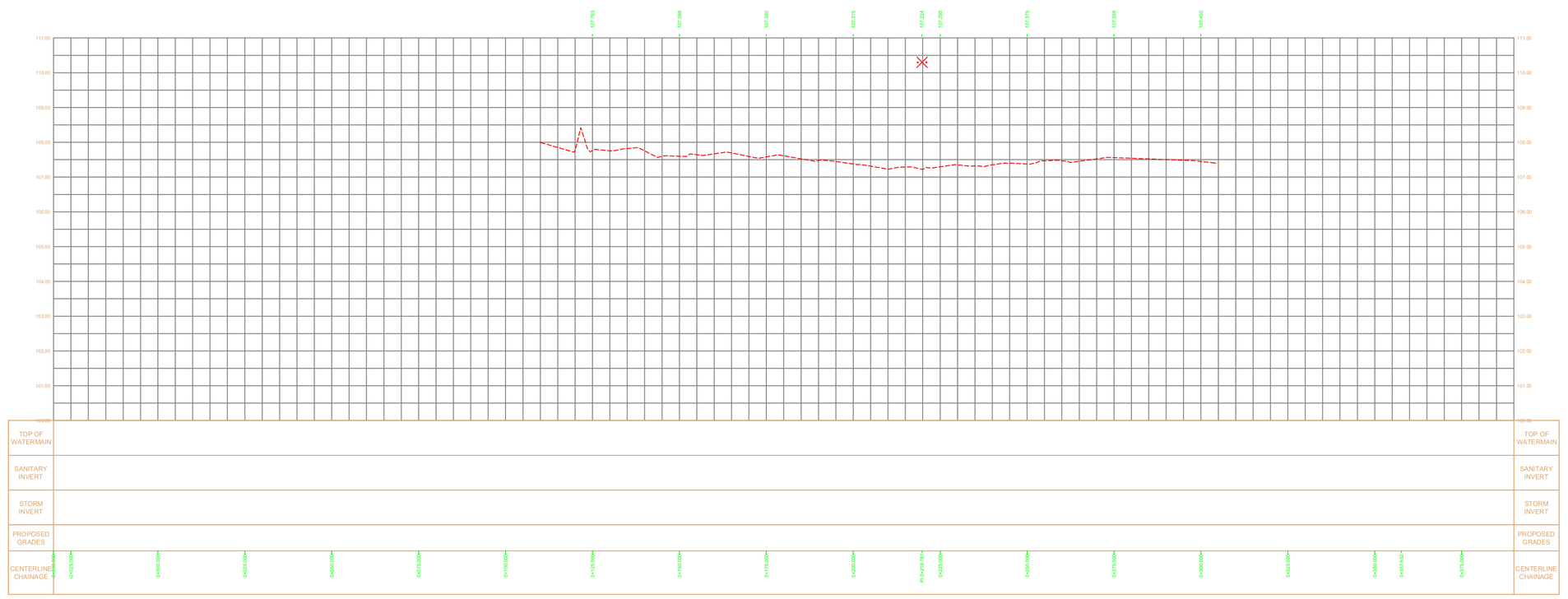
SCALE:	1:1000	PROJECT No.:	16-861
DATE:	AUGUST 2020	DRAWING:	5











