MINTO COMMUNITIES INC.

ARCADIA RESIDENTIAL STAGES 3, 4, 5 & 6 AND COMMERCIAL STAGES 2 & 3 OTTAWA, ONTARIO

STORMWATER MANAGEMENT STRATEGY REPORT

April 2017

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MINTO COMMUNITIES INC.
ARCADIA RESIDENTIAL
STAGES 3, 4, 5 & 6 AND COMMERCIAL STAGES 2 & 3

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STORMWATER MANAGEMENT STRATEGY REPORT

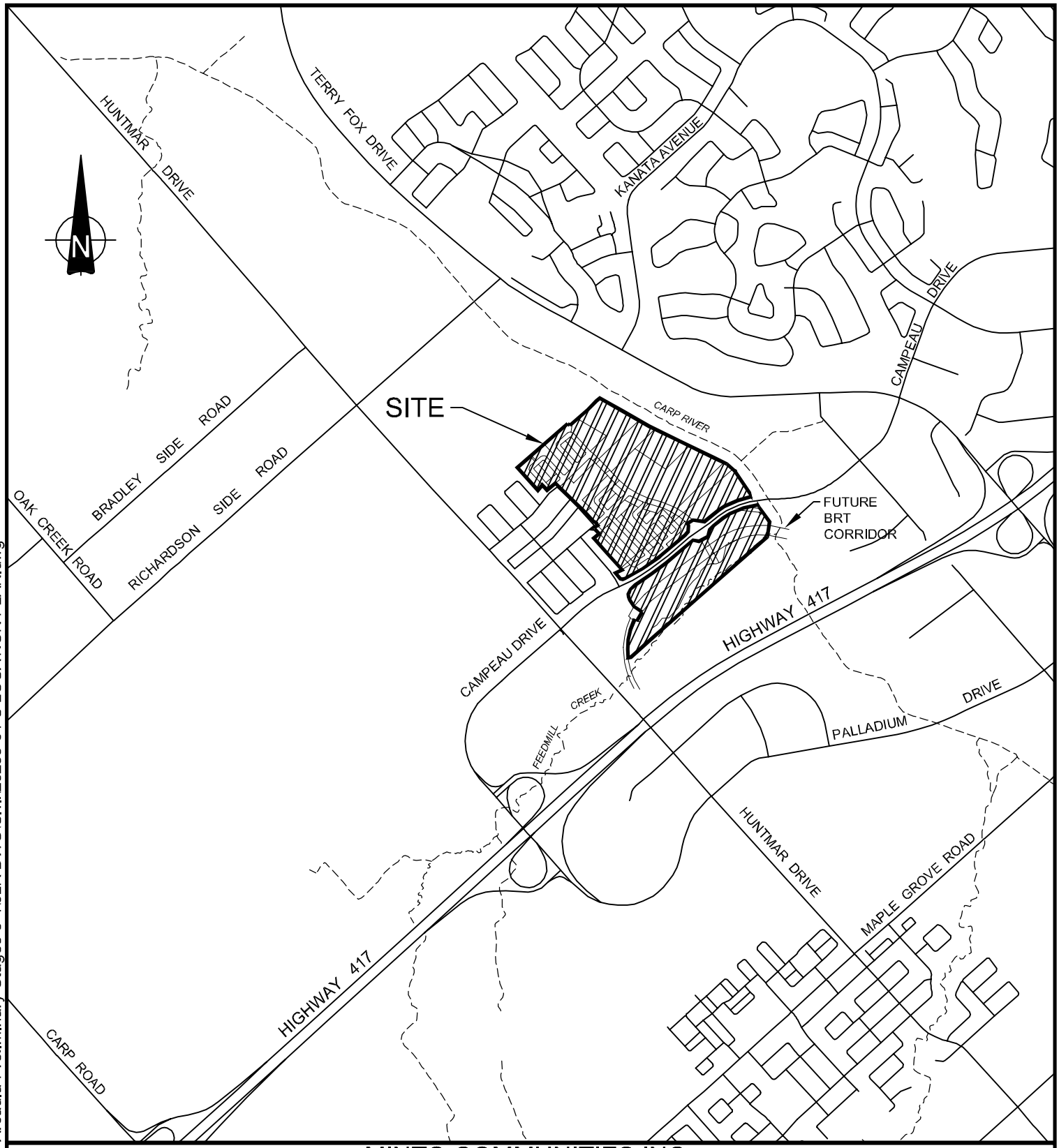
MINTO COMMUNITIES INC. ARCADIA RESIDENTIAL STAGES 3, 4, 5 & 6 AND COMMERCIAL STAGES 2 & 3

1.0 INTRODUCTION

This report is to support a proposed variation to the stormwater servicing and stormwater management (SWM) strategies recommended as part of the 2006 Kanata West Master Servicing Study (KWMSS) for Minto's Arcadia lands (located east of the Huntmar Drive and Campeau Drive intersection), a portion of the Campeau Drive right-of-way (ROW), and a portion of the future Transitway corridor located to the south of Campeau Drive. This report presents the advantages of a new servicing strategy that consists of two wet ponds outletting to the Carp River over the single pond strategy recommended for the Arcadia development area in the 2006 KWMSS.

1.1 Proposed Development

Minto's development known as Arcadia consists of six residential stages and three commercial stages. Approximately 23 ha of the Arcadia Lands known as Arcadia Stages 1 and 2 have been developed as a residential subdivision, while another ± 4 ha known as Commercial Stage 1 and a ± 4 ha external area located south of Campeau Drive, are pending approval for construction. Four residential stages (Stages 3 to 6) and two commercial stages (Stages 2 and 3) are proposed and scheduled for urbanization in Arcadia. These future stages, herein collectively referred to as the Arcadia Development, are sited on a ± 44 ha parcel of land that is bounded by the existing residential and planned commercial developments to the west, and by the Carp River to the east, as depicted on the Location Plan in **Figure 1-1**, the Staging Plan in **Figure 1-2**, and the Draft Plan of Subdivision provided in **Appendix 'A'**. The Arcadia Development is bisected near the south end by the future Campeau Drive extension and the future transitway. Currently, the land is undeveloped and generally drains easterly towards the Carp River. There is an existing drainage corridor within the Arcadia Development that serves as the dedicated outlet to the Carp River for the existing 'interim' pond servicing existing Arcadia Stages 1 and 2 and Commercial Stage 1, as well as for the western portion of the Campeau Drive ROW.



PROJECT:

MINTO COMMUNITIES INC.

ARCADIA STAGE 3,4,5,6 AND COMMERCIAL STAGES 2 AND 3

450 HUNTMAR DRIVE, OTTAWA, ONTARIO

DRAWING:

LOCATION PLAN

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
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DESIGN: HM	JLR NO: 26299-01
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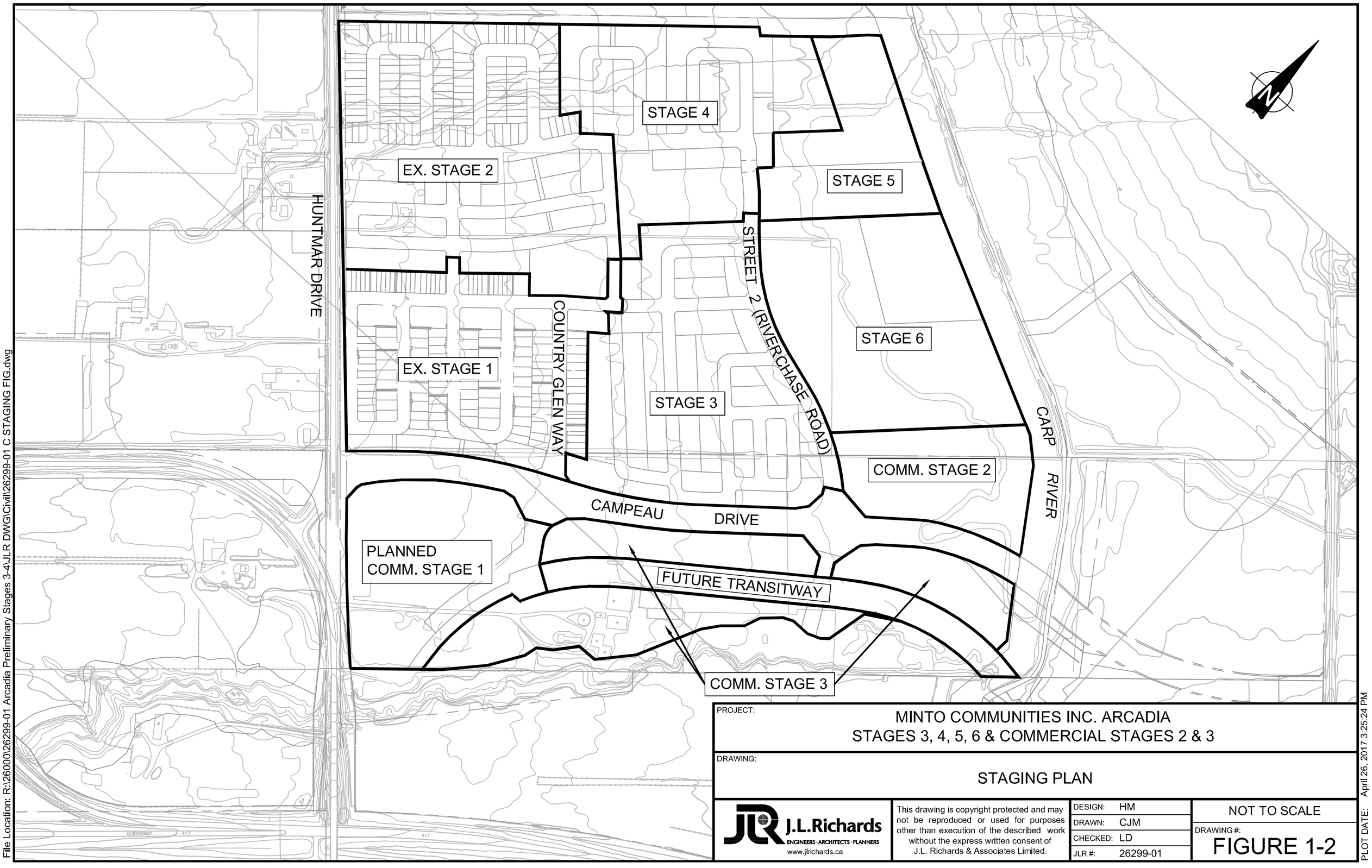

PROJECT:

MINTO COMMUNITIES INC. ARCADIA
STAGES 3, 4, 5, 6 & COMMERCIAL STAGES 2 & 3

DRAWING:

STAGING PLAN

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
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DESIGN:	HM
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FIGURE 1-2

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1.2 Background

In 2006, the KWMSS was prepared on behalf of the Kanata West Owners Group (KWOG) to investigate servicing requirements for a large mixed-use community referred to as Kanata West, which at build-out would include a population of approximately 17,000 persons in 6,300 households, 24,000 jobs in approximately 1 million square metres of commercial space. In terms of stormwater servicing and SWM, the KWMSS recommended that the ±725 ha area be serviced by seven (7) water quality/quantity facilities spread over the entire Kanata West Study Area. The largest facility in Kanata West, Pond 1, was identified to serve as the dedicated stormwater outlet for approximately 77 ha, which included all of Minto's Arcadia lands, the future transitway corridor (north of Feedmill Creek), and the Campeau Drive ROW (between Huntmar Drive and the Carp River). Refer to the 2006 KWMSS Storm Sewer Minor System Drawing ST-MN and Storm Drainage Area Plan North – Pond 1 Drawing ST-PN provided in **Appendix 'B'**.

Since construction of Pond 1 could not proceed until the Carp restoration works were completed, an 'interim' wet pond facility was constructed to allow for the development of Arcadia Stage 1 residential and commercial, Stage 2, and a portion of the Campeau Drive ROW to proceed. The 'interim' pond is located to the east of Stage 2 and is equipped with two (2) separate inlets and forebays, as shown on the Interim Storm Drainage Plan prepared by IBI and provided in **Appendix 'B'**. It was intended that this existing 'interim' pond would be decommissioned once the Carp River restoration works were completed and the permanent Pond 1 was constructed.

As part of the 2006 KWMSS, the ultimate Pond 1 was conceptually sized within a 1.50 ha block, based on design standards that were applicable at that time. Since then, the Ottawa Sewer Design Guidelines were updated and re-issued in October 2012 and a number of Technical Bulletins were also subsequently issued. The 2012 Design Guidelines provide more details in terms of the modelling approach for infiltration in urban areas (Horton Method), calculation of runoff coefficients based on maximum permissible zoning, calculation of time of concentration, and assessing the performance of the infrastructure under a specific climate change event.

More recently, preliminary sizing of the ultimate Pond 1 was carried out by IBI in accordance with the 2012 Design Guidelines as part of the Report titled "Conceptual Site Servicing Study – Arcadia Stages 1, 2, 5 & 8", dated September 2013. This sizing exercise showed that the Pond 1 block needed to be increased in size from 1.50 ha to approximately 2.45 ha in order to fulfill the requirements of the 2012 Design Guidelines and meet the design objectives of the 2006 KWMSS. The IBI Conceptual Site Servicing

Study provided the following configuration details for Pond 1 (refer to cross section provided in **Appendix 'B'**).

Table 1-2: IBI Pond 1 Concept Design (2013)

Pond Normal Water Level (NWL)	92.65
Pond 1:100 year Hydraulic Grade Line (HGL)	93.54
Pond Size	2.45 ha
Pond Bottom	92.00

It should be noted that the 2.45 ha SWM Block was not confirmed with a HGL analysis as noted in Section 5.6.2.1 of IBI's 2013 Conceptual Site Servicing Study. Additionally, the pond block was sized prior to the development of the calibrated Carp River PCSWMM model by the City. Since 2013, the City has developed a PCSWMM model of the areas tributary to the Carp River, which was calibrated and validated to actual recorded data. A PCSWMM model was subsequently developed to reflect the post-development conditions and a series of hydrographs were generated at key locations that are to be matched under post-development conditions.

Due to the changes to the Design Guidelines, as well as the completion of the Carp River PCSWMM model, the SWM strategy outlined for the Arcadia Development in the 2006 KWMSS and the 2013 IBI Conceptual Site Servicing Study needed to be re-evaluated.

2.0 EVALUATION OF STORM SERVICING AND SWM ALTERNATIVES

2.1 KWMSS Pond 1

JLR developed a conceptual storm sewer design for the Arcadia Development and carried out preliminary stormwater modelling using PCSWMM to re-assess the KWMSS Pond 1 SWM strategy based on current Design Guidelines and to meet the target hydrographs of the City's February 2017 calibrated Carp River PSCWMM model. As per the 2006 KWMSS, this storm servicing strategy would consist of runoff from all existing and future Arcadia Stages being conveyed to a wet pond located east of Riverchase Road (i.e., Street No. 2 per the Draft Plan in **Appendix 'A'**) and ±450 m north of Campeau Drive.

2.1.1 Hydrological Parameters

Catchment areas for the Arcadia Development were divided based on development stage and land use. Catchment areas were further subdivided for Stages 3, 4, 5 and 6 based on the conceptual storm sewer network developed for each Stage. The following parameters were incorporated into the PCSWMM model for the Arcadia Development:

Table 2-1-1: Land Use Percent Impervious and Runoff Coefficient Values

Land Use	Imperviousness (%)	Runoff Coefficient
Residential (plus roads)	64.3	0.65
Park Lands	14.3	0.30
Pond Blocks	35.0	0.45
Arterial Roads and Transitway	92.9	0.85
Commercial Lots	92.9	0.85

Runoff from existing Stages 1 and 2 and planned Commercial Stage 1, which drains to the existing 'interim' pond was modelled by IBI, as detailed in the Arcadia Stage 2 SWM Report and Stage 2 Inlet Design Brief, dated October 2014. As such, the existing flows to the ‘interim’ pond were extracted as hydrographs from the IBI XPSWMM model and incorporated in the PCSWMM model for the Arcadia Development at build-out.

As per the Carp River modelling, the Curve Number methodology was used to simulate infiltration. The curve number for each catchment was area weighted from the value used for the area in the City's Carp River model.

The model was used to simulate the 12 hour SCS storm (1:10 year and 1:100 year), which was identified as the critical storm distribution for the Carp River system.

2.1.2 Catchment Storage Simulation Parameters

The Arcadia Development is proposed to be designed with street sag storage in residential areas and on-site storage in commercial blocks. Street sag storage has been included in the model in the form of storage nodes based on a volume of 50 m^3/ha, in accordance with the storage requirements outlined the 2006 KWMSS. Storage nodes in the Commercial Blocks have been modelled to contain the 1:100 year event.

The allowable release rate to the minor system was set to 200 L/s/ha for residential areas, which is equivalent to a storm event between the 1:2 to 1:5 year event. An allowable release rate to the minor system of 280 L/s/ha was set for the Campeau Drive ROW and the future transitway corridor, which is equivalent to the 1:10 year event, in accordance with the Design Guidelines for arterials.

2.1.3 Preliminary Trunk Storm Sewer and Pond Design

With the construction of Pond 1, the existing ‘interim’ pond servicing existing residential Stages 1 and 2 and planned commercial Stage 1 would be decommissioned and runoff from these stages, as well as that from future Stages 4 and 5 would be conveyed to Pond 1 via a trunk storm sewer along Paine Avenue. It is anticipated that this trunk

sewer would be 2750 mm in diameter at its downstream end at the intersection of Riverchase Road.

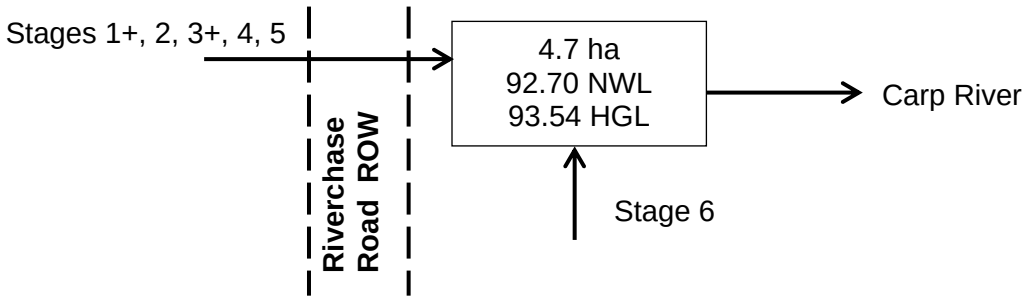
A trunk storm sewer along Riverchase Road would also be required to convey runoff from the future transitway corridor, Campeau Drive ROW, commercial Stages 2 and 3 and residential Stage 3, herein collectively referred to as 'Stage 3+'. The Riverchase Road trunk storm sewer would range in size from 1350 mm in diameter at the Campeau Drive intersection to 1650 mm in diameter at its downstream end. The Paine Avenue trunk and the Riverchase Road trunk storm sewers would ultimately converge to a single 2750 mm diameter inlet to the pond. A separate 1050 mm diameter inlet sewer to the pond would be provided and would service solely Stage 6.

The following Table and Figure provide the characteristics of the KWMSS Pond 1 servicing strategy evaluated in PCSWMM. Note that 'Stage 1+' herein refers to both existing residential Stage 1 and planned commercial Stage 1.

Table 2-1-2: KWMSS Pond 1 Characteristics

Pond (NWL)	92.70 m			
Pond 1:100 year HGL	93.54 m			
Pond Size	4.7 ha*			
Pond Inlets	**Stage(s)**	**Diameter**	**Invert Elevation**	**Depth of Submergence**
	1+,2,3+,4,5	2750 mm	90.35 m	2.35 m (85% submerged)
	6	1050 mm	92.80 m	0 m
Note *Pond size is conceptual only and does not include area required for access roads and/or clearances to adjacent properties/ROWs				

Figure 2-1: KWMSS Pond 1 Schematic



A normal water level in the pond of 92.70 m was selected based on the 1:2 year water level elevation of 92.69 m in the Carp River at the pond outlet location. A 1:100 year HGL elevation in the pond of 93.54 m was selected to be consistent with the IBI 2013 Concept Design for comparison purposes and to ensure that the HGL in existing Stage 1 and 2 sewers would be less than the current HGL elevations. With the development of a conceptual sewer design and the PCSWMM model, it was determined that a pond

footprint of approximately 4.7 ha would be required to match the post-development target hydrographs of the Carp River. As indicated in the table above, this footprint area does not include any areas required for access roads or clearances to adjacent properties and/or ROWs.

2.1.4 Constraints

In addition to the calculated Pond 1 footprint being approximately 3 ha larger than that identified in the 2006 KWMSS, and approximately 2 ha larger than that in the 2013 IBI concept design, some significant constraints were identified in completing the conceptual storm sewer design and PCSWMM model for the Arcadia Development. The following five constraints were noted:

1. Crossing conflict between Paine Avenue storm sewer and Riverchase sanitary sewer

A crossing conflict would occur between the future Paine Avenue trunk storm sewer conveying runoff from Stages 1+,2, 4 and 5 to the pond, and the future Riverchase Road sanitary sewer conveying wastewater from Stages 4 and 5 to the existing Campeau Drive trunk sanitary sewer.

As a best case scenario, if the Paine Avenue trunk were to be extended from the existing elliptical sewer at MH 510, at minimum slope (0.15%), with invert to invert connections, it would have a minimum invert elevation of 91.16 m at the intersection of Riverchase Road. Similarly, if the Riverchase Road sanitary sewer were extended at minimum slope (0.20%) from the existing stub at Campeau Drive, it would have a minimum obvert elevation of 91.69 m at the intersection of Paine Avenue. The Riverchase Road sanitary sewer would, therefore, have to be approximately 1 meter lower to be able to cross under the Paine Avenue trunk storm sewer, which is not feasible due to the elevation of the Campeau Drive trunk sanitary sewer. Alternatively, it would have to be 2.8 m higher (with an invert elevation of 94.50 m) to cross over the storm sewer trunk, which would not provide a viable outlet for Stage 5 where existing ground ranges between 93.00 to 93.50 m.

It should also be noted that providing sanitary servicing for Stages 4 and 5 via the existing sanitary sewers on Clonrush Way and Country Glen Way is not considered a viable alternative either, since the existing sanitary sewer obvert at the intersection of Clonrush Way and Paine Avenue is 94.02 m. This obvert elevation is approximately one meter higher than existing ground in Stage 5, meaning that extensive fill works up to 5 m (exceeding the permissible grade raise) would be required to provide a gravity sanitary sewer outlet for Stage 5 via Clonrush Way.

2. HGL exceeds centreline road elevation on Campeau Drive

Stantec is currently in the process of completing the detailed design for Campeau Drive to the south of the Arcadia Development from Country Glen Way to east of the Carp River. Construction of Campeau Drive is anticipated for commence in 2018.

Based on the results of the PCSWMM model provided on Figure C1a in **Appendix 'C'**, the 1:100 year HGL along Campeau Drive ± 120 m to the east of Riverchase Road would be approximately 94.44 m, which is 0.14 m higher than the future road centreline elevation of 94.30 m at that location (see Stantec plan & profile drawing for Campeau Drive provided in **Appendix 'B'**). It is noted that only the 120 m section of the Campeau Drive storm sewer east of Riverchase Road was incorporated in the PCSWMM model as this section was deemed most critical, as it has the lowest proposed centreline elevation. Additionally, this section of storm sewer was modelled as a 750 mm diameter sewer rather than a 600 mm diameter storm sewer, as per Stantec's drawing, in order to minimize the HGL elevation. If a 600 mm diameter were to be used to service the eastern portion of Campeau Drive, then the 1:100 year HGL would increase to 94.49 m or 0.19 m above the proposed road centreline elevation, as shown on Figure C1b of **Appendix 'C'**.

3. Submergence of Riverchase Road Trunk and Campeau Drive Storm Sewers

To provide a gravity storm sewer outlet for the eastern portion of the Campeau Drive ROW, the Riverchase Road trunk storm sewer at the intersection of Campeau Drive would have to have a maximum invert elevation of 91.30 m, as per the Campeau storm sewer design prepared by Stantec (refer to the plan and profile drawing provided in **Appendix 'B'**). The Riverchase Road trunk storm sewer at this location would be 1350 mm in diameter and would have an obvert elevation of 92.67 m. Based on a normal water level of 92.70 m in the pond, the entire Riverchase Road trunk sewer from the pond to Campeau Drive (approximately 500 m) would be fully (100%) submerged, as would a ±150 m section of Campeau Drive storm sewer east of Riverchase Road. Standing water would further extend an additional ± 20 m along the Campeau Drive storm sewer east of Riverchase Road, as well as 111 m along the Campeau Drive storm sewer west of Riverchase Road, until free flowing

4. Standing Water along Paine Avenue and Clonrush Way Trunk Storm Sewers

Although the storm sewers in the northern portion of the Arcadia Development will not be completely submerged, there will be extensive standing water along existing and future storm sewers. Based on a normal water level of 92.70 m, standing water will extend along the storm sewer system as follows:

- ± 440 m from the Pond to the west leg of Saddleback Crescent located in existing Stage 2.

- ± 145 m along Clonrush Way from Paine Avenue to south of Halyard way in Stage 2.

5. High HGL in southeastern portion of Stage 3 adjacent to Campeau Drive

Based on the results of the PCSWMM model provided on Figure C1a in **Appendix 'C'**, the 1:100 year HGL in future Stage 3 sewer northwest of the Campeau Drive and Riverchase Road intersection is approximately 95.10 m. It is noted that this HGL is almost equivalent to the adjacent Campeau Drive centreline elevation of 95.15 m, as per the Stantec Plan & Profile provided in **Appendix 'B'**. To provide the minimum required 0.30 m freeboard between the underside of footing (USF) and the HGL, a typical unit will require a minimum clearance of 2 m between the HGL and road centreline elevation. Based on this typical relationship, the most southerly street in Stage 3 would have a centreline elevation of approximately 97.10 m which would result in more than a 2 m grade difference between Stage 3 and Campeau Drive.

2.2 Pond Bisected By Riverchase Road with Hydraulically Connected Cells

The KWMSS Pond 1 servicing concept was re-evaluated with the objective of eliminating the critical crossing constraint at the intersection of Paine Avenue and Riverchase Road, as well as reducing submergence and standing water along the storm sewer system. An alternative stormwater servicing strategy was therefore developed where the existing 'interim' pond would be retrofitted and expanded to become a permanent facility. The pond would be bisected by Riverchase Road and the forebays and inlets for Stages 1+, 2, 4 and 5 would be located on the western side of Riverchase Road, while the forebays and inlets for Stages 3+ and 6 would be located on the eastern side of Riverchase Road. The western and eastern portions of the pond would be hydraulically connected via four 2.4 m by 1.5 m box culvert crossing under Riverchase Road.

2.2.1 Preliminary Trunk Storm Sewer and Pond Design

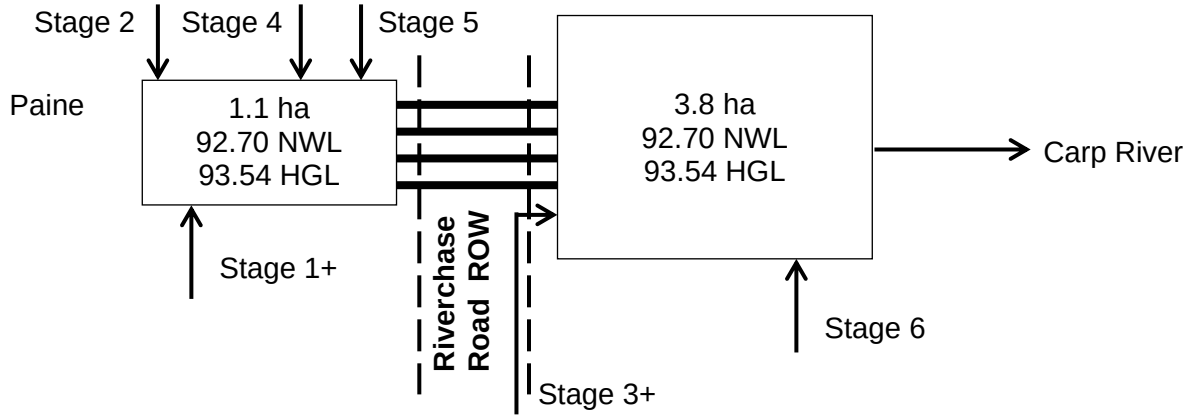
The following table and schematic provide the key characteristics of this Option:

Table 2-2: Pond Bisected by Riverchase with Hydraulically Connected Cells Characteristics

Pond NWL	92.70 m				
Pond 1:100 year HGL	93.54 m				
Pond Size	4.9 ha (1.1 ha west of Riverchase, 3.8 ha east of Riverchase)*				
Pond Inlets	**Stage**	**Outlet Location Relative to Riverchase**	**Diameter**	**Invert Elevation**	**Depth of Submergence**
	1+	West	2.4 x 1.8	92.30 m	0.4 m
	2	West	2.4 x 2.2	91.39 m	1.31 m
	3+	East	1650 mm	90.35 m	2.35 m (142% submerged)
	4	West	900 mm	92.80 m	0 m
	5	West	825 mm	92.80 m	0 m
	6	East	1050 mm	92.80 m	0 m

Note
*Pond size is conceptual only and does not include area required for access roads and/or clearances to adjacent properties/ROWs

Figure 2-2: Pond Bisected by Riverchase with Hydraulically Connected Cells Schematic



By maintaining the existing Stage 1+ and 2 pond inlets on the west side of Riverchase Road, the critical crossing constraint at the intersection of Paine Avenue and Riverchase Road, as identified in the KWMSS Pond 1 option above, would be eliminated. The inclusion of separate pond inlets for Stages 4 and 5 would also eliminate any standing water along the future Paine Avenue trunk storm sewer (i.e., east of Clonrush Way).

2.2.2 Constraints

Although some critical constraints would be eliminated by making use of the existing 'interim' pond and inlets to the west of Riverchase Road, it should be noted that this servicing alternative requires that the pond be ± 0.2 ha lager than the KWMSS Pond 1 option. Additionally, the following four constraints were noted:

1. HGL exceeds centreline road elevation on Campeau Drive

As shown in the PCSWMM results presented on Figure C2 in **Appendix 'C'**, the 1:100 year HGL elevations in Stage 3+ would remain essentially the same as those determined for the KWMSS Pond 1 option presented on Figure C1a. The HGL at Campeau Drive (120 m east of Riverchase Road) would be 0.14 m higher than the future road centreline elevation, as per Stantec's design for Campeau Drive. This HGL is based on a 750 mm diameter Campeau Drive storm sewer rather than the 600 mm diameter sewer proposed by Stantec.

2. Submergence of Riverchase Road Trunk and Campeau Drive Storm Sewers

As in the KWMSS Pond 1 strategy, the ±500 m long Riverchase Road trunk storm sewer and the ±145 m section of the Campeau Drive storm sewer would remain fully submerged.

3. Standing Water along Paine Avenue and Clonrush Way Trunk Storm Sewers

Standing water would extend along the existing storm sewer system as follows:

- ± 220 m along Paine Avenue from the Stage 2 pond inlet to the west leg of Saddleback Crescent
- ±145 m along Clonrush Way from Paine Avenue to south of Halyard Way
- ± 25 m along Stage 1+ outlet east of Clonrush Way

Note that the extent of standing water has been reduced by 195 m compared to the KWMSS Pond 1 alternative.

4. High HGL in southeastern portion of Stage 3 adjacent to Campeau Drive

As shown in the PCSWMM results presented on Figure C2 in **Appendix 'C'**, the 1:100 year HGL elevation in the Stage 3 sewer, north of Campeau Drive will be approximately equal to the centreline elevation of 95.15 m on Campeau Drive. To provide adequate cover over this HGL, a grade difference of at least 2 m is anticipated between Campeau Drive and the adjacent Stage 3 street to the north.

2.3 Pond Bisected By Riverchase Road with Hydraulically Separated Cells

The pond bisected by Riverchase Road alternative was re-evaluated with the objective of reducing the overall pond footprint. It was noted that currently the existing 'interim' pond has a 1:100 year HGL elevation of 94.21 m and, therefore, the existing storm sewer system can accommodate a higher HGL than 93.54 m, as was used in the

previous pond analyses. A new alternative was, therefore, developed where the pond would be bisected by Riverchase Road, but the west and east cells would be hydraulically separated and would have separate outlets to the Carp River. This alternative would allow for the 1:100 year HGL of the west cell to be maximized and the total pond footprint area to be minimized. As in the previous servicing alternative, Stages 1, 2, 4 and 5 would outlet to the west cell while Stages 3+ and 6 would outlet to the east cell.

2.3.1 Preliminary Trunk Storm Sewer and Pond Design

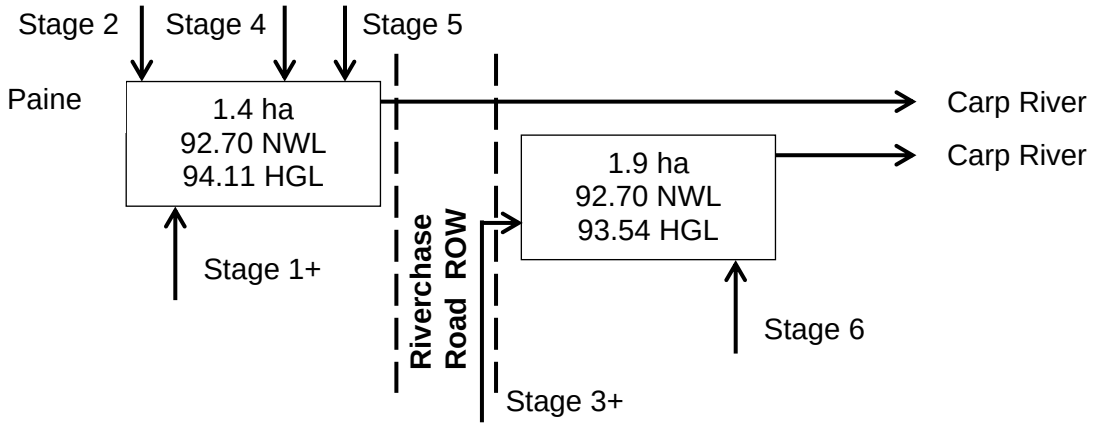
The following table and schematic provide the characteristics of the bisected pond option with hydraulically separated cells.

