SITE SERVICING REPORT

REVISED - PARKER LANDS RESIDENTIAL SUBDIVISION

WINNIPEG – MANITOBA

Presented to:
Andrew Marquess

6165347 Manitoba Inc.
1383-B Spruce Street
Winnipeg, Manitoba, R3E 2V8

Project No. 3170097 Jan 29, 2018

N:\Proj\3170097\8. Deliverables\Revised Site Servicing Report

Jan 29, 2018

6165347 Manitoba Inc.
1383-B Spruce Street
Winnipeg, MB, R3E 2V8

Attention: Andrew Marquess

Re: Revised - Parker Lands Servicing Report

Please find attached the revised servicing report for Parker Lands. We have addressed the comments as per Morrison Hershfield discussions with City of Winnipeg and the responses are below in red along with the city comments.

Wastewater servicing comments:

1) Please align the wastewater sewer (WWS) south along the former Beaumont Right-of-Way (ROW)

   Morrison Hershfield showed City that WWS is already along Beaumont Street and City Agreed. No change is required to the alignment of WWS.

- Beaumont apparently remains open from Asquith/Hurst to Parcel J of Misc. Plan 15011/1, so no easement would be needed in that area
- It appears there is City land part of the stormwater retention basin parcel, between GEM land and this open portion of Beaumont—no easement would be needed there either
- I will send an updated request to PPD asking for Parcel J of Misc. Plan 15011/1 to remain with the City

  We have removed the easement and City ok with the installation of utilities in the City land without registering an easement there.

2) Water and Waste (WWD) is looking for the WWS to be aligned within City land from the proposed new ROW to the south, e.g. in a public reserve with a pedestrian & cycling path, rather than in an easement

   Waste water and water mains are aligned with Beaumont Street row as requested by the City, being City land no easement is shown between Parker Lands and the termination point of Beaumont Street ROW. At 9 m public reserve strip will be provided for two services (water and waste water) between the Multifamily lots just north of Beaumont Street ROW.

3) This report indicated that the Heatherdale ROW is closed between the former Beaumont ROW and Daniel St, but this was not part of DAC 1/2016

   The ROW are updated as per the DAC1/2016. As the Heatherdale ROW is still active we have removed the easement from that area.

4) We recommend the contractor for this development coordinate with Plenary Roads or Winnipeg Transit's contractor for works affecting the new South West Rapid Transit way infrastructure

   Noted, we will do.

5) Section 4.2 – The number for population we calculated:

   -240 Units at 3.05 ppl/unit = 732 people

   -1502 Units at 2.30 ppl/unit = 3,455 people

   -Total people 4,187 not the 4797 in the report

   - 4.2 – The flows seem to be based on 4797 people

   Flows from the parker land subdivision are calculated for 4,187. But the offsite flows from MH 22- the existing Manhole are calculated based on 4,797 population considering additional population south of SWBRT and for BRT area as requested by City in 2016.

6) We will be holding this area to the maximum number of units used in the design. A revision to the report will be required if there is an increase in number of units.

   No Change to the units for the subdivision, explained above in comment 5

7) Figure 4A and 4B – See the above comments regarding the sewer from the GEM lands to approximately Heatherdale Ave. The new connection at Wynne St will not work as drawing. There is a Ø400 gas main and a LDS where the proposed MHs are. There is no space in the Parker Row for a new sewer.

   We have rearranged the WWS close to connection location to avoid conflict with gas line. Please see updated Figure 4B

8) This report needs to show that the area around the BRT can be serviced either off the existing Ø300 in Parker or off the new pipe in Heatherdale Ave.

   Area around the BRT will be serviced through the proposed 375 mm WWS along Beaumont ST. As mentioned in response for the comment 5.

9) Appendix B, Design Table – The population total population and flows are different from section 4.2. The total area does not match section 1.0. These need to be in agreement.

   We fixed this and numbers are matching now.

Water servicing comments:

1) Morrison Hershfield had noted that the water portion had already been approved. Our comments referred to the concept to facilitate providing flow-pressures curves for the initial layout. Typically there is further review at the servicing report stage.
   Agreed.
2) The GEM Equities lands servicing will need to be consistent with the overall PLMRS design.
   Noted.
3) Replacement of the north-south 250mm water main (WM) is to be limited to north of the new Hurst right-of-way.
   Fixed, replacement of north south 250 mm water is happening north of BRT close to Hurst Ave.
4) After receiving preliminary comments from Winnipeg Transit, alignment of the north-south off-site 200mm water main needs to be along the former Beaumont right-of-way (rather than along Georgina St).
   Water is moved along Beaumont Street instead of Georgina Street.
5) WWD is looking for the re-aligned water main connecting to the existing 250mm WM at the north boundary to be aligned within City land e.g. in a public reserve strip, rather than in an easement.
   A 6 m (20 ft.) wide public reserve strip is created to replace easement for water connection on north of the property.

This report was completed on Jan 29, 2018. Morrison Hershfield revised the Wastewater, Water and Land drainage design based on the comments received from the City of Winnipeg. LGN Consulting Engineering Ltd. teamed up with Morrison Hershfield to complete the Land Drainage Service Report (Stormwater Management Report). All the LDS comments are addressed in the LDS report in Appendix A. Please call if you have any questions.

Yours truly,
Morrison Hershfield Limited

Irshad Ahmad,
Sr. Project Manager

TABLE OF CONTENTS

PAGE

1. INTRODUCTION AND SCOPE 1

2. SITE CHARACTERISTICS AND GRADING 3

3. LAND DRAINAGE SERVICE (STORMWATER MANAGEMENT REPORT) 4

4. WASTEWATER SEWER EVALUATION 5

4.1 Wastewater Design Criteria 5

4.2 Wastewater Flow 6

4.3 Wastewater Sewer Connection Point 6

4.4 Proposed Wastewater Sewer Network 7

5. WATER DISTRIBUTION SYSTEM EVALUATION 8

5.1 Water Design Criteria 8

5.2 Water Connection Points 9

5.3 Water Demand 9

5.4 Proposed Water Network 10

5.5 Model Methodology and Scenarios 10

5.6 Results and Recommendation 10

6. SUMMARY OF RECOMMENDATIONS 11

6.1 Land Drainage Services (LDS) Conclusion & Recommendations 11

6.2 Wastewater Design Findings and Recommendations 11

6.3 Water Recommendations 11

7. CLOSURE 12

TABLE OF CONTENTS (Continued)

		Page
APPENDIX A		13
1.	LAND DRAINAGE SERVICE REPORT	13
2.	CORRESPONDENCE	13
APPENDIX B		14
1.	WASTEWATER SEWER DESIGN CALCULATIONS	14
2.	SFE REPORT	14
APPENDIX C		15
1.	WATER DISTRIBUTION MODEL RESULTS	15
2.	DEMANDS SIMULATION FLOW AND PRESSURE CURVES	15
3.	EMAIL CORRESPONDENCE	15

1. INTRODUCTION AND SCOPE

Morrison Hershfield Limited (MHL) was retained by 6165347 Manitoba Inc. to provide a site servicing report according to the latest proposed layout plan provided to MHL on April 17, 2017 (see Figure 1) and address City of Winnipeg comments on the August 15, 2017 site servicing report prepared by Morrison Hershfield Ltd. The new development plan presents single family homes, multi-family residents and a public reserve area. The total area of the development is 47.35 acres (19.16 hectare)

Distribution of the areas for the above is noted below.

1) Public Reserve Area = 3.87 Acres or 1.57 ha (Preserved Forest)
2) Single Family Area = 26.21 Acres or 10.61 ha
3) Multi-family Area = 17.27 Acres or 6.98 ha

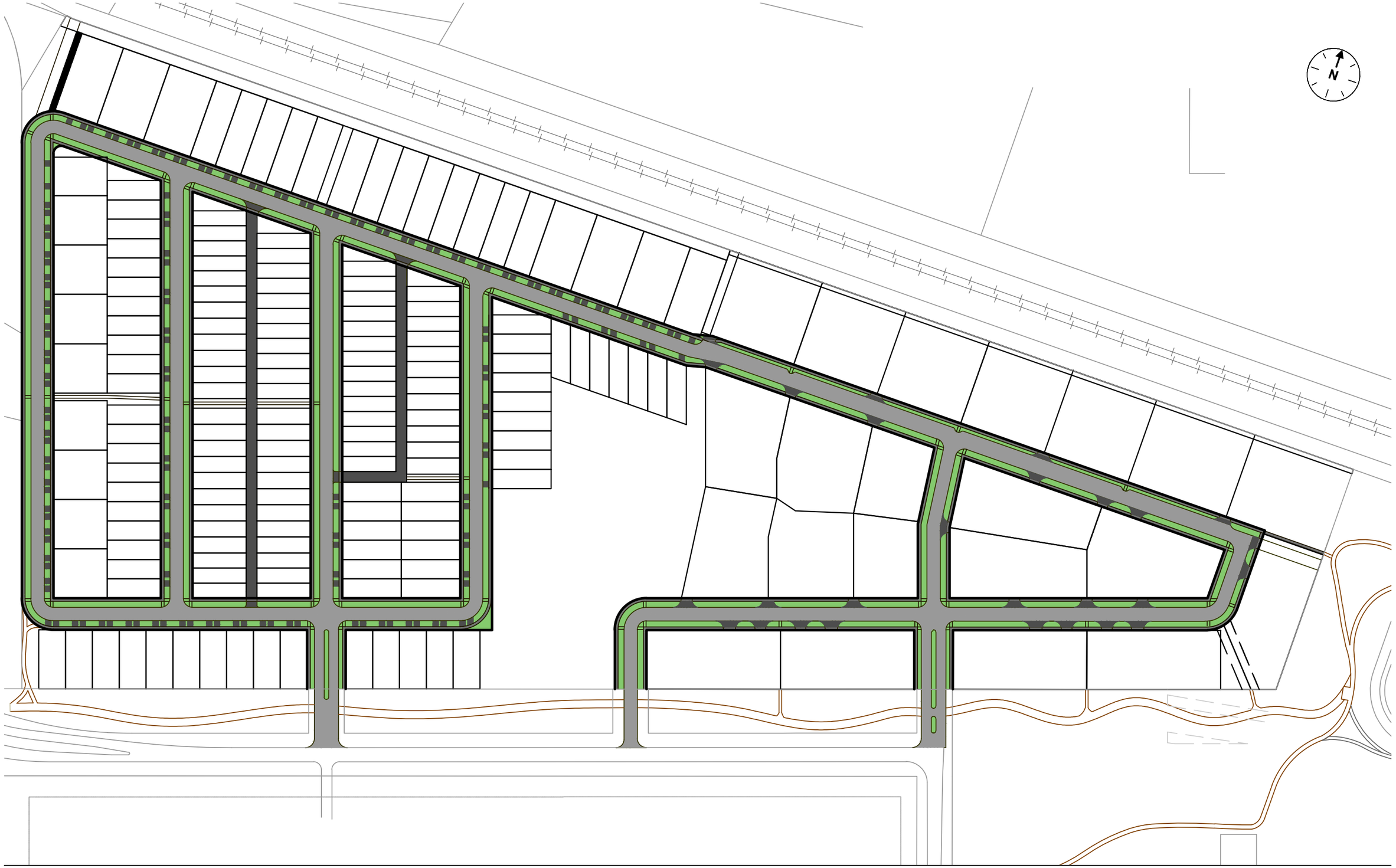
MHL reviewed the impact of the new development upon the existing servicing infrastructure and provided recommendations for new infrastructure to be installed to meet the serving requirements of the new development. MHL carried out watermain distribution, land drainage sewer, and a wastewater sewer study in support of this proposed development.

The study area is shown in Figure 2 on the following pages.

The proposed development area is located in close proximity to a fully developed residential community. Major arterial streets in close proximity to the proposed development are Hurst Way, South-Western Bus Rapid Transit (SWBRT) to the south and Parker Avenue to the south and east. In addition to the streets mentioned above, there is a CN rail right-of-way on the north property line, the Winnipeg Human Society, and a commercial development along the west property line of the site.

Scope:

I. Communicated with the respective City of Winnipeg departments.
II. Gathered information regarding existing and expected pressure and flows, land drainage flows, wastewater sewer flows and combined sewer flows.
III. Analyzed existing conditions of water and wastewater sewers in the vicinity.
IV. Analyzed the existing capacity and level-of-service for wastewater sewers.
V. Completed grading design for roads and lots for the subdivision to address drainage.
VI. Established anticipated water flow requirements for the new development, additional water mains, boundary conditions in coordination with the City.
VII. Established anticipated increase in land drainage sewer (LDS) flows from the new development, and completed tail water analysis for the LDS with rest to the reginal pond.
VIII. Established anticipated increase in wastewater sewer flows from the new development with respect to the available capacities in the existing wastewater system.
IX. Addressed City comments for LDS, wastewater and water on August 2017 report.



N:\Proj\3170097\9. Drawings & GIS\07 Sheets\FIG 1 SITE LAYOUT PLAN.dwg Last Saved: 1/22/2018 3:02 PM by CPirelaBohorquez Plotted: 1/29/2018 11:56 AM by Carlos Pirela Bohorquez

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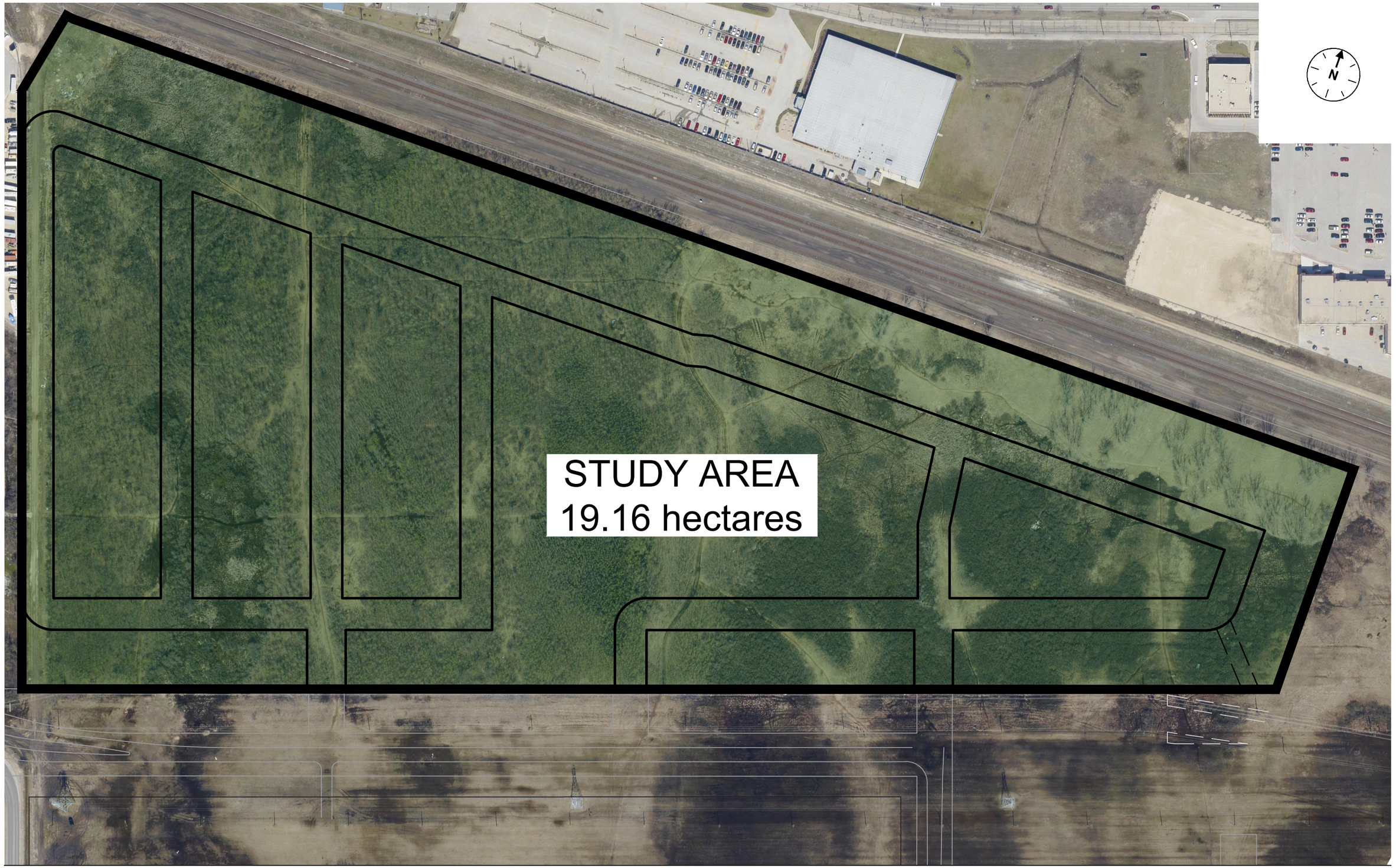
Parker Lands Figures

FIG 1 - SITE LAYOUT PLAN

PRELIMINARY - SUBJECT TO CHANGE

SCALE 1:2000



N:\Proj\31700971\9. Drawings & GIS\07 Sheets\FIG 2 STUDY AREA PLAN.dwg Last Saved: 1/22/2018 3:06 PM by CPielaBohorquez Plotted: 1/29/2018 11:57 AM by Carlos Pirela Bohorquez

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FIG 2 - STUDY AREA PLAN

PRELIMINARY - SUBJECT TO CHANGE

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X. Addressed drainage for the proposed park.
XI. Provided sanitary capacity for the development area south of SWBRT.

LGN Consulting Engineering teamed up with Morrison Hershfield and completed land drainage service design for parker lands. Luis Narvaez is the owner and Stormwater Engineer of LGN Consulting Engineering. Luis Narvaez had worked with MHL on multiple projects and had proved himself by doing an excellent job for analysis and storm drainage reports.

2. SITE CHARACTERISTICS AND GRADING

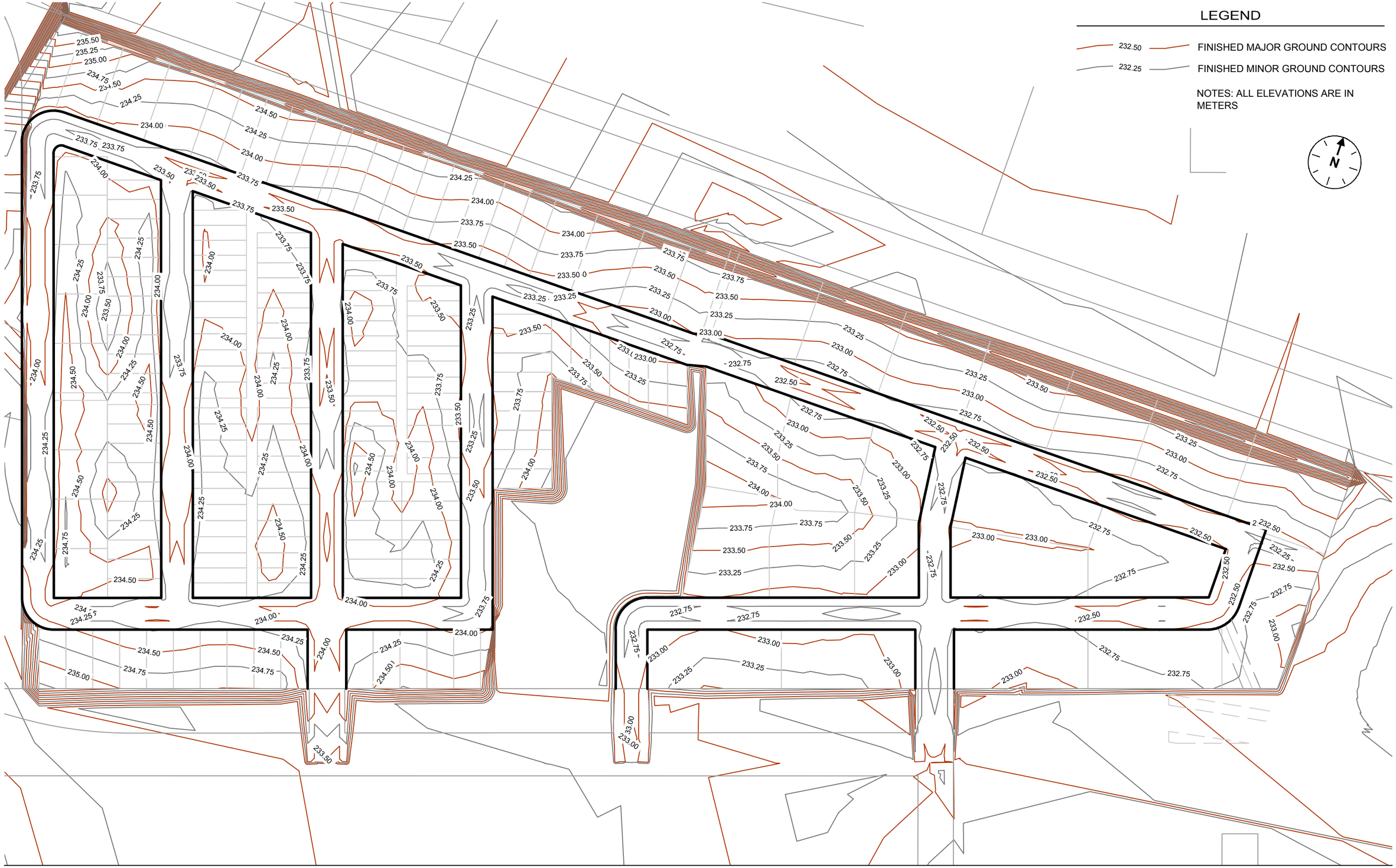
The Parker Lands are situated north of the existing Beaumont community, south of the CN Railway line, and east of Waverley Street. The lands have not been previously developed and are vacant. The Parker Lot has a series of overhead hydro transmission lines. All existing underground services are located in the adjacent community of Beaumont. There is an existing water line running north to south through the Parker Land property.

The City of Winnipeg has constructed the first phase of the SWBRT route extending downtown Winnipeg and the Pembina/Jubilee overpass. The second phase of the SWBRT is intended to continue from the Pembina/Jubilee overpass to the University of Manitoba and surrounding neighborhoods. The SWBRT alignment traverses just south of the Parker Lands. The Hurst way will also have a new alignment just south of the Parker Land development and north of SWBRT. The Parker Land development will have three access points from Hurst Way.

The property on the east side of the Parker Lands is owned by the City of Winnipeg. A regional storm retention pond will be constructed on this parcel by the City of Winnipeg as part of their program to eliminate combined sewers. The report for this pond is still in the finalization process by the City of Winnipeg. Parker Lands is included in the catchment area of this pond.

Site Grading:

Preliminary site grading is completed to address the drainage challenges for the entire subdivision. Grading of the site is driven by the sanitary connection point (See Figure 4B). Fill is required for the site to provide wastewater sewer service by gravity. Drainage of the site is controlled on site and subdivision flows towards the regional pond to the east of the subdivision. A berm is introduced along the Canadian National (CN) rail right-of-way for sound annotation purposes and drainage control. A retaining wall is introduced along the west and south property line (Specifically in the south –west corner of the subdivision) of the parcel to contain drainage on site. An open pipe inlet is provided to the proposed park to collect drainage and bring it to the LDS and eventually to the pond. Back sloping from the adjacent lots for the areas where there is no retaining wall is going into the CN rail and City property on north and south of the parcel (see Figure 3).



N:\Proj\3170097\9. Drawings & GIS\07 Sheets\FIG 3 SITE GRADING PLAN.dwg Last Saved: 1/22/2018 3:14 PM by CPirelaBohorquez Plotted: 1/29/2018 12:00 PM by Carlos Pirela Bohorquez

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Parker Lands Figures
FIG 3 - SITE GRADING PLAN
PRELIMINARY - SUBJECT TO CHANGE
SCALE 1:2000

3. LAND DRAINAGE SERVICE (STORMWATER MANAGEMENT REPORT)

The land drainage service (LDS) pipe design is completed for a 1:5-year storm utilizing the rational method.

A 1:25-year storm is used to determine the overland drainage system. On the whole drainage from within site is contained on site and is flowing from west to the east into the reginal pond. The inlet to the pond is designed considering the normal water level in the regional pond.

The Stormwater Management Report (SWMR) is completed by Luis Narvaez (LGN Consulting Engineering) and is included as **Appendix A** for your review. Luis addressed all the City comments provided on the previous version of the report. All figures related to the LDS are included in the report in Appendix A.

4. WASTEWATER SEWER EVALUATION

The wastewater network design has been revised to meet the requirements of the new proposed development plan shown in Figure 1. The revised design addresses all City of Winnipeg comments on the August 2017 report.

4.1 WASTEWATER DESIGN CRITERIA

The following table summarizes the wastewater design guidelines taken from the City of Winnipeg website. These design criteria were used to analyze the wastewater system.

TABLE 4.1: WASTEWATER DESIGN CRITERIA

LAND USE	DENSITY	
	(Units/Hectare)	(People/Unit)
Single Family	12.29	3.05
Multi-Family	74.13	2.3
OTHER DESIGN STANDARDS		
Manhole Drop @ Deflection < 45 deg (cm)	3	
Manhole Drop @ deflection 45-90 deg (cm)	6	
Groundwater Infiltration (L/ha/day)	2200	
Manhole Infiltration (L/min/manhole)	12	
Max. Manhole Spacing (m)	150	
Residential Manhole Density (MH/ha)	1.6	
Minimum Pipe Size (mm)	250	
Minimum Full Flow Velocity (m/s)	0.6	
Pipe Manning's n =	0.013	
Actual Per capita flow =	270	L/c/d

The manhole drops are not part of the guidelines but it is assumed that 3 cm and 6 cm are acceptable manhole drops for deflections less than 45 degrees and greater than 45 degrees, respectively, which may be used for this project.

4.2 WASTEWATER FLOW

The proposed concept plan indicates that the development will include single family and multi-family residential. The multi-family development would include apartment buildings. This development area is currently located within the Cockburn/Calrossie sewer district. The residential units based on building types and corresponding population are shown below:

- Single Family, 240 Units at 3.05 ppl/unit
- Multi-Family, 1502 Units at 2.30 ppl/unit
- Additional population is included for the units south of the SWBRT and existing properties just north of Parker Avenue as requested in the City comments on September 2016 report this brings the total anticipated population to 4,797 people

The number of people per unit is based on the City of Winnipeg "Wastewater Flow Estimation and Servicing Guidelines". Based on the above assumed population and design criteria, the wastewater flow is calculated to be:

- Average Dry Weather Flow (ADWF): 15.0 L/s
- Peak Dry Weather Flow (PDWF): 49.0 L/s (Harmon's Peaking Factor)
- MH infiltration (from Sags): 5.4 L/s
- Groundwater Infiltration (I/I): 0.43 L/s
- Peak Wet Weather Flow (PWWF): 54.8L/s

Therefore, the downstream system will need to accommodate 54.8 L/s Peak Wet Weather Flow (PWWF) from this proposed development as well as the areas south of the SWBRT.

4.3 WASTEWATER SEWER CONNECTION POINT

Based on the above criteria and anticipated population the sewer main would need to be a minimum diameter of 375 mm to accommodate wastewater from the study area. At the minimum slope requirements (0.145%) this size of sewer pipe would accommodate the Peak Wet Weather Flow (PWWF) and meet minimum and maximum velocity requirements. Manhole 22 to existing Manhole 18631, 375 mm pipe accommodate flow from the future properties located just south of the SWBRT and existing properties just north of Parker Avenue. This pipe will provide service to the new developments only and does not replace the existing 300 mm diameter combined sewer on Parker Avenue.

Most of the wastewater sewer pipes within the subdivision are 300 mm diameter PVC at a minimum slope of 0.20%, except the most upstream segments that are sloped at 0.45% to have 0.60 m/s flushing velocity with the low flow.

The connection point elevation is taken as 227.27 m as mentioned in the previous version of the report and was recorded physically at site. Manhole drops are considered and minimum cover requirements are met for all pipe segments. Being the City of Winnipeg land no easement is required for the pipes being installed between the south property line and the termination point of the Beaumont Street ROW. Please see Figure 4A and 4B.

An offsite pipe is installed north-south within the Beaumont Street alignment on the east side of the SWBRT bus terminal and east to Wynne Street along Heatherdale Avenue.

A 600 mm diameter combined sewer pipe exists at Parker Avenue and Wynne Street (downstream of Manhole 18631) that has the capacity to collect the wastewater flow from the proposed development. The existing trunk was installed with a cover depth of just over 4 m. Therefore, the proposed sewer main and on-site sewer piping will be constrained by the lowest possible tie-in invert elevation at this manhole.

As we were not sure how much area is flowing to existing 600 mm combined sewer, actual flow in this pipe is measured. Wastewater sewer flow monitoring at Manhole 18631 was completed by SFE Global from May 2015 to July 2015 (SFE report in Appendix A). The maximum flow that occurred at this location was 3.2 L/s which is much lower than the 363 L/s capacity of the 600 mm diameter pipe (slope=0.35%). Based on a peak flow from study area of 54.8 L/s and the current flow of 3.2 L/s, this totals 58.0 L/s which means the 600 mm combined trunk will be flowing 15.9% full during dry season. Since this is a combined sewer, the remaining capacity available will be used for Stormwater until the combined sewers are separated in the future.

4.4 PROPOSED WASTEWATER SEWER NETWORK

The wastewater sewer piping within the development (on-site) are designed to generally follow the overall grading and to maintain proper depth over the entire site. As mentioned above, one of the constraints is the existing upstream invert elevation of the 600 mm pipe. The design of the sewer network was completed by achieving the minimum slope requirements, minimum velocity, capacity of 85% full, and minimum depth of burial of 2.50 m. The wastewater layout is shown in Figure 4A and 4B on the following page. A detailed analysis of the complete system is provided in the table in **Appendix B**.

Figure 4A and 4B - Wastewater Layout Plans

LEGEND

PROPOSED SANITARY MAIN

TYPE 5A MANHOLE

NOTES: ALL LENGTHS ARE IN METERS

N

S MH 1
S MH 2
S MH 3
S MH 4
S MH 5
S MH 6
S MH 7
S MH 8
S MH 9
S MH 10
S MH 11
S MH 12
S MH 13
S MH 13A
S MH 14
S MH 15
S MH 16
S MH 17
S MH 18
S MH 19
S MH 20

S 300 PVC L=145.872 S=0.200%
S 300 PVC L=120.000 S=0.450%
S 300 PVC L=83.690 S=0.200%
S 300 PVC L=118.087 S=0.200%
S 300 PVC L=120.000 S=0.200%
S 300 PVC L=90.111 S=0.200%
S 300 PVC L=88.179 S=0.200%
S 300 PVC L=120.000 S=0.200%
S 300 PVC L=77.491 S=0.200%
S 300 PVC L=62.443 S=0.200%
S 300 PVC L=120.000 S=0.200%
S 375 PVC L=133.536 S=0.145%
S 375 PVC L=10.988 S=0.145%
S 375 PVC L=141.823 S=0.144%
S 375 PVC L=105.000 S=0.145%
S 375 PVC L=70.000 S=0.145%
S 375 PVC L=34.932 S=0.145%
S 375 PVC L=53.804 S=0.145%
S 375 PVC L=140.000 S=0.145%
L=78.943 S=0.450% S 300 PVC
L=85.039 S=0.200% S 300 PVC
L=73.056 S=0.200% S 300 PVC
L=130.000 S=0.450% S 250 PVC
L=150.000 S=0.250% S 300 PVC

PROPOSED 9.0m PUBLIC RESERVE

FIG 4B

N:\Proj\3170097\9. Drawings & GIS\07 Sheets\FIG 4A WASTEWATER LAYOUT PLAN.dwg Last Saved: 1/29/2018 11:46 AM by CPirelaBohorquez Plotted: 1/29/2018 2:18 PM by Carlos Pirela Bohorquez

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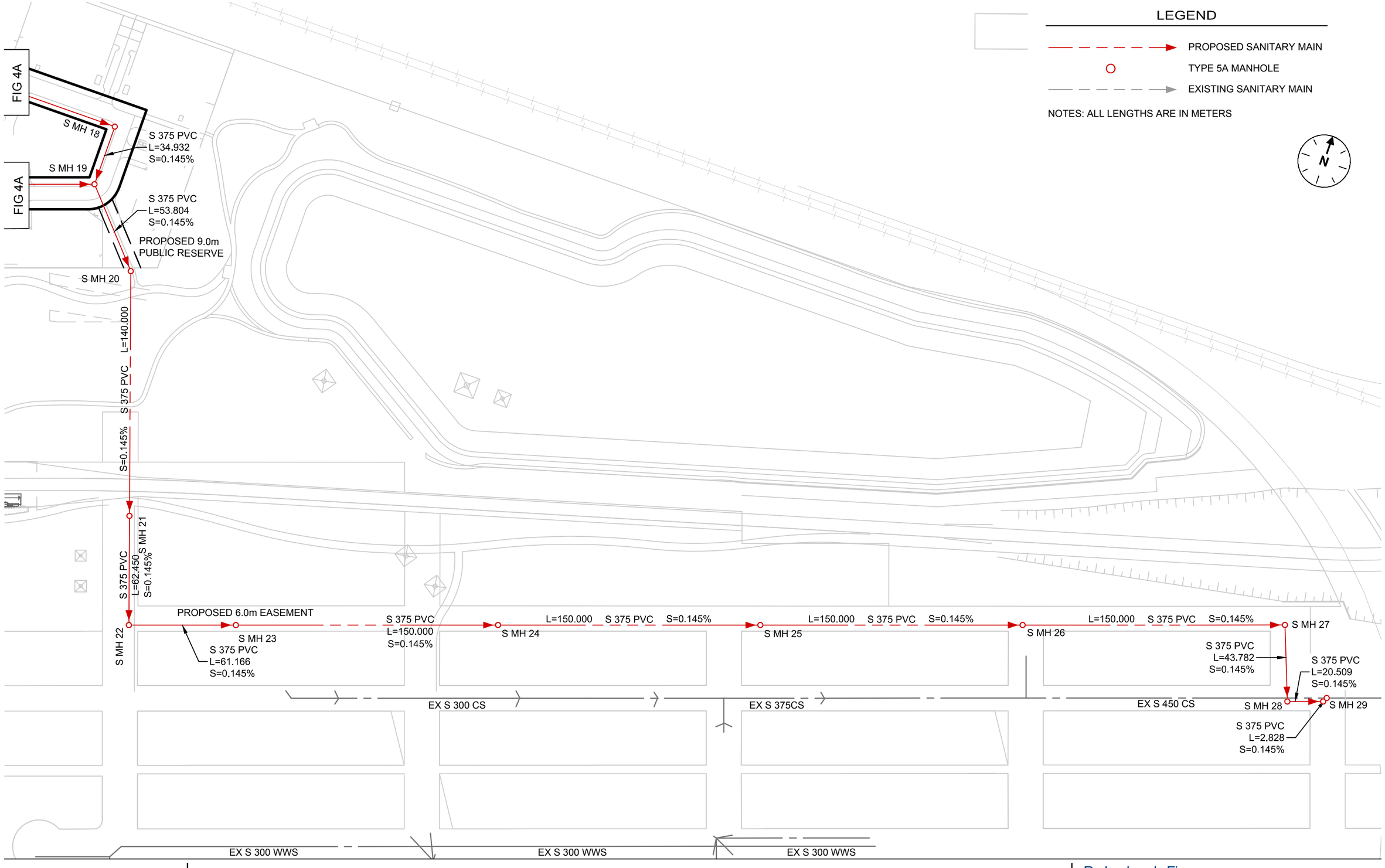
FIG 4A - WASTEWATER LAYOUT PLAN

PRELIMINARY - SUBJECT TO CHANGE

SCALE 1:2000



N:\Proj\317009\9. Drawings & GIS\07 Sheets\FIG 4B WASTEWATER LAYOUT PLAN.dwg Last Saved: 1/29/2018 11:44 AM by CPirelaBohorquez Plotted: 1/29/2018 2:17 PM by Carlos Pirela Bohorquez

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FIG 4B - WASTEWATER LAYOUT PLAN

PRELIMINARY - SUBJECT TO CHANGE

SCALE 1:2000

5. WATER DISTRIBUTION SYSTEM EVALUATION

A hydraulic water network analysis was completed considering the proposed domestic water and fire flow demands in the study area. The water mains were sized and evaluated for the effects of the new proposed development water demands on the existing City of Winnipeg water distribution system pressure and flows. The design criteria included sizing the new watermain to provide the required demands (flows) at acceptable residual pressures and velocities under the current city of Winnipeg distribution system conditions. The design was completed as per the new development plan and in coordination with The City of Winnipeg simulation flow and pressure curves. The City of Winnipeg has reviewed and approved the design. Please see simulation flow and pressure curves and correspondence in Appendix C.

5.1 WATER DESIGN CRITERIA

The following table summarizes the water demand estimation and design guidelines available from the City of Winnipeg website. These design criteria were used to analyze the proposed water distribution system.

TABLE 5.1: WATER NETWORK DESIGN CRITERIA

Actual ADD (l/c/d)	ADD	225+10%
Max Daily Demand (l/c/d)	MDD	1.6*ADD
Peak Hour Demand (l/c/d)	PHD	2.5*ADD
Minimum Fireflow (L/s)	Single Family	100
	Multi-Family	200
Hazen William's C-Factor	Diameter <=200 mm	120
	Diameter >200 mm	130
Pipe	Minimum Cover	2.5 m
	Minimum Diameter	150 mm
Minimum Residual Pressure (kPa)	Peak Hour (Water Main)	207
	Peak Hour (Feeder Main)	310
	MDD+Fire Flow	140
Maximum Desired Velocity (m/s)		3
People Per Unit	Single Family	3.05
	Multi Family	2.30

The minimum fireflow required for this site is 100 L/s for single family homes and 200 L/s for multi-family areas. All fireflows must attain a minimum residual pressure of 140 kPa.

5.2 WATER CONNECTION POINTS

To provide enough flow and pressure for the proposed distribution system, the following connection points were considered for the study area:

- Connection Point #1 – 250 mm diameter pipe tied-in to the existing 250 mm main at the property line of Parker Lands on the north.
- Connection Point #2 – 250 mm diameter pipe tied-in to the existing 250 mm main at the Cooney Street and Parker Avenue intersection
- Connection Point #3 – 200 mm diameter pipe tied-in at the existing 200 mm connection between Beaumont and Daniel Street on Parker Avenue

The available flow and pressure curves at each connection point were provided by the City of Winnipeg and are included in **Appendix C**.

5.3 WATER DEMAND

The City of Winnipeg guidelines for water supply consumption calls for 225 L/c/d + 10% as average daily demand (ADD) with a maximum daily demand (MDD) factor of 1.6 and with a peak hour demand (PHD) factor of 2.5. Table 5.2 shows the total population and demand values:

TABLE 5.2 - TOTAL POPULATION AND DEMAND

	Units	People per Units	Number of People	ADD (L/s)	MDD (L/s)	PHD (L/s)
Single Family	240	3.05	732	2.1	3.4	5.3
Multi-Family	1502	2.30	3455	9.9	15.8	24.8
Total	1742		4187	12.0	19.2	30.0

For a total population of 4187 people, a total PHD of 30 L/s is needed. The PHD minimum pressures required for water mains is 207 kPa, and 310 kPa for feeder mains. During MDD plus fireflow, a minimum residual pressure of 140 kPa is to be maintained.

5.4 PROPOSED WATER NETWORK

The proposed site layout including the node and demand boundaries shown on Figure 5. The water supply distribution network is based on a 250 mm main loop which links connection points #1 and #2 and then 200 mm secondary loops connected to it. The 250 mm diameter main is needed to meet the fire flow and velocity requirements at the multi-family sites.

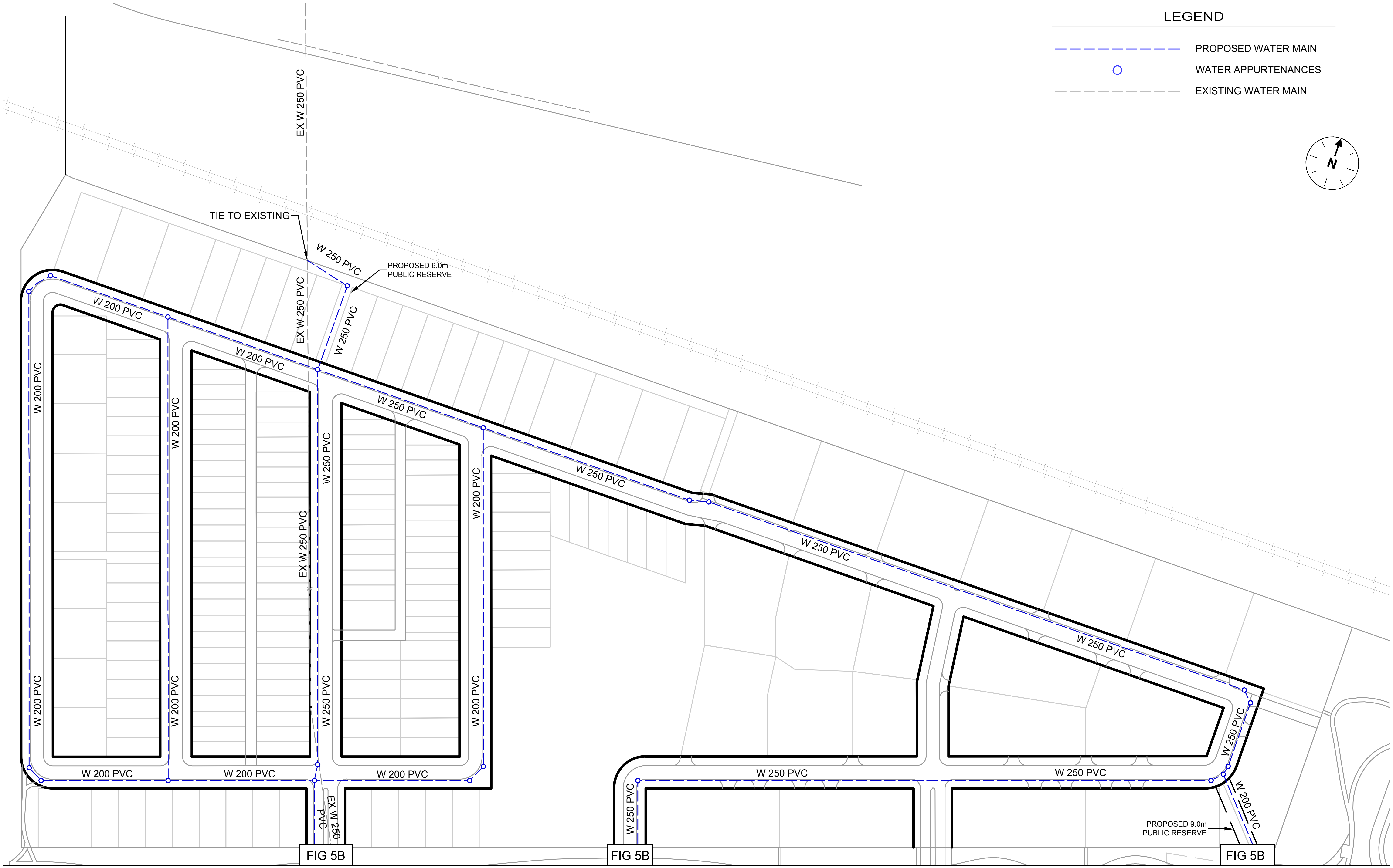
Figure 5A and 5B – Water Pipe Layout

5.5 MODEL METHODOLOGY AND SCENARIOS

The proposed water distribution network was analyzed using Bentley's WaterCAD software (V8i). The existing system connections were modeled by a reservoir and a pump system to simulate the available flow and pressure curves that the City provided. Since the fire flows are much higher than the consumption, the fire flow scenario was used to evaluate the connections.
MDD plus fireflow and PHD scenarios were analyzed assuming all three connections were active. At each scenario, pipe size changes were considered to achieve the best available fire flows as well as ensuring velocities do not exceed 3 m/s and pressures remain above 140 kPa. Appendix B contains the summary report of each scenario completed for this analysis. Individual fire flow node tests at high elevation points such as node J-14, J-5, J-7, and J-10 were checked to ensure velocities do not exceed 3 m/s.

5.6 RESULTS AND RECOMMENDATION

All three connection points including the pipe sizes provided enough flow and pressure to satisfy demands and fire flow requirements. Not all connections are needed; however, to add some redundancy for safety and security, a combination of all connections points is recommended.



N:\Proj\3170097\9. Drawings & GIS\07 Sheets\FIG 5A WATER DISTRIBUTION LAYOUT PLAN.dwg Last Saved: 1/29/2018 11:51 AM by CPirelaBohorquez Plotted: 1/29/2018 2:16 PM by Carlos Pirela Bohorquez

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Parker Lands Figures

FIG 5A - WATER DISTRIBUTION LAYOUT PLAN

PRELIMINARY - SUBJECT TO CHANGE

SCALE 1:2000

FIG 5A

FIG 5A

FIG 5A

EX W 250 PVC

W 250 PVC

W 200 PVC

W 200 PVC

W 200 PVC

W 250 PVC

W 250 PVC

W 250 PVC

W 250 PVC

W 250 PVC

W 250 PVC

W 250 PVC

W 250 PVC

W 200 PVC

PROPOSED 9.0m
PUBLIC RESERVE

W 200 PVC

W 200 PVC

W 200 PVC

TIE TO EXISTING

TIE TO EXISTING

W 200 PVC

LEGEND

PROPOSED WATER MAIN

WATER APPURTENANCES

EXISTING WATER MAIN

N

N:\Proj\31700979\9. Drawings & GIS\07 Sheets\FIG 5B WATER DISTRIBUTION LAYOUT PLAN.dwg Last Saved: 1/29/2018 11:51 AM by CPirelaBohorquez Plotted: 1/29/2018 2:22 PM by Carlos Pirela Bohorquez

MORRISON HERSHFIELD

6165347 MANITOBA INC.

Parker Lands Figures

FIG 5B - WATER DISTRIBUTION LAYOUT PLAN

PRELIMINARY - SUBJECT TO CHANGE

SCALE 1:2000

6. SUMMARY OF RECOMMENDATIONS

Here is the summary of the findings and recommendations for Wastewater, Water and Land Drainage Service designs.

6.1 LAND DRAINAGE SERVICES (LDS) CONCLUSION & RECOMMENDATIONS

All conclusions and recommendations for LDS are provided on page 10 of the Stormwater Management Report in **Appendix A** of this report.

6.2 WASTEWATER DESIGN FINDINGS AND RECOMMENDATIONS

Analysis shows the following:

- The Parker Land subdivision can be serviced by gravity without making any updates to the existing city infrastructure.
- The max on site invert elevation is 231.48 that is just below the existing ground elevations on site. A fill minimum of 2.5 m is required on top of wastewater sewer pipes to provide cover. Filling the site is recommended as dirt is available in the area. This will also help reduce the drainage backflow effect from the pond in any major storm event.
- An alternative solution could be the installation of a lift station or provision of insulation on top of pipes to reduce cover requirements. The lift station requires regular maintenance and sometimes a second lift station is required for backup. Reducing the cover sometimes causes service connection issues, which we would not recommend.

6.3 WATER RECOMMENDATIONS

Analysis shows the following:

- There are enough connection points available around the Parker Lands subdivision, including the 250 water main crossing the site north-south under the CN rail right-of-way. A portion of this existing main needs to be abandoned or removed. Connection to this existing 250 main will be rearranged according to the layout plan.
- No upgrades are required to the existing water network.

7. CLOSURE

This report and appendices are intended solely for the use of the individual, company, government or other entity for which this document was prepared, and for the purposes and within the limitations stated in the document. Duplication or distribution of this report or any portion hereof is forbidden and requires approval from the client and Morrison Hershfield Limited.

The information presented in this report is based on data that was available at the time of this investigation. It should be noted that the information is subject to change with detailed design and construction. Any errors or omissions found in this report should be submitted to Morrison Hershfield Limited as soon as possible.

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No. 1736

Appendix A

1. Land Drainage Service Report
2. Correspondence

PARKER LANDS

Revised Stormwater Management Report

Prepared for:

6165347 Manitoba Inc.

Prepared by:

LGN Consulting Engineering Ltd.
stormwater and water resources management

January 2018

Project LGN1719

Table of Contents

LIST OF TABLES iii

LIST OF FIGURES iv

1.0 INTRODUCTION 1

2.0 SITE DESCRIPTION AND DESIGN CRITERIA 2

2.1 Design Objectives 2
2.2 Source Control Best Management Practices 2

3.0 ANALYSIS METHODOLOGY AND DATA 4

3.1 Design Storm 4
Single Storm Event Analysis 4
3.2 Computer Model 4
3.3 Major – Minor System 4
3.4 Subcatchments 5
3.5 Infiltration 6
3.6 Storage 6

4.0 RESULTS 7

4.1 Storage 7
4.2 Minor System Flows 7
4.3 Major System Flows 8
4.4 Surcharge (Hydraulic Grade Line) Analysis 8

5.0 SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS 10

REFERENCES 12

APPENDICES

Appendix A PCSWMM Input & Report Files
Appendix B Minor System Analysis
Appendix C HGL Profiles
Appendix D Discharge Curves

List of Tables

Table 1 - Design Storm Parameters 4

Table 2 – Sub-Catchment Parameters used in the model 5

Table 3 - Infiltration Parameters 6

Table 4 - Permissible Discharge Rates and Preliminary On-site Storage Requirements for Multi-family Sites 7

Table 5 - Minor System Boundary Conditions – Outflow at ST MH2 8

Table 6 – Summary of Surcharge Conditions 8

List of Figures

Figure 1 - Site Location 13

Figure 2 - Study Area 14

Figure 3 - PCSWMM Subcatchment Boundaries 15

1.0 INTRODUCTION

LGN Consulting Engineering Ltd. was retained by Morrison Hershfield on behalf of 6165347 Manitoba Inc. to prepare a Stormwater Management Report (SWMR) for the Parker Lands, in support of a subdivision application.

The study area is located in Winnipeg, Manitoba. **Figure 1** shows the location of the site relative to the City of Winnipeg and **Figure 2** shows the study area relative to the existing surrounding communities.

There is a document that have set the guidelines for stormwater management for land development in the City of Winnipeg, it is the following:

- James F. MacLaren Limited; *Drainage Criteria Manual for the City of Winnipeg;* No date available.

This SWMR complies with all the criteria's set by the above noted report. The key objective of this study was to provide design requirements for the controlled flow of runoff resulting from intense storms up to and including the 1:100 year event. The key objective identified:

- Peak flows in the storm sewers are to be controlled to allowable limits based on design flows and capacities of individual segments.

The analysis in this report is an office study based on data and reports by others. No detailed field survey was undertaken by LGN. Morrison Hershfield provided a copy of the site layout and grading (see attached Drawings at the back). The site layout, grading and sub-catchment areas have been assumed to be accurate and correct.

2.0 SITE DESCRIPTION AND DESIGN CRITERIA

The study area is composed of three land uses; single family housing, multi-family sites and undeveloped lands that discharge into the proposed stormwater retention facility east of the proposed development. **Figure 2**, Study Area shows the site location and development boundary, which comprises of 18.31 ha of residential development.

The analysis is based on the following assumptions:

- The entire development area will be drained using the Dual Drainage Concept (minor/major system).
- The detail overland drainage design must ensure the safe conveyance through the development of the overland flows generated by the 100-year and the May 2010 event.
- Any stormwater runoff on the streets or individual development lots must meet the City of Winnipeg stormwater management guidelines.

2.1 Design Objectives

The objectives of the study are to quantify stormwater storage volume requirement and size of Inlet Control Devices (ICDs) that will control the discharge from multi-family sites into the minor system. During detail design the Multi-family sites must contain within their site runoff generated up to a 1:100 year storm event.

2.2 Source Control Best Management Practices

In the interest of an environmentally sensitive development, there are a range of alternative storm servicing concepts that can be considered in new developments. These concepts require additional area for stormwater facilities and/or implementation of some Stormwater Source Control.

The following Best Management Practices (BMP) were included in the PCSWMM model:

- All roof drainage from single family houses and garages to be directed to landscaped areas prior to draining to streets or lanes. Items like wide splash pads should be used to ensure that the roof drainage is properly distributed over the landscaped areas, see image below;

- Rear lot drainage from all homes backing on to MR's and environmental significant areas should discharge to those areas as sheet flow.

3.0 ANALYSIS METHODOLOGY AND DATA

3.1 Design Storm

The City of Winnipeg design requirements indicates that the runoff analysis includes the 1:5 year, 1:25 year, 1:100 year design storms and the May 2010 storm event.

Single Storm Event Analysis

The Single Storm Event Analysis is the most common stormwater management analysis method and is based on a single storm event which could be a real historic storm or a theoretical design storm. The precipitation input to the single event simulation model is obtained using the City of Winnipeg Intensity Duration Frequency (IDF) curve and the "Chicago Storm" distribution to shape the design hyetograph. For this study, a storm with 3 hours duration and 5 minute rainfall increments was used. **Table 1** summarizes the Design Storm Parameters.

Table 1 - Design Storm Parameters

Storm	a	b	C
1:5 year	1199	8	0.828
1:25 year	1842	9	0.842
1:100 year	Time Series provided by the City		
May 2010	Historical Data provided by the City		

Continuous Simulation

Continuous simulation modelling for a drainage area allows for a continuous analysis of runoff over a period of time. The continuous simulation was performed using precipitation data recorded at the City of Winnipeg for the period of May 28th to May 30th 2010.

3.2 Computer Model

The analysis for this study was performed using the PCSWMM 2017 computer model software Version 7.0.2480 Professional. PCSWMM is software developed by Computer Hydraulics International and is a comprehensive, GIS-based, spatial decision support system for urban drainage and watershed modeling. Integrating the US EPA SWMM5 engine Version 5.1.012, it accounts for various hydrologic processes that produce runoff from urban and rural areas. PCSWMM also contains a flexible set of hydraulic modeling capabilities used to route runoff, rainfall-dependent infiltration/inflow, and/or external inflows through the drainage system network of pipes, channels, storage/treatment units and diversion structures.

3.3 Major – Minor System

The PCSWMM model was primary used to evaluate the runoff generate for each storm event being analyzed, quantify pipe flows. It was also used to estimate the storage required in the multi-family site traplows for the 1:100 year storm event and determine the size of ICDs that will control the site discharge to the maximum allowed. The minor system was designed by Morrison Hershfield, see spreadsheet attached in **Appendix B**.

3.4 Subcatchments

Figure 3 shows the subcatchment boundaries and **Table 2** lists the model subcatchments and the parameters used in the computer model.