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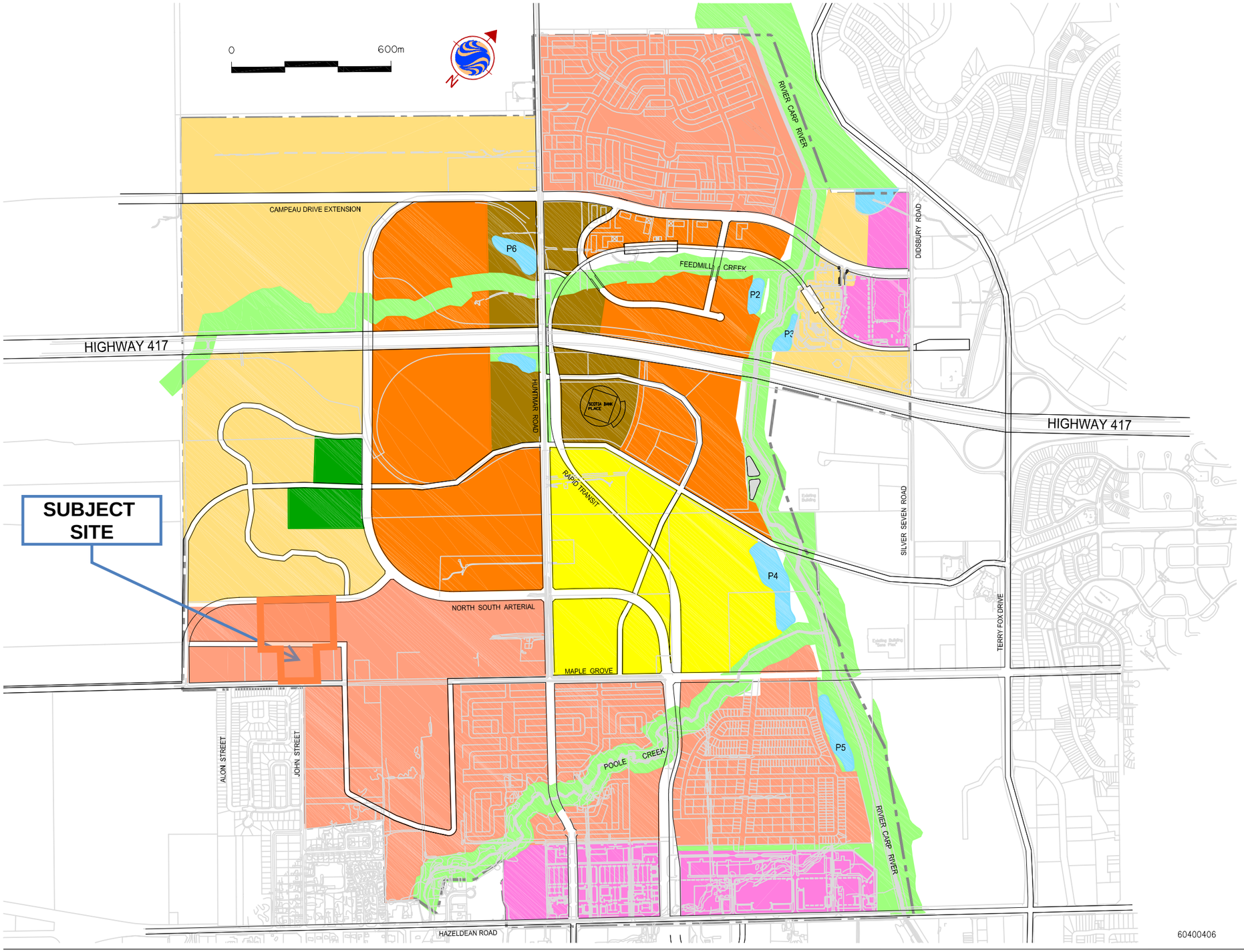
FORMASIAM 1919
MAPLE GROVE