Table 2-3: Pond Bisected by Riverchase Road with Hydraulically Separated Cells Characteristics

WEST CELL				
Pond NWL	92.70 m			
Pond 1:100 year HGL	94.11 m			
Pond Size	1.4 ha*			
Pond Inlets	**Stage(s)**	**Diameter**	**Invert Elevation**	**Depth of Submergence**
	1+	2.4 x 1.8	92.30 m	0.4 m
	2	2.4 x 2.2	91.39 m	1.31 m
	4	900	92.80 m	0 m
	5	825	92.80 m	0 m
EAST CELL				
Pond NWL	92.70 m			
Pond 1:100 year HGL	93.54 m			
Pond Size	1.9 ha*			
Pond Inlets	**Stage(s)**	**Diameter**	**Invert Elevation**	**Depth of Submergence**
	3+	1650 mm	90.35	2.35 m
	6	1050 mm	92.80	0 m

Note
*Pond size is conceptual only and does not include area required for access roads and/or clearances to adjacent properties/ROWs

Figure 2-3: Pond Bisected by Riverchase Road with Hydraulically Separated Cells Schematic



The 1:100 year HGL of the west cell was raised from 93.54 to 94.11 m, as this was the maximum HGL that would allow for the west cell serving as the outlet for Stages 1+,2,4, and 5 to be confined to a 1.4 ha block to the west of Riverchase Road. It is noted that this HGL is 0.10 m below the current HGL of 94.21 at the 'interim' pond and, therefore, does not negatively impact existing sewers. The cell serving as the outlet for Stages 3+ and 6 to the east of Riverchase Road would have a footprint area of 1.9 ha, resulting in a total pond footprint area of 3.3 ha.

2.3.2 Constraints

Although this servicing alternative successfully minimizes the total pond footprint area requirement, the constraints previously identified for the bisected pond option with hydraulically connected cells would exist. The following four constraints were noted:

1. HGL exceeds centreline road elevation on Campeau Drive

As shown in the PCSWMM results presented on Figure C3 in **Appendix 'C'**, the 1:100 year HGL elevations in Stage 3+ would be roughly the same as those determined for the KWMSS Pond 1 and the bisected hydraulically connected pond options. The 1:100 year HGL at Campeau Drive (120 m east of Riverchase Road) would be 0.14 m higher than the future road centreline elevation, as per Stantec's design for Campeau Drive. This result is based on a 750 mm diameter storm sewer on Campeau Drive rather than the 600 mm diameter sewer proposed by Stantec.

2. Submergence of Riverchase Road Trunk and Campeau Drive Storm Sewers

As in the two previous SWM analyses, the ± 500 m long Riverchase trunk storm sewer and the ±145 m section of the Campeau Drive storm sewer east of the Riverchase Road intersection would be fully submerged.

3. Standing Water along Paine Avenue and Clonrush Way Trunk Storm Sewers

Standing water would extend along the existing storm sewer system as follows:

- ± 220 m along Paine Avenue from the Stage 2 pond inlet to the west leg of Saddleback Crescent
- ± 145 m along Clonrush Way from Paine Avenue to south of Halyard Way
- ± 25 m along Stage 1+ outlet east of Clonrush Way

Note that the extent of standing water has been reduced by 195 m compared to the KWMSS Pond 1 alternative.

4. High HGL in southeastern portion of Stage 3 adjacent to Campeau Drive

As shown in the PCSWMM results presented on Figure C3 in **Appendix 'C'**, the 1:100 year HGL elevation in the Stage 3 sewer north of Campeau Drive will be approximately equal to the centreline elevation of 95.15 m on Campeau Drive. To provide adequate cover over this HGL, a grade difference of at least 2 m is anticipated between Campeau Drive and the adjacent Stage 3 street to the north.

2.3.3 Two Ponds: Campeau Drive and Paine Avenue

The pond alternative with hydraulically separate cells was further investigated with the objectives of reducing the HGL at Campeau Drive and the southerly limit of Stage 3, as well as the submergence along the Riverchase Road trunk storm sewer. It was determined that hydraulically separating two cells of a pond is essentially equivalent to a two pond concept and that if a second pond were to be located further south, closer to the Campeau Drive, then the aforementioned constraints could be mitigated. The 'Campeau Pond' was, therefore, conceptualized to serve as the dedicated stormwater outlet for Stages 3+. The Campeau Pond would be located south of Campeau Drive and west of the Carp River Corridor, within the Commercial Stage 3 lands, and would outlet to the Carp River immediately upstream of the Campeau Bridge crossing.

In addition to the Campeau Pond, the existing 'interim' wet detention pond would be retrofitted and expanded in size to become a permanent facility, herein referred to as the 'Paine Pond'. The Paine Pond would serve as the outlet for Stages 1+, 2, 4 and 5. This

pond would be bisected by Riverchase Road and hydraulically connected by four 2.4 m x 1.5 m box culvert crossings.

2.3.4 Preliminary Trunk Storm Sewer and Pond Design

To minimize sewer size and submergence, the Campeau Pond would have two inlet pipes: one for lands north of Campeau Drive and the eastern portion of the Campeau Drive ROW, and one for the western portion of the Campeau Drive ROW and lands to the south including the transitway corridor. The two inlet sewers would have a minimum invert elevation of 92.00 at the intersection of Riverchase Road and Campeau Drive to facilitate the crossing of the existing 600 mm diameter feedermain along Campeau Drive (as shown in the Campeau Drive As-constructed Plan & Profile prepared by IBI provided in **Appendix 'B'**).

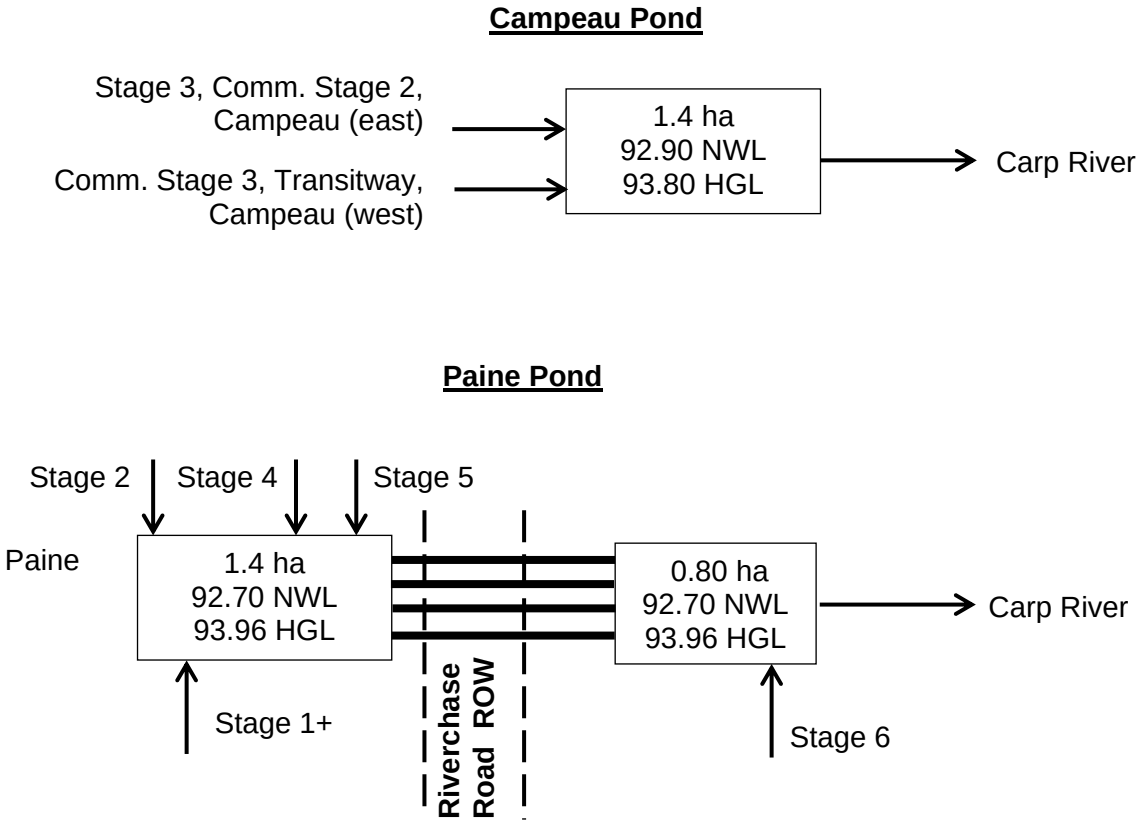
The characteristics of the two pond strategy are summarized in the table and schematic below.

Table 2-4: Two Pond Characteristics

CAMPEAU POND				
Pond NWL	92.90 m			
Pond 1:100 year HGL	93.80 m			
Pond Size	1.4 ha*			
Pond Inlets	**Stages**	**Diameter**	**Invert Elevation**	**Depth of Submergence**
	3, Comm. 2, Campeau (east)	1650 mm	91.90	1 m (61%)
	Comm. 3, Transitway, Campeau (west)	1200 mm	91.90	1 m (83%)
RETROFITTED PAINE POND				
Pond NWL	92.70			
Pond 1:100 year HGL	93.96			
Pond Size	2.2 ha (1.4 ha west, 0.8 ha east)*			
Pond Inlets	**Stage**	**Diameter**	**Invert Elevation**	**Depth of Submergence**
	1+	2.4 x 1.8	92.30	0.4 m
	2	2.4 x 2.2	91.39	1.3 m
	4	900	92.80	0 m
	5	825	92.80	0 m
	6	1050	92.80	0 m

Note
*Pond sizes are conceptual only and do not include area required for access roads and/or clearances to adjacent properties/ROWs

Figure 2-4: Two Pond Schematic



The normal water level of 92.90 was selected for the Campeau Pond based on a 1:2 year water elevation of 92.85 m in the Carp River at the pond outlet location, upstream of the Campeau Bridge. The HGL elevation of 93.80 m was allocated at the pond as this elevation was determined to be the lowest possible HGL elevation that would result in a pond footprint that would fit within the available 1.7 ha Commercial Stage 3 block. The Paine Pond HGL elevation of 93.96 m was selected to be consistent with the 2006 KWMSS.

The results of the PCSWMM model (presented on Figure C4a of **Appendix 'C'**) indicate that with the introduction of the Campeau Pond, the 1:100 year HGL on Campeau Drive (120 m of east of the Riverchase Road intersection) would be lowered to 94.07 m, which is 0.23 m below Stantec's proposed centreline elevation and ± 0.38 m lower than the HGL determined in the previous SWM alternatives. Furthermore, the HGL at the southeastern limit of Stage 3 would be reduced to 94.23, which would reduce the grade difference between Stage 3 and Campeau Drive. Additionally, based on a NWL elevation of 92.90 m, the Riverchase Road trunk storm sewer would not be fully submerged.

It is noted that the HGL results indicated above and presented on Figure C4a are based on the use of a 750 mm diameter storm sewer on Campeau Drive, rather than a 600 mm diameter sewer as indicated on Stantec's plans for Campeau Drive. This increase in storm sewer size was incorporated to minimize the HGL on Campeau Drive. Should a 600 mm diameter sewer be constructed on Campeau Drive, then an HGL elevation of approximately 94.59 m would be anticipated, as shown on Figure C4b in **Appendix 'C'**, thus exceeding the proposed centreline elevation by 0.29m.

2.3.5 Constraints

Although the two pond strategy mitigates many of the constraints identified in the previous SWM options evaluated, such as the high HGL on Campeau Drive and in Stage 3, as well as the submergence of the Riverchase Road trunk storm sewer, the following two constraints were noted:

1. Submergence and Cover Depth of Campeau Drive storm sewer

The 120 m long section of storm sewer on Campeau Drive east of Riverchase Road would be completely submerged. Based on an invert to invert connection to the Stage 3 outlet pipe, the Campeau Drive sewer would have a downstream invert elevation of 92.03 at the intersection of Riverchase Road. As previously mentioned, a minimum invert elevation of 92.00 is required for the storm sewer outlet to cross over the existing 600 mm diameter feedermain. Extending the 750 mm diameter storm sewer at a slope of 0.13% along Campeau Drive, the obvert elevation of the pipe at the upstream end, 120 m east of Riverchase Road, would be 92.95 which is only 5 cm higher than the NWL of the pond. Furthermore, with a centreline elevation of 94.30, there would only be 1.35 m of cover above the sewer.

2. Standing Water along Paine Avenue and Clonrush Way Trunk Storm Sewers

Standing water would extend along the existing storm sewer systems outletting to the Paine Avenue Pond as follows:

- 220 m along Paine Avenue from the Stage 2 pond inlet to the west leg of Saddleback Crescent
- 145 m along Clonrush Way from Paine Avenue to south of Halyard Way
- 25 m along Stage 1+ outlet east of Clonrush Way

Note that the extent of standing water has been reduced by 195 m compared to the KWMSS Pond 1 alternative.

3.0 RECOMMENDED STORM SERVICING AND SWM STRATEGY

3.1 Advantages of Two Pond Strategy

Based on the information presented above, the two pond strategy which includes the Campeau Pond and the Paine Pond is recommended to service the Arcadia Development. Key advantages that support the implementation of the proposed two pond strategy over the other three options evaluated are as follows:

- The crossing conflicts between storm and sanitary sewer systems are eliminated.
- The Campeau Pond provides the lowest HGL on Campeau Drive, which is also below the proposed minimum centreline elevation of 94.30.
- The Campeau and Paine Ponds require a smaller total footprint area compared to the KWMSS Pond 1 Option.
- The lengths of submergence and standing water in storm sewers are reduced resulting in reduced maintenance costs.
- The Campeau Pond provides the lowest possible HGL at the southern limit of Stage 3, thus minimizing the grade difference between Stage 3 and Campeau Drive.

3.2 Addressing Constraints of the Recommended Two Pond Strategy

The constraints associated with the two pond strategy could be mitigated in a number of ways.

Regarding the shallow Campeau Drive storm sewer, a combination of insulation and a raised centreline elevation could improve the cover depth constraint associated with this sewer. Raising the centreline would also increase the cover to the HGL elevation. It is understood however, that raising the Campeau Drive centreline elevation would require additional light weight fill. Alternatively, if the Campeau Drive storm sewer were reversed to flow easterly and outlet to the pond further east, then the sewer could be lowered to improve cover depth. A lower invert elevation would be feasible at ± 180 m east of Riverchase Road since the existing Campeau Drive watermain begins to lower to cross the Carp River at that location (refer to IBI as-constructed profile drawing for Campeau Drive provided in **Appendix 'B'**). Top of watermain elevation at this location is roughly at 90.00 m compared to 92.00 m at the intersection with Riverchase Road. Reducing the elevation of the Campeau Drive sewer would, however increase the extent of standing water in the sewer.

Regarding the Paine Avenue Pond, although the extent of standing water along the existing sewers cannot be changed due to the elevation of the 1:2 year event in the Carp River, the extent of standing water along the future sewer system has been minimized by including multiple outlets and smaller diameter sewers which was made possible by the addition of the Campeau Pond.

Recently, the City shared with JLR some possible deficiencies identified by their staff in regard to the existing 'interim' pond and general concerns, should it be converted to a permanent facility. These deficiencies were provided via an e-mail correspondence dated March 9, 2017, a copy of which has been included in **Appendix 'D'**. Each of the deficiencies identified was taken into consideration and has either been addressed through the conceptual analyses completed or will be addressed at detailed design. The details associated with these deficiencies and proposed expansion and retrofitting work are summarized in Table D1 in **Appendix 'D'**.

3.3 Water Quality and Quantity Control for the Two Pond Strategy

The proposed Campeau and Paine Ponds have been sized to provide water quality control to achieve an MOECC Normal Level of Protection (i.e., 70% total suspended solids removal) before outletting to the Carp River, in accordance with the Carp River Watershed Study and the 2006 KWMSS. The Campeau Pond will, therefore, have a permanent pool of 2,150 m^3 to provide quality control for Stages 3+. Preliminary water quality calculations are provided in **Appendix 'E'**.

As previously noted, the normal water level in the Paine Pond will be reduced from the current 'interim' elevation of 93.00 m to 92.70 m. The resulting loss of permanent pool from the lowered NWL will be offset with an expansion of the permanent pool. With this expansion, the permanent pool west of Riverchase will be increased from its current volume of 3,276 m^3, as per IBI Report and Design Brief Arcadia Stage 2 SWM Report and Stage 2 Inlet Design Brief, dated October 2014, to 3,690m^3 of storage required to provide quality control for Stages 1, 2, 4 and 5. Refer to quality control calculations provided in **Appendix 'E'**. Existing forebays for Stages 1 and 2 will be retrofitted, and new forebays for Stages 4 and 5 will be added to the expanded pond in accordance with the recommendations of the MOECC Stormwater Management Planning and Design, dated March 2003 (SMPDM).

The permanent pool for Stage 6 will be located east of Riverchase Road and will have a capacity of 630 m^3. Calculations on the Stage 6 permanent pool and forebay sizing are included in **'Appendix 'E'**. Both forebay and permanent pool were sized to meet the requirements of the MOECC SWMPDM. It is noted that prior to the development of Stage 6, the portion of the pond east of Riverchase will be comprised of only extended

detention storage, the outlet berm and associated restrictor. With the development of Stage 6, an additional permanent pool will be incorporated into the eastern portion of the pond to provide water quality control for Stage 6, as well as additional storage for quantity control. A single outlet structure located at the downstream end of the eastern side of the pond will control the storm discharge to the Carp River.

The 2006 KWMSS indicated that the outlet structure for Pond 1 would consist of three outlets; a low flow french drain outlet to provide flow augmentation to the Carp River, an extended water quantity volume outlet and a weir outlet for peak flow reduction control. Both the Paine Avenue Pond and Campeau Drive Pond will have this outlet configuration.

3.4 Major System with Two Pond Strategy

Major overland flows generated in Stage 3 will be conveyed southeasterly as shown on the Conceptual Grading Plan Drawing CG1. Since major overland flow crossing the Campeau Drive is not permitted in accordance with Design Guidelines (i.e., major system flows may not cross arterial roadways), a spillover area northwest of the Campeau Drive / Riverchase Road intersection is anticipated to be required assuming that the roadway sags provide insufficient major system storage. Major system flows stored in the dry pond would then be gradually released to the minor system.

Similarly, major system flows in Stages 4 and 5 will be conveyed to a dry pond area located in the park block of Stage 5 where they will be gradually released to the minor system. Major flows generated in Stage 6 will be conveyed directly to the Paine Pond.

Conversely, it is anticipated that Commercial Stages 2 and 3 will be designed with on site storage to contain the 1:100 year event.

3.5 Simulation of the Two Pond SWM Strategy

3.5.1 Pond Simulation Parameters

The retrofitted and expanded Paine Avenue Pond was simulated as two storage nodes connected via a four barrel conduit of 2.4 m by 1.5 m box culverts. The Campeau Drive Pond was modelled as a single storage node. The ponds were simulated based on the configurations summarized in Table 3-1. The flow augmentation outlets were used to set the invert levels of the storage nodes, which represent the top of the permanent pool; however, the outlets were not included in the model as the release rate would be negligible.

Table 3-1: Pond Storage Parameter Summary

Parameter	Paine Avenue Pond (West node)	Paine Avenue Pond (East node)	Campeau Drive Pond
Storage Volume (m^3)	12,613	8,660	20,120
Maximum Active Storage Depth (m)	1.2	1.2	0.9
Surface Area at Maximum Depth (m^2)	13,700	8,300	14,200
Permanent Pool Elevation (m)	92.70	92.70	92.90
Active Storage Outlet Elevation (m)	*The West node connects to the East node via a 4 barrel 2.4 m by 1.5 m box culvert with an invert elevation of 92.7 m*	92.85	93.05
Active Storage Outlet Diameter (mm)		250	250
Weir Elevation (m)		93.65	93.70
Weir Dimensions (L x H) (m)		30 x 0.35	13 x 0.35
High Water Level Elevation (m)	93.96	93.96	93.80

3.5.2 Simulation Results

The outflows from the end-of-pipe facilities need to conform to the flows and water levels set along the Carp River. The impact of the addition of the two pond strategy to the Carp River is summarized in the model results provided in the following tables. Refer to **Appendix 'F'** for the complete PCSWMM model output files for the recommended two pond strategy.

Table 3-2: City of Ottawa Carp River Model

	1:10 year	1:100 year
Peak Flow in Carp River downstream of Campeau Drive (m^3/s)	28.28	44.60
…at (hours)	11:40	10:40
Peak Flow in Carp River downstream of development (m^3/s)	27.06	43.46
…at (hours)	12:00	12:00

Table 3-3: Carp River Model Results with Two Pond SWM Strategy

	1:10 year	1:100 year
Paine Avenue Pond Peak Discharge Rate (m^3/s)	1.25	4.20
…at (hours)	6:45	6:25

	1:10 year	1:100 year
Campeau Drive Pond Peak Discharge Rate (m^3/s)	0.10	0.55
…at (hours)	8:50	6:45
Peak Flow in Carp River downstream of Campeau Drive (m^3/s)	28.37	44.58
…at (hours)	11:40	10:40
Peak Flow in Carp River downstream of development (m^3/s)	26.99	43.39
…at (hours)	12:00	12:00

The results presented in Table 3-3 above show that the addition of the Campeau and Paine Ponds has a negligible impact on peak flow and time to peak in the Carp River. This is due to the low release rates from the Ponds and their timing, which occurs several hours prior to the peak flow in the Carp River.

4.0 SANITARY SEWER OVERFLOWS

The sanitary sewers in Arcadia ultimately outlet to the Signature Ridge Pump Station (SRPS). The SRPS does not have capability for an emergency overflow within the surrounds of the pump station, and therefore alternative emergency overflows are provided within the SRPS service area. The purpose of an emergency overflow is to minimize the risk of basement flooding within the sewer system in the event of a catastrophic failure, and is a last line of protection during a situation where power back-up and redundant pump features within the pumping station and inoperable.

The “Update to: Signature Ridge Pump Station Hydraulic Grade Line Analysis Arcadia Stage 2” (IBI, September 2014)” presented proposed overflow configurations which utilized stormwater management facilities as overflow points. There is an emergency sanitary overflow located at the existing ‘interim’ pond for Stages 1 and 2.

The elevation of the emergency overflow outlet impacts the HGL of the sanitary sewer system, as the design assumes the SRPS is inoperable during wet weather flow. Given that the topography within the undeveloped portion of the Arcadia Development is relatively flat, it is essential to maintain the HGL in the sanitary sewer system as low as possible. Consequently, emergency overflows are sought at both the Campeau Pond and the Paine Pond. Furthermore, with the additional forebays proposed for the storm

servicing of Stages 4, 5 and 6, there is an opportunity to incorporate additional emergency overflows which would further lower the HGL within the surrounding sanitary sewer system.

The emergency overflows will only operate during the simultaneous occurrence of the 1:100 year storm event and catastrophic failure of the SRPS.

5.0 CONCLUSION

Based on the information presented above, the two pond strategy which includes the Campeau Pond and the Paine Pond is proposed to service the Arcadia Development. This servicing and stormwater management strategy can be developed at detailed design to meet regulatory requirements, and will manage stormwater more efficiently compared to the other three options evaluated. Key advantages that support the implementation of the proposed two pond strategy over the other three options evaluated are as follows:

- The crossing conflicts between storm and sanitary sewer systems are eliminated.
- The Campeau Pond provides the lowest HGL on Campeau Drive, based on a 750 mm diameter storm sewer on Campeau Drive. Furthermore, the HGL is below the proposed minimum centreline elevation of 94.30 m whereas all other SWM alternatives evaluated resulted in the HGL being above the proposed centreline elevation.
- The Campeau and Paine Ponds require a smaller total footprint area compared to the KWMSS Pond 1 Option.
- The lengths of submergence and standing water in storm sewers are reduced, resulting in reduced maintenance costs.
- The Campeau Pond provides the lowest possible HGL at the southern limit of Stage 3, thus minimizing the grade difference between Stage 3 and Campeau Drive.

For the above reasons, we recommend that the proposed deviation to the 2006 KWMSS SWM strategy which would utilize two wet ponds to service the Arcadia Development, the Campeau Drive ROW and the future Transitway corridor, be implemented.

Prepared by:

Hilary MacKay, P.Eng.

Reviewed by:

Guy Forget, P.Eng.

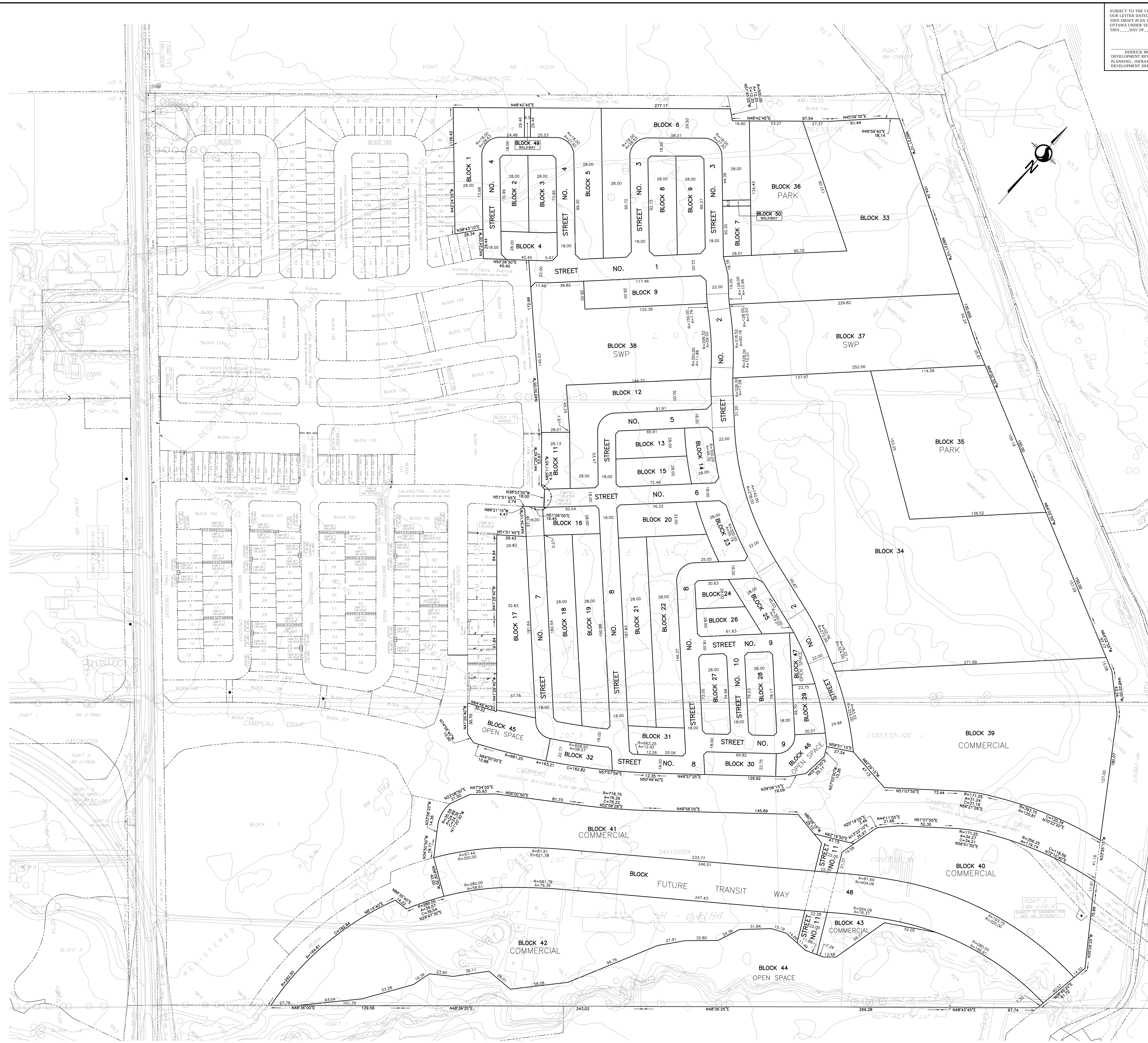
APPENDIX 'A'

DRAFT PLAN OF SUBDIVISION

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED ______________________20____ THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT. THIS____DAY OF_____________,2016.

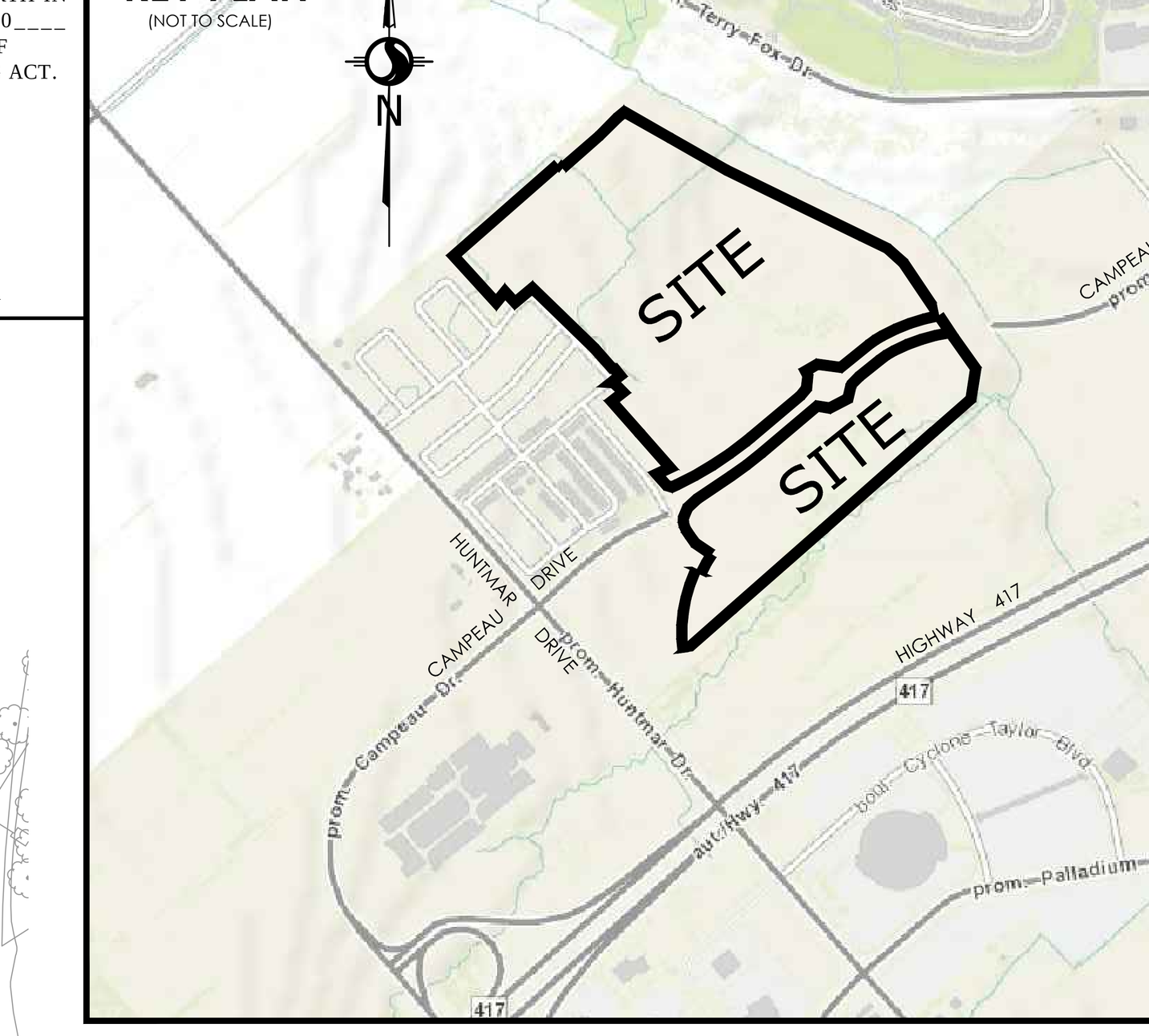
____

DERRICK MOODIE, MANAGER
DEVELOPMENT REVIEW, SUBURBAN SERVICES
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



KEY PLAN

(NOT TO SCALE)



DRAFT PLAN OF SUBDIVISION

PART OF LOTS 3 AND 4
CONCESSION 1
(GEOGRAPHIC TOWNSHIP OF MARCH)
CITY OF OTTAWA

Scale 1:1250

20 0 20 40 60 80 METRES

METRIC CONVERSION

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

SCHEDULE OF LAND USE			
BLOCKS	USE	UNITS	AREA (Ha/ac)
1 TO 31	RESIDENTIAL	*	9.92/24.51
32 AND 33	FUTURE RESIDENTIAL	*	8.71/21.52
34 AND 35	PARK		2.87/7.09
36 AND 37	STORM POND		3.34/8.27
38 TO 42	COMMERCIAL		10.73/26.52
43 TO 46	OPEN SPACE		3.82/9.43
47	FUTURE TRANSIT WAY		2.60/6.42
48	WALKWAY		0.03/0.08
STREETS	STREET		5.60/18.83
TOTAL		*	47.62/117.67

INFORMATION: REQUIRED UNDER SECTION 51 (17) OF THE PLANNING ACT R.S.O. 1990

a. SEE PLAN
b. SEE PLAN
c. SEE PLAN
d. SEE PROPOSED LAND USE SCHEDULE (ABOVE)
e. SEE PLAN
f. SEE PLAN
g. SEE PLAN
h. CITY WATER AVAILABLE
i. SEE SOIL REPORT
j. SEE TOPOGRAPHICAL INFORMATION
k. ALL CITY SERVICES AVAILABLE
l. SUBJECT TO EASEMENT PER INST. NO. OC1529517

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE STANTEC GEOMATICS LTD. TO SUBMIT THIS DRAFT PLAN OF SUBDIVISION ON MY BEHALF

_______________ DATE   _______________

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE SUBJECT LANDS AND THEIR RELATIONSHIP TO ADJOINING LANDS HAVE BEEN ACCURATELY AND CORRECTLY SHOWN.