Table 2 – Sub-Catchment Parameters used in the model

Catchment ID (PCSWMM)	Land use	Area (ha)	Imp (%)	Flow Length (m)	Flow Width (m)	Slope (%)
A1	Quadplex front yards	0.059	62	30	20	2
A2	Quadplex front yards	0.072	62	30	24	2
A3	Quadplex front yards	0.043	62	30	14	2
A4	Quadplex and Single Family	0.510	56	30	170	2
A5	Quadplex and Single Family	0.588	56	30	196	2
A6	Quadplex and Single Family	0.206	56	30	69	2
A7	Single Family	0.033	50	30	11	2
A8	Single Family Front Yard (Backlane)	0.066	50	30	22	2
A9	Single Family Front Yard (Backlane)	0.066	50	30	22	2
A10	Single Family Front Yard (Backlane)	0.022	50	30	7	2
A11	Single Family (Backlane)	0.214	50	30	71	2
A12	Single Family (Backlane)	0.650	50	30	217	2
A13	Single Family (Backlane)	0.451	50	30	150	2
A14	Quadplex (Sidelane)	0.213	62	30	71	2
A15	Quadplex and Duplex	0.363	57	30	121	2
A16	Duplex	0.384	52	30	128	2
A17	Duplex	0.357	52	30	119	2
A18	Duplex	0.153	52	30	51	2
A19	Duplex	0.102	52	30	34	2
A20	Duplex	0.153	52	30	51	2
A21	Single Family Front Yard	0.114	50	30	38	2
A22	Single Family Front Yard	0.036	50	30	12	2
A23	Single Family Front Yard (Backlane)	0.074	50	30	25	2
A24	Single Family Front Yard (Backlane)	0.025	50	30	8	2
A25	Single Family (Backlane)	0.501	50	30	167	2
A26	Single Family (Backlane)	0.399	50	30	133	2
A27	Single Family Front Yard (Backlane)	0.120	50	30	40	2
A28	Duplex	0.320	52	30	107	2
A29	Single Family	0.221	50	30	74	2
A30	Single Family	0.124	50	30	41	2
A31	Single Family	0.258	50	30	86	2
A32	Qaudplex	0.465	62	30	155	2
A33	Multi-Family Residential	0.254	58	30	85	2
A34	Multi-Family Residential	0.197	35	30	66	2
A35	Multi-Family Residential	0.476	58	30	159	2
A36	Multi-Family Residential	0.395	35	30	132	2
A37	Multi-Family Residential	0.266	58	30	89	2
A38	Multi-Family Residential	0.395	35	30	132	2
A39	Multi-Family Residential	0.297	58	30	99	2
A40	Multi-Family Residential	0.232	35	30	77	2
A41	Multi-Family Residential	0.232	35	30	77	2
A42	Multi-Family Mixed Use Residential	0.222	79	30	74	2
A43	Multi-Family Mixed Use Residential	0.545	79	30	182	2
A44	Multi-Family Residential	0.264	58	30	88	2
A45	Multi-Family Mixed Use Residential	0.255	79	30	85	2
A46	Multi-Family Residential	0.439	58	30	146	2
A47	Multi-Family Mixed Use Residential	0.255	79	30	85	2
A48	Multi-Family Residential	0.222	58	30	74	2
A49	Preserved Forest	1.567	0	80	196	2
R1	Road Right-of-way	0.157	75	2	785	2

Catchment ID (PCSWMM)	Land use	Area (ha)	Imp (%)	Flow Length (m)	Flow Width (m)	Slope (%)
R2	Road Right-of-way	0.189	75	2	944	2
R3	Road Right-of-way	0.186	75	2	932	2
R4	Road Right-of-way	0.227	75	2	1136	2
R5	Road Right-of-way	0.171	75	2	854	2
R6	Road Right-of-way	0.178	75	2	888	2
R7	Road Right-of-way	0.236	75	2	1178	2
R8	Road Right-of-way	0.202	75	2	1010	2
R9	Road Right-of-way	0.239	75	2	1194	2
R10	Road Right-of-way	0.188	75	2	941	2
R11	Road Right-of-way	0.189	75	2	947	2
R12	Road Right-of-way	0.228	75	2	1141	2
R13	Road Right-of-way	0.188	75	2	938	2
R14	Road Right-of-way	0.199	75	2	997	2
R15	Road Right-of-way	0.187	75	2	936	2
R16	Road Right-of-way	0.310	75	2	1552	2
R17	Road Right-of-way	0.145	75	2	725	2
R18	Road Right-of-way	0.145	75	2	727	2
R19	Road Right-of-way	0.173	75	2	867	2
R20	Road Right-of-way	0.159	75	2	795	2
R21	Road Right-of-way	0.339	75	2	1697	2
R22	Road Right-of-way	0.200	75	2	999	2
Total		**18.31**	**55**			

3.5 Infiltration

The SWMM computer model describes rainfall infiltration from the pervious area of a subcatchment into the unsaturated upper soil zone using three different methods:

- Horton Infiltration
- Green-Ampt infiltration
- Curve Number infiltration

The method used in this study is the Horton Infiltration. The analysis was performed using the City of Winnipeg Horton infiltration parameters and presented in the following Table.

Table 3 - Infiltration Parameters

Parameter	Units	Pond
Maximum Infiltration Rate	mm/hr	75
Minimum Infiltration Rate	mm/hr	3
Decay Constant	1/hr	4.14
Drying Time	Days	7

3.6 Storage

Storage Routing is a command used to simulate the effects of reservoir (pond, traplow) routing. The routing is conducted with the storage-discharge stage data method where solution is based on the conservation of mass. This command requires that the user provide the outflow-storage relationship of the reservoir.

4.0 RESULTS

4.1 Storage

Traplows play a very important role in overland drainage, because of this, the analysis of this report pays special attention to the traplow requirement in multi-family sites. The required storage conditions (volume, depth and elevations) of the multi-family site traplows and the expected 1:100 conditions based on the PCSWMM model are presented in **Table 4**.

Table 4 - Permissible Discharge Rates and Preliminary On-site Storage Requirements for Multi-family Sites

Subcatchment	Manhole Number	Invert (m)	Area (ha)	Discharge Rate		Storage Volume	
				(L/s/ha)	(L/s)	(m^3)	(m^3/ha)
A33	ST-7	TBD	0.254	70	18	100	394
A34	ST-7	TBD	0.197	70	14	68	345
A35	ST-6	TBD	0.476	70	33	188	395
A36	ST-6	TBD	0.395	70	28	136	345
A37	ST-5	TBD	0.266	70	19	105	395
A38	ST-5	TBD	0.395	70	28	136	345
A39	ST-4	TBD	0.297	70	21	117	394
A40	ST-4	TBD	0.232	70	16	80	344
A41	ST-3	TBD	0.232	70	16	80	344
A42	ST-22	TBD	0.222	70	16	97	437
A43	ST-22A	TBD	0.545	70	38	238	437
A44	ST-23	TBD	0.264	70	18	104	394
A45	ST-24	TBD	0.255	70	18	112	439
A46	ST-24	TBD	0.439	70	31	173	394
A47	ST-25	TBD	0.255	70	18	112	439
A48	ST-25	TBD	0.222	70	16	89	401
A49	ST-25	TBD	1.567	70	110	235	150

4.2 Minor System Flows

Minor system flows (segment number, design flow, full flow capacity, and model analysis results) are tabulated in attached Table in **Appendix B**. There are no minor inflows from external areas that need to be accounted in the proposed minor system. Minor system outflows are listed in **Table 5** and the discharge curves are presented in **Appendix D**. Minor system flows are within the rated hydraulic capacities of the individual segments.

Table 5 - Minor System Boundary Conditions – Outflow at ST MH2

Storm	Area (ha)	Flow Rate		Runoff Volume	
		(L/s)	(L/s/ha)	(m^3)	(mm)
3 hour - 1:5 year	18.308	2719	152	5730	31
3 hour – 1:25 year	18.308	4144	226	8816	48
5:25 hour – 100 year	18.308	5148	281	12384	68
May 2010	18.308	2920	159	19005	104

4.3 Major System Flows

There is no overland runoff from external areas that comes into the development area and that needs to be accounted for. Also there is no runoff spilling out of the development site that will need to be taken in consideration on existing or future downstream storm systems.

4.4 Surcharge (Hydraulic Grade Line) Analysis

As part of this analysis, the City of Winnipeg requested that a backflow analysis be performed using the normal water level (227.70 m) of the pond plus 0.75 m. **Table 6** summarizes the peak 1:5 year event HGL elevations at the manhole locations. The lowest top of footings (LTF) elevations for the homes adjacent to these locations will be set a minimum of 0.30 m above the corresponding HGL elevations. The PCSWMM model output file (**Appendix A**) also shows the HGL elevations at junctions/manholes under the heading 'Node Depth Summary'. Profiles showing the HGL from the Pond to MHs ST14, ST21 and ST25 are included in **Appendix C**.

Table 6 – Summary of Surcharge Conditions

Manhole Number	Upstream Invert (m)	Elevations		HGL Elev. (m)	HGL Below Ground (m)	Surcharge (m)
		Crown (m)	Rim (m)			
ST1	228.870	230.370	231.612	229.120	2.492	-
ST2	228.960	230.460	232.127	229.860	2.267	-
ST3	229.517	230.867	232.266	230.070	2.196	-
ST4	229.333	230.683	232.389	230.260	2.129	-
ST5	229.513	230.863	232.595	230.530	2.065	-
ST6	229.663	231.013	232.634	230.710	1.924	-
ST7	229.816	231.166	232.786	230.860	1.926	-
ST8	229.863	231.213	232.924	230.890	2.034	-
ST9	230.761	231.961	233.213	231.100	2.113	-
ST10	231.068	232.118	233.337	231.300	2.037	-
ST11	231.483	232.083	233.512	231.460	2.052	-
ST12	231.755	232.205	233.644	231.990	1.654	-
ST13	231.950	232.325	233.975	232.230	1.745	-
ST14	232.100	232.475	234.222	232.330	1.892	-
ST15	231.656	232.181	233.713	231.950	1.763	-
ST16	231.806	232.331	233.931	232.170	1.761	-
ST17	231.165	231.840	233.611	231.490	2.121	-
ST18	231.001	231.751	233.371	231.430	1.941	-
ST19	231.315	231.915	233.644	231.710	1.934	-
ST20	231.830	232.355	233.945	231.960	1.985	-
ST21	231.956	232.481	234.168	232.280	1.888	-
ST22	229.612	230.662	232.516	230.080	2.436	-

Manhole Number	Upstream Invert (m)	Elevations		HGL Elev. (m)	HGL Below Ground (m)	Surcharge (m)
		Crown (m)	Rim (m)			
ST22A	229.682	230.732	232.464	230.100	2.364	-
ST23	229.932	230.832	232.680	230.150	2.530	-
ST24	230.307	230.982	232.801	230.350	2.451	-
ST25	230.547	231.222	232.819	230.720	2.099	-

5.0 SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

- The results from the overall drainage concept analysed by this report is consistent with the recommendations in the City of Winnipeg drainage guidelines.
- The trap low storage provided within each multi-family sites is capable to detain the runoff generated by the individual lot, preventing any offsite discharge from the site that may have a negative impact in adjacent private or public property.
- Details in this report conform to the City of Winnipeg Design guidelines.

It is recommended that:

- All building roofs discharge to pervious areas and that items like wide splash pads be used to ensure that the roof drainage is properly distributed over the landscaped areas.
- The analysis presented in this report is accepted by the approving agencies.

Corporate Authorization

This document entitled, "Parker Lands – Revised Stormwater Management Report" was prepared by LGN Consulting Engineering Ltd. It is intended for the use of 6165347 Manitoba Inc., their consultants and contractors responsible for the development of noted property and approval authorities for which it has been prepared. The contents of the report represent LGN Consulting Engineering Ltd's best judgement based on available information at the time of preparation. Any use which a third party makes of the report, or reliance on or decisions made based on it, are the responsibilities of such third parties. LGN Consulting Engineering Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the report.

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No. 1736

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Chow, Ven Te, Maidment, David R. and Mays, Larry W; *Applied Hydrology*; McGraw-Hill Book Company; 1988.

James F. MacLaren Limited; *Drainage Criteria Manual for the City of Winnipeg;* No date available.

USDA, Natural Resources Conservation Service; *National Engineering Handbook/Part 630 – Hydrology, Chapter 7*; January 2009.

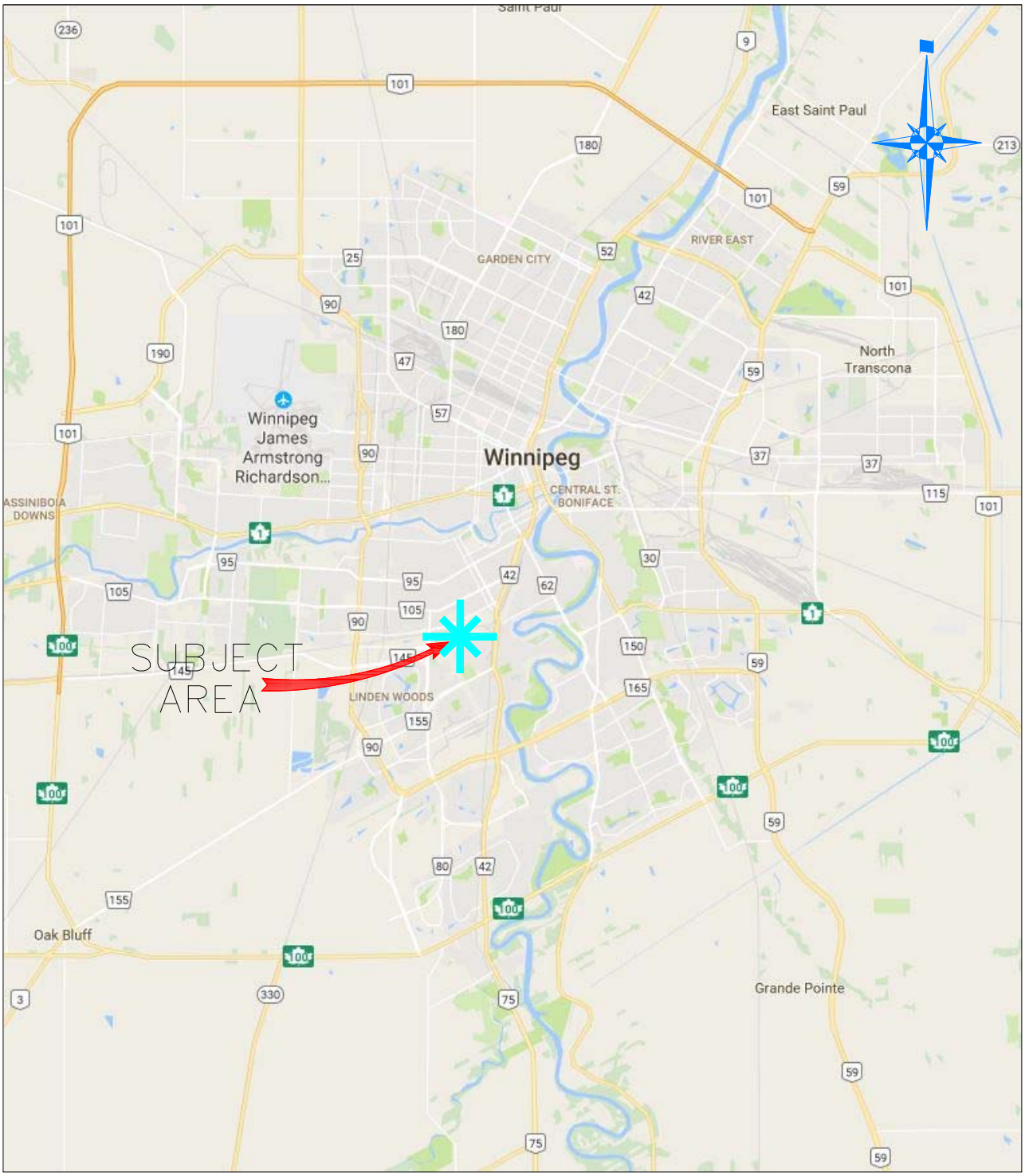


Figure 1 - Site Location

Figure 2 - Study Area

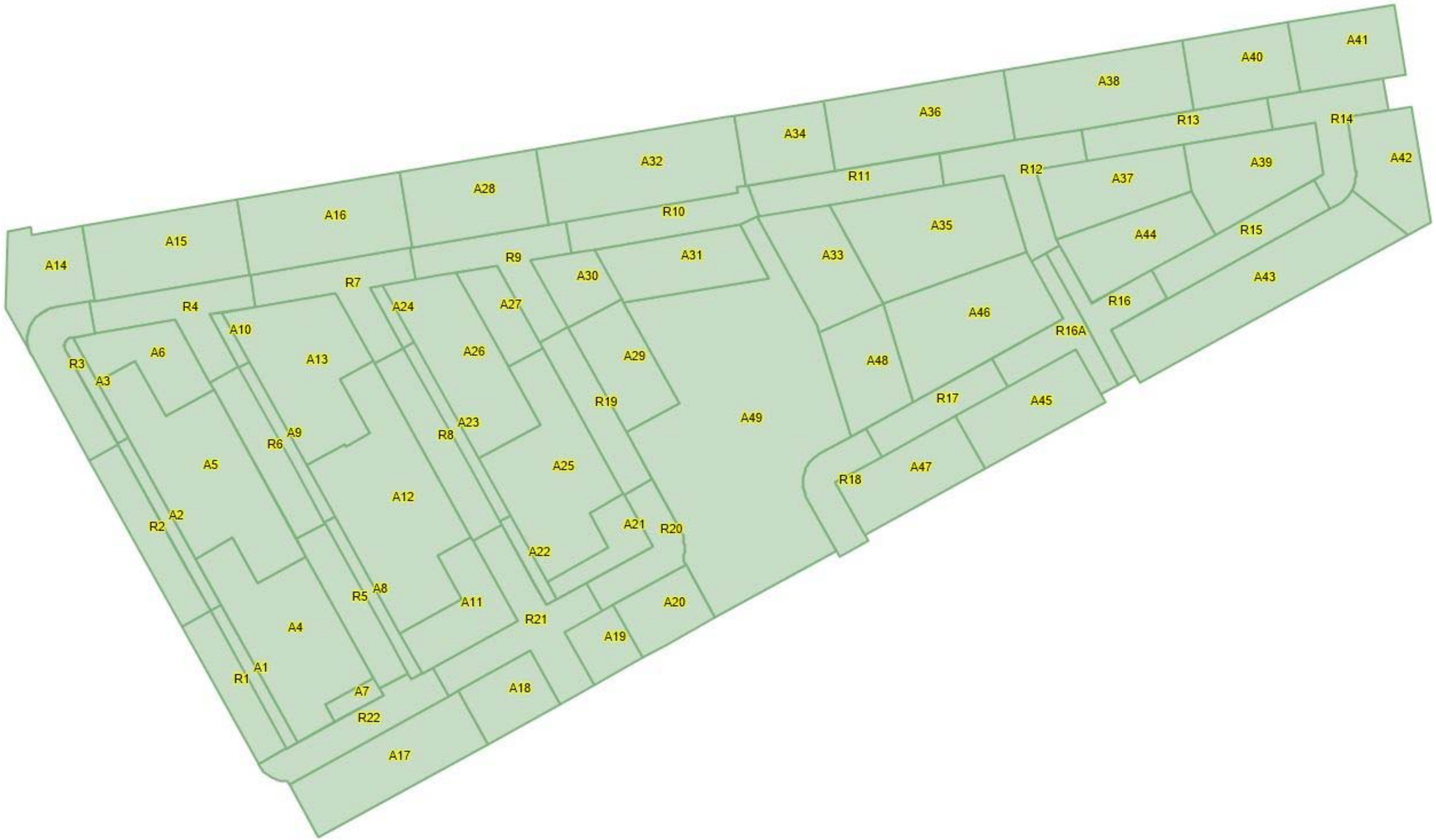


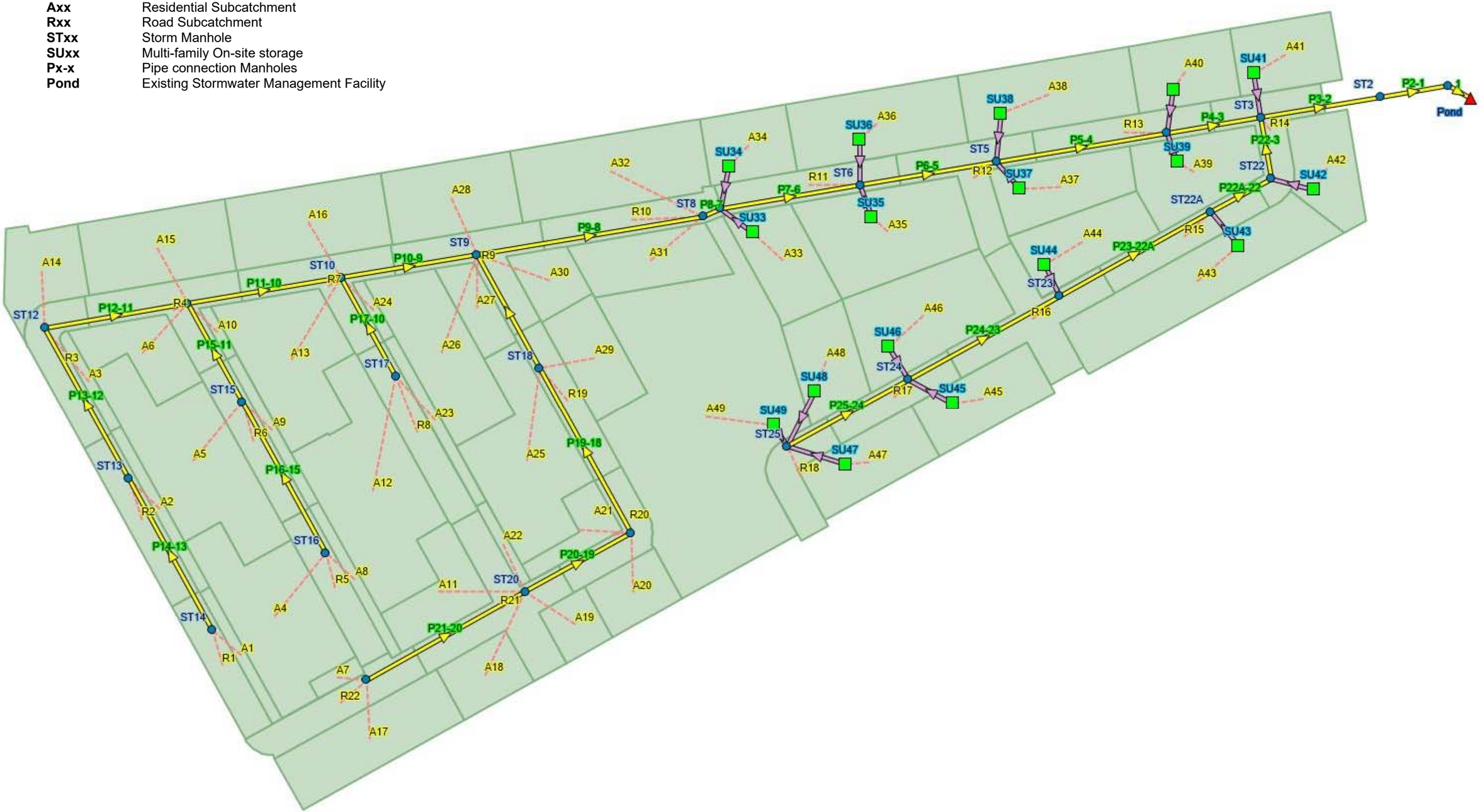
Figure 3 - PCSWMM Subcatchment Boundaries

APPENDIX A

- **PCSWMM Input & Report Files**

PCSWMM Model - Schematic Legend

Axx	Residential Subcatchment
Rxx	Road Subcatchment
STxx	Storm Manhole
SUxx	Multi-family On-site storage
Px-x	Pipe connection Manholes
Pond	Existing Stormwater Management Facility



Single Storm Event
3 hours - 5 year

- **Input File**
- **Report File**

To reduce the amount of data in the input file, the following sections have been excluded in this Appendix:

- Coordinates
- Vertices
- Polygons

```
[TITLE]
Parker Lands
Single Event
Winnipeg 3h-5y Storm


[OPTIONS]
;;Options            Value
;;------------------ ------------
FLOW_UNITS           CMS
INFILTRATION         HORTON
FLOW_ROUTING         DYNWAVE
START_DATE           01/25/2018
START_TIME           00:00:00
REPORT_START_DATE    01/25/2018
REPORT_START_TIME    00:00:00
END_DATE             01/25/2018
END_TIME             03:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:05:00
DRY_STEP             00:05:00
ROUTING_STEP         5
ALLOW_PONDING        NO
INERTIAL_DAMPING     PARTIAL
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
NORMAL_FLOW_LIMITED  BOTH
SKIP_STEADY_STATE    NO
FORCE_MAIN_EQUATION  H-W
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              4

[EVAPORATION]
;;Type          Parameters
;;------------- ----------
CONSTANT     0.0
DRY_ONLY     NO

[RAINGAGES]
;;               Rain      Time   Snow   Data
;;Name           Type      Intrvl Catch  Source
;;-------------- --------- ------ ------ ----------
Winnipeg_3h-5y   INTENSITY 0:05   1.0    TIMESERIES Winnipeg_3h-5y

[SUBCATCHMENTS]
;;                                          Total    Pcnt.             Pcnt.    Curb     Snow
;;Name           Raingage         Outlet     Area     Imperv   Width    Slope    Length   Pack
;;-------------- ---------------- ---------- -------- -------- -------- -------- -------- --------
;SF
A1               Winnipeg_3h-5y   ST14       0.0588   62       19.6     2        0
;SF
A10              Winnipeg_3h-5y   ST11       0.022    50       7.333    2        0
;SF
A11              Winnipeg_3h-5y   ST20       0.2138   50       71.267   2        0
;SF
A12              Winnipeg_3h-5y   ST17       0.6496   50       216.533  2        0
;SF
A13              Winnipeg_3h-5y   ST10       0.4509   50       150.3    2        0
;SF
A14              Winnipeg_3h-5y   ST12       0.213    62       71       2        0
;SF
A15              Winnipeg_3h-5y   ST11       0.363    57       121      2        0
;SF
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A16             Winnipeg_3h-5y   ST10            0.3835   52       127.833  2        0
;SF
A17             Winnipeg_3h-5y   ST21            0.3574   52       119.133  2        0
;SF
A18             Winnipeg_3h-5y   ST20            0.153    52       51       2        0
;SF
A19             Winnipeg_3h-5y   ST20            0.1019   52       33.967   2        0
;SF
A2              Winnipeg_3h-5y   ST13            0.0718   62       23.933   2        0
;SF
A20             Winnipeg_3h-5y   ST19            0.1531   52       51.033   2        0
;SF
A21             Winnipeg_3h-5y   ST19            0.1139   50       37.967   2        0
;SF
A22             Winnipeg_3h-5y   ST20            0.0358   50       11.933   2        0
;SF
A23             Winnipeg_3h-5y   ST17            0.0741   50       24.7     2        0
;SF
A24             Winnipeg_3h-5y   ST10            0.0251   50       8.367    2        0
;SF
A25             Winnipeg_3h-5y   ST18            0.5008   50       166.933  2        0
;SF
A26             Winnipeg_3h-5y   ST9             0.3988   50       132.933  2        0
;SF
A27             Winnipeg_3h-5y   ST9             0.1202   50       40.067   2        0
;SF
A28             Winnipeg_3h-5y   ST9             0.3196   52       106.533  2        0
;SF
A29             Winnipeg_3h-5y   ST18            0.2207   50       73.567   2        0
;SF
A3              Winnipeg_3h-5y   ST12            0.0425   62       14.167   2        0
;SF
A30             Winnipeg_3h-5y   ST9             0.1243   50       41.433   2        0
;SF
A31             Winnipeg_3h-5y   ST8             0.2575   50       85.833   2        0
;SF
A32             Winnipeg_3h-5y   ST8             0.4647   62       154.9    2        0
;MF-65%
A33             Winnipeg_3h-5y   SU33            0.254    58       84.667   2        0
;MF-45%
A34             Winnipeg_3h-5y   SU34            0.1973   35       65.767   2        0
;MF-65%
A35             Winnipeg_3h-5y   SU35            0.476    58       158.667  2        0
;MF-45%
A36             Winnipeg_3h-5y   SU36            0.3945   35       131.5    2        0
;MF-65%
A37             Winnipeg_3h-5y   SU37            0.2659   58       88.633   2        0
;MF-45%
A38             Winnipeg_3h-5y   SU38            0.3945   35       131.5    2        0
;MF-65%
A39             Winnipeg_3h-5y   SU39            0.2973   58       99.1     2        0
;SF
A4              Winnipeg_3h-5y   ST16            0.5104   56       170.133  2        0
;MF-45%
A40             Winnipeg_3h-5y   SU40            0.2324   35       77.467   2        0
;MF-45%
A41             Winnipeg_3h-5y   SU41            0.2324   35       77.467   2        0
;MF-65%
A42             Winnipeg_3h-5y   SU42            0.2222   79       74.067   2        0
;MF-65%
A43             Winnipeg_3h-5y   SU43            0.5449   79       181.633  2        0
;MF-65%
A44             Winnipeg_3h-5y   SU44            0.2637   58       87.9     2        0
;MF-65%
A45             Winnipeg_3h-5y   SU45            0.2549   79       84.967   2        0
;MF-65%
A46             Winnipeg_3h-5y   SU46            0.439    58       146.333  2        0
;MF-65%
A47             Winnipeg_3h-5y   SU47            0.2549   79       84.967   2        0
;MF-65%
A48             Winnipeg_3h-5y   SU48            0.222    58       74       2        0
;Forest
A49             Winnipeg_3h-5y   SU49            1.567    0        195.875  2        0
;SF
A5              Winnipeg_3h-5y   ST15            0.5877   56       195.9    2        0
;SF
A6              Winnipeg_3h-5y   ST11            0.2057   56       68.567   2        0
;SF
A7              Winnipeg_3h-5y   ST21            0.0334   50       11.133   2        0
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;SF
A8              Winnipeg_3h-5y   ST16            0.0664   50       22.133   2        0
;SF
A9              Winnipeg_3h-5y   ST15            0.0661   50       22.033   2        0
;Roads
R1              Winnipeg_3h-5y   ST14            0.157    75       785      2        0
;Roads
R10             Winnipeg_3h-5y   ST8             0.1881   75       940.5    2        0
;Roads
R11             Winnipeg_3h-5y   ST6             0.1893   75       946.5    2        0
;Roads
R12             Winnipeg_3h-5y   ST5             0.2281   75       1140.5   2        0
;Roads
R13             Winnipeg_3h-5y   ST4             0.1875   75       937.5    2        0
;Roads
R14             Winnipeg_3h-5y   ST3             0.1994   75       997      2        0
;Roads
R15             Winnipeg_3h-5y   ST22A           0.1871   75       935.5    2        0
;Roads
R16             Winnipeg_3h-5y   ST23            0.3104   75       1552     2        0
;Roads
R17             Winnipeg_3h-5y   ST24            0.145    75       725      2        0
;Roads
R18             Winnipeg_3h-5y   ST25            0.1454   75       727      2        0
;Roads
R19             Winnipeg_3h-5y   ST18            0.1734   75       867      2        0
;Roads
R2              Winnipeg_3h-5y   ST13            0.1888   75       944      2        0
;Roads
R20             Winnipeg_3h-5y   ST19            0.159    75       795      2        0
;Roads
R21             Winnipeg_3h-5y   ST20            0.3394   75       1697     2        0
;Roads
R22             Winnipeg_3h-5y   ST21            0.1997   75       998.5    2        0
;Roads
R3              Winnipeg_3h-5y   ST12            0.1864   75       932      2        0
;Roads
R4              Winnipeg_3h-5y   ST11            0.2271   75       1135.5   2        0
;Roads
R5              Winnipeg_3h-5y   ST16            0.1708   75       854      2        0
;Roads
R6              Winnipeg_3h-5y   ST15            0.1776   75       888      2        0
;Roads
R7              Winnipeg_3h-5y   ST10            0.2355   75       1177.5   2        0
;Roads
R8              Winnipeg_3h-5y   ST17            0.2019   75       1009.5   2        0
;Roads
R9              Winnipeg_3h-5y   ST9             0.2388   75       1194     2        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A1              0.015      0.25       1.6        3.2        0          OUTLET
A10             0.015      0.25       1.6        3.2        0          OUTLET
A11             0.015      0.25       1.6        3.2        0          OUTLET
A12             0.015      0.25       1.6        3.2        0          OUTLET
A13             0.015      0.25       1.6        3.2        0          OUTLET
A14             0.015      0.25       1.6        3.2        0          OUTLET
A15             0.015      0.25       1.6        3.2        0          OUTLET
A16             0.015      0.25       1.6        3.2        0          OUTLET
A17             0.015      0.25       1.6        3.2        0          OUTLET
A18             0.015      0.25       1.6        3.2        0          OUTLET
A19             0.015      0.25       1.6        3.2        0          OUTLET
A2              0.015      0.25       1.6        3.2        0          OUTLET
A20             0.015      0.25       1.6        3.2        0          OUTLET
A21             0.015      0.25       1.6        3.2        0          OUTLET
A22             0.015      0.25       1.6        3.2        0          OUTLET
A23             0.015      0.25       1.6        3.2        0          OUTLET
A24             0.015      0.25       1.6        3.2        0          OUTLET
A25             0.015      0.25       1.6        3.2        0          OUTLET
A26             0.015      0.25       1.6        3.2        0          OUTLET
A27             0.015      0.25       1.6        3.2        0          OUTLET
A28             0.015      0.25       1.6        3.2        0          OUTLET
A29             0.015      0.25       1.6        3.2        0          OUTLET
A3              0.015      0.25       1.6        3.2        0          OUTLET
A30             0.015      0.25       1.6        3.2        0          OUTLET
A31             0.015      0.25       1.6        3.2        0          OUTLET
A32             0.015      0.25       1.6        3.2        0          OUTLET
A33             0.015      0.25       1.6        3.2        0          OUTLET
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A34             0.015      0.25       1.6        3.2        0          OUTLET
A35             0.015      0.25       1.6        3.2        0          OUTLET
A36             0.015      0.25       1.6        3.2        0          OUTLET
A37             0.015      0.25       1.6        3.2        0          OUTLET
A38             0.015      0.25       1.6        3.2        0          OUTLET
A39             0.015      0.25       1.6        3.2        0          OUTLET
A4              0.015      0.25       1.6        3.2        0          OUTLET
A40             0.015      0.25       1.6        3.2        0          OUTLET
A41             0.015      0.25       1.6        3.2        0          OUTLET
A42             0.015      0.25       1.6        3.2        0          OUTLET
A43             0.015      0.25       1.6        3.2        0          OUTLET
A44             0.015      0.25       1.6        3.2        0          OUTLET
A45             0.015      0.25       1.6        3.2        0          OUTLET
A46             0.015      0.25       1.6        3.2        0          OUTLET
A47             0.015      0.25       1.6        3.2        0          OUTLET
A48             0.015      0.25       1.6        3.2        0          OUTLET
A49             0.015      0.25       1.6        3.2        0          OUTLET
A5              0.015      0.25       1.6        3.2        0          OUTLET
A6              0.015      0.25       1.6        3.2        0          OUTLET
A7              0.015      0.25       1.6        3.2        0          OUTLET
A8              0.015      0.25       1.6        3.2        0          OUTLET
A9              0.015      0.25       1.6        3.2        0          OUTLET
R1              0.015      0.25       1.6        3.2        0          OUTLET
R10             0.015      0.25       1.6        3.2        0          OUTLET
R11             0.015      0.25       1.6        3.2        0          OUTLET
R12             0.015      0.25       1.6        3.2        0          OUTLET
R13             0.015      0.25       1.6        3.2        0          OUTLET
R14             0.015      0.25       1.6        3.2        0          OUTLET
R15             0.015      0.25       1.6        3.2        0          OUTLET
R16             0.015      0.25       1.6        3.2        0          OUTLET
R17             0.015      0.25       1.6        3.2        0          OUTLET
R18             0.015      0.25       1.6        3.2        0          OUTLET
R19             0.015      0.25       1.6        3.2        0          OUTLET
R2              0.015      0.25       1.6        3.2        0          OUTLET
R20             0.015      0.25       1.6        3.2        0          OUTLET
R21             0.015      0.25       1.6        3.2        0          OUTLET
R22             0.015      0.25       1.6        3.2        0          OUTLET
R3              0.015      0.25       1.6        3.2        0          OUTLET
R4              0.015      0.25       1.6        3.2        0          OUTLET
R5              0.015      0.25       1.6        3.2        0          OUTLET
R6              0.015      0.25       1.6        3.2        0          OUTLET
R7              0.015      0.25       1.6        3.2        0          OUTLET
R8              0.015      0.25       1.6        3.2        0          OUTLET
R9              0.015      0.25       1.6        3.2        0          OUTLET

[INFILTRATION]
;;Subcatchment   MaxRate    MinRate    Decay      DryTime    MaxInfil
;;-------------- ---------- ---------- ---------- ---------- ----------
A1              75         3          4.14       7          0
A10             75         3          4.14       7          0
A11             75         3          4.14       7          0
A12             75         3          4.14       7          0
A13             75         3          4.14       7          0
A14             75         3          4.14       7          0
A15             75         3          4.14       7          0
A16             75         3          4.14       7          0
A17             75         3          4.14       7          0
A18             75         3          4.14       7          0
A19             75         3          4.14       7          0
A2              75         3          4.14       7          0
A20             75         3          4.14       7          0
A21             75         3          4.14       7          0
A22             75         3          4.14       7          0
A23             75         3          4.14       7          0
A24             75         3          4.14       7          0
A25             75         3          4.14       7          0
A26             75         3          4.14       7          0
A27             75         3          4.14       7          0
A28             75         3          4.14       7          0
A29             75         3          4.14       7          0
A3              75         3          4.14       7          0
A30             75         3          4.14       7          0
A31             75         3          4.14       7          0
A32             75         3          4.14       7          0
A33             75         3          4.14       7          0
A34             75         3          4.14       7          0
A35             75         3          4.14       7          0
A36             75         3          4.14       7          0
A37             75         3          4.14       7          0
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A38             75         3          4.14       7          0
A39             75         3          4.14       7          0
A4              75         3          4.14       7          0
A40             75         3          4.14       7          0
A41             75         3          4.14       7          0
A42             75         3          4.14       7          0
A43             75         3          4.14       7          0
A44             75         3          4.14       7          0
A45             75         3          4.14       7          0
A46             75         3          4.14       7          0
A47             75         3          4.14       7          0
A48             75         3          4.14       7          0
A49             75         3          4.14       7          0
A5              75         3          4.14       7          0
A6              75         3          4.14       7          0
A7              75         3          4.14       7          0
A8              75         3          4.14       7          0
A9              75         3          4.14       7          0
R1              75         3          4.14       7          0
R10             75         3          4.14       7          0
R11             75         3          4.14       7          0
R12             75         3          4.14       7          0
R13             75         3          4.14       7          0
R14             75         3          4.14       7          0
R15             75         3          4.14       7          0
R16             75         3          4.14       7          0
R17             75         3          4.14       7          0
R18             75         3          4.14       7          0
R19             75         3          4.14       7          0
R2              75         3          4.14       7          0
R20             75         3          4.14       7          0
R21             75         3          4.14       7          0
R22             75         3          4.14       7          0
R3              75         3          4.14       7          0
R4              75         3          4.14       7          0
R5              75         3          4.14       7          0
R6              75         3          4.14       7          0
R7              75         3          4.14       7          0
R8              75         3          4.14       7          0
R9              75         3          4.14       7          0

[JUNCTIONS]
;;              Invert     Max.       Init.      Surcharge  Ponded
;;Name          Elev.      Depth      Depth      Depth      Area
;;------------- ---------- ---------- ---------- ---------- ----------
ST1             228.237    3.375      0          0          0
ST10            230.543    2.794      0          0          0
ST11            230.783    2.729      0          0          0
ST12            231.605    2.039      0          0          0
ST13            231.875    2.1        0          0          0
ST14            232.1      2.122      0          0          0
ST15            231.506    2.207      0          0          0
ST16            231.806    2.125      0          0          0
ST17            231.165    2.446      0          0          0
ST18            230.851    2.52       0          0          0
ST19            231.165    2.479      0          0          0
ST2             228.93     3.197      0.116      0          0
ST20            231.455    2.49       0          0          0
ST21            231.956    2.212      0          0          0
ST22            229.552    2.964      0          0          0
ST22A           229.652    2.812      0          0          0
ST23            229.782    2.898      0          0          0
ST24            230.082    2.719      0          0          0
ST25            230.547    2.272      0          0          0
ST3             229.067    3.199      0          0          0
ST4             229.303    3.086      0          0          0
ST5             229.483    3.112      0          0          0
ST6             229.633    3.001      0          0          0
ST7             229.786    3          0          0          0
ST8             229.833    3.091      0          0          0
ST9             230.063    3.15       0          0          0

[OUTFALLS]
;;              Invert     Outfall    Stage/Table      Tide
;;Name          Elev.      Type       Time Series      Gate Route To
;;------------- ---------- ---------- ---------------- ---- ----------------
Pond            228.214    FIXED      228.45           NO

[STORAGE]
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;;Name	Invert Elev.	Max. Depth	Init. Depth	Storage Curve	Curve Params			Ponded Area	Evap. Frac.	Infiltration parameters
SU33	233.3	0.5	0	TABULAR	OS33			0	0	
SU34	233.3	0.5	0	TABULAR	OS34			0	0	
SU35	233	0.5	0	TABULAR	OS35			0	0	
SU36	233	0.5	0	TABULAR	OS36			0	0	
SU37	233	0.5	0	TABULAR	OS37			0	0	
SU38	233	0.5	0	TABULAR	OS38			0	0	
SU39	232.5	0.5	0	TABULAR	OS39			0	0	
SU40	232.5	0.5	0	TABULAR	OS40			0	0	
SU41	232.3	0.5	0	TABULAR	OS41			0	0	
SU42	232.8	0.5	0	TABULAR	OS42			0	0	
SU43	232.8	0.5	0	TABULAR	OS43			0	0	
SU44	233.3	0.5	0	TABULAR	OS44			0	0	
SU45	233.6	0.5	0	TABULAR	OS45			0	0	
SU46	233.6	0.5	0	TABULAR	OS46			0	0	
SU47	233.8	0.5	0	TABULAR	OS47			0	0	
SU48	233.8	0.5	0	TABULAR	OS48			0	0	
SU49	233.8	0.5	0	TABULAR	OS49			0	0	

[CONDUITS]

;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Offset	Outlet Offset	Init. Flow	Max. Flow
1	ST1	Pond	15	0.013	0	0	0	0
P10-9	ST10	ST9	79.55	0.013	0	0.4	0	0
P11-10	ST11	ST10	90.17	0.013	0	0.15	0	0
P12-11	ST12	ST11	83.69	0.011	0	0.7	0	0
P13-12	ST13	ST12	100	0.011	0	0.15	0	0
P14-13	ST14	ST13	100	0.011	0	0.075	0	0
P15-11	ST15	ST11	65	0.011	0	0.625	0	0
P16-15	ST16	ST15	100	0.011	0	0.15	0	0
P17-10	ST17	ST10	65	0.011	0	0.525	0	0
P18-9	ST18	ST9	75	0.013	0	0.698	0	0
P19-18	ST19	ST18	109.15	0.013	0	0.15	0	0
P20-19	ST20	ST19	70	0.013	0	0.15	0	0
P2-1	ST2	ST1	40	0.013	0	0.633	0	0
P21-20	ST21	ST20	105	0.011	0	0.375	0	0
P22-3	ST22	ST3	35.93	0.013	0	0.45	0	0
P22A-22	ST22A	ST22	40	0.013	0	0.06	0	0
P23-22A	ST23	ST22A	100	0.013	0	0.03	0	0
P24-23	ST24	ST23	100	0.013	0	0.15	0	0
P25-24	ST25	ST24	80	0.013	0	0.225	0	0
P3-2	ST3	ST2	70	0.013	0	0.03	0	0
P4-3	ST4	ST3	55	0.013	0	0.15	0	0
P5-4	ST5	ST4	100	0.013	0	0.03	0	0
P6-5	ST6	ST5	80	0.013	0	0.03	0	0
P7-6	ST7	ST6	81.95	0.013	0	0.03	0	0
P8-7	ST8	ST7	10.97	0.013	0	0.03	0	0
P9-8	ST9	ST8	132.72	0.013	0	0.03	0	0

[OUTLETS]

;;Name	Inlet Node	Outlet Node	Outflow Height	Outlet Type	Qcoeff/ QTable	Qexpon	Flap Gate
OL33	SU33	ST7	0	TABULAR/DEPTH	ICD33		NO
OL34	SU34	ST7	0	TABULAR/DEPTH	ICD34		NO
OL35	SU35	ST6	0	TABULAR/DEPTH	ICD35		NO
OL36	SU36	ST6	0	TABULAR/DEPTH	ICD36		NO
OL37	SU37	ST5	0	TABULAR/DEPTH	ICD37		NO
OL38	SU38	ST5	0	TABULAR/DEPTH	ICD38		NO
OL39	SU39	ST4	0	TABULAR/DEPTH	ICD39		NO
OL40	SU40	ST4	0	TABULAR/DEPTH	ICD40		NO
OL41	SU41	ST3	0	TABULAR/DEPTH	ICD41		NO
OL42	SU42	ST22	0	TABULAR/DEPTH	ICD42		NO
OL43	SU43	ST22A	0	TABULAR/DEPTH	ICD43		NO
OL44	SU44	ST23	0	TABULAR/DEPTH	ICD44		NO
OL45	SU45	ST24	0	TABULAR/DEPTH	ICD45		NO
OL46	SU46	ST24	0	TABULAR/DEPTH	ICD46		NO
OL47	SU47	ST25	0	TABULAR/DEPTH	ICD47		NO
OL48	SU48	ST25	0	TABULAR/DEPTH	ICD48		NO
OL49	SU49	ST25	0	TABULAR/DEPTH	ICD49		NO

[XSECTIONS]

;;Link	Shape	Geom1	Geom2	Geom3	Geom4	Barrels
1	CIRCULAR	1.5	0	0	0	1
P10-9	CIRCULAR	1.2	0	0	0	1

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P11-10           CIRCULAR     1.05            0          0          0          1
P12-11           CIRCULAR     0.6             0          0          0          1
P13-12           CIRCULAR     0.45            0          0          0          1
P14-13           CIRCULAR     0.375           0          0          0          1
P15-11           CIRCULAR     0.675           0          0          0          1
P16-15           CIRCULAR     0.525           0          0          0          1
P17-10           CIRCULAR     0.675           0          0          0          1
P18-9            CIRCULAR     0.9             0          0          0          1
P19-18           CIRCULAR     0.75            0          0          0          1
P20-19           CIRCULAR     0.6             0          0          0          1
P2-1             CIRCULAR     1.5             0          0          0          1
P21-20           CIRCULAR     0.525           0          0          0          1
P22-3            CIRCULAR     1.05            0          0          0          1
P22A-22          CIRCULAR     1.05            0          0          0          1
P23-22A          CIRCULAR     1.05            0          0          0          1
P24-23           CIRCULAR     0.9             0          0          0          1
P25-24           CIRCULAR     0.675           0          0          0          1
P3-2             CIRCULAR     1.5             0          0          0          1
P4-3             CIRCULAR     1.35            0          0          0          1
P5-4             CIRCULAR     1.35            0          0          0          1
P6-5             CIRCULAR     1.35            0          0          0          1
P7-6             CIRCULAR     1.35            0          0          0          1
P8-7             CIRCULAR     1.35            0          0          0          1
P9-8             CIRCULAR     1.35            0          0          0          1

[TRANSECTS]

;Full street, width = 14.5m, curb = 0.14m , cross-slope = 0.032m/m, bank-slope = 0.03m/m, bank-height = 0.5m.
NC 0.05     0.05     0.015
X1 PrimaryCollectorBothSides 9        -11.75   11.75    0.0       0.0       0.0      0.0      0.0
GR 0.5      -20.75   0.23     -11.75   0.14     -7.25    0         -7.25    0.225    0
GR 0        7.25     0.14     7.25     0.23     11.75    0.5       20.75

[LOSSES]
;;Link           Inlet      Outlet     Average    Flap Gate  SeepageRate
;;-------------- ---------- ---------- ---------- ---------- ----------

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
ICD33            Rating     0          0
ICD33                       0.5        0.0178

ICD34            Rating     0          0
ICD34                       0.5        0.0138

ICD35            Rating     0          0
ICD35                       0.5        0.0333

ICD36            Rating     0          0
ICD36                       0.5        0.0276

ICD37            Rating     0          0
ICD37                       0.5        0.0186

ICD38            Rating     0          0
ICD38                       0.5        0.0276

ICD39            Rating     0          0
ICD39                       0.5        0.0208

ICD40            Rating     0          0
ICD40                       0.5        0.0163

ICD41            Rating     0          0
ICD41                       0.5        0.0163

ICD42            Rating     0          0
ICD42                       0.5        0.0156

ICD43            Rating     0          0
ICD43                       0.5        0.0381

ICD44            Rating     0          0
ICD44                       0.5        0.0185

ICD45            Rating     0          0
ICD45                       0.5        0.0178
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ICD46            Rating     0          0
ICD46                       0.5        0.0307

ICD47            Rating     0          0
ICD47                       0.5        0.0178

ICD48            Rating     0          0
ICD48                       0.5        0.015

ICD49            Rating     0          0
ICD49                       0.5        0.1097

OS33             Storage    0          0
OS33                        0.5        400

OS34             Storage    0          0
OS34                        0.5        275

OS35             Storage    0          0
OS35                        0.5        760

OS36             Storage    0          0
OS36                        0.5        550

OS37             Storage    0          0
OS37                        0.5        420

OS38             Storage    0          0
OS38                        0.5        550

OS39             Storage    0          0
OS39                        0.5        470

OS40             Storage    0          0
OS40                        0.5        320

OS41             Storage    0          0
OS41                        0.5        320

OS42             Storage    0          0
OS42                        0.5        390

OS43             Storage    0          0
OS43                        0.5        960

OS44             Storage    0          0
OS44                        0.5        420

OS45             Storage    0          0
OS45                        0.5        450

OS46             Storage    0          0
OS46                        0.5        700

OS47             Storage    0          0
OS47                        0.5        450

OS48             Storage    0          0
OS48                        0.5        360

OS49             Storage    0          0
OS49                        0.5        1500

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Chicago design storm, a = 1199, b = 8, c = 0.828, Duration = 180 minutes, r = 0.3, rain units = mm/hr.
Winnipeg_3h-5y              0:00       3.407
Winnipeg_3h-5y              0:05       3.76
Winnipeg_3h-5y              0:10       4.202
Winnipeg_3h-5y              0:15       4.771
Winnipeg_3h-5y              0:20       5.53
Winnipeg_3h-5y              0:25       6.595
Winnipeg_3h-5y              0:30       8.194
Winnipeg_3h-5y              0:35       10.849
Winnipeg_3h-5y              0:40       16.043
Winnipeg_3h-5y              0:45       30.066
Winnipeg_3h-5y              0:50       113.523
Winnipeg_3h-5y              0:55       103.313
```

```
Winnipeg_3h-5y              1:00       51.024
Winnipeg_3h-5y              1:05       32.527
Winnipeg_3h-5y              1:10       23.471
Winnipeg_3h-5y              1:15       18.217
Winnipeg_3h-5y              1:20       14.831
Winnipeg_3h-5y              1:25       12.486
Winnipeg_3h-5y              1:30       10.773
Winnipeg_3h-5y              1:35       9.473
Winnipeg_3h-5y              1:40       8.453
Winnipeg_3h-5y              1:45       7.634
Winnipeg_3h-5y              1:50       6.962
Winnipeg_3h-5y              1:55       6.402
Winnipeg_3h-5y              2:00       5.927
Winnipeg_3h-5y              2:05       5.52
Winnipeg_3h-5y              2:10       5.167
Winnipeg_3h-5y              2:15       4.859
Winnipeg_3h-5y              2:20       4.586
Winnipeg_3h-5y              2:25       4.345
Winnipeg_3h-5y              2:30       4.128
Winnipeg_3h-5y              2:35       3.933
Winnipeg_3h-5y              2:40       3.757
Winnipeg_3h-5y              2:45       3.597
Winnipeg_3h-5y              2:50       3.45
Winnipeg_3h-5y              2:55       3.316
Winnipeg_3h-5y              3:00       0

[REPORT]
INPUT      YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS       631066.319121869 5523218.95515    631999.666440747 5523725.83185
UNITS            Meters

[COORDINATES]
;;Node           X-Coord          Y-Coord
;;-------------- ---------------- ----------------

[VERTICES]
;;Link           X-Coord          Y-Coord
;;-------------- ---------------- ----------------

[POLYGONS]
;;Subcatchment   X-Coord          Y-Coord
;;-------------- ---------------- ----------------

[SYMBOLS]
;;Gage           X-Coord          Y-Coord
;;-------------- ---------------- ----------------
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

Parker Lands
Single Event
Winnipeg 3h-5y Storm


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 71
Number of nodes ........... 44
Number of links ........... 43
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
Winnipeg_3h-5y       Winnipeg_3h-5y              INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                       Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------------
A1                         0.06     19.60     62.00    2.0000 Winnipeg_3h-5y       ST14
A10                        0.02      7.33     50.00    2.0000 Winnipeg_3h-5y       ST11
A11                        0.21     71.27     50.00    2.0000 Winnipeg_3h-5y       ST20
A12                        0.65    216.53     50.00    2.0000 Winnipeg_3h-5y       ST17
A13                        0.45    150.30     50.00    2.0000 Winnipeg_3h-5y       ST10
A14                        0.21     71.00     62.00    2.0000 Winnipeg_3h-5y       ST12
A15                        0.36    121.00     57.00    2.0000 Winnipeg_3h-5y       ST11
A16                        0.38    127.83     52.00    2.0000 Winnipeg_3h-5y       ST10
A17                        0.36    119.13     52.00    2.0000 Winnipeg_3h-5y       ST21
A18                        0.15     51.00     52.00    2.0000 Winnipeg_3h-5y       ST20
A19                        0.10     33.97     52.00    2.0000 Winnipeg_3h-5y       ST20
A2                         0.07     23.93     62.00    2.0000 Winnipeg_3h-5y       ST13
A20                        0.15     51.03     52.00    2.0000 Winnipeg_3h-5y       ST19
A21                        0.11     37.97     50.00    2.0000 Winnipeg_3h-5y       ST19
A22                        0.04     11.93     50.00    2.0000 Winnipeg_3h-5y       ST20
A23                        0.07     24.70     50.00    2.0000 Winnipeg_3h-5y       ST17
A24                        0.03      8.37     50.00    2.0000 Winnipeg_3h-5y       ST10
A25                        0.50    166.93     50.00    2.0000 Winnipeg_3h-5y       ST18
A26                        0.40    132.93     50.00    2.0000 Winnipeg_3h-5y       ST9
A27                        0.12     40.07     50.00    2.0000 Winnipeg_3h-5y       ST9
A28                        0.32    106.53     52.00    2.0000 Winnipeg_3h-5y       ST9
A29                        0.22     73.57     50.00    2.0000 Winnipeg_3h-5y       ST18
A3                         0.04     14.17     62.00    2.0000 Winnipeg_3h-5y       ST12
A30                        0.12     41.43     50.00    2.0000 Winnipeg_3h-5y       ST9
A31                        0.26     85.83     50.00    2.0000 Winnipeg_3h-5y       ST8
A32                        0.46    154.90     62.00    2.0000 Winnipeg_3h-5y       ST8
A33                        0.25     84.67     58.00    2.0000 Winnipeg_3h-5y       SU33
A34                        0.20     65.77     35.00    2.0000 Winnipeg_3h-5y       SU34
A35                        0.48    158.67     58.00    2.0000 Winnipeg_3h-5y       SU35
A36                        0.39    131.50     35.00    2.0000 Winnipeg_3h-5y       SU36
A37                        0.27     88.63     58.00    2.0000 Winnipeg_3h-5y       SU37
A38                        0.39    131.50     35.00    2.0000 Winnipeg_3h-5y       SU38
A39                        0.30     99.10     58.00    2.0000 Winnipeg_3h-5y       SU39
A4                         0.51    170.13     56.00    2.0000 Winnipeg_3h-5y       ST16
A40                        0.23     77.47     35.00    2.0000 Winnipeg_3h-5y       SU40
A41                        0.23     77.47     35.00    2.0000 Winnipeg_3h-5y       SU41
A42                        0.22     74.07     79.00    2.0000 Winnipeg_3h-5y       SU42
A43                        0.54    181.63     79.00    2.0000 Winnipeg_3h-5y       SU43
A44                        0.26     87.90     58.00    2.0000 Winnipeg_3h-5y       SU44
A45                        0.25     84.97     79.00    2.0000 Winnipeg_3h-5y       SU45
A46                        0.44    146.33     58.00    2.0000 Winnipeg_3h-5y       SU46
A47                        0.25     84.97     79.00    2.0000 Winnipeg_3h-5y       SU47
A48                        0.22     74.00     58.00    2.0000 Winnipeg_3h-5y       SU48
A49                        1.57    195.87      0.00    2.0000 Winnipeg_3h-5y       SU49
A5                         0.59    195.90     56.00    2.0000 Winnipeg_3h-5y       ST15
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A6	0.21	68.57	56.00	2.0000	Winnipeg_3h-5y	ST11
A7	0.03	11.13	50.00	2.0000	Winnipeg_3h-5y	ST21
A8	0.07	22.13	50.00	2.0000	Winnipeg_3h-5y	ST16
A9	0.07	22.03	50.00	2.0000	Winnipeg_3h-5y	ST15
R1	0.16	785.00	75.00	2.0000	Winnipeg_3h-5y	ST14
R10	0.19	940.50	75.00	2.0000	Winnipeg_3h-5y	ST8
R11	0.19	946.50	75.00	2.0000	Winnipeg_3h-5y	ST6
R12	0.23	1140.50	75.00	2.0000	Winnipeg_3h-5y	ST5
R13	0.19	937.50	75.00	2.0000	Winnipeg_3h-5y	ST4
R14	0.20	997.00	75.00	2.0000	Winnipeg_3h-5y	ST3
R15	0.19	935.50	75.00	2.0000	Winnipeg_3h-5y	ST22A
R16	0.31	1552.00	75.00	2.0000	Winnipeg_3h-5y	ST23
R17	0.14	725.00	75.00	2.0000	Winnipeg_3h-5y	ST24
R18	0.15	727.00	75.00	2.0000	Winnipeg_3h-5y	ST25
R19	0.17	867.00	75.00	2.0000	Winnipeg_3h-5y	ST18
R2	0.19	944.00	75.00	2.0000	Winnipeg_3h-5y	ST13
R20	0.16	795.00	75.00	2.0000	Winnipeg_3h-5y	ST19
R21	0.34	1697.00	75.00	2.0000	Winnipeg_3h-5y	ST20
R22	0.20	998.50	75.00	2.0000	Winnipeg_3h-5y	ST21
R3	0.19	932.00	75.00	2.0000	Winnipeg_3h-5y	ST12
R4	0.23	1135.50	75.00	2.0000	Winnipeg_3h-5y	ST11
R5	0.17	854.00	75.00	2.0000	Winnipeg_3h-5y	ST16
R6	0.18	888.00	75.00	2.0000	Winnipeg_3h-5y	ST15
R7	0.24	1177.50	75.00	2.0000	Winnipeg_3h-5y	ST10
R8	0.20	1009.50	75.00	2.0000	Winnipeg_3h-5y	ST17
R9	0.24	1194.00	75.00	2.0000	Winnipeg_3h-5y	ST9

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
ST1	JUNCTION	228.24	3.38	0.0	
ST10	JUNCTION	230.54	2.79	0.0	
ST11	JUNCTION	230.78	2.73	0.0	
ST12	JUNCTION	231.61	2.04	0.0	
ST13	JUNCTION	231.88	2.10	0.0	
ST14	JUNCTION	232.10	2.12	0.0	
ST15	JUNCTION	231.51	2.21	0.0	
ST16	JUNCTION	231.81	2.13	0.0	
ST17	JUNCTION	231.16	2.45	0.0	
ST18	JUNCTION	230.85	2.52	0.0	
ST19	JUNCTION	231.16	2.48	0.0	
ST2	JUNCTION	228.93	3.20	0.0	
ST20	JUNCTION	231.46	2.49	0.0	
ST21	JUNCTION	231.96	2.21	0.0	
ST22	JUNCTION	229.55	2.96	0.0	
ST22A	JUNCTION	229.65	2.81	0.0	
ST23	JUNCTION	229.78	2.90	0.0	
ST24	JUNCTION	230.08	2.72	0.0	
ST25	JUNCTION	230.55	2.27	0.0	
ST3	JUNCTION	229.07	3.20	0.0	
ST4	JUNCTION	229.30	3.09	0.0	
ST5	JUNCTION	229.48	3.11	0.0	
ST6	JUNCTION	229.63	3.00	0.0	
ST7	JUNCTION	229.79	3.00	0.0	
ST8	JUNCTION	229.83	3.09	0.0	
ST9	JUNCTION	230.06	3.15	0.0	
Pond	OUTFALL	228.21	1.50	0.0	
SU33	STORAGE	233.30	0.50	0.0	
SU34	STORAGE	233.30	0.50	0.0	
SU35	STORAGE	233.00	0.50	0.0	
SU36	STORAGE	233.00	0.50	0.0	
SU37	STORAGE	233.00	0.50	0.0	
SU38	STORAGE	233.00	0.50	0.0	
SU39	STORAGE	232.50	0.50	0.0	
SU40	STORAGE	232.50	0.50	0.0	
SU41	STORAGE	232.30	0.50	0.0	
SU42	STORAGE	232.80	0.50	0.0	
SU43	STORAGE	232.80	0.50	0.0	
SU44	STORAGE	233.30	0.50	0.0	
SU45	STORAGE	233.60	0.50	0.0	
SU46	STORAGE	233.60	0.50	0.0	
SU47	STORAGE	233.80	0.50	0.0	
SU48	STORAGE	233.80	0.50	0.0	
SU49	STORAGE	233.80	0.50	0.0	

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************
Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
1	ST1	Pond	CONDUIT	15.0	0.1533	0.0130
P10-9	ST10	ST9	CONDUIT	79.6	0.1006	0.0130
P11-10	ST11	ST10	CONDUIT	90.2	0.0998	0.0130
P12-11	ST12	ST11	CONDUIT	83.7	0.1458	0.0110
P13-12	ST13	ST12	CONDUIT	100.0	0.1200	0.0110
P14-13	ST14	ST13	CONDUIT	100.0	0.1500	0.0110
P15-11	ST15	ST11	CONDUIT	65.0	0.1508	0.0110
P16-15	ST16	ST15	CONDUIT	100.0	0.1500	0.0110
P17-10	ST17	ST10	CONDUIT	65.0	0.1492	0.0110
P18-9	ST18	ST9	CONDUIT	75.0	0.1200	0.0130
P19-18	ST19	ST18	CONDUIT	109.1	0.1503	0.0130
P20-19	ST20	ST19	CONDUIT	70.0	0.2000	0.0130
P2-1	ST2	ST1	CONDUIT	40.0	0.1500	0.0130
P21-20	ST21	ST20	CONDUIT	105.0	0.1200	0.0110
P22-3	ST22	ST3	CONDUIT	35.9	0.0974	0.0130
P22A-22	ST22A	ST22	CONDUIT	40.0	0.1000	0.0130
P23-22A	ST23	ST22A	CONDUIT	100.0	0.1000	0.0130
P24-23	ST24	ST23	CONDUIT	100.0	0.1500	0.0130
P25-24	ST25	ST24	CONDUIT	80.0	0.3000	0.0130
P3-2	ST3	ST2	CONDUIT	70.0	0.1529	0.0130
P4-3	ST4	ST3	CONDUIT	55.0	0.1564	0.0130
P5-4	ST5	ST4	CONDUIT	100.0	0.1500	0.0130
P6-5	ST6	ST5	CONDUIT	80.0	0.1500	0.0130
P7-6	ST7	ST6	CONDUIT	82.0	0.1501	0.0130
P8-7	ST8	ST7	CONDUIT	11.0	0.1550	0.0130
P9-8	ST9	ST8	CONDUIT	132.7	0.1507	0.0130
OL33	SU33	ST7	OUTLET			
OL34	SU34	ST7	OUTLET			
OL35	SU35	ST6	OUTLET			
OL36	SU36	ST6	OUTLET			
OL37	SU37	ST5	OUTLET			
OL38	SU38	ST5	OUTLET			
OL39	SU39	ST4	OUTLET			
OL40	SU40	ST4	OUTLET			
OL41	SU41	ST3	OUTLET			
OL42	SU42	ST22	OUTLET			
OL43	SU43	ST22A	OUTLET			
OL44	SU44	ST23	OUTLET			
OL45	SU45	ST24	OUTLET			
OL46	SU46	ST24	OUTLET			
OL47	SU47	ST25	OUTLET			
OL48	SU48	ST25	OUTLET			
OL49	SU49	ST25	OUTLET			

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********************
Cross Section Summary
********************
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
1	CIRCULAR	1.50	1.77	0.38	1.50	1	2.77
P10-9	CIRCULAR	1.20	1.13	0.30	1.20	1	1.24
P11-10	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P12-11	CIRCULAR	0.60	0.28	0.15	0.60	1	0.28
P13-12	CIRCULAR	0.45	0.16	0.11	0.45	1	0.12
P14-13	CIRCULAR	0.38	0.11	0.09	0.38	1	0.08
P15-11	CIRCULAR	0.68	0.36	0.17	0.68	1	0.39
P16-15	CIRCULAR	0.53	0.22	0.13	0.53	1	0.20
P17-10	CIRCULAR	0.68	0.36	0.17	0.68	1	0.38
P18-9	CIRCULAR	0.90	0.64	0.23	0.90	1	0.63
P19-18	CIRCULAR	0.75	0.44	0.19	0.75	1	0.43
P20-19	CIRCULAR	0.60	0.28	0.15	0.60	1	0.27
P2-1	CIRCULAR	1.50	1.77	0.38	1.50	1	2.74
P21-20	CIRCULAR	0.53	0.22	0.13	0.53	1	0.18
P22-3	CIRCULAR	1.05	0.87	0.26	1.05	1	0.85
P22A-22	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P23-22A	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P24-23	CIRCULAR	0.90	0.64	0.23	0.90	1	0.70
P25-24	CIRCULAR	0.68	0.36	0.17	0.68	1	0.46
P3-2	CIRCULAR	1.50	1.77	0.38	1.50	1	2.76
P4-3	CIRCULAR	1.35	1.43	0.34	1.35	1	2.11
P5-4	CIRCULAR	1.35	1.43	0.34	1.35	1	2.07