CITY OF OTTAWA

PROFILES

SCALE:	1:100	PROJECT No.:	16-861
DATE:	AUGUST 2020	DRAWING:	6

LAND USE PLAN



Kanata-West Concept Plan Boundary

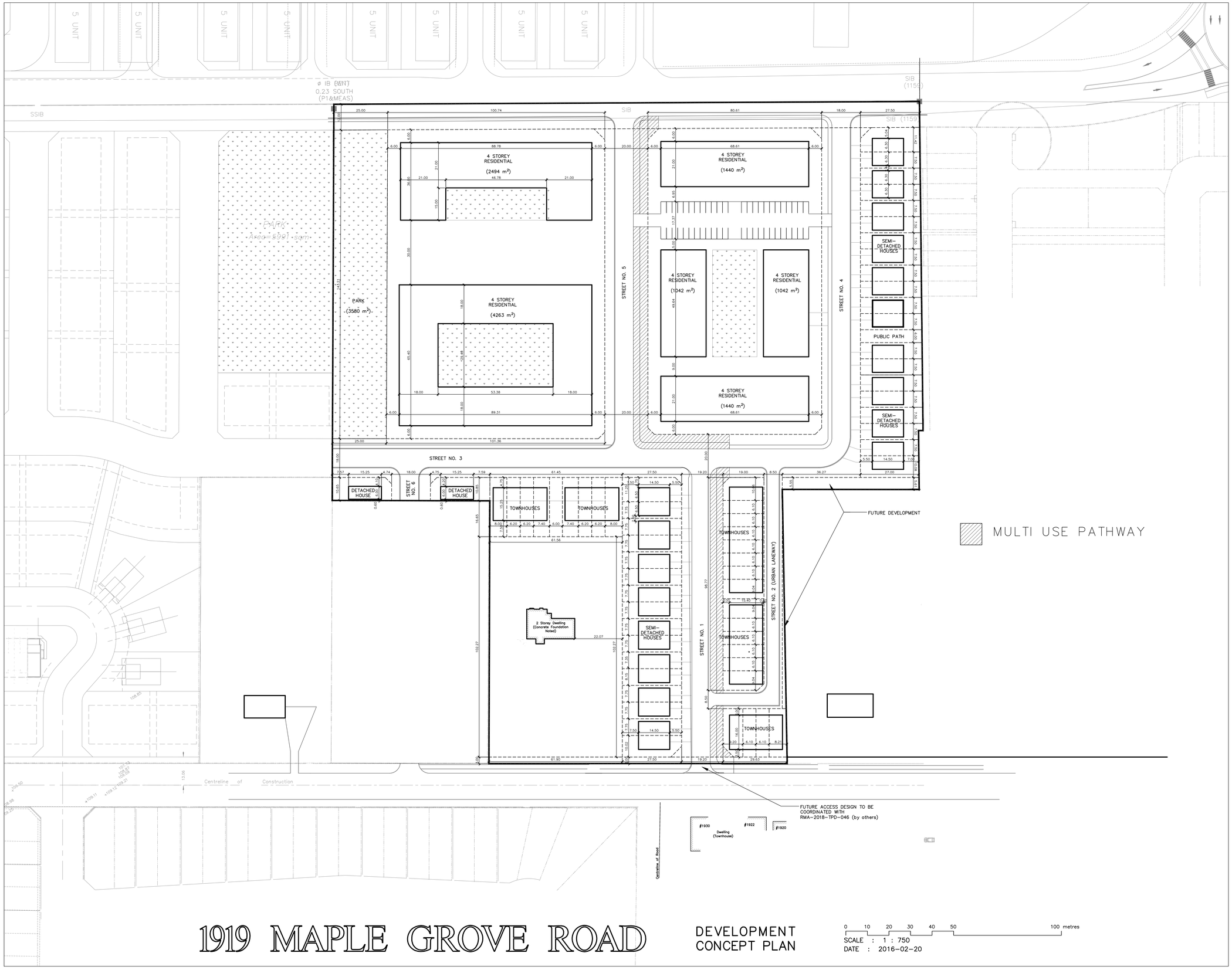
- PRESTIGE BUSINESS PARK
- OPEN SPACE
- COMMUNITY RETAIL
- DISTRICT PARK
- RESIDENTIAL
- MIXED USE
- HIGH PROFILE EMPLOYMENT
- EXTENSIVE EMPLOYMENT

Stantec

CCL/IBI
Cumming Cockburn Limited

MAY 2006

FIG. 2.1



1919 MAPLE GROVE ROAD

DEVELOPMENT CONCEPT PLAN

0 10 20 30 40 50 100 metres

SCALE : 1 : 750

DATE : 2016-02-20

KEY PLAN:

110 ARCHITECTS INC.
ARCHITECTURE + URBAN DESIGN
110 ARTHUR STREET, OTTAWA, ONTARIO, CANADA, K1R 7C2
TEL. 613-799-9117 E-mail: info@110architects.com

SEAL AND SIGNATURE:

CLIENT:
FORMASIAN DEVELOPMENT CORP.
1919 MAPLE GROVE ROAD
STITTSVILLE, ONTARIO K2S 1B9
TEL. (613) 836-9453
E-MAIL: vinceli@formasian.ca

PROJECT:
1919 MAPLE GROVE MASTER PLAN
1919 Maple Grove Road

DATE ISSUED	REV.	FOR SUBMISSION	BY
2021-08-27	7	COORDINATION	
2021-07-27	6	DRAFT	
2021-04-06	5	DRAFT	
2021-02-11	4	COORDINATION	
2020-03-02	3	COORDINATION	
2020-02-26	2	CLIENT CHANGES	
2020-02-05	1	COORDINATION	

TITLE:
Site Plan

SCALE: AS NOTED
PROJECT No.: 010
DATE: DEC 31, 2019
APPROVED BY: JG
DRAWN BY: JG

A-001