_______________ DATE   _______________
BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

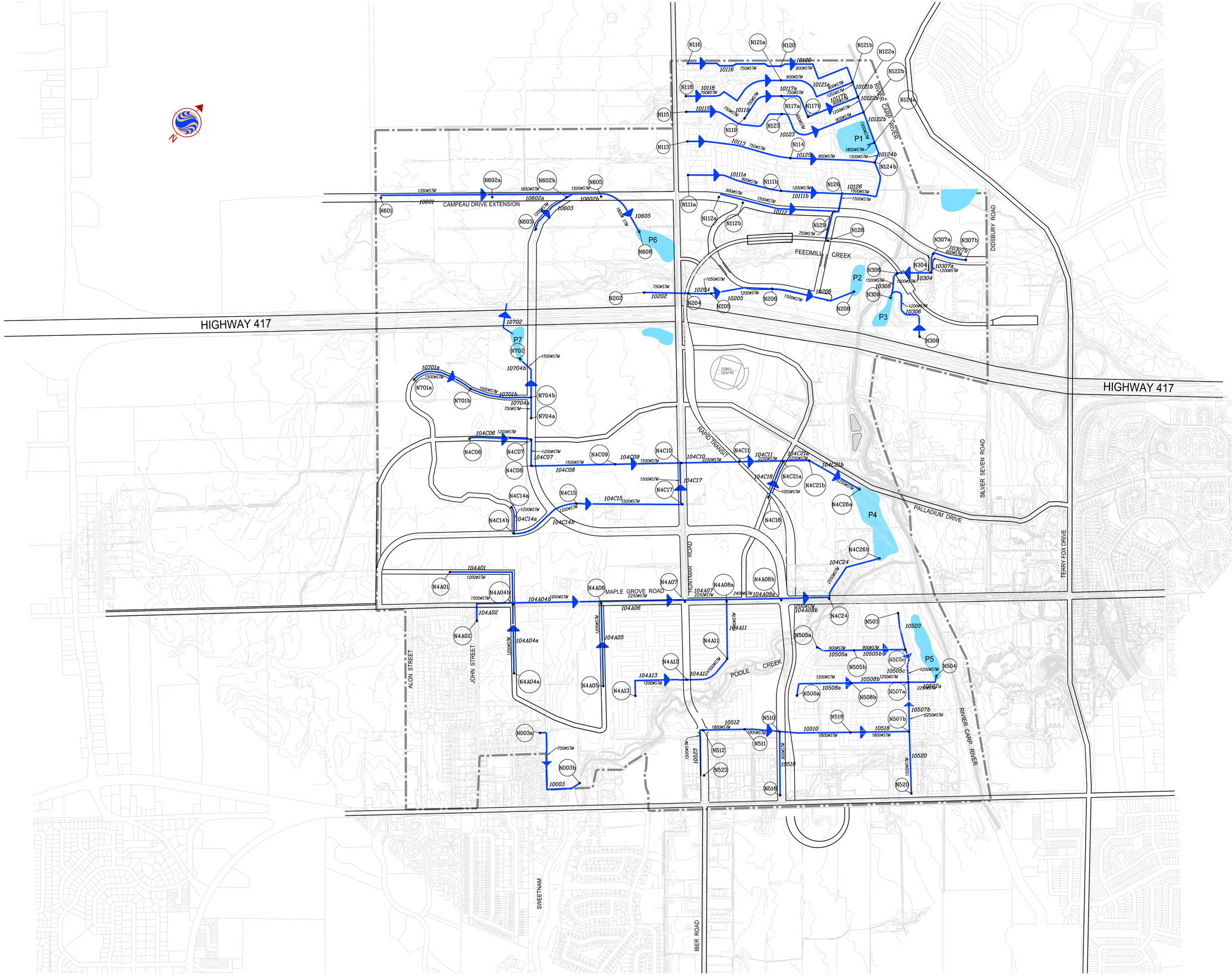
Stantec

Stantec Geomatics Ltd.
CANADA LAND SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
TEL. 613.722.4420 FAX. 613.722.2799
stantec.com

DRAWN: CEC	CHECKED: *	PM: FP	FIELD: N/A	PROJECT No.: 161613606-131

APPENDIX 'B'

BACKGROUND STORM SERVICING AND SWM DOCUMENTS



Stantec Consulting Ltd.
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Ottawa ON Canada
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Tel. 613.722.4420
Fax. 613.722.2799
www.stantec.com

Legend

- KANATA–WEST CONCEPT PLAN BOUNDARY
- 1500#STM — PROPOSED STORM SEWER & SIZE
- N100 — STORM NODE
- 10304 — STORM SEWER IDENTIFICATION

CCL/IBI
Cumming Cockburn Limited
1770 WOODWARD DR., OTTAWA (613)225–1311

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		LM	MAF	MAF	AUG./05
		Dwn.	Chkd.	Dsgn.	Date

Seals

Client/Project

Kanata West Concept Plan
Master Servicing Study

Ottawa, Ontario

Title

MODEL SCHEMATIC
STORM SEWER MINOR SYSTEM

Project No.	Scale	Sheet	Revision
60400406	1:7500 (0, 75, 225, 375m)	6 of 7	2

Drawing No. ST-MN

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Fax. 613.722.2799
www.stantec.com

Stantec

KANATA–WEST CONCEPT PLAN BOUNDARY

POND DRAINAGE BOUNDARY

STORM SEWER DRAINAGE LIMIT

A-1	DRAINAGE AREA IDENTIFICATION
A= 72.31 ha.	AREA IN HECTARES
C= 0.60	RUNOFF COEFFICIENT
I= 246 L/s	100yr. INLET CAPACITY (L/s)
MNR= N4A01	MINOR SYSTEM NODE NUMBER
MJR= 4A01	MAJOR SYSTEM SEGMENT NUMBER
INF=73 mm/yr	INFILTRATION

Notes

* REFER TO FIGURE 3.2 IN KANATA WEST MASTER SERVICING STUDY FOR FURTHER INFILTRATION DETAILS

1. THOSE AREAS WHICH ARE COMPLETELY SURROUNDED BY ARTERIAL ROADWAYS (SPECIFICALLY AREAS A-9, C-9, C-12, C-15, C-17, C-18) MUST PROVIDE SURFACE STORAGE IN THE AMOUNT OF 360m³/ha, OR IN SUFFICIENT QUANTITY TO DEMONSTRATE COMPLETE CONTAINMENT OF THE 100yr EVENT. (i.e. NO MAJOR SYSTEM FLOW IN THE 1:100yr EVENT)

CCL/IBI

Revision	By	Appd.	Date
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

Client/Project

Kanata West Concept Plan
Master Servicing Study

Ottawa, Ontario

Title

STORM DRAINAGE AREA PLAN
NORTH PONDS

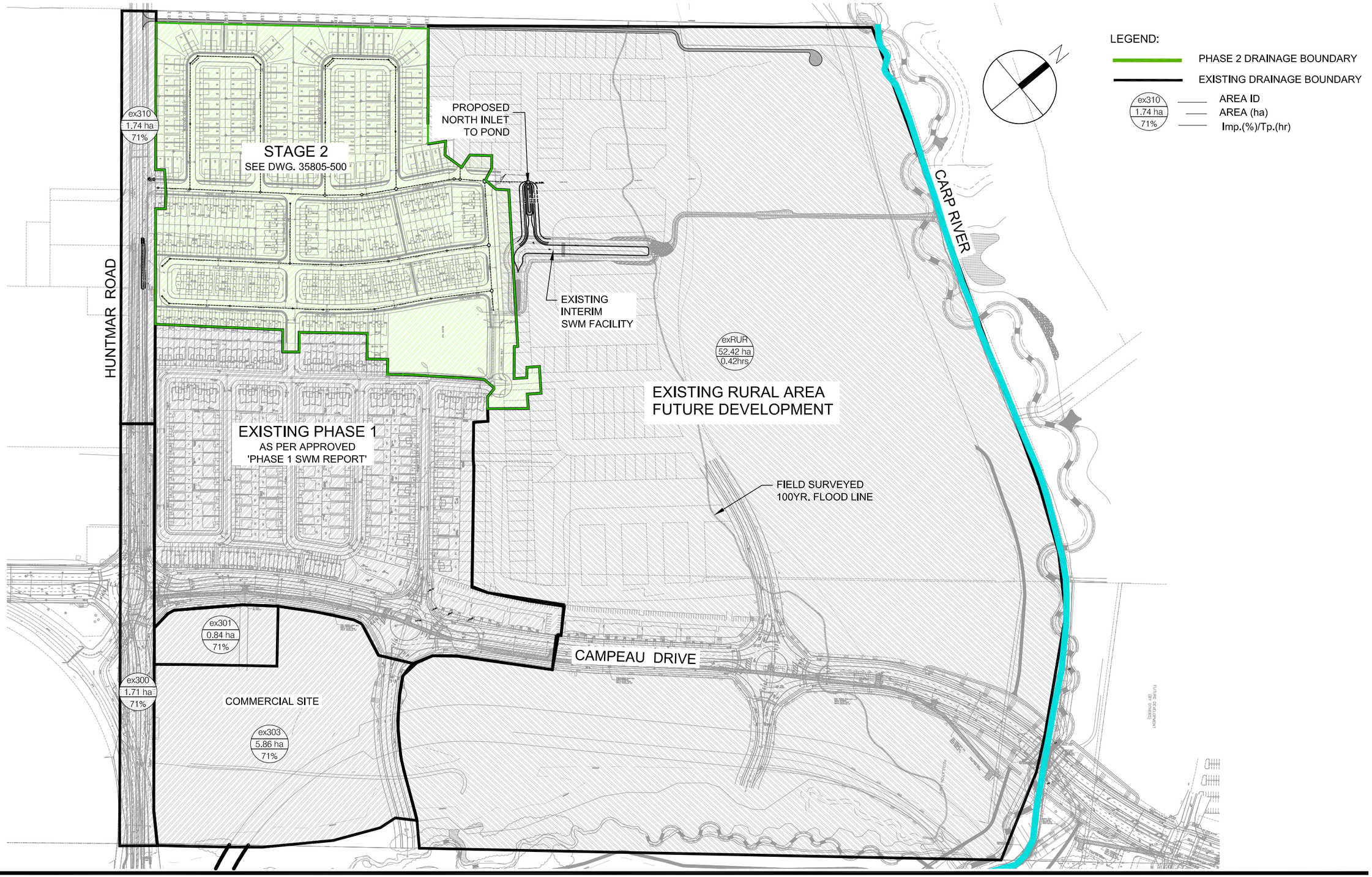
Project No. 60400406

Scale 1:3000 (0, 30, 90, 150m)

Drawing No. ST-PN

Sheet 4 of 7

Revision 2



J:\35805-ArcadiaSWM\5.0 Drawings\50swm\current\35805_ Model Drainage area.dwg Layout Name: 2tur Plot Style: ---- Plot Scale: 1:2.5849 Plotted At: 9/23/2014 12:50 PM Last Saved By: SYukic Last Saved At: Sep. 23, 14

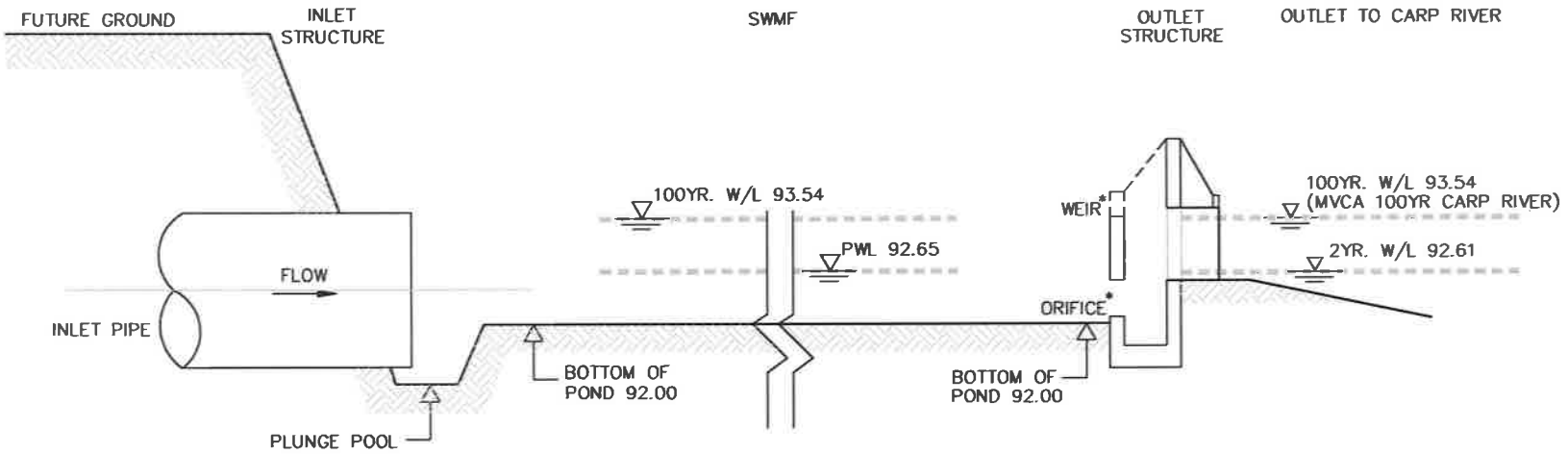
IBI GROUP

Scale: 1:4000

Project Title: ARCADIA STAGE 2 SWM REPORT

Drawing Title: INTERIM DEVELOPMENT SCENARIO DRAINAGE AREA PLAN

Sheet No.: FIGURE 2-RUR



NOTE:

* WEIR ELEVATION AND ORIFICE SIZE TO BE ADJUSTED TO PROVIDE EXTENDED DETENTION RELEASE FOR QUALITY TREATMENT.

J:\3775_KanataWest\5.9 Drawings\59swm\current\Phase2\3775 SWM-Figures_ph2-2013-08-21.dwg Layout Name: FIGURE 6

Plot Style: AIA STANDARD COLOR-HALF.CTB Plot Scale: 1:1 Plotted At: Oct. 1, 13 12:27 PM Printed By: PETER DEIR Last Saved By: PDEIR Last Saved At: Sep. 20, 13

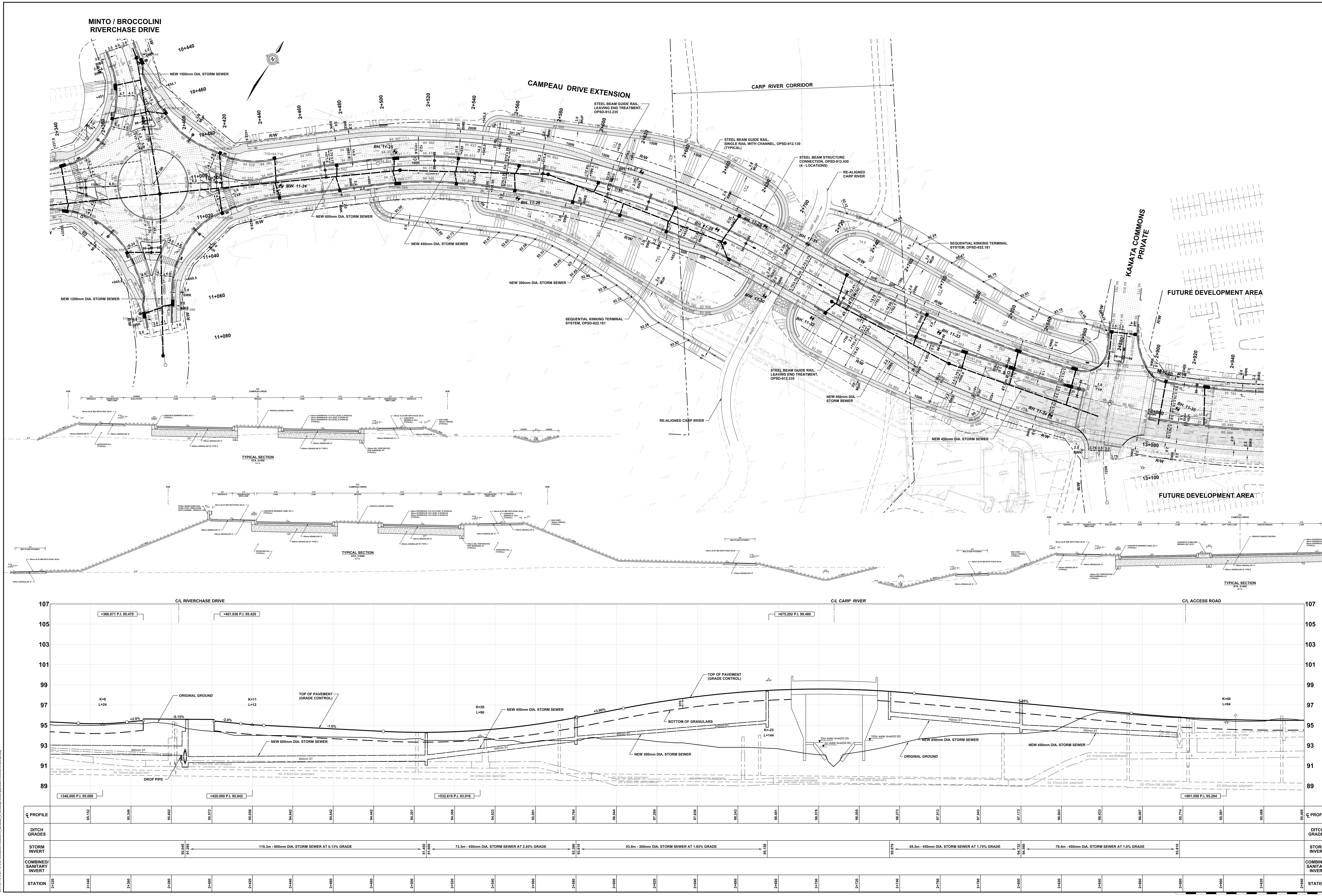
IBI GROUP

ULTIMATE POND CONCEPTUAL SECTION

FIGURE 6

Sheet No.

PROJECT No. 3775
DATE: 18-09-2013
SCALE: N.T.S.



CAMPEAU DRIVE EXTENSION

PALLADIUM DRIVE TO DIDSBURY ROAD

PLAN AND PROFILE

CAMPEAU DRIVE

Ottawa

Contract No. ISD — Dwg. No. 001

Sheet 1 of 1

Asset No.

Asset Group

W. R. NEWELL, P. ENG.
General Manager
Infrastructure Services Department

M. TREMBLAY, C.E.T.
Project Manager
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Stantec

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Des.	Chk'd.
J.B.	L.G.C.

Dwn.	Chk'd.
G.R.L.	L.G.C.

Utility Circ. No. — Index No.

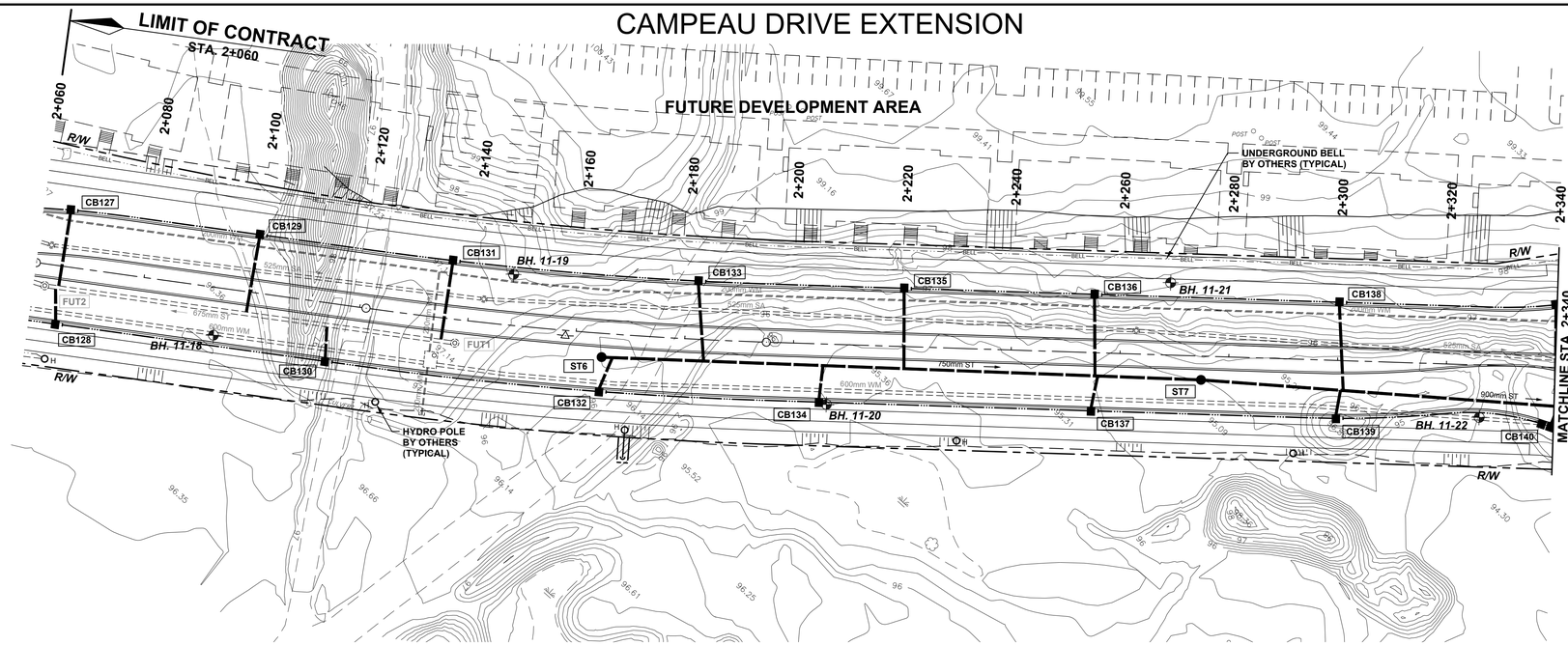
Const. Inspector

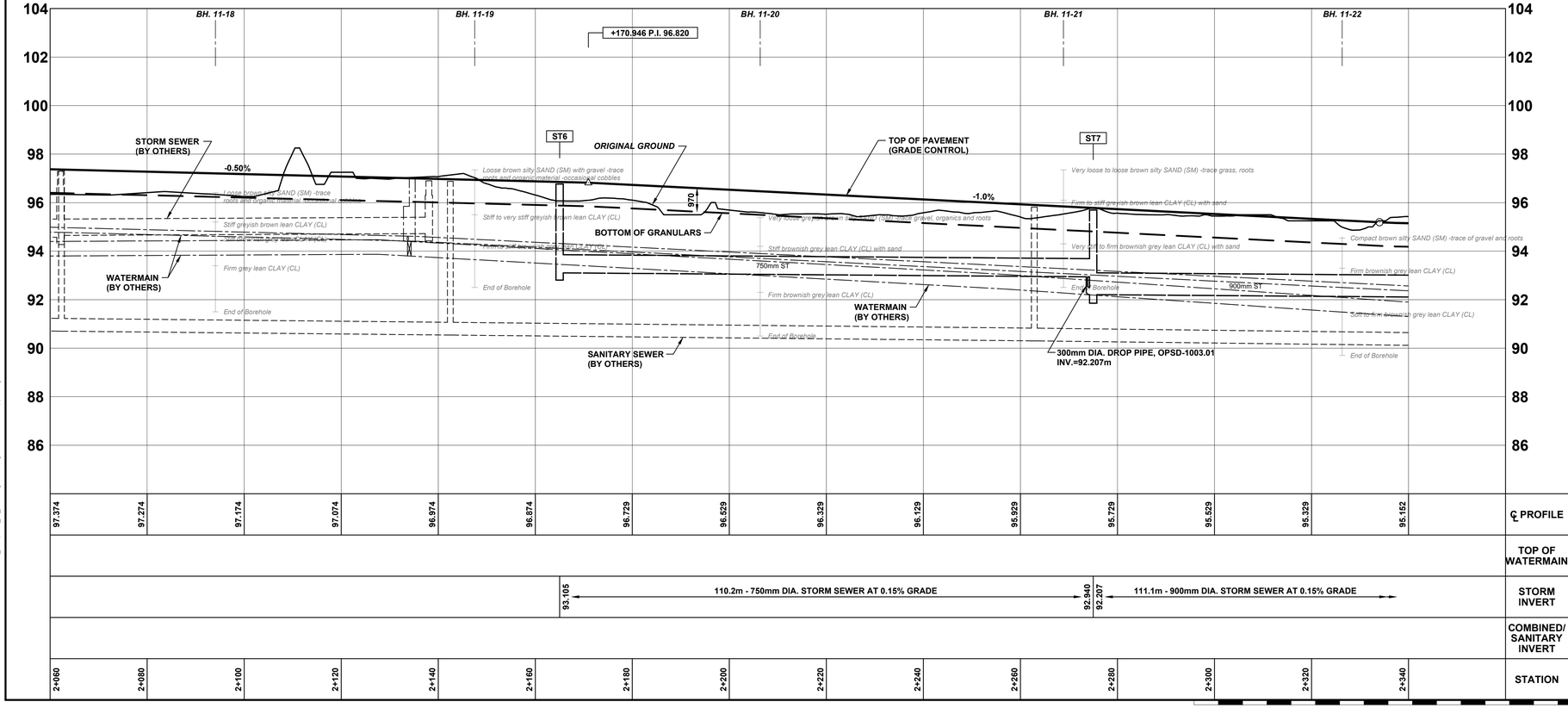
Scale: HORIZONTAL 1:500 (0m 5 10 20); VERTICAL 1:100 (0m 2 4)

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

REVISIONS No.	Description	By	Date (dd/mm/yyyy)

CAMPEAU DRIVE EXTENSION





℄ PROFILE	97.374	97.274	97.174	97.074
TOP OF WATERMAIN				
STORM INVERT				
COMBINED/ SANITARY INVERT				
STATION	2+060	2+080	2+100	2+120

℄ PROFILE	96.974	96.874	96.729	96.529
TOP OF WATERMAIN				
STORM INVERT			93.105	
COMBINED/ SANITARY INVERT				
STATION	2+140	2+160	2+180	2+200

℄ PROFILE	96.329	96.129	95.929	95.729
TOP OF WATERMAIN				
STORM INVERT	110.2m - 750mm DIA. STORM SEWER AT 0.15% GRADE			92.940
COMBINED/ SANITARY INVERT				
STATION	2+220	2+240	2+260	2+280

℄ PROFILE	95.529	95.329	95.152	
TOP OF WATERMAIN				
STORM INVERT	92.207	111.1m - 900mm DIA. STORM SEWER AT 0.15% GRADE		
COMBINED/ SANITARY INVERT				
STATION	2+300	2+320	2+340	

CATCHBASIN & MAINTENANCE HOLE DATA

NO.	STATION	OFFSET (m)	TYPE		ICD(L/s)	ELEVATION	
			Structure	Cover	Odour Trap	Grate	Low Inv.
ST6	2+165.0	4.38 RT	701.011	SL	80NT	96.762	93.105
ST7	2+275.0	4.38 RT	701.011	SL	80NT	95.692	92.207
*CB127	2+065.0	9.72 LT	705.010	S22/S23	80NOT	97.155	95.655
*CB128	2+065.0	10.00 RT	705.010	S22/S23	80	97.149	95.349
*CB129	2+100.0	10.00 LT	705.010	S22/S23	80	96.974	95.474
*CB130	2+115.0	10.00 RT	705.010	S22/S23	80	96.899	95.099
*CB131	2+136.0	10.00 LT	705.010	S22/S23	80	96.794	95.294
*CB132	2+165.0	10.00 RT	705.010	S22/S23	80	96.649	95.149
*CB133	2+182.0	10.00 LT	705.010	S22/S23	80	96.509	94.709
*CB134	2+205.0	10.00 RT	705.010	S22/S23	80	96.279	94.479
*CB135	2+220.0	10.00 LT	705.010	S22/S23	80	96.129	94.329
*CB136	2+255.0	10.00 LT	705.010	S22/S23	80	95.779	93.979
*CB137	2+255.0	10.00 RT	705.010	S22/S23	80	95.779	93.979
*CB138	2+300.0	10.00 LT	705.010	S22/S23	80	95.329	93.529
*CB139	2+300.0	9.94 RT	705.010	S22/S23	80	95.330	93.530
*CB140	2+338.9	10.01 RT	705.020	S22/S23	80	94.949	94.049

* DENOTES STRUCTURE TO BE INSULATED AS PER CITY OF OTTAWA STANDARD W23
SL DENOTES SELF-LEVELLING FRAME AND COVER

STORM SEWER DATA

NO. to NO. (high to low)		SIZE (mm)	LENGTH (m)	CLASS	INVERTS	
					Inlet	Outlet
ST6	ST7	750	110.2	CONC 100D	93.105	92.940 **
ST7	ST5	900	111.1	CONC 100D	92.207	92.040 **
CB127	PIPE	200	14.0	SDR 35	95.655	95.375 *
CB128	PIPE	200	6.5	SDR 35	95.349	95.219 *
CB129	PIPE	200	14.5	SDR 35	95.474	95.184 *
CB130	PIPE	200	6.0	SDR 35	95.099	94.979 *
CB131	PIPE	200	14.5	SDR 35	95.294	95.004
CB132	PIPE	200	6.5	SDR 35	95.149	95.019 *
CB133	PIPE	200	14.5	SDR 35	94.709	94.564 *
CB134	PIPE	200	6.5	SDR 35	94.479	94.349 *
CB135	PIPE	200	14.5	SDR 35	94.329	94.039 *
CB136	PIPE	200	14.5	SDR 35	93.979	93.689 *
CB137	PIPE	200	6.0	SDR 35	93.979	93.859 *
CB138	PIPE	200	16.0	SDR 35	93.529	93.369 *
CB139	PIPE	200	5.0	SDR 35	93.530	93.430 *
CB140	PIPE	250	3.5	SDR 35	94.049	93.979 *

* DENOTES INVERT GIVEN AT TOP OF RISER
** DENOTES DROP PIPE AT MAINTENANCE HOLE

CAMPEAU DRIVE EXTENSION
PALLADIUM DRIVE TO DIDSBURY ROAD

PLAN AND PROFILE
CAMPEAU DRIVE EXTENSION
STA. 2+060 TO STA. 2+340

W. R. NEWELL, P. ENG.
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Ottawa

Contract No. ISD12-5240 | Dwg. No. 011

Sheet 11 of 40

Asset No.

Asset Group

Des.	Chk'd,
J.B.	L.G.C.
Dwn,	Chk'd,
G.R.L.	J.B.

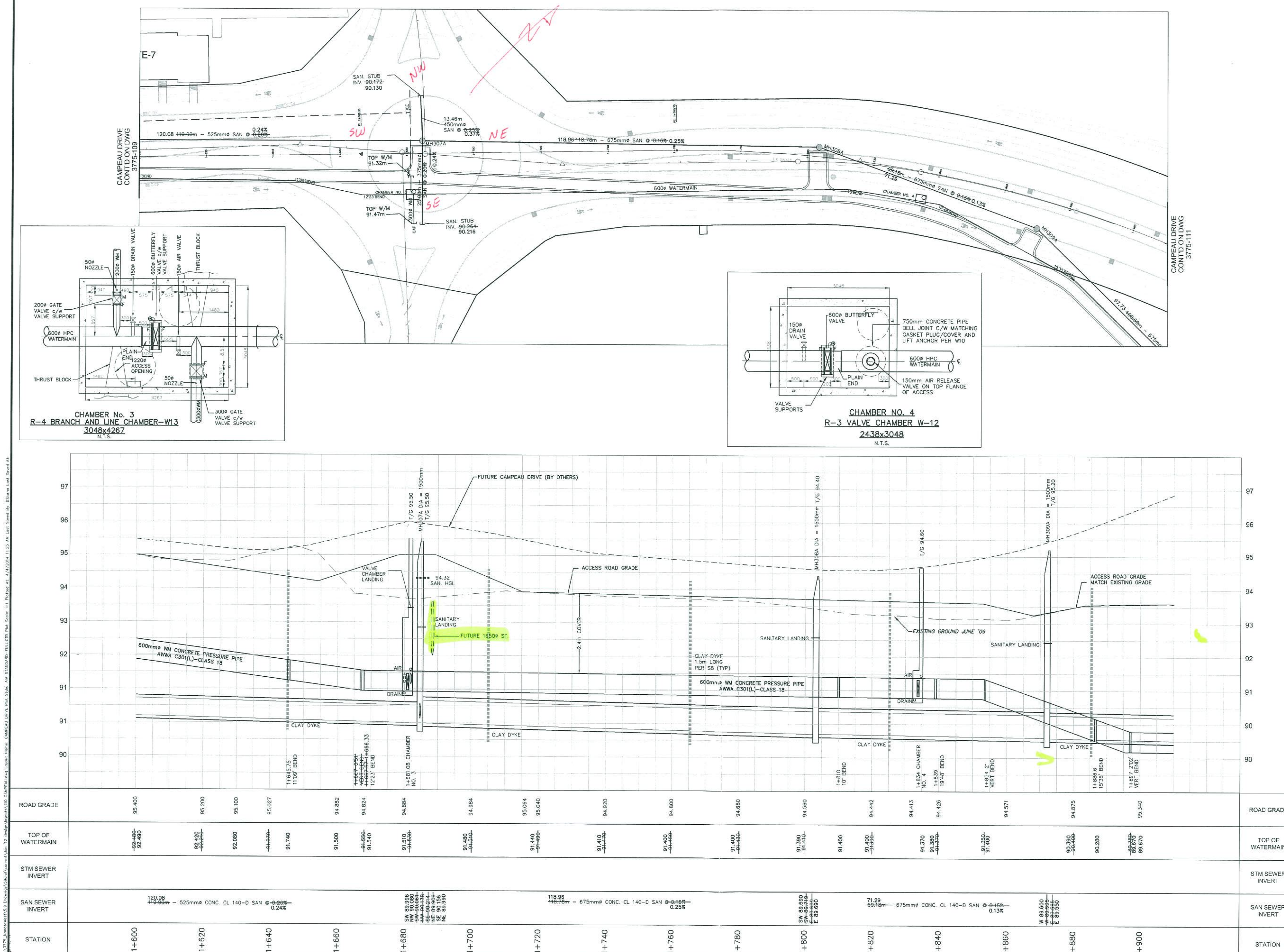
Utility Circ. No. | Index No.