```
P6-5            CIRCULAR            1.35     1.43     0.34     1.35        1     2.07
P7-6            CIRCULAR            1.35     1.43     0.34     1.35        1     2.07
P8-7            CIRCULAR            1.35     1.43     0.34     1.35        1     2.10
P9-8            CIRCULAR            1.35     1.43     0.34     1.35        1     2.07


***************
Transect Summary
***************

Transect PrimaryCollectorBothSides
Area:
           0.0003     0.0012     0.0027     0.0047     0.0074
           0.0107     0.0145     0.0189     0.0240     0.0296
           0.0358     0.0426     0.0500     0.0580     0.0671
           0.0776     0.0897     0.1033     0.1184     0.1350
           0.1531     0.1727     0.1938     0.2157     0.2382
           0.2613     0.2850     0.3094     0.3343     0.3599
           0.3861     0.4129     0.4403     0.4683     0.4970
           0.5262     0.5561     0.5865     0.6176     0.6493
           0.6816     0.7146     0.7481     0.7822     0.8170
           0.8524     0.8884     0.9250     0.9622     1.0000
Hrad:
           0.0186     0.0373     0.0559     0.0746     0.0932
           0.1119     0.1305     0.1492     0.1678     0.1865
           0.2051     0.2238     0.2424     0.2611     0.2564
           0.2580     0.2637     0.2722     0.2827     0.2947
           0.3078     0.3218     0.3410     0.3782     0.4140
           0.4484     0.4814     0.5133     0.5440     0.5735
           0.6021     0.6296     0.6562     0.6818     0.7067
           0.7307     0.7539     0.7764     0.7982     0.8193
           0.8398     0.8597     0.8790     0.8978     0.9160
           0.9337     0.9510     0.9678     0.9841     1.0000
Width:
           0.0155     0.0311     0.0466     0.0621     0.0776
           0.0932     0.1087     0.1242     0.1398     0.1553
           0.1708     0.1863     0.2019     0.2174     0.2570
           0.2967     0.3363     0.3759     0.4155     0.4552
           0.4948     0.5344     0.5663     0.5823     0.5984
           0.6145     0.6305     0.6466     0.6627     0.6787
           0.6948     0.7108     0.7269     0.7430     0.7590
           0.7751     0.7912     0.8072     0.8233     0.8394
           0.8554     0.8715     0.8876     0.9036     0.9197
           0.9357     0.9518     0.9679     0.9839     1.0000


*********************************************************
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
  RDII ...................  NO
  Snowmelt ...............  NO
  Groundwater ............  NO
  Flow Routing ...........  YES
  Ponding Allowed ........  NO
  Water Quality ..........  NO
Infiltration Method ......  HORTON
Flow Routing Method ......  DYNWAVE
Starting Date ............  01/25/2018 00:00:00
Ending Date ..............  01/25/2018 03:00:00
Antecedent Dry Days ......  0.0
Report Time Step .........  00:01:00
Wet Time Step ............  00:05:00
Dry Time Step ............  00:05:00
Routing Time Step ........  5.00 sec
Variable Time Step .......  YES
Maximum Trials ...........  8
Number of Threads ........  4
Head Tolerance ...........  0.001500 m
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	0.862	47.091
Evaporation Loss	0.000	0.000
Infiltration Loss	0.201	10.964
Surface Runoff	0.614	33.534
Final Storage	0.056	3.076
Continuity Error (%)	-1.024	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.612	6.118
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.571	5.714
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.003
Final Stored Volume	0.039	0.387
Continuity Error (%)	0.329	

Highest Continuity Errors

Node ST24 (1.20%)

Time-Step Critical Elements

Link P8-7 (66.99%)
Link 1 (18.53%)

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	1.01 sec
Average Time Step	:	3.41 sec
Maximum Time Step	:	5.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.02
Percent Not Converging	:	0.00

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A1	47.09	0.00	0.00	9.23	35.53	0.02	0.01	0.754
A10	47.09	0.00	0.00	12.15	32.28	0.01	0.00	0.685
A11	47.09	0.00	0.00	12.15	32.28	0.07	0.04	0.685
A12	47.09	0.00	0.00	12.15	32.28	0.21	0.13	0.685
A13	47.09	0.00	0.00	12.15	32.28	0.15	0.09	0.685
A14	47.09	0.00	0.00	9.23	35.53	0.08	0.05	0.754
A15	47.09	0.00	0.00	10.44	34.18	0.12	0.08	0.726
A16	47.09	0.00	0.00	11.66	32.82	0.13	0.08	0.697
A17	47.09	0.00	0.00	11.66	32.82	0.12	0.07	0.697
A18	47.09	0.00	0.00	11.66	32.82	0.05	0.03	0.697
A19	47.09	0.00	0.00	11.66	32.82	0.03	0.02	0.697

A2	47.09	0.00	0.00	9.23	35.53	0.03	0.02	0.754
A20	47.09	0.00	0.00	11.66	32.82	0.05	0.03	0.697
A21	47.09	0.00	0.00	12.15	32.28	0.04	0.02	0.685
A22	47.09	0.00	0.00	12.15	32.28	0.01	0.01	0.685
A23	47.09	0.00	0.00	12.15	32.28	0.02	0.01	0.685
A24	47.09	0.00	0.00	12.15	32.28	0.01	0.00	0.685
A25	47.09	0.00	0.00	12.15	32.28	0.16	0.10	0.685
A26	47.09	0.00	0.00	12.15	32.28	0.13	0.08	0.685
A27	47.09	0.00	0.00	12.15	32.28	0.04	0.02	0.685
A28	47.09	0.00	0.00	11.66	32.82	0.10	0.06	0.697
A29	47.09	0.00	0.00	12.15	32.28	0.07	0.04	0.685
A3	47.09	0.00	0.00	9.23	35.53	0.02	0.01	0.754
A30	47.09	0.00	0.00	12.15	32.28	0.04	0.02	0.685
A31	47.09	0.00	0.00	12.15	32.28	0.08	0.05	0.685
A32	47.09	0.00	0.00	9.23	35.53	0.17	0.10	0.754
A33	47.09	0.00	0.00	10.20	34.45	0.09	0.05	0.732
A34	47.09	0.00	0.00	15.79	28.15	0.06	0.03	0.598
A35	47.09	0.00	0.00	10.20	34.45	0.16	0.10	0.732
A36	47.09	0.00	0.00	15.79	28.15	0.11	0.06	0.598
A37	47.09	0.00	0.00	10.20	34.45	0.09	0.06	0.732
A38	47.09	0.00	0.00	15.79	28.15	0.11	0.06	0.598
A39	47.09	0.00	0.00	10.20	34.45	0.10	0.06	0.732
A4	47.09	0.00	0.00	10.69	33.91	0.17	0.11	0.720
A40	47.09	0.00	0.00	15.79	28.15	0.07	0.04	0.598
A41	47.09	0.00	0.00	15.79	28.15	0.07	0.04	0.598
A42	47.09	0.00	0.00	5.10	40.04	0.09	0.06	0.850
A43	47.09	0.00	0.00	5.10	40.04	0.22	0.14	0.850
A44	47.09	0.00	0.00	10.20	34.45	0.09	0.06	0.732
A45	47.09	0.00	0.00	5.10	40.04	0.10	0.07	0.850
A46	47.09	0.00	0.00	10.20	34.45	0.15	0.09	0.732
A47	47.09	0.00	0.00	5.10	40.04	0.10	0.07	0.850
A48	47.09	0.00	0.00	10.20	34.45	0.08	0.05	0.732
A49	47.09	0.00	0.00	24.29	15.72	0.25	0.06	0.334
A5	47.09	0.00	0.00	10.69	33.91	0.20	0.12	0.720
A6	47.09	0.00	0.00	10.69	33.91	0.07	0.04	0.720
A7	47.09	0.00	0.00	12.15	32.28	0.01	0.01	0.685
A8	47.09	0.00	0.00	12.15	32.28	0.02	0.01	0.685
A9	47.09	0.00	0.00	12.15	32.28	0.02	0.01	0.685
R1	47.09	0.00	0.00	6.07	39.90	0.06	0.04	0.847
R10	47.09	0.00	0.00	6.07	39.90	0.08	0.05	0.847
R11	47.09	0.00	0.00	6.07	39.90	0.08	0.05	0.847
R12	47.09	0.00	0.00	6.07	39.90	0.09	0.07	0.847
R13	47.09	0.00	0.00	6.07	39.90	0.07	0.05	0.847
R14	47.09	0.00	0.00	6.07	39.90	0.08	0.06	0.847
R15	47.09	0.00	0.00	6.07	39.90	0.07	0.05	0.847
R16	47.09	0.00	0.00	6.07	39.90	0.12	0.09	0.847
R17	47.09	0.00	0.00	6.07	39.90	0.06	0.04	0.847
R18	47.09	0.00	0.00	6.07	39.90	0.06	0.04	0.847
R19	47.09	0.00	0.00	6.07	39.90	0.07	0.05	0.847
R2	47.09	0.00	0.00	6.07	39.90	0.08	0.05	0.847
R20	47.09	0.00	0.00	6.07	39.90	0.06	0.05	0.847
R21	47.09	0.00	0.00	6.07	39.90	0.14	0.10	0.847
R22	47.09	0.00	0.00	6.07	39.90	0.08	0.06	0.847
R3	47.09	0.00	0.00	6.07	39.90	0.07	0.05	0.847
R4	47.09	0.00	0.00	6.07	39.90	0.09	0.06	0.847
R5	47.09	0.00	0.00	6.07	39.90	0.07	0.05	0.847
R6	47.09	0.00	0.00	6.07	39.90	0.07	0.05	0.847
R7	47.09	0.00	0.00	6.07	39.90	0.09	0.07	0.847
R8	47.09	0.00	0.00	6.07	39.90	0.08	0.06	0.847
R9	47.09	0.00	0.00	6.07	39.90	0.10	0.07	0.847

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
ST1	JUNCTION	0.42	0.89	229.12	0 01:02	0.88
ST10	JUNCTION	0.29	0.75	231.30	0 01:00	0.75
ST11	JUNCTION	0.25	0.67	231.46	0 01:00	0.67
ST12	JUNCTION	0.14	0.39	231.99	0 01:00	0.39
ST13	JUNCTION	0.13	0.35	232.23	0 01:00	0.35
ST14	JUNCTION	0.08	0.23	232.33	0 00:57	0.23
ST15	JUNCTION	0.17	0.44	231.95	0 01:00	0.44
ST16	JUNCTION	0.13	0.36	232.17	0 01:00	0.36

ST17	JUNCTION	0.13	0.32	231.49	0	01:00	0.32
ST18	JUNCTION	0.23	0.58	231.43	0	01:00	0.58
ST19	JUNCTION	0.20	0.55	231.71	0	01:00	0.54
ST2	JUNCTION	0.41	0.93	229.86	0	01:02	0.93
ST20	JUNCTION	0.18	0.50	231.96	0	01:00	0.50
ST21	JUNCTION	0.13	0.33	232.28	0	01:00	0.33
ST22	JUNCTION	0.24	0.53	230.08	0	01:02	0.53
ST22A	JUNCTION	0.23	0.45	230.10	0	01:02	0.45
ST23	JUNCTION	0.22	0.37	230.15	0	01:02	0.37
ST24	JUNCTION	0.19	0.27	230.35	0	01:00	0.27
ST25	JUNCTION	0.13	0.18	230.72	0	01:00	0.18
ST3	JUNCTION	0.44	1.00	230.07	0	01:02	1.00
ST4	JUNCTION	0.38	0.96	230.26	0	01:01	0.96
ST5	JUNCTION	0.40	1.05	230.53	0	01:01	1.05
ST6	JUNCTION	0.40	1.07	230.71	0	01:01	1.07
ST7	JUNCTION	0.38	1.08	230.86	0	01:01	1.08
ST8	JUNCTION	0.36	1.05	230.89	0	01:01	1.05
ST9	JUNCTION	0.36	1.04	231.10	0	01:00	1.04
Pond	OUTFALL	0.40	0.85	229.07	0	01:02	0.85
SU33	STORAGE	0.22	0.33	233.63	0	01:20	0.33
SU34	STORAGE	0.19	0.29	233.59	0	01:23	0.29
SU35	STORAGE	0.22	0.32	233.32	0	01:21	0.32
SU36	STORAGE	0.19	0.29	233.29	0	01:23	0.29
SU37	STORAGE	0.22	0.33	233.33	0	01:20	0.33
SU38	STORAGE	0.19	0.29	233.29	0	01:23	0.29
SU39	STORAGE	0.22	0.33	232.83	0	01:20	0.33
SU40	STORAGE	0.19	0.29	232.79	0	01:23	0.29
SU41	STORAGE	0.19	0.29	232.59	0	01:23	0.29
SU42	STORAGE	0.24	0.35	233.15	0	01:20	0.35
SU43	STORAGE	0.24	0.35	233.15	0	01:20	0.35
SU44	STORAGE	0.22	0.32	233.62	0	01:20	0.32
SU45	STORAGE	0.24	0.34	233.94	0	01:20	0.34
SU46	STORAGE	0.22	0.32	233.92	0	01:21	0.32
SU47	STORAGE	0.24	0.34	234.14	0	01:20	0.34
SU48	STORAGE	0.22	0.32	234.12	0	01:21	0.32
SU49	STORAGE	0.10	0.18	233.98	0	01:41	0.18

****
Node Inflow Summary
****

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	Flow Balance Error Percent
ST1	JUNCTION	0.000	2.719	0	01:02	0	5.72	0.041
ST10	JUNCTION	0.233	1.178	0	01:00	0.372	1.86	0.551
ST11	JUNCTION	0.186	0.758	0	01:00	0.291	1.19	0.501
ST12	JUNCTION	0.107	0.229	0	01:00	0.165	0.347	0.425
ST13	JUNCTION	0.069	0.124	0	00:56	0.101	0.183	0.222
ST14	JUNCTION	0.057	0.057	0	00:55	0.0833	0.0833	1.223
ST15	JUNCTION	0.184	0.349	0	01:00	0.291	0.551	0.350
ST16	JUNCTION	0.166	0.166	0	01:00	0.262	0.262	0.527
ST17	JUNCTION	0.196	0.196	0	01:00	0.313	0.313	0.331
ST18	JUNCTION	0.188	0.599	0	01:00	0.301	0.948	0.307
ST19	JUNCTION	0.096	0.415	0	01:00	0.15	0.651	0.706
ST2	JUNCTION	0.000	2.719	0	01:02	0	5.73	0.157
ST20	JUNCTION	0.191	0.321	0	01:00	0.299	0.504	0.567
ST21	JUNCTION	0.132	0.132	0	01:00	0.207	0.207	0.694
ST22	JUNCTION	0.000	0.274	0	00:58	0	1.21	0.378
ST22A	JUNCTION	0.053	0.283	0	00:59	0.0744	1.14	0.485
ST23	JUNCTION	0.089	0.221	0	01:00	0.123	0.897	0.637
ST24	JUNCTION	0.041	0.130	0	01:00	0.0577	0.704	1.213
ST25	JUNCTION	0.041	0.069	0	01:00	0.0578	0.438	0.832
ST3	JUNCTION	0.057	2.722	0	01:02	0.0793	5.74	0.247
ST4	JUNCTION	0.053	2.398	0	01:01	0.0746	4.42	0.487
ST5	JUNCTION	0.065	2.337	0	01:01	0.0907	4.21	0.470
ST6	JUNCTION	0.054	2.266	0	01:00	0.0753	3.96	0.484
ST7	JUNCTION	0.000	2.194	0	01:00	0	3.66	0.236
ST8	JUNCTION	0.205	2.179	0	01:00	0.322	3.52	-0.288
ST9	JUNCTION	0.254	2.006	0	01:00	0.407	3.2	0.253
Pond	OUTFALL	0.000	2.719	0	01:02	0	5.73	0.000
SU33	STORAGE	0.055	0.055	0	01:00	0.0872	0.0872	0.001
SU34	STORAGE	0.031	0.031	0	01:00	0.0554	0.0554	0.003
SU35	STORAGE	0.103	0.103	0	01:00	0.163	0.163	0.001
SU36	STORAGE	0.062	0.062	0	01:00	0.111	0.111	0.001

SU37	STORAGE	0.057	0.057	0	01:00	0.0913	0.0913	0.001
SU38	STORAGE	0.062	0.062	0	01:00	0.111	0.111	0.001
SU39	STORAGE	0.064	0.064	0	01:00	0.102	0.102	0.001
SU40	STORAGE	0.037	0.037	0	01:00	0.0652	0.0652	0.002
SU41	STORAGE	0.037	0.037	0	01:00	0.0652	0.0652	0.002
SU42	STORAGE	0.058	0.058	0	01:00	0.0887	0.0887	0.002
SU43	STORAGE	0.142	0.142	0	01:00	0.217	0.217	0.001
SU44	STORAGE	0.057	0.057	0	01:00	0.0906	0.0905	0.001
SU45	STORAGE	0.067	0.067	0	01:00	0.102	0.102	0.002
SU46	STORAGE	0.095	0.095	0	01:00	0.151	0.151	0.001
SU47	STORAGE	0.067	0.067	0	01:00	0.102	0.102	0.002
SU48	STORAGE	0.048	0.048	0	01:00	0.0762	0.0762	0.002
SU49	STORAGE	0.059	0.059	0	01:10	0.245	0.245	0.001

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
SU33	0.024	24	0	0	0.043	43	0 01:20	0.012
SU34	0.012	18	0	0	0.024	34	0 01:23	0.008
SU35	0.044	23	0	0	0.080	42	0 01:21	0.022
SU36	0.025	18	0	0	0.047	34	0 01:23	0.016
SU37	0.025	23	0	0	0.045	42	0 01:20	0.012
SU38	0.025	18	0	0	0.047	34	0 01:23	0.016
SU39	0.028	23	0	0	0.050	42	0 01:20	0.014
SU40	0.014	18	0	0	0.028	35	0 01:23	0.010
SU41	0.014	18	0	0	0.028	35	0 01:23	0.010
SU42	0.027	28	0	0	0.047	48	0 01:20	0.011
SU43	0.066	28	0	0	0.114	48	0 01:20	0.026
SU44	0.024	23	0	0	0.044	42	0 01:20	0.012
SU45	0.031	28	0	0	0.054	48	0 01:20	0.012
SU46	0.041	23	0	0	0.074	42	0 01:21	0.020
SU47	0.031	28	0	0	0.054	48	0 01:20	0.012
SU48	0.021	24	0	0	0.038	42	0 01:21	0.010
SU49	0.023	6	0	0	0.050	13	0 01:41	0.040

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Pond	99.97	0.730	2.719	5.730
System	99.97	0.730	2.719	5.730

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth

1	CONDUIT	2.719	0	01:02	2.56	0.98	0.58
P10-9	CONDUIT	1.167	0	01:00	1.79	0.94	0.58
P11-10	CONDUIT	0.752	0	01:00	1.39	0.87	0.61
P12-11	CONDUIT	0.228	0	01:00	1.34	0.82	0.58
P13-12	CONDUIT	0.121	0	01:00	1.09	1.04	0.66
P14-13	CONDUIT	0.056	0	00:57	0.78	0.70	0.67
P15-11	CONDUIT	0.347	0	01:00	1.54	0.90	0.60
P16-15	CONDUIT	0.165	0	01:00	1.18	0.84	0.62
P17-10	CONDUIT	0.194	0	01:00	1.28	0.51	0.44
P18-9	CONDUIT	0.594	0	01:00	1.58	0.95	0.57
P19-18	CONDUIT	0.412	0	01:00	1.36	0.96	0.65
P20-19	CONDUIT	0.320	0	01:00	1.42	1.16	0.75
P2-1	CONDUIT	2.719	0	01:02	2.49	0.99	0.59
P21-20	CONDUIT	0.130	0	01:00	1.10	0.74	0.54
P22-3	CONDUIT	0.288	0	01:04	1.14	0.34	0.51
P22A-22	CONDUIT	0.266	0	00:58	1.18	0.31	0.44
P23-22A	CONDUIT	0.212	0	00:59	0.84	0.25	0.37
P24-23	CONDUIT	0.130	0	01:01	0.96	0.19	0.27
P25-24	CONDUIT	0.068	0	01:01	0.98	0.15	0.25
P3-2	CONDUIT	2.719	0	01:02	2.30	0.98	0.63
P4-3	CONDUIT	2.400	0	01:02	2.36	1.14	0.67
P5-4	CONDUIT	2.337	0	01:01	2.08	1.13	0.73
P6-5	CONDUIT	2.262	0	01:01	1.90	1.09	0.78
P7-6	CONDUIT	2.191	0	01:01	1.82	1.06	0.79
P8-7	CONDUIT	2.179	0	01:00	1.83	1.04	0.78
P9-8	CONDUIT	1.990	0	01:01	1.70	0.96	0.76
OL33	DUMMY	0.012	0	01:20			
OL34	DUMMY	0.008	0	01:23			
OL35	DUMMY	0.022	0	01:21			
OL36	DUMMY	0.016	0	01:23			
OL37	DUMMY	0.012	0	01:20			
OL38	DUMMY	0.016	0	01:23			
OL39	DUMMY	0.014	0	01:20			
OL40	DUMMY	0.010	0	01:23			
OL41	DUMMY	0.010	0	01:23			
OL42	DUMMY	0.011	0	01:20			
OL43	DUMMY	0.026	0	01:20			
OL44	DUMMY	0.012	0	01:20			
OL45	DUMMY	0.012	0	01:20			
OL46	DUMMY	0.020	0	01:21			
OL47	DUMMY	0.012	0	01:20			
OL48	DUMMY	0.010	0	01:21			
OL49	DUMMY	0.040	0	01:41			

****
Flow Classification Summary
****

	Adjusted	Fraction of Time in Flow Class								
Conduit	/Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
P10-9	1.00	0.08	0.00	0.00	0.07	0.00	0.00	0.85	0.00	0.00
P11-10	1.00	0.08	0.00	0.00	0.22	0.00	0.00	0.70	0.00	0.00
P12-11	1.00	0.08	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00
P13-12	1.00	0.08	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00
P14-13	1.00	0.08	0.00	0.00	0.28	0.00	0.00	0.65	0.09	0.00
P15-11	1.00	0.08	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00
P16-15	1.00	0.08	0.00	0.00	0.10	0.00	0.00	0.82	0.00	0.00
P17-10	1.00	0.08	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00
P18-9	1.00	0.08	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00
P19-18	1.00	0.08	0.00	0.00	0.12	0.00	0.00	0.80	0.00	0.00
P20-19	1.00	0.08	0.00	0.00	0.09	0.00	0.00	0.83	0.00	0.00
P2-1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
P21-20	1.00	0.08	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00
P22-3	1.00	0.08	0.00	0.00	0.17	0.00	0.00	0.76	0.00	0.00
P22A-22	1.00	0.08	0.00	0.00	0.24	0.00	0.00	0.68	0.00	0.00
P23-22A	1.00	0.08	0.00	0.00	0.91	0.00	0.00	0.02	0.00	0.00
P24-23	1.00	0.08	0.00	0.00	0.10	0.00	0.00	0.82	0.00	0.00
P25-24	1.00	0.08	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00
P3-2	1.00	0.05	0.02	0.00	0.84	0.00	0.00	0.08	0.00	0.00
P4-3	1.00	0.08	0.00	0.00	0.12	0.00	0.00	0.81	0.00	0.00
P5-4	1.00	0.08	0.00	0.00	0.88	0.00	0.00	0.05	0.00	0.00
P6-5	1.00	0.08	0.00	0.00	0.88	0.00	0.00	0.05	0.00	0.00
P7-6	1.00	0.08	0.00	0.00	0.88	0.00	0.00	0.04	0.00	0.00

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P8-7                    1.00   0.08  0.00  0.00  0.87  0.00  0.00  0.06  0.01  0.00
P9-8                    1.00   0.08  0.00  0.00  0.90  0.00  0.00  0.02  0.02  0.00


*************************
Conduit Surcharge Summary
*************************

-------------------------------------------------------------------------------
                                                          Hours        Hours
                        --------- Hours Full --------   Above Full   Capacity
Conduit                 Both Ends  Upstream  Dnstream   Normal Flow   Limited
-------------------------------------------------------------------------------
P13-12                       0.01      0.01      0.01      0.06         0.01
P20-19                       0.01      0.01      0.01      0.11         0.01
P4-3                         0.01      0.01      0.01      0.11         0.01
P5-4                         0.01      0.01      0.01      0.11         0.01
P6-5                         0.01      0.01      0.01      0.10         0.01
P7-6                         0.01      0.01      0.01      0.08         0.01
P8-7                         0.01      0.01      0.01      0.06         0.01


Analysis begun on:  Thu Jan 25 10:02:57 2018
Analysis ended on:  Thu Jan 25 10:02:57 2018
Total elapsed time: < 1 sec
```

Single Storm Event
3 hours - 25 year

- **Input File**
- **Report File**

To reduce the amount of data in the input file, the following sections have been excluded in this Appendix:

- Coordinates
- Vertices
- Polygons

```
[TITLE]
Parker Lands
Single Event
Winnipeg 3h-25y Storm


[OPTIONS]
;;Options            Value
;;------------------ ------------
FLOW_UNITS           CMS
INFILTRATION         HORTON
FLOW_ROUTING         DYNWAVE
START_DATE           01/25/2018
START_TIME           00:00:00
REPORT_START_DATE    01/25/2018
REPORT_START_TIME    00:00:00
END_DATE             01/25/2018
END_TIME             03:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:05:00
DRY_STEP             00:05:00
ROUTING_STEP         5
ALLOW_PONDING        NO
INERTIAL_DAMPING     PARTIAL
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
NORMAL_FLOW_LIMITED  BOTH
SKIP_STEADY_STATE    NO
FORCE_MAIN_EQUATION  H-W
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              4

[EVAPORATION]
;;Type          Parameters
;;------------- ----------
CONSTANT     0.0
DRY_ONLY     NO

[RAINGAGES]
;;               Rain      Time   Snow   Data
;;Name           Type      Intrvl Catch  Source
;;-------------- --------- ------ ------ ----------
Winnipeg_3h-25y  INTENSITY 0:05   1.0    TIMESERIES Winnipeg_3h-25y

[SUBCATCHMENTS]
;;                                          Total    Pcnt.            Pcnt.    Curb     Snow
;;Name           Raingage         Outlet     Area     Imperv   Width   Slope    Length   Pack
;;-------------- ---------------- ---------- -------- -------- ------- -------- -------- --------
;SF
A1               Winnipeg_3h-25y  ST14       0.0588   62       19.6    2        0
;SF
A10              Winnipeg_3h-25y  ST11       0.022    50       7.333   2        0
;SF
A11              Winnipeg_3h-25y  ST20       0.2138   50       71.267  2        0
;SF
A12              Winnipeg_3h-25y  ST17       0.6496   50       216.533 2        0
;SF
A13              Winnipeg_3h-25y  ST10       0.4509   50       150.3   2        0
;SF
A14              Winnipeg_3h-25y  ST12       0.213    62       71      2        0
;SF
A15              Winnipeg_3h-25y  ST11       0.363    57       121     2        0
;SF
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A16             Winnipeg_3h-25y  ST10            0.3835   52       127.833  2        0
;SF
A17             Winnipeg_3h-25y  ST21            0.3574   52       119.133  2        0
;SF
A18             Winnipeg_3h-25y  ST20            0.153    52       51       2        0
;SF
A19             Winnipeg_3h-25y  ST20            0.1019   52       33.967   2        0
;SF
A2              Winnipeg_3h-25y  ST13            0.0718   62       23.933   2        0
;SF
A20             Winnipeg_3h-25y  ST19            0.1531   52       51.033   2        0
;SF
A21             Winnipeg_3h-25y  ST19            0.1139   50       37.967   2        0
;SF
A22             Winnipeg_3h-25y  ST20            0.0358   50       11.933   2        0
;SF
A23             Winnipeg_3h-25y  ST17            0.0741   50       24.7     2        0
;SF
A24             Winnipeg_3h-25y  ST10            0.0251   50       8.367    2        0
;SF
A25             Winnipeg_3h-25y  ST18            0.5008   50       166.933  2        0
;SF
A26             Winnipeg_3h-25y  ST9             0.3988   50       132.933  2        0
;SF
A27             Winnipeg_3h-25y  ST9             0.1202   50       40.067   2        0
;SF
A28             Winnipeg_3h-25y  ST9             0.3196   52       106.533  2        0
;SF
A29             Winnipeg_3h-25y  ST18            0.2207   50       73.567   2        0
;SF
A3              Winnipeg_3h-25y  ST12            0.0425   62       14.167   2        0
;SF
A30             Winnipeg_3h-25y  ST9             0.1243   50       41.433   2        0
;SF
A31             Winnipeg_3h-25y  ST8             0.2575   50       85.833   2        0
;SF
A32             Winnipeg_3h-25y  ST8             0.4647   62       154.9    2        0
;MF-65%
A33             Winnipeg_3h-25y  SU33            0.254    58       84.667   2        0
;MF-45%
A34             Winnipeg_3h-25y  SU34            0.1973   35       65.767   2        0
;MF-65%
A35             Winnipeg_3h-25y  SU35            0.476    58       158.667  2        0
;MF-45%
A36             Winnipeg_3h-25y  SU36            0.3945   35       131.5    2        0
;MF-65%
A37             Winnipeg_3h-25y  SU37            0.2659   58       88.633   2        0
;MF-45%
A38             Winnipeg_3h-25y  SU38            0.3945   35       131.5    2        0
;MF-65%
A39             Winnipeg_3h-25y  SU39            0.2973   58       99.1     2        0
;SF
A4              Winnipeg_3h-25y  ST16            0.5104   56       170.133  2        0
;MF-45%
A40             Winnipeg_3h-25y  SU40            0.2324   35       77.467   2        0
;MF-45%
A41             Winnipeg_3h-25y  SU41            0.2324   35       77.467   2        0
;MF-65%
A42             Winnipeg_3h-25y  SU42            0.2222   79       74.067   2        0
;MF-65%
A43             Winnipeg_3h-25y  SU43            0.5449   79       181.633  2        0
;MF-65%
A44             Winnipeg_3h-25y  SU44            0.2637   58       87.9     2        0
;MF-65%
A45             Winnipeg_3h-25y  SU45            0.2549   79       84.967   2        0
;MF-65%
A46             Winnipeg_3h-25y  SU46            0.439    58       146.333  2        0
;MF-65%
A47             Winnipeg_3h-25y  SU47            0.2549   79       84.967   2        0
;MF-65%
A48             Winnipeg_3h-25y  SU48            0.222    58       74       2        0
;Forest
A49             Winnipeg_3h-25y  SU49            1.567    0        195.875  2        0
;SF
A5              Winnipeg_3h-25y  ST15            0.5877   56       195.9    2        0
;SF
A6              Winnipeg_3h-25y  ST11            0.2057   56       68.567   2        0
;SF
A7              Winnipeg_3h-25y  ST21            0.0334   50       11.133   2        0
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;SF
A8              Winnipeg_3h-25y  ST16            0.0664   50       22.133   2        0
;SF
A9              Winnipeg_3h-25y  ST15            0.0661   50       22.033   2        0
;Roads
R1              Winnipeg_3h-25y  ST14            0.157    75       785      2        0
;Roads
R10             Winnipeg_3h-25y  ST8             0.1881   75       940.5    2        0
;Roads
R11             Winnipeg_3h-25y  ST6             0.1893   75       946.5    2        0
;Roads
R12             Winnipeg_3h-25y  ST5             0.2281   75       1140.5   2        0
;Roads
R13             Winnipeg_3h-25y  ST4             0.1875   75       937.5    2        0
;Roads
R14             Winnipeg_3h-25y  ST3             0.1994   75       997      2        0
;Roads
R15             Winnipeg_3h-25y  ST22A           0.1871   75       935.5    2        0
;Roads
R16             Winnipeg_3h-25y  ST23            0.3104   75       1552     2        0
;Roads
R17             Winnipeg_3h-25y  ST24            0.145    75       725      2        0
;Roads
R18             Winnipeg_3h-25y  ST25            0.1454   75       727      2        0
;Roads
R19             Winnipeg_3h-25y  ST18            0.1734   75       867      2        0
;Roads
R2              Winnipeg_3h-25y  ST13            0.1888   75       944      2        0
;Roads
R20             Winnipeg_3h-25y  ST19            0.159    75       795      2        0
;Roads
R21             Winnipeg_3h-25y  ST20            0.3394   75       1697     2        0
;Roads
R22             Winnipeg_3h-25y  ST21            0.1997   75       998.5    2        0
;Roads
R3              Winnipeg_3h-25y  ST12            0.1864   75       932      2        0
;Roads
R4              Winnipeg_3h-25y  ST11            0.2271   75       1135.5   2        0
;Roads
R5              Winnipeg_3h-25y  ST16            0.1708   75       854      2        0
;Roads
R6              Winnipeg_3h-25y  ST15            0.1776   75       888      2        0
;Roads
R7              Winnipeg_3h-25y  ST10            0.2355   75       1177.5   2        0
;Roads
R8              Winnipeg_3h-25y  ST17            0.2019   75       1009.5   2        0
;Roads
R9              Winnipeg_3h-25y  ST9             0.2388   75       1194     2        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A1              0.015      0.25       1.6        3.2        0          OUTLET
A10             0.015      0.25       1.6        3.2        0          OUTLET
A11             0.015      0.25       1.6        3.2        0          OUTLET
A12             0.015      0.25       1.6        3.2        0          OUTLET
A13             0.015      0.25       1.6        3.2        0          OUTLET
A14             0.015      0.25       1.6        3.2        0          OUTLET
A15             0.015      0.25       1.6        3.2        0          OUTLET
A16             0.015      0.25       1.6        3.2        0          OUTLET
A17             0.015      0.25       1.6        3.2        0          OUTLET
A18             0.015      0.25       1.6        3.2        0          OUTLET
A19             0.015      0.25       1.6        3.2        0          OUTLET
A2              0.015      0.25       1.6        3.2        0          OUTLET
A20             0.015      0.25       1.6        3.2        0          OUTLET
A21             0.015      0.25       1.6        3.2        0          OUTLET
A22             0.015      0.25       1.6        3.2        0          OUTLET
A23             0.015      0.25       1.6        3.2        0          OUTLET
A24             0.015      0.25       1.6        3.2        0          OUTLET
A25             0.015      0.25       1.6        3.2        0          OUTLET
A26             0.015      0.25       1.6        3.2        0          OUTLET
A27             0.015      0.25       1.6        3.2        0          OUTLET
A28             0.015      0.25       1.6        3.2        0          OUTLET
A29             0.015      0.25       1.6        3.2        0          OUTLET
A3              0.015      0.25       1.6        3.2        0          OUTLET
A30             0.015      0.25       1.6        3.2        0          OUTLET
A31             0.015      0.25       1.6        3.2        0          OUTLET
A32             0.015      0.25       1.6        3.2        0          OUTLET
A33             0.015      0.25       1.6        3.2        0          OUTLET
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A34             0.015      0.25       1.6        3.2        0          OUTLET
A35             0.015      0.25       1.6        3.2        0          OUTLET
A36             0.015      0.25       1.6        3.2        0          OUTLET
A37             0.015      0.25       1.6        3.2        0          OUTLET
A38             0.015      0.25       1.6        3.2        0          OUTLET
A39             0.015      0.25       1.6        3.2        0          OUTLET
A4              0.015      0.25       1.6        3.2        0          OUTLET
A40             0.015      0.25       1.6        3.2        0          OUTLET
A41             0.015      0.25       1.6        3.2        0          OUTLET
A42             0.015      0.25       1.6        3.2        0          OUTLET
A43             0.015      0.25       1.6        3.2        0          OUTLET
A44             0.015      0.25       1.6        3.2        0          OUTLET
A45             0.015      0.25       1.6        3.2        0          OUTLET
A46             0.015      0.25       1.6        3.2        0          OUTLET
A47             0.015      0.25       1.6        3.2        0          OUTLET
A48             0.015      0.25       1.6        3.2        0          OUTLET
A49             0.015      0.25       1.6        3.2        0          OUTLET
A5              0.015      0.25       1.6        3.2        0          OUTLET
A6              0.015      0.25       1.6        3.2        0          OUTLET
A7              0.015      0.25       1.6        3.2        0          OUTLET
A8              0.015      0.25       1.6        3.2        0          OUTLET
A9              0.015      0.25       1.6        3.2        0          OUTLET
R1              0.015      0.25       1.6        3.2        0          OUTLET
R10             0.015      0.25       1.6        3.2        0          OUTLET
R11             0.015      0.25       1.6        3.2        0          OUTLET
R12             0.015      0.25       1.6        3.2        0          OUTLET
R13             0.015      0.25       1.6        3.2        0          OUTLET
R14             0.015      0.25       1.6        3.2        0          OUTLET
R15             0.015      0.25       1.6        3.2        0          OUTLET
R16             0.015      0.25       1.6        3.2        0          OUTLET
R17             0.015      0.25       1.6        3.2        0          OUTLET
R18             0.015      0.25       1.6        3.2        0          OUTLET
R19             0.015      0.25       1.6        3.2        0          OUTLET
R2              0.015      0.25       1.6        3.2        0          OUTLET
R20             0.015      0.25       1.6        3.2        0          OUTLET
R21             0.015      0.25       1.6        3.2        0          OUTLET
R22             0.015      0.25       1.6        3.2        0          OUTLET
R3              0.015      0.25       1.6        3.2        0          OUTLET
R4              0.015      0.25       1.6        3.2        0          OUTLET
R5              0.015      0.25       1.6        3.2        0          OUTLET
R6              0.015      0.25       1.6        3.2        0          OUTLET
R7              0.015      0.25       1.6        3.2        0          OUTLET
R8              0.015      0.25       1.6        3.2        0          OUTLET
R9              0.015      0.25       1.6        3.2        0          OUTLET

[INFILTRATION]
;;Subcatchment   MaxRate    MinRate    Decay      DryTime    MaxInfil
;;-------------- ---------- ---------- ---------- ---------- ----------
A1              75         3          4.14       7          0
A10             75         3          4.14       7          0
A11             75         3          4.14       7          0
A12             75         3          4.14       7          0
A13             75         3          4.14       7          0
A14             75         3          4.14       7          0
A15             75         3          4.14       7          0
A16             75         3          4.14       7          0
A17             75         3          4.14       7          0
A18             75         3          4.14       7          0
A19             75         3          4.14       7          0
A2              75         3          4.14       7          0
A20             75         3          4.14       7          0
A21             75         3          4.14       7          0
A22             75         3          4.14       7          0
A23             75         3          4.14       7          0
A24             75         3          4.14       7          0
A25             75         3          4.14       7          0
A26             75         3          4.14       7          0
A27             75         3          4.14       7          0
A28             75         3          4.14       7          0
A29             75         3          4.14       7          0
A3              75         3          4.14       7          0
A30             75         3          4.14       7          0
A31             75         3          4.14       7          0
A32             75         3          4.14       7          0
A33             75         3          4.14       7          0
A34             75         3          4.14       7          0
A35             75         3          4.14       7          0
A36             75         3          4.14       7          0
A37             75         3          4.14       7          0
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A38             75         3          4.14       7          0
A39             75         3          4.14       7          0
A4              75         3          4.14       7          0
A40             75         3          4.14       7          0
A41             75         3          4.14       7          0
A42             75         3          4.14       7          0
A43             75         3          4.14       7          0
A44             75         3          4.14       7          0
A45             75         3          4.14       7          0
A46             75         3          4.14       7          0
A47             75         3          4.14       7          0
A48             75         3          4.14       7          0
A49             75         3          4.14       7          0
A5              75         3          4.14       7          0
A6              75         3          4.14       7          0
A7              75         3          4.14       7          0
A8              75         3          4.14       7          0
A9              75         3          4.14       7          0
R1              75         3          4.14       7          0
R10             75         3          4.14       7          0
R11             75         3          4.14       7          0
R12             75         3          4.14       7          0
R13             75         3          4.14       7          0
R14             75         3          4.14       7          0
R15             75         3          4.14       7          0
R16             75         3          4.14       7          0
R17             75         3          4.14       7          0
R18             75         3          4.14       7          0
R19             75         3          4.14       7          0
R2              75         3          4.14       7          0
R20             75         3          4.14       7          0
R21             75         3          4.14       7          0
R22             75         3          4.14       7          0
R3              75         3          4.14       7          0
R4              75         3          4.14       7          0
R5              75         3          4.14       7          0
R6              75         3          4.14       7          0
R7              75         3          4.14       7          0
R8              75         3          4.14       7          0
R9              75         3          4.14       7          0

[JUNCTIONS]
;;              Invert     Max.       Init.      Surcharge  Ponded
;;Name          Elev.      Depth      Depth      Depth      Area
;;------------- ---------- ---------- ---------- ---------- ----------
ST1             228.237    3.375      0          0          0
ST10            230.543    2.794      0          0          0
ST11            230.783    2.729      0          0          0
ST12            231.605    2.039      0          0          0
ST13            231.875    2.1        0          0          0
ST14            232.1      2.122      0          0          0
ST15            231.506    2.207      0          0          0
ST16            231.806    2.125      0          0          0
ST17            231.165    2.446      0          0          0
ST18            230.851    2.52       0          0          0
ST19            231.165    2.479      0          0          0
ST2             228.93     3.197      0.116      0          0
ST20            231.455    2.49       0          0          0
ST21            231.956    2.212      0          0          0
ST22            229.552    2.964      0          0          0
ST22A           229.652    2.812      0          0          0
ST23            229.782    2.898      0          0          0
ST24            230.082    2.719      0          0          0
ST25            230.547    2.272      0          0          0
ST3             229.067    3.199      0          0          0
ST4             229.303    3.086      0          0          0
ST5             229.483    3.112      0          0          0
ST6             229.633    3.001      0          0          0
ST7             229.786    3          0          0          0
ST8             229.833    3.091      0          0          0
ST9             230.063    3.15       0          0          0

[OUTFALLS]
;;              Invert     Outfall    Stage/Table      Tide
;;Name          Elev.      Type       Time Series      Gate Route To
;;------------- ---------- ---------- ---------------- ---- ----------------
Pond            228.214    FIXED      228.45           NO

[STORAGE]
```

;;Name	Invert Elev.	Max. Depth	Init. Depth	Storage Curve	Curve Params			Ponded Area	Evap. Frac.	Infiltration parameters
SU33	233.3	0.5	0	TABULAR	OS33			0	0	
SU34	233.3	0.5	0	TABULAR	OS34			0	0	
SU35	233	0.5	0	TABULAR	OS35			0	0	
SU36	233	0.5	0	TABULAR	OS36			0	0	
SU37	233	0.5	0	TABULAR	OS37			0	0	
SU38	233	0.5	0	TABULAR	OS38			0	0	
SU39	232.5	0.5	0	TABULAR	OS39			0	0	
SU40	232.5	0.5	0	TABULAR	OS40			0	0	
SU41	232.3	0.5	0	TABULAR	OS41			0	0	
SU42	232.8	0.5	0	TABULAR	OS42			0	0	
SU43	232.8	0.5	0	TABULAR	OS43			0	0	
SU44	233.3	0.5	0	TABULAR	OS44			0	0	
SU45	233.6	0.5	0	TABULAR	OS45			0	0	
SU46	233.6	0.5	0	TABULAR	OS46			0	0	
SU47	233.8	0.5	0	TABULAR	OS47			0	0	
SU48	233.8	0.5	0	TABULAR	OS48			0	0	
SU49	233.8	0.5	0	TABULAR	OS49			0	0	

[CONDUITS]

;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Offset	Outlet Offset	Init. Flow	Max. Flow
1	ST1	Pond	15	0.013	0	0	0	0
P10-9	ST10	ST9	79.55	0.013	0	0.4	0	0
P11-10	ST11	ST10	90.17	0.013	0	0.15	0	0
P12-11	ST12	ST11	83.69	0.011	0	0.7	0	0
P13-12	ST13	ST12	100	0.011	0	0.15	0	0
P14-13	ST14	ST13	100	0.011	0	0.075	0	0
P15-11	ST15	ST11	65	0.011	0	0.625	0	0
P16-15	ST16	ST15	100	0.011	0	0.15	0	0
P17-10	ST17	ST10	65	0.011	0	0.525	0	0
P18-9	ST18	ST9	75	0.013	0	0.698	0	0
P19-18	ST19	ST18	109.15	0.013	0	0.15	0	0
P20-19	ST20	ST19	70	0.013	0	0.15	0	0
P2-1	ST2	ST1	40	0.013	0	0.633	0	0
P21-20	ST21	ST20	105	0.011	0	0.375	0	0
P22-3	ST22	ST3	35.93	0.013	0	0.45	0	0
P22A-22	ST22A	ST22	40	0.013	0	0.06	0	0
P23-22A	ST23	ST22A	100	0.013	0	0.03	0	0
P24-23	ST24	ST23	100	0.013	0	0.15	0	0
P25-24	ST25	ST24	80	0.013	0	0.225	0	0
P3-2	ST3	ST2	70	0.013	0	0.03	0	0
P4-3	ST4	ST3	55	0.013	0	0.15	0	0
P5-4	ST5	ST4	100	0.013	0	0.03	0	0
P6-5	ST6	ST5	80	0.013	0	0.03	0	0
P7-6	ST7	ST6	81.95	0.013	0	0.03	0	0
P8-7	ST8	ST7	10.97	0.013	0	0.03	0	0
P9-8	ST9	ST8	132.72	0.013	0	0.03	0	0

[OUTLETS]

;;Name	Inlet Node	Outlet Node	Outflow Height	Outlet Type	Qcoeff/ QTable	Qexpon	Flap Gate
OL33	SU33	ST7	0	TABULAR/DEPTH	ICD33		NO
OL34	SU34	ST7	0	TABULAR/DEPTH	ICD34		NO
OL35	SU35	ST6	0	TABULAR/DEPTH	ICD35		NO
OL36	SU36	ST6	0	TABULAR/DEPTH	ICD36		NO
OL37	SU37	ST5	0	TABULAR/DEPTH	ICD37		NO
OL38	SU38	ST5	0	TABULAR/DEPTH	ICD38		NO
OL39	SU39	ST4	0	TABULAR/DEPTH	ICD39		NO
OL40	SU40	ST4	0	TABULAR/DEPTH	ICD40		NO
OL41	SU41	ST3	0	TABULAR/DEPTH	ICD41		NO
OL42	SU42	ST22	0	TABULAR/DEPTH	ICD42		NO
OL43	SU43	ST22A	0	TABULAR/DEPTH	ICD43		NO
OL44	SU44	ST23	0	TABULAR/DEPTH	ICD44		NO
OL45	SU45	ST24	0	TABULAR/DEPTH	ICD45		NO
OL46	SU46	ST24	0	TABULAR/DEPTH	ICD46		NO
OL47	SU47	ST25	0	TABULAR/DEPTH	ICD47		NO
OL48	SU48	ST25	0	TABULAR/DEPTH	ICD48		NO
OL49	SU49	ST25	0	TABULAR/DEPTH	ICD49		NO

[XSECTIONS]

;;Link	Shape	Geom1	Geom2	Geom3	Geom4	Barrels
1	CIRCULAR	1.5	0	0	0	1
P10-9	CIRCULAR	1.2	0	0	0	1

```
P11-10           CIRCULAR     1.05            0          0          0          1
P12-11           CIRCULAR     0.6             0          0          0          1
P13-12           CIRCULAR     0.45            0          0          0          1
P14-13           CIRCULAR     0.375           0          0          0          1
P15-11           CIRCULAR     0.675           0          0          0          1
P16-15           CIRCULAR     0.525           0          0          0          1
P17-10           CIRCULAR     0.675           0          0          0          1
P18-9            CIRCULAR     0.9             0          0          0          1
P19-18           CIRCULAR     0.75            0          0          0          1
P20-19           CIRCULAR     0.6             0          0          0          1
P2-1             CIRCULAR     1.5             0          0          0          1
P21-20           CIRCULAR     0.525           0          0          0          1
P22-3            CIRCULAR     1.05            0          0          0          1
P22A-22          CIRCULAR     1.05            0          0          0          1
P23-22A          CIRCULAR     1.05            0          0          0          1
P24-23           CIRCULAR     0.9             0          0          0          1
P25-24           CIRCULAR     0.675           0          0          0          1
P3-2             CIRCULAR     1.5             0          0          0          1
P4-3             CIRCULAR     1.35            0          0          0          1
P5-4             CIRCULAR     1.35            0          0          0          1
P6-5             CIRCULAR     1.35            0          0          0          1
P7-6             CIRCULAR     1.35            0          0          0          1
P8-7             CIRCULAR     1.35            0          0          0          1
P9-8             CIRCULAR     1.35            0          0          0          1

[TRANSECTS]

;Full street, width = 14.5m, curb = 0.14m , cross-slope = 0.032m/m, bank-slope = 0.03m/m, bank-height = 0.5m.
NC 0.05     0.05     0.015
X1 PrimaryCollectorBothSides 9        -11.75   11.75    0.0       0.0       0.0      0.0      0.0
GR 0.5      -20.75   0.23     -11.75   0.14     -7.25    0         -7.25    0.225    0
GR 0        7.25     0.14     7.25     0.23     11.75    0.5       20.75

[LOSSES]
;;Link           Inlet      Outlet     Average    Flap Gate  SeepageRate
;;-------------- ---------- ---------- ---------- ---------- ----------

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
ICD33            Rating     0          0
ICD33                       0.5        0.0178

ICD34            Rating     0          0
ICD34                       0.5        0.0138

ICD35            Rating     0          0
ICD35                       0.5        0.0333

ICD36            Rating     0          0
ICD36                       0.5        0.0276

ICD37            Rating     0          0
ICD37                       0.5        0.0186

ICD38            Rating     0          0
ICD38                       0.5        0.0276

ICD39            Rating     0          0
ICD39                       0.5        0.0208

ICD40            Rating     0          0
ICD40                       0.5        0.0163

ICD41            Rating     0          0
ICD41                       0.5        0.0163

ICD42            Rating     0          0
ICD42                       0.5        0.0156

ICD43            Rating     0          0
ICD43                       0.5        0.0381

ICD44            Rating     0          0
ICD44                       0.5        0.0185

ICD45            Rating     0          0
ICD45                       0.5        0.0178
```

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ICD46            Rating     0          0
ICD46                       0.5        0.0307

ICD47            Rating     0          0
ICD47                       0.5        0.0178

ICD48            Rating     0          0
ICD48                       0.5        0.015

ICD49            Rating     0          0
ICD49                       0.5        0.1097

OS33             Storage    0          0
OS33                        0.5        400

OS34             Storage    0          0
OS34                        0.5        275

OS35             Storage    0          0
OS35                        0.5        760

OS36             Storage    0          0
OS36                        0.5        550

OS37             Storage    0          0
OS37                        0.5        420

OS38             Storage    0          0
OS38                        0.5        550

OS39             Storage    0          0
OS39                        0.5        470

OS40             Storage    0          0
OS40                        0.5        320

OS41             Storage    0          0
OS41                        0.5        320

OS42             Storage    0          0
OS42                        0.5        390

OS43             Storage    0          0
OS43                        0.5        960

OS44             Storage    0          0
OS44                        0.5        420

OS45             Storage    0          0
OS45                        0.5        450

OS46             Storage    0          0
OS46                        0.5        700

OS47             Storage    0          0
OS47                        0.5        450

OS48             Storage    0          0
OS48                        0.5        360

OS49             Storage    0          0
OS49                        0.5        1500

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
;Chicago design storm, a = 1842, b = 9, c = 0.842, Duration = 180 minutes, r = 0.3, rain units = mm/hr.
Winnipeg_3h-25y             0:00       4.637
Winnipeg_3h-25y             0:05       5.139
Winnipeg_3h-25y             0:10       5.77
Winnipeg_3h-25y             0:15       6.587
Winnipeg_3h-25y             0:20       7.684
Winnipeg_3h-25y             0:25       9.232
Winnipeg_3h-25y             0:30       11.572
Winnipeg_3h-25y             0:35       15.485
Winnipeg_3h-25y             0:40       23.181
Winnipeg_3h-25y             0:45       43.88
Winnipeg_3h-25y             0:50       158.951
Winnipeg_3h-25y             0:55       146.688
```

```
Winnipeg_3h-25y             1:00       74.323
Winnipeg_3h-25y             1:05       47.522
Winnipeg_3h-25y             1:10       34.188
Winnipeg_3h-25y             1:15       26.407
Winnipeg_3h-25y             1:20       21.383
Winnipeg_3h-25y             1:25       17.906
Winnipeg_3h-25y             1:30       15.372
Winnipeg_3h-25y             1:35       13.453
Winnipeg_3h-25y             1:40       11.952
Winnipeg_3h-25y             1:45       10.75
Winnipeg_3h-25y             1:50       9.767
Winnipeg_3h-25y             1:55       8.95
Winnipeg_3h-25y             2:00       8.259
Winnipeg_3h-25y             2:05       7.669
Winnipeg_3h-25y             2:10       7.159
Winnipeg_3h-25y             2:15       6.714
Winnipeg_3h-25y             2:20       6.322
Winnipeg_3h-25y             2:25       5.975
Winnipeg_3h-25y             2:30       5.665
Winnipeg_3h-25y             2:35       5.386
Winnipeg_3h-25y             2:40       5.135
Winnipeg_3h-25y             2:45       4.907
Winnipeg_3h-25y             2:50       4.699
Winnipeg_3h-25y             2:55       4.509
Winnipeg_3h-25y             3:00       0

[REPORT]
INPUT      YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS       631066.319121869 5523218.95515    631999.666440747 5523725.83185
UNITS            Meters

[COORDINATES]
;;Node           X-Coord          Y-Coord
;;-------------- ---------------- ----------------

[VERTICES]
;;Link           X-Coord          Y-Coord
;;-------------- ---------------- ----------------

[POLYGONS]
;;Subcatchment   X-Coord          Y-Coord
;;-------------- ---------------- ----------------

 [SYMBOLS]
;;Gage           X-Coord          Y-Coord
;;-------------- ---------------- ----------------
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

Parker Lands
Single Event
Winnipeg 3h-25y Storm


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 71
Number of nodes ........... 44
Number of links ........... 43
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
Winnipeg_3h-25y      Winnipeg_3h-25y             INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
A1                           0.06     19.60     62.00    2.0000 Winnipeg_3h-25y      ST14
A10                          0.02      7.33     50.00    2.0000 Winnipeg_3h-25y      ST11
A11                          0.21     71.27     50.00    2.0000 Winnipeg_3h-25y      ST20
A12                          0.65    216.53     50.00    2.0000 Winnipeg_3h-25y      ST17
A13                          0.45    150.30     50.00    2.0000 Winnipeg_3h-25y      ST10
A14                          0.21     71.00     62.00    2.0000 Winnipeg_3h-25y      ST12
A15                          0.36    121.00     57.00    2.0000 Winnipeg_3h-25y      ST11
A16                          0.38    127.83     52.00    2.0000 Winnipeg_3h-25y      ST10
A17                          0.36    119.13     52.00    2.0000 Winnipeg_3h-25y      ST21
A18                          0.15     51.00     52.00    2.0000 Winnipeg_3h-25y      ST20
A19                          0.10     33.97     52.00    2.0000 Winnipeg_3h-25y      ST20
A2                           0.07     23.93     62.00    2.0000 Winnipeg_3h-25y      ST13
A20                          0.15     51.03     52.00    2.0000 Winnipeg_3h-25y      ST19
A21                          0.11     37.97     50.00    2.0000 Winnipeg_3h-25y      ST19
A22                          0.04     11.93     50.00    2.0000 Winnipeg_3h-25y      ST20
A23                          0.07     24.70     50.00    2.0000 Winnipeg_3h-25y      ST17
A24                          0.03      8.37     50.00    2.0000 Winnipeg_3h-25y      ST10
A25                          0.50    166.93     50.00    2.0000 Winnipeg_3h-25y      ST18
A26                          0.40    132.93     50.00    2.0000 Winnipeg_3h-25y      ST9
A27                          0.12     40.07     50.00    2.0000 Winnipeg_3h-25y      ST9
A28                          0.32    106.53     52.00    2.0000 Winnipeg_3h-25y      ST9
A29                          0.22     73.57     50.00    2.0000 Winnipeg_3h-25y      ST18
A3                           0.04     14.17     62.00    2.0000 Winnipeg_3h-25y      ST12
A30                          0.12     41.43     50.00    2.0000 Winnipeg_3h-25y      ST9
A31                          0.26     85.83     50.00    2.0000 Winnipeg_3h-25y      ST8
A32                          0.46    154.90     62.00    2.0000 Winnipeg_3h-25y      ST8
A33                          0.25     84.67     58.00    2.0000 Winnipeg_3h-25y      SU33
A34                          0.20     65.77     35.00    2.0000 Winnipeg_3h-25y      SU34
A35                          0.48    158.67     58.00    2.0000 Winnipeg_3h-25y      SU35
A36                          0.39    131.50     35.00    2.0000 Winnipeg_3h-25y      SU36
A37                          0.27     88.63     58.00    2.0000 Winnipeg_3h-25y      SU37
A38                          0.39    131.50     35.00    2.0000 Winnipeg_3h-25y      SU38
A39                          0.30     99.10     58.00    2.0000 Winnipeg_3h-25y      SU39
A4                           0.51    170.13     56.00    2.0000 Winnipeg_3h-25y      ST16
A40                          0.23     77.47     35.00    2.0000 Winnipeg_3h-25y      SU40
A41                          0.23     77.47     35.00    2.0000 Winnipeg_3h-25y      SU41
A42                          0.22     74.07     79.00    2.0000 Winnipeg_3h-25y      SU42
A43                          0.54    181.63     79.00    2.0000 Winnipeg_3h-25y      SU43
A44                          0.26     87.90     58.00    2.0000 Winnipeg_3h-25y      SU44
A45                          0.25     84.97     79.00    2.0000 Winnipeg_3h-25y      SU45
A46                          0.44    146.33     58.00    2.0000 Winnipeg_3h-25y      SU46
A47                          0.25     84.97     79.00    2.0000 Winnipeg_3h-25y      SU47
A48                          0.22     74.00     58.00    2.0000 Winnipeg_3h-25y      SU48
A49                          1.57    195.87      0.00    2.0000 Winnipeg_3h-25y      SU49
A5                           0.59    195.90     56.00    2.0000 Winnipeg_3h-25y      ST15
```

A6	0.21	68.57	56.00	2.0000	Winnipeg_3h-25y	ST11
A7	0.03	11.13	50.00	2.0000	Winnipeg_3h-25y	ST21
A8	0.07	22.13	50.00	2.0000	Winnipeg_3h-25y	ST16
A9	0.07	22.03	50.00	2.0000	Winnipeg_3h-25y	ST15
R1	0.16	785.00	75.00	2.0000	Winnipeg_3h-25y	ST14
R10	0.19	940.50	75.00	2.0000	Winnipeg_3h-25y	ST8
R11	0.19	946.50	75.00	2.0000	Winnipeg_3h-25y	ST6
R12	0.23	1140.50	75.00	2.0000	Winnipeg_3h-25y	ST5
R13	0.19	937.50	75.00	2.0000	Winnipeg_3h-25y	ST4
R14	0.20	997.00	75.00	2.0000	Winnipeg_3h-25y	ST3
R15	0.19	935.50	75.00	2.0000	Winnipeg_3h-25y	ST22A
R16	0.31	1552.00	75.00	2.0000	Winnipeg_3h-25y	ST23
R17	0.14	725.00	75.00	2.0000	Winnipeg_3h-25y	ST24
R18	0.15	727.00	75.00	2.0000	Winnipeg_3h-25y	ST25
R19	0.17	867.00	75.00	2.0000	Winnipeg_3h-25y	ST18
R2	0.19	944.00	75.00	2.0000	Winnipeg_3h-25y	ST13
R20	0.16	795.00	75.00	2.0000	Winnipeg_3h-25y	ST19
R21	0.34	1697.00	75.00	2.0000	Winnipeg_3h-25y	ST20
R22	0.20	998.50	75.00	2.0000	Winnipeg_3h-25y	ST21
R3	0.19	932.00	75.00	2.0000	Winnipeg_3h-25y	ST12
R4	0.23	1135.50	75.00	2.0000	Winnipeg_3h-25y	ST11
R5	0.17	854.00	75.00	2.0000	Winnipeg_3h-25y	ST16
R6	0.18	888.00	75.00	2.0000	Winnipeg_3h-25y	ST15
R7	0.24	1177.50	75.00	2.0000	Winnipeg_3h-25y	ST10
R8	0.20	1009.50	75.00	2.0000	Winnipeg_3h-25y	ST17
R9	0.24	1194.00	75.00	2.0000	Winnipeg_3h-25y	ST9

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
ST1	JUNCTION	228.24	3.38	0.0	
ST10	JUNCTION	230.54	2.79	0.0	
ST11	JUNCTION	230.78	2.73	0.0	
ST12	JUNCTION	231.61	2.04	0.0	
ST13	JUNCTION	231.88	2.10	0.0	
ST14	JUNCTION	232.10	2.12	0.0	
ST15	JUNCTION	231.51	2.21	0.0	
ST16	JUNCTION	231.81	2.13	0.0	
ST17	JUNCTION	231.16	2.45	0.0	
ST18	JUNCTION	230.85	2.52	0.0	
ST19	JUNCTION	231.16	2.48	0.0	
ST2	JUNCTION	228.93	3.20	0.0	
ST20	JUNCTION	231.46	2.49	0.0	
ST21	JUNCTION	231.96	2.21	0.0	
ST22	JUNCTION	229.55	2.96	0.0	
ST22A	JUNCTION	229.65	2.81	0.0	
ST23	JUNCTION	229.78	2.90	0.0	
ST24	JUNCTION	230.08	2.72	0.0	
ST25	JUNCTION	230.55	2.27	0.0	
ST3	JUNCTION	229.07	3.20	0.0	
ST4	JUNCTION	229.30	3.09	0.0	
ST5	JUNCTION	229.48	3.11	0.0	
ST6	JUNCTION	229.63	3.00	0.0	
ST7	JUNCTION	229.79	3.00	0.0	
ST8	JUNCTION	229.83	3.09	0.0	
ST9	JUNCTION	230.06	3.15	0.0	
Pond	OUTFALL	228.21	1.50	0.0	
SU33	STORAGE	233.30	0.50	0.0	
SU34	STORAGE	233.30	0.50	0.0	
SU35	STORAGE	233.00	0.50	0.0	
SU36	STORAGE	233.00	0.50	0.0	
SU37	STORAGE	233.00	0.50	0.0	
SU38	STORAGE	233.00	0.50	0.0	
SU39	STORAGE	232.50	0.50	0.0	
SU40	STORAGE	232.50	0.50	0.0	
SU41	STORAGE	232.30	0.50	0.0	
SU42	STORAGE	232.80	0.50	0.0	
SU43	STORAGE	232.80	0.50	0.0	
SU44	STORAGE	233.30	0.50	0.0	
SU45	STORAGE	233.60	0.50	0.0	
SU46	STORAGE	233.60	0.50	0.0	
SU47	STORAGE	233.80	0.50	0.0	
SU48	STORAGE	233.80	0.50	0.0	
SU49	STORAGE	233.80	0.50	0.0	

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
1	ST1	Pond	CONDUIT	15.0	0.1533	0.0130
P10-9	ST10	ST9	CONDUIT	79.6	0.1006	0.0130
P11-10	ST11	ST10	CONDUIT	90.2	0.0998	0.0130
P12-11	ST12	ST11	CONDUIT	83.7	0.1458	0.0110
P13-12	ST13	ST12	CONDUIT	100.0	0.1200	0.0110
P14-13	ST14	ST13	CONDUIT	100.0	0.1500	0.0110
P15-11	ST15	ST11	CONDUIT	65.0	0.1508	0.0110
P16-15	ST16	ST15	CONDUIT	100.0	0.1500	0.0110
P17-10	ST17	ST10	CONDUIT	65.0	0.1492	0.0110
P18-9	ST18	ST9	CONDUIT	75.0	0.1200	0.0130
P19-18	ST19	ST18	CONDUIT	109.1	0.1503	0.0130
P20-19	ST20	ST19	CONDUIT	70.0	0.2000	0.0130
P2-1	ST2	ST1	CONDUIT	40.0	0.1500	0.0130
P21-20	ST21	ST20	CONDUIT	105.0	0.1200	0.0110
P22-3	ST22	ST3	CONDUIT	35.9	0.0974	0.0130
P22A-22	ST22A	ST22	CONDUIT	40.0	0.1000	0.0130
P23-22A	ST23	ST22A	CONDUIT	100.0	0.1000	0.0130
P24-23	ST24	ST23	CONDUIT	100.0	0.1500	0.0130
P25-24	ST25	ST24	CONDUIT	80.0	0.3000	0.0130
P3-2	ST3	ST2	CONDUIT	70.0	0.1529	0.0130
P4-3	ST4	ST3	CONDUIT	55.0	0.1564	0.0130
P5-4	ST5	ST4	CONDUIT	100.0	0.1500	0.0130
P6-5	ST6	ST5	CONDUIT	80.0	0.1500	0.0130
P7-6	ST7	ST6	CONDUIT	82.0	0.1501	0.0130
P8-7	ST8	ST7	CONDUIT	11.0	0.1550	0.0130
P9-8	ST9	ST8	CONDUIT	132.7	0.1507	0.0130
OL33	SU33	ST7	OUTLET			
OL34	SU34	ST7	OUTLET			
OL35	SU35	ST6	OUTLET			
OL36	SU36	ST6	OUTLET			
OL37	SU37	ST5	OUTLET			
OL38	SU38	ST5	OUTLET			
OL39	SU39	ST4	OUTLET			
OL40	SU40	ST4	OUTLET			
OL41	SU41	ST3	OUTLET			
OL42	SU42	ST22	OUTLET			
OL43	SU43	ST22A	OUTLET			
OL44	SU44	ST23	OUTLET			
OL45	SU45	ST24	OUTLET			
OL46	SU46	ST24	OUTLET			
OL47	SU47	ST25	OUTLET			
OL48	SU48	ST25	OUTLET			
OL49	SU49	ST25	OUTLET			

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Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
1	CIRCULAR	1.50	1.77	0.38	1.50	1	2.77
P10-9	CIRCULAR	1.20	1.13	0.30	1.20	1	1.24
P11-10	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P12-11	CIRCULAR	0.60	0.28	0.15	0.60	1	0.28
P13-12	CIRCULAR	0.45	0.16	0.11	0.45	1	0.12
P14-13	CIRCULAR	0.38	0.11	0.09	0.38	1	0.08
P15-11	CIRCULAR	0.68	0.36	0.17	0.68	1	0.39
P16-15	CIRCULAR	0.53	0.22	0.13	0.53	1	0.20
P17-10	CIRCULAR	0.68	0.36	0.17	0.68	1	0.38
P18-9	CIRCULAR	0.90	0.64	0.23	0.90	1	0.63
P19-18	CIRCULAR	0.75	0.44	0.19	0.75	1	0.43
P20-19	CIRCULAR	0.60	0.28	0.15	0.60	1	0.27
P2-1	CIRCULAR	1.50	1.77	0.38	1.50	1	2.74
P21-20	CIRCULAR	0.53	0.22	0.13	0.53	1	0.18
P22-3	CIRCULAR	1.05	0.87	0.26	1.05	1	0.85
P22A-22	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P23-22A	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P24-23	CIRCULAR	0.90	0.64	0.23	0.90	1	0.70
P25-24	CIRCULAR	0.68	0.36	0.17	0.68	1	0.46
P3-2	CIRCULAR	1.50	1.77	0.38	1.50	1	2.76
P4-3	CIRCULAR	1.35	1.43	0.34	1.35	1	2.11
P5-4	CIRCULAR	1.35	1.43	0.34	1.35	1	2.07

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P6-5            CIRCULAR            1.35     1.43     0.34     1.35       1     2.07
P7-6            CIRCULAR            1.35     1.43     0.34     1.35       1     2.07
P8-7            CIRCULAR            1.35     1.43     0.34     1.35       1     2.10
P9-8            CIRCULAR            1.35     1.43     0.34     1.35       1     2.07


***************
Transect Summary
***************

Transect PrimaryCollectorBothSides
Area:
           0.0003     0.0012     0.0027     0.0047     0.0074
           0.0107     0.0145     0.0189     0.0240     0.0296
           0.0358     0.0426     0.0500     0.0580     0.0671
           0.0776     0.0897     0.1033     0.1184     0.1350
           0.1531     0.1727     0.1938     0.2157     0.2382
           0.2613     0.2850     0.3094     0.3343     0.3599
           0.3861     0.4129     0.4403     0.4683     0.4970
           0.5262     0.5561     0.5865     0.6176     0.6493
           0.6816     0.7146     0.7481     0.7822     0.8170
           0.8524     0.8884     0.9250     0.9622     1.0000
Hrad:
           0.0186     0.0373     0.0559     0.0746     0.0932
           0.1119     0.1305     0.1492     0.1678     0.1865
           0.2051     0.2238     0.2424     0.2611     0.2564
           0.2580     0.2637     0.2722     0.2827     0.2947
           0.3078     0.3218     0.3410     0.3782     0.4140
           0.4484     0.4814     0.5133     0.5440     0.5735
           0.6021     0.6296     0.6562     0.6818     0.7067
           0.7307     0.7539     0.7764     0.7982     0.8193
           0.8398     0.8597     0.8790     0.8978     0.9160
           0.9337     0.9510     0.9678     0.9841     1.0000
Width:
           0.0155     0.0311     0.0466     0.0621     0.0776
           0.0932     0.1087     0.1242     0.1398     0.1553
           0.1708     0.1863     0.2019     0.2174     0.2570
           0.2967     0.3363     0.3759     0.4155     0.4552
           0.4948     0.5344     0.5663     0.5823     0.5984
           0.6145     0.6305     0.6466     0.6627     0.6787
           0.6948     0.7108     0.7269     0.7430     0.7590
           0.7751     0.7912     0.8072     0.8233     0.8394
           0.8554     0.8715     0.8876     0.9036     0.9197
           0.9357     0.9518     0.9679     0.9839     1.0000


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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.
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***************
Analysis Options
***************
Flow Units ..............  CMS
Process Models:
  Rainfall/Runoff ........  YES
  RDII ...................  NO
  Snowmelt ...............  NO
  Groundwater ............  NO
  Flow Routing ...........  YES
  Ponding Allowed ........  NO
  Water Quality ..........  NO
Infiltration Method ......  HORTON
Flow Routing Method ......  DYNWAVE
Starting Date ............  01/25/2018 00:00:00
Ending Date ..............  01/25/2018 03:00:00
Antecedent Dry Days ......  0.0
Report Time Step .........  00:01:00
Wet Time Step ............  00:05:00
Dry Time Step ............  00:05:00
Routing Time Step ........  5.00 sec
Variable Time Step .......  YES
Maximum Trials ...........  8
Number of Threads ........  4
Head Tolerance ...........  0.001500 m
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Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	1.225	66.932
Evaporation Loss	0.000	0.000
Infiltration Loss	0.203	11.066
Surface Runoff	0.974	53.197
Final Storage	0.062	3.391
Continuity Error (%)	-1.080	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.971	9.709
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.880	8.801
Flooding Loss	0.000	0.004
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.003
Final Stored Volume	0.089	0.891
Continuity Error (%)	0.161	

Time-Step Critical Elements

Link P8-7 (59.05%)
Link 1 (30.00%)

Highest Flow Instability Indexes

Link P8-7 (6)
Link P9-8 (4)
Link 1 (3)
Link P22-3 (1)
Link P19-18 (1)

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	3.04 sec
Maximum Time Step	:	5.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.24
Percent Not Converging	:	3.10

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A1	66.93	0.00	0.00	9.32	55.36	0.03	0.02	0.827
A10	66.93	0.00	0.00	12.26	52.04	0.01	0.01	0.777
A11	66.93	0.00	0.00	12.26	52.04	0.11	0.07	0.777
A12	66.93	0.00	0.00	12.26	52.04	0.34	0.21	0.777
A13	66.93	0.00	0.00	12.26	52.04	0.23	0.15	0.777
A14	66.93	0.00	0.00	9.32	55.36	0.12	0.08	0.827
A15	66.93	0.00	0.00	10.54	53.99	0.20	0.13	0.807
A16	66.93	0.00	0.00	11.77	52.60	0.20	0.13	0.786
A17	66.93	0.00	0.00	11.77	52.60	0.19	0.12	0.786
A18	66.93	0.00	0.00	11.77	52.60	0.08	0.05	0.786
A19	66.93	0.00	0.00	11.77	52.60	0.05	0.03	0.786
A2	66.93	0.00	0.00	9.32	55.36	0.04	0.03	0.827
A20	66.93	0.00	0.00	11.77	52.60	0.08	0.05	0.786

A21	66.93	0.00	0.00	12.26	52.04	0.06	0.04	0.777
A22	66.93	0.00	0.00	12.26	52.04	0.02	0.01	0.777
A23	66.93	0.00	0.00	12.26	52.04	0.04	0.02	0.777
A24	66.93	0.00	0.00	12.26	52.04	0.01	0.01	0.777
A25	66.93	0.00	0.00	12.26	52.04	0.26	0.16	0.777
A26	66.93	0.00	0.00	12.26	52.04	0.21	0.13	0.777
A27	66.93	0.00	0.00	12.26	52.04	0.06	0.04	0.777
A28	66.93	0.00	0.00	11.77	52.60	0.17	0.11	0.786
A29	66.93	0.00	0.00	12.26	52.04	0.11	0.07	0.777
A3	66.93	0.00	0.00	9.32	55.36	0.02	0.02	0.827
A30	66.93	0.00	0.00	12.26	52.04	0.06	0.04	0.777
A31	66.93	0.00	0.00	12.26	52.04	0.13	0.08	0.777
A32	66.93	0.00	0.00	9.32	55.36	0.26	0.17	0.827
A33	66.93	0.00	0.00	10.30	54.26	0.14	0.09	0.811
A34	66.93	0.00	0.00	15.94	47.79	0.09	0.06	0.714
A35	66.93	0.00	0.00	10.30	54.26	0.26	0.17	0.811
A36	66.93	0.00	0.00	15.94	47.79	0.19	0.11	0.714
A37	66.93	0.00	0.00	10.30	54.26	0.14	0.09	0.811
A38	66.93	0.00	0.00	15.94	47.79	0.19	0.11	0.714
A39	66.93	0.00	0.00	10.30	54.26	0.16	0.10	0.811
A4	66.93	0.00	0.00	10.79	53.71	0.27	0.17	0.802
A40	66.93	0.00	0.00	15.94	47.79	0.11	0.07	0.714
A41	66.93	0.00	0.00	15.94	47.79	0.11	0.07	0.714
A42	66.93	0.00	0.00	5.15	59.95	0.13	0.09	0.896
A43	66.93	0.00	0.00	5.15	59.95	0.33	0.21	0.896
A44	66.93	0.00	0.00	10.30	54.26	0.14	0.09	0.811
A45	66.93	0.00	0.00	5.15	59.95	0.15	0.10	0.896
A46	66.93	0.00	0.00	10.30	54.26	0.24	0.15	0.811
A47	66.93	0.00	0.00	5.15	59.95	0.15	0.10	0.896
A48	66.93	0.00	0.00	10.30	54.26	0.12	0.08	0.811
A49	66.93	0.00	0.00	24.52	34.01	0.53	0.15	0.508
A5	66.93	0.00	0.00	10.79	53.71	0.32	0.20	0.802
A6	66.93	0.00	0.00	10.79	53.71	0.11	0.07	0.802
A7	66.93	0.00	0.00	12.26	52.04	0.02	0.01	0.777
A8	66.93	0.00	0.00	12.26	52.04	0.03	0.02	0.777
A9	66.93	0.00	0.00	12.26	52.04	0.03	0.02	0.777
R1	66.93	0.00	0.00	6.13	59.72	0.09	0.07	0.892
R10	66.93	0.00	0.00	6.13	59.72	0.11	0.08	0.892
R11	66.93	0.00	0.00	6.13	59.72	0.11	0.08	0.892
R12	66.93	0.00	0.00	6.13	59.72	0.14	0.10	0.892
R13	66.93	0.00	0.00	6.13	59.72	0.11	0.08	0.892
R14	66.93	0.00	0.00	6.13	59.72	0.12	0.08	0.892
R15	66.93	0.00	0.00	6.13	59.72	0.11	0.08	0.892
R16	66.93	0.00	0.00	6.13	59.72	0.19	0.13	0.892
R17	66.93	0.00	0.00	6.13	59.72	0.09	0.06	0.892
R18	66.93	0.00	0.00	6.13	59.72	0.09	0.06	0.892
R19	66.93	0.00	0.00	6.13	59.72	0.10	0.07	0.892
R2	66.93	0.00	0.00	6.13	59.72	0.11	0.08	0.892
R20	66.93	0.00	0.00	6.13	59.72	0.09	0.07	0.892
R21	66.93	0.00	0.00	6.13	59.72	0.20	0.14	0.892
R22	66.93	0.00	0.00	6.13	59.72	0.12	0.08	0.892
R3	66.93	0.00	0.00	6.13	59.72	0.11	0.08	0.892
R4	66.93	0.00	0.00	6.13	59.72	0.14	0.10	0.892
R5	66.93	0.00	0.00	6.13	59.72	0.10	0.07	0.892
R6	66.93	0.00	0.00	6.13	59.72	0.11	0.07	0.892
R7	66.93	0.00	0.00	6.13	59.72	0.14	0.10	0.892
R8	66.93	0.00	0.00	6.13	59.72	0.12	0.09	0.892
R9	66.93	0.00	0.00	6.13	59.72	0.14	0.10	0.892

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
ST1	JUNCTION	0.52	1.11	229.35	0 00:59	1.11
ST10	JUNCTION	0.42	2.47	233.02	0 00:58	2.40
ST11	JUNCTION	0.37	2.73	233.51	0 00:58	2.42
ST12	JUNCTION	0.20	2.04	233.64	0 00:58	2.04
ST13	JUNCTION	0.18	2.10	233.98	0 00:58	2.10
ST14	JUNCTION	0.14	2.12	234.22	0 00:58	2.04
ST15	JUNCTION	0.24	2.21	233.71	0 00:58	1.90
ST16	JUNCTION	0.20	2.13	233.93	0 00:58	1.86
ST17	JUNCTION	0.20	2.45	233.61	0 00:58	1.84
ST18	JUNCTION	0.33	2.15	233.00	0 00:58	2.06

ST19	JUNCTION	0.30	2.24	233.40	0	00:58	2.11
ST2	JUNCTION	0.52	1.19	230.12	0	00:59	1.18
ST20	JUNCTION	0.28	2.43	233.89	0	00:58	2.29
ST21	JUNCTION	0.20	2.21	234.17	0	00:58	1.96
ST22	JUNCTION	0.33	0.92	230.47	0	01:00	0.81
ST22A	JUNCTION	0.31	0.79	230.44	0	01:00	0.78
ST23	JUNCTION	0.30	0.73	230.51	0	01:01	0.71
ST24	JUNCTION	0.24	0.47	230.55	0	01:02	0.45
ST25	JUNCTION	0.17	0.22	230.77	0	01:37	0.22
ST3	JUNCTION	0.56	1.33	230.40	0	01:00	1.32
ST4	JUNCTION	0.50	1.68	230.98	0	00:58	1.62
ST5	JUNCTION	0.54	1.93	231.41	0	00:59	1.90
ST6	JUNCTION	0.54	2.14	231.77	0	00:59	2.11
ST7	JUNCTION	0.54	2.36	232.14	0	00:58	2.31
ST8	JUNCTION	0.52	2.37	232.20	0	00:58	2.32
ST9	JUNCTION	0.53	2.72	232.78	0	00:58	2.64
Pond	OUTFALL	0.50	1.06	229.27	0	01:00	1.06
SU33	STORAGE	0.30	0.43	233.73	0	01:24	0.43
SU34	STORAGE	0.28	0.41	233.71	0	01:27	0.41
SU35	STORAGE	0.30	0.43	233.43	0	01:25	0.43
SU36	STORAGE	0.28	0.41	233.41	0	01:27	0.41
SU37	STORAGE	0.30	0.43	233.43	0	01:24	0.43
SU38	STORAGE	0.28	0.41	233.41	0	01:27	0.41
SU39	STORAGE	0.30	0.43	232.93	0	01:24	0.43
SU40	STORAGE	0.28	0.41	232.91	0	01:27	0.41
SU41	STORAGE	0.28	0.41	232.71	0	01:27	0.41
SU42	STORAGE	0.31	0.44	233.24	0	01:24	0.44
SU43	STORAGE	0.31	0.44	233.24	0	01:24	0.44
SU44	STORAGE	0.30	0.43	233.73	0	01:24	0.43
SU45	STORAGE	0.31	0.44	234.04	0	01:24	0.44
SU46	STORAGE	0.30	0.43	234.03	0	01:25	0.43
SU47	STORAGE	0.31	0.44	234.24	0	01:24	0.44
SU48	STORAGE	0.30	0.43	234.23	0	01:26	0.43
SU49	STORAGE	0.21	0.34	234.14	0	01:45	0.34

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Node Inflow Summary
****

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	Flow Balance Error Percent
ST1	JUNCTION	0.000	4.140	0	01:00	0	8.81	0.034
ST10	JUNCTION	0.375	1.888	0	01:00	0.588	2.91	0.527
ST11	JUNCTION	0.292	1.196	0	01:00	0.452	1.83	0.365
ST12	JUNCTION	0.164	0.354	0	00:58	0.252	0.528	0.616
ST13	JUNCTION	0.103	0.186	0	00:57	0.152	0.277	0.154
ST14	JUNCTION	0.085	0.085	0	00:55	0.126	0.126	0.855
ST15	JUNCTION	0.293	0.556	0	01:00	0.455	0.862	0.493
ST16	JUNCTION	0.264	0.264	0	01:00	0.41	0.409	0.371
ST17	JUNCTION	0.316	0.316	0	01:00	0.496	0.496	0.574
ST18	JUNCTION	0.304	0.962	0	01:00	0.478	1.49	0.598
ST19	JUNCTION	0.150	0.658	0	01:00	0.234	1.02	0.476
ST2	JUNCTION	0.000	4.149	0	01:00	0	8.82	0.185
ST20	JUNCTION	0.299	0.508	0	01:00	0.465	0.787	0.496
ST21	JUNCTION	0.208	0.208	0	01:00	0.324	0.324	0.485
ST22	JUNCTION	0.000	0.550	0	01:02	0	1.83	0.290
ST22A	JUNCTION	0.079	0.480	0	01:03	0.111	1.74	0.444
ST23	JUNCTION	0.131	0.360	0	01:03	0.185	1.4	0.715
ST24	JUNCTION	0.061	0.190	0	01:00	0.0864	1.12	0.924
ST25	JUNCTION	0.061	0.108	0	01:36	0.0866	0.748	0.826
ST3	JUNCTION	0.084	4.187	0	00:59	0.119	8.84	0.207
ST4	JUNCTION	0.079	3.941	0	01:00	0.112	6.84	0.385
ST5	JUNCTION	0.096	3.844	0	01:00	0.136	6.54	0.385
ST6	JUNCTION	0.080	3.726	0	01:00	0.113	6.16	0.339
ST7	JUNCTION	0.000	3.610	0	01:00	0	5.71	0.180
ST8	JUNCTION	0.324	3.587	0	01:00	0.502	5.51	-0.359
ST9	JUNCTION	0.410	3.262	0	01:00	0.644	5.02	0.213
Pond	OUTFALL	0.000	4.144	0	01:00	0	8.82	0.000
SU33	STORAGE	0.088	0.088	0	01:00	0.137	0.137	0.014
SU34	STORAGE	0.056	0.056	0	01:00	0.094	0.094	0.015
SU35	STORAGE	0.165	0.165	0	01:00	0.258	0.258	0.014
SU36	STORAGE	0.112	0.112	0	01:00	0.188	0.188	0.014
SU37	STORAGE	0.092	0.092	0	01:00	0.144	0.144	0.014
SU38	STORAGE	0.112	0.112	0	01:00	0.188	0.188	0.015

SU39	STORAGE	0.103	0.103	0	01:00	0.161	0.161	0.014
SU40	STORAGE	0.066	0.066	0	01:00	0.111	0.111	0.015
SU41	STORAGE	0.066	0.066	0	01:00	0.111	0.111	0.015
SU42	STORAGE	0.087	0.087	0	01:00	0.133	0.133	0.014
SU43	STORAGE	0.212	0.212	0	01:00	0.326	0.326	0.013
SU44	STORAGE	0.092	0.092	0	01:00	0.143	0.143	0.014
SU45	STORAGE	0.099	0.099	0	01:00	0.152	0.152	0.014
SU46	STORAGE	0.153	0.153	0	01:00	0.238	0.237	0.014
SU47	STORAGE	0.099	0.099	0	01:00	0.152	0.152	0.014
SU48	STORAGE	0.077	0.077	0	01:00	0.12	0.12	0.015
SU49	STORAGE	0.152	0.152	0	01:10	0.53	0.53	0.010

****
Node Surcharge Summary
****

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
ST10	JUNCTION	0.10	1.272	0.322
ST11	JUNCTION	0.05	1.429	0.000
ST12	JUNCTION	0.05	1.439	0.000
ST13	JUNCTION	0.12	1.650	0.000
ST14	JUNCTION	0.09	1.747	0.000
ST15	JUNCTION	0.06	1.532	0.000
ST16	JUNCTION	0.07	1.600	0.000
ST17	JUNCTION	0.08	1.771	0.000
ST18	JUNCTION	0.10	1.253	0.367
ST19	JUNCTION	0.11	1.489	0.240
ST20	JUNCTION	0.08	1.531	0.059
ST21	JUNCTION	0.08	1.687	0.000
ST4	JUNCTION	0.02	0.296	1.410
ST5	JUNCTION	0.07	0.547	1.185
ST6	JUNCTION	0.11	0.759	0.862
ST7	JUNCTION	0.13	0.979	0.641
ST8	JUNCTION	0.13	0.992	0.719
ST9	JUNCTION	0.09	1.115	0.435

****
Node Flooding Summary
****

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
ST11	0.01	0.123	0 00:58	0.000	0.000
ST12	0.01	0.206	0 00:58	0.002	0.000
ST13	0.01	0.038	0 00:58	0.001	0.000
ST14	0.01	0.003	0 00:58	0.000	0.000
ST15	0.01	0.101	0 00:58	0.000	0.000
ST16	0.01	0.055	0 00:58	0.000	0.000
ST17	0.01	0.111	0 00:58	0.000	0.000
ST21	0.01	0.061	0 00:58	0.000	0.000

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
SU33	0.044	44	0	0	0.074	74	0 01:24	0.015
SU34	0.027	39	0	0	0.047	68	0 01:27	0.011
SU35	0.083	44	0	0	0.139	73	0 01:25	0.028
SU36	0.054	39	0	0	0.093	68	0 01:27	0.023
SU37	0.046	44	0	0	0.077	74	0 01:24	0.016
SU38	0.054	39	0	0	0.093	68	0 01:27	0.023

SU39	0.052	44	0	0	0.086	74	0	01:24	0.018
SU40	0.031	39	0	0	0.055	69	0	01:27	0.013
SU41	0.031	39	0	0	0.055	69	0	01:27	0.013
SU42	0.046	48	0	0	0.075	77	0	01:24	0.014
SU43	0.114	48	0	0	0.184	77	0	01:24	0.033
SU44	0.046	44	0	0	0.077	73	0	01:24	0.016
SU45	0.054	48	0	0	0.086	76	0	01:24	0.016
SU46	0.077	44	0	0	0.128	73	0	01:25	0.026
SU47	0.054	48	0	0	0.086	76	0	01:24	0.016
SU48	0.040	44	0	0	0.066	73	0	01:26	0.013
SU49	0.088	24	0	0	0.175	47	0	01:45	0.075

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Pond	99.94	1.137	4.144	8.816
System	99.94	1.137	4.144	8.816

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
1	CONDUIT	4.144	0 01:00	3.03	1.50	0.72
P10-9	CONDUIT	1.889	0 01:00	1.84	1.53	1.00
P11-10	CONDUIT	1.196	0 01:00	1.45	1.39	1.00
P12-11	CONDUIT	0.361	0 00:58	1.51	1.30	1.00
P13-12	CONDUIT	0.191	0 00:58	1.27	1.63	1.00
P14-13	CONDUIT	0.084	0 00:57	0.80	1.05	1.00
P15-11	CONDUIT	0.557	0 01:00	1.76	1.44	1.00
P16-15	CONDUIT	0.264	0 01:00	1.22	1.34	1.00
P17-10	CONDUIT	0.316	0 01:00	1.39	0.82	1.00
P18-9	CONDUIT	0.963	0 01:00	1.67	1.53	1.00
P19-18	CONDUIT	0.659	0 01:00	1.49	1.53	1.00
P20-19	CONDUIT	0.508	0 01:00	1.80	1.85	1.00
P2-1	CONDUIT	4.140	0 01:00	2.93	1.51	0.75
P21-20	CONDUIT	0.208	0 01:00	1.15	1.18	1.00
P22-3	CONDUIT	0.604	0 01:02	1.23	0.71	0.85
P22A-22	CONDUIT	0.538	0 01:02	1.23	0.62	0.78
P23-22A	CONDUIT	0.405	0 01:03	0.89	0.47	0.69
P24-23	CONDUIT	0.265	0 01:03	1.04	0.38	0.54
P25-24	CONDUIT	0.108	0 01:37	1.12	0.23	0.34
P3-2	CONDUIT	4.149	0 01:00	2.67	1.50	0.82
P4-3	CONDUIT	3.958	0 00:59	2.85	1.88	0.94
P5-4	CONDUIT	3.845	0 01:00	2.69	1.86	1.00
P6-5	CONDUIT	3.727	0 01:00	2.60	1.80	1.00
P7-6	CONDUIT	3.615	0 01:00	2.53	1.75	1.00
P8-7	CONDUIT	3.591	0 01:00	2.51	1.71	1.00
P9-8	CONDUIT	3.263	0 01:00	2.28	1.57	1.00
OL33	DUMMY	0.015	0 01:24			
OL34	DUMMY	0.011	0 01:27			
OL35	DUMMY	0.028	0 01:25			
OL36	DUMMY	0.023	0 01:27			
OL37	DUMMY	0.016	0 01:24			
OL38	DUMMY	0.023	0 01:27			
OL39	DUMMY	0.018	0 01:24			
OL40	DUMMY	0.013	0 01:27			
OL41	DUMMY	0.013	0 01:27			
OL42	DUMMY	0.014	0 01:24			
OL43	DUMMY	0.033	0 01:24			
OL44	DUMMY	0.016	0 01:24			
OL45	DUMMY	0.016	0 01:24			
OL46	DUMMY	0.026	0 01:25			
OL47	DUMMY	0.016	0 01:24			
OL48	DUMMY	0.013	0 01:26			
OL49	DUMMY	0.075	0 01:45			

****
Flow Classification Summary
****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
P10-9	1.00	0.05	0.00	0.00	0.17	0.00	0.00	0.78	0.00	0.00
P11-10	1.00	0.05	0.00	0.00	0.31	0.00	0.00	0.64	0.00	0.00
P12-11	1.00	0.05	0.00	0.00	0.06	0.00	0.00	0.89	0.00	0.00
P13-12	1.00	0.05	0.00	0.00	0.12	0.00	0.00	0.83	0.00	0.00
P14-13	1.00	0.05	0.00	0.00	0.36	0.00	0.00	0.58	0.07	0.00
P15-11	1.00	0.05	0.00	0.00	0.06	0.00	0.00	0.89	0.00	0.00
P16-15	1.00	0.05	0.00	0.00	0.16	0.00	0.00	0.79	0.00	0.00
P17-10	1.00	0.05	0.00	0.00	0.13	0.00	0.00	0.81	0.00	0.00
P18-9	1.00	0.05	0.00	0.00	0.13	0.00	0.00	0.82	0.00	0.00
P19-18	1.00	0.05	0.00	0.00	0.20	0.00	0.00	0.75	0.00	0.00
P20-19	1.00	0.05	0.00	0.00	0.16	0.00	0.00	0.78	0.00	0.00
P2-1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
P21-20	1.00	0.05	0.00	0.00	0.10	0.00	0.00	0.85	0.00	0.00
P22-3	1.00	0.05	0.00	0.00	0.24	0.00	0.00	0.71	0.00	0.00
P22A-22	1.00	0.05	0.00	0.00	0.68	0.00	0.00	0.27	0.00	0.00
P23-22A	1.00	0.05	0.00	0.00	0.94	0.00	0.00	0.01	0.00	0.00
P24-23	1.00	0.05	0.00	0.00	0.20	0.00	0.00	0.75	0.01	0.00
P25-24	1.00	0.05	0.00	0.00	0.01	0.00	0.00	0.93	0.00	0.00
P3-2	1.00	0.03	0.02	0.00	0.88	0.00	0.00	0.07	0.00	0.00
P4-3	1.00	0.05	0.00	0.00	0.21	0.00	0.00	0.74	0.00	0.00
P5-4	1.00	0.05	0.00	0.00	0.91	0.00	0.00	0.04	0.00	0.00
P6-5	1.00	0.05	0.00	0.00	0.91	0.00	0.00	0.04	0.00	0.00
P7-6	1.00	0.05	0.00	0.00	0.91	0.00	0.00	0.04	0.29	0.00
P8-7	1.00	0.05	0.00	0.00	0.90	0.00	0.00	0.05	0.01	0.00
P9-8	1.00	0.05	0.00	0.00	0.93	0.00	0.00	0.02	0.01	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
1	0.01	0.01	0.01	0.23	0.01
P10-9	0.09	0.10	0.09	0.20	0.08
P11-10	0.10	0.10	0.10	0.17	0.09
P12-11	0.05	0.05	0.05	0.14	0.05
P13-12	0.05	0.12	0.05	0.19	0.05
P14-13	0.09	0.09	0.12	0.06	0.06
P15-11	0.05	0.06	0.05	0.17	0.05
P16-15	0.06	0.07	0.06	0.16	0.06
P17-10	0.08	0.08	0.10	0.01	0.01
P18-9	0.09	0.10	0.09	0.19	0.09
P19-18	0.10	0.11	0.10	0.19	0.10
P20-19	0.11	0.17	0.11	0.23	0.11
P2-1	0.01	0.01	0.01	0.23	0.01
P21-20	0.08	0.08	0.08	0.10	0.05
P3-2	0.01	0.01	0.01	0.23	0.01
P4-3	0.01	0.02	0.01	0.26	0.01
P5-4	0.02	0.09	0.02	0.26	0.02
P6-5	0.07	0.13	0.07	0.25	0.07
P7-6	0.11	0.15	0.11	0.24	0.11
P8-7	0.13	0.14	0.13	0.23	0.13
P9-8	0.13	0.15	0.13	0.21	0.13

Analysis begun on: Thu Jan 25 10:03:48 2018
Analysis ended on: Thu Jan 25 10:03:49 2018
Total elapsed time: 00:00:01

Single Storm Event
5:25 hours - 100 year

- **Input File**
- **Report File**

To reduce the amount of data in the input file, the following sections have been excluded in this Appendix:

- Coordinates
- Vertices
- Polygons

```
[TITLE]
Parker Lands
Single Event
Winnipeg 5.4h-100y Storm


[OPTIONS]
;;Options            Value
;;------------------ ------------
FLOW_UNITS           CMS
INFILTRATION         HORTON
FLOW_ROUTING         DYNWAVE
START_DATE           01/25/2018
START_TIME           00:00:00
REPORT_START_DATE    01/25/2018
REPORT_START_TIME    00:00:00
END_DATE             01/25/2018
END_TIME             05:25:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:05:00
DRY_STEP             00:05:00
ROUTING_STEP         5
ALLOW_PONDING        NO
INERTIAL_DAMPING     PARTIAL
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
NORMAL_FLOW_LIMITED  BOTH
SKIP_STEADY_STATE    NO
FORCE_MAIN_EQUATION  H-W
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              4

[EVAPORATION]
;;Type          Parameters
;;------------- ----------
CONSTANT     0.0
DRY_ONLY     NO

[RAINGAGES]
;;                Rain      Time   Snow   Data
;;Name            Type      Intrvl Catch  Source
;;--------------- --------- ------ ------ ----------
Winnipeg_5.4h-100y INTENSITY 0:05   1.0    TIMESERIES Winnpeg_5.4h-100y

[SUBCATCHMENTS]
;;                                          Total    Pcnt.             Pcnt.    Curb     Snow
;;Name           Raingage         Outlet          Area     Imperv   Width    Slope    Length   Pack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- --------
;SF
A1               Winnipeg_5.4h-100y ST14          0.0588   62       19.6     2        0
;SF
A10              Winnipeg_5.4h-100y ST11          0.022    50       7.333    2        0
;SF
A11              Winnipeg_5.4h-100y ST20          0.2138   50       71.267   2        0
;SF
A12              Winnipeg_5.4h-100y ST17          0.6496   50       216.533  2        0
;SF
A13              Winnipeg_5.4h-100y ST10          0.4509   50       150.3    2        0
;SF
A14              Winnipeg_5.4h-100y ST12          0.213    62       71       2        0
;SF
A15              Winnipeg_5.4h-100y ST11          0.363    57       121      2        0
;SF
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A16             Winnipeg_5.4h-100y ST10          0.3835   52       127.833  2        0
;SF
A17             Winnipeg_5.4h-100y ST21          0.3574   52       119.133  2        0
;SF
A18             Winnipeg_5.4h-100y ST20          0.153    52       51       2        0
;SF
A19             Winnipeg_5.4h-100y ST20          0.1019   52       33.967   2        0
;SF
A2              Winnipeg_5.4h-100y ST13          0.0718   62       23.933   2        0
;SF
A20             Winnipeg_5.4h-100y ST19          0.1531   52       51.033   2        0
;SF
A21             Winnipeg_5.4h-100y ST19          0.1139   50       37.967   2        0
;SF
A22             Winnipeg_5.4h-100y ST20          0.0358   50       11.933   2        0
;SF
A23             Winnipeg_5.4h-100y ST17          0.0741   50       24.7     2        0
;SF
A24             Winnipeg_5.4h-100y ST10          0.0251   50       8.367    2        0
;SF
A25             Winnipeg_5.4h-100y ST18          0.5008   50       166.933  2        0
;SF
A26             Winnipeg_5.4h-100y ST9           0.3988   50       132.933  2        0
;SF
A27             Winnipeg_5.4h-100y ST9           0.1202   50       40.067   2        0
;SF
A28             Winnipeg_5.4h-100y ST9           0.3196   52       106.533  2        0
;SF
A29             Winnipeg_5.4h-100y ST18          0.2207   50       73.567   2        0
;SF
A3              Winnipeg_5.4h-100y ST12          0.0425   62       14.167   2        0
;SF
A30             Winnipeg_5.4h-100y ST9           0.1243   50       41.433   2        0
;SF
A31             Winnipeg_5.4h-100y ST8           0.2575   50       85.833   2        0
;SF
A32             Winnipeg_5.4h-100y ST8           0.4647   62       154.9    2        0
;MF-65%
A33             Winnipeg_5.4h-100y SU33          0.254    58       84.667   2        0
;MF-45%
A34             Winnipeg_5.4h-100y SU34          0.1973   35       65.767   2        0
;MF-65%
A35             Winnipeg_5.4h-100y SU35          0.476    58       158.667  2        0
;MF-45%
A36             Winnipeg_5.4h-100y SU36          0.3945   35       131.5    2        0
;MF-65%
A37             Winnipeg_5.4h-100y SU37          0.2659   58       88.633   2        0
;MF-45%
A38             Winnipeg_5.4h-100y SU38          0.3945   35       131.5    2        0
;MF-65%
A39             Winnipeg_5.4h-100y SU39          0.2973   58       99.1     2        0
;SF
A4              Winnipeg_5.4h-100y ST16          0.5104   56       170.133  2        0
;MF-45%
A40             Winnipeg_5.4h-100y SU40          0.2324   35       77.467   2        0
;MF-45%
A41             Winnipeg_5.4h-100y SU41          0.2324   35       77.467   2        0
;MF-65%
A42             Winnipeg_5.4h-100y SU42          0.2222   79       74.067   2        0
;MF-65%
A43             Winnipeg_5.4h-100y SU43          0.5449   79       181.633  2        0
;MF-65%
A44             Winnipeg_5.4h-100y SU44          0.2637   58       87.9     2        0
;MF-65%
A45             Winnipeg_5.4h-100y SU45          0.2549   79       84.967   2        0
;MF-65%
A46             Winnipeg_5.4h-100y SU46          0.439    58       146.333  2        0
;MF-65%
A47             Winnipeg_5.4h-100y SU47          0.2549   79       84.967   2        0
;MF-65%
A48             Winnipeg_5.4h-100y SU48          0.222    58       74       2        0
;Forest
A49             Winnipeg_5.4h-100y SU49          1.567    0        195.875  2        0
;SF
A5              Winnipeg_5.4h-100y ST15          0.5877   56       195.9    2        0
;SF
A6              Winnipeg_5.4h-100y ST11          0.2057   56       68.567   2        0
;SF
A7              Winnipeg_5.4h-100y ST21          0.0334   50       11.133   2        0
```