Const. Inspector

Scale:
HORIZONTAL 1:500
0m 5 10 20
0m 2 4
VERTICAL 1:100

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

REVISIONS	No.	Description	By	Date (dd/mm/yyyy)
	--	--	--	--



NOTES :

1. ALL CONSTRUCTION IN ACCORDANCE WITH CURRENT CITY OF OTTAWA DRAWINGS & SPECIFICATIONS.
2. ALL CONNECTIONS TO EXISTING WATERMAIN BY CITY FORCES. CONTRACTOR TO EXCAVATE, BACKFILL, COMPACT AND REINSTATE.
3. ALL RYCB LEAD PIPES TO BE 200ø PVC DR 35 @ 1.00% UNLESS NOTED OTHERWISE.
4. THE HYDRAULIC GRADE LINE (HGL) IS SHOWN ONLY WHEN IT IS HIGHER THAN THE OBVERT OF THE SEWER.
5. FOR GEOMETRIC LAYOUT OF STREETS AND LOTS, REFER TO PLAN OF SUBDIVISION BY STANTEC GEOMATICS LTD.
6. STORM AND SANITARY SEWER LENGTHS AND INVERTS ARE CALCULATED AT THE CENTER OF EACH MAINTENANCE HOLE NOT AT THE OPENINGS. CONTRACTOR TO ENSURE THAT THE PROPER FALL IS PROVIDED THROUGH THE MAINTENANCE HOLE PER THE DESIGN PIPE GRADES.

LEGEND:

- SINGLE SERVICE LOCATION
- DOUBLE SERVICE LOCATION
- DRIVEWAY LOCATION
- STANDARD STREET CATCHBASIN *
- REARYARD CB C/W TOP OF GRATE *
- ELBOW OR TEE REARYARD CB C/W TOP OF GRATE
- SINGLE CONNECTION BETWEEN PAIRS OF STREET CATCHBASINS
- BARRIER CURB
- MOUNTABLE CURB
- DEPRESSED CURB

* REFER TO CATCHBASIN DATA TABLE ON DRAWING 3775–100B FOR TOP OF GRATE ELEVATION, LEAD INVERT, PIPE SIZE AND INLET CONTROL DEVICE INFORMATION

No.	REVISIONS	By	Date
14			
13			
12	AS–BUILT	LME	14:02:13
11	REVISE WATERMAIN PIPE CLASS TO 18	LME	13:01:31
10	WATER CHAMBER REVISIONS	LME	12:12:19
9	GENERAL REVISIONS	LME	12:11:28
8	GENERAL WATERMAIN REVISIONS	LME	12:11:14
7	ADDED ACCESS ROAD	LME	12:10:30
6	ISSUED FOR TENDER	LME	12:08:21
5	REVISED PER CITY COMMENTS	LME	12:06:27
4	REVISED PER CITY COMMENTS	LME	12:06:08
3	REVISED PER LEGAL & CITY COMMENTS	LME	12:05:16
2	REVISED PER NEW LEGAL	LME	12:02:17
1	ISSUED FOR SUBMISSION	LME	10:11:26

IBI GROUP
333 Preston Street
Tower 1, Suite 400
Ottawa, Ontario
Canada K1S 5N4
Tel (613)225–1311
FAX (613)225–9868

Project Title

ARCADIA KANATA WEST
PHASE I

L. M. ERON

Drawing Title

CAMPEAU DRIVE

STA. 1+600 TO STA. 1+910

Scale	HORIZ. SCALE 1:500 / VERT. SCALE 1:50
Design: L.M.E.	Date: MARCH '09
Drawn: M.M.	Checked: R.W.W.
Project No.: 3775	Drawing No.: 110

APPENDIX 'C'

PCSWMM RESULTS FOR STORM SERVICING AND SWM ALTERNATIVES

Legend

- Junctions
- Storages
  - Sag Storage
  - Manhole
  - Pond
- Conduits
  - Storm Sewers
  - Carp River
- Orifices
- Weirs
  - Surface Flow
  - Pond Outlet
- Outlets
- Subcatchments
  - Visible
  - City Model Areas

N

200 m

PROJECT:

ARCADIA RESIDENTIAL STAGES 3, 4, 5 & 6 AND COMMERCIAL STAGES 2 & 3
OTTAWA, CITY OF OTTAWA

DRAWING:

KWMSS Pond 1

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	BP	JLR NO.:	26299
DRAWN:	BP	DRAWING NO.:	Figure C1a
CHECKED:			

PROJECT:

ARCADIA RESIDENTIAL STAGES 3, 4, 5 & 6 AND COMMERCIAL STAGES 2 & 3
OTTAWA, CITY OF OTTAWA

DRAWING:

KWMSS Pond 1
(with 600 mm diameter sewer on Campeau Drive)

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	BP	JLR NO.:	26299
DRAWN:	BP	DRAWING NO.:	Figure C1b
CHECKED:			

Legend

- Junctions
- Storages
  - Sag Storage
  - Manhole
  - Pond
- Conduits
  - Storm Sewers
  - Carp River
- Orifices
- Weirs
  - Surface Flow
  - Pond Outlet
- Outlets
- Subcatchments
  - Visible
  - City Model Areas

N

200 m

PROJECT:

ARCADIA RESIDENTIAL STAGES 3, 4, 5 & 6 AND COMMERCIAL STAGES 2 & 3
OTTAWA, CITY OF OTTAWA

DRAWING:

Pond Bisected by Riverchase Road
with hydraulicly connected cells

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	BP	JLR NO.:	26299
DRAWN:	BP	DRAWING NO.:	Figure C2
CHECKED:			

Legend

- Junctions
- Storages
  - Sag Storage
  - Manhole
  - Pond
- Conduits
  - Storm Sewers
  - Carp River
- Orifices
- Weirs
  - Surface Flow
  - Pond Outlet
- Outlets
- Subcatchments
  - Visible
  - City Model Areas

N

200 m

PROJECT:

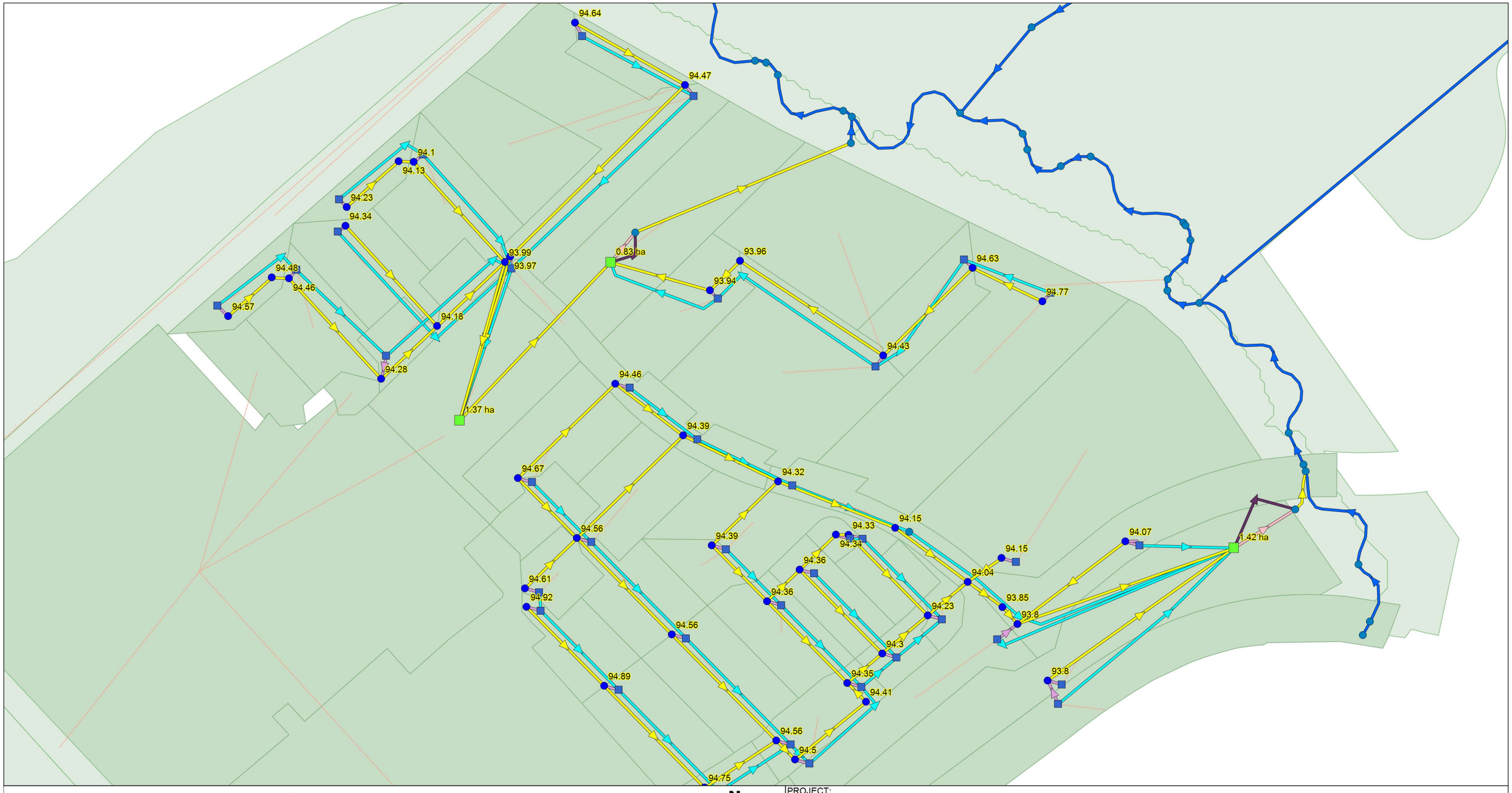
ARCADIA RESIDENTIAL STAGES 3, 4, 5 & 6 AND COMMERCIAL STAGES 2 & 3
OTTAWA, CITY OF OTTAWA

DRAWING:

Pond Bisected by Riverchase Road
with hydraulically separate cells

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	BP	JLR NO.:	26299
DRAWN:	BP	DRAWING NO.:	Figure C3
CHECKED:			



Legend

- Junctions
- Storages
  - Sag Storage
  - Manhole
  - Pond
- Conduits
  - Storm Sewers
  - Carp River
- Orifices
- Weirs
  - Surface Flow
  - Pond Outlet
- Outlets
- Subcatchments
  - Visible
  - City Model Areas

N

200 m

PROJECT:

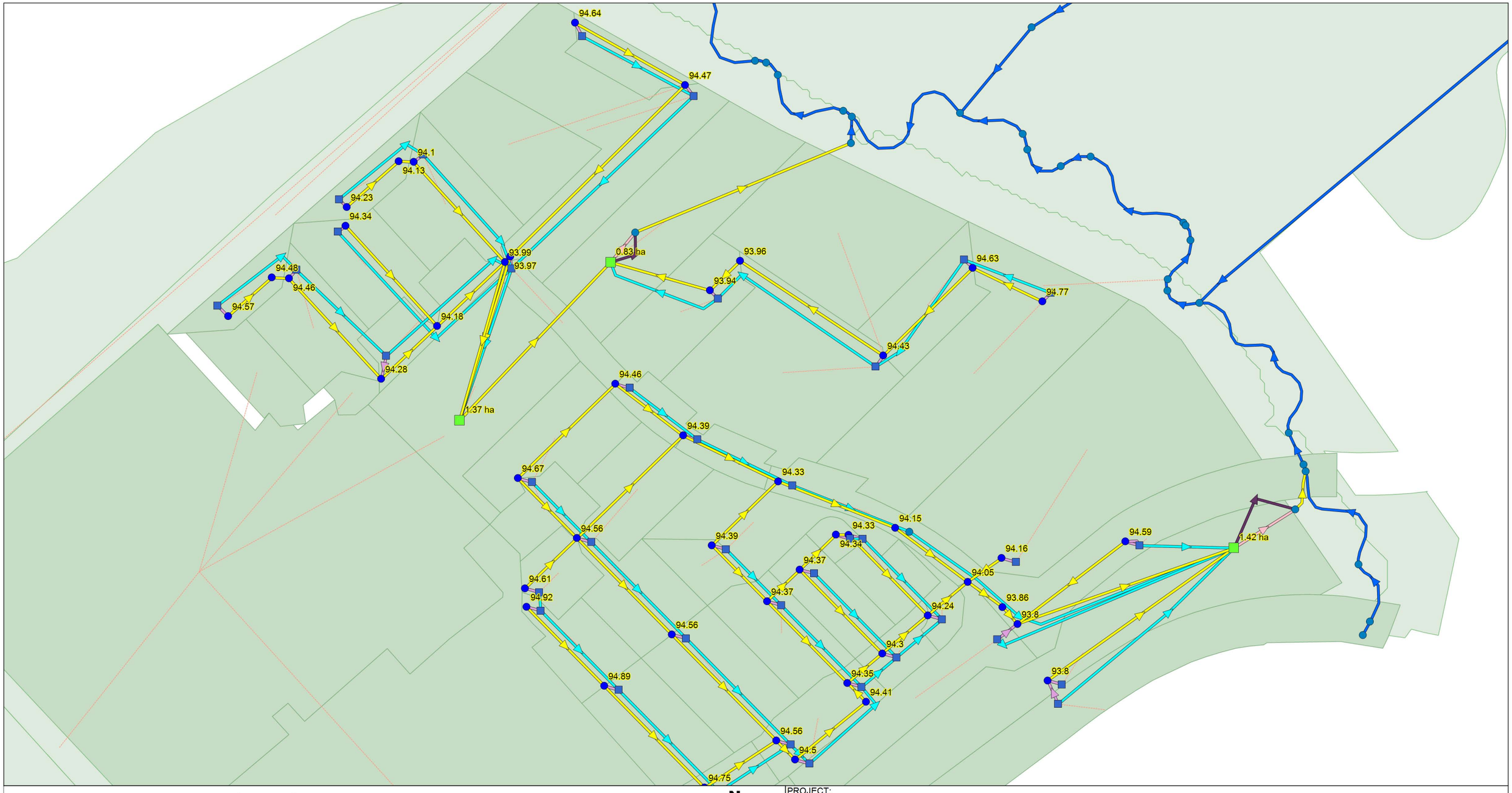
ARCADIA RESIDENTIAL STAGES 3, 4, 5 & 6 AND COMMERCIAL STAGES 2 & 3
OTTAWA, CITY OF OTTAWA

DRAWING:

Two Ponds: Campeau Drive and Paine Avenue
(with 750mm diameter sewer on Campeau Drive)

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	BP	JLR NO.:	26299
DRAWN:	BP	DRAWING NO.:	Figure C4a
CHECKED:			



Legend

- Junctions
- Storages
  - Sag Storage
  - Manhole
  - Pond
- Conduits
  - Storm Sewers
  - Carp River
- Orifices
- Weirs
  - Surface Flow
  - Pond Outlet
- Outlets
- Subcatchments
  - Visible
  - City Model Areas

N

200 m

PROJECT:

ARCADIA RESIDENTIAL STAGES 3, 4, 5 & 6 AND COMMERCIAL STAGES 2 & 3
OTTAWA, CITY OF OTTAWA

DRAWING:

Two Ponds: Campeau Drive and Paine Avenue
(with 600 mm diameter sewer on Campeau Drive)

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

DESIGN:	BP	JLR NO.:	26299
DRAWN:	BP	DRAWING NO.:	Figure C4b
CHECKED:			

APPENDIX 'D'

EXISTING INTERIM POND DIFFICIENCIES IDENTIFIED BY CITY

Hilary MacKay

From: Guy Forget
Sent: April 25, 2017 3:46 PM
To: Hilary MacKay
Subject: FW: Campeau Rd/Arcadia Stormwater

Guy Forget, P.Eng., LEED AP
Associate
Senior Water Resources Engineer

J.L. Richards & Associates Limited
864 Lady Ellen Place, Ottawa, ON K1Z 5M2
Tel: 613-728-3571 Fax: 613-728-6012

From: Jolliet, Laurent [mailto:Laurent.Jolliet@ottawa.ca]
Sent: March 8, 2017 3:27 PM
To: Guy Forget
Cc: Lucie Dalrymple; Bobby Pettigrew; Newton, Tim; Dickinson, Mary; Moodie, Derrick; 'SMurphy@minto.com'
Subject: Campeau Rd/Arcadia Stormwater

Bonjour Guy,

Below are the comments regarding the existing interim pond.
Let me know if you have any questions.

Salutations,

Laurent Jolliet, M.A.Sc., P.Eng.
Project Manager, Infrastructure Policy
Asset Management Branch, Infrastructure Services
Planning, Infrastructure and Economic Development Department

Gestionnaire de projet, politique des infrastructures
Gestion des biens, service des infrastructures
Service de planification, d'infrastructure et de développement économique

City of Ottawa | Ville d'Ottawa
Tel. 613.580.2424 ext./poste 17149
110 Laurier Avenue West - 3rd Floor East, Ottawa, ON K1P 1J1

Comments received from Chris Melanson (Surface Water Services) on August 26, 2016:

Should the option to convert the status of this facility be entertained further, we will require a full design report and review.

From what is on site today and what this report would be required to address:

Water Quality
- Sediment forebays do not meet criteria for settlement (plunge pool, depth, length vs width ratio).
- It appears that the two sediment forebays may be treated as one, in that the check dam is located midway into the wet cell? This may be an issue if development types and rates in the two contributing areas differ greatly. We would like to minimize the overall maintenance frequency.
- Permanent pool volume and extended detention volumes of the wet cell appear inadequate.

Structural
- Presently there are no headwalls on the inlets, but the inlet design must include the means to isolate and dewater the sewer and forebay elements.
- It appears that the box pipe inlets will be submerged, the western entirely. This is to be minimized to the greatest extent possible and dewatering/sediment removal methodologies and logistics must be factored into the design.
- While there is presently no outlet structure to speak of, the outlet design must include control features that allow the greatest dewatering capacity via gravity possible and provide other operational features such as access, dewatering sumps and worker and public safety.
- Spillway is to be redesigned.

Maintenance
- In addition to the widening and deepening of the sediment forebays, the forebays require granular bottoms and the means to remove accumulated sediments - either from within or from along the sides.
- Access to the outlet structure is to be provided.
- The provision of a sediment management area is required. The required area is approximately that of the combined total surface area of the sediment forebays.

Outlet channel
- Since this facility would require a lengthy and flat channel to the Carp River, we would require this channel be located within the SWM Block and that an access road be placed adjacent to the channel to allow for the inevitable removal of vegetation.

Grading
- It appears that significant grade alterations would be required to "fit" the existing structures and water features within the lay of the land adjacent to the development. This may results in excessively steel slopes very close to the residential area. This is to be avoided.

That’s all we have for now, I hope it's of assistance. Photos are available upon request.

As noted in Section 3.2 of this Report, some of the deficiencies have been taken into consideration as part of the Conceptual Paine Avenue Pond design (i.e., settling calculations, sloping, etc.); however, other concerns will be addressed as part of Detailed Design of the ultimate facility. As an example, final configuration of the inlet structures and outlet channel would be finalized during detailed design and submitted to the City for their review.

Table D1: Existing 'Interim' Pond Deficiencies identified by the City with JLR Responses

'Interim' Pond Deficiencies noted by the City per March 8, 2017 E-mail	Responses – Expanded/Retrofitted Ultimate Pond
Water Quality	
Sedimentation forebays do not meet the criteria for settlement.	Calculations associated with the expanded facility were carried out in accordance with the MOECC SMPDM and are included in Appendix 'E'.
Two sedimentation forebays treated as a single feature.	The grading of the expanded facility includes a berm between the existing forebays (Stage 1 and Stage 2). The berm will act as a deflector, isolating both forebays and minimizing turbulence. The berm will discourage short circuiting and encourage plug flow. As a result, dispersion and settling calculations were completed separately.
Location of check dam midway in the permanent pool.	The rock check dam of the expanded facility will be relocated further upstream and in accordance with the MOECC SWMPDM (i.e., based on the most critical length between Stages 1 and 2 inlets based on the 4 hour 25 mm storm event). The area upstream of rock check dam is not to exceed 30% per the MOECC.
Location of rock check dam to minimize maintenance frequency?	Proposed location will be set further upstream in accordance with the MOECC. Optimized location to minimize the frequency of sediment removal.
Permanent pool & extended detention storage appear inadequate.	Calculations were completed which demonstrate that both the minimum permanent pool & extended detention volume required as per the MOECC SWMPDM have been exceeded.
Structural	
Inlets 1 and 2 have no headwall, which makes it difficult to isolate during dewatering.	A headwall will be incorporated into the design of the expanded facility for Stages 1 & 2 pond inlets. Similarly, the expanded facility will include inlet headwalls for Stages 4 and 5.

'Interim' Pond Deficiencies noted by the City per March 8, 2017 E-mail	Responses – Expanded/Retrofitted Ultimate Pond
Box pipe inlet is submerged.	The proposed NWL will be lowered from 93.00 to 92.70, which is slightly above the recommendation of 92.65 provided in the 2006 KWMSS. The NWL will be slightly above the Carp River 1:2 year water level of 92.69. Submergence in the sewers will be reduced when compared to current conditions.
Outlet structure without control features which makes dewatering very difficult.	Outlet structures of the expanded facility will be redesigned per the recommendations of the 2006 KWMSS. Gravity dewatering is virtually impossible due to grade constraints. Dewatering during sediment removal operations will need to occur with pumps.
Spillway to be redesigned.	Spillway of the expanded facility will be designed to be more robust.
Maintenance	
Sedimentation forebays require upgrades.	Retrofit of the existing forebays will include a compacted granular base, proper length to width ratio for settlement and dispersion, etc.
Lack of sedimentation drying area	Sedimentation drying areas will be incorporated along the expanded facility. To facilitate sedimentation removal activities, one drying area will be located on either side of Riverchase.
Outlet Channel	
Outlet channel including access road to be located within the SWM Block.	A significant portion of the outlet channel will be removed. The remainder will be incorporated into the SWM Block. Access to the expanded facility can be provided via Clonrush Way, Riverchase and/or Paine Avenue.
Grading	
Grade alterations would be required to integrate the existing structures. Grading might be challenging given the proximity of the adjacent subdivision.	Structures of the expanded facility will be integrated into the design without impacting the subdivision.

APPENDIX 'E'

WATER QUALITY CONTROL CALCULATIONS

Calculation Sheet for Permanent Pool Sizing - Paine Avenue Pond - West Cell

Removal Efficiency:	Normal 70% long-term S.S. removal	
SWMP Type:	Wet Pond	
Total Drainage Area:	44.6	ha
Average Imperviousness:	64%	
Storage Volume (m^3/ha)	123	*(See Table 3.2 from MOECC SWMPDG, copied below)*
Extended Detention Volume (m^3/ha)	40	
Permanent Pool Volume Required:	**3690**	**m^3**
Extended Detention Volume Required:	**1790**	**m^3**

Protection Level	**SWMP Type**	**Storage Volume (m^3/ha) for Impervious Level**			
		35%	55%	70%	85%
Enhanced 80% long-term S.S. removal	Infiltration	25	30	35	40
	Wetlands	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. removal	Infiltration	20	20	25	30
	Wetlands	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. removal	Infiltration	20	20	20	20
	Wetlands	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

Calculation by: BP
Reviewed by:
Date: Apr 26, 2017

Calculation Sheet for Permanent Pool Sizing - Paine Avenue Pond - East Cell

Removal Efficiency:	Normal 70% long-term S.S. removal	
SWMP Type:	Wet Pond	
Total Drainage Area:	9.7	ha
Average Imperviousness:	49%	
Storage Volume (m^3/ha)	104	*(See Table 3.2 from MOECC SWMPDG, copied below)*
Extended Detention Volume (m^3/ha)	40	
Permanent Pool Volume Required:	**630**	**m^3**
Extended Detention Volume Required:	**390**	**m^3**

Protection Level	**SWMP Type**	**Storage Volume (m^3/ha) for Impervious Level**			
		35%	55%	70%	85%
Enhanced 80% long-term S.S. removal	Infiltration	25	30	35	40
	Wetlands	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. removal	Infiltration	20	20	25	30
	Wetlands	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. removal	Infiltration	20	20	20	20
	Wetlands	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

Calculation by: BP
Reviewed by:
Date: Apr 26, 2017

Calculation Sheet for Permanent Pool Sizing - Campeau Drive Pond

Removal Efficiency:	Normal 70% long-term S.S. removal	
SWMP Type:	Wet Pond	
Total Drainage Area:	22.9	ha
Average Imperviousness:	73%	
Storage Volume (m^3/ha)	134	*(See Table 3.2 from MOECC SWMPDG, copied below)*
Extended Detention Volume (m^3/ha)	40	
Permanent Pool Volume Required:	**2150**	**m^3**
Extended Detention Volume Required:	**920**	**m^3**

Protection Level	**SWMP Type**	**Storage Volume (m^3/ha) for Impervious Level**			
		35%	55%	70%	85%
Enhanced 80% long-term S.S. removal	Infiltration	25	30	35	40
	Wetlands	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. removal	Infiltration	20	20	25	30
	Wetlands	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. removal	Infiltration	20	20	20	20
	Wetlands	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

Calculation by: BP
Reviewed by:
Date: Apr 26, 2017

Calculation Sheet for SWM Facility Forebay Sizing - STAGE 1

Settling Criteria

$$L_{min}=\left(\frac{rQp}{V_S}\right)^{0.5}$$

Where:
- r = length to width ratio at the invert of the inlet pipe
- Q_p = peak outflow during design quality storm
- V_s = settling velocity

Input:
- l = length = 70 m
- w = width = 5 m
- r = 14.00
- Q_p = 0.02 m³/s
- V_s = 0.0003 m/s

L_{min} = 27 m

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls.

Dispersion Criteria

$$L_{min}=\frac{8Q}{dV_f}$$

Where:
- Q = Inlet flowrate (1:10 year, 12-hour SCS Storm)
- d = depth of permanent pool (forebay)
- V_f = desired final velocity

Input:
- Q = 4.05 m³/s
- d = 1.5 m
- V_f = 0.5 m/s

L_{min} = 43 m

The minimum forebay length is determined by the larger of the settling or dispersion criteria.
Minimum length of forebay required = 43.20 m
Length of Forebay Provided = 70.00 m

Average Forebay Velocity

$$V_{avg}=\frac{Q}{d\,W_{avg}}$$

Where:
- Q = Inlet flowrate (1:10 year, 12-hour SCS Storm)
- d = depth of pond during peak 1:10 year inflow
- W_{avg} = average width of forebay

Input:
- Q = 4.05 m³/s
- d = 2.0 m
- W_{avg} = 14 m

V_{avg} = 0.15 m/s <0.15 m/s

Calculation by: BP
Reviewed by:
Date: Apr 26, 2017

Calculation Sheet for SWM Facility Forebay Sizing - STAGE 2

Settling Criteria

$$L_{min}=\left(\frac{rQp}{V_S}\right)^{0.5}$$

Where:
- r = length to width ratio at the invert of the inlet pipe
- Q_p = peak outflow during design quality storm
- V_s = settling velocity

Input:
- l = length = 50 m
- w = width = 9 m
- r = 5.56
- Q_p = 0.05 m³/s
- V_s = 0.0003 m/s

L_{min} = 31 m

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls.

Dispersion Criteria

$$L_{min}=\frac{8Q}{dV_f}$$

Where:
- Q = Inlet flowrate (1:10 year, 12-hour SCS Storm)
- d = depth of permanent pool (forebay)
- V_f = desired final velocity

Input:
- Q = 2.44 m³/s
- d = 1.5 m
- V_f = 0.5 m/s

L_{min} = 26 m

The minimum forebay length is determined by the larger of the settling or dispersion criteria.
Minimum length of forebay required = 30.90 m
Length of Forebay Provided = 50.00 m

Average Forebay Velocity

$$V_{avg}=\frac{Q}{d\,W_{avg}}$$

Where:
- Q = Inlet flowrate (1:10 year, 12-hour SCS Storm)
- d = depth of pond during peak 1:10 year inflow
- W_{avg} = average width of forebay

Input:
- Q = 2.44 m³/s
- d = 2.5 m
- W_{avg} = 15 m

V_{avg} = 0.07 m/s <0.15 m/s

Calculation by: BP
Reviewed by:
Date: Apr 26, 2017

Calculation Sheet for SWM Facility Forebay Sizing - STAGE 4 and 5

Settling Criteria

$$L_{min}=\left(\frac{rQp}{V_S}\right)^{0.5}$$

Where:
- r = length to width ratio at the invert of the inlet pipe
- Q_p = peak outflow during design quality storm
- V_s = settling velocity

Input:
- l = length = 45 m
- w = width = 13 m
- r = 3.46
- Q_p = 0.05 m³/s
- V_s = 0.0003 m/s

L_{min} = 24 m

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls.

Dispersion Criteria

$$L_{min}=\frac{8Q}{dV_f}$$

Where:
- Q = Inlet flowrate (1:10 year, 12-hour SCS Storm)
- d = depth of permanent pool (forebay)
- V_f = desired final velocity

Input:
- Q = 1.134 m³/s
- d = 1.5 m
- V_f = 0.5 m/s

L_{min} = 12.10 m

The minimum forebay length is determined by the larger of the settling or dispersion criteria.
Minimum length of forebay required = 24.40 m
Length of Forebay Provided = 45.00 m

Average Forebay Velocity

$$V_{avg}=\frac{Q}{d\,W_{avg}}$$

Where:
- Q = Inlet flowrate (1:10 year, 12-hour SCS Storm)
- d = depth of pond during peak 1:10 year inflow
- W_{avg} = average width of forebay

Input:
- Q = 1.134 m³/s
- d = 2.5 m
- W_{avg} = 15 m

V_{avg} = 0.03 m/s <0.15 m/s

Calculation by: BP
Reviewed by:
Date: Apr 26, 2017

Calculation Sheet for SWM Facility Forebay Sizing - STAGE 6

Settling Criteria

$$L_{min}=\left(\frac{rQ_p}{V_S}\right)^{0.5}$$

Where:
- r = length to width ratio at the invert of the inlet pipe
- Q_p = peak outflow during design quality storm
- V_s = settling velocity

Input:
- l = length = 90 m
- w = width = 8 m
- r = 11.25
- Q_p = 0.05 m³/s
- V_s = 0.0003 m/s

L_{min} = 43.4 m

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls.

Dispersion Criteria

$$L_{min}=\frac{8Q}{dV_f}$$

Where:
- Q = Inlet flowrate (1:10 year, 12-hour SCS Storm)
- d = depth of permanent pool (forebay)
- V_f = desired final velocity

Input:
- Q = 1.085 m³/s
- d = 1.5 m
- V_f = 0.5 m/s

L_{min} = 11.60 m

The minimum forebay length is determined by the larger of the settling or dispersion criteria.
Minimum length of forebay required = 43.40 m
Length of Forebay Provided = 90.00 m

Average Forebay Velocity

$$V_{avg}=\frac{Q}{d\,W_{avg}}$$

Where:
- Q = Inlet flowrate (1:10 year, 12-hour SCS Storm)
- d = depth of pond during peak 1:10 year inflow
- W_{avg} = average width of forebay

Input:
- Q = 1.085 m³/s
- d = 2.6 m
- W_{avg} = 15 m

V_{avg} = 0.03 m/s <0.15 m/s

Calculation by: BP
Reviewed by:
Date: Apr 26, 2017

Calculation Sheet for SWM Facility Forebay Sizing - CAMPEAU POND

Settling Criteria

$$L_{min}=\left(\frac{rQ_p}{V_S}\right)^{0.5}$$

Where:
- r = length to width ratio at the invert of the inlet pipe
- Q_p = peak outflow during design quality storm
- V_s = settling velocity

Input:
- l = length = 90 m
- w = width = 6 m
- r = 15.00
- Q_p = 0.102 m³/s
- V_s = 0.0003 m/s

L_{min} = 71.50 m

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls.