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;SF
A8              Winnipeg_5.4h-100y ST16          0.0664   50       22.133   2        0
;SF
A9              Winnipeg_5.4h-100y ST15          0.0661   50       22.033   2        0
;Roads
R1              Winnipeg_5.4h-100y ST14          0.157    75       785      2        0
;Roads
R10             Winnipeg_5.4h-100y ST8           0.1881   75       940.5    2        0
;Roads
R11             Winnipeg_5.4h-100y ST6           0.1893   75       946.5    2        0
;Roads
R12             Winnipeg_5.4h-100y ST5           0.2281   75       1140.5   2        0
;Roads
R13             Winnipeg_5.4h-100y ST4           0.1875   75       937.5    2        0
;Roads
R14             Winnipeg_5.4h-100y ST3           0.1994   75       997      2        0
;Roads
R15             Winnipeg_5.4h-100y ST22A         0.1871   75       935.5    2        0
;Roads
R16             Winnipeg_5.4h-100y ST23          0.3104   75       1552     2        0
;Roads
R17             Winnipeg_5.4h-100y ST24          0.145    75       725      2        0
;Roads
R18             Winnipeg_5.4h-100y ST25          0.1454   75       727      2        0
;Roads
R19             Winnipeg_5.4h-100y ST18          0.1734   75       867      2        0
;Roads
R2              Winnipeg_5.4h-100y ST13          0.1888   75       944      2        0
;Roads
R20             Winnipeg_5.4h-100y ST19          0.159    75       795      2        0
;Roads
R21             Winnipeg_5.4h-100y ST20          0.3394   75       1697     2        0
;Roads
R22             Winnipeg_5.4h-100y ST21          0.1997   75       998.5    2        0
;Roads
R3              Winnipeg_5.4h-100y ST12          0.1864   75       932      2        0
;Roads
R4              Winnipeg_5.4h-100y ST11          0.2271   75       1135.5   2        0
;Roads
R5              Winnipeg_5.4h-100y ST16          0.1708   75       854      2        0
;Roads
R6              Winnipeg_5.4h-100y ST15          0.1776   75       888      2        0
;Roads
R7              Winnipeg_5.4h-100y ST10          0.2355   75       1177.5   2        0
;Roads
R8              Winnipeg_5.4h-100y ST17          0.2019   75       1009.5   2        0
;Roads
R9              Winnipeg_5.4h-100y ST9           0.2388   75       1194     2        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A1              0.015      0.25       1.6        3.2        0          OUTLET
A10             0.015      0.25       1.6        3.2        0          OUTLET
A11             0.015      0.25       1.6        3.2        0          OUTLET
A12             0.015      0.25       1.6        3.2        0          OUTLET
A13             0.015      0.25       1.6        3.2        0          OUTLET
A14             0.015      0.25       1.6        3.2        0          OUTLET
A15             0.015      0.25       1.6        3.2        0          OUTLET
A16             0.015      0.25       1.6        3.2        0          OUTLET
A17             0.015      0.25       1.6        3.2        0          OUTLET
A18             0.015      0.25       1.6        3.2        0          OUTLET
A19             0.015      0.25       1.6        3.2        0          OUTLET
A2              0.015      0.25       1.6        3.2        0          OUTLET
A20             0.015      0.25       1.6        3.2        0          OUTLET
A21             0.015      0.25       1.6        3.2        0          OUTLET
A22             0.015      0.25       1.6        3.2        0          OUTLET
A23             0.015      0.25       1.6        3.2        0          OUTLET
A24             0.015      0.25       1.6        3.2        0          OUTLET
A25             0.015      0.25       1.6        3.2        0          OUTLET
A26             0.015      0.25       1.6        3.2        0          OUTLET
A27             0.015      0.25       1.6        3.2        0          OUTLET
A28             0.015      0.25       1.6        3.2        0          OUTLET
A29             0.015      0.25       1.6        3.2        0          OUTLET
A3              0.015      0.25       1.6        3.2        0          OUTLET
A30             0.015      0.25       1.6        3.2        0          OUTLET
A31             0.015      0.25       1.6        3.2        0          OUTLET
A32             0.015      0.25       1.6        3.2        0          OUTLET
A33             0.015      0.25       1.6        3.2        0          OUTLET
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A34             0.015      0.25       1.6        3.2        0          OUTLET
A35             0.015      0.25       1.6        3.2        0          OUTLET
A36             0.015      0.25       1.6        3.2        0          OUTLET
A37             0.015      0.25       1.6        3.2        0          OUTLET
A38             0.015      0.25       1.6        3.2        0          OUTLET
A39             0.015      0.25       1.6        3.2        0          OUTLET
A4              0.015      0.25       1.6        3.2        0          OUTLET
A40             0.015      0.25       1.6        3.2        0          OUTLET
A41             0.015      0.25       1.6        3.2        0          OUTLET
A42             0.015      0.25       1.6        3.2        0          OUTLET
A43             0.015      0.25       1.6        3.2        0          OUTLET
A44             0.015      0.25       1.6        3.2        0          OUTLET
A45             0.015      0.25       1.6        3.2        0          OUTLET
A46             0.015      0.25       1.6        3.2        0          OUTLET
A47             0.015      0.25       1.6        3.2        0          OUTLET
A48             0.015      0.25       1.6        3.2        0          OUTLET
A49             0.015      0.25       1.6        3.2        0          OUTLET
A5              0.015      0.25       1.6        3.2        0          OUTLET
A6              0.015      0.25       1.6        3.2        0          OUTLET
A7              0.015      0.25       1.6        3.2        0          OUTLET
A8              0.015      0.25       1.6        3.2        0          OUTLET
A9              0.015      0.25       1.6        3.2        0          OUTLET
R1              0.015      0.25       1.6        3.2        0          OUTLET
R10             0.015      0.25       1.6        3.2        0          OUTLET
R11             0.015      0.25       1.6        3.2        0          OUTLET
R12             0.015      0.25       1.6        3.2        0          OUTLET
R13             0.015      0.25       1.6        3.2        0          OUTLET
R14             0.015      0.25       1.6        3.2        0          OUTLET
R15             0.015      0.25       1.6        3.2        0          OUTLET
R16             0.015      0.25       1.6        3.2        0          OUTLET
R17             0.015      0.25       1.6        3.2        0          OUTLET
R18             0.015      0.25       1.6        3.2        0          OUTLET
R19             0.015      0.25       1.6        3.2        0          OUTLET
R2              0.015      0.25       1.6        3.2        0          OUTLET
R20             0.015      0.25       1.6        3.2        0          OUTLET
R21             0.015      0.25       1.6        3.2        0          OUTLET
R22             0.015      0.25       1.6        3.2        0          OUTLET
R3              0.015      0.25       1.6        3.2        0          OUTLET
R4              0.015      0.25       1.6        3.2        0          OUTLET
R5              0.015      0.25       1.6        3.2        0          OUTLET
R6              0.015      0.25       1.6        3.2        0          OUTLET
R7              0.015      0.25       1.6        3.2        0          OUTLET
R8              0.015      0.25       1.6        3.2        0          OUTLET
R9              0.015      0.25       1.6        3.2        0          OUTLET

[INFILTRATION]
;;Subcatchment   MaxRate    MinRate    Decay      DryTime    MaxInfil
;;-------------- ---------- ---------- ---------- ---------- ----------
A1              75         3          4.14       7          0
A10             75         3          4.14       7          0
A11             75         3          4.14       7          0
A12             75         3          4.14       7          0
A13             75         3          4.14       7          0
A14             75         3          4.14       7          0
A15             75         3          4.14       7          0
A16             75         3          4.14       7          0
A17             75         3          4.14       7          0
A18             75         3          4.14       7          0
A19             75         3          4.14       7          0
A2              75         3          4.14       7          0
A20             75         3          4.14       7          0
A21             75         3          4.14       7          0
A22             75         3          4.14       7          0
A23             75         3          4.14       7          0
A24             75         3          4.14       7          0
A25             75         3          4.14       7          0
A26             75         3          4.14       7          0
A27             75         3          4.14       7          0
A28             75         3          4.14       7          0
A29             75         3          4.14       7          0
A3              75         3          4.14       7          0
A30             75         3          4.14       7          0
A31             75         3          4.14       7          0
A32             75         3          4.14       7          0
A33             75         3          4.14       7          0
A34             75         3          4.14       7          0
A35             75         3          4.14       7          0
A36             75         3          4.14       7          0
A37             75         3          4.14       7          0
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A38             75         3          4.14       7          0
A39             75         3          4.14       7          0
A4              75         3          4.14       7          0
A40             75         3          4.14       7          0
A41             75         3          4.14       7          0
A42             75         3          4.14       7          0
A43             75         3          4.14       7          0
A44             75         3          4.14       7          0
A45             75         3          4.14       7          0
A46             75         3          4.14       7          0
A47             75         3          4.14       7          0
A48             75         3          4.14       7          0
A49             75         3          4.14       7          0
A5              75         3          4.14       7          0
A6              75         3          4.14       7          0
A7              75         3          4.14       7          0
A8              75         3          4.14       7          0
A9              75         3          4.14       7          0
R1              75         3          4.14       7          0
R10             75         3          4.14       7          0
R11             75         3          4.14       7          0
R12             75         3          4.14       7          0
R13             75         3          4.14       7          0
R14             75         3          4.14       7          0
R15             75         3          4.14       7          0
R16             75         3          4.14       7          0
R17             75         3          4.14       7          0
R18             75         3          4.14       7          0
R19             75         3          4.14       7          0
R2              75         3          4.14       7          0
R20             75         3          4.14       7          0
R21             75         3          4.14       7          0
R22             75         3          4.14       7          0
R3              75         3          4.14       7          0
R4              75         3          4.14       7          0
R5              75         3          4.14       7          0
R6              75         3          4.14       7          0
R7              75         3          4.14       7          0
R8              75         3          4.14       7          0
R9              75         3          4.14       7          0

[JUNCTIONS]
;;              Invert     Max.       Init.      Surcharge  Ponded
;;Name          Elev.      Depth      Depth      Depth      Area
;;------------- ---------- ---------- ---------- ---------- ----------
ST1             228.237    3.375      0          0          0
ST10            230.543    2.794      0          0          0
ST11            230.783    2.729      0          0          0
ST12            231.605    2.039      0          0          0
ST13            231.875    2.1        0          0          0
ST14            232.1      2.122      0          0          0
ST15            231.506    2.207      0          0          0
ST16            231.806    2.125      0          0          0
ST17            231.165    2.446      0          0          0
ST18            230.851    2.52       0          0          0
ST19            231.165    2.479      0          0          0
ST2             228.93     3.197      0.116      0          0
ST20            231.455    2.49       0          0          0
ST21            231.956    2.212      0          0          0
ST22            229.552    2.964      0          0          0
ST22A           229.652    2.812      0          0          0
ST23            229.782    2.898      0          0          0
ST24            230.082    2.719      0          0          0
ST25            230.547    2.272      0          0          0
ST3             229.067    3.199      0          0          0
ST4             229.303    3.086      0          0          0
ST5             229.483    3.112      0          0          0
ST6             229.633    3.001      0          0          0
ST7             229.786    3          0          0          0
ST8             229.833    3.091      0          0          0
ST9             230.063    3.15       0          0          0

[OUTFALLS]
;;              Invert     Outfall    Stage/Table      Tide
;;Name          Elev.      Type       Time Series      Gate Route To
;;------------- ---------- ---------- ---------------- ---- ----------------
Pond            228.214    FIXED      228.45           NO

[STORAGE]
```

;;Name	Invert Elev.	Max. Depth	Init. Depth	Storage Curve	Curve Params			Ponded Area	Evap. Frac.	Infiltration parameters
SU33	233.3	0.5	0	TABULAR	OS33			0	0	
SU34	233.3	0.5	0	TABULAR	OS34			0	0	
SU35	233	0.5	0	TABULAR	OS35			0	0	
SU36	233	0.5	0	TABULAR	OS36			0	0	
SU37	233	0.5	0	TABULAR	OS37			0	0	
SU38	233	0.5	0	TABULAR	OS38			0	0	
SU39	232.5	0.5	0	TABULAR	OS39			0	0	
SU40	232.5	0.5	0	TABULAR	OS40			0	0	
SU41	232.3	0.5	0	TABULAR	OS41			0	0	
SU42	232.8	0.5	0	TABULAR	OS42			0	0	
SU43	232.8	0.5	0	TABULAR	OS43			0	0	
SU44	233.3	0.5	0	TABULAR	OS44			0	0	
SU45	233.6	0.5	0	TABULAR	OS45			0	0	
SU46	233.6	0.5	0	TABULAR	OS46			0	0	
SU47	233.8	0.5	0	TABULAR	OS47			0	0	
SU48	233.8	0.5	0	TABULAR	OS48			0	0	
SU49	233.8	0.5	0	TABULAR	OS49			0	0	

[CONDUITS]

;;Name	Inlet Node	Outlet Node	Length	Manning N	Inlet Offset	Outlet Offset	Init. Flow	Max. Flow
1	ST1	Pond	15	0.013	0	0	0	0
P10-9	ST10	ST9	79.55	0.013	0	0.4	0	0
P11-10	ST11	ST10	90.17	0.013	0	0.15	0	0
P12-11	ST12	ST11	83.69	0.011	0	0.7	0	0
P13-12	ST13	ST12	100	0.011	0	0.15	0	0
P14-13	ST14	ST13	100	0.011	0	0.075	0	0
P15-11	ST15	ST11	65	0.011	0	0.625	0	0
P16-15	ST16	ST15	100	0.011	0	0.15	0	0
P17-10	ST17	ST10	65	0.011	0	0.525	0	0
P18-9	ST18	ST9	75	0.013	0	0.698	0	0
P19-18	ST19	ST18	109.15	0.013	0	0.15	0	0
P20-19	ST20	ST19	70	0.013	0	0.15	0	0
P2-1	ST2	ST1	40	0.013	0	0.633	0	0
P21-20	ST21	ST20	105	0.011	0	0.375	0	0
P22-3	ST22	ST3	35.93	0.013	0	0.45	0	0
P22A-22	ST22A	ST22	40	0.013	0	0.06	0	0
P23-22A	ST23	ST22A	100	0.013	0	0.03	0	0
P24-23	ST24	ST23	100	0.013	0	0.15	0	0
P25-24	ST25	ST24	80	0.013	0	0.225	0	0
P3-2	ST3	ST2	70	0.013	0	0.03	0	0
P4-3	ST4	ST3	55	0.013	0	0.15	0	0
P5-4	ST5	ST4	100	0.013	0	0.03	0	0
P6-5	ST6	ST5	80	0.013	0	0.03	0	0
P7-6	ST7	ST6	81.95	0.013	0	0.03	0	0
P8-7	ST8	ST7	10.97	0.013	0	0.03	0	0
P9-8	ST9	ST8	132.72	0.013	0	0.03	0	0

[OUTLETS]

;;Name	Inlet Node	Outlet Node	Outflow Height	Outlet Type	Qcoeff/ QTable	Qexpon	Flap Gate
OL33	SU33	ST7	0	TABULAR/DEPTH	ICD33		NO
OL34	SU34	ST7	0	TABULAR/DEPTH	ICD34		NO
OL35	SU35	ST6	0	TABULAR/DEPTH	ICD35		NO
OL36	SU36	ST6	0	TABULAR/DEPTH	ICD36		NO
OL37	SU37	ST5	0	TABULAR/DEPTH	ICD37		NO
OL38	SU38	ST5	0	TABULAR/DEPTH	ICD38		NO
OL39	SU39	ST4	0	TABULAR/DEPTH	ICD39		NO
OL40	SU40	ST4	0	TABULAR/DEPTH	ICD40		NO
OL41	SU41	ST3	0	TABULAR/DEPTH	ICD41		NO
OL42	SU42	ST22	0	TABULAR/DEPTH	ICD42		NO
OL43	SU43	ST22A	0	TABULAR/DEPTH	ICD43		NO
OL44	SU44	ST23	0	TABULAR/DEPTH	ICD44		NO
OL45	SU45	ST24	0	TABULAR/DEPTH	ICD45		NO
OL46	SU46	ST24	0	TABULAR/DEPTH	ICD46		NO
OL47	SU47	ST25	0	TABULAR/DEPTH	ICD47		NO
OL48	SU48	ST25	0	TABULAR/DEPTH	ICD48		NO
OL49	SU49	ST25	0	TABULAR/DEPTH	ICD49		NO

[XSECTIONS]

;;Link	Shape	Geom1	Geom2	Geom3	Geom4	Barrels
1	CIRCULAR	1.5	0	0	0	1
P10-9	CIRCULAR	1.2	0	0	0	1

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P11-10           CIRCULAR     1.05            0          0          0          1
P12-11           CIRCULAR     0.6             0          0          0          1
P13-12           CIRCULAR     0.45            0          0          0          1
P14-13           CIRCULAR     0.375           0          0          0          1
P15-11           CIRCULAR     0.675           0          0          0          1
P16-15           CIRCULAR     0.525           0          0          0          1
P17-10           CIRCULAR     0.675           0          0          0          1
P18-9            CIRCULAR     0.9             0          0          0          1
P19-18           CIRCULAR     0.75            0          0          0          1
P20-19           CIRCULAR     0.6             0          0          0          1
P2-1             CIRCULAR     1.5             0          0          0          1
P21-20           CIRCULAR     0.525           0          0          0          1
P22-3            CIRCULAR     1.05            0          0          0          1
P22A-22          CIRCULAR     1.05            0          0          0          1
P23-22A          CIRCULAR     1.05            0          0          0          1
P24-23           CIRCULAR     0.9             0          0          0          1
P25-24           CIRCULAR     0.675           0          0          0          1
P3-2             CIRCULAR     1.5             0          0          0          1
P4-3             CIRCULAR     1.35            0          0          0          1
P5-4             CIRCULAR     1.35            0          0          0          1
P6-5             CIRCULAR     1.35            0          0          0          1
P7-6             CIRCULAR     1.35            0          0          0          1
P8-7             CIRCULAR     1.35            0          0          0          1
P9-8             CIRCULAR     1.35            0          0          0          1

[TRANSECTS]

;Full street, width = 14.5m, curb = 0.14m , cross-slope = 0.032m/m, bank-slope = 0.03m/m, bank-height = 0.5m.
NC 0.05     0.05     0.015
X1 PrimaryCollectorBothSides 9        -11.75   11.75    0.0       0.0       0.0      0.0      0.0
GR 0.5      -20.75   0.23     -11.75   0.14     -7.25    0         -7.25    0.225    0
GR 0        7.25     0.14     7.25     0.23     11.75    0.5       20.75

[LOSSES]
;;Link           Inlet      Outlet     Average    Flap Gate  SeepageRate
;;-------------- ---------- ---------- ---------- ---------- ----------

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
ICD33            Rating     0          0
ICD33                       0.5        0.0178

ICD34            Rating     0          0
ICD34                       0.5        0.0138

ICD35            Rating     0          0
ICD35                       0.5        0.0333

ICD36            Rating     0          0
ICD36                       0.5        0.0276

ICD37            Rating     0          0
ICD37                       0.5        0.0186

ICD38            Rating     0          0
ICD38                       0.5        0.0276

ICD39            Rating     0          0
ICD39                       0.5        0.0208

ICD40            Rating     0          0
ICD40                       0.5        0.0163

ICD41            Rating     0          0
ICD41                       0.5        0.0163

ICD42            Rating     0          0
ICD42                       0.5        0.0156

ICD43            Rating     0          0
ICD43                       0.5        0.0381

ICD44            Rating     0          0
ICD44                       0.5        0.0185

ICD45            Rating     0          0
ICD45                       0.5        0.0178
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ICD46            Rating     0          0
ICD46                       0.5        0.0307

ICD47            Rating     0          0
ICD47                       0.5        0.0178

ICD48            Rating     0          0
ICD48                       0.5        0.015

ICD49            Rating     0          0
ICD49                       0.5        0.1097

OS33             Storage    0          0
OS33                        0.5        400

OS34             Storage    0          0
OS34                        0.5        275

OS35             Storage    0          0
OS35                        0.5        760

OS36             Storage    0          0
OS36                        0.5        550

OS37             Storage    0          0
OS37                        0.5        420

OS38             Storage    0          0
OS38                        0.5        550

OS39             Storage    0          0
OS39                        0.5        470

OS40             Storage    0          0
OS40                        0.5        320

OS41             Storage    0          0
OS41                        0.5        320

OS42             Storage    0          0
OS42                        0.5        390

OS43             Storage    0          0
OS43                        0.5        960

OS44             Storage    0          0
OS44                        0.5        420

OS45             Storage    0          0
OS45                        0.5        450

OS46             Storage    0          0
OS46                        0.5        700

OS47             Storage    0          0
OS47                        0.5        450

OS48             Storage    0          0
OS48                        0.5        360

OS49             Storage    0          0
OS49                        0.5        1500

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
Winnpeg_5.4h-100y            0:00       2.54
Winnpeg_5.4h-100y            0:05       2.54
Winnpeg_5.4h-100y            0:10       2.794
Winnpeg_5.4h-100y            0:15       2.794
Winnpeg_5.4h-100y            0:20       3.048
Winnpeg_5.4h-100y            0:25       3.048
Winnpeg_5.4h-100y            0:30       3.302
Winnpeg_5.4h-100y            0:35       3.556
Winnpeg_5.4h-100y            0:40       3.81
Winnpeg_5.4h-100y            0:45       4.064
Winnpeg_5.4h-100y            0:50       4.572
Winnpeg_5.4h-100y            0:55       4.826
Winnpeg_5.4h-100y            1:00       5.334
```

```
Winnpeg_5.4h-100y           1:05       6.096
Winnpeg_5.4h-100y           1:10       6.858
Winnpeg_5.4h-100y           1:15       7.874
Winnpeg_5.4h-100y           1:20       9.398
Winnpeg_5.4h-100y           1:25       11.684
Winnpeg_5.4h-100y           1:30       14.986
Winnpeg_5.4h-100y           1:35       21.336
Winnpeg_5.4h-100y           1:40       35.56
Winnpeg_5.4h-100y           1:45       89.662
Winnpeg_5.4h-100y           1:50       258.318
Winnpeg_5.4h-100y           1:55       120.65
Winnpeg_5.4h-100y           2:00       67.31
Winnpeg_5.4h-100y           2:05       44.958
Winnpeg_5.4h-100y           2:10       33.274
Winnpeg_5.4h-100y           2:15       26.162
Winnpeg_5.4h-100y           2:20       21.336
Winnpeg_5.4h-100y           2:25       18.034
Winnpeg_5.4h-100y           2:30       15.494
Winnpeg_5.4h-100y           2:35       13.716
Winnpeg_5.4h-100y           2:40       12.192
Winnpeg_5.4h-100y           2:45       10.922
Winnpeg_5.4h-100y           2:50       10.16
Winnpeg_5.4h-100y           2:55       9.144
Winnpeg_5.4h-100y           3:00       8.636
Winnpeg_5.4h-100y           3:05       7.874
Winnpeg_5.4h-100y           3:10       7.366
Winnpeg_5.4h-100y           3:15       6.858
Winnpeg_5.4h-100y           3:20       6.604
Winnpeg_5.4h-100y           3:25       6.096
Winnpeg_5.4h-100y           3:30       5.842
Winnpeg_5.4h-100y           3:35       5.588
Winnpeg_5.4h-100y           3:40       5.334
Winnpeg_5.4h-100y           3:45       5.08
Winnpeg_5.4h-100y           3:50       4.826
Winnpeg_5.4h-100y           3:55       4.572
Winnpeg_5.4h-100y           4:00       4.572
Winnpeg_5.4h-100y           4:05       4.318
Winnpeg_5.4h-100y           4:10       4.064
Winnpeg_5.4h-100y           4:15       4.064
Winnpeg_5.4h-100y           4:20       3.81
Winnpeg_5.4h-100y           4:25       3.81
Winnpeg_5.4h-100y           4:30       3.556
Winnpeg_5.4h-100y           4:35       3.556
Winnpeg_5.4h-100y           4:40       3.556
Winnpeg_5.4h-100y           4:45       3.302
Winnpeg_5.4h-100y           4:50       3.302
Winnpeg_5.4h-100y           4:55       3.302
Winnpeg_5.4h-100y           5:00       3.048
Winnpeg_5.4h-100y           5:05       3.048
Winnpeg_5.4h-100y           5:10       3.048
Winnpeg_5.4h-100y           5:15       2.794
Winnpeg_5.4h-100y           5:20       2.794
Winnpeg_5.4h-100y           5:25       2.794

[REPORT]
INPUT      YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS       631066.319121869 5523218.95515    631999.666440747 5523725.83185
UNITS            Meters

[COORDINATES]
;;Node           X-Coord          Y-Coord
;;-------------- ---------------- ----------------

[VERTICES]
;;Link           X-Coord          Y-Coord
;;-------------- ---------------- ----------------

[POLYGONS]
;;Subcatchment   X-Coord          Y-Coord
;;-------------- ---------------- ----------------
```

```
[SYMBOLS]
;;Gage           X-Coord          Y-Coord
;;-------------- ---------------- ----------------
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

Parker Lands
Single Event
Winnipeg 5.4h-100y Storm


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 71
Number of nodes ........... 44
Number of links ........... 43
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
Winnipeg_5.4h-100y   Winnpeg_5.4h-100y           INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
------------------------------------------------------------------------------------------------
A1                          0.06     19.60     62.00    2.0000 Winnipeg_5.4h-100y   ST14
A10                         0.02      7.33     50.00    2.0000 Winnipeg_5.4h-100y   ST11
A11                         0.21     71.27     50.00    2.0000 Winnipeg_5.4h-100y   ST20
A12                         0.65    216.53     50.00    2.0000 Winnipeg_5.4h-100y   ST17
A13                         0.45    150.30     50.00    2.0000 Winnipeg_5.4h-100y   ST10
A14                         0.21     71.00     62.00    2.0000 Winnipeg_5.4h-100y   ST12
A15                         0.36    121.00     57.00    2.0000 Winnipeg_5.4h-100y   ST11
A16                         0.38    127.83     52.00    2.0000 Winnipeg_5.4h-100y   ST10
A17                         0.36    119.13     52.00    2.0000 Winnipeg_5.4h-100y   ST21
A18                         0.15     51.00     52.00    2.0000 Winnipeg_5.4h-100y   ST20
A19                         0.10     33.97     52.00    2.0000 Winnipeg_5.4h-100y   ST20
A2                          0.07     23.93     62.00    2.0000 Winnipeg_5.4h-100y   ST13
A20                         0.15     51.03     52.00    2.0000 Winnipeg_5.4h-100y   ST19
A21                         0.11     37.97     50.00    2.0000 Winnipeg_5.4h-100y   ST19
A22                         0.04     11.93     50.00    2.0000 Winnipeg_5.4h-100y   ST20
A23                         0.07     24.70     50.00    2.0000 Winnipeg_5.4h-100y   ST17
A24                         0.03      8.37     50.00    2.0000 Winnipeg_5.4h-100y   ST10
A25                         0.50    166.93     50.00    2.0000 Winnipeg_5.4h-100y   ST18
A26                         0.40    132.93     50.00    2.0000 Winnipeg_5.4h-100y   ST9
A27                         0.12     40.07     50.00    2.0000 Winnipeg_5.4h-100y   ST9
A28                         0.32    106.53     52.00    2.0000 Winnipeg_5.4h-100y   ST9
A29                         0.22     73.57     50.00    2.0000 Winnipeg_5.4h-100y   ST18
A3                          0.04     14.17     62.00    2.0000 Winnipeg_5.4h-100y   ST12
A30                         0.12     41.43     50.00    2.0000 Winnipeg_5.4h-100y   ST9
A31                         0.26     85.83     50.00    2.0000 Winnipeg_5.4h-100y   ST8
A32                         0.46    154.90     62.00    2.0000 Winnipeg_5.4h-100y   ST8
A33                         0.25     84.67     58.00    2.0000 Winnipeg_5.4h-100y   SU33
A34                         0.20     65.77     35.00    2.0000 Winnipeg_5.4h-100y   SU34
A35                         0.48    158.67     58.00    2.0000 Winnipeg_5.4h-100y   SU35
A36                         0.39    131.50     35.00    2.0000 Winnipeg_5.4h-100y   SU36
A37                         0.27     88.63     58.00    2.0000 Winnipeg_5.4h-100y   SU37
A38                         0.39    131.50     35.00    2.0000 Winnipeg_5.4h-100y   SU38
A39                         0.30     99.10     58.00    2.0000 Winnipeg_5.4h-100y   SU39
A4                          0.51    170.13     56.00    2.0000 Winnipeg_5.4h-100y   ST16
A40                         0.23     77.47     35.00    2.0000 Winnipeg_5.4h-100y   SU40
A41                         0.23     77.47     35.00    2.0000 Winnipeg_5.4h-100y   SU41
A42                         0.22     74.07     79.00    2.0000 Winnipeg_5.4h-100y   SU42
A43                         0.54    181.63     79.00    2.0000 Winnipeg_5.4h-100y   SU43
A44                         0.26     87.90     58.00    2.0000 Winnipeg_5.4h-100y   SU44
A45                         0.25     84.97     79.00    2.0000 Winnipeg_5.4h-100y   SU45
A46                         0.44    146.33     58.00    2.0000 Winnipeg_5.4h-100y   SU46
A47                         0.25     84.97     79.00    2.0000 Winnipeg_5.4h-100y   SU47
A48                         0.22     74.00     58.00    2.0000 Winnipeg_5.4h-100y   SU48
A49                         1.57    195.87      0.00    2.0000 Winnipeg_5.4h-100y   SU49
A5                          0.59    195.90     56.00    2.0000 Winnipeg_5.4h-100y   ST15
```

A6	0.21	68.57	56.00	2.0000 Winnipeg_5.4h-100y	ST11
A7	0.03	11.13	50.00	2.0000 Winnipeg_5.4h-100y	ST21
A8	0.07	22.13	50.00	2.0000 Winnipeg_5.4h-100y	ST16
A9	0.07	22.03	50.00	2.0000 Winnipeg_5.4h-100y	ST15
R1	0.16	785.00	75.00	2.0000 Winnipeg_5.4h-100y	ST14
R10	0.19	940.50	75.00	2.0000 Winnipeg_5.4h-100y	ST8
R11	0.19	946.50	75.00	2.0000 Winnipeg_5.4h-100y	ST6
R12	0.23	1140.50	75.00	2.0000 Winnipeg_5.4h-100y	ST5
R13	0.19	937.50	75.00	2.0000 Winnipeg_5.4h-100y	ST4
R14	0.20	997.00	75.00	2.0000 Winnipeg_5.4h-100y	ST3
R15	0.19	935.50	75.00	2.0000 Winnipeg_5.4h-100y	ST22A
R16	0.31	1552.00	75.00	2.0000 Winnipeg_5.4h-100y	ST23
R17	0.14	725.00	75.00	2.0000 Winnipeg_5.4h-100y	ST24
R18	0.15	727.00	75.00	2.0000 Winnipeg_5.4h-100y	ST25
R19	0.17	867.00	75.00	2.0000 Winnipeg_5.4h-100y	ST18
R2	0.19	944.00	75.00	2.0000 Winnipeg_5.4h-100y	ST13
R20	0.16	795.00	75.00	2.0000 Winnipeg_5.4h-100y	ST19
R21	0.34	1697.00	75.00	2.0000 Winnipeg_5.4h-100y	ST20
R22	0.20	998.50	75.00	2.0000 Winnipeg_5.4h-100y	ST21
R3	0.19	932.00	75.00	2.0000 Winnipeg_5.4h-100y	ST12
R4	0.23	1135.50	75.00	2.0000 Winnipeg_5.4h-100y	ST11
R5	0.17	854.00	75.00	2.0000 Winnipeg_5.4h-100y	ST16
R6	0.18	888.00	75.00	2.0000 Winnipeg_5.4h-100y	ST15
R7	0.24	1177.50	75.00	2.0000 Winnipeg_5.4h-100y	ST10
R8	0.20	1009.50	75.00	2.0000 Winnipeg_5.4h-100y	ST17
R9	0.24	1194.00	75.00	2.0000 Winnipeg_5.4h-100y	ST9

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
ST1	JUNCTION	228.24	3.38	0.0	
ST10	JUNCTION	230.54	2.79	0.0	
ST11	JUNCTION	230.78	2.73	0.0	
ST12	JUNCTION	231.61	2.04	0.0	
ST13	JUNCTION	231.88	2.10	0.0	
ST14	JUNCTION	232.10	2.12	0.0	
ST15	JUNCTION	231.51	2.21	0.0	
ST16	JUNCTION	231.81	2.13	0.0	
ST17	JUNCTION	231.16	2.45	0.0	
ST18	JUNCTION	230.85	2.52	0.0	
ST19	JUNCTION	231.16	2.48	0.0	
ST2	JUNCTION	228.93	3.20	0.0	
ST20	JUNCTION	231.46	2.49	0.0	
ST21	JUNCTION	231.96	2.21	0.0	
ST22	JUNCTION	229.55	2.96	0.0	
ST22A	JUNCTION	229.65	2.81	0.0	
ST23	JUNCTION	229.78	2.90	0.0	
ST24	JUNCTION	230.08	2.72	0.0	
ST25	JUNCTION	230.55	2.27	0.0	
ST3	JUNCTION	229.07	3.20	0.0	
ST4	JUNCTION	229.30	3.09	0.0	
ST5	JUNCTION	229.48	3.11	0.0	
ST6	JUNCTION	229.63	3.00	0.0	
ST7	JUNCTION	229.79	3.00	0.0	
ST8	JUNCTION	229.83	3.09	0.0	
ST9	JUNCTION	230.06	3.15	0.0	
Pond	OUTFALL	228.21	1.50	0.0	
SU33	STORAGE	233.30	0.50	0.0	
SU34	STORAGE	233.30	0.50	0.0	
SU35	STORAGE	233.00	0.50	0.0	
SU36	STORAGE	233.00	0.50	0.0	
SU37	STORAGE	233.00	0.50	0.0	
SU38	STORAGE	233.00	0.50	0.0	
SU39	STORAGE	232.50	0.50	0.0	
SU40	STORAGE	232.50	0.50	0.0	
SU41	STORAGE	232.30	0.50	0.0	
SU42	STORAGE	232.80	0.50	0.0	
SU43	STORAGE	232.80	0.50	0.0	
SU44	STORAGE	233.30	0.50	0.0	
SU45	STORAGE	233.60	0.50	0.0	
SU46	STORAGE	233.60	0.50	0.0	
SU47	STORAGE	233.80	0.50	0.0	
SU48	STORAGE	233.80	0.50	0.0	
SU49	STORAGE	233.80	0.50	0.0	

```
************
Link Summary
************
```

Name	From Node	To Node	Type	Length	%Slope	Roughness
1	ST1	Pond	CONDUIT	15.0	0.1533	0.0130
P10-9	ST10	ST9	CONDUIT	79.6	0.1006	0.0130
P11-10	ST11	ST10	CONDUIT	90.2	0.0998	0.0130
P12-11	ST12	ST11	CONDUIT	83.7	0.1458	0.0110
P13-12	ST13	ST12	CONDUIT	100.0	0.1200	0.0110
P14-13	ST14	ST13	CONDUIT	100.0	0.1500	0.0110
P15-11	ST15	ST11	CONDUIT	65.0	0.1508	0.0110
P16-15	ST16	ST15	CONDUIT	100.0	0.1500	0.0110
P17-10	ST17	ST10	CONDUIT	65.0	0.1492	0.0110
P18-9	ST18	ST9	CONDUIT	75.0	0.1200	0.0130
P19-18	ST19	ST18	CONDUIT	109.1	0.1503	0.0130
P20-19	ST20	ST19	CONDUIT	70.0	0.2000	0.0130
P2-1	ST2	ST1	CONDUIT	40.0	0.1500	0.0130
P21-20	ST21	ST20	CONDUIT	105.0	0.1200	0.0110
P22-3	ST22	ST3	CONDUIT	35.9	0.0974	0.0130
P22A-22	ST22A	ST22	CONDUIT	40.0	0.1000	0.0130
P23-22A	ST23	ST22A	CONDUIT	100.0	0.1000	0.0130
P24-23	ST24	ST23	CONDUIT	100.0	0.1500	0.0130
P25-24	ST25	ST24	CONDUIT	80.0	0.3000	0.0130
P3-2	ST3	ST2	CONDUIT	70.0	0.1529	0.0130
P4-3	ST4	ST3	CONDUIT	55.0	0.1564	0.0130
P5-4	ST5	ST4	CONDUIT	100.0	0.1500	0.0130
P6-5	ST6	ST5	CONDUIT	80.0	0.1500	0.0130
P7-6	ST7	ST6	CONDUIT	82.0	0.1501	0.0130
P8-7	ST8	ST7	CONDUIT	11.0	0.1550	0.0130
P9-8	ST9	ST8	CONDUIT	132.7	0.1507	0.0130
OL33	SU33	ST7	OUTLET			
OL34	SU34	ST7	OUTLET			
OL35	SU35	ST6	OUTLET			
OL36	SU36	ST6	OUTLET			
OL37	SU37	ST5	OUTLET			
OL38	SU38	ST5	OUTLET			
OL39	SU39	ST4	OUTLET			
OL40	SU40	ST4	OUTLET			
OL41	SU41	ST3	OUTLET			
OL42	SU42	ST22	OUTLET			
OL43	SU43	ST22A	OUTLET			
OL44	SU44	ST23	OUTLET			
OL45	SU45	ST24	OUTLET			
OL46	SU46	ST24	OUTLET			
OL47	SU47	ST25	OUTLET			
OL48	SU48	ST25	OUTLET			
OL49	SU49	ST25	OUTLET			

```
*********************
Cross Section Summary
*********************
```

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
1	CIRCULAR	1.50	1.77	0.38	1.50	1	2.77
P10-9	CIRCULAR	1.20	1.13	0.30	1.20	1	1.24
P11-10	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P12-11	CIRCULAR	0.60	0.28	0.15	0.60	1	0.28
P13-12	CIRCULAR	0.45	0.16	0.11	0.45	1	0.12
P14-13	CIRCULAR	0.38	0.11	0.09	0.38	1	0.08
P15-11	CIRCULAR	0.68	0.36	0.17	0.68	1	0.39
P16-15	CIRCULAR	0.53	0.22	0.13	0.53	1	0.20
P17-10	CIRCULAR	0.68	0.36	0.17	0.68	1	0.38
P18-9	CIRCULAR	0.90	0.64	0.23	0.90	1	0.63
P19-18	CIRCULAR	0.75	0.44	0.19	0.75	1	0.43
P20-19	CIRCULAR	0.60	0.28	0.15	0.60	1	0.27
P2-1	CIRCULAR	1.50	1.77	0.38	1.50	1	2.74
P21-20	CIRCULAR	0.53	0.22	0.13	0.53	1	0.18
P22-3	CIRCULAR	1.05	0.87	0.26	1.05	1	0.85
P22A-22	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P23-22A	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P24-23	CIRCULAR	0.90	0.64	0.23	0.90	1	0.70
P25-24	CIRCULAR	0.68	0.36	0.17	0.68	1	0.46
P3-2	CIRCULAR	1.50	1.77	0.38	1.50	1	2.76
P4-3	CIRCULAR	1.35	1.43	0.34	1.35	1	2.11
P5-4	CIRCULAR	1.35	1.43	0.34	1.35	1	2.07

```
P6-5            CIRCULAR            1.35     1.43     0.34     1.35        1     2.07
P7-6            CIRCULAR            1.35     1.43     0.34     1.35        1     2.07
P8-7            CIRCULAR            1.35     1.43     0.34     1.35        1     2.10
P9-8            CIRCULAR            1.35     1.43     0.34     1.35        1     2.07


***************
Transect Summary
***************

Transect PrimaryCollectorBothSides
Area:
           0.0003     0.0012     0.0027     0.0047     0.0074
           0.0107     0.0145     0.0189     0.0240     0.0296
           0.0358     0.0426     0.0500     0.0580     0.0671
           0.0776     0.0897     0.1033     0.1184     0.1350
           0.1531     0.1727     0.1938     0.2157     0.2382
           0.2613     0.2850     0.3094     0.3343     0.3599
           0.3861     0.4129     0.4403     0.4683     0.4970
           0.5262     0.5561     0.5865     0.6176     0.6493
           0.6816     0.7146     0.7481     0.7822     0.8170
           0.8524     0.8884     0.9250     0.9622     1.0000
Hrad:
           0.0186     0.0373     0.0559     0.0746     0.0932
           0.1119     0.1305     0.1492     0.1678     0.1865
           0.2051     0.2238     0.2424     0.2611     0.2564
           0.2580     0.2637     0.2722     0.2827     0.2947
           0.3078     0.3218     0.3410     0.3782     0.4140
           0.4484     0.4814     0.5133     0.5440     0.5735
           0.6021     0.6296     0.6562     0.6818     0.7067
           0.7307     0.7539     0.7764     0.7982     0.8193
           0.8398     0.8597     0.8790     0.8978     0.9160
           0.9337     0.9510     0.9678     0.9841     1.0000
Width:
           0.0155     0.0311     0.0466     0.0621     0.0776
           0.0932     0.1087     0.1242     0.1398     0.1553
           0.1708     0.1863     0.2019     0.2174     0.2570
           0.2967     0.3363     0.3759     0.4155     0.4552
           0.4948     0.5344     0.5663     0.5823     0.5984
           0.6145     0.6305     0.6466     0.6627     0.6787
           0.6948     0.7108     0.7269     0.7430     0.7590
           0.7751     0.7912     0.8072     0.8233     0.8394
           0.8554     0.8715     0.8876     0.9036     0.9197
           0.9357     0.9518     0.9679     0.9839     1.0000


*********************************************************
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
  RDII ...................  NO
  Snowmelt ...............  NO
  Groundwater ............  NO
  Flow Routing ...........  YES
  Ponding Allowed ........  NO
  Water Quality ..........  NO
Infiltration Method ......  HORTON
Flow Routing Method ......  DYNWAVE
Starting Date ............  01/25/2018 00:00:00
Ending Date ..............  01/25/2018 05:25:00
Antecedent Dry Days ......  0.0
Report Time Step .........  00:01:00
Wet Time Step ............  00:05:00
Dry Time Step ............  00:05:00
Routing Time Step ........  5.00 sec
Variable Time Step .......  YES
Maximum Trials ...........  8
Number of Threads ........  4
Head Tolerance ...........  0.001500 m
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	1.596	87.164
Evaporation Loss	0.000	0.000
Infiltration Loss	0.242	13.197
Surface Runoff	1.315	71.845
Final Storage	0.052	2.814
Continuity Error (%)	-0.794	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	1.314	13.137
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	1.237	12.366
Flooding Loss	0.043	0.432
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.003
Final Stored Volume	0.033	0.333
Continuity Error (%)	0.070	

Time-Step Critical Elements

Link 1 (46.87%)
Link P8-7 (36.11%)

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	0.50 sec
Average Time Step	:	3.45 sec
Maximum Time Step	:	5.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.29
Percent Not Converging	:	3.82

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A1	87.16	0.00	0.00	11.11	74.20	0.04	0.04	0.851
A10	87.16	0.00	0.00	14.62	70.50	0.02	0.01	0.809
A11	87.16	0.00	0.00	14.62	70.50	0.15	0.12	0.809
A12	87.16	0.00	0.00	14.62	70.50	0.46	0.37	0.809
A13	87.16	0.00	0.00	14.62	70.50	0.32	0.25	0.809
A14	87.16	0.00	0.00	11.11	74.20	0.16	0.13	0.851
A15	87.16	0.00	0.00	12.57	72.66	0.26	0.22	0.834
A16	87.16	0.00	0.00	14.03	71.12	0.27	0.22	0.816
A17	87.16	0.00	0.00	14.03	71.12	0.25	0.20	0.816
A18	87.16	0.00	0.00	14.03	71.12	0.11	0.09	0.816
A19	87.16	0.00	0.00	14.03	71.12	0.07	0.06	0.816
A2	87.16	0.00	0.00	11.11	74.20	0.05	0.04	0.851
A20	87.16	0.00	0.00	14.03	71.12	0.11	0.09	0.816
A21	87.16	0.00	0.00	14.62	70.50	0.08	0.06	0.809
A22	87.16	0.00	0.00	14.62	70.50	0.03	0.02	0.809
A23	87.16	0.00	0.00	14.62	70.50	0.05	0.04	0.809
A24	87.16	0.00	0.00	14.62	70.50	0.02	0.01	0.809

A25	87.16	0.00	0.00	14.62	70.50	0.35	0.28	0.809
A26	87.16	0.00	0.00	14.62	70.50	0.28	0.22	0.809
A27	87.16	0.00	0.00	14.62	70.50	0.08	0.07	0.809
A28	87.16	0.00	0.00	14.03	71.12	0.23	0.18	0.816
A29	87.16	0.00	0.00	14.62	70.50	0.16	0.12	0.809
A3	87.16	0.00	0.00	11.11	74.20	0.03	0.03	0.851
A30	87.16	0.00	0.00	14.62	70.50	0.09	0.07	0.809
A31	87.16	0.00	0.00	14.62	70.50	0.18	0.14	0.809
A32	87.16	0.00	0.00	11.11	74.20	0.34	0.29	0.851
A33	87.16	0.00	0.00	12.28	72.97	0.19	0.15	0.837
A34	87.16	0.00	0.00	19.01	65.81	0.13	0.09	0.755
A35	87.16	0.00	0.00	12.28	72.97	0.35	0.29	0.837
A36	87.16	0.00	0.00	19.01	65.81	0.26	0.19	0.755
A37	87.16	0.00	0.00	12.28	72.97	0.19	0.16	0.837
A38	87.16	0.00	0.00	19.01	65.81	0.26	0.19	0.755
A39	87.16	0.00	0.00	12.28	72.97	0.22	0.18	0.837
A4	87.16	0.00	0.00	12.87	72.35	0.37	0.30	0.830
A40	87.16	0.00	0.00	19.01	65.81	0.15	0.11	0.755
A41	87.16	0.00	0.00	19.01	65.81	0.15	0.11	0.755
A42	87.16	0.00	0.00	6.14	79.33	0.18	0.15	0.910
A43	87.16	0.00	0.00	6.14	79.33	0.43	0.37	0.910
A44	87.16	0.00	0.00	12.28	72.97	0.19	0.16	0.837
A45	87.16	0.00	0.00	6.14	79.33	0.20	0.18	0.910
A46	87.16	0.00	0.00	12.28	72.97	0.32	0.26	0.837
A47	87.16	0.00	0.00	6.14	79.33	0.20	0.18	0.910
A48	87.16	0.00	0.00	12.28	72.97	0.16	0.13	0.837
A49	87.16	0.00	0.00	29.24	52.44	0.82	0.26	0.602
A5	87.16	0.00	0.00	12.87	72.35	0.43	0.35	0.830
A6	87.16	0.00	0.00	12.87	72.35	0.15	0.12	0.830
A7	87.16	0.00	0.00	14.62	70.50	0.02	0.02	0.809
A8	87.16	0.00	0.00	14.62	70.50	0.05	0.04	0.809
A9	87.16	0.00	0.00	14.62	70.50	0.05	0.04	0.809
R1	87.16	0.00	0.00	7.31	78.56	0.12	0.11	0.901
R10	87.16	0.00	0.00	7.31	78.56	0.15	0.13	0.901
R11	87.16	0.00	0.00	7.31	78.56	0.15	0.13	0.901
R12	87.16	0.00	0.00	7.31	78.56	0.18	0.16	0.901
R13	87.16	0.00	0.00	7.31	78.56	0.15	0.13	0.901
R14	87.16	0.00	0.00	7.31	78.56	0.16	0.14	0.901
R15	87.16	0.00	0.00	7.31	78.56	0.15	0.13	0.901
R16	87.16	0.00	0.00	7.31	78.56	0.24	0.22	0.901
R17	87.16	0.00	0.00	7.31	78.56	0.11	0.10	0.901
R18	87.16	0.00	0.00	7.31	78.56	0.11	0.10	0.901
R19	87.16	0.00	0.00	7.31	78.56	0.14	0.12	0.901
R2	87.16	0.00	0.00	7.31	78.56	0.15	0.13	0.901
R20	87.16	0.00	0.00	7.31	78.56	0.12	0.11	0.901
R21	87.16	0.00	0.00	7.31	78.56	0.27	0.24	0.901
R22	87.16	0.00	0.00	7.31	78.56	0.16	0.14	0.901
R3	87.16	0.00	0.00	7.31	78.56	0.15	0.13	0.901
R4	87.16	0.00	0.00	7.31	78.56	0.18	0.16	0.901
R5	87.16	0.00	0.00	7.31	78.56	0.13	0.12	0.901
R6	87.16	0.00	0.00	7.31	78.56	0.14	0.13	0.901
R7	87.16	0.00	0.00	7.31	78.56	0.19	0.17	0.901
R8	87.16	0.00	0.00	7.31	78.56	0.16	0.14	0.901
R9	87.16	0.00	0.00	7.31	78.56	0.19	0.17	0.901

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Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
ST1	JUNCTION	0.46	1.25	229.48	0 01:58	1.24
ST10	JUNCTION	0.39	2.79	233.34	0 01:53	2.79
ST11	JUNCTION	0.35	2.73	233.51	0 01:53	2.73
ST12	JUNCTION	0.21	2.04	233.64	0 01:53	2.04
ST13	JUNCTION	0.20	2.10	233.98	0 01:52	2.10
ST14	JUNCTION	0.16	2.12	234.22	0 01:52	2.12
ST15	JUNCTION	0.24	2.21	233.71	0 01:53	2.21
ST16	JUNCTION	0.21	2.13	233.93	0 01:53	2.13
ST17	JUNCTION	0.22	2.45	233.61	0 01:53	2.45
ST18	JUNCTION	0.32	2.52	233.37	0 01:53	2.52
ST19	JUNCTION	0.29	2.48	233.64	0 01:53	2.48
ST2	JUNCTION	0.46	1.37	230.30	0 01:58	1.34
ST20	JUNCTION	0.28	2.49	233.94	0 01:53	2.49
ST21	JUNCTION	0.21	2.21	234.17	0 01:53	2.21

ST22	JUNCTION	0.31	2.05	231.60	0	01:55	1.09
ST22A	JUNCTION	0.30	2.02	231.67	0	01:56	1.04
ST23	JUNCTION	0.29	2.19	231.98	0	01:56	1.01
ST24	JUNCTION	0.24	0.84	230.92	0	01:57	0.79
ST25	JUNCTION	0.17	0.37	230.92	0	01:58	0.37
ST3	JUNCTION	0.49	1.94	231.00	0	01:55	1.55
ST4	JUNCTION	0.44	2.74	232.05	0	01:54	1.66
ST5	JUNCTION	0.47	3.11	232.60	0	01:53	2.11
ST6	JUNCTION	0.48	3.00	232.63	0	01:53	2.47
ST7	JUNCTION	0.47	3.00	232.79	0	01:53	2.80
ST8	JUNCTION	0.45	3.04	232.87	0	01:53	2.81
ST9	JUNCTION	0.47	3.15	233.21	0	01:53	3.12
Pond	OUTFALL	0.44	1.18	229.39	0	01:58	1.18
SU33	STORAGE	0.29	0.50	233.80	0	02:22	0.50
SU34	STORAGE	0.27	0.49	233.79	0	02:24	0.49
SU35	STORAGE	0.29	0.50	233.50	0	02:22	0.50
SU36	STORAGE	0.27	0.49	233.49	0	02:24	0.49
SU37	STORAGE	0.29	0.50	233.50	0	02:22	0.50
SU38	STORAGE	0.27	0.49	233.49	0	02:24	0.49
SU39	STORAGE	0.29	0.50	233.00	0	02:22	0.50
SU40	STORAGE	0.27	0.50	233.00	0	02:24	0.50
SU41	STORAGE	0.27	0.50	232.80	0	02:24	0.50
SU42	STORAGE	0.30	0.50	233.30	0	02:21	0.50
SU43	STORAGE	0.30	0.50	233.30	0	02:21	0.50
SU44	STORAGE	0.29	0.50	233.80	0	02:22	0.50
SU45	STORAGE	0.30	0.50	234.10	0	02:21	0.50
SU46	STORAGE	0.29	0.50	234.10	0	02:22	0.50
SU47	STORAGE	0.30	0.50	234.30	0	02:21	0.50
SU48	STORAGE	0.29	0.50	234.30	0	02:23	0.50
SU49	STORAGE	0.22	0.45	234.25	0	02:40	0.45

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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	Flow Balance Error Percent
ST1	JUNCTION	0.000	5.141	0	01:58	0	12.4	0.018
ST10	JUNCTION	0.654	2.347	0	01:55	0.792	3.72	0.228
ST11	JUNCTION	0.512	1.738	0	01:53	0.606	2.32	0.125
ST12	JUNCTION	0.291	0.504	0	01:53	0.336	0.681	0.631
ST13	JUNCTION	0.178	0.281	0	01:55	0.201	0.361	-0.077
ST14	JUNCTION	0.147	0.147	0	01:55	0.167	0.167	0.428
ST15	JUNCTION	0.512	0.786	0	01:53	0.611	1.11	0.498
ST16	JUNCTION	0.461	0.461	0	01:55	0.55	0.55	0.208
ST17	JUNCTION	0.550	0.550	0	01:55	0.668	0.668	0.393
ST18	JUNCTION	0.529	1.331	0	01:53	0.644	1.88	0.457
ST19	JUNCTION	0.264	0.911	0	01:53	0.314	1.26	0.277
ST2	JUNCTION	0.000	5.143	0	01:58	0	12.4	0.072
ST20	JUNCTION	0.526	0.763	0	01:55	0.623	1.03	0.320
ST21	JUNCTION	0.365	0.365	0	01:55	0.434	0.434	0.179
ST22	JUNCTION	0.000	0.755	0	02:00	0	3	-0.055
ST22A	JUNCTION	0.132	1.115	0	01:54	0.147	2.85	0.130
ST23	JUNCTION	0.219	0.945	0	01:55	0.244	2.31	0.289
ST24	JUNCTION	0.102	0.516	0	01:56	0.114	1.87	0.170
ST25	JUNCTION	0.103	0.152	0	01:55	0.114	1.26	0.273
ST3	JUNCTION	0.141	5.138	0	01:58	0.156	12.4	-0.017
ST4	JUNCTION	0.132	4.565	0	01:55	0.147	9.13	0.398
ST5	JUNCTION	0.161	4.410	0	01:55	0.179	8.65	0.199
ST6	JUNCTION	0.134	4.223	0	01:55	0.149	8.05	0.146
ST7	JUNCTION	0.000	4.055	0	01:55	0	7.33	0.099
ST8	JUNCTION	0.567	4.037	0	01:55	0.673	7	-0.348
ST9	JUNCTION	0.714	3.823	0	01:53	0.867	6.34	0.150
Pond	OUTFALL	0.000	5.148	0	01:58	0	12.4	0.000
SU33	STORAGE	0.153	0.153	0	01:55	0.185	0.185	0.030
SU34	STORAGE	0.095	0.095	0	01:55	0.13	0.13	0.033
SU35	STORAGE	0.287	0.287	0	01:55	0.347	0.347	0.030
SU36	STORAGE	0.189	0.189	0	01:55	0.259	0.259	0.032
SU37	STORAGE	0.160	0.160	0	01:55	0.194	0.194	0.030
SU38	STORAGE	0.189	0.189	0	01:55	0.259	0.259	0.032
SU39	STORAGE	0.179	0.179	0	01:55	0.217	0.217	0.030
SU40	STORAGE	0.111	0.111	0	01:55	0.153	0.153	0.033
SU41	STORAGE	0.111	0.111	0	01:55	0.153	0.153	0.033
SU42	STORAGE	0.153	0.153	0	01:55	0.176	0.176	0.028

SU43	STORAGE	0.375	0.375	0	01:55	0.432	0.432	0.028
SU44	STORAGE	0.159	0.159	0	01:55	0.192	0.192	0.030
SU45	STORAGE	0.175	0.175	0	01:55	0.202	0.202	0.028
SU46	STORAGE	0.265	0.265	0	01:55	0.32	0.32	0.030
SU47	STORAGE	0.175	0.175	0	01:55	0.202	0.202	0.028
SU48	STORAGE	0.134	0.134	0	01:55	0.162	0.162	0.030
SU49	STORAGE	0.258	0.258	0	02:00	0.821	0.821	0.022

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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
ST10	JUNCTION	0.17	1.594	0.000
ST11	JUNCTION	0.13	1.429	0.000
ST12	JUNCTION	0.13	1.439	0.000
ST13	JUNCTION	0.16	1.650	0.000
ST14	JUNCTION	0.14	1.747	0.000
ST15	JUNCTION	0.15	1.532	0.000
ST16	JUNCTION	0.16	1.600	0.000
ST17	JUNCTION	0.16	1.771	0.000
ST18	JUNCTION	0.17	1.620	0.000
ST19	JUNCTION	0.19	1.729	0.000
ST20	JUNCTION	0.16	1.590	0.000
ST21	JUNCTION	0.16	1.687	0.000
ST22	JUNCTION	0.01	0.937	0.917
ST22A	JUNCTION	0.01	0.941	0.791
ST23	JUNCTION	0.01	1.143	0.705
ST3	JUNCTION	0.05	0.436	1.263
ST4	JUNCTION	0.11	1.364	0.342
ST5	JUNCTION	0.15	1.732	0.000
ST6	JUNCTION	0.18	1.621	0.000
ST7	JUNCTION	0.19	1.620	0.000
ST8	JUNCTION	0.19	1.656	0.055
ST9	JUNCTION	0.16	1.550	0.000

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Node Flooding Summary
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Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CMS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 ltr	Maximum Ponded Depth Meters
ST10	0.08	0.562	0 01:55	0.095	0.000
ST11	0.07	0.885	0 01:53	0.050	0.000
ST12	0.09	0.184	0 01:55	0.042	0.000
ST13	0.09	0.086	0 01:55	0.016	0.000
ST14	0.07	0.047	0 01:52	0.006	0.000
ST15	0.08	0.192	0 01:55	0.033	0.000
ST16	0.09	0.219	0 01:55	0.045	0.000
ST17	0.01	0.238	0 01:53	0.003	0.000
ST18	0.06	0.243	0 01:53	0.013	0.000
ST19	0.08	0.101	0 01:55	0.016	0.000
ST20	0.10	0.357	0 01:55	0.085	0.000
ST21	0.09	0.128	0 01:55	0.023	0.000
ST5	0.01	0.774	0 01:53	0.002	0.000
ST6	0.01	0.044	0 01:53	0.000	0.000
ST7	0.01	0.098	0 01:53	0.000	0.000
ST9	0.01	0.876	0 01:53	0.004	0.000

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Storage Volume Summary
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	Average Volume	Avg Pcnt	Evap Pcnt	Exfil Pcnt	Maximum Volume	Max Pcnt	Time of Max Occurrence	Maximum Outflow

Storage Unit	1000 m3	Full	Loss	Loss	1000 m3	Full	days hr:min	CMS
SU33	0.046	46	0	0	0.099	99	0 02:22	0.018
SU34	0.029	42	0	0	0.067	97	0 02:24	0.014
SU35	0.086	46	0	0	0.187	98	0 02:22	0.033
SU36	0.058	42	0	0	0.134	97	0 02:24	0.027
SU37	0.048	46	0	0	0.104	99	0 02:22	0.019
SU38	0.058	42	0	0	0.134	97	0 02:24	0.027
SU39	0.054	46	0	0	0.117	99	0 02:22	0.021
SU40	0.034	42	0	0	0.078	98	0 02:24	0.016
SU41	0.034	42	0	0	0.078	98	0 02:24	0.016
SU42	0.047	48	0	0	0.097	99	0 02:21	0.016
SU43	0.116	48	0	0	0.238	99	0 02:21	0.038
SU44	0.048	45	0	0	0.103	98	0 02:22	0.018
SU45	0.054	48	0	0	0.111	99	0 02:21	0.018
SU46	0.080	46	0	0	0.172	98	0 02:22	0.030
SU47	0.054	48	0	0	0.111	99	0 02:21	0.018
SU48	0.042	46	0	0	0.088	98	0 02:23	0.015
SU49	0.116	31	0	0	0.305	81	0 02:40	0.099

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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
Pond	99.98	0.953	5.148	12.384
System	99.98	0.953	5.148	12.384

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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
1	CONDUIT	5.148	0 01:58	3.37	1.86	0.81
P10-9	CONDUIT	2.039	0 01:58	1.84	1.65	1.00
P11-10	CONDUIT	1.381	0 01:53	1.61	1.60	1.00
P12-11	CONDUIT	0.524	0 01:53	1.87	1.89	1.00
P13-12	CONDUIT	0.267	0 01:53	1.68	2.29	1.00
P14-13	CONDUIT	0.122	0 01:53	1.10	1.51	1.00
P15-11	CONDUIT	0.800	0 01:53	2.26	2.07	1.00
P16-15	CONDUIT	0.373	0 01:53	1.72	1.90	1.00
P17-10	CONDUIT	0.550	0 01:55	1.54	1.43	1.00
P18-9	CONDUIT	1.331	0 01:53	2.11	2.12	1.00
P19-18	CONDUIT	0.911	0 01:53	2.06	2.11	1.00
P20-19	CONDUIT	0.701	0 01:53	2.48	2.55	1.00
P2-1	CONDUIT	5.141	0 01:58	3.24	1.88	0.85
P21-20	CONDUIT	0.282	0 01:53	1.30	1.60	1.00
P22-3	CONDUIT	0.785	0 02:01	1.30	0.92	1.00
P22A-22	CONDUIT	0.741	0 02:00	1.23	0.86	1.00
P23-22A	CONDUIT	0.624	0 01:58	0.94	0.72	0.98
P24-23	CONDUIT	0.444	0 01:57	1.11	0.63	0.88
P25-24	CONDUIT	0.202	0 01:58	1.22	0.44	0.66
P3-2	CONDUIT	5.143	0 01:58	3.01	1.86	0.95
P4-3	CONDUIT	4.568	0 01:55	3.22	2.16	1.00
P5-4	CONDUIT	4.411	0 01:55	3.08	2.13	1.00
P6-5	CONDUIT	4.223	0 01:55	2.95	2.04	1.00
P7-6	CONDUIT	4.057	0 01:55	2.83	1.96	1.00
P8-7	CONDUIT	4.036	0 01:55	2.82	1.92	1.00
P9-8	CONDUIT	3.517	0 01:56	2.46	1.70	1.00
OL33	DUMMY	0.018	0 02:22			
OL34	DUMMY	0.014	0 02:24			
OL35	DUMMY	0.033	0 02:22			
OL36	DUMMY	0.027	0 02:24			
OL37	DUMMY	0.019	0 02:22			
OL38	DUMMY	0.027	0 02:24			
OL39	DUMMY	0.021	0 02:22			
OL40	DUMMY	0.016	0 02:24			
OL41	DUMMY	0.016	0 02:24			

OL42	DUMMY	0.016	0	02:21
OL43	DUMMY	0.038	0	02:21
OL44	DUMMY	0.018	0	02:22
OL45	DUMMY	0.018	0	02:21
OL46	DUMMY	0.030	0	02:22
OL47	DUMMY	0.018	0	02:21
OL48	DUMMY	0.015	0	02:23
OL49	DUMMY	0.099	0	02:40

****
Flow Classification Summary
****

	Adjusted	Fraction of Time in Flow Class								
Conduit	/Actual Length	Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
P10-9	1.00	0.06	0.00	0.00	0.12	0.00	0.00	0.81	0.00	0.00
P11-10	1.00	0.06	0.00	0.00	0.22	0.00	0.00	0.72	0.00	0.00
P12-11	1.00	0.06	0.00	0.00	0.07	0.00	0.00	0.87	0.00	0.00
P13-12	1.00	0.06	0.00	0.00	0.09	0.00	0.00	0.85	0.00	0.00
P14-13	1.00	0.06	0.00	0.00	0.25	0.00	0.00	0.68	0.04	0.00
P15-11	1.00	0.06	0.00	0.00	0.06	0.00	0.00	0.87	0.00	0.00
P16-15	1.00	0.06	0.00	0.00	0.11	0.00	0.00	0.82	0.00	0.00
P17-10	1.00	0.06	0.00	0.00	0.10	0.00	0.00	0.84	0.00	0.00
P18-9	1.00	0.06	0.00	0.00	0.10	0.00	0.00	0.84	0.00	0.00
P19-18	1.00	0.06	0.00	0.00	0.14	0.00	0.00	0.80	0.00	0.00
P20-19	1.00	0.06	0.00	0.00	0.12	0.00	0.00	0.82	0.00	0.00
P2-1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
P21-20	1.00	0.06	0.00	0.00	0.08	0.00	0.00	0.85	0.00	0.00
P22-3	1.00	0.06	0.00	0.00	0.17	0.00	0.00	0.77	0.00	0.00
P22A-22	1.00	0.06	0.00	0.00	0.53	0.00	0.00	0.40	0.00	0.00
P23-22A	1.00	0.06	0.00	0.00	0.92	0.00	0.00	0.02	0.00	0.00
P24-23	1.00	0.06	0.00	0.00	0.14	0.00	0.00	0.79	0.00	0.00
P25-24	1.00	0.06	0.00	0.00	0.04	0.00	0.00	0.90	0.01	0.00
P3-2	1.00	0.05	0.01	0.00	0.88	0.00	0.00	0.06	0.00	0.00
P4-3	1.00	0.06	0.00	0.00	0.38	0.00	0.00	0.56	0.00	0.00
P5-4	1.00	0.06	0.00	0.00	0.90	0.00	0.00	0.04	0.00	0.00
P6-5	1.00	0.06	0.00	0.00	0.90	0.00	0.00	0.03	0.00	0.00
P7-6	1.00	0.06	0.00	0.00	0.91	0.00	0.00	0.03	0.37	0.00
P8-7	1.00	0.06	0.00	0.00	0.90	0.00	0.00	0.04	0.00	0.00
P9-8	1.00	0.06	0.00	0.00	0.89	0.00	0.00	0.05	0.01	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
1	0.01	0.01	0.01	0.28	0.01
P10-9	0.16	0.17	0.16	0.24	0.16
P11-10	0.17	0.18	0.17	0.21	0.17
P12-11	0.13	0.13	0.13	0.18	0.11
P13-12	0.13	0.16	0.13	0.22	0.13
P14-13	0.14	0.14	0.16	0.11	0.10
P15-11	0.13	0.15	0.13	0.21	0.13
P16-15	0.15	0.16	0.15	0.20	0.15
P17-10	0.16	0.16	0.17	0.08	0.07
P18-9	0.16	0.17	0.16	0.24	0.16
P19-18	0.17	0.19	0.17	0.23	0.17
P20-19	0.19	0.22	0.19	0.27	0.19
P2-1	0.01	0.01	0.01	0.28	0.01
P21-20	0.16	0.16	0.16	0.15	0.13
P22-3	0.04	0.05	0.05	0.01	0.02
P22A-22	0.01	0.02	0.01	0.01	0.01
P23-22A	0.01	0.01	0.01	0.01	0.01
P24-23	0.01	0.01	0.01	0.01	0.01
P3-2	0.01	0.05	0.01	0.28	0.01
P4-3	0.05	0.12	0.05	0.30	0.05
P5-4	0.11	0.16	0.11	0.30	0.11
P6-5	0.15	0.19	0.15	0.29	0.15
P7-6	0.18	0.20	0.18	0.28	0.18

P8-7	0.19	0.20	0.19	0.27	0.19
P9-8	0.19	0.20	0.19	0.25	0.19

Analysis begun on: Thu Jan 25 10:04:31 2018
Analysis ended on: Thu Jan 25 10:04:31 2018
Total elapsed time: < 1 sec

Continuous Simulation
May 2010 Storm Event

- **Input File**
- **Report File**

To reduce the amount of data in the input file, the following sections have been excluded in this Appendix:

- Coordinates
- Vertices
- Polygons