Dispersion Criteria

$$L_{min}=\frac{8Q}{dV_f}$$

Where:
- Q = Inlet flowrate (1:10 year, 12-hour SCS Storm)
- d = depth of permanent pool (forebay)
- V_f = desired final velocity

Input:
- Q = 3.696 m³/s
- d = 1.0 m
- V_f = 0.5 m/s

L_{min} = 59.20 m

The minimum forebay length is determined by the larger of the settling or dispersion criteria.
Minimum length of forebay required = 71.50 m
Length of Forebay Provided = 90 m

Average Forebay Velocity

$$V_{avg}=\frac{Q}{d\,W_{avg}}$$

Where:
- Q = Inlet flowrate (1:10 year, 12-hour SCS Storm)
- d = depth of pond during peak 1:10 year inflow
- W_{avg} = average width of forebay

Input:
- Q = 3.696 m³/s
- d = 1.5 m
- W_{avg} = 20 m

V_{avg} = 0.13 m/s <0.15 m/s

Calculation by: BP
Reviewed by:
Date: Apr 26, 2017

APPENDIX 'F'

PCSWMM MODEL OUTPUTS FOR TWO POND STRATGEY

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------

E - North Pond - 2 Connected Cells
Campeau Pond
Campeau Drive Sewer 750mm

***********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
***********************************************************

***************
Analysis Options
***************
Flow Units ..................... CMS
Process Models:
  Rainfall/Runoff ........ YES
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Starting Date ............ JUL-23-2009 00:00:00
Ending Date .............. JUL-25-2009 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Wet Time Step ............ 00:05:00
Dry Time Step ............ 01:00:00
Routing Time Step ........ 2.00 sec


WARNING 04: minimum elevation drop used for Conduit C6

WARNING 04: minimum elevation drop used for Conduit CC076

WARNING 04: minimum elevation drop used for Conduit CC079

WARNING 04: minimum elevation drop used for Conduit CC083

WARNING 04: minimum elevation drop used for Conduit CC089

WARNING 04: minimum elevation drop used for Conduit CC104

WARNING 04: minimum elevation drop used for Conduit CC106

WARNING 02: maximum depth increased for Node 111-S

WARNING 02: maximum depth increased for Node CJ066

WARNING 02: maximum depth increased for Node CJ070

WARNING 02: maximum depth increased for Node CJ071

WARNING 02: maximum depth increased for Node CJ073

WARNING 02: maximum depth increased for Node CJ074

WARNING 02: maximum depth increased for Node CJ075

WARNING 02: maximum depth increased for Node CJ077

WARNING 02: maximum depth increased for Node CJ084

WARNING 02: maximum depth increased for Node CJ089

WARNING 02: maximum depth increased for Node CJ094

WARNING 02: maximum depth increased for Node CJ100

WARNING 02: maximum depth increased for Node CJ101

WARNING 02: maximum depth increased for Node CJ104

WARNING 02: maximum depth increased for Node CJ105

WARNING 02: maximum depth increased for Node CJ106

WARNING 02: maximum depth increased for Node J10

*************
Element Count
*************
Number of rain gages ...... 16
Number of subcatchments ... 62
Number of nodes ........... 125
Number of links ........... 168
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                    Data        Recording
Name                Data Source     Type        Interval
-----------------------------------------------------------
CHI_3hr_10          CHI_3hr_10      INTENSITY     5 min.
CHI_3hr_100         CHI_3hr_100     INTENSITY     5 min.
CHI_3hr_100CC       CHI_3hr_100CC   INTENSITY     5 min.
CHI_3hr_2           CHI_3hr_2       INTENSITY     5 min.
CHI_3hr_25          CHI_3hr_25      INTENSITY     5 min.
CHI_3hr_5           CHI_3hr_5       INTENSITY     5 min.
CHI_3hr_50          CHI_3hr_50      INTENSITY     5 min.
MTO_100CCyrSCS12hr  MTO_100CCyrSCS12hr  INTENSITY    15 min.
MTO_100yrSCS12hr    MTO_100yrSCS12hr    INTENSITY    15 min.
MTO_10mmSCS12hr     MTO_10mmSCS12hr     INTENSITY    15 min.
MTO_10yrSCS12hr     MTO_10yrSCS12hr     INTENSITY    15 min.
MTO_20mmSCS12hr     MTO_20mmSCS12hr     INTENSITY    15 min.
MTO_25yrSCS12hr     MTO_25yrSCS12hr     INTENSITY    15 min.
MTO_2yrSCS12hr      MTO_2yrSCS12hr      INTENSITY    15 min.
MTO_50yrSCS12hr     MTO_50yrSCS12hr     INTENSITY    15 min.
MTO_5yrSCS12hr      MTO_5yrSCS12hr      INTENSITY    15 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope    Rain Gage            Outlet
-------------------------------------------------------------------------------------------------
112-115                     0.27    111.23     64.30    0.5000    MTO_100yrSCS12hr     112-S
114-112                     0.51    370.42     64.30    0.5000    MTO_100yrSCS12hr     114-S
114-118                     0.47    238.64     64.30    0.5000    MTO_100yrSCS12hr     118-S
115-110                     0.18     65.88      0.00    0.5000    MTO_100yrSCS12hr     115-S
116-115                     0.47    238.64     64.30    0.5000    MTO_100yrSCS12hr     116-S
120-111                     0.55    444.55     71.40    0.5000    MTO_100yrSCS12hr     120-S
122-120                     0.27    174.79     71.40    0.5000    MTO_100yrSCS12hr     122-S
124-120                     0.32     74.93     64.30    0.5000    MTO_100yrSCS12hr     124-S
124-126                     0.31     91.35     64.30    0.5000    MTO_100yrSCS12hr     124-S
126-128                     0.67    197.08     64.30    0.5000    MTO_100yrSCS12hr     126-S
131-129                     0.55    170.96     64.30    0.5000    MTO_100yrSCS12hr     131-S
132-130                     0.55     89.20     64.30    0.5000    MTO_100yrSCS12hr     132-S
134-132                     0.77    230.33     64.30    0.5000    MTO_100yrSCS12hr     134-S
136-134                     0.51    150.29     64.30    0.5000    MTO_100yrSCS12hr     136-S
138-140                     0.34    107.51     64.30    0.5000    MTO_100yrSCS12hr     138-S
140-122                     0.74    234.19     64.30    0.5000    MTO_100yrSCS12hr     140-S
140-142                     0.64    240.84     64.30    0.5000    MTO_100yrSCS12hr     140-S
142-130                     0.86    264.29     64.30    0.5000    MTO_100yrSCS12hr     142-S
144-140                     0.40    119.38     64.30    0.5000    MTO_100yrSCS12hr     144-S
144-146                     0.89    281.65     64.30    0.5000    MTO_100yrSCS12hr     144-S
146-122                     0.25    129.84     71.40    0.5000    MTO_100yrSCS12hr     146-S
154-512                     0.87     75.77     64.29    1.5000    MTO_100yrSCS12hr     St154
```

157-158	0.74	64.47	64.29	1.5000	MTO_100yrSCS12hr	St157
158-160	0.56	38.30	64.29	1.5000	MTO_100yrSCS12hr	St158
170-156	0.36	49.05	64.29	1.5000	MTO_100yrSCS12hr	St170
172-160	0.75	61.39	64.29	1.5000	MTO_100yrSCS12hr	St172
173-174	0.36	45.36	64.29	1.5000	MTO_100yrSCS12hr	St173
512A-OUTLET	0.33	23.85	25.00	1.5000	MTO_100yrSCS12hr	St512A
513-512A	2.99	145.75	43.22	1.5000	MTO_100yrSCS12hr	St513
513-512A_PARK	0.99	70.81	25.00	1.5000	MTO_100yrSCS12hr	513
514-513	0.33	28.88	64.29	1.5000	MTO_100yrSCS12hr	St514
605-OUTLET	0.82	78.80	64.29	1.5000	MTO_100yrSCS12hr	St605
620-610_EAST	1.88	114.68	14.30	1.5000	MTO_100yrSCS12hr	620
620-610_WEST	2.06	75.95	64.29	1.5000	MTO_100yrSCS12hr	St620
630-620	0.66	62.31	64.29	1.5000	MTO_100yrSCS12hr	St630
640-630	2.57	89.39	64.29	1.5000	MTO_100yrSCS12hr	St640
CAMPEAU_DRIVE_1	1.95	60.05	92.90	0.5040	MTO_100yrSCS12hr	EXISTING_STAGE_1
COMMERCIAL_STAGE_1	5.61	168.72	70.53	0.5010	MTO_100yrSCS12hr	CAMPEAU_DRIVE_1
COMMERCIAL_STAGE_3_SOUTH_2	1.55	53.03	92.90	0.5780	MTO_100yrSCS12hr	COMMERCIAL_STAGE_1
COMMERCIAL_STAGE_3_WEST_2	0.73	56.74	92.90	0.5000	MTO_100yrSCS12hr	COMMERCIAL_STAGE_1
CS063_1	92.82	630.00	0.00	0.8000	MTO_100yrSCS12hr	CJ065
CS063_2	30.75	260.01	8.00	3.0000	MTO_100yrSCS12hr	CJ065
CS073	5.37	150.00	0.00	0.8000	MTO_100yrSCS12hr	CJ083
CS077_2	12.29	360.01	76.40	1.0000	MTO_100yrSCS12hr	CJ077
CS082_1	36.92	500.01	58.00	0.7000	MTO_100yrSCS12hr	CJ082
CS082_2	8.84	170.01	70.00	0.7000	MTO_100yrSCS12hr	CJ082
CS098	90.47	650.01	36.40	1.2000	MTO_100yrSCS12hr	CJ098
CS267_4	1.53	16.24	71.00	0.5000	MTO_100yrSCS12hr	COMMERCIAL_STAGE_1
CS267_5	1.05	15.07	71.00	0.5000	MTO_100yrSCS12hr	EXISTING_STAGE_2
CS267_7	1.71	18.97	69.00	0.5000	MTO_100yrSCS12hr	CJ065
EXISTING_STAGE_1	9.08	144.88	68.95	0.5000	MTO_100yrSCS12hr	EXISTING_STAGE_2
EXISTING_STAGE_2	12.63	289.91	64.36	0.5000	MTO_100yrSCS12hr	OF1
FUTURE_TRANSITWAY	2.22	88.80	71.43	0.5340	MTO_100yrSCS12hr	FUTURE_TRANSITWAY-S
FUTURE_TRANSITWAY_2	0.58	46.04	92.90	0.5340	MTO_100yrSCS12hr	COMMERCIAL_STAGE_1
FutureCamp-117	1.43	726.97	71.43	0.5000	MTO_100yrSCS12hr	FutureCamp-S
FutureCampEast-117	1.00	50.00	71.43	0.5000	MTO_100yrSCS12hr	117-S
FutureComm-CAMPEAU_DRIVE_POND	4.19	83.46	85.71	0.5000	MTO_100yrSCS12hr	FutureComm-S
Pond_1	1.72	287.78	35.00	0.5000	MTO_100yrSCS12hr	EX_POND
Pond_2	1.75	335.40	35.00	0.5000	MTO_100yrSCS12hr	NEW_POND
STAGE_2	0.48	500.00	25.00	0.5000	MTO_100yrSCS12hr	EXISTING_STAGE_2
STAGE_2_ROAD	0.12	500.06	25.00	0.5000	MTO_100yrSCS12hr	EXISTING_STAGE_2
Stub-110	3.56	99.05	85.71	0.5000	MTO_100yrSCS12hr	Stub-S

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
111-S	JUNCTION	96.15	0.50	0.0	
CJ065	JUNCTION	91.00	5.51	100.0	
CJ066	JUNCTION	91.02	5.60	100.0	
CJ067	JUNCTION	91.08	5.62	100.0	
CJ068	JUNCTION	91.06	6.19	100.0	
CJ069	JUNCTION	91.06	6.24	100.0	
CJ070	JUNCTION	91.10	6.21	100.0	
CJ071	JUNCTION	91.15	6.25	100.0	
CJ072	JUNCTION	91.14	6.25	100.0	
CJ073	JUNCTION	91.18	8.21	100.0	
CJ074	JUNCTION	91.20	7.69	100.0	
CJ075	JUNCTION	91.21	7.69	100.0	
CJ076	JUNCTION	91.21	6.70	100.0	
CJ077	JUNCTION	91.23	7.40	100.0	
CJ078	JUNCTION	91.22	6.38	100.0	
CJ079	JUNCTION	91.22	5.61	100.0	
CJ080	JUNCTION	91.22	5.57	100.0	
CJ081	JUNCTION	91.24	5.48	100.0	
CJ082	JUNCTION	92.27	10.00	1000.0	
CJ083	JUNCTION	91.24	5.38	100.0	
CJ084	JUNCTION	91.25	5.37	100.0	
CJ089	JUNCTION	91.25	7.01	100.0	
CJ094	JUNCTION	92.74	6.80	100.0	
CJ095	JUNCTION	92.86	3.00	100.0	
CJ096	JUNCTION	93.15	3.00	100.0	
CJ098	JUNCTION	93.40	3.00	100.0	
CJ100	JUNCTION	91.30	4.70	100.0	
CJ101	JUNCTION	91.32	4.68	100.0	
CJ103	JUNCTION	91.36	3.85	100.0	Yes
CJ104	JUNCTION	91.32	4.68	100.0	
CJ105	JUNCTION	91.35	4.65	100.0	
CJ106	JUNCTION	91.35	4.65	100.0	
CJ266	JUNCTION	92.30	3.70	100.0	
J10	JUNCTION	92.80	1.26	0.0	
J11	JUNCTION	92.90	2.10	0.0	
CJ064	OUTFALL	90.95	5.51	0.0	
OF1	OUTFALL	0.00	0.00	0.0	
110	STORAGE	92.67	3.44	0.0	
111	STORAGE	93.31	2.84	0.0	
112	STORAGE	93.13	3.37	0.0	
112-S	STORAGE	96.50	0.50	0.0	
113	STORAGE	92.36	3.64	0.0	
114	STORAGE	93.75	2.90	0.0	
114-S	STORAGE	96.65	0.50	0.0	
115	STORAGE	93.04	3.41	0.0	
115-S	STORAGE	96.45	0.50	0.0	
116	STORAGE	93.66	2.94	0.0	
116-S	STORAGE	96.60	0.50	0.0	
117	STORAGE	92.33	3.67	0.0	
117-S	STORAGE	95.50	1.00	0.0	
118	STORAGE	93.83	2.77	0.0	
118-S	STORAGE	96.60	0.50	0.0	
120	STORAGE	93.50	2.80	0.0	
120-S	STORAGE	96.30	0.50	0.0	
122	STORAGE	93.61	2.79	0.0	
122-S	STORAGE	96.40	0.50	0.0	
124	STORAGE	94.13	2.67	0.0	
124-S	STORAGE	96.80	0.50	0.0	
126	STORAGE	93.82	2.88	0.0	
126-S	STORAGE	96.70	0.50	0.0	
128	STORAGE	93.22	3.33	0.0	
128-S	STORAGE	96.55	0.50	0.0	
129	STORAGE	93.26	3.34	0.0	
130	STORAGE	93.48	3.22	0.0	
130-S	STORAGE	96.70	0.50	0.0	
131	STORAGE	93.37	3.28	0.0	
131-S	STORAGE	96.65	0.50	0.0	
132	STORAGE	93.90	2.90	0.0	
132-S	STORAGE	96.80	0.50	0.0	
134	STORAGE	94.09	2.81	0.0	
134-S	STORAGE	96.90	0.50	0.0	
136	STORAGE	94.30	2.67	0.0	
136-S	STORAGE	96.97	0.50	0.0	
138	STORAGE	94.31	2.66	0.0	
138-S	STORAGE	96.97	0.50	0.0	
140	STORAGE	94.03	3.07	0.0	
140-S	STORAGE	97.10	0.50	0.0	
142	STORAGE	93.82	3.08	0.0	
142-S	STORAGE	96.90	0.50	0.0	
144	STORAGE	94.26	2.94	0.0	
144-S	STORAGE	97.20	0.50	0.0	
146	STORAGE	93.95	2.55	0.0	
146-S	STORAGE	96.50	0.50	0.0	
154	STORAGE	93.28	3.02	0.0	
156	STORAGE	93.84	3.16	0.0	
157	STORAGE	93.58	3.12	0.0	
158	STORAGE	93.32	3.38	0.0	
160	STORAGE	93.14	3.26	0.0	
170	STORAGE	93.97	3.03	0.0	
172	STORAGE	93.61	2.79	0.0	
173	STORAGE	93.77	2.63	0.0	
174	STORAGE	93.62	2.78	0.0	
512	STORAGE	92.87	3.43	0.0	
512A	STORAGE	92.88	3.62	0.0	
513	STORAGE	93.21	3.09	0.0	
514	STORAGE	93.94	2.36	0.0	
605	STORAGE	92.87	3.58	0.0	
610	STORAGE	92.92	3.33	0.0	

620	STORAGE	93.15	3.20	0.0	
630	STORAGE	93.46	2.99	0.0	
640	STORAGE	93.65	2.80	0.0	
CAMPEAU_DRIVE_POND	STORAGE	92.20	2.80	0.0	
CSto097	STORAGE	93.20	3.30	100.0	
EX_POND	STORAGE	92.70	1.30	0.0	Yes
FUTURE_TRANSITWAY-S	STORAGE	95.50	0.50	0.0	
FutureCamp	STORAGE	92.50	2.30	0.0	
FutureCamp-S	STORAGE	94.30	0.50	0.0	
FutureComm	STORAGE	92.79	3.21	0.0	
FutureComm-S	STORAGE	95.50	0.50	0.0	
NEW_POND	STORAGE	92.70	1.30	0.0	
St154	STORAGE	96.30	0.50	0.0	
St157	STORAGE	96.70	0.50	0.0	
St158	STORAGE	96.70	0.50	0.0	
St170	STORAGE	97.00	0.50	0.0	
St172	STORAGE	96.40	0.50	0.0	
St173	STORAGE	96.40	0.50	0.0	
St512A	STORAGE	96.50	0.50	0.0	
St513	STORAGE	96.30	0.50	0.0	
St514	STORAGE	96.30	0.50	0.0	
St605	STORAGE	96.45	0.50	0.0	
St620	STORAGE	96.35	0.50	0.0	
St630	STORAGE	96.45	0.50	0.0	
St640	STORAGE	96.45	0.50	0.0	
Stub	STORAGE	92.71	2.09	0.0	
Stub-S	STORAGE	96.15	0.50	0.0	

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
110-113	110	113	CONDUIT	38.1	0.1496	0.0130
111-110	111	110	CONDUIT	75.4	0.1499	0.0130
112-115	112	115	CONDUIT	46.1	0.1996	0.0130
113-117	113	117	CONDUIT	16.8	0.1488	0.0130
114-112	114	112	CONDUIT	110.7	0.1996	0.0130
114-118	114	118	CONDUIT	39.9	0.2005	0.0130
115-110	115	110	CONDUIT	46.1	0.1497	0.0130
116-115	116	115	CONDUIT	107.8	0.1503	0.0130
117-CAMPEAU_DRIVE_POND117		CAMPEAU_DRIVE_POND	CONDUIT	66.5	0.2000	0.0130
118-116	118	116	CONDUIT	8.6	0.1977	0.0130
120-111	120	111	CONDUIT	122.6	0.1501	0.0130
122-120	122	120	CONDUIT	78.7	0.1499	0.0130
124-120	124	120	CONDUIT	76.2	0.2493	0.0130
124-126	124	126	CONDUIT	68.9	0.1988	0.0130
126-114	126	114	CONDUIT	46.0	0.1500	0.0130
126-128	126	128	CONDUIT	107.5	0.1498	0.0130
128-112	128	112	CONDUIT	46.1	0.2017	0.0130
129-128	129	128	CONDUIT	23.4	0.1496	0.0130
130-131	130	131	CONDUIT	23.2	0.1509	0.0130
131-129	131	129	CONDUIT	74.3	0.1494	0.0130
132-130	132	130	CONDUIT	75.5	0.1497	0.0130
134-132	134	132	CONDUIT	124.8	0.1498	0.0130
136-134	136	134	CONDUIT	92.2	0.1497	0.0130
138-140	138	140	CONDUIT	64.0	0.2000	0.0130
140-122	140	122	CONDUIT	124.0	0.1500	0.0130
140-142	140	142	CONDUIT	115.7	0.1495	0.0130
142-130	142	130	CONDUIT	127.2	0.1494	0.0130
144-140	144	140	CONDUIT	74.0	0.2000	0.0130
144-146	144	146	CONDUIT	117.0	0.2000	0.0130
146-122	146	122	CONDUIT	74.3	0.1507	0.0130
154-512	154	512	CONDUIT	120.0	0.1500	0.0130
156-157	156	157	CONDUIT	13.0	0.2308	0.0130
157-158	157	158	CONDUIT	120.0	0.1500	0.0130
158-160	158	160	CONDUIT	70.0	0.1429	0.0130
160-512	160	512	CONDUIT	82.0	0.1463	0.0130
170-156	170	156	CONDUIT	50.0	0.2600	0.0130
172-160	172	160	CONDUIT	120.0	0.2000	0.0130
173-174	173	174	CONDUIT	60.0	0.2500	0.0130
174-154	174	154	CONDUIT	15.0	0.2667	0.0130
512A-EX_POND	512A	EX_POND	CONDUIT	55.0	0.3273	0.0130
512-EX_POND	512	EX_POND	CONDUIT	45.0	0.3778	0.0130
513-512A	513	512A	CONDUIT	215.0	0.1535	0.0130
514-513	514	513	CONDUIT	110.0	0.2545	0.0130
605-NEW_POND	605	NEW_POND	CONDUIT	46.0	0.1522	0.0130
610-605	610	605	CONDUIT	35.0	0.1429	0.0130
620-610	620	610	CONDUIT	150.0	0.1533	0.0130
630-620	630	620	CONDUIT	110.0	0.1455	0.0130
640-630	640	630	CONDUIT	70.0	0.1571	0.0130
C12	J10	CJ266	CONDUIT	260.0	0.1923	0.0350
C2	J11	CJ104	CONDUIT	400.0	0.3950	0.0350
C6	EX_POND	NEW_POND	CONDUIT	40.0	0.0008	0.0130
CC065	CJ065	CJ064	CONDUIT	14.9	0.3358	0.0350
CC066	CJ066	CJ065	CONDUIT	9.8	0.1636	0.0350
CC067	CJ067	CJ066	CONDUIT	39.1	0.1636	0.0350
CC068	CJ067	CJ068	CONDUIT	151.6	0.0152	0.0350
CC069	CJ069	CJ068	CONDUIT	9.8	0.0307	0.0350
CC070	CJ070	CJ069	CONDUIT	9.9	0.4020	0.0350
CC071	CJ071	CJ070	CONDUIT	39.8	0.1257	0.0350
CC072	CJ071	CJ072	CONDUIT	9.9	0.1005	0.0350
CC073	CJ073	CJ072	CONDUIT	114.4	0.0350	0.0350
CC074	CJ074	CJ073	CONDUIT	54.7	0.0366	0.0350
CC075	CJ075	CJ074	CONDUIT	9.8	0.1015	0.0350
CC076	CJ076	CJ075	CONDUIT	64.0	0.0005	0.0350
CC077	CJ077	CJ089	CONDUIT	363.1	0.1008	0.0400
CC078	CJ078	CJ076	CONDUIT	24.6	0.0406	0.0350
CC079	CJ079	CJ078	CONDUIT	137.9	0.0002	0.0350
CC080	CJ082	CJ077	CONDUIT	408.0	0.2559	0.0130
CC080_1	CJ080	CJ079	CONDUIT	4.9	0.0813	0.0350
CC081	CJ081	CJ080	CONDUIT	19.7	0.0812	0.0350
CC083	CJ083	CJ081	CONDUIT	14.8	0.0021	0.0350
CC084	CJ084	CJ083	CONDUIT	9.8	0.1015	0.0350
CC089	CJ089	CJ084	CONDUIT	19.8	0.0015	0.0350
CC094	CJ094	CJ073	CONDUIT	130.5	0.1150	0.0400
CC095	CJ095	CJ094	CONDUIT	50.0	0.2200	0.0130
CC096	CJ096	CJ095	CONDUIT	49.0	0.5924	0.0130
CC098	CJ098	CSto097	CONDUIT	20.0	0.5000	0.0130
CC100	CJ100	CJ089	CONDUIT	217.6	0.0230	0.0350
CC101	CJ101	CJ100	CONDUIT	29.4	0.0680	0.0100
CC102	CJ103	CJ106	CONDUIT	14.5	0.0690	0.0200
CC104	CJ104	CJ101	CONDUIT	6.4	0.0048	0.0350
CC105	CJ105	CJ104	CONDUIT	106.1	0.0283	0.0350
CC106	CJ106	CJ105	CONDUIT	54.0	0.0006	0.0350
CC266	CJ266	CJ072	CONDUIT	77.4	1.1630	0.0250
FutureCamp-117	FutureCamp	117	CONDUIT	120.0	0.1292	0.0130
FutureComm-CAMPEAU_DRIVE_POND	FutureComm	CAMPEAU_DRIVE_POND	CONDUIT	58.9	0.1528	0.0130
Stub-110	Stub	110	CONDUIT	30.0	0.1500	0.0130
CDP_Low	CAMPEAU_DRIVE_POND	J11	ORIFICE			
COR097_1	CSto097	CJ096	ORIFICE			
COR097_2	CSto097	CJ096	ORIFICE			
NP_Low	NEW_POND	J10	ORIFICE			
10	St173	St154	WEIR			
11	St172	St512A	WEIR			
111-120-S	120-S	111-S	WEIR			
111-S-POND	111-S	CAMPEAU_DRIVE_POND	WEIR			
112-128-S	128-S	112-S	WEIR			
114-112-S	114-S	112-S	WEIR			
115-112-S	112-S	115-S	WEIR			
115-116-S	116-S	115-S	WEIR			
116-118-S	118-S	116-S	WEIR			
117-S-CAMPEAU_DRIVE_POND117-S		CAMPEAU_DRIVE_POND	WEIR			
12	St514	St513	WEIR			
120-122-S	122-S	120-S	WEIR			
122-146-S	146-S	122-S	WEIR			
126-124-S	124-S	126-S	WEIR			
128-126-S	126-S	128-S	WEIR			
130-142-S	142-S	130-S	WEIR			
131-128-S	131-S	128-S	WEIR			
131-130-S	130-S	131-S	WEIR			
132-130-S	132-S	130-S	WEIR			
132-134-S	134-S	132-S	WEIR			
134-136-S	136-S	134-S	WEIR			
138-136-S	138-S	136-S	WEIR			

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14              St513           St512A          WEIR
140-144-S       144-S           140-S           WEIR
142-140-S       140-S           142-S           WEIR
15              St640           St630           WEIR
16              St630           St620           WEIR
17              St620           St605           WEIR
18              St605           NEW_POND        WEIR
5               St170           St157           WEIR
6               St157           St158           WEIR
7               St158           St512A          WEIR
8               St512A          EX_POND         WEIR
9               St154           St512A          WEIR
CDP_High        CAMPEAU_DRIVE_PONDJ11             WEIR
CW097_3         CSto097         CJ096           WEIR
FUTURE_TRANSITWAY-S-CAMPEAU_DRIVE_PONDFUTURE_TRANSITWAY-SCAMPEAU_DRIVE_PONDWEIR
FutureCamp-CAMPEAU_DRIVE_PONDFutureCamp-S    CAMPEAU_DRIVE_PONDWEIR
NP_High         NEW_POND        J10             WEIR
112-IC          112-S           112             OUTLET
114-IC          114-S           114             OUTLET
115-IC          115-S           115             OUTLET
116-IC          116-S           116             OUTLET
117-IC          117-S           117             OUTLET
118-IC          118-S           118             OUTLET
120-IC          120-S           120             OUTLET
122-IC          122-S           122             OUTLET
124-IC          124-S           124             OUTLET
126-IC          126-S           126             OUTLET
128-IC          128-S           128             OUTLET
130-IC          130-S           130             OUTLET
131-IC          131-S           131             OUTLET
132-IC          132-S           132             OUTLET
134-IC          134-S           134             OUTLET
136-IC          136-S           136             OUTLET
138-IC          138-S           138             OUTLET
140-IC          140-S           140             OUTLET
142-IC          142-S           142             OUTLET
144-IC          144-S           144             OUTLET
146-IC          146-S           146             OUTLET
FUTURE_TRANSITWAY-ICFUTURE_TRANSITWAY-SFutureComm     OUTLET
FutureCamp-BackwaterFutureCamp      FutureCamp-S    OUTLET
FutureCamp-IC   FutureCamp-S    FutureCamp      OUTLET
FutureComm-IC   FutureComm-S    FutureComm      OUTLET
O154            St154           154             OUTLET
O157            St157           157             OUTLET
O158            St158           158             OUTLET
O170            St170           170             OUTLET
O172            St172           172             OUTLET
O173            St173           173             OUTLET
O512A           St512A          512A            OUTLET
O513            St513           513             OUTLET
O514            St514           514             OUTLET
O605            St605           605             OUTLET
O620            St620           620             OUTLET
O630            St630           630             OUTLET
O640            St640           640             OUTLET
Stub-IC         Stub-S          Stub            OUTLET


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Cross Section Summary
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                                    Full     Full     Hyd.     Max.   No. of     Full
Conduit          Shape             Depth     Area     Rad.    Width  Barrels     Flow
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110-113          FILLED_CIRCULAR      1.01     1.15     0.28     1.35     1        1.46
111-110          CIRCULAR             0.82     0.53     0.21     0.82     1        0.56
112-115          CIRCULAR             1.05     0.87     0.26     1.05     1        1.22
113-117          FILLED_CIRCULAR      1.24     1.72     0.34     1.65     1        2.48
114-112          CIRCULAR             0.45     0.16     0.11     0.45     1        0.13
114-118          CIRCULAR             0.45     0.16     0.11     0.45     1        0.13
115-110          CIRCULAR             1.05     0.87     0.26     1.05     1        1.06
116-115          CIRCULAR             0.60     0.28     0.15     0.60     1        0.24
117-CAMPEAU_DRIVE_POND FILLED_CIRCULAR     1.24     1.72     0.34     1.65     1        2.88
118-116          CIRCULAR             0.45     0.16     0.11     0.45     1        0.13
120-111          CIRCULAR             0.82     0.53     0.21     0.82     1        0.56
122-120          CIRCULAR             0.82     0.53     0.21     0.82     1        0.56
124-120          CIRCULAR             0.38     0.11     0.09     0.38     1        0.09
124-126          CIRCULAR             0.45     0.16     0.11     0.45     1        0.13
126-114          CIRCULAR             0.60     0.28     0.15     0.60     1        0.24
126-128          CIRCULAR             0.60     0.28     0.15     0.60     1        0.24
128-112          CIRCULAR             1.05     0.87     0.26     1.05     1        1.23
129-128          CIRCULAR             1.05     0.87     0.26     1.05     1        1.06
130-131          CIRCULAR             0.97     0.75     0.24     0.97     1        0.87
131-129          CIRCULAR             1.05     0.87     0.26     1.05     1        1.06
132-130          CIRCULAR             0.68     0.36     0.17     0.68     1        0.33
134-132          CIRCULAR             0.68     0.36     0.17     0.68     1        0.33
136-134          CIRCULAR             0.60     0.28     0.15     0.60     1        0.24
138-140          CIRCULAR             0.45     0.16     0.11     0.45     1        0.13
140-122          CIRCULAR             0.60     0.28     0.15     0.60     1        0.24
140-142          CIRCULAR             0.75     0.44     0.19     0.75     1        0.43
142-130          CIRCULAR             0.82     0.53     0.21     0.82     1        0.55
144-140          CIRCULAR             0.45     0.16     0.11     0.45     1        0.13
144-146          CIRCULAR             0.53     0.22     0.13     0.53     1        0.19
146-122          CIRCULAR             0.60     0.28     0.15     0.60     1        0.24
154-512          CIRCULAR             0.68     0.36     0.17     0.68     1        0.33
156-157          CIRCULAR             0.38     0.11     0.09     0.38     1        0.08
157-158          CIRCULAR             0.60     0.28     0.15     0.60     1        0.24
158-160          CIRCULAR             0.68     0.36     0.17     0.68     1        0.32
160-512          CIRCULAR             0.75     0.44     0.19     0.75     1        0.43
170-156          CIRCULAR             0.38     0.11     0.09     0.38     1        0.09
172-160          CIRCULAR             0.53     0.22     0.13     0.53     1        0.19
173-174          CIRCULAR             0.38     0.11     0.09     0.38     1        0.09
174-154          CIRCULAR             0.38     0.11     0.09     0.38     1        0.09
512A-EX_POND     CIRCULAR             0.82     0.53     0.21     0.82     1        0.82
512-EX_POND      CIRCULAR             0.90     0.64     0.23     0.90     1        1.11
513-512A         CIRCULAR             0.82     0.53     0.21     0.82     1        0.56
514-513          CIRCULAR             0.38     0.11     0.09     0.38     1        0.09
605-NEW_POND     CIRCULAR             1.05     0.87     0.26     1.05     1        1.07
610-605          CIRCULAR             1.05     0.87     0.26     1.05     1        1.03
620-610          CIRCULAR             1.05     0.87     0.26     1.05     1        1.07
630-620          CIRCULAR             0.90     0.64     0.23     0.90     1        0.69
640-630          CIRCULAR             0.82     0.53     0.21     0.82     1        0.57
C12              TRAPEZOIDAL          1.00     6.00     0.64     9.00     1        5.60
C2               RECT_OPEN            1.00     1.00     0.33     1.00     1        0.86
C6               RECT_CLOSED          1.50     3.60     0.46     2.40     4        0.46
CC065            40703                5.51   886.40     1.59   214.56     1     1998.46
CC066            40713.               4.98   833.59     1.48   209.62     1     1253.08
CC067            40753                5.60   983.57     1.59   224.90     1     1547.17
CC068            40900.3              4.94   922.55     1.28   228.85     1      383.30
CC069            40910                4.94   811.51     1.34   208.22     1      493.96
CC070            40919.2              6.21  1065.37     1.41   242.84     1     2429.72
CC071            40956.               4.85   864.04     1.38   220.16     1     1084.41
CC072            40965.2              6.25  1072.10     1.71   220.44     1     1386.94
CC073            41071                4.82   724.41     1.37   195.56     1      478.60
CC074            41117                7.33  1337.67     2.24   220.36     1     1252.54
CC075            41125.4              7.69  1383.90     1.92   221.70     1     1945.44
CC076            41180                4.79   994.12     1.24   259.67     1       71.44
CC077            DITCH                6.80    27.78     1.91     6.00     1       33.97
CC078            41198                4.78   931.37     1.19   252.82     1      601.94
CC079            41320                4.78  1202.14     1.07   357.02     1       53.34
CC080            CIRCULAR             2.25     3.98     0.56     2.25     1       10.54
CC080_1          41323.6              4.78  1189.05     1.06   360.88     1     1006.27
CC081            41338                4.76  1246.63     1.09   376.32     1     1072.99
CC083            41349.4              5.38  1326.57     1.13   406.06     1      186.82
CC084            41357                5.37  1333.30     1.14   379.29     1     1401.26
CC089            41374.8              4.75   338.24     2.07   110.62     1       61.68
CC094            DITCH                6.80    27.78     1.91     6.00     1       36.28
CC095            CIRCULAR             1.20     1.13     0.30     1.20     1        1.83
CC096            CIRCULAR             1.20     1.13     0.30     1.20     1        3.00
CC098            CIRCULAR             1.65     2.14     0.41     1.65     1        6.45
CC100            41572                4.70   459.63     2.20   110.12     1      336.94
CC101            FutureCampeau_Culvert     4.45    93.93     1.53    28.01     1      324.82
CC102            FutureTransitway_Culvert     3.68    67.40     1.13    28.00     1       95.93
CC104            41608                4.68   454.67     1.79   110.12     1      132.22
CC105            41671                4.65   362.08     1.54   113.32     1      232.37
CC106            41725.5              4.65   782.66     1.25   227.21     1       61.63
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CC266            TRAPEZOIDAL          1.00     6.00     0.64     9.00     1        19.29
FutureCamp-117   FILLED_CIRCULAR      0.56     0.36     0.15     0.75     1        0.28
FutureComm-CAMPEAU_DRIVE_POND FILLED_CIRCULAR      0.90     0.91     0.25     1.20     1        1.08
Stub-110         FILLED_CIRCULAR      0.79     0.70     0.22     1.05     1        0.75

*************
Shape Summary
*************

Shape FutureCampeau_Culvert
Area:
            0.0060     0.0125     0.0195     0.0272     0.0353
            0.0441     0.0534     0.0632     0.0736     0.0845
            0.0960     0.1081     0.1207     0.1338     0.1476
            0.1618     0.1766     0.1920     0.2079     0.2244
            0.2415     0.2590     0.2835     0.3100     0.3365
            0.3631     0.3896     0.4162     0.4427     0.4692
            0.4958     0.5223     0.5488     0.5754     0.6019
            0.6285     0.6550     0.6815     0.7081     0.7346
            0.7612     0.7877     0.8142     0.8408     0.8673
            0.8938     0.9204     0.9469     0.9735     1.0000
Hrad:
            0.0555     0.1063     0.1536     0.1980     0.2403
            0.2807     0.3196     0.3573     0.3939     0.4297
            0.4647     0.4990     0.5328     0.5661     0.5990
            0.6314     0.6636     0.6954     0.7270     0.7583
            0.7893     0.8202     0.6072     0.6599     0.7121
            0.7635     0.8144     0.8646     0.9143     0.9633
            1.0118     1.0597     1.1071     1.1539     1.2001
            1.2459     1.2911     1.3358     1.3800     1.4237
            1.4669     1.5096     1.5519     1.5937     1.6350
            1.6759     1.7164     1.7564     1.7960     1.0000
Width:
            0.2351     0.2559     0.2768     0.2977     0.3185
            0.3394     0.3602     0.3811     0.4020     0.4228
            0.4437     0.4646     0.4854     0.5063     0.5271
            0.5480     0.5689     0.5897     0.6106     0.6314
            0.6523     0.6732     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000

Shape FutureTransitway_Culvert
Area:
            0.0078     0.0160     0.0245     0.0332     0.0423
            0.0517     0.0614     0.0714     0.0817     0.0924
            0.1033     0.1145     0.1261     0.1380     0.1501
            0.1626     0.1754     0.1885     0.2019     0.2157
            0.2342     0.2543     0.2747     0.2953     0.3161
            0.3371     0.3583     0.3797     0.4013     0.4232
            0.4452     0.4675     0.4900     0.5127     0.5414
            0.5720     0.6025     0.6331     0.6637     0.6943
            0.7248     0.7554     0.7860     0.8166     0.8471
            0.8777     0.9083     0.9389     0.9694     1.0000
Hrad:
            0.0637     0.1244     0.1827     0.2386     0.2926
            0.3448     0.3954     0.4446     0.4924     0.5391
            0.5847     0.6293     0.6730     0.7159     0.7581
            0.7996     0.8404     0.8806     0.9203     0.9594
            0.7313     0.7843     0.8366     0.8883     0.9394
            0.9898     1.0397     1.0891     1.1379     1.1861
            1.2339     1.2812     1.3280     1.3744     1.0951
            1.1512     1.2068     1.2618     1.3162     1.3702
            1.4236     1.4765     1.5289     1.5808     1.6322
            1.6831     1.7336     1.7835     1.8330     1.0000
Width:
            0.2616     0.2717     0.2818     0.2919     0.3021
            0.3122     0.3223     0.3324     0.3426     0.3527
            0.3628     0.3729     0.3831     0.3932     0.4033
            0.4134     0.4236     0.4337     0.4438     0.4540
            0.6559     0.6628     0.6697     0.6766     0.6835
            0.6904     0.6973     0.7042     0.7110     0.7179
            0.7248     0.7317     0.7386     0.7455     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000


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Transect Summary
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Transect 40703
Area:
            0.0007     0.0015     0.0026     0.0037     0.0051
            0.0066     0.0084     0.0106     0.0134     0.0167
            0.0236     0.0360     0.0569     0.0807     0.1047
            0.1290     0.1534     0.1780     0.2026     0.2274
            0.2523     0.2772     0.3022     0.3273     0.3524
            0.3776     0.4028     0.4281     0.4535     0.4789
            0.5044     0.5299     0.5555     0.5812     0.6069
            0.6327     0.6585     0.6844     0.7104     0.7364
            0.7625     0.7886     0.8148     0.8411     0.8674
            0.8938     0.9203     0.9468     0.9734     1.0000
Hrad:
            0.0613     0.1128     0.1590     0.2020     0.2428
            0.2823     0.2898     0.2918     0.3049     0.3306
            0.3234     0.2755     0.2230     0.2125     0.2193
            0.2329     0.2505     0.2700     0.2906     0.3121
            0.3343     0.3570     0.3798     0.4029     0.4260
            0.4493     0.4726     0.4959     0.5192     0.5425
            0.5658     0.5891     0.6124     0.6356     0.6588
            0.6819     0.7050     0.7280     0.7510     0.7739
            0.7968     0.8196     0.8423     0.8650     0.8877
            0.9103     0.9328     0.9552     0.9777     1.0000
Width:
            0.0289     0.0352     0.0415     0.0477     0.0540
            0.0603     0.0744     0.0937     0.1131     0.1429
            0.3276     0.5993     0.8851     0.8954     0.9057
            0.9148     0.9191     0.9233     0.9276     0.9315
            0.9338     0.9361     0.9384     0.9407     0.9429
            0.9452     0.9475     0.9498     0.9521     0.9544
            0.9566     0.9589     0.9612     0.9635     0.9658
            0.9681     0.9703     0.9726     0.9749     0.9772
            0.9795     0.9817     0.9840     0.9863     0.9886
            0.9909     0.9932     0.9954     0.9977     1.0000

Transect 40713.
Area:
            0.0006     0.0014     0.0024     0.0035     0.0057
            0.0138     0.0224     0.0317     0.0418     0.0526
            0.0650     0.0826     0.1039     0.1256     0.1478
            0.1702     0.1929     0.2159     0.2391     0.2625
            0.2860     0.3097     0.3336     0.3575     0.3815
            0.4055     0.4297     0.4540     0.4783     0.5027
            0.5271     0.5515     0.5761     0.6007     0.6253
            0.6500     0.6747     0.6996     0.7244     0.7494
            0.7744     0.7995     0.8245     0.8496     0.8747
            0.8997     0.9248     0.9499     0.9749     1.0000
Hrad:
            0.0599     0.1106     0.1561     0.1984     0.1842
            0.1113     0.1107     0.1165     0.1294     0.1444
            0.1558     0.1480     0.1660     0.1856     0.2059
            0.2270     0.2483     0.2696     0.2915     0.3138
            0.3361     0.3582     0.3809     0.4036     0.4264
            0.4490     0.4716     0.4945     0.5175     0.5405
            0.5634     0.5862     0.6090     0.6317     0.6544
            0.6769     0.6992     0.7214     0.7436     0.7657
            0.7877     0.8110     0.8346     0.8583     0.8819
            0.9056     0.9292     0.9528     0.9764     1.0000
Width:
            0.0288     0.0347     0.0406     0.0465     0.3147
```

0.3341	0.3561	0.3866	0.4170	0.4515
0.5537	0.8323	0.8612	0.8755	0.8897
0.9007	0.9115	0.9222	0.9300	0.9360
0.9420	0.9480	0.9522	0.9557	0.9592
0.9627	0.9662	0.9688	0.9709	0.9731
0.9752	0.9774	0.9796	0.9817	0.9839
0.9863	0.9889	0.9915	0.9941	0.9967
0.9993	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000

Transect 40753
Area:

0.0006	0.0014	0.0023	0.0048	0.0118
0.0193	0.0274	0.0361	0.0485	0.0652
0.0831	0.1045	0.1262	0.1481	0.1702
0.1925	0.2150	0.2376	0.2603	0.2831
0.3061	0.3291	0.3521	0.3753	0.3985
0.4218	0.4451	0.4685	0.4920	0.5156
0.5392	0.5628	0.5866	0.6104	0.6343
0.6582	0.6822	0.7062	0.7304	0.7546
0.7788	0.8031	0.8275	0.8520	0.8765
0.9010	0.9257	0.9504	0.9751	1.0000

Hrad:

0.0615	0.1124	0.1580	0.1276	0.0936
0.0991	0.1144	0.1329	0.1152	0.1370
0.1573	0.1739	0.1932	0.2138	0.2352
0.2569	0.2788	0.3012	0.3242	0.3472
0.3702	0.3935	0.4169	0.4401	0.4634
0.4866	0.5097	0.5327	0.5558	0.5788
0.6018	0.6247	0.6475	0.6702	0.6929
0.7155	0.7381	0.7605	0.7829	0.8052
0.8275	0.8497	0.8718	0.8938	0.9158
0.9377	0.9595	0.9813	1.0030	1.0000

Width:

0.0271	0.0337	0.0403	0.2632	0.2802
0.3044	0.3286	0.3529	0.6282	0.6710
0.8011	0.8454	0.8524	0.8593	0.8663
0.8733	0.8803	0.8859	0.8895	0.8932
0.8968	0.8996	0.9022	0.9049	0.9076
0.9103	0.9130	0.9156	0.9182	0.9207
0.9232	0.9257	0.9282	0.9307	0.9332
0.9357	0.9382	0.9408	0.9433	0.9458
0.9483	0.9508	0.9533	0.9558	0.9583
0.9608	0.9633	0.9658	0.9683	1.0000

Transect 40900.3
Area:

0.0005	0.0011	0.0018	0.0026	0.0068
0.0144	0.0222	0.0304	0.0387	0.0491
0.0656	0.0845	0.1047	0.1257	0.1474
0.1696	0.1925	0.2160	0.2401	0.2644
0.2889	0.3134	0.3379	0.3624	0.3869
0.4115	0.4360	0.4605	0.4850	0.5095
0.5341	0.5586	0.5831	0.6076	0.6322
0.6567	0.6812	0.7057	0.7302	0.7548
0.7793	0.8038	0.8283	0.8529	0.8774
0.9019	0.9264	0.9510	0.9755	1.0000

Hrad:

0.0706	0.1323	0.1882	0.2397	0.1218
0.1023	0.1148	0.1333	0.1538	0.1460
0.1493	0.1600	0.1730	0.1886	0.2052
0.2223	0.2395	0.2569	0.2751	0.2978
0.3205	0.3436	0.3671	0.3907	0.4144
0.4380	0.4617	0.4853	0.5090	0.5326
0.5562	0.5798	0.6034	0.6270	0.6505
0.6740	0.6975	0.7209	0.7444	0.7678
0.7911	0.8145	0.8378	0.8610	0.8843
0.9075	0.9307	0.9538	0.9769	1.0000

Width:

0.0230	0.0264	0.0299	0.0334	0.3036
0.3144	0.3252	0.3360	0.3468	0.5293
0.7388	0.7987	0.8453	0.8698	0.8945
0.9198	0.9451	0.9703	0.9921	0.9950
0.9979	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000

Transect 40910
Area:

0.0006	0.0013	0.0020	0.0029	0.0038
0.0049	0.0060	0.0073	0.0086	0.0189
0.0380	0.0590	0.0810	0.1033	0.1259
0.1487	0.1718	0.1952	0.2189	0.2428
0.2670	0.2914	0.3161	0.3410	0.3663
0.3916	0.4170	0.4423	0.4677	0.4930
0.5184	0.5437	0.5691	0.5944	0.6198
0.6451	0.6705	0.6958	0.7212	0.7465
0.7719	0.7972	0.8225	0.8479	0.8732
0.8986	0.9239	0.9493	0.9746	1.0000

Hrad:

0.0677	0.1271	0.1809	0.2310	0.2783
0.3236	0.3674	0.4099	0.4515	0.1497
0.1206	0.1259	0.1425	0.1624	0.1836
0.2053	0.2272	0.2492	0.2712	0.2931
0.3150	0.3367	0.3582	0.3796	0.4007
0.4219	0.4430	0.4732	0.4973	0.5215
0.5456	0.5698	0.5939	0.6180	0.6421
0.6661	0.6902	0.7142	0.7382	0.7621
0.7861	0.8099	0.8338	0.8576	0.8815
0.9052	0.9290	0.9527	0.9764	1.0000

Width:

0.0249	0.0286	0.0322	0.0358	0.0394
0.0430	0.0466	0.0503	0.0539	0.6078
0.7931	0.8606	0.8740	0.8847	0.8955
0.9063	0.9171	0.9279	0.9384	0.9486
0.9589	0.9691	0.9794	0.9897	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000

Transect 40919.2
Area:

0.0006	0.0012	0.0020	0.0028	0.0037
0.0048	0.0059	0.0080	0.0113	0.0199
0.0310	0.0443	0.0594	0.0764	0.0955
0.1164	0.1389	0.1629	0.1871	0.2117
0.2365	0.2617	0.2870	0.3123	0.3378
0.3633	0.3889	0.4146	0.4403	0.4662
0.4921	0.5181	0.5442	0.5703	0.5966
0.6229	0.6493	0.6758	0.7024	0.7290
0.7558	0.7826	0.8095	0.8365	0.8635
0.8906	0.9179	0.9452	0.9725	1.0000

Hrad:

0.0806	0.1510	0.2148	0.2739	0.3285
0.3799	0.4298	0.4300	0.3954	0.2704
0.2304	0.2172	0.2166	0.2202	0.2265
0.2364	0.2475	0.2639	0.2845	0.3061
0.3281	0.3481	0.3717	0.3958	0.4200
0.4445	0.4689	0.4935	0.5181	0.5427
0.5672	0.5918	0.6163	0.6408	0.6652
0.6896	0.7139	0.7381	0.7623	0.7865
0.8105	0.8345	0.8584	0.8823	0.9061
0.9298	0.9534	0.9770	1.0004	1.0000

Width:

0.0217	0.0249	0.0280	0.0311	0.0344
0.0378	0.0412	0.0925	0.1670	0.3526
0.4315	0.5025	0.5651	0.6380	0.7107
0.7683	0.8258	0.8523	0.8630	0.8738
0.8846	0.8914	0.8950	0.8979	0.9008
0.9036	0.9065	0.9093	0.9122	0.9150
0.9179	0.9208	0.9236	0.9265	0.9293

0.9322	0.9350	0.9379	0.9407	0.9436
0.9464	0.9493	0.9522	0.9550	0.9579
0.9607	0.9636	0.9664	0.9693	1.0000

Transect 40956.
Area:

0.0005	0.0011	0.0018	0.0045	0.0110
0.0179	0.0250	0.0325	0.0404	0.0514
0.0658	0.0832	0.1048	0.1272	0.1502
0.1734	0.1966	0.2199	0.2433	0.2668
0.2904	0.3141	0.3378	0.3616	0.3856
0.4095	0.4336	0.4578	0.4820	0.5064
0.5308	0.5553	0.5799	0.6046	0.6293
0.6540	0.6787	0.7034	0.7281	0.7528
0.7776	0.8023	0.8270	0.8517	0.8764
0.9011	0.9259	0.9506	0.9753	1.0000

Hrad:

0.0648	0.1217	0.1734	0.1073	0.0824
0.0944	0.1114	0.1299	0.1314	0.1151
0.1210	0.1354	0.1485	0.1628	0.1840
0.2067	0.2297	0.2528	0.2760	0.2993
0.3225	0.3458	0.3690	0.3921	0.4152
0.4383	0.4612	0.4841	0.5069	0.5297
0.5523	0.5749	0.5974	0.6198	0.6438
0.6677	0.6917	0.7156	0.7395	0.7633
0.7871	0.8109	0.8346	0.8584	0.8821
0.9057	0.9293	0.9529	0.9765	1.0000

Width:

0.0227	0.0259	0.0291	0.2591	0.2711
0.2831	0.2952	0.3073	0.3640	0.5217
0.6349	0.8480	0.8901	0.9273	0.9350
0.9384	0.9418	0.9453	0.9487	0.9521
0.9555	0.9589	0.9623	0.9657	0.9692
0.9726	0.9760	0.9794	0.9828	0.9862
0.9897	0.9931	0.9965	0.9999	0.9999
0.9999	0.9999	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000

Transect 40965.2
Area:

0.0006	0.0014	0.0028	0.0096	0.0168
0.0243	0.0322	0.0424	0.0569	0.0738
0.0920	0.1114	0.1314	0.1519	0.1729
0.1943	0.2161	0.2380	0.2601	0.2823
0.3047	0.3271	0.3496	0.3723	0.3950
0.4179	0.4409	0.4640	0.4873	0.5106
0.5342	0.5578	0.5815	0.6052	0.6291
0.6530	0.6770	0.7011	0.7253	0.7497
0.7742	0.7988	0.8235	0.8483	0.8733
0.8984	0.9236	0.9490	0.9744	1.0000

Hrad:

0.0677	0.1273	0.1243	0.0741	0.0874
0.1057	0.1173	0.1028	0.1093	0.1288
0.1498	0.1703	0.1913	0.2123	0.2331
0.2538	0.2771	0.3004	0.3239	0.3474
0.3709	0.3942	0.4174	0.4405	0.4635
0.4864	0.5089	0.5312	0.5533	0.5753
0.5974	0.6204	0.6433	0.6660	0.6887
0.7113	0.7335	0.7548	0.7759	0.7969
0.8178	0.8386	0.8593	0.8799	0.9004
0.9207	0.9410	0.9612	0.9813	1.0000

Width:

0.0264	0.0299	0.2561	0.2708	0.2852
0.2997	0.3295	0.4711	0.6264	0.6822
0.7352	0.7693	0.7881	0.8069	0.8257
0.8437	0.8513	0.8581	0.8624	0.8667
0.8710	0.8753	0.8796	0.8839	0.8883
0.8926	0.8975	0.9026	0.9078	0.9129
0.9177	0.9207	0.9237	0.9268	0.9298
0.9328	0.9363	0.9411	0.9458	0.9506
0.9554	0.9602	0.9650	0.9698	0.9746
0.9793	0.9841	0.9889	0.9937	1.0000

Transect 41071
Area:

0.0013	0.0027	0.0040	0.0093	0.0165
0.0240	0.0316	0.0395	0.0476	0.0564
0.0663	0.0774	0.0896	0.1036	0.1203
0.1393	0.1600	0.1820	0.2056	0.2301
0.2547	0.2796	0.3047	0.3298	0.3549
0.3802	0.4055	0.4308	0.4562	0.4817
0.5072	0.5328	0.5585	0.5842	0.6100
0.6359	0.6618	0.6877	0.7137	0.7398
0.7658	0.7918	0.8178	0.8439	0.8699
0.8959	0.9219	0.9480	0.9740	1.0000

Hrad:

0.0686	0.1347	0.1986	0.1344	0.1285
0.1423	0.1607	0.1807	0.1980	0.2018
0.2014	0.2055	0.2125	0.2194	0.2294
0.2386	0.2538	0.2720	0.2879	0.3065
0.3259	0.3459	0.3675	0.3900	0.4127
0.4355	0.4585	0.4815	0.5046	0.5277
0.5508	0.5739	0.5970	0.6201	0.6432
0.6662	0.6892	0.7122	0.7358	0.7600
0.7841	0.8082	0.8322	0.8563	0.8803
0.9043	0.9283	0.9522	0.9761	1.0000

Width:

0.0512	0.0522	0.0532	0.2742	0.2821
0.2899	0.2978	0.3057	0.3224	0.3594
0.4030	0.4466	0.4901	0.5911	0.6905
0.7642	0.8208	0.8690	0.9356	0.9432
0.9527	0.9598	0.9637	0.9660	0.9684
0.9707	0.9731	0.9754	0.9778	0.9802
0.9825	0.9849	0.9872	0.9896	0.9920
0.9943	0.9967	0.9990	0.9999	0.9999
0.9999	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000

Transect 41117
Area:

0.0010	0.0021	0.0084	0.0152	0.0221
0.0298	0.0400	0.0519	0.0688	0.0881
0.1087	0.1297	0.1508	0.1719	0.1934
0.2153	0.2372	0.2593	0.2814	0.3037
0.3259	0.3483	0.3707	0.3932	0.4157
0.4384	0.4610	0.4838	0.5066	0.5294
0.5523	0.5753	0.5984	0.6215	0.6447
0.6679	0.6912	0.7146	0.7380	0.7615
0.7851	0.8087	0.8324	0.8562	0.8800
0.9039	0.9278	0.9518	0.9759	1.0000

Hrad:

0.0633	0.1231	0.0649	0.0790	0.0978
0.1025	0.1024	0.1127	0.1184	0.1278
0.1433	0.1653	0.1877	0.2104	0.2307
0.2533	0.2760	0.2987	0.3213	0.3441
0.3670	0.3898	0.4126	0.4353	0.4580
0.4806	0.5031	0.5256	0.5479	0.5702
0.5925	0.6146	0.6367	0.6586	0.6805
0.7024	0.7241	0.7458	0.7674	0.7889
0.8104	0.8317	0.8530	0.8742	0.8954
0.9165	0.9374	0.9584	0.9792	1.0000

Width:

0.0425	0.0437	0.2761	0.2846	0.2930
0.3760	0.4474	0.6000	0.7574	0.8334
0.8658	0.8700	0.8741	0.8782	0.9040
0.9075	0.9110	0.9146	0.9181	0.9212
0.9238	0.9264	0.9291	0.9317	0.9343
0.9370	0.9396	0.9422	0.9448	0.9475
0.9501	0.9527	0.9554	0.9580	0.9606
0.9632	0.9659	0.9685	0.9711	0.9737
0.9764	0.9790	0.9816	0.9842	0.9869
0.9895	0.9921	0.9947	0.9974	1.0000

Transect 41125.4
Area:

	0.0006	0.0015	0.0058	0.0106	0.0159
	0.0224	0.0314	0.0424	0.0551	0.0705
	0.0884	0.1093	0.1306	0.1522	0.1740
	0.1960	0.2182	0.2405	0.2631	0.2857
	0.3084	0.3312	0.3541	0.3770	0.4001
	0.4232	0.4463	0.4696	0.4930	0.5164
	0.5399	0.5635	0.5872	0.6109	0.6347
	0.6586	0.6826	0.7066	0.7308	0.7549
	0.7792	0.8035	0.8279	0.8523	0.8768
	0.9014	0.9261	0.9507	0.9754	1.0000
Hrad:					
	0.0753	0.1213	0.0743	0.0895	0.1080
	0.1126	0.1178	0.1323	0.1481	0.1583
	0.1700	0.1818	0.1984	0.2167	0.2361
	0.2561	0.2765	0.2970	0.3188	0.3412
	0.3637	0.3861	0.4085	0.4309	0.4533
	0.4756	0.4978	0.5200	0.5421	0.5641
	0.5861	0.6080	0.6298	0.6515	0.6732
	0.6949	0.7167	0.7384	0.7601	0.7817
	0.8032	0.8246	0.8459	0.8672	0.8884
	0.9088	0.9317	0.9545	0.9773	1.0000
Width:					
	0.0270	0.1636	0.1849	0.2062	0.2275
	0.3098	0.4173	0.4725	0.5694	0.6744
	0.7930	0.8618	0.8705	0.8803	0.8882
	0.8962	0.9042	0.9122	0.9169	0.9201
	0.9233	0.9266	0.9298	0.9330	0.9363
	0.9395	0.9427	0.9460	0.9492	0.9525
	0.9557	0.9589	0.9622	0.9654	0.9686
	0.9716	0.9744	0.9771	0.9799	0.9827
	0.9855	0.9882	0.9910	0.9938	0.9965
	1.0000	1.0000	1.0000	1.0000	1.0000
Transect 41180					
Area:					
	0.0006	0.0011	0.0017	0.0071	0.0128
	0.0188	0.0251	0.0316	0.0386	0.0468
	0.0582	0.0728	0.0901	0.1105	0.1324
	0.1552	0.1784	0.2019	0.2258	0.2501
	0.2747	0.2995	0.3244	0.3494	0.3744
	0.3995	0.4245	0.4495	0.4745	0.4995
	0.5246	0.5496	0.5746	0.5996	0.6247
	0.6497	0.6747	0.6997	0.7247	0.7498
	0.7748	0.7998	0.8248	0.8499	0.8749
	0.8999	0.9249	0.9500	0.9750	1.0000
Hrad:					
	0.0744	0.1438	0.2092	0.0841	0.0936
	0.1115	0.1311	0.1511	0.1611	0.1578
	0.1601	0.1589	0.1585	0.1706	0.1856
	0.2035	0.2224	0.2418	0.2615	0.2813
	0.3012	0.3245	0.3481	0.3717	0.3958
	0.4202	0.4445	0.4689	0.4933	0.5176
	0.5420	0.5663	0.5906	0.6149	0.6391
	0.6634	0.6876	0.7118	0.7360	0.7601
	0.7842	0.8083	0.8324	0.8564	0.8804
	0.9044	0.9283	0.9522	0.9761	1.0000
Width:					
	0.0226	0.0238	0.0250	0.2237	0.2342
	0.2446	0.2551	0.2655	0.3002	0.3827
	0.5217	0.6433	0.7566	0.8451	0.9046
	0.9190	0.9334	0.9479	0.9623	0.9767
	0.9911	0.9944	0.9967	0.9990	0.9999
	0.9999	0.9999	0.9999	0.9999	0.9999
	1.0000	1.0000	1.0000	1.0000	1.0000
	1.0000	1.0000	1.0000	1.0000	1.0000
	1.0000	1.0000	1.0000	1.0000	1.0000
	1.0000	1.0000	1.0000	1.0000	1.0000
Transect 41198					
Area:					
	0.0005	0.0011	0.0021	0.0080	0.0142
	0.0207	0.0275	0.0346	0.0422	0.0510
	0.0615	0.0741	0.0887	0.1054	0.1233
	0.1423	0.1624	0.1837	0.2060	0.2295
	0.2542	0.2795	0.3049	0.3303	0.3557
	0.3812	0.4067	0.4322	0.4577	0.4833
	0.5089	0.5345	0.5602	0.5859	0.6116
	0.6373	0.6631	0.6889	0.7147	0.7406
	0.7665	0.7924	0.8184	0.8443	0.8702
	0.8962	0.9221	0.9481	0.9740	1.0000
Hrad:					
	0.0757	0.1444	0.1567	0.0771	0.0910
	0.1109	0.1321	0.1535	0.1634	0.1716
	0.1766	0.1816	0.1886	0.2001	0.2181
	0.2355	0.2521	0.2683	0.2840	0.2993
	0.3140	0.3340	0.3564	0.3791	0.4022
	0.4255	0.4489	0.4725	0.4961	0.5199
	0.5436	0.5674	0.5913	0.6151	0.6390
	0.6628	0.6867	0.7105	0.7344	0.7582
	0.7820	0.8058	0.8297	0.8541	0.8785
	0.9028	0.9271	0.9515	0.9757	1.0000
Width:					
	0.0207	0.0227	0.2236	0.2343	0.2451
	0.2558	0.2665	0.2773	0.3161	0.3672
	0.4444	0.5217	0.6177	0.6675	0.7106
	0.7537	0.7968	0.8399	0.8830	0.9261
	0.9709	0.9772	0.9783	0.9794	0.9805
	0.9816	0.9827	0.9838	0.9849	0.9860
	0.9871	0.9882	0.9893	0.9904	0.9915
	0.9926	0.9937	0.9948	0.9959	0.9970
	0.9981	0.9992	1.0000	1.0000	1.0000
	1.0000	1.0000	1.0000	1.0000	1.0000
Transect 41320					
Area:					
	0.0005	0.0011	0.0022	0.0084	0.0149
	0.0216	0.0286	0.0357	0.0434	0.0521
	0.0617	0.0724	0.0846	0.0986	0.1137
	0.1296	0.1465	0.1644	0.1831	0.2028
	0.2234	0.2450	0.2676	0.2909	0.3146
	0.3386	0.3629	0.3875	0.4124	0.4377
	0.4636	0.4902	0.5176	0.5457	0.5741
	0.6025	0.6309	0.6593	0.6877	0.7161
	0.7445	0.7729	0.8013	0.8296	0.8580
	0.8864	0.9148	0.9432	0.9716	1.0000
Hrad:					
	0.0856	0.1651	0.1796	0.0870	0.1026
	0.1254	0.1496	0.1742	0.1863	0.1976
	0.2092	0.2211	0.2205	0.2421	0.2623
	0.2825	0.2998	0.3173	0.3343	0.3508
	0.3668	0.3825	0.3970	0.4148	0.4331
	0.4519	0.4709	0.4901	0.5095	0.5282
	0.5386	0.5496	0.5610	0.5759	0.6023
	0.6287	0.6552	0.6817	0.7082	0.7347
	0.7613	0.7878	0.8144	0.8409	0.8674
	0.8940	0.9205	0.9470	0.9735	1.0000
Width:					
	0.0200	0.0214	0.2169	0.2247	0.2325
	0.2403	0.2480	0.2558	0.2882	0.3230
	0.3577	0.3925	0.4799	0.5128	0.5457
	0.5786	0.6115	0.6444	0.6773	0.7103
	0.7432	0.7761	0.8168	0.8280	0.8393
	0.8505	0.8618	0.8731	0.8843	0.8969
	0.9241	0.9513	0.9785	1.0000	1.0000
	1.0000	1.0000	1.0000	1.0000	1.0000
	1.0000	1.0000	1.0000	1.0000	1.0000
	1.0000	1.0000	1.0000	1.0000	1.0000
Transect 41323.6					
Area:					
	0.0005	0.0011	0.0017	0.0023	0.0030
	0.0037	0.0045	0.0053	0.0062	0.0072
	0.0082	0.0093	0.0199	0.0368	0.0549
	0.0740	0.0942	0.1154	0.1375	0.1605
	0.1842	0.2088	0.2343	0.2602	0.2864
	0.3129	0.3397	0.3667	0.3940	0.4216

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            0.4497     0.4782     0.5072     0.5362     0.5651
            0.5941     0.6231     0.6521     0.6811     0.7101
            0.7391     0.7681     0.7971     0.8261     0.8550
            0.8840     0.9130     0.9420     0.9710     1.0000
Hrad:
            0.0865     0.1670     0.2427     0.3143     0.3824
            0.4352     0.4843     0.5323     0.5796     0.6264
            0.6728     0.7188     0.3328     0.2248     0.2070
            0.2106     0.2217     0.2364     0.2531     0.2709
            0.2899     0.3078     0.3269     0.3483     0.3701
            0.3922     0.4145     0.4368     0.4592     0.4809
            0.4994     0.5181     0.5419     0.5687     0.5955
            0.6224     0.6493     0.6762     0.7032     0.7302
            0.7572     0.7841     0.8111     0.8381     0.8651
            0.8921     0.9191     0.9461     0.9730     1.0000
Width:
            0.0189     0.0201     0.0212     0.0224     0.0236
            0.0256     0.0278     0.0300     0.0322     0.0344
            0.0367     0.0389     0.5312     0.6067     0.6424
            0.6772     0.7145     0.7475     0.7782     0.8070
            0.8303     0.8644     0.8897     0.8992     0.9087
            0.9183     0.9278     0.9374     0.9469     0.9579
            0.9761     0.9937     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000

Transect 41338
Area:
            0.0004     0.0009     0.0013     0.0018     0.0024
            0.0029     0.0035     0.0041     0.0048     0.0055
            0.0062     0.0069     0.0077     0.0165     0.0312
            0.0510     0.0736     0.0979     0.1231     0.1491
            0.1755     0.2023     0.2294     0.2567     0.2842
            0.3119     0.3398     0.3681     0.3965     0.4253
            0.4540     0.4827     0.5115     0.5402     0.5689
            0.5977     0.6264     0.6551     0.6839     0.7126
            0.7414     0.7701     0.7988     0.8276     0.8563
            0.8850     0.9138     0.9425     0.9713     1.0000
Hrad:
            0.0837     0.1611     0.2335     0.3018     0.3667
            0.4287     0.4884     0.5460     0.6018     0.6561
            0.7090     0.7608     0.4931     0.2299     0.1721
            0.1562     0.1596     0.1739     0.1916     0.2130
            0.2350     0.2590     0.2834     0.3080     0.3326
            0.3573     0.3818     0.4057     0.4294     0.4551
            0.4823     0.5095     0.5367     0.5640     0.5913
            0.6186     0.6459     0.6732     0.7005     0.7277
            0.7550     0.7823     0.8096     0.8368     0.8640
            0.8913     0.9185     0.9457     0.9728     1.0000
Width:
            0.0150     0.0160     0.0170     0.0180     0.0190
            0.0200     0.0210     0.0219     0.0229     0.0239
            0.0249     0.0259     0.0461     0.4592     0.6055
            0.7424     0.8240     0.8619     0.8936     0.9107
            0.9305     0.9381     0.9457     0.9534     0.9610
            0.9687     0.9767     0.9864     0.9960     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000