```
[TITLE]
Parker Lands
Continuous Simulation
Winnipeg May 2010 Storm


[OPTIONS]
;;Options            Value
;;------------------ ------------
FLOW_UNITS           CMS
INFILTRATION         HORTON
FLOW_ROUTING         DYNWAVE
START_DATE           05/28/2010
START_TIME           05:05:00
REPORT_START_DATE    05/28/2010
REPORT_START_TIME    05:05:00
END_DATE             05/30/2010
END_TIME             11:35:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:05:00
DRY_STEP             00:05:00
ROUTING_STEP         5
ALLOW_PONDING        NO
INERTIAL_DAMPING     PARTIAL
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
NORMAL_FLOW_LIMITED  BOTH
SKIP_STEADY_STATE    NO
FORCE_MAIN_EQUATION  H-W
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              4

[EVAPORATION]
;;Type          Parameters
;;------------- ----------
CONSTANT     0.0
DRY_ONLY     NO

[RAINGAGES]
;;               Rain      Time   Snow   Data
;;Name           Type      Intrvl Catch  Source
;;-------------- --------- ------ ------ ----------
May_2010_storm   INTENSITY 0:05   1.0    TIMESERIES Winnipeg_May_2010_storm

[SUBCATCHMENTS]
;;                                          Total    Pcnt.             Pcnt.    Curb     Snow
;;Name           Raingage         Outlet     Area     Imperv   Width    Slope    Length   Pack
;;-------------- ---------------- ---------- -------- -------- -------- -------- -------- --------
;SF
A1               May_2010_storm   ST14       0.0588   62       19.6     2        0
;SF
A10              May_2010_storm   ST11       0.022    50       7.333    2        0
;SF
A11              May_2010_storm   ST20       0.2138   50       71.267   2        0
;SF
A12              May_2010_storm   ST17       0.6496   50       216.533  2        0
;SF
A13              May_2010_storm   ST10       0.4509   50       150.3    2        0
;SF
A14              May_2010_storm   ST12       0.213    62       71       2        0
;SF
A15              May_2010_storm   ST11       0.363    57       121      2        0
;SF
```

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A16             May_2010_storm   ST10            0.3835   52       127.833  2        0
;SF
A17             May_2010_storm   ST21            0.3574   52       119.133  2        0
;SF
A18             May_2010_storm   ST20            0.153    52       51       2        0
;SF
A19             May_2010_storm   ST20            0.1019   52       33.967   2        0
;SF
A2              May_2010_storm   ST13            0.0718   62       23.933   2        0
;SF
A20             May_2010_storm   ST19            0.1531   52       51.033   2        0
;SF
A21             May_2010_storm   ST19            0.1139   50       37.967   2        0
;SF
A22             May_2010_storm   ST20            0.0358   50       11.933   2        0
;SF
A23             May_2010_storm   ST17            0.0741   50       24.7     2        0
;SF
A24             May_2010_storm   ST10            0.0251   50       8.367    2        0
;SF
A25             May_2010_storm   ST18            0.5008   50       166.933  2        0
;SF
A26             May_2010_storm   ST9             0.3988   50       132.933  2        0
;SF
A27             May_2010_storm   ST9             0.1202   50       40.067   2        0
;SF
A28             May_2010_storm   ST9             0.3196   52       106.533  2        0
;SF
A29             May_2010_storm   ST18            0.2207   50       73.567   2        0
;SF
A3              May_2010_storm   ST12            0.0425   62       14.167   2        0
;SF
A30             May_2010_storm   ST9             0.1243   50       41.433   2        0
;SF
A31             May_2010_storm   ST8             0.2575   50       85.833   2        0
;SF
A32             May_2010_storm   ST8             0.4647   62       154.9    2        0
;MF-65%
A33             May_2010_storm   SU33            0.254    58       84.667   2        0
;MF-45%
A34             May_2010_storm   SU34            0.1973   35       65.767   2        0
;MF-65%
A35             May_2010_storm   SU35            0.476    58       158.667  2        0
;MF-45%
A36             May_2010_storm   SU36            0.3945   35       131.5    2        0
;MF-65%
A37             May_2010_storm   SU37            0.2659   58       88.633   2        0
;MF-45%
A38             May_2010_storm   SU38            0.3945   35       131.5    2        0
;MF-65%
A39             May_2010_storm   SU39            0.2973   58       99.1     2        0
;SF
A4              May_2010_storm   ST16            0.5104   56       170.133  2        0
;MF-45%
A40             May_2010_storm   SU40            0.2324   35       77.467   2        0
;MF-45%
A41             May_2010_storm   SU41            0.2324   35       77.467   2        0
;MF-65%
A42             May_2010_storm   SU42            0.2222   79       74.067   2        0
;MF-65%
A43             May_2010_storm   SU43            0.5449   79       181.633  2        0
;MF-65%
A44             May_2010_storm   SU44            0.2637   58       87.9     2        0
;MF-65%
A45             May_2010_storm   SU45            0.2549   79       84.967   2        0
;MF-65%
A46             May_2010_storm   SU46            0.439    58       146.333  2        0
;MF-65%
A47             May_2010_storm   SU47            0.2549   79       84.967   2        0
;MF-65%
A48             May_2010_storm   SU48            0.222    58       74       2        0
;Forest
A49             May_2010_storm   SU49            1.567    0        195.875  2        0
;SF
A5              May_2010_storm   ST15            0.5877   56       195.9    2        0
;SF
A6              May_2010_storm   ST11            0.2057   56       68.567   2        0
;SF
A7              May_2010_storm   ST21            0.0334   50       11.133   2        0
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;SF
A8              May_2010_storm   ST16            0.0664   50       22.133   2        0
;SF
A9              May_2010_storm   ST15            0.0661   50       22.033   2        0
;Roads
R1              May_2010_storm   ST14            0.157    75       785      2        0
;Roads
R10             May_2010_storm   ST8             0.1881   75       940.5    2        0
;Roads
R11             May_2010_storm   ST6             0.1893   75       946.5    2        0
;Roads
R12             May_2010_storm   ST5             0.2281   75       1140.5   2        0
;Roads
R13             May_2010_storm   ST4             0.1875   75       937.5    2        0
;Roads
R14             May_2010_storm   ST3             0.1994   75       997      2        0
;Roads
R15             May_2010_storm   ST22A           0.1871   75       935.5    2        0
;Roads
R16             May_2010_storm   ST23            0.3104   75       1552     2        0
;Roads
R17             May_2010_storm   ST24            0.145    75       725      2        0
;Roads
R18             May_2010_storm   ST25            0.1454   75       727      2        0
;Roads
R19             May_2010_storm   ST18            0.1734   75       867      2        0
;Roads
R2              May_2010_storm   ST13            0.1888   75       944      2        0
;Roads
R20             May_2010_storm   ST19            0.159    75       795      2        0
;Roads
R21             May_2010_storm   ST20            0.3394   75       1697     2        0
;Roads
R22             May_2010_storm   ST21            0.1997   75       998.5    2        0
;Roads
R3              May_2010_storm   ST12            0.1864   75       932      2        0
;Roads
R4              May_2010_storm   ST11            0.2271   75       1135.5   2        0
;Roads
R5              May_2010_storm   ST16            0.1708   75       854      2        0
;Roads
R6              May_2010_storm   ST15            0.1776   75       888      2        0
;Roads
R7              May_2010_storm   ST10            0.2355   75       1177.5   2        0
;Roads
R8              May_2010_storm   ST17            0.2019   75       1009.5   2        0
;Roads
R9              May_2010_storm   ST9             0.2388   75       1194     2        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A1              0.015      0.25       1.6        3.2        0          OUTLET
A10             0.015      0.25       1.6        3.2        0          OUTLET
A11             0.015      0.25       1.6        3.2        0          OUTLET
A12             0.015      0.25       1.6        3.2        0          OUTLET
A13             0.015      0.25       1.6        3.2        0          OUTLET
A14             0.015      0.25       1.6        3.2        0          OUTLET
A15             0.015      0.25       1.6        3.2        0          OUTLET
A16             0.015      0.25       1.6        3.2        0          OUTLET
A17             0.015      0.25       1.6        3.2        0          OUTLET
A18             0.015      0.25       1.6        3.2        0          OUTLET
A19             0.015      0.25       1.6        3.2        0          OUTLET
A2              0.015      0.25       1.6        3.2        0          OUTLET
A20             0.015      0.25       1.6        3.2        0          OUTLET
A21             0.015      0.25       1.6        3.2        0          OUTLET
A22             0.015      0.25       1.6        3.2        0          OUTLET
A23             0.015      0.25       1.6        3.2        0          OUTLET
A24             0.015      0.25       1.6        3.2        0          OUTLET
A25             0.015      0.25       1.6        3.2        0          OUTLET
A26             0.015      0.25       1.6        3.2        0          OUTLET
A27             0.015      0.25       1.6        3.2        0          OUTLET
A28             0.015      0.25       1.6        3.2        0          OUTLET
A29             0.015      0.25       1.6        3.2        0          OUTLET
A3              0.015      0.25       1.6        3.2        0          OUTLET
A30             0.015      0.25       1.6        3.2        0          OUTLET
A31             0.015      0.25       1.6        3.2        0          OUTLET
A32             0.015      0.25       1.6        3.2        0          OUTLET
A33             0.015      0.25       1.6        3.2        0          OUTLET
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A34             0.015      0.25       1.6        3.2        0          OUTLET
A35             0.015      0.25       1.6        3.2        0          OUTLET
A36             0.015      0.25       1.6        3.2        0          OUTLET
A37             0.015      0.25       1.6        3.2        0          OUTLET
A38             0.015      0.25       1.6        3.2        0          OUTLET
A39             0.015      0.25       1.6        3.2        0          OUTLET
A4              0.015      0.25       1.6        3.2        0          OUTLET
A40             0.015      0.25       1.6        3.2        0          OUTLET
A41             0.015      0.25       1.6        3.2        0          OUTLET
A42             0.015      0.25       1.6        3.2        0          OUTLET
A43             0.015      0.25       1.6        3.2        0          OUTLET
A44             0.015      0.25       1.6        3.2        0          OUTLET
A45             0.015      0.25       1.6        3.2        0          OUTLET
A46             0.015      0.25       1.6        3.2        0          OUTLET
A47             0.015      0.25       1.6        3.2        0          OUTLET
A48             0.015      0.25       1.6        3.2        0          OUTLET
A49             0.015      0.25       1.6        3.2        0          OUTLET
A5              0.015      0.25       1.6        3.2        0          OUTLET
A6              0.015      0.25       1.6        3.2        0          OUTLET
A7              0.015      0.25       1.6        3.2        0          OUTLET
A8              0.015      0.25       1.6        3.2        0          OUTLET
A9              0.015      0.25       1.6        3.2        0          OUTLET
R1              0.015      0.25       1.6        3.2        0          OUTLET
R10             0.015      0.25       1.6        3.2        0          OUTLET
R11             0.015      0.25       1.6        3.2        0          OUTLET
R12             0.015      0.25       1.6        3.2        0          OUTLET
R13             0.015      0.25       1.6        3.2        0          OUTLET
R14             0.015      0.25       1.6        3.2        0          OUTLET
R15             0.015      0.25       1.6        3.2        0          OUTLET
R16             0.015      0.25       1.6        3.2        0          OUTLET
R17             0.015      0.25       1.6        3.2        0          OUTLET
R18             0.015      0.25       1.6        3.2        0          OUTLET
R19             0.015      0.25       1.6        3.2        0          OUTLET
R2              0.015      0.25       1.6        3.2        0          OUTLET
R20             0.015      0.25       1.6        3.2        0          OUTLET
R21             0.015      0.25       1.6        3.2        0          OUTLET
R22             0.015      0.25       1.6        3.2        0          OUTLET
R3              0.015      0.25       1.6        3.2        0          OUTLET
R4              0.015      0.25       1.6        3.2        0          OUTLET
R5              0.015      0.25       1.6        3.2        0          OUTLET
R6              0.015      0.25       1.6        3.2        0          OUTLET
R7              0.015      0.25       1.6        3.2        0          OUTLET
R8              0.015      0.25       1.6        3.2        0          OUTLET
R9              0.015      0.25       1.6        3.2        0          OUTLET

[INFILTRATION]
;;Subcatchment   MaxRate    MinRate    Decay      DryTime    MaxInfil
;;-------------- ---------- ---------- ---------- ---------- ----------
A1              75         3          4.14       7          0
A10             75         3          4.14       7          0
A11             75         3          4.14       7          0
A12             75         3          4.14       7          0
A13             75         3          4.14       7          0
A14             75         3          4.14       7          0
A15             75         3          4.14       7          0
A16             75         3          4.14       7          0
A17             75         3          4.14       7          0
A18             75         3          4.14       7          0
A19             75         3          4.14       7          0
A2              75         3          4.14       7          0
A20             75         3          4.14       7          0
A21             75         3          4.14       7          0
A22             75         3          4.14       7          0
A23             75         3          4.14       7          0
A24             75         3          4.14       7          0
A25             75         3          4.14       7          0
A26             75         3          4.14       7          0
A27             75         3          4.14       7          0
A28             75         3          4.14       7          0
A29             75         3          4.14       7          0
A3              75         3          4.14       7          0
A30             75         3          4.14       7          0
A31             75         3          4.14       7          0
A32             75         3          4.14       7          0
A33             75         3          4.14       7          0
A34             75         3          4.14       7          0
A35             75         3          4.14       7          0
A36             75         3          4.14       7          0
A37             75         3          4.14       7          0
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A38             75         3          4.14       7          0
A39             75         3          4.14       7          0
A4              75         3          4.14       7          0
A40             75         3          4.14       7          0
A41             75         3          4.14       7          0
A42             75         3          4.14       7          0
A43             75         3          4.14       7          0
A44             75         3          4.14       7          0
A45             75         3          4.14       7          0
A46             75         3          4.14       7          0
A47             75         3          4.14       7          0
A48             75         3          4.14       7          0
A49             75         3          4.14       7          0
A5              75         3          4.14       7          0
A6              75         3          4.14       7          0
A7              75         3          4.14       7          0
A8              75         3          4.14       7          0
A9              75         3          4.14       7          0
R1              75         3          4.14       7          0
R10             75         3          4.14       7          0
R11             75         3          4.14       7          0
R12             75         3          4.14       7          0
R13             75         3          4.14       7          0
R14             75         3          4.14       7          0
R15             75         3          4.14       7          0
R16             75         3          4.14       7          0
R17             75         3          4.14       7          0
R18             75         3          4.14       7          0
R19             75         3          4.14       7          0
R2              75         3          4.14       7          0
R20             75         3          4.14       7          0
R21             75         3          4.14       7          0
R22             75         3          4.14       7          0
R3              75         3          4.14       7          0
R4              75         3          4.14       7          0
R5              75         3          4.14       7          0
R6              75         3          4.14       7          0
R7              75         3          4.14       7          0
R8              75         3          4.14       7          0
R9              75         3          4.14       7          0

[JUNCTIONS]
;;              Invert     Max.       Init.      Surcharge  Ponded
;;Name          Elev.      Depth      Depth      Depth      Area
;;------------- ---------- ---------- ---------- ---------- ----------
ST1             228.237    3.375      0          0          0
ST10            230.543    2.794      0          0          0
ST11            230.783    2.729      0          0          0
ST12            231.605    2.039      0          0          0
ST13            231.875    2.1        0          0          0
ST14            232.1      2.122      0          0          0
ST15            231.506    2.207      0          0          0
ST16            231.806    2.125      0          0          0
ST17            231.165    2.446      0          0          0
ST18            230.851    2.52       0          0          0
ST19            231.165    2.479      0          0          0
ST2             228.93     3.197      0.116      0          0
ST20            231.455    2.49       0          0          0
ST21            231.956    2.212      0          0          0
ST22            229.552    2.964      0          0          0
ST22A           229.652    2.812      0          0          0
ST23            229.782    2.898      0          0          0
ST24            230.082    2.719      0          0          0
ST25            230.547    2.272      0          0          0
ST3             229.067    3.199      0          0          0
ST4             229.303    3.086      0          0          0
ST5             229.483    3.112      0          0          0
ST6             229.633    3.001      0          0          0
ST7             229.786    3          0          0          0
ST8             229.833    3.091      0          0          0
ST9             230.063    3.15       0          0          0

[OUTFALLS]
;;              Invert     Outfall    Stage/Table      Tide
;;Name          Elev.      Type       Time Series      Gate Route To
;;------------- ---------- ---------- ---------------- ---- ----------------
Pond            228.214    FIXED      228.45           NO

[STORAGE]
```

```
;;               Invert   Max.     Init.    Storage    Curve                    Ponded   Evap.
;;Name          Elev.    Depth    Depth    Curve      Params                   Area     Frac.    Infiltration parameters
;;-------------- -------- -------- -------- ---------- -------- -------- -------- -------- -------- ----------
SU33             233.3    0.5      0        TABULAR    OS33                      0        0
SU34             233.3    0.5      0        TABULAR    OS34                      0        0
SU35             233      0.5      0        TABULAR    OS35                      0        0
SU36             233      0.5      0        TABULAR    OS36                      0        0
SU37             233      0.5      0        TABULAR    OS37                      0        0
SU38             233      0.5      0        TABULAR    OS38                      0        0
SU39             232.5    0.5      0        TABULAR    OS39                      0        0
SU40             232.5    0.5      0        TABULAR    OS40                      0        0
SU41             232.3    0.5      0        TABULAR    OS41                      0        0
SU42             232.8    0.5      0        TABULAR    OS42                      0        0
SU43             232.8    0.5      0        TABULAR    OS43                      0        0
SU44             233.3    0.5      0        TABULAR    OS44                      0        0
SU45             233.6    0.5      0        TABULAR    OS45                      0        0
SU46             233.6    0.5      0        TABULAR    OS46                      0        0
SU47             233.8    0.5      0        TABULAR    OS47                      0        0
SU48             233.8    0.5      0        TABULAR    OS48                      0        0
SU49             233.8    0.5      0        TABULAR    OS49                      0        0

[CONDUITS]
;;               Inlet            Outlet                      Manning    Inlet      Outlet     Init.      Max.
;;Name          Node             Node             Length     N          Offset     Offset     Flow       Flow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
1                ST1              Pond             15         0.013      0          0          0          0
P10-9            ST10             ST9              79.55      0.013      0          0.4        0          0
P11-10           ST11             ST10             90.17      0.013      0          0.15       0          0
P12-11           ST12             ST11             83.69      0.011      0          0.7        0          0
P13-12           ST13             ST12             100        0.011      0          0.15       0          0
P14-13           ST14             ST13             100        0.011      0          0.075      0          0
P15-11           ST15             ST11             65         0.011      0          0.625      0          0
P16-15           ST16             ST15             100        0.011      0          0.15       0          0
P17-10           ST17             ST10             65         0.011      0          0.525      0          0
P18-9            ST18             ST9              75         0.013      0          0.698      0          0
P19-18           ST19             ST18             109.15     0.013      0          0.15       0          0
P20-19           ST20             ST19             70         0.013      0          0.15       0          0
P2-1             ST2              ST1              40         0.013      0          0.633      0          0
P21-20           ST21             ST20             105        0.011      0          0.375      0          0
P22-3            ST22             ST3              35.93      0.013      0          0.45       0          0
P22A-22          ST22A            ST22             40         0.013      0          0.06       0          0
P23-22A          ST23             ST22A            100        0.013      0          0.03       0          0
P24-23           ST24             ST23             100        0.013      0          0.15       0          0
P25-24           ST25             ST24             80         0.013      0          0.225      0          0
P3-2             ST3              ST2              70         0.013      0          0.03       0          0
P4-3             ST4              ST3              55         0.013      0          0.15       0          0
P5-4             ST5              ST4              100        0.013      0          0.03       0          0
P6-5             ST6              ST5              80         0.013      0          0.03       0          0
P7-6             ST7              ST6              81.95      0.013      0          0.03       0          0
P8-7             ST8              ST7              10.97      0.013      0          0.03       0          0
P9-8             ST9              ST8              132.72     0.013      0          0.03       0          0

[OUTLETS]
;;               Inlet            Outlet           Outflow    Outlet           Qcoeff/                    Flap
;;Name          Node             Node             Height     Type             QTable           Qexpon    Gate
;;-------------- ---------------- ---------------- ---------- ---------------- ---------------- ---------- ----
OL33             SU33             ST7              0          TABULAR/DEPTH    ICD33                       NO
OL34             SU34             ST7              0          TABULAR/DEPTH    ICD34                       NO
OL35             SU35             ST6              0          TABULAR/DEPTH    ICD35                       NO
OL36             SU36             ST6              0          TABULAR/DEPTH    ICD36                       NO
OL37             SU37             ST5              0          TABULAR/DEPTH    ICD37                       NO
OL38             SU38             ST5              0          TABULAR/DEPTH    ICD38                       NO
OL39             SU39             ST4              0          TABULAR/DEPTH    ICD39                       NO
OL40             SU40             ST4              0          TABULAR/DEPTH    ICD40                       NO
OL41             SU41             ST3              0          TABULAR/DEPTH    ICD41                       NO
OL42             SU42             ST22             0          TABULAR/DEPTH    ICD42                       NO
OL43             SU43             ST22A            0          TABULAR/DEPTH    ICD43                       NO
OL44             SU44             ST23             0          TABULAR/DEPTH    ICD44                       NO
OL45             SU45             ST24             0          TABULAR/DEPTH    ICD45                       NO
OL46             SU46             ST24             0          TABULAR/DEPTH    ICD46                       NO
OL47             SU47             ST25             0          TABULAR/DEPTH    ICD47                       NO
OL48             SU48             ST25             0          TABULAR/DEPTH    ICD48                       NO
OL49             SU49             ST25             0          TABULAR/DEPTH    ICD49                       NO

[XSECTIONS]
;;Link          Shape        Geom1            Geom2      Geom3      Geom4      Barrels
;;-------------- ------------ ---------------- ---------- ---------- ---------- ----------
1                CIRCULAR     1.5              0          0          0          1
P10-9            CIRCULAR     1.2              0          0          0          1
```

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P11-10           CIRCULAR     1.05            0          0          0          1
P12-11           CIRCULAR     0.6             0          0          0          1
P13-12           CIRCULAR     0.45            0          0          0          1
P14-13           CIRCULAR     0.375           0          0          0          1
P15-11           CIRCULAR     0.675           0          0          0          1
P16-15           CIRCULAR     0.525           0          0          0          1
P17-10           CIRCULAR     0.675           0          0          0          1
P18-9            CIRCULAR     0.9             0          0          0          1
P19-18           CIRCULAR     0.75            0          0          0          1
P20-19           CIRCULAR     0.6             0          0          0          1
P2-1             CIRCULAR     1.5             0          0          0          1
P21-20           CIRCULAR     0.525           0          0          0          1
P22-3            CIRCULAR     1.05            0          0          0          1
P22A-22          CIRCULAR     1.05            0          0          0          1
P23-22A          CIRCULAR     1.05            0          0          0          1
P24-23           CIRCULAR     0.9             0          0          0          1
P25-24           CIRCULAR     0.675           0          0          0          1
P3-2             CIRCULAR     1.5             0          0          0          1
P4-3             CIRCULAR     1.35            0          0          0          1
P5-4             CIRCULAR     1.35            0          0          0          1
P6-5             CIRCULAR     1.35            0          0          0          1
P7-6             CIRCULAR     1.35            0          0          0          1
P8-7             CIRCULAR     1.35            0          0          0          1
P9-8             CIRCULAR     1.35            0          0          0          1

[TRANSECTS]

;Full street, width = 14.5m, curb = 0.14m , cross-slope = 0.032m/m, bank-slope = 0.03m/m, bank-height = 0.5m.
NC 0.05     0.05     0.015
X1 PrimaryCollectorBothSides 9        -11.75   11.75    0.0       0.0       0.0      0.0      0.0
GR 0.5      -20.75   0.23     -11.75   0.14     -7.25    0         -7.25    0.225    0
GR 0        7.25     0.14     7.25     0.23     11.75    0.5       20.75

[LOSSES]
;;Link           Inlet      Outlet     Average    Flap Gate  SeepageRate
;;-------------- ---------- ---------- ---------- ---------- ----------

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
ICD33            Rating     0          0
ICD33                       0.5        0.0178

ICD34            Rating     0          0
ICD34                       0.5        0.0138

ICD35            Rating     0          0
ICD35                       0.5        0.0333

ICD36            Rating     0          0
ICD36                       0.5        0.0276

ICD37            Rating     0          0
ICD37                       0.5        0.0186

ICD38            Rating     0          0
ICD38                       0.5        0.0276

ICD39            Rating     0          0
ICD39                       0.5        0.0208

ICD40            Rating     0          0
ICD40                       0.5        0.0163

ICD41            Rating     0          0
ICD41                       0.5        0.0163

ICD42            Rating     0          0
ICD42                       0.5        0.0156

ICD43            Rating     0          0
ICD43                       0.5        0.0381

ICD44            Rating     0          0
ICD44                       0.5        0.0185

ICD45            Rating     0          0
ICD45                       0.5        0.0178
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ICD46            Rating     0          0
ICD46                       0.5        0.0307

ICD47            Rating     0          0
ICD47                       0.5        0.0178

ICD48            Rating     0          0
ICD48                       0.5        0.015

ICD49            Rating     0          0
ICD49                       0.5        0.1097

OS33             Storage    0          0
OS33                        0.5        400

OS34             Storage    0          0
OS34                        0.5        275

OS35             Storage    0          0
OS35                        0.5        760

OS36             Storage    0          0
OS36                        0.5        550

OS37             Storage    0          0
OS37                        0.5        420

OS38             Storage    0          0
OS38                        0.5        550

OS39             Storage    0          0
OS39                        0.5        470

OS40             Storage    0          0
OS40                        0.5        320

OS41             Storage    0          0
OS41                        0.5        320

OS42             Storage    0          0
OS42                        0.5        390

OS43             Storage    0          0
OS43                        0.5        960

OS44             Storage    0          0
OS44                        0.5        420

OS45             Storage    0          0
OS45                        0.5        450

OS46             Storage    0          0
OS46                        0.5        700

OS47             Storage    0          0
OS47                        0.5        450

OS48             Storage    0          0
OS48                        0.5        360

OS49             Storage    0          0
OS49                        0.5        1500

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
Winnipeg_May_2010_storm 05/28/2010 5:05       0.000
Winnipeg_May_2010_storm 05/28/2010 5:10       2.400
Winnipeg_May_2010_storm 05/28/2010 5:15       7.200
Winnipeg_May_2010_storm 05/28/2010 5:20       2.400
Winnipeg_May_2010_storm 05/28/2010 5:25       2.400
Winnipeg_May_2010_storm 05/28/2010 5:30       9.600
Winnipeg_May_2010_storm 05/28/2010 5:35       7.200
Winnipeg_May_2010_storm 05/28/2010 5:40       0.000
Winnipeg_May_2010_storm 05/28/2010 5:45       4.800
Winnipeg_May_2010_storm 05/28/2010 5:50       0.000
Winnipeg_May_2010_storm 05/28/2010 5:55       2.400
Winnipeg_May_2010_storm 05/28/2010 6:00       16.800
Winnipeg_May_2010_storm 05/28/2010 6:05       26.400
```

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Winnipeg_May_2010_storm 05/28/2010 6:10       4.800
Winnipeg_May_2010_storm 05/28/2010 6:15       2.400
Winnipeg_May_2010_storm 05/28/2010 6:20       0.000
Winnipeg_May_2010_storm 05/28/2010 6:25       0.000
Winnipeg_May_2010_storm 05/28/2010 6:30       0.000
Winnipeg_May_2010_storm 05/28/2010 6:35       12.000
Winnipeg_May_2010_storm 05/28/2010 6:40       14.400
Winnipeg_May_2010_storm 05/28/2010 6:45       26.400
Winnipeg_May_2010_storm 05/28/2010 6:50       12.000
Winnipeg_May_2010_storm 05/28/2010 6:55       16.800
Winnipeg_May_2010_storm 05/28/2010 7:00       16.800
Winnipeg_May_2010_storm 05/28/2010 7:05       4.800
Winnipeg_May_2010_storm 05/28/2010 7:10       4.800
Winnipeg_May_2010_storm 05/28/2010 7:15       2.400
Winnipeg_May_2010_storm 05/28/2010 7:20       7.200
Winnipeg_May_2010_storm 05/28/2010 7:25       0.000
Winnipeg_May_2010_storm 05/28/2010 7:30       4.800
Winnipeg_May_2010_storm 05/28/2010 7:35       2.400
Winnipeg_May_2010_storm 05/28/2010 7:40       0.000
Winnipeg_May_2010_storm 05/28/2010 7:45       2.400
Winnipeg_May_2010_storm 05/28/2010 7:50       12.000
Winnipeg_May_2010_storm 05/28/2010 7:55       2.400
Winnipeg_May_2010_storm 05/28/2010 8:00       0.000
Winnipeg_May_2010_storm 05/28/2010 8:05       2.400
Winnipeg_May_2010_storm 05/28/2010 8:10       2.400
Winnipeg_May_2010_storm 05/28/2010 8:15       2.400
Winnipeg_May_2010_storm 05/28/2010 8:20       2.400
Winnipeg_May_2010_storm 05/28/2010 8:25       9.600
Winnipeg_May_2010_storm 05/28/2010 8:30       4.800
Winnipeg_May_2010_storm 05/28/2010 8:35       2.400
Winnipeg_May_2010_storm 05/28/2010 8:40       0.000
Winnipeg_May_2010_storm 05/28/2010 8:45       0.000
Winnipeg_May_2010_storm 05/28/2010 8:50       0.000
Winnipeg_May_2010_storm 05/28/2010 8:55       0.000
Winnipeg_May_2010_storm 05/28/2010 9:00       0.000
Winnipeg_May_2010_storm 05/28/2010 9:05       2.400
Winnipeg_May_2010_storm 05/28/2010 9:10       0.000
Winnipeg_May_2010_storm 05/28/2010 9:15       0.000
Winnipeg_May_2010_storm 05/28/2010 9:20       2.400
Winnipeg_May_2010_storm 05/28/2010 9:25       2.400
Winnipeg_May_2010_storm 05/28/2010 9:30       0.000
Winnipeg_May_2010_storm 05/28/2010 9:35       2.400
Winnipeg_May_2010_storm 05/28/2010 9:40       2.400
Winnipeg_May_2010_storm 05/28/2010 9:45       0.000
Winnipeg_May_2010_storm 05/28/2010 9:50       2.400
Winnipeg_May_2010_storm 05/28/2010 9:55       4.800
Winnipeg_May_2010_storm 05/28/2010 10:00      4.800
Winnipeg_May_2010_storm 05/28/2010 10:05      4.800
Winnipeg_May_2010_storm 05/28/2010 10:10      7.200
Winnipeg_May_2010_storm 05/28/2010 10:15      7.200
Winnipeg_May_2010_storm 05/28/2010 10:20      4.800
Winnipeg_May_2010_storm 05/28/2010 10:25      4.800
Winnipeg_May_2010_storm 05/28/2010 10:30      2.400
Winnipeg_May_2010_storm 05/28/2010 10:35      7.200
Winnipeg_May_2010_storm 05/28/2010 10:40      0.000
Winnipeg_May_2010_storm 05/28/2010 10:45      2.400
Winnipeg_May_2010_storm 05/28/2010 10:50      0.000
Winnipeg_May_2010_storm 05/28/2010 10:55      0.000
Winnipeg_May_2010_storm 05/28/2010 11:00      0.000
Winnipeg_May_2010_storm 05/28/2010 11:05      0.000
Winnipeg_May_2010_storm 05/28/2010 11:10      0.000
Winnipeg_May_2010_storm 05/28/2010 11:15      0.000
Winnipeg_May_2010_storm 05/28/2010 11:20      0.000
Winnipeg_May_2010_storm 05/28/2010 11:25      0.000
Winnipeg_May_2010_storm 05/28/2010 11:30      0.000
Winnipeg_May_2010_storm 05/28/2010 11:35      0.000
Winnipeg_May_2010_storm 05/28/2010 11:40      0.000
Winnipeg_May_2010_storm 05/28/2010 11:45      0.000
Winnipeg_May_2010_storm 05/28/2010 11:50      0.000
Winnipeg_May_2010_storm 05/28/2010 11:55      0.000
Winnipeg_May_2010_storm 05/28/2010 12:00      0.000
Winnipeg_May_2010_storm 05/28/2010 12:05      0.000
Winnipeg_May_2010_storm 05/28/2010 12:10      0.000
Winnipeg_May_2010_storm 05/28/2010 12:15      0.000
Winnipeg_May_2010_storm 05/28/2010 12:20      0.000
Winnipeg_May_2010_storm 05/28/2010 12:25      0.000
Winnipeg_May_2010_storm 05/28/2010 12:30      0.000
Winnipeg_May_2010_storm 05/28/2010 12:35      0.000
Winnipeg_May_2010_storm 05/28/2010 12:40      0.000
```

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Winnipeg_May_2010_storm 05/28/2010 12:45      0.000
Winnipeg_May_2010_storm 05/28/2010 12:50      0.000
Winnipeg_May_2010_storm 05/28/2010 12:55      0.000
Winnipeg_May_2010_storm 05/28/2010 13:00      0.000
Winnipeg_May_2010_storm 05/28/2010 13:05      0.000
Winnipeg_May_2010_storm 05/28/2010 13:10      0.000
Winnipeg_May_2010_storm 05/28/2010 13:15      0.000
Winnipeg_May_2010_storm 05/28/2010 13:20      0.000
Winnipeg_May_2010_storm 05/28/2010 13:25      0.000
Winnipeg_May_2010_storm 05/28/2010 13:30      0.000
Winnipeg_May_2010_storm 05/28/2010 13:35      0.000
Winnipeg_May_2010_storm 05/28/2010 13:40      0.000
Winnipeg_May_2010_storm 05/28/2010 13:45      0.000
Winnipeg_May_2010_storm 05/28/2010 13:50      0.000
Winnipeg_May_2010_storm 05/28/2010 13:55      0.000
Winnipeg_May_2010_storm 05/28/2010 14:00      0.000
Winnipeg_May_2010_storm 05/28/2010 14:05      0.000
Winnipeg_May_2010_storm 05/28/2010 14:10      0.000
Winnipeg_May_2010_storm 05/28/2010 14:15      0.000
Winnipeg_May_2010_storm 05/28/2010 14:20      0.000
Winnipeg_May_2010_storm 05/28/2010 14:25      0.000
Winnipeg_May_2010_storm 05/28/2010 14:30      0.000
Winnipeg_May_2010_storm 05/28/2010 14:35      0.000
Winnipeg_May_2010_storm 05/28/2010 14:40      0.000
Winnipeg_May_2010_storm 05/28/2010 14:45      0.000
Winnipeg_May_2010_storm 05/28/2010 14:50      0.000
Winnipeg_May_2010_storm 05/28/2010 14:55      0.000
Winnipeg_May_2010_storm 05/28/2010 15:00      0.000
Winnipeg_May_2010_storm 05/28/2010 15:05      0.000
Winnipeg_May_2010_storm 05/28/2010 15:10      0.000
Winnipeg_May_2010_storm 05/28/2010 15:15      0.000
Winnipeg_May_2010_storm 05/28/2010 15:20      0.000
Winnipeg_May_2010_storm 05/28/2010 15:25      0.000
Winnipeg_May_2010_storm 05/28/2010 15:30      0.000
Winnipeg_May_2010_storm 05/28/2010 15:35      0.000
Winnipeg_May_2010_storm 05/28/2010 15:40      0.000
Winnipeg_May_2010_storm 05/28/2010 15:45      0.000
Winnipeg_May_2010_storm 05/28/2010 15:50      0.000
Winnipeg_May_2010_storm 05/28/2010 15:55      0.000
Winnipeg_May_2010_storm 05/28/2010 16:00      0.000
Winnipeg_May_2010_storm 05/28/2010 16:05      0.000
Winnipeg_May_2010_storm 05/28/2010 16:10      0.000
Winnipeg_May_2010_storm 05/28/2010 16:15      0.000
Winnipeg_May_2010_storm 05/28/2010 16:20      0.000
Winnipeg_May_2010_storm 05/28/2010 16:25      0.000
Winnipeg_May_2010_storm 05/28/2010 16:30      0.000
Winnipeg_May_2010_storm 05/28/2010 16:35      0.000
Winnipeg_May_2010_storm 05/28/2010 16:40      0.000
Winnipeg_May_2010_storm 05/28/2010 16:45      0.000
Winnipeg_May_2010_storm 05/28/2010 16:50      0.000
Winnipeg_May_2010_storm 05/28/2010 16:55      0.000
Winnipeg_May_2010_storm 05/28/2010 17:00      0.000
Winnipeg_May_2010_storm 05/28/2010 17:05      0.000
Winnipeg_May_2010_storm 05/28/2010 17:10      0.000
Winnipeg_May_2010_storm 05/28/2010 17:15      0.000
Winnipeg_May_2010_storm 05/28/2010 17:20      0.000
Winnipeg_May_2010_storm 05/28/2010 17:25      0.000
Winnipeg_May_2010_storm 05/28/2010 17:30      0.000
Winnipeg_May_2010_storm 05/28/2010 17:35      0.000
Winnipeg_May_2010_storm 05/28/2010 17:40      0.000
Winnipeg_May_2010_storm 05/28/2010 17:45      0.000
Winnipeg_May_2010_storm 05/28/2010 17:50      0.000
Winnipeg_May_2010_storm 05/28/2010 17:55      0.000
Winnipeg_May_2010_storm 05/28/2010 18:00      0.000
Winnipeg_May_2010_storm 05/28/2010 18:05      0.000
Winnipeg_May_2010_storm 05/28/2010 18:10      0.000
Winnipeg_May_2010_storm 05/28/2010 18:15      0.000
Winnipeg_May_2010_storm 05/28/2010 18:20      0.000
Winnipeg_May_2010_storm 05/28/2010 18:25      0.000
Winnipeg_May_2010_storm 05/28/2010 18:30      0.000
Winnipeg_May_2010_storm 05/28/2010 18:35      0.000
Winnipeg_May_2010_storm 05/28/2010 18:40      0.000
Winnipeg_May_2010_storm 05/28/2010 18:45      0.000
Winnipeg_May_2010_storm 05/28/2010 18:50      0.000
Winnipeg_May_2010_storm 05/28/2010 18:55      0.000
Winnipeg_May_2010_storm 05/28/2010 19:00      0.000
Winnipeg_May_2010_storm 05/28/2010 19:05      0.000
Winnipeg_May_2010_storm 05/28/2010 19:10      0.000
Winnipeg_May_2010_storm 05/28/2010 19:15      0.000
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Winnipeg_May_2010_storm 05/28/2010 19:20      0.000
Winnipeg_May_2010_storm 05/28/2010 19:25      0.000
Winnipeg_May_2010_storm 05/28/2010 19:30      0.000
Winnipeg_May_2010_storm 05/28/2010 19:35      0.000
Winnipeg_May_2010_storm 05/28/2010 19:40      0.000
Winnipeg_May_2010_storm 05/28/2010 19:45      0.000
Winnipeg_May_2010_storm 05/28/2010 19:50      0.000
Winnipeg_May_2010_storm 05/28/2010 19:55      0.000
Winnipeg_May_2010_storm 05/28/2010 20:00      0.000
Winnipeg_May_2010_storm 05/28/2010 20:05      0.000
Winnipeg_May_2010_storm 05/28/2010 20:10      0.000
Winnipeg_May_2010_storm 05/28/2010 20:15      0.000
Winnipeg_May_2010_storm 05/28/2010 20:20      0.000
Winnipeg_May_2010_storm 05/28/2010 20:25      0.000
Winnipeg_May_2010_storm 05/28/2010 20:30      0.000
Winnipeg_May_2010_storm 05/28/2010 20:35      0.000
Winnipeg_May_2010_storm 05/28/2010 20:40      0.000
Winnipeg_May_2010_storm 05/28/2010 20:45      0.000
Winnipeg_May_2010_storm 05/28/2010 20:50      0.000
Winnipeg_May_2010_storm 05/28/2010 20:55      0.000
Winnipeg_May_2010_storm 05/28/2010 21:00      0.000
Winnipeg_May_2010_storm 05/28/2010 21:05      0.000
Winnipeg_May_2010_storm 05/28/2010 21:10      0.000
Winnipeg_May_2010_storm 05/28/2010 21:15      0.000
Winnipeg_May_2010_storm 05/28/2010 21:20      0.000
Winnipeg_May_2010_storm 05/28/2010 21:25      0.000
Winnipeg_May_2010_storm 05/28/2010 21:30      0.000
Winnipeg_May_2010_storm 05/28/2010 21:35      0.000
Winnipeg_May_2010_storm 05/28/2010 21:40      0.000
Winnipeg_May_2010_storm 05/28/2010 21:45      0.000
Winnipeg_May_2010_storm 05/28/2010 21:50      0.000
Winnipeg_May_2010_storm 05/28/2010 21:55      0.000
Winnipeg_May_2010_storm 05/28/2010 22:00      0.000
Winnipeg_May_2010_storm 05/28/2010 22:05      0.000
Winnipeg_May_2010_storm 05/28/2010 22:10      0.000
Winnipeg_May_2010_storm 05/28/2010 22:15      0.000
Winnipeg_May_2010_storm 05/28/2010 22:20      0.000
Winnipeg_May_2010_storm 05/28/2010 22:25      0.000
Winnipeg_May_2010_storm 05/28/2010 22:30      0.000
Winnipeg_May_2010_storm 05/28/2010 22:35      0.000
Winnipeg_May_2010_storm 05/28/2010 22:40      0.000
Winnipeg_May_2010_storm 05/28/2010 22:45      0.000
Winnipeg_May_2010_storm 05/28/2010 22:50      0.000
Winnipeg_May_2010_storm 05/28/2010 22:55      0.000
Winnipeg_May_2010_storm 05/28/2010 23:00      0.000
Winnipeg_May_2010_storm 05/28/2010 23:05      0.000
Winnipeg_May_2010_storm 05/28/2010 23:10      0.000
Winnipeg_May_2010_storm 05/28/2010 23:15      0.000
Winnipeg_May_2010_storm 05/28/2010 23:20      0.000
Winnipeg_May_2010_storm 05/28/2010 23:25      0.000
Winnipeg_May_2010_storm 05/28/2010 23:30      0.000
Winnipeg_May_2010_storm 05/28/2010 23:35      0.000
Winnipeg_May_2010_storm 05/28/2010 23:40      0.000
Winnipeg_May_2010_storm 05/28/2010 23:45      0.000
Winnipeg_May_2010_storm 05/28/2010 23:50      0.000
Winnipeg_May_2010_storm 05/28/2010 23:55      0.000
Winnipeg_May_2010_storm 05/29/2010 0:00       0.000
Winnipeg_May_2010_storm 05/29/2010 0:05       0.000
Winnipeg_May_2010_storm 05/29/2010 0:10       0.000
Winnipeg_May_2010_storm 05/29/2010 0:15       0.000
Winnipeg_May_2010_storm 05/29/2010 0:20       0.000
Winnipeg_May_2010_storm 05/29/2010 0:25       0.000
Winnipeg_May_2010_storm 05/29/2010 0:30       0.000
Winnipeg_May_2010_storm 05/29/2010 0:35       0.000
Winnipeg_May_2010_storm 05/29/2010 0:40       0.000
Winnipeg_May_2010_storm 05/29/2010 0:45       0.000
Winnipeg_May_2010_storm 05/29/2010 0:50       0.000
Winnipeg_May_2010_storm 05/29/2010 0:55       0.000
Winnipeg_May_2010_storm 05/29/2010 1:00       0.000
Winnipeg_May_2010_storm 05/29/2010 1:05       0.000
Winnipeg_May_2010_storm 05/29/2010 1:10       0.000
Winnipeg_May_2010_storm 05/29/2010 1:15       0.000
Winnipeg_May_2010_storm 05/29/2010 1:20       0.000
Winnipeg_May_2010_storm 05/29/2010 1:25       0.000
Winnipeg_May_2010_storm 05/29/2010 1:30       0.000
Winnipeg_May_2010_storm 05/29/2010 1:35       0.000
Winnipeg_May_2010_storm 05/29/2010 1:40       0.000
Winnipeg_May_2010_storm 05/29/2010 1:45       0.000
Winnipeg_May_2010_storm 05/29/2010 1:50       0.000
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Winnipeg_May_2010_storm 05/29/2010 1:55       0.000
Winnipeg_May_2010_storm 05/29/2010 2:00       0.000
Winnipeg_May_2010_storm 05/29/2010 2:05       0.000
Winnipeg_May_2010_storm 05/29/2010 2:10       0.000
Winnipeg_May_2010_storm 05/29/2010 2:15       0.000
Winnipeg_May_2010_storm 05/29/2010 2:20       0.000
Winnipeg_May_2010_storm 05/29/2010 2:25       0.000
Winnipeg_May_2010_storm 05/29/2010 2:30       0.000
Winnipeg_May_2010_storm 05/29/2010 2:35       0.000
Winnipeg_May_2010_storm 05/29/2010 2:40       0.000
Winnipeg_May_2010_storm 05/29/2010 2:45       0.000
Winnipeg_May_2010_storm 05/29/2010 2:50       0.000
Winnipeg_May_2010_storm 05/29/2010 2:55       0.000
Winnipeg_May_2010_storm 05/29/2010 3:00       0.000
Winnipeg_May_2010_storm 05/29/2010 3:05       0.000
Winnipeg_May_2010_storm 05/29/2010 3:10       0.000
Winnipeg_May_2010_storm 05/29/2010 3:15       0.000
Winnipeg_May_2010_storm 05/29/2010 3:20       0.000
Winnipeg_May_2010_storm 05/29/2010 3:25       0.000
Winnipeg_May_2010_storm 05/29/2010 3:30       0.000
Winnipeg_May_2010_storm 05/29/2010 3:35       0.000
Winnipeg_May_2010_storm 05/29/2010 3:40       0.000
Winnipeg_May_2010_storm 05/29/2010 3:45       0.000
Winnipeg_May_2010_storm 05/29/2010 3:50       0.000
Winnipeg_May_2010_storm 05/29/2010 3:55       0.000
Winnipeg_May_2010_storm 05/29/2010 4:00       0.000
Winnipeg_May_2010_storm 05/29/2010 4:05       0.000
Winnipeg_May_2010_storm 05/29/2010 4:10       0.000
Winnipeg_May_2010_storm 05/29/2010 4:15       0.000
Winnipeg_May_2010_storm 05/29/2010 4:20       0.000
Winnipeg_May_2010_storm 05/29/2010 4:25       0.000
Winnipeg_May_2010_storm 05/29/2010 4:30       0.000
Winnipeg_May_2010_storm 05/29/2010 4:35       0.000
Winnipeg_May_2010_storm 05/29/2010 4:40       0.000
Winnipeg_May_2010_storm 05/29/2010 4:45       0.000
Winnipeg_May_2010_storm 05/29/2010 4:50       0.000
Winnipeg_May_2010_storm 05/29/2010 4:55       0.000
Winnipeg_May_2010_storm 05/29/2010 5:00       0.000
Winnipeg_May_2010_storm 05/29/2010 5:05       0.000
Winnipeg_May_2010_storm 05/29/2010 5:10       0.000
Winnipeg_May_2010_storm 05/29/2010 5:15       0.000
Winnipeg_May_2010_storm 05/29/2010 5:20       0.000
Winnipeg_May_2010_storm 05/29/2010 5:25       0.000
Winnipeg_May_2010_storm 05/29/2010 5:30       0.000
Winnipeg_May_2010_storm 05/29/2010 5:35       0.000
Winnipeg_May_2010_storm 05/29/2010 5:40       0.000
Winnipeg_May_2010_storm 05/29/2010 5:45       0.000
Winnipeg_May_2010_storm 05/29/2010 5:50       0.000
Winnipeg_May_2010_storm 05/29/2010 5:55       0.000
Winnipeg_May_2010_storm 05/29/2010 6:00       0.000
Winnipeg_May_2010_storm 05/29/2010 6:05       0.000
Winnipeg_May_2010_storm 05/29/2010 6:10       0.000
Winnipeg_May_2010_storm 05/29/2010 6:15       0.000
Winnipeg_May_2010_storm 05/29/2010 6:20       0.000
Winnipeg_May_2010_storm 05/29/2010 6:25       0.000
Winnipeg_May_2010_storm 05/29/2010 6:30       0.000
Winnipeg_May_2010_storm 05/29/2010 6:35       0.000
Winnipeg_May_2010_storm 05/29/2010 6:40       0.000
Winnipeg_May_2010_storm 05/29/2010 6:45       0.000
Winnipeg_May_2010_storm 05/29/2010 6:50       0.000
Winnipeg_May_2010_storm 05/29/2010 6:55       0.000
Winnipeg_May_2010_storm 05/29/2010 7:00       0.000
Winnipeg_May_2010_storm 05/29/2010 7:05       0.000
Winnipeg_May_2010_storm 05/29/2010 7:10       0.000
Winnipeg_May_2010_storm 05/29/2010 7:15       0.000
Winnipeg_May_2010_storm 05/29/2010 7:20       0.000
Winnipeg_May_2010_storm 05/29/2010 7:25       0.000
Winnipeg_May_2010_storm 05/29/2010 7:30       0.000
Winnipeg_May_2010_storm 05/29/2010 7:35       0.000
Winnipeg_May_2010_storm 05/29/2010 7:40       0.000
Winnipeg_May_2010_storm 05/29/2010 7:45       0.000
Winnipeg_May_2010_storm 05/29/2010 7:50       0.000
Winnipeg_May_2010_storm 05/29/2010 7:55       0.000
Winnipeg_May_2010_storm 05/29/2010 8:00       0.000
Winnipeg_May_2010_storm 05/29/2010 8:05       9.600
Winnipeg_May_2010_storm 05/29/2010 8:10       21.600
Winnipeg_May_2010_storm 05/29/2010 8:15       2.400
Winnipeg_May_2010_storm 05/29/2010 8:20       14.400
Winnipeg_May_2010_storm 05/29/2010 8:25       4.800
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Winnipeg_May_2010_storm 05/29/2010 8:30       55.200
Winnipeg_May_2010_storm 05/29/2010 8:35       117.600
Winnipeg_May_2010_storm 05/29/2010 8:40       86.400
Winnipeg_May_2010_storm 05/29/2010 8:45       33.600
Winnipeg_May_2010_storm 05/29/2010 8:50       4.800
Winnipeg_May_2010_storm 05/29/2010 8:55       9.600
Winnipeg_May_2010_storm 05/29/2010 9:00       26.400
Winnipeg_May_2010_storm 05/29/2010 9:05       57.600
Winnipeg_May_2010_storm 05/29/2010 9:10       31.200
Winnipeg_May_2010_storm 05/29/2010 9:15       9.600
Winnipeg_May_2010_storm 05/29/2010 9:20       2.400
Winnipeg_May_2010_storm 05/29/2010 9:25       0.000
Winnipeg_May_2010_storm 05/29/2010 9:30       0.000
Winnipeg_May_2010_storm 05/29/2010 9:35       2.400
Winnipeg_May_2010_storm 05/29/2010 9:40       0.000
Winnipeg_May_2010_storm 05/29/2010 9:45       0.000
Winnipeg_May_2010_storm 05/29/2010 9:50       0.000
Winnipeg_May_2010_storm 05/29/2010 9:55       0.000
Winnipeg_May_2010_storm 05/29/2010 10:00      0.000
Winnipeg_May_2010_storm 05/29/2010 10:05      0.000
Winnipeg_May_2010_storm 05/29/2010 10:10      0.000
Winnipeg_May_2010_storm 05/29/2010 10:15      0.000
Winnipeg_May_2010_storm 05/29/2010 10:20      0.000
Winnipeg_May_2010_storm 05/29/2010 10:25      0.000
Winnipeg_May_2010_storm 05/29/2010 10:30      0.000
Winnipeg_May_2010_storm 05/29/2010 10:35      0.000
Winnipeg_May_2010_storm 05/29/2010 10:40      0.000
Winnipeg_May_2010_storm 05/29/2010 10:45      0.000
Winnipeg_May_2010_storm 05/29/2010 10:50      0.000
Winnipeg_May_2010_storm 05/29/2010 10:55      0.000
Winnipeg_May_2010_storm 05/29/2010 11:00      0.000
Winnipeg_May_2010_storm 05/29/2010 11:05      0.000
Winnipeg_May_2010_storm 05/29/2010 11:10      0.000
Winnipeg_May_2010_storm 05/29/2010 11:15      0.000
Winnipeg_May_2010_storm 05/29/2010 11:20      0.000
Winnipeg_May_2010_storm 05/29/2010 11:25      0.000
Winnipeg_May_2010_storm 05/29/2010 11:30      0.000
Winnipeg_May_2010_storm 05/29/2010 11:35      0.000
Winnipeg_May_2010_storm 05/29/2010 11:40      0.000
Winnipeg_May_2010_storm 05/29/2010 11:45      0.000
Winnipeg_May_2010_storm 05/29/2010 11:50      0.000
Winnipeg_May_2010_storm 05/29/2010 11:55      0.000
Winnipeg_May_2010_storm 05/29/2010 12:00      0.000
Winnipeg_May_2010_storm 05/29/2010 12:05      0.000
Winnipeg_May_2010_storm 05/29/2010 12:10      0.000
Winnipeg_May_2010_storm 05/29/2010 12:15      0.000
Winnipeg_May_2010_storm 05/29/2010 12:20      0.000
Winnipeg_May_2010_storm 05/29/2010 12:25      0.000
Winnipeg_May_2010_storm 05/29/2010 12:30      0.000
Winnipeg_May_2010_storm 05/29/2010 12:35      0.000
Winnipeg_May_2010_storm 05/29/2010 12:40      0.000
Winnipeg_May_2010_storm 05/29/2010 12:45      0.000
Winnipeg_May_2010_storm 05/29/2010 12:50      0.000
Winnipeg_May_2010_storm 05/29/2010 12:55      0.000
Winnipeg_May_2010_storm 05/29/2010 13:00      0.000
Winnipeg_May_2010_storm 05/29/2010 13:05      0.000
Winnipeg_May_2010_storm 05/29/2010 13:10      0.000
Winnipeg_May_2010_storm 05/29/2010 13:15      0.000
Winnipeg_May_2010_storm 05/29/2010 13:20      0.000
Winnipeg_May_2010_storm 05/29/2010 13:25      0.000
Winnipeg_May_2010_storm 05/29/2010 13:30      0.000
Winnipeg_May_2010_storm 05/29/2010 13:35      0.000
Winnipeg_May_2010_storm 05/29/2010 13:40      0.000
Winnipeg_May_2010_storm 05/29/2010 13:45      0.000
Winnipeg_May_2010_storm 05/29/2010 13:50      0.000
Winnipeg_May_2010_storm 05/29/2010 13:55      0.000
Winnipeg_May_2010_storm 05/29/2010 14:00      0.000
Winnipeg_May_2010_storm 05/29/2010 14:05      0.000
Winnipeg_May_2010_storm 05/29/2010 14:10      0.000
Winnipeg_May_2010_storm 05/29/2010 14:15      0.000
Winnipeg_May_2010_storm 05/29/2010 14:20      0.000
Winnipeg_May_2010_storm 05/29/2010 14:25      0.000
Winnipeg_May_2010_storm 05/29/2010 14:30      0.000
Winnipeg_May_2010_storm 05/29/2010 14:35      0.000
Winnipeg_May_2010_storm 05/29/2010 14:40      0.000
Winnipeg_May_2010_storm 05/29/2010 14:45      0.000
Winnipeg_May_2010_storm 05/29/2010 14:50      0.000
Winnipeg_May_2010_storm 05/29/2010 14:55      0.000
Winnipeg_May_2010_storm 05/29/2010 15:00      0.000
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Winnipeg_May_2010_storm 05/29/2010 15:05      0.000
Winnipeg_May_2010_storm 05/29/2010 15:10      0.000
Winnipeg_May_2010_storm 05/29/2010 15:15      0.000
Winnipeg_May_2010_storm 05/29/2010 15:20      0.000
Winnipeg_May_2010_storm 05/29/2010 15:25      0.000
Winnipeg_May_2010_storm 05/29/2010 15:30      2.400
Winnipeg_May_2010_storm 05/29/2010 15:35      0.000
Winnipeg_May_2010_storm 05/29/2010 15:40      2.400
Winnipeg_May_2010_storm 05/29/2010 15:45      7.200
Winnipeg_May_2010_storm 05/29/2010 15:50      2.400
Winnipeg_May_2010_storm 05/29/2010 15:55      0.000
Winnipeg_May_2010_storm 05/29/2010 16:00      2.400
Winnipeg_May_2010_storm 05/29/2010 16:05      0.000
Winnipeg_May_2010_storm 05/29/2010 16:10      0.000
Winnipeg_May_2010_storm 05/29/2010 16:15      0.000
Winnipeg_May_2010_storm 05/29/2010 16:20      0.000
Winnipeg_May_2010_storm 05/29/2010 16:25      0.000
Winnipeg_May_2010_storm 05/29/2010 16:30      0.000
Winnipeg_May_2010_storm 05/29/2010 16:35      0.000
Winnipeg_May_2010_storm 05/29/2010 16:40      0.000
Winnipeg_May_2010_storm 05/29/2010 16:45      0.000
Winnipeg_May_2010_storm 05/29/2010 16:50      0.000
Winnipeg_May_2010_storm 05/29/2010 16:55      0.000
Winnipeg_May_2010_storm 05/29/2010 17:00      0.000
Winnipeg_May_2010_storm 05/29/2010 17:05      0.000
Winnipeg_May_2010_storm 05/29/2010 17:10      0.000
Winnipeg_May_2010_storm 05/29/2010 17:15      0.000
Winnipeg_May_2010_storm 05/29/2010 17:20      0.000
Winnipeg_May_2010_storm 05/29/2010 17:25      2.400
Winnipeg_May_2010_storm 05/29/2010 17:30      0.000
Winnipeg_May_2010_storm 05/29/2010 17:35      0.000
Winnipeg_May_2010_storm 05/29/2010 17:40      0.000
Winnipeg_May_2010_storm 05/29/2010 17:45      0.000
Winnipeg_May_2010_storm 05/29/2010 17:50      0.000
Winnipeg_May_2010_storm 05/29/2010 17:55      0.000
Winnipeg_May_2010_storm 05/29/2010 18:00      0.000
Winnipeg_May_2010_storm 05/29/2010 18:05      0.000
Winnipeg_May_2010_storm 05/29/2010 18:10      0.000
Winnipeg_May_2010_storm 05/29/2010 18:15      0.000
Winnipeg_May_2010_storm 05/29/2010 18:20      0.000
Winnipeg_May_2010_storm 05/29/2010 18:25      0.000
Winnipeg_May_2010_storm 05/29/2010 18:30      74.400
Winnipeg_May_2010_storm 05/29/2010 18:35      91.200
Winnipeg_May_2010_storm 05/29/2010 18:40      40.800
Winnipeg_May_2010_storm 05/29/2010 18:45      31.200
Winnipeg_May_2010_storm 05/29/2010 18:50      36.000
Winnipeg_May_2010_storm 05/29/2010 18:55      76.800
Winnipeg_May_2010_storm 05/29/2010 19:00      12.000
Winnipeg_May_2010_storm 05/29/2010 19:05      4.800
Winnipeg_May_2010_storm 05/29/2010 19:10      19.200
Winnipeg_May_2010_storm 05/29/2010 19:15      14.400
Winnipeg_May_2010_storm 05/29/2010 19:20      2.400
Winnipeg_May_2010_storm 05/29/2010 19:25      0.000
Winnipeg_May_2010_storm 05/29/2010 19:30      2.400
Winnipeg_May_2010_storm 05/29/2010 19:35      12.000
Winnipeg_May_2010_storm 05/29/2010 19:40      50.400
Winnipeg_May_2010_storm 05/29/2010 19:45      14.400
Winnipeg_May_2010_storm 05/29/2010 19:50      33.600
Winnipeg_May_2010_storm 05/29/2010 19:55      21.600
Winnipeg_May_2010_storm 05/29/2010 20:00      28.800
Winnipeg_May_2010_storm 05/29/2010 20:05      26.400
Winnipeg_May_2010_storm 05/29/2010 20:10      9.600
Winnipeg_May_2010_storm 05/29/2010 20:15      16.800
Winnipeg_May_2010_storm 05/29/2010 20:20      7.200
Winnipeg_May_2010_storm 05/29/2010 20:25      0.000
Winnipeg_May_2010_storm 05/29/2010 20:30      0.000
Winnipeg_May_2010_storm 05/29/2010 20:35      2.400
Winnipeg_May_2010_storm 05/29/2010 20:40      2.400
Winnipeg_May_2010_storm 05/29/2010 20:45      7.200
Winnipeg_May_2010_storm 05/29/2010 20:50      14.400
Winnipeg_May_2010_storm 05/29/2010 20:55      16.800
Winnipeg_May_2010_storm 05/29/2010 21:00      9.600
Winnipeg_May_2010_storm 05/29/2010 21:05      4.800
Winnipeg_May_2010_storm 05/29/2010 21:10      4.800
Winnipeg_May_2010_storm 05/29/2010 21:15      2.400
Winnipeg_May_2010_storm 05/29/2010 21:20      2.400
Winnipeg_May_2010_storm 05/29/2010 21:25      0.000
Winnipeg_May_2010_storm 05/29/2010 21:30      2.400
Winnipeg_May_2010_storm 05/29/2010 21:35      0.000
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Winnipeg_May_2010_storm 05/29/2010 21:40      0.000
Winnipeg_May_2010_storm 05/29/2010 21:45      0.000
Winnipeg_May_2010_storm 05/29/2010 21:50      0.000
Winnipeg_May_2010_storm 05/29/2010 21:55      0.000
Winnipeg_May_2010_storm 05/29/2010 22:00      0.000
Winnipeg_May_2010_storm 05/29/2010 22:05      0.000
Winnipeg_May_2010_storm 05/29/2010 22:10      0.000
Winnipeg_May_2010_storm 05/29/2010 22:15      0.000
Winnipeg_May_2010_storm 05/29/2010 22:20      0.000
Winnipeg_May_2010_storm 05/29/2010 22:25      0.000
Winnipeg_May_2010_storm 05/29/2010 22:30      0.000
Winnipeg_May_2010_storm 05/29/2010 22:35      0.000
Winnipeg_May_2010_storm 05/29/2010 22:40      0.000
Winnipeg_May_2010_storm 05/29/2010 22:45      0.000
Winnipeg_May_2010_storm 05/29/2010 22:50      2.400
Winnipeg_May_2010_storm 05/29/2010 22:55      2.400
Winnipeg_May_2010_storm 05/29/2010 23:00      2.400
Winnipeg_May_2010_storm 05/29/2010 23:05      0.000
Winnipeg_May_2010_storm 05/29/2010 23:10      0.000
Winnipeg_May_2010_storm 05/29/2010 23:15      0.000
Winnipeg_May_2010_storm 05/29/2010 23:20      0.000
Winnipeg_May_2010_storm 05/29/2010 23:25      0.000
Winnipeg_May_2010_storm 05/29/2010 23:30      0.000
Winnipeg_May_2010_storm 05/29/2010 23:35      0.000
Winnipeg_May_2010_storm 05/29/2010 23:40      0.000
Winnipeg_May_2010_storm 05/29/2010 23:45      0.000
Winnipeg_May_2010_storm 05/29/2010 23:50      0.000
Winnipeg_May_2010_storm 05/29/2010 23:55      0.000
Winnipeg_May_2010_storm 05/30/2010 0:00       0.000
Winnipeg_May_2010_storm 05/30/2010 0:05       0.000
Winnipeg_May_2010_storm 05/30/2010 0:10       0.000
Winnipeg_May_2010_storm 05/30/2010 0:15       0.000
Winnipeg_May_2010_storm 05/30/2010 0:20       0.000
Winnipeg_May_2010_storm 05/30/2010 0:25       0.000
Winnipeg_May_2010_storm 05/30/2010 0:30       0.000
Winnipeg_May_2010_storm 05/30/2010 0:35       0.000
Winnipeg_May_2010_storm 05/30/2010 0:40       0.000
Winnipeg_May_2010_storm 05/30/2010 0:45       0.000
Winnipeg_May_2010_storm 05/30/2010 0:50       0.000
Winnipeg_May_2010_storm 05/30/2010 0:55       0.000
Winnipeg_May_2010_storm 05/30/2010 1:00       0.000
Winnipeg_May_2010_storm 05/30/2010 1:05       0.000
Winnipeg_May_2010_storm 05/30/2010 1:10       0.000
Winnipeg_May_2010_storm 05/30/2010 1:15       0.000
Winnipeg_May_2010_storm 05/30/2010 1:20       0.000
Winnipeg_May_2010_storm 05/30/2010 1:25       0.000
Winnipeg_May_2010_storm 05/30/2010 1:30       0.000
Winnipeg_May_2010_storm 05/30/2010 1:35       0.000
Winnipeg_May_2010_storm 05/30/2010 1:40       0.000
Winnipeg_May_2010_storm 05/30/2010 1:45       0.000
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Winnipeg_May_2010_storm 05/30/2010 1:55       0.000
Winnipeg_May_2010_storm 05/30/2010 2:00       0.000
Winnipeg_May_2010_storm 05/30/2010 2:05       0.000
Winnipeg_May_2010_storm 05/30/2010 2:10       0.000
Winnipeg_May_2010_storm 05/30/2010 2:15       0.000
Winnipeg_May_2010_storm 05/30/2010 2:20       0.000
Winnipeg_May_2010_storm 05/30/2010 2:25       0.000
Winnipeg_May_2010_storm 05/30/2010 2:30       0.000
Winnipeg_May_2010_storm 05/30/2010 2:35       0.000
Winnipeg_May_2010_storm 05/30/2010 2:40       0.000
Winnipeg_May_2010_storm 05/30/2010 2:45       0.000
Winnipeg_May_2010_storm 05/30/2010 2:50       0.000
Winnipeg_May_2010_storm 05/30/2010 2:55       0.000
Winnipeg_May_2010_storm 05/30/2010 3:00       0.000
Winnipeg_May_2010_storm 05/30/2010 3:05       0.000
Winnipeg_May_2010_storm 05/30/2010 3:10       0.000
Winnipeg_May_2010_storm 05/30/2010 3:15       0.000
Winnipeg_May_2010_storm 05/30/2010 3:20       0.000
Winnipeg_May_2010_storm 05/30/2010 3:25       0.000
Winnipeg_May_2010_storm 05/30/2010 3:30       0.000
Winnipeg_May_2010_storm 05/30/2010 3:35       2.400
Winnipeg_May_2010_storm 05/30/2010 3:40       2.400
Winnipeg_May_2010_storm 05/30/2010 3:45       4.800
Winnipeg_May_2010_storm 05/30/2010 3:50       4.800
Winnipeg_May_2010_storm 05/30/2010 3:55       7.200
Winnipeg_May_2010_storm 05/30/2010 4:00       2.400
Winnipeg_May_2010_storm 05/30/2010 4:05       0.000
Winnipeg_May_2010_storm 05/30/2010 4:10       0.000
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Winnipeg_May_2010_storm 05/30/2010 4:15       12.000
Winnipeg_May_2010_storm 05/30/2010 4:20       9.600
Winnipeg_May_2010_storm 05/30/2010 4:25       2.400
Winnipeg_May_2010_storm 05/30/2010 4:30       2.400
Winnipeg_May_2010_storm 05/30/2010 4:35       2.400
Winnipeg_May_2010_storm 05/30/2010 4:40       0.000
Winnipeg_May_2010_storm 05/30/2010 4:45       0.000
Winnipeg_May_2010_storm 05/30/2010 4:50       0.000
Winnipeg_May_2010_storm 05/30/2010 4:55       2.400
Winnipeg_May_2010_storm 05/30/2010 5:00       0.000
Winnipeg_May_2010_storm 05/30/2010 5:05       0.000
Winnipeg_May_2010_storm 05/30/2010 5:10       0.000
Winnipeg_May_2010_storm 05/30/2010 5:15       0.000
Winnipeg_May_2010_storm 05/30/2010 5:20       0.000
Winnipeg_May_2010_storm 05/30/2010 5:25       0.000
Winnipeg_May_2010_storm 05/30/2010 5:30       0.000
Winnipeg_May_2010_storm 05/30/2010 5:35       0.000
Winnipeg_May_2010_storm 05/30/2010 5:40       0.000
Winnipeg_May_2010_storm 05/30/2010 5:45       0.000
Winnipeg_May_2010_storm 05/30/2010 5:50       0.000
Winnipeg_May_2010_storm 05/30/2010 5:55       0.000
Winnipeg_May_2010_storm 05/30/2010 6:00       0.000
Winnipeg_May_2010_storm 05/30/2010 6:05       0.000
Winnipeg_May_2010_storm 05/30/2010 6:10       0.000
Winnipeg_May_2010_storm 05/30/2010 6:15       0.000
Winnipeg_May_2010_storm 05/30/2010 6:20       0.000
Winnipeg_May_2010_storm 05/30/2010 6:25       0.000
Winnipeg_May_2010_storm 05/30/2010 6:30       0.000
Winnipeg_May_2010_storm 05/30/2010 6:35       0.000
Winnipeg_May_2010_storm 05/30/2010 6:40       0.000
Winnipeg_May_2010_storm 05/30/2010 6:45       0.000
Winnipeg_May_2010_storm 05/30/2010 6:50       2.400
Winnipeg_May_2010_storm 05/30/2010 6:55       0.000
Winnipeg_May_2010_storm 05/30/2010 7:00       0.000
Winnipeg_May_2010_storm 05/30/2010 7:05       0.000
Winnipeg_May_2010_storm 05/30/2010 7:10       0.000
Winnipeg_May_2010_storm 05/30/2010 7:15       0.000
Winnipeg_May_2010_storm 05/30/2010 7:20       0.000
Winnipeg_May_2010_storm 05/30/2010 7:25       4.800
Winnipeg_May_2010_storm 05/30/2010 7:30       4.800
Winnipeg_May_2010_storm 05/30/2010 7:35       2.400
Winnipeg_May_2010_storm 05/30/2010 7:40       2.400
Winnipeg_May_2010_storm 05/30/2010 7:45       0.000
Winnipeg_May_2010_storm 05/30/2010 7:50       0.000
Winnipeg_May_2010_storm 05/30/2010 7:55       0.000
Winnipeg_May_2010_storm 05/30/2010 8:00       0.000
Winnipeg_May_2010_storm 05/30/2010 8:05       0.000
Winnipeg_May_2010_storm 05/30/2010 8:10       0.000
Winnipeg_May_2010_storm 05/30/2010 8:15       0.000
Winnipeg_May_2010_storm 05/30/2010 8:20       0.000
Winnipeg_May_2010_storm 05/30/2010 8:25       0.000
Winnipeg_May_2010_storm 05/30/2010 8:30       0.000
Winnipeg_May_2010_storm 05/30/2010 8:35       0.000
Winnipeg_May_2010_storm 05/30/2010 8:40       0.000
Winnipeg_May_2010_storm 05/30/2010 8:45       0.000
Winnipeg_May_2010_storm 05/30/2010 8:50       0.000
Winnipeg_May_2010_storm 05/30/2010 8:55       0.000
Winnipeg_May_2010_storm 05/30/2010 9:00       0.000
Winnipeg_May_2010_storm 05/30/2010 9:05       0.000
Winnipeg_May_2010_storm 05/30/2010 9:10       0.000
Winnipeg_May_2010_storm 05/30/2010 9:15       0.000
Winnipeg_May_2010_storm 05/30/2010 9:20       0.000
Winnipeg_May_2010_storm 05/30/2010 9:25       0.000
Winnipeg_May_2010_storm 05/30/2010 9:30       0.000
Winnipeg_May_2010_storm 05/30/2010 9:35       0.000
Winnipeg_May_2010_storm 05/30/2010 9:40       0.000
Winnipeg_May_2010_storm 05/30/2010 9:45       0.000
Winnipeg_May_2010_storm 05/30/2010 9:50       0.000
Winnipeg_May_2010_storm 05/30/2010 9:55       0.000
Winnipeg_May_2010_storm 05/30/2010 10:00      0.000
Winnipeg_May_2010_storm 05/30/2010 10:05      0.000
Winnipeg_May_2010_storm 05/30/2010 10:10      0.000
Winnipeg_May_2010_storm 05/30/2010 10:15      0.000
Winnipeg_May_2010_storm 05/30/2010 10:20      0.000
Winnipeg_May_2010_storm 05/30/2010 10:25      0.000
Winnipeg_May_2010_storm 05/30/2010 10:30      0.000
Winnipeg_May_2010_storm 05/30/2010 10:35      0.000
Winnipeg_May_2010_storm 05/30/2010 10:40      0.000
Winnipeg_May_2010_storm 05/30/2010 10:45      0.000
```

```
Winnipeg_May_2010_storm 05/30/2010 10:50      0.000
Winnipeg_May_2010_storm 05/30/2010 10:55      0.000
Winnipeg_May_2010_storm 05/30/2010 11:00      0.000
Winnipeg_May_2010_storm 05/30/2010 11:05      0.000
Winnipeg_May_2010_storm 05/30/2010 11:10      0.000
Winnipeg_May_2010_storm 05/30/2010 11:15      0.000
Winnipeg_May_2010_storm 05/30/2010 11:20      2.400
Winnipeg_May_2010_storm 05/30/2010 11:25      0.000
Winnipeg_May_2010_storm 05/30/2010 11:30      0.000
Winnipeg_May_2010_storm 05/30/2010 11:35      2.400

[REPORT]
INPUT      YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS       631066.319121869 5523218.95515    631999.666440747 5523725.83185
UNITS            Meters

[COORDINATES]
;;Node           X-Coord          Y-Coord
;;-------------- ---------------- ----------------

[VERTICES]
;;Link           X-Coord          Y-Coord
;;-------------- ---------------- ----------------

[POLYGONS]
;;Subcatchment   X-Coord          Y-Coord
;;-------------- ---------------- ----------------

[SYMBOLS]
;;Gage           X-Coord          Y-Coord
;;-------------- ---------------- ----------------
```

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EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

Parker Lands
Continuous Simulation
Winnipeg May 2010 Storm


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 71
Number of nodes ........... 44
Number of links ........... 43
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
May_2010_storm       Winnipeg_May_2010_storm     INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
A1                          0.06     19.60     62.00    2.0000 May_2010_storm       ST14
A10                         0.02      7.33     50.00    2.0000 May_2010_storm       ST11
A11                         0.21     71.27     50.00    2.0000 May_2010_storm       ST20
A12                         0.65    216.53     50.00    2.0000 May_2010_storm       ST17
A13                         0.45    150.30     50.00    2.0000 May_2010_storm       ST10
A14                         0.21     71.00     62.00    2.0000 May_2010_storm       ST12
A15                         0.36    121.00     57.00    2.0000 May_2010_storm       ST11
A16                         0.38    127.83     52.00    2.0000 May_2010_storm       ST10
A17                         0.36    119.13     52.00    2.0000 May_2010_storm       ST21
A18                         0.15     51.00     52.00    2.0000 May_2010_storm       ST20
A19                         0.10     33.97     52.00    2.0000 May_2010_storm       ST20
A2                          0.07     23.93     62.00    2.0000 May_2010_storm       ST13
A20                         0.15     51.03     52.00    2.0000 May_2010_storm       ST19
A21                         0.11     37.97     50.00    2.0000 May_2010_storm       ST19
A22                         0.04     11.93     50.00    2.0000 May_2010_storm       ST20
A23                         0.07     24.70     50.00    2.0000 May_2010_storm       ST17
A24                         0.03      8.37     50.00    2.0000 May_2010_storm       ST10
A25                         0.50    166.93     50.00    2.0000 May_2010_storm       ST18
A26                         0.40    132.93     50.00    2.0000 May_2010_storm       ST9
A27                         0.12     40.07     50.00    2.0000 May_2010_storm       ST9
A28                         0.32    106.53     52.00    2.0000 May_2010_storm       ST9
A29                         0.22     73.57     50.00    2.0000 May_2010_storm       ST18
A3                          0.04     14.17     62.00    2.0000 May_2010_storm       ST12
A30                         0.12     41.43     50.00    2.0000 May_2010_storm       ST9
A31                         0.26     85.83     50.00    2.0000 May_2010_storm       ST8
A32                         0.46    154.90     62.00    2.0000 May_2010_storm       ST8
A33                         0.25     84.67     58.00    2.0000 May_2010_storm       SU33
A34                         0.20     65.77     35.00    2.0000 May_2010_storm       SU34
A35                         0.48    158.67     58.00    2.0000 May_2010_storm       SU35
A36                         0.39    131.50     35.00    2.0000 May_2010_storm       SU36
A37                         0.27     88.63     58.00    2.0000 May_2010_storm       SU37
A38                         0.39    131.50     35.00    2.0000 May_2010_storm       SU38
A39                         0.30     99.10     58.00    2.0000 May_2010_storm       SU39
A4                          0.51    170.13     56.00    2.0000 May_2010_storm       ST16
A40                         0.23     77.47     35.00    2.0000 May_2010_storm       SU40
A41                         0.23     77.47     35.00    2.0000 May_2010_storm       SU41
A42                         0.22     74.07     79.00    2.0000 May_2010_storm       SU42
A43                         0.54    181.63     79.00    2.0000 May_2010_storm       SU43
A44                         0.26     87.90     58.00    2.0000 May_2010_storm       SU44
A45                         0.25     84.97     79.00    2.0000 May_2010_storm       SU45
A46                         0.44    146.33     58.00    2.0000 May_2010_storm       SU46
A47                         0.25     84.97     79.00    2.0000 May_2010_storm       SU47
A48                         0.22     74.00     58.00    2.0000 May_2010_storm       SU48
A49                         1.57    195.87      0.00    2.0000 May_2010_storm       SU49
A5                          0.59    195.90     56.00    2.0000 May_2010_storm       ST15
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A6	0.21	68.57	56.00	2.0000	May_2010_storm	ST11
A7	0.03	11.13	50.00	2.0000	May_2010_storm	ST21
A8	0.07	22.13	50.00	2.0000	May_2010_storm	ST16
A9	0.07	22.03	50.00	2.0000	May_2010_storm	ST15
R1	0.16	785.00	75.00	2.0000	May_2010_storm	ST14
R10	0.19	940.50	75.00	2.0000	May_2010_storm	ST8
R11	0.19	946.50	75.00	2.0000	May_2010_storm	ST6
R12	0.23	1140.50	75.00	2.0000	May_2010_storm	ST5
R13	0.19	937.50	75.00	2.0000	May_2010_storm	ST4
R14	0.20	997.00	75.00	2.0000	May_2010_storm	ST3
R15	0.19	935.50	75.00	2.0000	May_2010_storm	ST22A
R16	0.31	1552.00	75.00	2.0000	May_2010_storm	ST23
R17	0.14	725.00	75.00	2.0000	May_2010_storm	ST24
R18	0.15	727.00	75.00	2.0000	May_2010_storm	ST25
R19	0.17	867.00	75.00	2.0000	May_2010_storm	ST18
R2	0.19	944.00	75.00	2.0000	May_2010_storm	ST13
R20	0.16	795.00	75.00	2.0000	May_2010_storm	ST19
R21	0.34	1697.00	75.00	2.0000	May_2010_storm	ST20
R22	0.20	998.50	75.00	2.0000	May_2010_storm	ST21
R3	0.19	932.00	75.00	2.0000	May_2010_storm	ST12
R4	0.23	1135.50	75.00	2.0000	May_2010_storm	ST11
R5	0.17	854.00	75.00	2.0000	May_2010_storm	ST16
R6	0.18	888.00	75.00	2.0000	May_2010_storm	ST15
R7	0.24	1177.50	75.00	2.0000	May_2010_storm	ST10
R8	0.20	1009.50	75.00	2.0000	May_2010_storm	ST17
R9	0.24	1194.00	75.00	2.0000	May_2010_storm	ST9

****
Node Summary
****

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
ST1	JUNCTION	228.24	3.38	0.0	
ST10	JUNCTION	230.54	2.79	0.0	
ST11	JUNCTION	230.78	2.73	0.0	
ST12	JUNCTION	231.61	2.04	0.0	
ST13	JUNCTION	231.88	2.10	0.0	
ST14	JUNCTION	232.10	2.12	0.0	
ST15	JUNCTION	231.51	2.21	0.0	
ST16	JUNCTION	231.81	2.13	0.0	
ST17	JUNCTION	231.16	2.45	0.0	
ST18	JUNCTION	230.85	2.52	0.0	
ST19	JUNCTION	231.16	2.48	0.0	
ST2	JUNCTION	228.93	3.20	0.0	
ST20	JUNCTION	231.46	2.49	0.0	
ST21	JUNCTION	231.96	2.21	0.0	
ST22	JUNCTION	229.55	2.96	0.0	
ST22A	JUNCTION	229.65	2.81	0.0	
ST23	JUNCTION	229.78	2.90	0.0	
ST24	JUNCTION	230.08	2.72	0.0	
ST25	JUNCTION	230.55	2.27	0.0	
ST3	JUNCTION	229.07	3.20	0.0	
ST4	JUNCTION	229.30	3.09	0.0	
ST5	JUNCTION	229.48	3.11	0.0	
ST6	JUNCTION	229.63	3.00	0.0	
ST7	JUNCTION	229.79	3.00	0.0	
ST8	JUNCTION	229.83	3.09	0.0	
ST9	JUNCTION	230.06	3.15	0.0	
Pond	OUTFALL	228.21	1.50	0.0	
SU33	STORAGE	233.30	0.50	0.0	
SU34	STORAGE	233.30	0.50	0.0	
SU35	STORAGE	233.00	0.50	0.0	
SU36	STORAGE	233.00	0.50	0.0	
SU37	STORAGE	233.00	0.50	0.0	
SU38	STORAGE	233.00	0.50	0.0	
SU39	STORAGE	232.50	0.50	0.0	
SU40	STORAGE	232.50	0.50	0.0	
SU41	STORAGE	232.30	0.50	0.0	
SU42	STORAGE	232.80	0.50	0.0	
SU43	STORAGE	232.80	0.50	0.0	
SU44	STORAGE	233.30	0.50	0.0	
SU45	STORAGE	233.60	0.50	0.0	
SU46	STORAGE	233.60	0.50	0.0	
SU47	STORAGE	233.80	0.50	0.0	
SU48	STORAGE	233.80	0.50	0.0	
SU49	STORAGE	233.80	0.50	0.0	

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Link Summary
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Name	From Node	To Node	Type	Length	%Slope	Roughness
1	ST1	Pond	CONDUIT	15.0	0.1533	0.0130
P10-9	ST10	ST9	CONDUIT	79.6	0.1006	0.0130
P11-10	ST11	ST10	CONDUIT	90.2	0.0998	0.0130
P12-11	ST12	ST11	CONDUIT	83.7	0.1458	0.0110
P13-12	ST13	ST12	CONDUIT	100.0	0.1200	0.0110
P14-13	ST14	ST13	CONDUIT	100.0	0.1500	0.0110
P15-11	ST15	ST11	CONDUIT	65.0	0.1508	0.0110
P16-15	ST16	ST15	CONDUIT	100.0	0.1500	0.0110
P17-10	ST17	ST10	CONDUIT	65.0	0.1492	0.0110
P18-9	ST18	ST9	CONDUIT	75.0	0.1200	0.0130
P19-18	ST19	ST18	CONDUIT	109.1	0.1503	0.0130
P20-19	ST20	ST19	CONDUIT	70.0	0.2000	0.0130
P2-1	ST2	ST1	CONDUIT	40.0	0.1500	0.0130
P21-20	ST21	ST20	CONDUIT	105.0	0.1200	0.0110
P22-3	ST22	ST3	CONDUIT	35.9	0.0974	0.0130
P22A-22	ST22A	ST22	CONDUIT	40.0	0.1000	0.0130
P23-22A	ST23	ST22A	CONDUIT	100.0	0.1000	0.0130
P24-23	ST24	ST23	CONDUIT	100.0	0.1500	0.0130
P25-24	ST25	ST24	CONDUIT	80.0	0.3000	0.0130
P3-2	ST3	ST2	CONDUIT	70.0	0.1529	0.0130
P4-3	ST4	ST3	CONDUIT	55.0	0.1564	0.0130
P5-4	ST5	ST4	CONDUIT	100.0	0.1500	0.0130
P6-5	ST6	ST5	CONDUIT	80.0	0.1500	0.0130
P7-6	ST7	ST6	CONDUIT	82.0	0.1501	0.0130
P8-7	ST8	ST7	CONDUIT	11.0	0.1550	0.0130
P9-8	ST9	ST8	CONDUIT	132.7	0.1507	0.0130
OL33	SU33	ST7	OUTLET			
OL34	SU34	ST7	OUTLET			
OL35	SU35	ST6	OUTLET			
OL36	SU36	ST6	OUTLET			
OL37	SU37	ST5	OUTLET			
OL38	SU38	ST5	OUTLET			
OL39	SU39	ST4	OUTLET			
OL40	SU40	ST4	OUTLET			
OL41	SU41	ST3	OUTLET			
OL42	SU42	ST22	OUTLET			
OL43	SU43	ST22A	OUTLET			
OL44	SU44	ST23	OUTLET			
OL45	SU45	ST24	OUTLET			
OL46	SU46	ST24	OUTLET			
OL47	SU47	ST25	OUTLET			
OL48	SU48	ST25	OUTLET			
OL49	SU49	ST25	OUTLET			

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*********************
Cross Section Summary
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Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
1	CIRCULAR	1.50	1.77	0.38	1.50	1	2.77
P10-9	CIRCULAR	1.20	1.13	0.30	1.20	1	1.24
P11-10	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P12-11	CIRCULAR	0.60	0.28	0.15	0.60	1	0.28
P13-12	CIRCULAR	0.45	0.16	0.11	0.45	1	0.12
P14-13	CIRCULAR	0.38	0.11	0.09	0.38	1	0.08
P15-11	CIRCULAR	0.68	0.36	0.17	0.68	1	0.39
P16-15	CIRCULAR	0.53	0.22	0.13	0.53	1	0.20
P17-10	CIRCULAR	0.68	0.36	0.17	0.68	1	0.38
P18-9	CIRCULAR	0.90	0.64	0.23	0.90	1	0.63
P19-18	CIRCULAR	0.75	0.44	0.19	0.75	1	0.43
P20-19	CIRCULAR	0.60	0.28	0.15	0.60	1	0.27
P2-1	CIRCULAR	1.50	1.77	0.38	1.50	1	2.74
P21-20	CIRCULAR	0.53	0.22	0.13	0.53	1	0.18
P22-3	CIRCULAR	1.05	0.87	0.26	1.05	1	0.85
P22A-22	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P23-22A	CIRCULAR	1.05	0.87	0.26	1.05	1	0.86
P24-23	CIRCULAR	0.90	0.64	0.23	0.90	1	0.70
P25-24	CIRCULAR	0.68	0.36	0.17	0.68	1	0.46
P3-2	CIRCULAR	1.50	1.77	0.38	1.50	1	2.76
P4-3	CIRCULAR	1.35	1.43	0.34	1.35	1	2.11
P5-4	CIRCULAR	1.35	1.43	0.34	1.35	1	2.07

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P6-5            CIRCULAR            1.35     1.43     0.34     1.35        1     2.07
P7-6            CIRCULAR            1.35     1.43     0.34     1.35        1     2.07
P8-7            CIRCULAR            1.35     1.43     0.34     1.35        1     2.10
P9-8            CIRCULAR            1.35     1.43     0.34     1.35        1     2.07


***************
Transect Summary
***************

Transect PrimaryCollectorBothSides
Area:
           0.0003     0.0012     0.0027     0.0047     0.0074
           0.0107     0.0145     0.0189     0.0240     0.0296
           0.0358     0.0426     0.0500     0.0580     0.0671
           0.0776     0.0897     0.1033     0.1184     0.1350
           0.1531     0.1727     0.1938     0.2157     0.2382
           0.2613     0.2850     0.3094     0.3343     0.3599
           0.3861     0.4129     0.4403     0.4683     0.4970
           0.5262     0.5561     0.5865     0.6176     0.6493
           0.6816     0.7146     0.7481     0.7822     0.8170
           0.8524     0.8884     0.9250     0.9622     1.0000
Hrad:
           0.0186     0.0373     0.0559     0.0746     0.0932
           0.1119     0.1305     0.1492     0.1678     0.1865
           0.2051     0.2238     0.2424     0.2611     0.2564
           0.2580     0.2637     0.2722     0.2827     0.2947
           0.3078     0.3218     0.3410     0.3782     0.4140
           0.4484     0.4814     0.5133     0.5440     0.5735
           0.6021     0.6296     0.6562     0.6818     0.7067
           0.7307     0.7539     0.7764     0.7982     0.8193
           0.8398     0.8597     0.8790     0.8978     0.9160
           0.9337     0.9510     0.9678     0.9841     1.0000
Width:
           0.0155     0.0311     0.0466     0.0621     0.0776
           0.0932     0.1087     0.1242     0.1398     0.1553
           0.1708     0.1863     0.2019     0.2174     0.2570
           0.2967     0.3363     0.3759     0.4155     0.4552
           0.4948     0.5344     0.5663     0.5823     0.5984
           0.6145     0.6305     0.6466     0.6627     0.6787
           0.6948     0.7108     0.7269     0.7430     0.7590
           0.7751     0.7912     0.8072     0.8233     0.8394
           0.8554     0.8715     0.8876     0.9036     0.9197
           0.9357     0.9518     0.9679     0.9839     1.0000


*********************************************************
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
  RDII ...................  NO
  Snowmelt ...............  NO
  Groundwater ............  NO
  Flow Routing ...........  YES
  Ponding Allowed ........  NO
  Water Quality ..........  NO
Infiltration Method ......  HORTON
Flow Routing Method ......  DYNWAVE
Starting Date ............  05/28/2010 05:05:00
Ending Date ..............  05/30/2010 11:35:00
Antecedent Dry Days ......  0.0
Report Time Step .........  00:01:00
Wet Time Step ............  00:05:00
Dry Time Step ............  00:05:00
Routing Time Step ........  5.00 sec
Variable Time Step .......  YES
Maximum Trials ...........  8
Number of Threads ........  4
Head Tolerance ...........  0.001500 m
```

Runoff Quantity Continuity	Volume hectare-m	Depth mm
Total Precipitation	2.453	134.000
Evaporation Loss	0.000	0.000
Infiltration Loss	0.545	29.758
Surface Runoff	1.919	104.837
Final Storage	0.017	0.907
Continuity Error (%)	-1.121	

Flow Routing Continuity	Volume hectare-m	Volume 10^6 ltr
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	1.918	19.180
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	1.899	18.988
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.003
Final Stored Volume	0.002	0.016
Continuity Error (%)	0.934	

Time-Step Critical Elements

Link P8-7 (13.59%)
Link 1 (5.13%)

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step	:	1.31 sec
Average Time Step	:	4.65 sec
Maximum Time Step	:	5.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.01
Percent Not Converging	:	0.02

Subcatchment Runoff Summary

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff CMS	Runoff Coeff
A1	134.00	0.00	0.00	24.57	110.19	0.06	0.01	0.822
A10	134.00	0.00	0.00	32.59	102.11	0.02	0.00	0.762
A11	134.00	0.00	0.00	32.59	102.11	0.22	0.05	0.762
A12	134.00	0.00	0.00	32.59	102.11	0.66	0.14	0.762
A13	134.00	0.00	0.00	32.59	102.11	0.46	0.10	0.762
A14	134.00	0.00	0.00	24.57	110.19	0.23	0.05	0.822
A15	134.00	0.00	0.00	27.90	106.83	0.39	0.09	0.797
A16	134.00	0.00	0.00	31.24	103.47	0.40	0.09	0.772
A17	134.00	0.00	0.00	31.24	103.47	0.37	0.08	0.772
A18	134.00	0.00	0.00	31.24	103.47	0.16	0.03	0.772
A19	134.00	0.00	0.00	31.24	103.47	0.11	0.02	0.772
A2	134.00	0.00	0.00	24.57	110.19	0.08	0.02	0.822
A20	134.00	0.00	0.00	31.24	103.47	0.16	0.03	0.772
A21	134.00	0.00	0.00	32.59	102.11	0.12	0.03	0.762
A22	134.00	0.00	0.00	32.59	102.11	0.04	0.01	0.762
A23	134.00	0.00	0.00	32.59	102.11	0.08	0.02	0.762
A24	134.00	0.00	0.00	32.59	102.11	0.03	0.01	0.762

A25	134.00	0.00	0.00	32.59	102.11	0.51	0.11	0.762
A26	134.00	0.00	0.00	32.59	102.11	0.41	0.09	0.762
A27	134.00	0.00	0.00	32.59	102.11	0.12	0.03	0.762
A28	134.00	0.00	0.00	31.24	103.47	0.33	0.07	0.772
A29	134.00	0.00	0.00	32.59	102.11	0.23	0.05	0.762
A3	134.00	0.00	0.00	24.57	110.19	0.05	0.01	0.822
A30	134.00	0.00	0.00	32.59	102.11	0.13	0.03	0.762
A31	134.00	0.00	0.00	32.59	102.11	0.26	0.06	0.762
A32	134.00	0.00	0.00	24.57	110.19	0.51	0.12	0.822
A33	134.00	0.00	0.00	27.24	107.57	0.27	0.06	0.803
A34	134.00	0.00	0.00	42.74	91.88	0.18	0.04	0.686
A35	134.00	0.00	0.00	27.24	107.57	0.51	0.12	0.803
A36	134.00	0.00	0.00	42.74	91.88	0.36	0.07	0.686
A37	134.00	0.00	0.00	27.24	107.57	0.29	0.06	0.803
A38	134.00	0.00	0.00	42.74	91.88	0.36	0.07	0.686
A39	134.00	0.00	0.00	27.24	107.57	0.32	0.07	0.803
A4	134.00	0.00	0.00	28.57	106.16	0.54	0.12	0.792
A40	134.00	0.00	0.00	42.74	91.88	0.21	0.04	0.686
A41	134.00	0.00	0.00	42.74	91.88	0.21	0.04	0.686
A42	134.00	0.00	0.00	13.41	121.38	0.27	0.07	0.906
A43	134.00	0.00	0.00	13.41	121.38	0.66	0.16	0.906
A44	134.00	0.00	0.00	27.24	107.57	0.28	0.06	0.803
A45	134.00	0.00	0.00	13.41	121.38	0.31	0.08	0.906
A46	134.00	0.00	0.00	27.24	107.57	0.47	0.11	0.803
A47	134.00	0.00	0.00	13.41	121.38	0.31	0.08	0.906
A48	134.00	0.00	0.00	27.24	107.57	0.24	0.05	0.803
A49	134.00	0.00	0.00	71.37	62.90	0.99	0.13	0.469
A5	134.00	0.00	0.00	28.57	106.16	0.62	0.14	0.792
A6	134.00	0.00	0.00	28.57	106.16	0.22	0.05	0.792
A7	134.00	0.00	0.00	32.59	102.11	0.03	0.01	0.762
A8	134.00	0.00	0.00	32.59	102.11	0.07	0.01	0.762
A9	134.00	0.00	0.00	32.59	102.11	0.07	0.01	0.762
R1	134.00	0.00	0.00	15.63	118.71	0.19	0.05	0.886
R10	134.00	0.00	0.00	15.63	118.71	0.22	0.06	0.886
R11	134.00	0.00	0.00	15.63	118.71	0.22	0.06	0.886
R12	134.00	0.00	0.00	15.63	118.71	0.27	0.07	0.886
R13	134.00	0.00	0.00	15.63	118.71	0.22	0.06	0.886
R14	134.00	0.00	0.00	15.63	118.71	0.24	0.06	0.886
R15	134.00	0.00	0.00	15.63	118.71	0.22	0.06	0.886
R16	134.00	0.00	0.00	15.63	118.71	0.37	0.10	0.886
R17	134.00	0.00	0.00	15.63	118.71	0.17	0.05	0.886
R18	134.00	0.00	0.00	15.63	118.71	0.17	0.05	0.886
R19	134.00	0.00	0.00	15.63	118.71	0.21	0.06	0.886
R2	134.00	0.00	0.00	15.63	118.71	0.22	0.06	0.886
R20	134.00	0.00	0.00	15.63	118.71	0.19	0.05	0.886
R21	134.00	0.00	0.00	15.63	118.71	0.40	0.11	0.886
R22	134.00	0.00	0.00	15.63	118.71	0.24	0.06	0.886
R3	134.00	0.00	0.00	15.63	118.71	0.22	0.06	0.886
R4	134.00	0.00	0.00	15.63	118.71	0.27	0.07	0.886
R5	134.00	0.00	0.00	15.63	118.71	0.20	0.05	0.886
R6	134.00	0.00	0.00	15.63	118.71	0.21	0.06	0.886
R7	134.00	0.00	0.00	15.63	118.71	0.28	0.08	0.886
R8	134.00	0.00	0.00	15.63	118.71	0.24	0.06	0.886
R9	134.00	0.00	0.00	15.63	118.71	0.28	0.08	0.886

****
Node Depth Summary
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Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
ST1	JUNCTION	0.26	0.92	229.16	1 03:41	0.92
ST10	JUNCTION	0.08	0.81	231.35	1 03:38	0.81
ST11	JUNCTION	0.07	0.72	231.50	1 03:37	0.72
ST12	JUNCTION	0.04	0.40	232.01	1 03:37	0.40
ST13	JUNCTION	0.04	0.37	232.24	1 03:37	0.37
ST14	JUNCTION	0.02	0.25	232.35	1 03:36	0.25
ST15	JUNCTION	0.05	0.48	231.99	1 03:36	0.48
ST16	JUNCTION	0.04	0.39	232.20	1 03:35	0.39
ST17	JUNCTION	0.03	0.35	231.51	1 03:35	0.35
ST18	JUNCTION	0.07	0.61	231.46	1 03:37	0.61
ST19	JUNCTION	0.06	0.58	231.75	1 03:37	0.58
ST2	JUNCTION	0.13	0.97	229.90	1 03:41	0.97
ST20	JUNCTION	0.05	0.55	232.01	1 03:36	0.55
ST21	JUNCTION	0.04	0.35	232.30	1 03:36	0.35

ST22	JUNCTION	0.08	0.57	230.12	1	03:40	0.57
ST22A	JUNCTION	0.08	0.49	230.14	1	03:41	0.49
ST23	JUNCTION	0.07	0.40	230.18	1	03:41	0.40
ST24	JUNCTION	0.06	0.28	230.37	1	13:56	0.28
ST25	JUNCTION	0.04	0.21	230.76	1	15:05	0.21
ST3	JUNCTION	0.13	1.05	230.11	1	03:40	1.04
ST4	JUNCTION	0.12	1.01	230.31	1	03:40	1.01
ST5	JUNCTION	0.12	1.11	230.60	1	03:39	1.11
ST6	JUNCTION	0.12	1.15	230.78	1	03:39	1.14
ST7	JUNCTION	0.11	1.16	230.94	1	03:39	1.16
ST8	JUNCTION	0.10	1.13	230.97	1	03:39	1.13
ST9	JUNCTION	0.10	1.12	231.18	1	03:39	1.12
Pond	OUTFALL	0.27	0.89	229.10	1	03:41	0.89
SU33	STORAGE	0.06	0.36	233.66	1	04:14	0.36
SU34	STORAGE	0.05	0.34	233.64	1	04:14	0.34
SU35	STORAGE	0.05	0.36	233.36	1	04:14	0.36
SU36	STORAGE	0.05	0.34	233.34	1	04:14	0.34
SU37	STORAGE	0.06	0.36	233.36	1	04:14	0.36
SU38	STORAGE	0.05	0.34	233.34	1	04:14	0.34
SU39	STORAGE	0.06	0.36	232.86	1	04:14	0.36
SU40	STORAGE	0.05	0.35	232.85	1	04:14	0.35
SU41	STORAGE	0.05	0.35	232.65	1	04:14	0.35
SU42	STORAGE	0.06	0.36	233.16	1	04:13	0.36
SU43	STORAGE	0.06	0.36	233.16	1	04:13	0.36
SU44	STORAGE	0.05	0.36	233.66	1	04:14	0.36
SU45	STORAGE	0.06	0.36	233.96	1	04:13	0.36
SU46	STORAGE	0.06	0.36	233.96	1	04:14	0.36
SU47	STORAGE	0.06	0.36	234.16	1	04:13	0.36
SU48	STORAGE	0.06	0.36	234.16	1	04:14	0.36
SU49	STORAGE	0.03	0.30	234.10	1	15:18	0.30

****
Node Inflow Summary
****

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	Flow Balance Error Percent
ST1	JUNCTION	0.000	2.920	1	03:41	0	19	0.010
ST10	JUNCTION	0.267	1.299	1	03:37	1.16	5.8	0.124
ST11	JUNCTION	0.214	0.831	1	03:36	0.898	3.67	0.153
ST12	JUNCTION	0.125	0.244	1	03:36	0.503	1.06	0.021
ST13	JUNCTION	0.079	0.138	1	03:35	0.303	0.551	-0.657
ST14	JUNCTION	0.065	0.065	1	03:35	0.251	0.251	1.321
ST15	JUNCTION	0.211	0.394	1	03:35	0.902	1.71	0.038
ST16	JUNCTION	0.191	0.191	1	03:35	0.812	0.812	-0.024
ST17	JUNCTION	0.224	0.224	1	03:35	0.978	0.978	-0.002
ST18	JUNCTION	0.215	0.659	1	03:36	0.942	2.96	-0.023
ST19	JUNCTION	0.111	0.458	1	03:35	0.463	2.02	0.175
ST2	JUNCTION	0.000	2.921	1	03:40	0	19	-0.154
ST20	JUNCTION	0.221	0.354	1	03:36	0.921	1.56	0.142
ST21	JUNCTION	0.152	0.152	1	03:35	0.641	0.64	0.015
ST22	JUNCTION	0.000	0.291	1	03:42	0	4.46	-0.012
ST22A	JUNCTION	0.060	0.299	1	03:38	0.222	4.19	0.136
ST23	JUNCTION	0.099	0.235	1	03:37	0.368	3.31	0.019
ST24	JUNCTION	0.046	0.152	1	13:55	0.172	2.66	0.009
ST25	JUNCTION	0.046	0.099	1	14:40	0.173	1.71	0.006
ST3	JUNCTION	0.064	2.925	1	03:40	0.237	19	0.237
ST4	JUNCTION	0.060	2.597	1	03:39	0.222	14.1	0.169
ST5	JUNCTION	0.073	2.531	1	03:39	0.271	13.4	0.431
ST6	JUNCTION	0.060	2.457	1	03:39	0.225	12.5	0.330
ST7	JUNCTION	0.000	2.390	1	03:38	0	11.5	0.267
ST8	JUNCTION	0.235	2.384	1	03:38	0.998	11	0.082
ST9	JUNCTION	0.291	2.195	1	03:37	1.27	10	-0.126
Pond	OUTFALL	0.000	2.920	1	03:41	0	19	0.000
SU33	STORAGE	0.062	0.062	1	03:35	0.273	0.273	0.011
SU34	STORAGE	0.036	0.036	1	03:40	0.181	0.181	0.010
SU35	STORAGE	0.116	0.116	1	03:35	0.512	0.512	0.011
SU36	STORAGE	0.073	0.073	1	03:40	0.362	0.362	0.010
SU37	STORAGE	0.065	0.065	1	03:35	0.286	0.286	0.011
SU38	STORAGE	0.073	0.073	1	03:40	0.362	0.362	0.010
SU39	STORAGE	0.072	0.072	1	03:35	0.32	0.32	0.011
SU40	STORAGE	0.043	0.043	1	03:40	0.213	0.213	0.010
SU41	STORAGE	0.043	0.043	1	03:40	0.213	0.213	0.010
SU42	STORAGE	0.066	0.066	1	03:35	0.27	0.269	0.012