Transect 41349.4
Area:
            0.0005     0.0010     0.0015     0.0021     0.0027
            0.0033     0.0040     0.0047     0.0054     0.0062
            0.0070     0.0079     0.0090     0.0103     0.0144
            0.0296     0.0531     0.0778     0.1037     0.1302
            0.1573     0.1848     0.2126     0.2406     0.2688
            0.2971     0.3255     0.3539     0.3824     0.4109
            0.4394     0.4681     0.4967     0.5255     0.5543
            0.5831     0.6120     0.6409     0.6699     0.6990
            0.7281     0.7572     0.7865     0.8157     0.8450
            0.8744     0.9041     0.9352     0.9673     1.0000
Hrad:
            0.0907     0.1744     0.2525     0.3260     0.3956
            0.4598     0.5205     0.5793     0.6365     0.6922
            0.7467     0.7522     0.7161     0.6126     0.4241
            0.2494     0.1966     0.1966     0.2094     0.2297
            0.2525     0.2770     0.3028     0.3298     0.3578
            0.3867     0.4158     0.4450     0.4743     0.5037
            0.5332     0.5627     0.5922     0.6216     0.6511
            0.6806     0.7100     0.7393     0.7687     0.7980
            0.8272     0.8564     0.8856     0.9147     0.9437
            0.9727     1.0012     1.0277     1.0529     1.0000
Width:
            0.0147     0.0157     0.0167     0.0177     0.0187
            0.0198     0.0210     0.0222     0.0234     0.0246
            0.0258     0.0288     0.0346     0.0672     0.1451
            0.6977     0.7322     0.7668     0.7998     0.8137
            0.8277     0.8396     0.8487     0.8545     0.8581
            0.8598     0.8614     0.8631     0.8648     0.8665
            0.8681     0.8697     0.8713     0.8730     0.8746
            0.8762     0.8778     0.8794     0.8810     0.8826
            0.8843     0.8859     0.8875     0.8891     0.8907
            0.8923     0.9212     0.9653     0.9836     1.0000

Transect 41357
Area:
            0.0004     0.0009     0.0014     0.0020     0.0026
            0.0032     0.0039     0.0047     0.0055     0.0063
            0.0072     0.0081     0.0102     0.0184     0.0321
            0.0486     0.0673     0.0896     0.1149     0.1414
            0.1682     0.1953     0.2228     0.2505     0.2785
            0.3066     0.3348     0.3631     0.3914     0.4198
            0.4482     0.4767     0.5053     0.5339     0.5626
            0.5913     0.6200     0.6489     0.6777     0.7067
            0.7357     0.7647     0.7938     0.8229     0.8521
            0.8814     0.9107     0.9400     0.9697     1.0000
Hrad:
            0.0811     0.1539     0.2208     0.2832     0.3422
            0.3985     0.4527     0.5051     0.5561     0.6059
            0.6547     0.6171     0.4575     0.2649     0.1955
            0.1892     0.1945     0.1993     0.2019     0.2219
            0.2438     0.2667     0.2902     0.3139     0.3392
            0.3651     0.3912     0.4175     0.4441     0.4708
            0.4976     0.5244     0.5511     0.5779     0.6046
            0.6314     0.6581     0.6847     0.7114     0.7380
            0.7645     0.7911     0.8175     0.8439     0.8703
            0.8967     0.9229     0.9492     0.9750     1.0000
Width:
            0.0145     0.0160     0.0175     0.0191     0.0206
            0.0221     0.0237     0.0252     0.0268     0.0283
            0.0298     0.0360     0.1376     0.3618     0.5081
            0.5764     0.6447     0.7951     0.8622     0.8724
            0.8827     0.8929     0.9031     0.9134     0.9179
            0.9210     0.9240     0.9266     0.9284     0.9302
            0.9319     0.9337     0.9354     0.9372     0.9389
            0.9407     0.9425     0.9442     0.9460     0.9477
            0.9495     0.9512     0.9530     0.9548     0.9565
            0.9583     0.9600     0.9626     0.9813     1.0000

Transect 41374.8
Area:
            0.0018     0.0037     0.0057     0.0078     0.0099
            0.0121     0.0144     0.0168     0.0193     0.0220
            0.0249     0.0279     0.0312     0.0349     0.0394
            0.0447     0.0508     0.0588     0.0693     0.0824
            0.0996     0.1301     0.1612     0.1923     0.2233
            0.2544     0.2855     0.3165     0.3476     0.3787
            0.4097     0.4408     0.4719     0.5029     0.5340
            0.5651     0.5961     0.6272     0.6583     0.6893
            0.7204     0.7515     0.7825     0.8136     0.8447
            0.8757     0.9068     0.9379     0.9689     1.0000
Hrad:
            0.0441     0.0856     0.1248     0.1620     0.1975
```

0.2315	0.2644	0.2967	0.3180	0.3393
0.3607	0.3813	0.3883	0.3697	0.3529
0.3466	0.3313	0.2822	0.2632	0.2587
0.2562	0.2589	0.2745	0.2950	0.3181
0.3427	0.3682	0.3944	0.4210	0.4480
0.4752	0.5025	0.5300	0.5576	0.5852
0.6128	0.6405	0.6682	0.6960	0.7237
0.7514	0.7791	0.8068	0.8345	0.8621
0.8897	0.9173	0.9449	0.9725	1.0000

Width:

0.0599	0.0625	0.0651	0.0677	0.0703
0.0729	0.0754	0.0777	0.0834	0.0891
0.0948	0.1008	0.1111	0.1318	0.1570
0.1823	0.2180	0.2989	0.3799	0.4608
0.8300	0.9998	0.9998	0.9998	0.9998
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000

Transect 41572
Area:

0.0009	0.0020	0.0033	0.0048	0.0133
0.0290	0.0476	0.0658	0.0844	0.1035
0.1237	0.1448	0.1668	0.1893	0.2118
0.2343	0.2569	0.2794	0.3019	0.3244
0.3469	0.3695	0.3920	0.4145	0.4370
0.4595	0.4820	0.5046	0.5271	0.5496
0.5721	0.5946	0.6172	0.6397	0.6622
0.6847	0.7072	0.7298	0.7523	0.7748
0.7973	0.8198	0.8424	0.8649	0.8874
0.9099	0.9324	0.9550	0.9775	1.0000

Hrad:

0.0383	0.0710	0.1004	0.1277	0.0471
0.0658	0.0883	0.1114	0.1341	0.1551
0.1747	0.1934	0.2120	0.2329	0.2543
0.2758	0.2975	0.3191	0.3408	0.3625
0.3842	0.4059	0.4276	0.4492	0.4708
0.4924	0.5140	0.5355	0.5570	0.5785
0.5999	0.6213	0.6427	0.6640	0.6853
0.7065	0.7277	0.7489	0.7701	0.7911
0.8122	0.8332	0.8542	0.8751	0.8960
0.9169	0.9377	0.9585	0.9793	1.0000

Width:

0.0449	0.0534	0.0619	0.0705	0.6194
0.7752	0.7955	0.8157	0.8360	0.8730
0.9159	0.9587	0.9957	0.9998	0.9998
0.9998	0.9998	0.9998	0.9998	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000

Transect 41608
Area:

0.0009	0.0021	0.0034	0.0049	0.0120
0.0249	0.0413	0.0600	0.0799	0.1001
0.1208	0.1418	0.1631	0.1846	0.2066
0.2293	0.2520	0.2746	0.2973	0.3200
0.3426	0.3653	0.3880	0.4106	0.4333
0.4560	0.4786	0.5013	0.5240	0.5466
0.5693	0.5920	0.6146	0.6373	0.6600
0.6826	0.7053	0.7280	0.7506	0.7733
0.7960	0.8186	0.8413	0.8640	0.8867
0.9093	0.9320	0.9547	0.9773	1.0000

Hrad:

0.0469	0.0866	0.1224	0.1556	0.0730
0.0853	0.0998	0.1153	0.1343	0.1543
0.1745	0.1947	0.2161	0.2375	0.2529
0.2744	0.2960	0.3178	0.3395	0.3613
0.3831	0.4048	0.4266	0.4483	0.4701
0.4918	0.5134	0.5350	0.5566	0.5782
0.5997	0.6211	0.6426	0.6639	0.6853
0.7066	0.7278	0.7490	0.7702	0.7913
0.8124	0.8334	0.8544	0.8753	0.8962
0.9171	0.9379	0.9586	0.9793	1.0000

Width:

0.0453	0.0542	0.0632	0.0721	0.4610
0.6755	0.7747	0.8663	0.8840	0.9018
0.9195	0.9369	0.9431	0.9494	0.9998
0.9998	0.9998	0.9998	0.9998	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000

Transect 41671
Area:

0.0021	0.0043	0.0067	0.0091	0.0117
0.0144	0.0173	0.0202	0.0235	0.0275
0.0323	0.0378	0.0442	0.0548	0.0688
0.0858	0.1058	0.1269	0.1483	0.1701
0.1922	0.2147	0.2375	0.2607	0.2843
0.3083	0.3331	0.3597	0.3888	0.4179
0.4470	0.4761	0.5052	0.5343	0.5634
0.5925	0.6216	0.6507	0.6798	0.7089
0.7381	0.7672	0.7963	0.8254	0.8545
0.8836	0.9127	0.9418	0.9709	1.0000

Hrad:

0.0581	0.1127	0.1645	0.2138	0.2611
0.3065	0.3504	0.3929	0.3762	0.3681
0.3707	0.3801	0.3979	0.4093	0.4050
0.3960	0.3876	0.3903	0.3996	0.4127
0.4281	0.4450	0.4629	0.4813	0.5002
0.5164	0.5296	0.5381	0.5420	0.5608
0.5803	0.6005	0.6211	0.6421	0.6635
0.6851	0.7069	0.7289	0.7511	0.7734
0.7958	0.8183	0.8409	0.8635	0.8862
0.9089	0.9316	0.9544	0.9772	1.0000

Width:

0.0745	0.0786	0.0826	0.0867	0.0908
0.0949	0.0990	0.1030	0.1257	0.1510
0.1764	0.2017	0.2598	0.4308	0.5336
0.6364	0.7186	0.7306	0.7426	0.7545
0.7665	0.7784	0.7904	0.8024	0.8143
0.8383	0.8741	0.9880	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	0.9999	0.9999	0.9999
0.9999	0.9999	1.0000	1.0000	1.0000
1.0000	1.0000	1.0000	1.0000	1.0000

Transect 41725.5
Area:

0.0006	0.0012	0.0020	0.0028	0.0037
0.0089	0.0192	0.0299	0.0409	0.0522
0.0648	0.0788	0.0930	0.1077	0.1243
0.1424	0.1611	0.1803	0.2001	0.2204
0.2413	0.2628	0.2848	0.3074	0.3307
0.3548	0.3798	0.4061	0.4330	0.4600
0.4870	0.5140	0.5410	0.5680	0.5950
0.6220	0.6490	0.6760	0.7030	0.7300
0.7570	0.7840	0.8110	0.8380	0.8650
0.8920	0.9190	0.9460	0.9730	1.0000

Hrad:

0.0693	0.1310	0.1874	0.2400	0.2889
0.0866	0.0979	0.1227	0.1495	0.1765
0.1878	0.2117	0.2361	0.2503	0.2570
0.2763	0.2964	0.3163	0.3358	0.3551
0.3741	0.3926	0.4101	0.4273	0.4437
0.4579	0.4707	0.4793	0.5020	0.5249
0.5481	0.5713	0.5948	0.6183	0.6419

```
            0.6656     0.6894     0.7132     0.7370     0.7609
            0.7848     0.8087     0.8326     0.8565     0.8804
            0.9044     0.9283     0.9522     0.9761     1.0000
  Width:
            0.0230     0.0258     0.0286     0.0314     0.0440
            0.3582     0.3899     0.4010     0.4120     0.4231
            0.5143     0.5229     0.5316     0.5745     0.6560
            0.6813     0.7018     0.7223     0.7429     0.7634
            0.7839     0.8048     0.8275     0.8498     0.8762
            0.9093     0.9468     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000
            1.0000     1.0000     1.0000     1.0000     1.0000

  Transect DITCH
  Area:
            0.0011     0.0044     0.0152     0.0279     0.0410
            0.0544     0.0682     0.0823     0.0968     0.1117
            0.1269     0.1425     0.1584     0.1747     0.1914
            0.2084     0.2257     0.2435     0.2615     0.2800
            0.2988     0.3180     0.3375     0.3573     0.3776
            0.3982     0.4191     0.4404     0.4621     0.4841
            0.5065     0.5293     0.5524     0.5758     0.5997
            0.6238     0.6484     0.6733     0.6985     0.7241
            0.7501     0.7764     0.8031     0.8302     0.8576
            0.8854     0.9135     0.9420     0.9708     1.0000
  Hrad:
            0.0304     0.0607     0.0807     0.1206     0.1588
            0.1944     0.2275     0.2586     0.2880     0.3160
            0.3427     0.3683     0.3929     0.4166     0.4396
            0.4618     0.4834     0.5044     0.5248     0.5447
            0.5641     0.5831     0.6017     0.6198     0.6376
            0.6550     0.6721     0.6888     0.7053     0.7214
            0.7373     0.7529     0.7683     0.7835     0.7984
            0.8131     0.8276     0.8418     0.8559     0.8698
            0.8835     0.8971     0.9105     0.9237     0.9368
            0.9497     0.9625     0.9751     0.9876     1.0000
  Width:
            0.0756     0.1511     0.4264     0.4386     0.4508
            0.4630     0.4752     0.4874     0.4996     0.5118
            0.5240     0.5362     0.5484     0.5606     0.5728
            0.5850     0.5972     0.6094     0.6216     0.6338
            0.6461     0.6583     0.6705     0.6827     0.6949
            0.7071     0.7193     0.7315     0.7437     0.7559
            0.7681     0.7803     0.7925     0.8047     0.8169
            0.8291     0.8413     0.8535     0.8657     0.8779
            0.8902     0.9024     0.9146     0.9268     0.9390
            0.9512     0.9634     0.9756     0.9878     1.0000


  **************************        Volume         Depth
  Runoff Quantity Continuity     hectare-m          mm
  **************************     ---------       -------
  Total Precipitation .......        34.283        96.000
  Evaporation Loss ..........         0.000         0.000
  Infiltration Loss .........        10.062        28.177
  Surface Runoff ............        23.172        64.887
  Final Surface Storage ....          1.086         3.042
  Continuity Error (%) .....         -0.110


  **************************        Volume         Volume
  Flow Routing Continuity        hectare-m      10^6 ltr
  **************************     ---------      ---------
  Dry Weather Inflow .......         0.000         0.000
  Wet Weather Inflow .......        23.171       231.715
  Groundwater Inflow .......         0.000         0.000
  RDII Inflow ..............         0.000         0.000
  External Inflow ..........       272.598      2726.004
  External Outflow .........       293.093      2930.960
  Internal Outflow .........         0.000         0.000
  Storage Losses ...........         0.000         0.000
  Initial Stored Volume ....        10.473       104.728
  Final Stored Volume ......        13.177       131.775
  Continuity Error (%) .....        -0.009


  *************************
  Highest Continuity Errors
  *************************
  Node 514 (1.36%)
  Node 116 (1.08%)


  ***************************
  Time-Step Critical Elements
  ***************************
  Link CC104 (73.35%)


  ********************************
  Highest Flow Instability Indexes
  ********************************
  Link FutureComm-IC (12)
  Link Stub-IC (11)
  Link FUTURE_TRANSITWAY-IC (7)
  Link 117-IC (6)
  Link 0640 (5)


  *************************
  Routing Time Step Summary
  *************************
  Minimum Time Step           :     0.50 sec
  Average Time Step           :     1.44 sec
  Maximum Time Step           :     2.00 sec
  Percent in Steady State     :     0.00
  Average Iterations per Step :     2.01


  ****************************
  Subcatchment Runoff Summary
  ****************************

  ------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total      Total       Total     Peak  Runoff
                         Precip      Runon       Evap      Infil     Runoff      Runoff   Runoff  Coeff
  Subcatchment             mm         mm         mm         mm         mm    10^6 ltr      CMS
  ------------------------------------------------------------------------------------------------
  112-115                 96.00       0.00       0.00      16.95      77.89        0.21     0.08   0.811
  114-112                 96.00       0.00       0.00      16.88      77.88        0.40     0.16   0.811
  114-118                 96.00       0.00       0.00      16.91      77.89        0.37     0.14   0.811
  115-110                 96.00       0.00       0.00      48.06      46.78        0.08     0.02   0.487
  116-115                 96.00       0.00       0.00      16.91      77.89        0.37     0.14   0.811
  120-111                 96.00       0.00       0.00      13.50      81.24        0.45     0.17   0.846
  122-120                 96.00       0.00       0.00      13.51      81.26        0.22     0.09   0.846
  124-120                 96.00       0.00       0.00      17.03      77.84        0.25     0.09   0.811
  124-126                 96.00       0.00       0.00      16.99      77.87        0.24     0.09   0.811
  126-128                 96.00       0.00       0.00      16.99      77.87        0.52     0.20   0.811
  131-129                 96.00       0.00       0.00      16.98      77.88        0.43     0.16   0.811
  132-130                 96.00       0.00       0.00      17.11      77.77        0.43     0.15   0.810
  134-132                 96.00       0.00       0.00      16.99      77.87        0.60     0.23   0.811
  136-134                 96.00       0.00       0.00      16.99      77.87        0.40     0.15   0.811
  138-140                 96.00       0.00       0.00      16.98      77.88        0.26     0.10   0.811
  140-122                 96.00       0.00       0.00      16.98      77.88        0.58     0.22   0.811
  140-142                 96.00       0.00       0.00      16.96      77.89        0.50     0.19   0.811
  142-130                 96.00       0.00       0.00      16.98      77.88        0.67     0.25   0.811
  144-140                 96.00       0.00       0.00      16.99      77.87        0.31     0.12   0.811
  144-146                 96.00       0.00       0.00      16.98      77.88        0.69     0.26   0.811
  146-122                 96.00       0.00       0.00      13.53      81.28        0.20     0.08   0.847
  154-512                 96.00       0.00       0.00      17.13      77.74        0.68     0.24   0.810
  157-158                 96.00       0.00       0.00      17.13      77.74        0.58     0.21   0.810
  158-160                 96.00       0.00       0.00      17.20      77.67        0.43     0.15   0.809
  170-156                 96.00       0.00       0.00      17.03      77.84        0.28     0.10   0.811
  172-160                 96.00       0.00       0.00      17.15      77.72        0.58     0.21   0.810
```

173-174	96.00	0.00	0.00	17.05	77.83	0.28	0.10	0.811
512A-OUTLET	96.00	0.00	0.00	36.64	58.16	0.19	0.05	0.606
513-512A	96.00	0.00	0.00	27.83	67.00	2.00	0.58	0.698
513-512A_PARK	96.00	0.00	0.00	36.66	58.15	0.57	0.15	0.606
514-513	96.00	0.00	0.00	17.13	77.74	0.26	0.09	0.810
605-OUTLET	96.00	0.00	0.00	17.10	77.77	0.64	0.23	0.810
620-610_EAST	96.00	0.00	0.00	42.26	52.53	0.99	0.20	0.547
620-610_WEST	96.00	0.00	0.00	17.42	77.39	1.59	0.52	0.806
630-620	96.00	0.00	0.00	17.12	77.76	0.51	0.19	0.810
640-630	96.00	0.00	0.00	17.44	77.36	1.99	0.65	0.806
CAMPEAU_DRIVE_1	96.00	426.00	0.00	3.70	517.58	10.08	2.22	0.992
COMMERCIAL_STAGE_1	96.00	68.33	0.00	15.32	148.02	8.30	2.17	0.901
COMMERCIAL_STAGE_3_SOUTH_2	96.00	0.00	0.00	3.05	92.00	1.42	0.48	0.958
COMMERCIAL_STAGE_3_WEST_2	96.00	0.00	0.00	3.48	91.68	0.67	0.24	0.955
CS063_1	96.00	0.00	0.00	27.87	60.51	56.17	1.64	0.630
CS063_2	96.00	0.00	0.00	56.62	38.17	11.74	1.21	0.398
CS073	96.00	0.00	0.00	39.35	55.43	2.97	0.22	0.577
CS077_2	96.00	0.00	0.00	6.58	88.42	10.87	3.64	0.921
CS082_1	96.00	0.00	0.00	9.62	84.17	31.08	7.42	0.877
CS082_2	96.00	0.00	0.00	10.85	84.12	7.43	2.14	0.876
CS098	96.00	0.00	0.00	39.89	54.96	49.72	10.67	0.572
CS267_4	96.00	0.00	0.00	15.43	79.44	1.21	0.29	0.827
CS267_5	96.00	0.00	0.00	15.19	79.73	0.84	0.22	0.830
CS267_7	96.00	0.00	0.00	16.52	78.36	1.34	0.32	0.816
EXISTING_STAGE_1	96.00	110.99	0.00	16.86	189.03	17.17	2.85	0.913
EXISTING_STAGE_2	96.00	145.38	0.00	19.38	220.92	27.91	4.44	0.915
FUTURE_TRANSITWAY	96.00	0.00	0.00	14.15	80.61	1.79	0.58	0.840
FUTURE_TRANSITWAY_2	96.00	0.00	0.00	3.40	91.77	0.53	0.19	0.956
FutureCamp-117	96.00	0.00	0.00	13.52	81.29	1.16	0.45	0.847
FutureCampEast-117	96.00	0.00	0.00	13.95	80.83	0.81	0.27	0.842
FutureComm-CAMPEAU_DRIVE_POND	96.00	0.00	0.00	7.02	87.61	3.67	1.08	0.913
Pond_1	96.00	0.00	0.00	31.45	63.38	1.09	0.34	0.660
Pond_2	96.00	0.00	0.00	31.37	63.46	1.11	0.35	0.661
STAGE_2	96.00	0.00	0.00	35.55	59.31	0.28	0.12	0.618
STAGE_2_ROAD	96.00	0.00	0.00	35.31	59.59	0.07	0.03	0.621
Stub-110	96.00	0.00	0.00	6.95	87.72	3.12	1.00	0.914

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min
111-S	JUNCTION	0.27	0.34	96.49	0 05:55
CJ065	JUNCTION	2.03	2.51	93.51	0 13:25
CJ066	JUNCTION	2.01	2.50	93.51	0 13:25
CJ067	JUNCTION	1.95	2.43	93.51	0 13:25
CJ068	JUNCTION	1.98	2.46	93.52	0 13:25
CJ069	JUNCTION	1.97	2.46	93.52	0 13:25
CJ070	JUNCTION	1.93	2.42	93.52	0 13:25
CJ071	JUNCTION	1.88	2.37	93.52	0 13:25
CJ072	JUNCTION	1.89	2.38	93.52	0 13:21
CJ073	JUNCTION	1.86	2.35	93.53	0 13:21
CJ074	JUNCTION	1.84	2.33	93.53	0 13:21
CJ075	JUNCTION	1.83	2.33	93.54	0 13:21
CJ076	JUNCTION	1.83	2.33	93.54	0 13:21
CJ077	JUNCTION	1.90	3.97	95.20	0 06:01
CJ078	JUNCTION	1.83	2.32	93.54	0 13:19
CJ079	JUNCTION	1.83	2.33	93.55	0 13:18
CJ080	JUNCTION	1.83	2.32	93.55	0 13:18
CJ081	JUNCTION	1.81	2.31	93.55	0 13:18
CJ082	JUNCTION	0.86	7.53	99.80	0 05:50
CJ083	JUNCTION	1.82	2.31	93.55	0 13:17
CJ084	JUNCTION	1.81	2.30	93.55	0 13:17
CJ089	JUNCTION	1.83	2.32	93.57	0 13:11
CJ094	JUNCTION	0.59	0.90	93.64	0 12:20
CJ095	JUNCTION	0.48	0.79	93.65	0 12:12
CJ096	JUNCTION	0.25	0.48	93.63	0 12:01
CJ098	JUNCTION	0.93	1.77	95.17	0 10:05
CJ100	JUNCTION	1.79	2.28	93.58	0 13:08
CJ101	JUNCTION	1.80	2.34	93.66	0 12:44
CJ103	JUNCTION	1.82	2.43	93.79	0 12:20
CJ104	JUNCTION	1.80	2.34	93.66	0 12:44
CJ105	JUNCTION	1.79	2.34	93.69	0 12:40
CJ106	JUNCTION	1.79	2.35	93.70	0 12:39
CJ266	JUNCTION	0.74	1.22	93.52	0 13:21
J10	JUNCTION	0.34	1.09	93.89	0 06:24
J11	JUNCTION	0.40	0.88	93.78	0 08:05
CJ064	OUTFALL	2.08	2.56	93.51	0 13:25
OF1	OUTFALL	0.00	0.00	0.00	0 00:00
110	STORAGE	0.83	1.38	94.04	0 06:07
111	STORAGE	0.23	0.84	94.15	0 06:07
112	STORAGE	0.38	1.17	94.30	0 06:08
112-S	STORAGE	0.00	0.42	96.92	0 06:00
113	STORAGE	1.12	1.49	93.85	0 06:08
114	STORAGE	0.12	0.61	94.36	0 06:08
114-S	STORAGE	0.00	0.32	96.97	0 06:00
115	STORAGE	0.46	1.20	94.23	0 06:08
115-S	STORAGE	0.00	0.07	96.52	0 06:04
116	STORAGE	0.04	0.67	94.33	0 06:08
116-S	STORAGE	0.00	0.35	96.95	0 06:00
117	STORAGE	1.14	1.47	93.80	0 07:11
117-S	STORAGE	0.00	0.01	95.51	0 06:00
118	STORAGE	0.02	0.51	94.34	0 06:08
118-S	STORAGE	0.01	0.36	96.96	0 06:00
120	STORAGE	0.11	0.83	94.32	0 06:09
120-S	STORAGE	0.00	0.34	96.64	0 06:00
122	STORAGE	0.06	0.77	94.39	0 06:09
122-S	STORAGE	0.00	0.01	96.41	0 06:00
124	STORAGE	0.02	0.26	94.39	0 06:09
124-S	STORAGE	0.00	0.33	97.13	0 06:00
126	STORAGE	0.05	0.54	94.36	0 06:08
126-S	STORAGE	0.00	0.36	97.06	0 06:00
128	STORAGE	0.30	1.13	94.35	0 06:07
128-S	STORAGE	0.00	0.44	96.99	0 06:00
129	STORAGE	0.27	1.15	94.41	0 06:08
130	STORAGE	0.12	1.08	94.56	0 06:08
130-S	STORAGE	0.00	0.42	97.12	0 06:00
131	STORAGE	0.19	1.13	94.50	0 06:08
131-S	STORAGE	0.00	0.42	97.07	0 06:00
132	STORAGE	0.04	0.85	94.75	0 06:08
132-S	STORAGE	0.00	0.35	97.15	0 06:00
134	STORAGE	0.03	0.80	94.89	0 06:08
134-S	STORAGE	0.00	0.34	97.24	0 06:00
136	STORAGE	0.02	0.62	94.92	0 06:09
136-S	STORAGE	0.00	0.33	97.30	0 06:00
138	STORAGE	0.02	0.30	94.61	0 06:09
138-S	STORAGE	0.00	0.33	97.30	0 06:00
140	STORAGE	0.03	0.53	94.56	0 06:09
140-S	STORAGE	0.01	0.40	97.50	0 06:00
142	STORAGE	0.03	0.74	94.56	0 06:08
142-S	STORAGE	0.00	0.42	97.32	0 06:00
144	STORAGE	0.03	0.41	94.67	0 05:52
144-S	STORAGE	0.00	0.35	97.55	0 06:00
146	STORAGE	0.03	0.50	94.46	0 06:09
146-S	STORAGE	0.00	0.31	96.81	0 06:00
154	STORAGE	0.22	0.82	94.10	0 06:10
156	STORAGE	0.02	0.64	94.48	0 06:09
157	STORAGE	0.05	0.88	94.46	0 06:10
158	STORAGE	0.19	0.96	94.28	0 06:09
160	STORAGE	0.34	1.04	94.18	0 06:09
170	STORAGE	0.02	0.60	94.57	0 06:09
172	STORAGE	0.03	0.73	94.34	0 06:09
173	STORAGE	0.02	0.46	94.23	0 06:09
174	STORAGE	0.03	0.51	94.13	0 06:09
512	STORAGE	0.58	1.12	93.99	0 06:10
512A	STORAGE	0.57	1.09	93.97	0 06:22
513	STORAGE	0.28	1.26	94.47	0 06:00
514	STORAGE	0.02	0.70	94.64	0 06:01
605	STORAGE	0.58	1.07	93.94	0 06:23
610	STORAGE	0.54	1.04	93.96	0 06:23
620	STORAGE	0.33	1.28	94.43	0 06:00

630	STORAGE	0.11	1.17	94.63	0	06:01
640	STORAGE	0.04	1.12	94.77	0	06:01
CAMPEAU_DRIVE_POND	STORAGE	1.28	1.60	93.80	0	07:08
CSto097	STORAGE	1.10	1.97	95.17	0	10:06
EX_POND	STORAGE	0.74	1.24	93.94	0	06:22
FUTURE_TRANSITWAY-S	STORAGE	0.00	0.01	95.51	0	06:00
FutureCamp	STORAGE	0.98	1.57	94.07	0	06:03
FutureCamp-S	STORAGE	0.00	0.11	94.41	0	06:00
FutureComm	STORAGE	0.70	1.01	93.80	0	07:07
FutureComm-S	STORAGE	0.00	0.02	95.52	0	06:03
NEW_POND	STORAGE	0.74	1.23	93.93	0	06:23
St154	STORAGE	0.00	0.31	96.61	0	06:01
St157	STORAGE	0.00	0.31	97.01	0	06:01
St158	STORAGE	0.00	0.28	96.98	0	06:02
St170	STORAGE	0.00	0.31	97.31	0	06:00
St172	STORAGE	0.00	0.29	96.69	0	06:02
St173	STORAGE	0.00	0.31	96.71	0	06:00
St512A	STORAGE	0.00	0.01	96.51	0	06:02
St513	STORAGE	0.00	0.01	96.31	0	06:00
St514	STORAGE	0.00	0.30	96.60	0	06:02
St605	STORAGE	0.00	0.22	96.67	0	06:00
St620	STORAGE	0.00	0.01	96.36	0	06:00
St630	STORAGE	0.00	0.30	96.75	0	06:01
St640	STORAGE	0.00	0.14	96.59	0	06:02
Stub	STORAGE	0.78	1.44	94.15	0	06:07
Stub-S	STORAGE	0.00	0.22	96.37	0	06:03

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Node Inflow Summary
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Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min		Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr
111-S	JUNCTION	0.000	0.121	0	06:00	0.000	0.092
CJ065	JUNCTION	2.866	44.046	0	12:02	69.237	2904.054
CJ066	JUNCTION	0.000	42.863	0	12:02	0.000	2835.138
CJ067	JUNCTION	0.000	43.107	0	12:02	0.000	2836.445
CJ068	JUNCTION	0.000	43.316	0	11:58	0.000	2837.507
CJ069	JUNCTION	0.000	43.342	0	11:53	0.000	2837.560
CJ070	JUNCTION	0.000	43.410	0	11:43	0.000	2837.889
CJ071	JUNCTION	0.000	43.480	0	11:43	0.000	2838.223
CJ072	JUNCTION	0.000	43.668	0	11:14	0.000	2838.884
CJ073	JUNCTION	0.000	43.649	0	10:59	0.000	2803.888
CJ074	JUNCTION	0.000	42.960	0	10:59	0.000	2759.741
CJ075	JUNCTION	0.000	43.143	0	10:54	0.000	2760.252
CJ076	JUNCTION	0.000	43.372	0	10:50	0.000	2760.858
CJ077	JUNCTION	3.637	13.199	0	06:00	10.871	49.390
CJ078	JUNCTION	0.000	43.848	0	10:45	0.000	2761.874
CJ079	JUNCTION	0.000	44.284	0	10:44	0.000	2762.729
CJ080	JUNCTION	0.000	44.374	0	10:41	0.000	2762.801
CJ081	JUNCTION	0.000	44.502	0	10:41	0.000	2762.918
CJ082	JUNCTION	9.563	9.563	0	06:00	38.511	38.516
CJ083	JUNCTION	0.219	44.587	0	10:41	2.975	2762.903
CJ084	JUNCTION	0.000	44.583	0	10:41	0.000	2759.954
CJ089	JUNCTION	0.000	44.819	0	10:40	0.000	2760.816
CJ094	JUNCTION	0.000	0.834	0	10:06	0.000	44.558
CJ095	JUNCTION	0.000	0.834	0	10:06	0.000	44.569
CJ096	JUNCTION	0.000	0.834	0	10:05	0.000	44.570
CJ098	JUNCTION	10.673	10.673	0	06:00	49.719	49.717
CJ100	JUNCTION	0.000	44.578	0	10:40	0.000	2712.571
CJ101	JUNCTION	0.000	44.588	0	10:40	0.000	2712.575
CJ103	JUNCTION	44.637	44.637	0	10:35	2697.907	2697.906
CJ104	JUNCTION	0.000	44.660	0	10:38	0.000	2712.794
CJ105	JUNCTION	0.000	44.568	0	10:38	0.000	2697.566
CJ106	JUNCTION	0.000	44.635	0	10:35	0.000	2697.902
CJ266	JUNCTION	0.000	4.203	0	06:24	0.000	35.835
J10	JUNCTION	0.000	4.283	0	06:19	0.000	35.739
J11	JUNCTION	0.000	0.596	0	06:41	0.000	15.733
CJ064	OUTFALL	0.000	44.018	0	12:02	0.000	2903.895
OF1	OUTFALL	4.441	4.441	0	06:00	27.906	27.905
110	STORAGE	0.000	2.451	0	06:06	0.000	11.193
111	STORAGE	0.000	0.549	0	06:01	0.000	2.655
112	STORAGE	0.000	1.016	0	06:06	0.000	4.080
112-S	STORAGE	0.081	0.789	0	06:00	0.210	0.500
113	STORAGE	0.000	2.451	0	06:06	0.000	11.190
114	STORAGE	0.000	0.135	0	05:58	0.000	0.447
114-S	STORAGE	0.157	0.157	0	06:00	0.397	0.397
115	STORAGE	0.000	1.206	0	06:06	0.000	5.412
115-S	STORAGE	0.025	0.926	0	06:00	0.084	0.517
116	STORAGE	0.000	0.158	0	06:09	0.000	0.822
116-S	STORAGE	0.143	0.262	0	06:00	0.366	0.485
117	STORAGE	0.000	3.031	0	06:00	0.000	13.162
117-S	STORAGE	0.268	0.268	0	06:00	0.808	0.808
118	STORAGE	0.000	0.087	0	05:58	0.000	0.477
118-S	STORAGE	0.143	0.143	0	06:00	0.366	0.366
120	STORAGE	0.000	0.565	0	06:00	0.000	2.653
120-S	STORAGE	0.175	0.175	0	05:59	0.447	0.447
122	STORAGE	0.000	0.492	0	05:59	0.000	2.094
122-S	STORAGE	0.086	0.114	0	06:00	0.219	0.228
124	STORAGE	0.000	0.094	0	05:46	0.000	0.448
124-S	STORAGE	0.184	0.184	0	06:00	0.491	0.491
126	STORAGE	0.000	0.120	0	06:10	0.000	0.763
126-S	STORAGE	0.198	0.287	0	06:00	0.522	0.565
128	STORAGE	0.000	0.896	0	06:06	0.000	3.750
128-S	STORAGE	0.000	0.815	0	06:00	0.000	0.418
129	STORAGE	0.000	0.734	0	06:08	0.000	2.916
130	STORAGE	0.000	0.638	0	05:53	0.000	2.480
130-S	STORAGE	0.000	0.780	0	06:00	0.000	0.475
131	STORAGE	0.000	0.709	0	05:54	0.000	2.913
131-S	STORAGE	0.163	0.733	0	06:00	0.428	0.701
132	STORAGE	0.000	0.388	0	06:09	0.000	1.410
132-S	STORAGE	0.154	0.280	0	06:00	0.428	0.448
134	STORAGE	0.000	0.261	0	06:09	0.000	0.981
134-S	STORAGE	0.227	0.297	0	06:00	0.600	0.611
136	STORAGE	0.000	0.102	0	05:48	0.000	0.391
136-S	STORAGE	0.150	0.179	0	06:00	0.397	0.402
138	STORAGE	0.000	0.068	0	05:48	0.000	0.260
138-S	STORAGE	0.101	0.101	0	06:00	0.265	0.265
140	STORAGE	0.000	0.232	0	06:07	0.000	1.100
140-S	STORAGE	0.411	0.613	0	06:00	1.075	1.185
142	STORAGE	0.000	0.205	0	05:51	0.000	0.916
142-S	STORAGE	0.254	0.786	0	06:00	0.670	1.085
144	STORAGE	0.000	0.178	0	05:46	0.000	0.895
144-S	STORAGE	0.382	0.382	0	06:00	1.005	1.005
146	STORAGE	0.000	0.209	0	06:00	0.000	1.052
146-S	STORAGE	0.079	0.079	0	06:00	0.203	0.203
154	STORAGE	0.000	0.246	0	05:58	0.000	0.955
156	STORAGE	0.000	0.072	0	05:49	0.000	0.277
157	STORAGE	0.000	0.219	0	05:57	0.000	0.853
158	STORAGE	0.000	0.329	0	05:57	0.000	1.287
160	STORAGE	0.000	0.472	0	05:56	0.000	1.871
170	STORAGE	0.000	0.072	0	05:48	0.000	0.277
172	STORAGE	0.000	0.150	0	05:49	0.000	0.583
173	STORAGE	0.000	0.072	0	05:48	0.000	0.278
174	STORAGE	0.000	0.072	0	05:59	0.000	0.278
512	STORAGE	0.000	0.710	0	05:56	0.000	2.818
512A	STORAGE	0.000	0.783	0	06:00	0.000	3.026
513	STORAGE	0.147	0.783	0	06:00	0.575	2.831
514	STORAGE	0.000	0.066	0	05:49	0.000	0.257
605	STORAGE	0.000	1.514	0	06:00	0.000	5.713
610	STORAGE	0.000	1.359	0	06:00	0.000	5.099
620	STORAGE	0.199	1.394	0	06:00	0.988	5.092
630	STORAGE	0.000	0.661	0	06:03	0.000	2.497
640	STORAGE	0.000	0.514	0	05:51	0.000	1.989
CAMPEAU_DRIVE_POND	STORAGE	0.000	4.553	0	06:00	0.000	26.841
CSto097	STORAGE	0.000	10.673	0	06:00	0.000	49.699
EX_POND	STORAGE	8.165	9.490	0	06:02	28.322	34.973
FUTURE_TRANSITWAY-S	STORAGE	0.580	0.580	0	06:00	1.790	1.789
FutureCamp	STORAGE	0.000	0.400	0	05:49	0.000	1.167
FutureCamp-S	STORAGE	0.451	0.451	0	06:00	1.163	1.162
FutureComm	STORAGE	0.000	1.417	0	06:00	0.000	5.466

FutureComm-S	STORAGE	1.079	1.079	0	06:00	3.671	3.671
NEW_POND	STORAGE	0.353	6.094	0	06:11	1.110	38.199
St154	STORAGE	0.242	0.258	0	06:00	0.676	0.679
St157	STORAGE	0.206	0.231	0	06:00	0.575	0.578
St158	STORAGE	0.152	0.152	0	06:00	0.435	0.437
St170	STORAGE	0.104	0.104	0	06:00	0.280	0.280
St172	STORAGE	0.208	0.208	0	06:00	0.583	0.583
St173	STORAGE	0.104	0.104	0	06:00	0.280	0.280
St512A	STORAGE	0.049	0.056	0	06:01	0.192	0.193
St513	STORAGE	0.582	0.582	0	06:00	2.003	2.003
St514	STORAGE	0.092	0.092	0	06:00	0.257	0.257
St605	STORAGE	0.230	0.230	0	06:00	0.636	0.636
St620	STORAGE	0.524	0.587	0	06:00	1.594	1.606
St630	STORAGE	0.185	0.185	0	06:00	0.513	0.513
St640	STORAGE	0.649	0.649	0	06:00	1.988	1.988
Stub	STORAGE	0.000	0.712	0	05:52	0.000	3.135
Stub-S	STORAGE	0.995	0.995	0	06:00	3.123	3.123

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Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Meters	Min. Depth Below Rim Meters
CJ082	JUNCTION	0.37	5.282	2.468
CJ098	JUNCTION	5.86	0.125	1.225
CJ266	JUNCTION	10.88	0.223	2.477
110	STORAGE	0.13	0.017	2.059
111	STORAGE	0.10	0.012	2.001
112	STORAGE	0.23	0.108	2.201
115	STORAGE	0.30	0.138	2.216
116	STORAGE	0.16	0.065	2.274
118	STORAGE	0.16	0.062	2.260
128	STORAGE	0.16	0.069	2.200
129	STORAGE	0.20	0.099	2.192
130	STORAGE	0.18	0.097	2.142
131	STORAGE	0.17	0.079	2.150
132	STORAGE	0.22	0.174	2.050
134	STORAGE	0.15	0.127	2.010
136	STORAGE	0.04	0.017	2.052
154	STORAGE	0.24	0.143	2.202
156	STORAGE	0.16	0.265	2.520
157	STORAGE	0.16	0.271	2.244
158	STORAGE	0.20	0.276	2.424
160	STORAGE	0.67	0.289	2.216
170	STORAGE	0.13	0.221	2.434
172	STORAGE	0.12	0.210	2.055
173	STORAGE	0.05	0.083	2.172
174	STORAGE	0.09	0.131	2.274
512	STORAGE	1.04	0.217	2.308
512A	STORAGE	2.52	0.269	2.526
513	STORAGE	0.20	0.436	1.829
514	STORAGE	0.14	0.329	1.656
605	STORAGE	0.26	0.025	2.505
620	STORAGE	0.19	0.231	1.919
630	STORAGE	0.20	0.266	1.819
640	STORAGE	0.22	0.298	1.677
FutureComm-S	STORAGE	48.00	0.023	0.477
Stub	STORAGE	4.43	0.393	0.647
Stub-S	STORAGE	48.00	0.225	0.275

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Node Flooding Summary
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No nodes were flooded.

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Storage Volume Summary
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Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
110	0.001	24	0	0.002	40	0 06:07	2.451
111	0.000	8	0	0.001	29	0 06:07	0.585
112	0.000	11	0	0.001	35	0 06:08	1.013
112-S	0.000	0	0	0.016	85	0 06:00	0.789
113	0.001	31	0	0.002	41	0 06:08	2.450
114	0.000	4	0	0.001	21	0 06:08	0.137
114-S	0.000	0	0	0.023	64	0 06:00	0.156
115	0.001	14	0	0.001	35	0 06:08	1.204
115-S	0.021	1	0	0.425	15	0 06:04	0.036
116	0.000	1	0	0.001	23	0 06:08	0.167
116-S	0.000	1	0	0.018	70	0 06:00	0.262
117	0.001	31	0	0.002	40	0 07:11	3.022
117-S	0.000	0	0	0.001	1	0 06:00	0.268
118	0.000	1	0	0.001	18	0 06:08	0.087
118-S	0.000	1	0	0.006	72	0 06:00	0.143
120	0.000	4	0	0.001	30	0 06:09	0.549
120-S	0.000	1	0	0.013	67	0 06:00	0.175
122	0.000	2	0	0.001	28	0 06:09	0.465
122-S	0.000	0	0	0.001	2	0 06:00	0.114
124	0.000	1	0	0.000	10	0 06:09	0.104
124-S	0.000	0	0	0.022	66	0 06:00	0.184
126	0.000	2	0	0.001	19	0 06:08	0.178
126-S	0.000	1	0	0.016	71	0 06:00	0.287
128	0.000	9	0	0.001	34	0 06:07	0.894
128-S	0.000	0	0	0.042	87	0 06:00	0.810
129	0.000	8	0	0.001	34	0 06:08	0.751
130	0.000	4	0	0.001	33	0 06:08	0.612
130-S	0.000	0	0	0.052	84	0 06:00	0.758
131	0.000	6	0	0.001	34	0 06:08	0.734
131-S	0.000	0	0	0.033	83	0 06:00	0.727
132	0.000	1	0	0.001	29	0 06:08	0.404
132-S	0.000	0	0	0.027	70	0 06:00	0.265
134	0.000	1	0	0.001	29	0 06:08	0.278
134-S	0.000	0	0	0.037	68	0 06:00	0.286
136	0.000	1	0	0.001	23	0 06:09	0.107
136-S	0.000	0	0	0.024	65	0 06:00	0.175
138	0.000	1	0	0.000	11	0 06:09	0.069
138-S	0.000	0	0	0.016	66	0 06:00	0.097
140	0.000	1	0	0.001	17	0 06:09	0.253
140-S	0.000	1	0	0.023	80	0 06:00	0.612
142	0.000	1	0	0.001	24	0 06:08	0.268
142-S	0.000	1	0	0.038	83	0 06:00	0.785
144	0.000	1	0	0.000	14	0 05:52	0.179
144-S	0.000	0	0	0.045	71	0 06:00	0.380
146	0.000	1	0	0.001	20	0 06:09	0.206
146-S	0.000	0	0	0.011	63	0 06:00	0.079
154	0.000	7	0	0.001	27	0 06:10	0.245
156	0.000	1	0	0.001	20	0 06:09	0.071
157	0.000	1	0	0.001	28	0 06:10	0.217
158	0.000	6	0	0.001	28	0 06:09	0.324
160	0.000	10	0	0.001	32	0 06:09	0.468
170	0.000	1	0	0.001	20	0 06:09	0.072
172	0.000	1	0	0.001	26	0 06:09	0.149
173	0.000	1	0	0.001	17	0 06:09	0.072
174	0.000	1	0	0.001	18	0 06:09	0.077
512	0.001	17	0	0.001	33	0 06:10	0.691
512A	0.001	16	0	0.001	30	0 06:22	0.756
513	0.000	9	0	0.001	41	0 06:00	0.736
514	0.000	1	0	0.001	30	0 06:01	0.084
605	0.001	16	0	0.001	30	0 06:23	1.503
610	0.001	16	0	0.001	31	0 06:23	1.350
620	0.000	10	0	0.001	40	0 06:00	1.359
630	0.000	4	0	0.001	39	0 06:01	0.698

640	0.000	2	0	0.001	40	0	06:01	0.529
CAMPEAU_DRIVE_POND	15.716	41	0	20.120	52	0	07:08	0.596
CSto097	14.909	26	0	28.775	51	0	10:06	0.834
EX_POND	6.864	51	0	12.613	94	0	06:22	5.332
FUTURE_TRANSITWAY-S	0.000	0	0	0.003	2	0	06:00	0.579
FutureCamp	0.001	43	0	0.002	68	0	06:03	0.398
FutureCamp-S	0.000	0	0	0.023	23	0	06:00	0.400
FutureComm	0.001	22	0	0.001	31	0	07:07	1.415
FutureComm-S	0.002	0	0	0.127	5	0	06:03	0.838
NEW_POND	4.832	52	0	8.656	94	0	06:23	4.283
St154	0.000	0	0	0.039	62	0	06:01	0.191
St157	0.000	0	0	0.033	63	0	06:01	0.173
St158	0.000	0	0	0.022	55	0	06:02	0.112
St170	0.000	0	0	0.016	63	0	06:00	0.100
St172	0.000	0	0	0.031	57	0	06:02	0.150
St173	0.000	0	0	0.016	63	0	06:00	0.097
St512A	0.000	0	0	0.000	2	0	06:02	0.056
St513	0.000	0	0	0.004	2	0	06:00	0.581
St514	0.000	0	0	0.014	59	0	06:02	0.066
St605	0.000	0	0	0.026	45	0	06:00	0.227
St620	0.000	0	0	0.004	1	0	06:00	0.585
St630	0.000	0	0	0.029	61	0	06:01	0.142
St640	0.000	0	0	0.053	29	0	06:02	0.514
Stub	0.001	38	0	0.002	69	0	06:07	0.715
Stub-S	0.001	0	0	0.114	45	0	06:03	0.712

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Outfall Loading Summary
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Outfall Node	Flow Freq. Pcnt.	Avg. Flow CMS	Max. Flow CMS	Total Volume 10^6 ltr
CJ064	100.00	19.670	44.018	2903.895
OF1	99.99	0.174	4.441	27.905
System	99.99	19.844	44.255	2931.800

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Link Flow Summary
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Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
110-113	CONDUIT	2.451	0 06:06	2.18	1.68	0.95
111-110	CONDUIT	0.585	0 06:13	1.28	1.05	1.00
112-115	CONDUIT	1.013	0 06:06	1.17	0.83	1.00
113-117	CONDUIT	2.450	0 06:05	1.63	0.99	0.84
114-112	CONDUIT	0.075	0 06:08	0.73	0.59	0.95
114-118	CONDUIT	0.064	0 05:58	0.68	0.50	1.00
115-110	CONDUIT	1.204	0 06:06	1.39	1.14	1.00
116-115	CONDUIT	0.167	0 06:09	0.95	0.70	1.00
117-CAMPEAU_DRIVE_POND	CONDUIT	3.022	0 06:00	2.30	1.05	0.90
118-116	CONDUIT	0.087	0 06:09	0.96	0.69	1.00
120-111	CONDUIT	0.540	0 06:01	1.16	0.99	1.00
122-120	CONDUIT	0.465	0 06:00	0.98	0.84	0.97
124-120	CONDUIT	0.052	0 06:06	0.85	0.60	0.82
124-126	CONDUIT	0.058	0 06:10	0.79	0.45	0.69
126-114	CONDUIT	0.072	0 06:09	0.28	0.30	0.95
126-128	CONDUIT	0.114	0 05:51	0.86	0.48	0.94
128-112	CONDUIT	0.894	0 06:06	1.07	0.73	1.00
129-128	CONDUIT	0.751	0 06:08	0.87	0.71	1.00
130-131	CONDUIT	0.612	0 06:10	0.98	0.70	1.00
131-129	CONDUIT	0.734	0 06:08	0.95	0.70	1.00
132-130	CONDUIT	0.404	0 06:09	1.13	1.24	1.00
134-132	CONDUIT	0.278	0 06:09	0.79	0.85	1.00
136-134	CONDUIT	0.107	0 06:09	0.65	0.45	1.00
138-140	CONDUIT	0.069	0 05:56	0.86	0.54	0.75
140-122	CONDUIT	0.223	0 06:08	0.84	0.94	0.90
140-142	CONDUIT	0.077	0 05:51	0.68	0.18	0.76
142-130	CONDUIT	0.268	0 06:11	0.88	0.48	0.95
144-140	CONDUIT	0.024	0 06:09	0.63	0.19	0.35
144-146	CONDUIT	0.159	0 06:00	0.99	0.82	0.78
146-122	CONDUIT	0.206	0 05:51	1.21	0.86	0.87
154-512	CONDUIT	0.245	0 05:53	1.04	0.75	1.00
156-157	CONDUIT	0.071	0 05:57	0.97	0.84	1.00
157-158	CONDUIT	0.217	0 06:10	0.89	0.91	1.00
158-160	CONDUIT	0.324	0 05:56	0.97	1.02	1.00
160-512	CONDUIT	0.468	0 05:56	1.16	1.10	1.00
170-156	CONDUIT	0.072	0 05:49	0.89	0.81	1.00
172-160	CONDUIT	0.149	0 05:50	0.90	0.77	1.00
173-174	CONDUIT	0.072	0 05:59	0.89	0.82	1.00
174-154	CONDUIT	0.077	0 06:10	1.06	0.86	1.00
512A-EX_POND	CONDUIT	0.756	0 06:01	1.41	0.92	1.00
512-EX_POND	CONDUIT	0.691	0 05:55	1.33	0.62	1.00
513-512A	CONDUIT	0.736	0 06:00	1.38	1.31	1.00
514-513	CONDUIT	0.084	0 06:05	0.86	0.95	1.00
605-NEW_POND	CONDUIT	1.503	0 06:00	2.20	1.41	1.00
610-605	CONDUIT	1.350	0 06:00	1.65	1.31	0.99
620-610	CONDUIT	1.359	0 06:00	1.57	1.27	0.99
630-620	CONDUIT	0.698	0 06:03	1.10	1.01	1.00
640-630	CONDUIT	0.529	0 06:03	1.07	0.93	1.00
C12	CONDUIT	4.203	0 06:24	1.11	0.75	0.86
C2	CONDUIT	0.547	0 06:45	0.60	0.63	0.94
C6	CONDUIT	5.332	0 06:11	0.52	2.92	0.76
CC065	CHANNEL	44.018	0 12:02	0.18	0.02	0.46
CC066	CHANNEL	42.806	0 12:02	0.14	0.03	0.50
CC067	CHANNEL	42.863	0 12:02	0.14	0.03	0.44
CC068	CHANNEL	43.107	0 12:02	0.13	0.11	0.50
CC069	CHANNEL	43.316	0 11:58	0.16	0.09	0.50
CC070	CHANNEL	43.342	0 11:53	0.27	0.02	0.39
CC071	CHANNEL	43.410	0 11:43	0.15	0.04	0.49
CC072	CHANNEL	43.480	0 11:43	0.17	0.03	0.38
CC073	CHANNEL	43.368	0 11:19	0.20	0.09	0.49
CC074	CHANNEL	42.838	0 11:04	0.17	0.03	0.32
CC075	CHANNEL	42.960	0 10:59	0.21	0.02	0.30
CC076	CHANNEL	43.143	0 10:54	0.14	0.60	0.49
CC077	CHANNEL	11.893	0 06:01	1.77	0.35	0.36
CC078	CHANNEL	43.372	0 10:50	0.17	0.07	0.49
CC079	CHANNEL	43.848	0 10:45	0.15	0.82	0.49
CC080	CONDUIT	9.563	0 06:00	2.40	0.91	1.00
CC080_1	CHANNEL	44.284	0 10:44	0.21	0.04	0.49
CC081	CHANNEL	44.374	0 10:41	0.37	0.04	0.49
CC083	CHANNEL	44.502	0 10:41	1.01	0.24	0.43
CC084	CHANNEL	44.527	0 10:41	0.74	0.03	0.43
CC089	CHANNEL	44.583	0 10:41	1.23	0.72	0.49
CC094	CHANNEL	0.833	0 10:07	0.69	0.02	0.13
CC095	CONDUIT	0.834	0 10:06	1.03	0.46	0.70
CC096	CONDUIT	0.834	0 10:06	1.43	0.28	0.53
CC098	CONDUIT	10.673	0 06:00	5.04	1.66	1.00
CC100	CHANNEL	44.372	0 10:41	0.24	0.13	0.49
CC101	CONDUIT	44.578	0 10:40	1.44	0.14	0.52
CC102	CONDUIT	44.635	0 10:35	1.44	0.47	0.65
CC104	CHANNEL	44.588	0 10:40	0.24	0.34	0.50
CC105	CHANNEL	44.444	0 10:40	0.46	0.19	0.50
CC106	CHANNEL	44.568	0 10:38	0.18	0.72	0.50
CC266	CONDUIT	4.200	0 06:26	1.11	0.22	1.00
FutureCamp-117	CONDUIT	0.398	0 06:03	1.12	1.41	1.00
FutureComm-CAMPEAU_DRIVE_POND	CONDUIT	1.415	0 06:00	2.05	1.31	0.84
Stub-110	CONDUIT	0.715	0 06:09	1.03	0.96	1.00
CDP_Low	ORIFICE	0.109	0 06:19			1.00
COR097_1	ORIFICE	0.397	0 10:06			1.00
COR097_2	ORIFICE	0.026	0 09:36			1.00
NP_Low	ORIFICE	0.123	0 06:03			1.00
10	WEIR	0.025	0 06:00			0.06
11	WEIR	0.000	0 00:00			0.00
111-120-S	WEIR	0.121	0 06:00			0.19
111-S-POND	WEIR	0.133	0 05:55			0.20
112-128-S	WEIR	0.676	0 06:00			0.68

114-112-S	WEIR	0.054	0	06:00	0.11	
115-112-S	WEIR	0.735	0	06:00	0.62	
115-116-S	WEIR	0.191	0	06:00	0.25	
116-118-S	WEIR	0.120	0	06:00	0.29	
117-S-CAMPEAU_DRIVE_POND	WEIR	0.000	0	00:00	0.00	
12	WEIR	0.000	0	00:00	0.00	
120-122-S	WEIR	0.000	0	00:00	0.00	
122-146-S	WEIR	0.029	0	06:00	0.07	
126-124-S	WEIR	0.090	0	06:00	0.15	
128-126-S	WEIR	0.225	0	06:00	0.28	
130-142-S	WEIR	0.657	0	06:00	0.58	
131-128-S	WEIR	0.617	0	06:00	0.58	
131-130-S	WEIR	0.586	0	06:00	0.61	
132-130-S	WEIR	0.155	0	06:00	0.24	
132-134-S	WEIR	0.132	0	06:00	0.20	
134-136-S	WEIR	0.073	0	06:00	0.13	
138-136-S	WEIR	0.029	0	06:00	0.14	
14	WEIR	0.000	0	00:00	0.00	
140-144-S	WEIR	0.202	0	06:00	0.26	
142-140-S	WEIR	0.532	0	06:00	0.50	
15	WEIR	0.005	0	06:01	0.02	
16	WEIR	0.005	0	06:01	0.02	
17	WEIR	0.063	0	06:00	0.12	
18	WEIR	0.000	0	00:00	0.00	
5	WEIR	0.028	0	06:00	0.07	
6	WEIR	0.025	0	06:01	0.07	
7	WEIR	0.000	0	00:00	0.00	
8	WEIR	0.000	0	00:00	0.00	
9	WEIR	0.017	0	06:02	0.05	
CDP_High	WEIR	0.554	0	06:41	0.24	
CW097_3	WEIR	0.411	0	10:06	0.45	
FUTURE_TRANSITWAY-S-CAMPEAU_DRIVE_POND	WEIR	0.000	0	00:00	0.00	
FutureCamp-CAMPEAU_DRIVE_POND	WEIR	0.000	0	00:00	0.00	
NP_High	WEIR	4.251	0	06:19	0.92	
112-IC	DUMMY	0.054	0	05:48		
114-IC	DUMMY	0.102	0	05:48		
115-IC	DUMMY	0.036	0	05:55		
116-IC	DUMMY	0.071	0	05:45		
117-IC	DUMMY	0.268	0	06:00		
118-IC	DUMMY	0.023	0	05:32		
120-IC	DUMMY	0.054	0	05:36		
122-IC	DUMMY	0.114	0	06:00		
124-IC	DUMMY	0.094	0	05:46		
126-IC	DUMMY	0.062	0	05:43		
128-IC	DUMMY	0.134	0	05:53		
130-IC	DUMMY	0.172	0	05:49		
131-IC	DUMMY	0.110	0	05:48		
132-IC	DUMMY	0.110	0	05:49		
134-IC	DUMMY	0.154	0	05:48		
136-IC	DUMMY	0.102	0	05:48		
138-IC	DUMMY	0.068	0	05:48		
140-IC	DUMMY	0.080	0	05:33		
142-IC	DUMMY	0.128	0	05:43		
144-IC	DUMMY	0.178	0	05:46		
146-IC	DUMMY	0.050	0	05:47		
FUTURE_TRANSITWAY-IC	DUMMY	0.579	0	06:00		
FutureCamp-Backwater	DUMMY	0.000	0	00:00		
FutureCamp-IC	DUMMY	0.400	0	05:49		
FutureComm-IC	DUMMY	0.838	0	05:54		
O154	DUMMY	0.174	0	05:49		
O157	DUMMY	0.148	0	05:49		
O158	DUMMY	0.112	0	05:49		
O170	DUMMY	0.072	0	05:48		
O172	DUMMY	0.150	0	05:49		
O173	DUMMY	0.072	0	05:48		
O512A	DUMMY	0.056	0	06:02		
O513	DUMMY	0.581	0	06:00		
O514	DUMMY	0.066	0	05:49		
O605	DUMMY	0.164	0	05:49		
O620	DUMMY	0.585	0	06:00		
O630	DUMMY	0.132	0	05:49		
O640	DUMMY	0.514	0	05:51		
Stub-IC	DUMMY	0.712	0	05:52		

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Flow Classification Summary
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Conduit	Adjusted /Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
110-113	1.00	0.01	0.00	0.00	0.92	0.00	0.00	0.07	0.07	0.0000
111-110	1.00	0.02	0.03	0.00	0.81	0.00	0.00	0.14	0.07	0.0000
112-115	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.0000
113-117	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
114-112	1.00	0.84	0.11	0.00	0.03	0.00	0.00	0.02	0.02	0.0000
114-118	1.00	0.01	0.75	0.00	0.24	0.00	0.00	0.00	0.06	0.0000
115-110	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.0000
116-115	1.00	0.01	0.00	0.00	0.54	0.00	0.00	0.45	0.07	0.0000
117-CAMPEAU_DRIVE_POND	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
118-116	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.26	0.0000
120-111	1.00	0.01	0.06	0.00	0.93	0.00	0.00	0.00	0.07	0.0000
122-120	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.10	0.0000
124-120	1.00	0.71	0.00	0.00	0.01	0.00	0.00	0.29	0.19	0.0000
124-126	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.27	0.0000
126-114	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.01	0.0000
126-128	1.00	0.01	0.00	0.00	0.28	0.00	0.00	0.70	0.25	0.0000
128-112	1.00	0.01	0.05	0.00	0.94	0.00	0.00	0.00	0.06	0.0000
129-128	1.00	0.01	0.02	0.00	0.97	0.00	0.00	0.00	0.05	0.0000
130-131	1.00	0.01	0.00	0.00	0.60	0.00	0.00	0.39	0.10	0.0000
131-129	1.00	0.01	0.03	0.00	0.96	0.00	0.00	0.00	0.06	0.0000
132-130	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.29	0.0000
134-132	1.00	0.01	0.00	0.00	0.42	0.00	0.00	0.57	0.18	0.0000
136-134	1.00	0.01	0.00	0.00	0.02	0.00	0.00	0.97	0.23	0.0000
138-140	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.24	0.0000
140-122	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.27	0.0000
140-142	1.00	0.75	0.00	0.00	0.03	0.00	0.00	0.22	0.13	0.0000
142-130	1.00	0.01	0.00	0.00	0.37	0.00	0.00	0.62	0.13	0.0000
144-140	1.00	0.99	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.0000
144-146	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.29	0.0000
146-122	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.28	0.0000
154-512	1.00	0.01	0.03	0.00	0.88	0.00	0.00	0.08	0.05	0.0000
156-157	1.00	0.01	0.00	0.00	0.02	0.00	0.00	0.97	0.28	0.0000
157-158	1.00	0.01	0.00	0.00	0.64	0.00	0.00	0.35	0.08	0.0000
158-160	1.00	0.01	0.01	0.00	0.82	0.00	0.00	0.17	0.06	0.0000
160-512	1.00	0.01	0.00	0.00	0.91	0.00	0.00	0.08	0.05	0.0000
170-156	1.00	0.01	0.06	0.00	0.93	0.00	0.00	0.00	0.22	0.0000
172-160	1.00	0.01	0.00	0.00	0.67	0.00	0.00	0.32	0.08	0.0000
173-174	1.00	0.01	0.02	0.00	0.97	0.00	0.00	0.00	0.17	0.0000
174-154	1.00	0.01	0.00	0.00	0.38	0.00	0.00	0.61	0.11	0.0000
512A-EX_POND	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.02	0.0000
512-EX_POND	1.00	0.00	0.01	0.00	0.99	0.00	0.00	0.00	0.03	0.0000
513-512A	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.0000
514-513	1.00	0.01	0.00	0.00	0.08	0.00	0.00	0.91	0.30	0.0000
605-NEW_POND	1.00	0.01	0.00	0.00	0.94	0.00	0.00	0.05	0.06	0.0000
610-605	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.05	0.0000
620-610	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.06	0.0000
630-620	1.00	0.01	0.00	0.00	0.75	0.00	0.00	0.24	0.10	0.0000
640-630	1.00	0.01	0.00	0.00	0.46	0.00	0.00	0.53	0.23	0.0000
C12	1.00	0.00	0.04	0.00	0.96	0.00	0.00	0.00	0.05	0.0000
C2	1.00	0.00	0.02	0.00	0.98	0.00	0.00	0.00	0.05	0.0000
C6	1.00	0.01	0.00	0.00	0.96	0.00	0.00	0.04	0.02	0.0002
CC065	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
CC066	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
CC067	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
CC068	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
CC069	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
CC070	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.05	0.0000
CC071	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000
CC072	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
CC073	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
CC074	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000
CC075	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0000

CC076	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000	
CC077	1.00	0.00	0.00	0.00	0.99	0.00	0.00	0.01	0.02	0.0000	
CC078	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000	
CC079	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000	
CC080	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000	
CC080_1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.04	0.0000	
CC081	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.06	0.0000	
CC083	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.14	0.0000	
CC084	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.11	0.0000	
CC089	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.23	0.0000	
CC094	1.00	0.01	0.00	0.00	0.77	0.00	0.00	0.23	0.23	0.0000	
CC095	1.00	0.00	0.00	0.00	0.97	0.00	0.00	0.02	0.25	0.0000	
CC096	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.50	0.0000	
CC098	1.00	0.00	0.00	0.00	0.91	0.00	0.00	0.09	0.12	0.0000	
CC100	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000	
CC101	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.22	0.0000	
CC102	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.21	0.0000	
CC104	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000	
CC105	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.10	0.0000	
CC106	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.03	0.0000	
CC266	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.02	0.0000	
FutureCamp-117	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.0001	
FutureComm-CAMPEAU_DRIVE_POND	1.00	0.01	0.00	0.00	0.91	0.00	0.00	0.08	0.06	0.0000	
Stub-110	1.00	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.01	0.0001	

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Conduit Surcharge Summary
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Conduit	Hours Full (Both Ends)	Hours Full (Upstream)	Hours Full (Dnstream)	Hours Above Full Normal Flow	Hours Capacity Limited
110-113	0.01	0.01	0.01	0.48	0.01
111-110	0.09	0.09	0.10	0.01	0.01
112-115	0.25	0.25	0.25	0.01	0.01
114-118	0.02	0.02	0.02	0.01	0.01
115-110	0.15	0.15	0.15	0.29	0.15
116-115	0.17	0.17	0.17	0.01	0.01
117-CAMPEAU_DRIVE_POND	0.01	0.01	0.01	0.14	0.01
118-116	0.16	0.16	0.16	0.01	0.01
120-111	0.03	0.03	0.03	0.01	0.01
128-112	0.18	0.18	0.18	0.01	0.01
129-128	0.18	0.18	0.18	0.01	0.18
130-131	0.17	0.17	0.17	0.01	0.17
131-129	0.17	0.17	0.17	0.01	0.01
132-130	0.18	0.18	0.18	0.32	0.18
134-132	0.15	0.15	0.15	0.01	0.01
136-134	0.04	0.04	0.04	0.01	0.01
154-512	0.23	0.23	0.24	0.01	0.01
156-157	0.16	0.16	0.16	0.01	0.01
157-158	0.16	0.16	0.16	0.01	0.01
158-160	0.20	0.20	0.20	0.10	0.01
160-512	0.65	0.65	0.65	0.25	0.15
170-156	0.13	0.13	0.13	0.01	0.01
172-160	0.12	0.12	0.12	0.01	0.01
173-174	0.05	0.05	0.05	0.01	0.01
174-154	0.09	0.09	0.09	0.01	0.01
512A-EX_POND	2.49	2.49	2.49	0.01	0.09
512-EX_POND	1.08	1.08	1.08	0.01	0.01
513-512A	0.15	0.15	0.15	0.23	0.12
514-513	0.14	0.14	0.14	0.01	0.03
605-NEW_POND	0.26	0.26	0.26	0.28	0.01
610-605	0.01	0.01	0.01	0.23	0.01
620-610	0.01	0.01	0.01	0.22	0.01
630-620	0.19	0.19	0.19	0.05	0.19
640-630	0.20	0.20	0.20	0.01	0.20
C6	0.01	0.01	0.01	3.57	0.01
CC080	0.37	0.37	0.37	0.01	0.01
CC098	5.78	5.78	5.78	0.27	0.01
CC266	10.88	10.88	10.88	0.01	0.01
FutureCamp-117	34.05	34.05	34.05	0.27	0.29
FutureComm-CAMPEAU_DRIVE_POND	0.01	0.01	0.01	0.28	0.01
Stub-110	4.42	4.42	4.42	0.01	0.39

Analysis begun on: Thu Apr 27 11:00:54 2017
Analysis ended on: Thu Apr 27 11:01:17 2017
Total elapsed time: 00:00:23