SU43	STORAGE	0.162	0.162	1	03:35	0.661	0.661	0.012
SU44	STORAGE	0.064	0.064	1	03:35	0.284	0.283	0.011
SU45	STORAGE	0.076	0.076	1	03:35	0.309	0.309	0.012
SU46	STORAGE	0.107	0.107	1	03:35	0.472	0.472	0.011
SU47	STORAGE	0.076	0.076	1	03:35	0.309	0.309	0.012
SU48	STORAGE	0.054	0.054	1	03:35	0.239	0.239	0.011
SU49	STORAGE	0.128	0.128	1	13:55	0.986	0.986	0.005

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
SU33	0.006	6	0	0	0.051	51	1 04:14	0.013
SU34	0.003	5	0	0	0.033	47	1 04:14	0.010
SU35	0.011	6	0	0	0.097	51	1 04:14	0.024
SU36	0.007	5	0	0	0.065	47	1 04:14	0.019
SU37	0.006	6	0	0	0.054	51	1 04:14	0.013
SU38	0.007	5	0	0	0.065	47	1 04:14	0.019
SU39	0.007	6	0	0	0.060	51	1 04:14	0.015
SU40	0.004	5	0	0	0.038	48	1 04:14	0.011
SU41	0.004	5	0	0	0.038	48	1 04:14	0.011
SU42	0.006	6	0	0	0.052	53	1 04:13	0.011
SU43	0.015	6	0	0	0.127	53	1 04:13	0.028
SU44	0.006	6	0	0	0.053	51	1 04:14	0.013
SU45	0.007	6	0	0	0.060	53	1 04:13	0.013
SU46	0.010	6	0	0	0.089	51	1 04:14	0.022
SU47	0.007	6	0	0	0.060	53	1 04:13	0.013
SU48	0.005	6	0	0	0.046	51	1 04:14	0.011
SU49	0.012	3	0	0	0.138	37	1 15:18	0.067

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
Pond	78.58	0.210	2.920	19.005
System	78.58	0.210	2.920	19.005

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CMS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
1	CONDUIT	2.920	1 03:41	2.63	1.05	0.60
P10-9	CONDUIT	1.278	1 03:36	1.81	1.03	0.64
P11-10	CONDUIT	0.830	1 03:37	1.40	0.96	0.65
P12-11	CONDUIT	0.243	1 03:37	1.37	0.88	0.60
P13-12	CONDUIT	0.130	1 03:37	1.11	1.11	0.69

P14-13	CONDUIT	0.062	1	03:36	0.77	0.77	0.72
P15-11	CONDUIT	0.393	1	03:36	1.60	1.02	0.65
P16-15	CONDUIT	0.187	1	03:35	1.19	0.95	0.69
P17-10	CONDUIT	0.223	1	03:36	1.33	0.58	0.48
P18-9	CONDUIT	0.656	1	03:38	1.64	1.05	0.60
P19-18	CONDUIT	0.454	1	03:37	1.39	1.05	0.70
P20-19	CONDUIT	0.352	1	03:36	1.45	1.28	0.82
P2-1	CONDUIT	2.920	1	03:41	2.55	1.07	0.62
P21-20	CONDUIT	0.145	1	03:37	1.13	0.82	0.57
P22-3	CONDUIT	0.308	1	03:42	1.23	0.36	0.56
P22A-22	CONDUIT	0.283	1	03:36	1.20	0.33	0.48
P23-22A	CONDUIT	0.228	1	03:38	0.89	0.26	0.41
P24-23	CONDUIT	0.148	1	13:56	1.02	0.21	0.29
P25-24	CONDUIT	0.097	1	15:05	1.08	0.21	0.30
P3-2	CONDUIT	2.921	1	03:40	2.36	1.06	0.66
P4-3	CONDUIT	2.596	1	03:40	2.41	1.23	0.70
P5-4	CONDUIT	2.533	1	03:39	2.13	1.23	0.77
P6-5	CONDUIT	2.451	1	03:39	1.94	1.19	0.83
P7-6	CONDUIT	2.379	1	03:39	1.86	1.15	0.84
P8-7	CONDUIT	2.375	1	03:38	1.89	1.13	0.84
P9-8	CONDUIT	2.171	1	03:38	1.75	1.05	0.82
OL33	DUMMY	0.013	1	04:14			
OL34	DUMMY	0.010	1	04:14			
OL35	DUMMY	0.024	1	04:14			
OL36	DUMMY	0.019	1	04:14			
OL37	DUMMY	0.013	1	04:14			
OL38	DUMMY	0.019	1	04:14			
OL39	DUMMY	0.015	1	04:14			
OL40	DUMMY	0.011	1	04:14			
OL41	DUMMY	0.011	1	04:14			
OL42	DUMMY	0.011	1	04:13			
OL43	DUMMY	0.028	1	04:13			
OL44	DUMMY	0.013	1	04:14			
OL45	DUMMY	0.013	1	04:13			
OL46	DUMMY	0.022	1	04:14			
OL47	DUMMY	0.013	1	04:13			
OL48	DUMMY	0.011	1	04:14			
OL49	DUMMY	0.067	1	15:19			

****
Flow Classification Summary
****

	Adjusted	Fraction of Time in Flow Class							
	/Actual		Up	Down	Sub	Sup	Up	Down	Norm	Inlet
Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
1	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
P10-9	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.99	0.00	0.00
P11-10	1.00	0.01	0.00	0.00	0.05	0.00	0.00	0.94	0.00	0.00
P12-11	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
P13-12	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
P14-13	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.92	0.01	0.00
P15-11	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
P16-15	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.00	0.00
P17-10	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
P18-9	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
P19-18	1.00	0.01	0.00	0.00	0.02	0.00	0.00	0.97	0.00	0.00
P20-19	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.00	0.00
P2-1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00
P21-20	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
P22-3	1.00	0.01	0.00	0.00	0.03	0.00	0.00	0.96	0.00	0.00
P22A-22	1.00	0.01	0.00	0.00	0.07	0.00	0.00	0.92	0.00	0.00
P23-22A	1.00	0.01	0.00	0.00	0.45	0.00	0.00	0.54	0.00	0.00
P24-23	1.00	0.01	0.00	0.00	0.01	0.00	0.00	0.98	0.00	0.00
P25-24	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00
P3-2	1.00	0.01	0.00	0.00	0.38	0.00	0.00	0.61	0.00	0.00
P4-3	1.00	0.01	0.00	0.00	0.02	0.00	0.00	0.98	0.00	0.00
P5-4	1.00	0.01	0.00	0.00	0.41	0.00	0.00	0.58	0.00	0.00
P6-5	1.00	0.01	0.00	0.00	0.51	0.00	0.00	0.48	0.01	0.00
P7-6	1.00	0.01	0.00	0.00	0.48	0.00	0.00	0.51	0.06	0.00
P8-7	1.00	0.01	0.00	0.00	0.44	0.03	0.00	0.52	0.01	0.00
P9-8	1.00	0.01	0.00	0.00	0.23	0.00	0.00	0.77	0.00	0.00

****
Conduit Surcharge Summary

****

Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
1	0.01	0.01	0.01	0.08	0.01
P10-9	0.01	0.01	0.01	0.06	0.01
P13-12	0.01	0.01	0.01	0.09	0.01
P15-11	0.01	0.01	0.01	0.03	0.01
P18-9	0.01	0.01	0.01	0.06	0.01
P19-18	0.01	0.01	0.01	0.06	0.01
P20-19	0.01	0.01	0.01	0.15	0.01
P2-1	0.01	0.01	0.01	0.09	0.01
P3-2	0.01	0.01	0.01	0.08	0.01
P4-3	0.01	0.01	0.01	0.14	0.01
P5-4	0.01	0.01	0.01	0.13	0.01
P6-5	0.01	0.01	0.01	0.13	0.01
P7-6	0.01	0.01	0.01	0.12	0.01
P8-7	0.01	0.01	0.01	0.11	0.01
P9-8	0.01	0.01	0.01	0.07	0.01

Analysis begun on: Thu Jan 25 10:05:22 2018
Analysis ended on: Thu Jan 25 10:05:24 2018
Total elapsed time: 00:00:02

APPENDIX B

Minor System Analysis

Rational Method

Parker Lands LDS Network

Initial Time of Concentration: 10
Average Runoff Coefficient: 0.60

File No.:
Date: Jan 2018
User: IA

MANHOLE FROM	TO	AREAS ADDED					ADDED AREA (ha)	TOTAL AREA (ha)	COEFFICIENT OF RUNOFF C	ADDED A*C	CUMULATIVE A*C	TIME OF CONC. Tc	INTENSITY i	ADDED Q (l/s)	DESIGN Q (l/s)	SIZE (mm)	SLOPE (%)	CAPACITY (l/s)	VELOCITY (m/s)	LENGTH (m)	Cumulative Travel time min.	REMARKS
14	13	A1		R1			0.220	0.220	0.60	0.13	0.132	10.000	109.5	40.19	40.19	375	0.150	76.62	0.73	100.000	0.000	PVC
13	12	A2		R2			0.260	0.480	0.60	0.16	0.288	12.294	99.2	43.00	79.39	450	0.120	115.62	0.73	100.000	2.294	PVC
12	11	A3		A14		R3	0.430	0.910	0.60	0.26	0.546	14.565	90.8	65.14	137.85	600	0.145	270.82	0.98	83.690	4.565	PVC
16	15	A4		A8		R5	0.740	0.740	0.60	0.44	0.444	10.000	109.5	135.17	135.17	525	0.150	199.10	0.91	100.000	0.000	PVC
15	11	A5		A9		R6	0.840	1.580	0.60	0.50	0.948	11.833	101.1	141.60	266.34	675	0.150	336.06	0.91	65.000	1.833	CONC
11	10	A6	A10	A15		R4	0.820	3.310	0.60	0.49	1.986	15.992	86.3	118.07	476.59	1050	0.150	1091.72	1.22	90.173	5.992	CONC
17	10	A12	A23	A26		R8	1.330	1.330	0.60	0.80	0.798	10.000	109.5	242.94	242.94	675	0.150	336.06	0.91	65.000	0.000	CONC
10	9	A13	A16	A24		R7	1.090	5.730	0.60	0.65	3.438	17.222	82.8	150.58	791.57	1200	0.100	1272.65	1.09	79.549	7.222	CONC
21	20	A7	A17			R22	0.610	0.610	0.60	0.37	0.366	10.000	109.5	111.42	111.42	525	0.120	178.08	0.81	105.000	0.000	PVC
20	19	A11	A18	A19	A22	R21	0.790	1.400	0.60	0.47	0.840	12.152	99.7	131.42	232.90	600	0.200	318.06	1.15	70.000	2.152	PVC
19	18	A19	A21			R20	0.370	1.770	0.60	0.22	1.062	13.168	95.8	59.10	282.70	750	0.150	445.08	0.98	109.151	3.168	CONC
18	9	A25	A29			R19	0.900	2.670	0.60	0.54	1.602	15.032	89.3	134.04	397.66	900	0.120	647.34	0.99	75.000	5.032	CONC
9	8	A27	A28	A30	A32	R9	1.250	9.650	0.60	0.75	5.790	18.439	79.7	166.08	1282.12	1350	0.150	2133.85	1.44	132.722	8.439	CONC
8	7						0.000	9.650	0.60	0.00	5.790	19.970	76.0	0.00	1223.70	1350	0.150	2133.85	1.44	10.969	9.970	CONC
7	6	A33	A34				0.450	10.100	0.60	0.27	6.060	20.097	75.7	56.85	1275.99	1350	0.150	2133.85	1.44	81.948	10.097	CONC
6	5	A35	A36			R11	1.060	11.160	0.60	0.64	6.696	21.043	73.7	130.29	1371.78	1350	0.150	2133.85	1.44	80.000	11.043	CONC
5	4	A37	A38			R12	0.890	12.050	0.60	0.53	7.230	21.966	71.8	106.60	1443.29	1350	0.150	2133.85	1.44	100.000	11.966	CONC
4	3	A39	A40			R13	0.720	12.770	0.60	0.43	7.662	23.120	69.6	83.58	1482.41	1350	0.160	2203.83	1.49	55.000	13.120	CONC
INLET	25	A49					1.560	1.560	0.25	0.39	0.390	10.000	109.5	118.73	118.73	300	2.000	160.93	2.29	56.000	0.000	PVC
25	24	A47	A48			R18	0.620	2.180	0.60	0.37	1.308	10.408	107.5	111.17	390.88	675	0.300	475.26	1.29	80.000	0.408	CONC
24	23	A45	A46			R17	0.840	3.020	0.60	0.50	1.812	11.445	102.7	143.94	517.49	900	0.150	723.75	1.10	100.000	1.445	CONC
23	22A	A43	A44			R16	1.110	4.130	0.60	0.67	2.478	12.957	96.6	178.76	665.13	1050	0.100	891.39	1.00	100.000	2.957	CONC
22A	22	R15					0.190	4.320	0.60	0.11	2.592	14.628	90.6	28.72	652.91	1050	0.100	891.39	1.00	40.000	4.628	CONC
22	3	A42					0.220	4.540	0.60	0.13	2.724	15.297	88.5	32.46	669.81	1050	0.100	891.39	1.00	35.932	5.297	CONC
3	2	A41				R14	0.420	17.730	0.60	0.25	10.638	23.735	68.5	47.97	2025.14	1500	0.150	2826.07	1.55	70.000	13.735	CONC
2	Pond						0.000	17.730	0.60	0.00	10.638	24.488	67.2	0.00	1986.19	1500	0.150	2826.07	1.55	40.000	14.488	CONC

Total = 17.730

Design Basis:

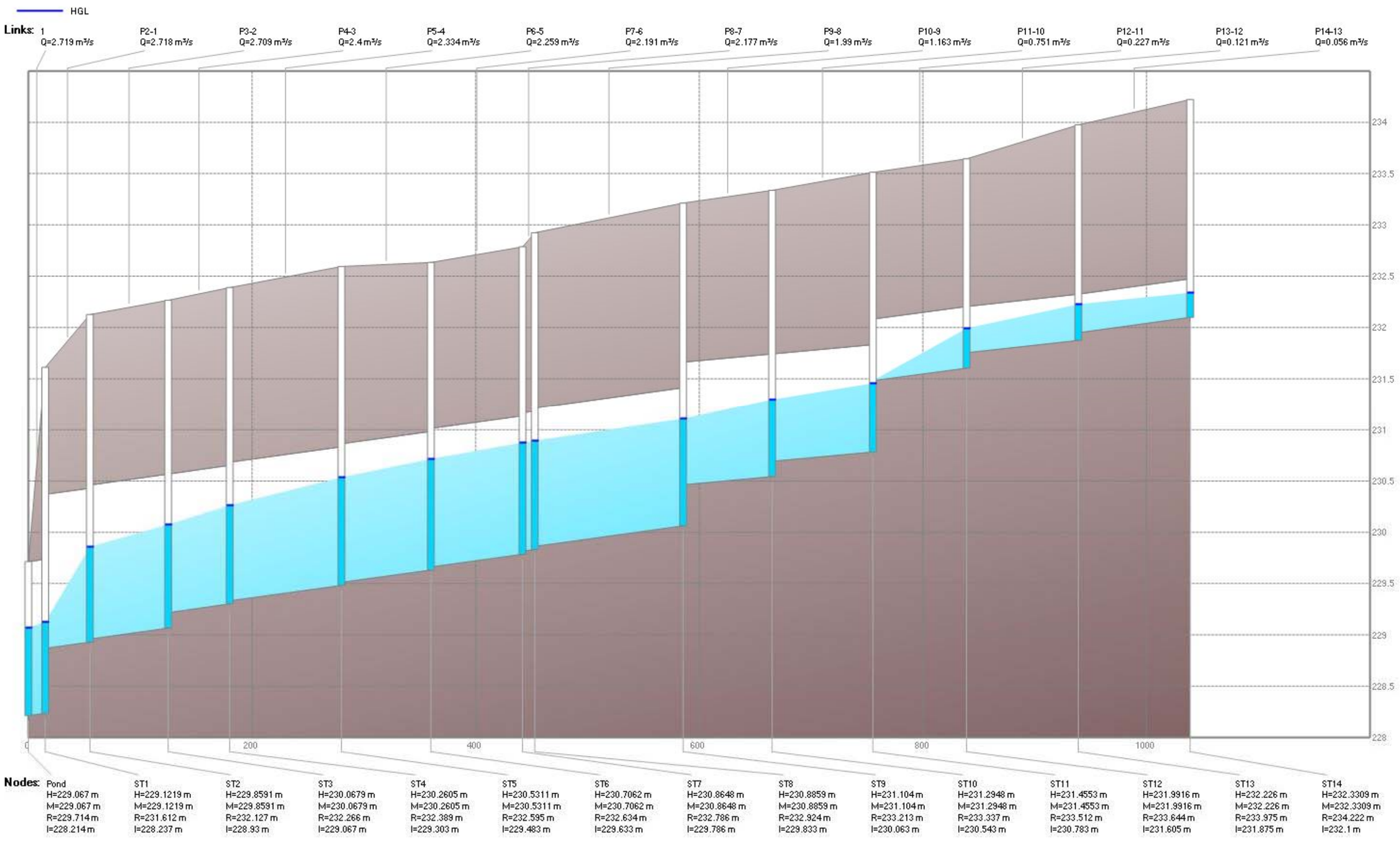
1.00 Minor storm system is designed on 5 year return period
2.00 Intensity for 5 year is 109.5 mm/h
3.00 Time of concentration is taken as 10 minutes.
4.00 Average coeefficient of runoff is recommended by City 0.60

Intensity Formula: $\frac{1199.00}{(Tc + 8)^{0.828}}$
City of Winnipeg

APPENDIX C

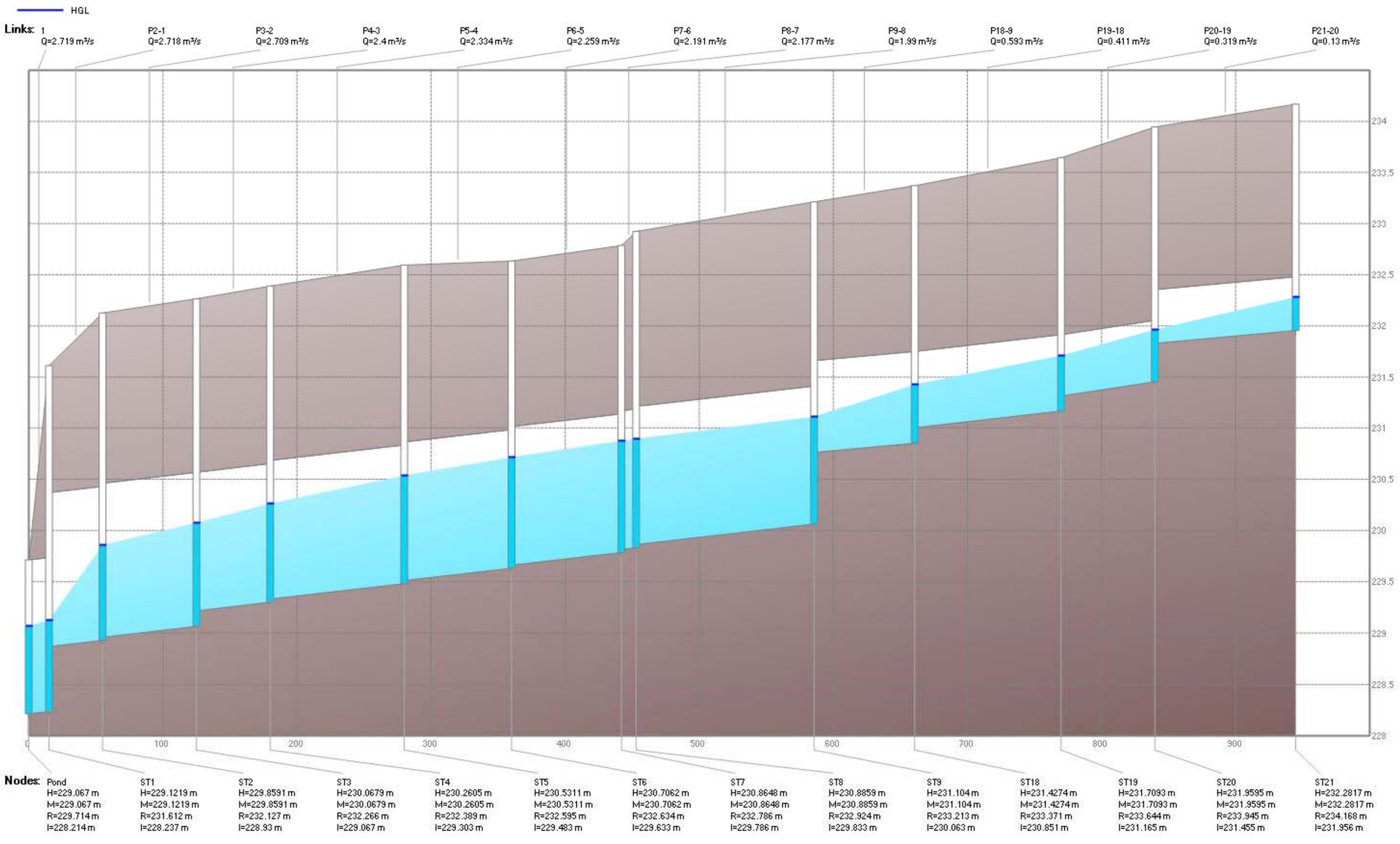
HGL Profile

HGL Profile from Pond to manhole ST14

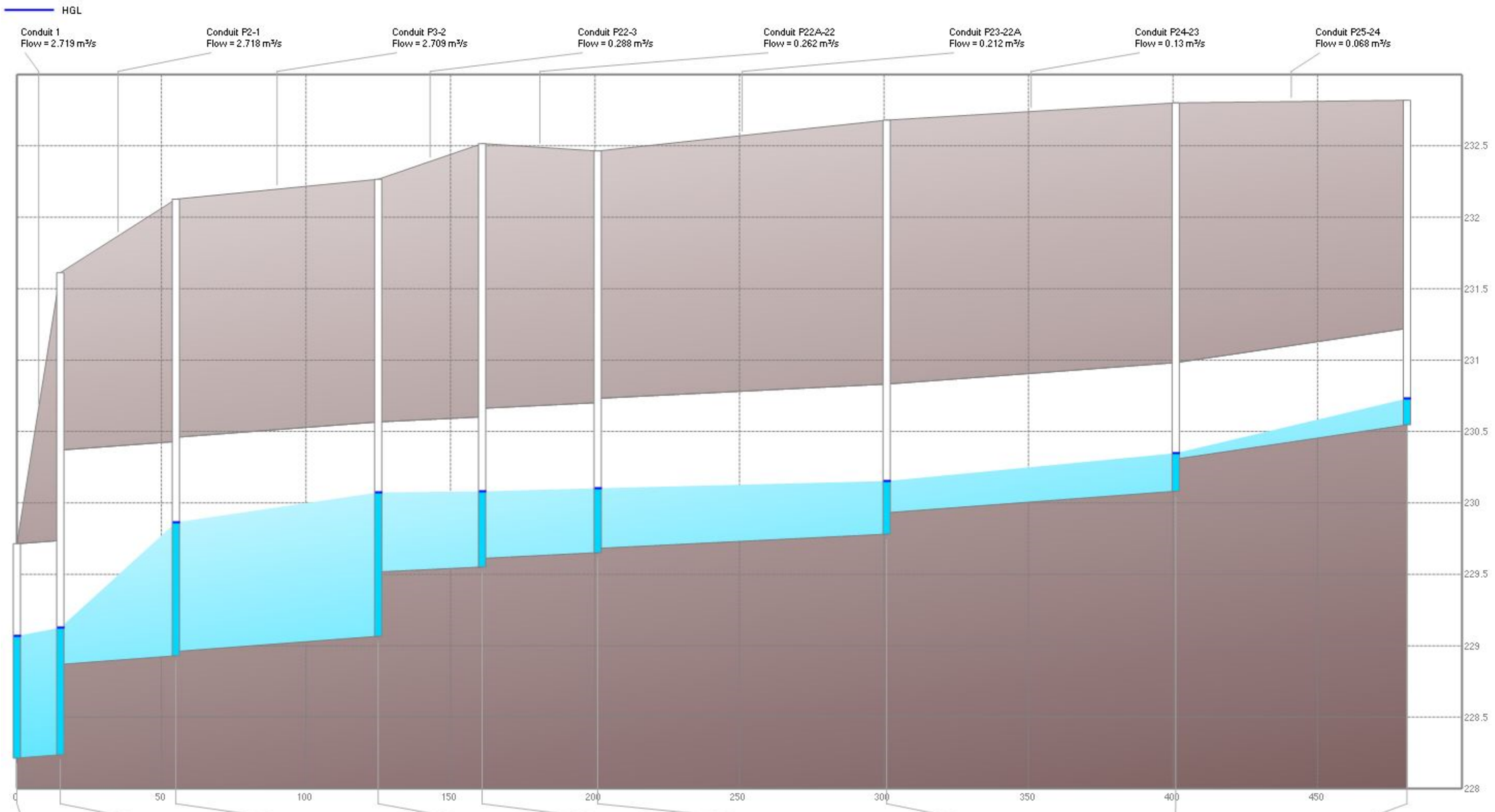


LGN Consulting Engineering Ltd.

HGL Profile from Pond to manhole ST21



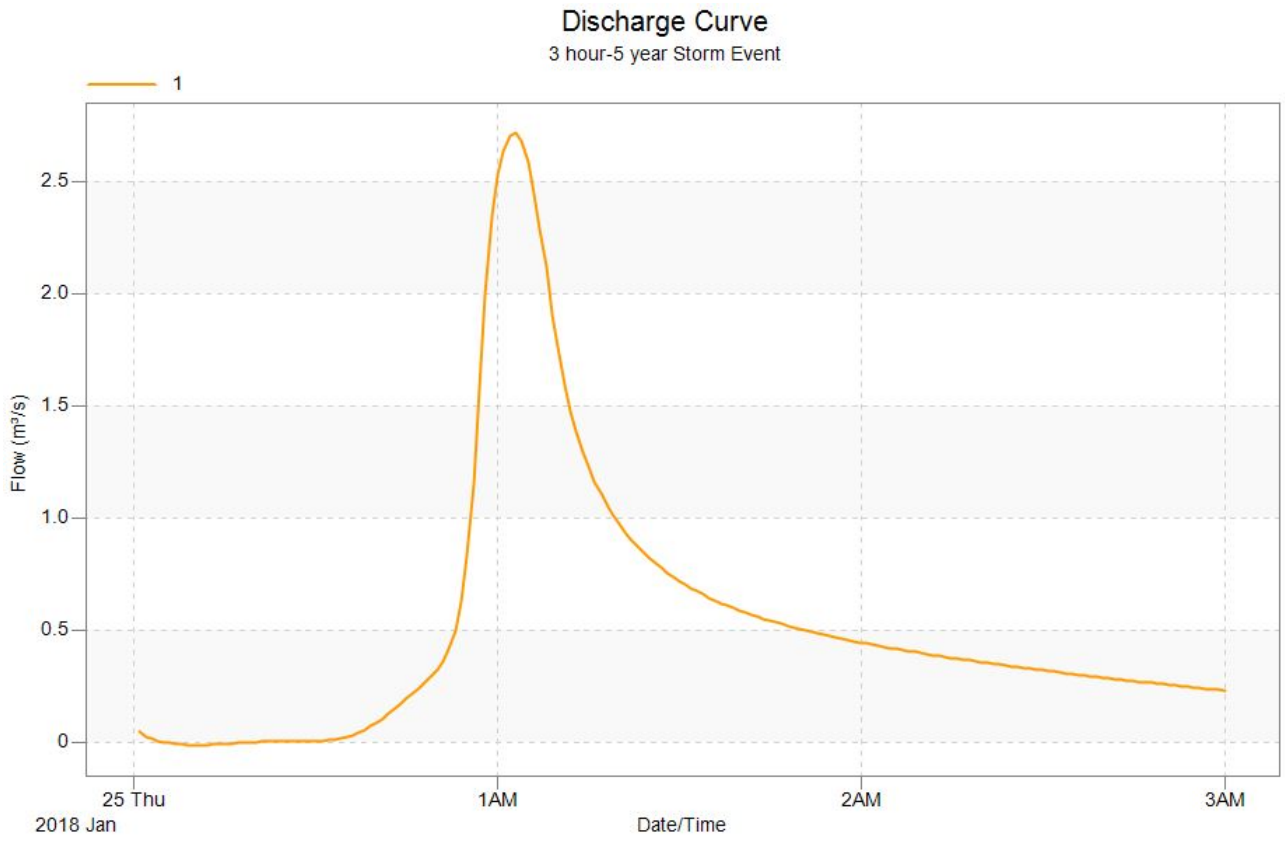
HGL Profile from Pond to manhole ST25

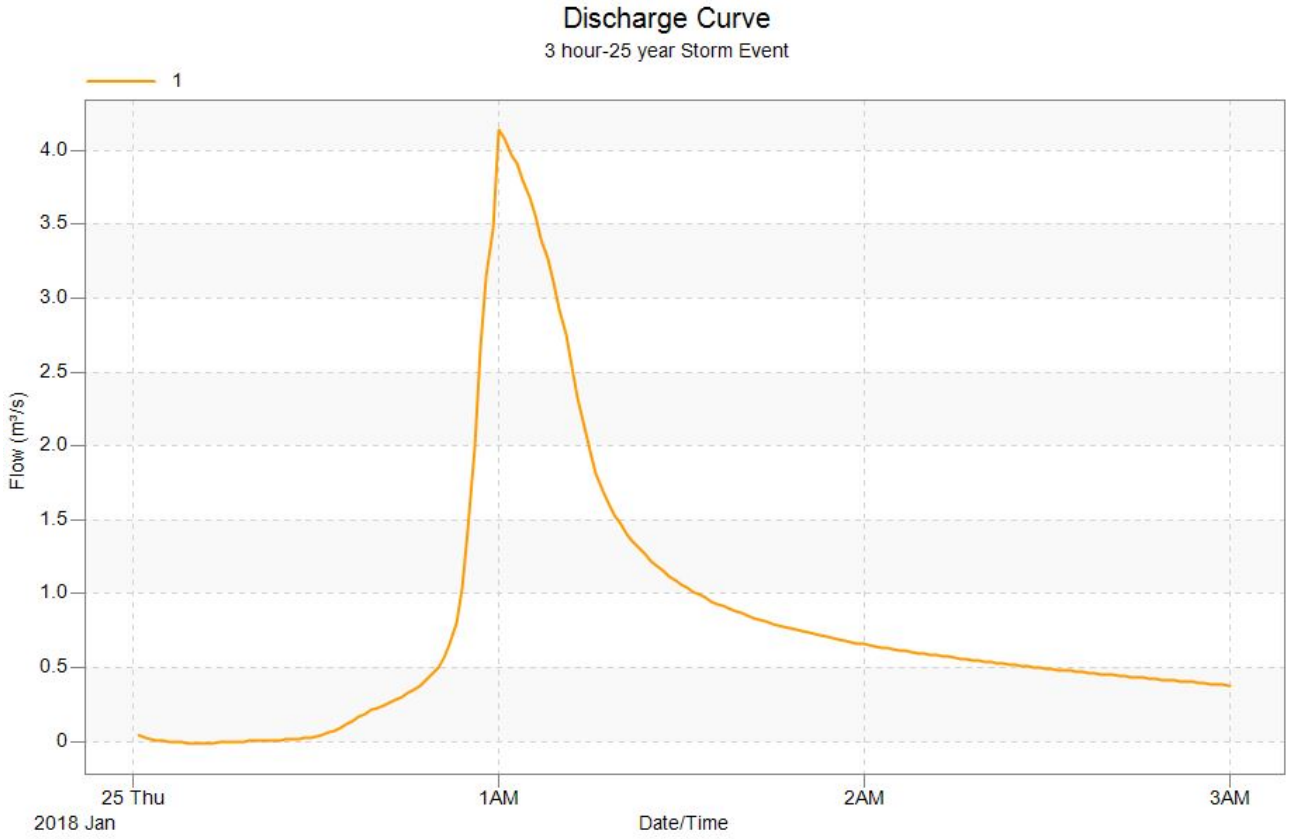


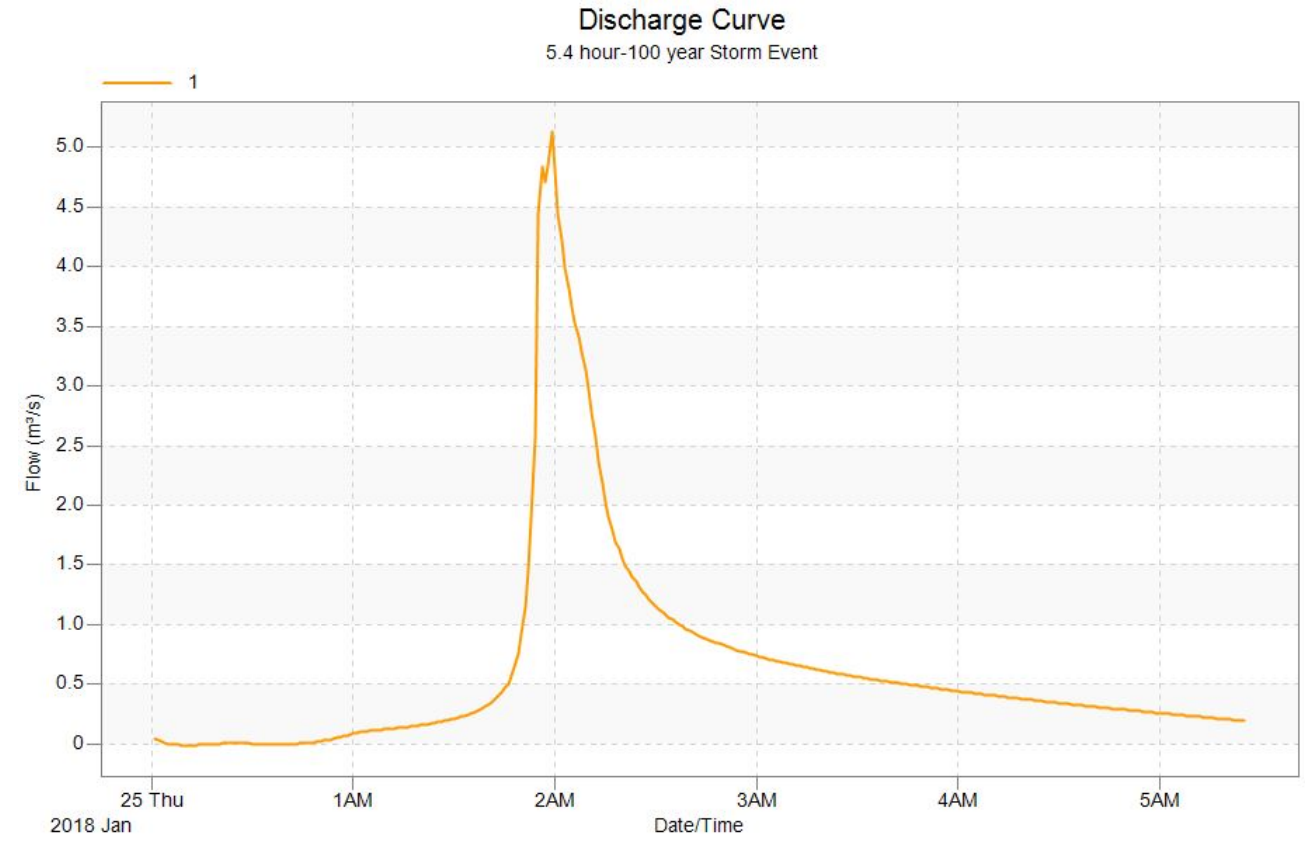
LGN Consulting Engineering Ltd.

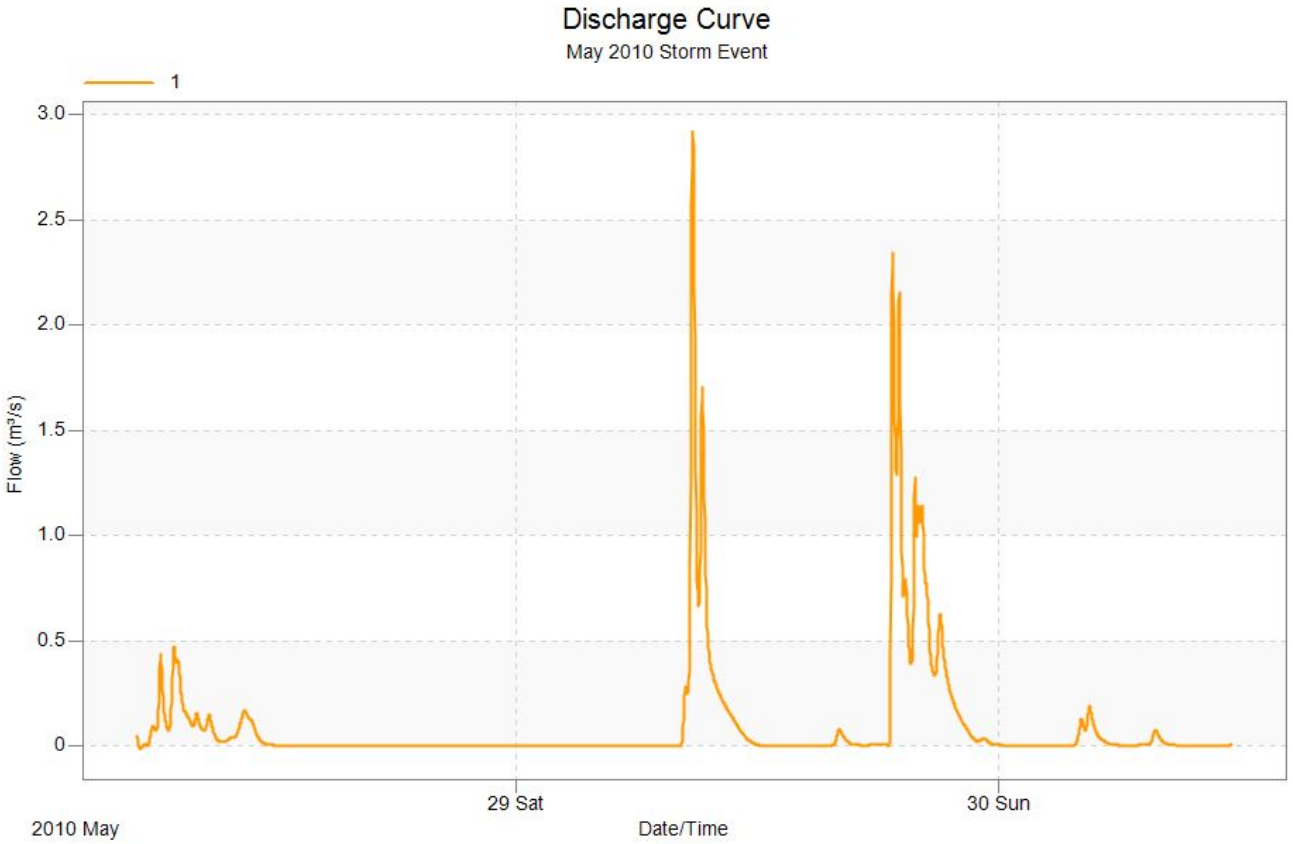
APPENDIX D

Discharge Curves


Discharge Curve
3 hour-5 year Storm Event
1
2.5
2.0
1.5
1.0
0.5
0
Flow (m³/s)
25 Thu
2018 Jan
1AM
2AM
3AM
Date/Time


Discharge Curve
3 hour-25 year Storm Event
1
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0
Flow (m³/s)
25 Thu
2018 Jan
1AM
2AM
3AM
Date/Time


Discharge Curve
5.4 hour-100 year Storm Event
1
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0
Flow (m³/s)
25 Thu
2018 Jan
1AM
2AM
3AM
4AM
5AM
Date/Time


Discharge Curve
May 2010 Storm Event
1
3.0
2.5
2.0
1.5
1.0
0.5
0
Flow (m³/s)
29 Sat
30 Sun
2010 May
Date/Time

Irshad Ahmad

From: LNarvaez@LGNeng.ca
Sent: Tuesday, January 16, 2018 7:12 AM
To: 'Jayakody, Swarna'
Cc: Irshad Ahmad; 'Gajda, Marek'
Subject: RE: Parker Lands MRS - Servicing Report Submission

Importance: High

Good morning Swarna,

Back in November we had a conference call with respect to the City comments to the Stormwater Management Plan prepared by LGN. I have been trying to meet your criteria and I am having great difficulty without going to very large pipes. Do you have some time today to chat with me and clarify some of the City requirements as far as stormwater management; I think it should not take more than 15 minutes. Please let me know when can I call you.

Your help is much appreciated, thank you,

LGN Consulting Engineering Ltd.
Luis G. Narvaez, B.Sc., P.Eng.
Senior Stormwater Engineer
(403) 975-0598
Please consider the environment before printing this email.

From: Gajda, Marek [mailto:mgajda@winnipeg.ca]
Sent: November 14, 2017 8:49 AM
To: Luis Narvaez <LNarvaez@LGNeng.ca>
Cc: 'Irshad Ahmad' <IAhmad@morrisonhershfield.com>; Jayakody, Swarna <SJayakody@winnipeg.ca>
Subject: RE: Parker Lands MRS - Servicing Report Submission

Hi Luis,

Sorry for the delay. We have a few options for a confcall today:

- 11:30am (CST)
- 1:30pm (CST)
- 3:30pm (CST)

Please let us know which time works for you.

Regards,

Marek Gajda
Services Development Engineer
Water and Waste Department
204 986 7626

From: Luis Narvaez [mailto:LNarvaez@LGNeng.ca]
Sent: Monday, November 13, 2017 12:54 PM
To: Gajda, Marek

Cc: 'Irshad Ahmad'
Subject: RE: Parker Lands MRS - Servicing Report Submission

Good morning Marek,

About a week ago I left you a voice mail requesting for a contact information of the person I should discuss with the stormwater comments. If is you, please let me know when is convenient for me to call you.

Thank you,

LGN Consulting Engineering Ltd.
Luis G. Narvaez, B.Sc., P.Eng.
Senior Stormwater Engineer
(403) 975-0598
Please consider the environment before printing this email.

From: Irshad Ahmad [mailto:IAhmad@morrisonhershfield.com]
Sent: November 2, 2017 9:40 AM
To: Luis Narvaez (LNarvaez@LGneng.ca) <LNarvaez@LGneng.ca>
Subject: FW: Parker Lands MRS - Servicing Report Submission

Hi Luis,
Please see below the Comments from City of Winnipeg on the storm repot. Let me know about your thoughts.
See attached as well.
Regards,
Irshad Ahmad

From: Gajda, Marek [mailto:mgajda@winnipeg.ca]
Sent: Wednesday, November 01, 2017 10:25 AM
To: Andrew Marquess <andrew.marquess@gemequities.ca>; Irshad Ahmad <IAhmad@morrisonhershfield.com>
Cc: Imy Kassam <IKassam@morrisonhershfield.com>
Subject: Parker Lands MRS - Servicing Report Submission

Hello Andrew and Irshad,

Sorry for the delay in providing feedback to the GEM Equities lands servicing report.

As a general comment, the overall Parker Lands Major Redevelopment Site (PLMRS) servicing design will need to be determined through the Secondary Plan process.

Wastewater servicing comments:

- Please align the wastewater sewer (WWS) south along the former Beaumont Right-of-Way (ROW)
  - Beaumont apparently remains open from Asquith/Hurst to Parcel J of Misc Plan 15011/1, so no easement would be needed in that area
  - It appears there is City land part of the stormwater retention basin parcel, between GEM land and this open portion of Beaumont—no easement would be needed there either
  - I will send an updated request to PPD asking for Parcel J of Misc Plan 15011/1 to remain with the City
- Water and Waste (WWD) is looking for the WWS to be aligned within City land from the proposed new ROW to the south, e.g. in a public reserve with a pedestrian & cycling path, rather than in an easement
- This report indicated that the Heatherdale ROW is closed between the former Beaumont ROW and Daniel St, but this was not part of DAC 1/2016
- We recommend the contractor for this development coordinate with Plenary Roads or Winnipeg Transit's contractor for works affecting the new South West Rapid Transitway infrastructure

- 4.2 – The number for population we calculated:
    - 240 Units at 3.05 ppl/unit = 732 people
    - 1502 Units at 2.30 ppl/unit = 3,455 people
    - Total people 4,187 not the 4797 in the report
- 4.2 – The flows seem to be based on 4797 people
- We will be holding this area to the maximum number of units used in the design. A revision to the report will be required if there is an increase in number of units.
- Figure 4A and 4B – See the above comments regarding the sewer from the GEM lands to approximately Heatherdale Ave. The new connection at Wynne St will not work as drawing. There is a Ø400 gas main and a LDS where the proposed MHs are. There is no space in the Parker Row for a new sewer. This report needs to show that the area around the BRT can be serviced either off the existing Ø300 in Parker or off the new pipe in Heatherdale Ave.
- Appendix B, Design Table – The population total population and flows are different from section 4.2. The total area does not match section 1.0. These need to be in agreement.

Water Servicing comments:
Morrison Hershfield had noted that the water portion had already been approved. Our comments referred to the concept to facilitate providing flow-pressures curves for the initial layout. Typically there is further review at the servicing report stage.

The GEM Equities lands servicing will need to be consistent with the overall PLMRS design.

Replacement of the north-south 250mm water main (WM) is to be limited to north of the new Hurst right-of-way.

After receiving preliminary comments from Winnipeg Transit, alignment of the north-south off-site 200mm water main needs to be along the former Beaumont right-of-way (rather than along Georgina St).

WWD is looking for the re-aligned water main connecting to the existing 250mm WM at the north boundary to be aligned within City land e.g. in a public reserve strip, rather than in an easement

Land Drainage servicing comments:
Site servicing report

Section 3:

- Change the 1st statement in the 2nd paragraph. There are additional analyses with different rainfalls in the report (in Appendix A).

Appendix A – Land Drainage Service Report

Section 2:

- Area 18.31 ha of residential development – The main report describes a different land use plan (the area value is different as well).
- 2nd bullet- 100 year and the May 2010 event

Section 2.2:

- 1st bullet- no image in the report.

Section 3.4:

- Table 2 – Use 50% imperviousness (as minimum) for residential developments. Where the density increases (units/Acre), use a reasonable value (higher than 50%).
- Provide the correct land use type for the catchments in the table.

Section 4.1:

- Storing 100 year on the residential streets is not acceptable.
- Inlet Control Devices are not acceptable in the residential streets.

Section 4.2:

- Table 5 – The data provided in the table is unclear. The volumes under the spill conditions are less than the volumes under the 100 year results and the depths exceed 0.3m as well.

- Table 6 – Include the relevant rainfall event in the table.

Section 4.3:

- Update the 100 year analysis with the given rainfall data attached.

Section 4.4: - The statement is unclear. If this would be for the off-site drainage flows, re-write the statement to clarify it.

Section 5.0 – 3rd bullet – " preventing any offsite discharge" – Is this spill flow over the trap lows, explain clearly?

Rational Analysis: The initial time of concentration should be 10 min.

Please contact me with any questions—I will re-direct your technical enquiries as required.

Regards,

Marek Gajda
Services Development Engineer
Water and Waste Department
204 986 7626

From: Andrew Marquess [mailto:andrew.marquess@gemequities.ca]
Sent: Wednesday, October 04, 2017 10:10 AM
To: Gajda, Marek
Cc: Irshad Ahmad; Imy Kassam
Subject: RE: Parker Lands Fill Permit

Marek,

Have you had a chance to review the report and make any comments if necessary?

Andrew

From: Andrew Marquess
Sent: Monday, September 11, 2017 4:10 PM
To: Gajda, Marek <mgajda@winnipeg.ca>
Cc: Geoff Zywina <geoff.zywina@gemequities.ca>; 'dshaw@winnipeg.ca' <dshaw@winnipeg.ca>; 'rkowal@winnipeg.ca' <rkowal@winnipeg.ca>; 'cmckay@winnipeg.ca' <cmckay@winnipeg.ca>; 'John Wintrup' <jwintrup@me.com>; 'Imy Kassam' <IKassam@morrisonhershfield.com>; Irshad Ahmad <IAhmad@morrisonhershfield.com>; James Platt (jplatt@winnipeg.ca) <jplatt@winnipeg.ca>; Kiernan, John <JKiernan@winnipeg.ca>
Subject: FW: Parker Lands Fill Permit

Hi Marek,

Thanks for the response.

I am attaching the final site servicing report for the site as prepared by Morrison Hershfield.

In speaking with Morrison Hershfield they are unaware of any engineering information that may be outstanding to process the permit application. I believe they will give you a call just to confirm this to be the case.

I am very interested in which City departments have concerns with the application. My understanding was that the main department to review the application was Water and Waste.

If other departments are reviewing the application, what information would be required by them to provide input into the permit application?

I or Chris Snelgrove have never been asked for any information other than the rough grading plan prepared by Morrison Hershfield.

Given that we are over 13 weeks into this permit application, I have received no other requests for information from other departments.

I look forward to hearing from you or if you are not the designated contact person for this application please put me in touch with the person responsible for this file.

Regards

Andrew

From: Gajda, Marek [mailto:mgajda@winnipeg.ca]
Sent: Monday, September 11, 2017 1:46 PM
To: John Wintrup <jwintrup@me.com>
Cc: Andrew Marquess <andrew.marquess@gemequities.ca>; Geoff Zywina <geoff.zywina@gemequities.ca>; Shaw, David <DShaw@winnipeg.ca>; Kowal, Richard <RKowal@winnipeg.ca>; McKay, Cynthia <CMckay@winnipeg.ca>
Subject: RE: Parker Lands Fill Permit

Hello John and Andrew,

Sorry for the delay in replying.

My understanding is multiple Departments have concerns with the proposed fill works. Water and Waste is conferring with Planning, Property and Development Department to ensure you receive a coordinated response. You will receive a follow up as soon as possible.

Regards,

Marek Gajda, P. Eng.
Services Development Engineer
Engineering Services Div., Water and Waste Department
City of Winnipeg

Phone: 204 986 7626
Email: mgajda@winnipeg.ca
Website: winnipeg.ca
Address: 110-1199 Pacific Avenue, Winnipeg, MB R3E 3S8

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recipient is strictly prohibited. If you have received this message in error, please notify the sender and permanently delete the complete message and any attachments. Thank you.

From: John Wintrup [mailto:jwintrup@me.com]
Sent: Monday, September 11, 2017 8:34 AM
To: Gajda, Marek
Cc: Andrew Marquess; Geoff Zywina; Shaw, David; Kowal, Richard; McKay, Cynthia
Subject: Re: Parker Lands Fill Permit
Importance: High

Good Morning Marek,

We understand you have been on holidays. We are looking to get un update on the Development Permit for fill on the Parker Lands. My clients have been seeking this permit since June and now nearby infrastructure projects need a neighbouring land owner to accept fill in a matter of days. Please let us know what, if any, additional information is required for this matter to processed as my client wishes to move forward with accepting fill on his privately owned lands.

Thanks!

John S. Wintrup

J.Wintrup Consulting Ltd.

> On Sep 5, 2017, at 9:27 AM, John Wintrup <jwintrup@me.com> wrote:
>
> Hi Marek,
>
> We would like to get this permit going, please let us know the status of the review.
>
> John S. Wintrup
>
> **J.Wintrup Consulting Ltd.**
>
> > On Sep 5, 2017, at 9:09 AM, McKay, Cynthia <CMckay@winnipeg.ca> wrote:
> >
> > Morning John,
> >
> > I'll defer your question to Marek Gajda whom I've cc'd in this email.
> >
> > <image001.jpg> **Cynthia McKay**
> > Senior Technologist III
> > Engineering, Water and Waste
> > City of Winnipeg
> >
> > Phone: 204-986-3484

Email: cmckay@winnipeg.ca
Website: winnipeg.ca
Address: 110-1199 Pacific Avenue, Winnipeg, MB R3E 3S8

<image002.jpg>

Connect with us:<image003.jpg> <image004.jpg>

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From: John Wintrup [mailto:jwintrup@me.com]
Sent: Monday, September 04, 2017 6:34 PM
To: McKay, Cynthia
Cc: Andrew Marquess; Geoff Zywina
Subject: Parker Lands Fill Permit

Hi Cynthia,

I am enquiring about the status of DP 17 137443 000 00 for the lands known colloquially as the 'Parker Lands' - see attached. It would appear the documents were submitted some 12 weeks ago, back on June 9, 2017.

My clients, the landowners, would like to understand what, if anything, remains outstanding for the City [Water & Waste] to review and issue this permit so work can lawfully begin on these privately owned lands.

Thanks!

John S. Wintrup

J.Wintrup Consulting Ltd.

Irshad Ahmad

From: Gajda, Marek <mgajda@winnipeg.ca>
Sent: Wednesday, June 14, 2017 10:12 AM
To: 'Luis Narvaez'
Cc: Imy Kassam; Irshad Ahmad
Subject: RE: Parker Lands

Hello Luis,

The Parker Lands Major Redevelopment Site is currently at the secondary plan preparation stage.

Design criteria for the GEM Equities portion of the relief SRB catchment have been provided to GEM Equities and previous engineering consultants for GEM Equities, but it would be worthwhile to highlight the following:

- The GEM Equities land area needs to be controlled to a 1.3m^3/s to the Regional Pond as per the Cockburn Calrossie Sewer Relief Work.
- Internal Sub-catchments need to be controlled to a 0.6 C value for the future condition.

To answer your questions:

1. The relief SRB dynamic hydraulic modelling has been carried out separately, but the GEM Equities lands modelling will need to include the 1:5yr, 1:25yr, 1:100yr design storms and May 2010 event in accordance with City of Winnipeg design requirements

2. Please see number 4

3. The typical commercial/multi-family residential site run-off control up to the 25 year event as described on the City's webpage, however due to the downstream restriction of 1.3m^3/s an assessment of the 100 yr event impact will be required as well. On site runoff control is typically done later at the permit application stage or at detailed design.

4. The proposed lateral land drainage system will need to be analysed with the Rational Method. With the Parker Pond, the 5 year event rise is about 1.1 m which is almost equal to our 25 year design water level rise criterion for a normal pond. Therefore, we recommend using a tailwater condition for the Parker Land LDS at or above 0.75m (as a minimum vs 5 yr rise) higher than the normal water level (227.70m).

Regards,

Marek Gajda
Services Development Engineer
Water and Waste Department
204 986 7626

From: Luis Narvaez [mailto:LNarvaez@LGNeng.ca]
Sent: Monday, June 12, 2017 1:10 PM
To: Gajda, Marek
Cc: 'Imy Kassam'; 'Irshad Ahmad'
Subject: Parker Lands

Good morning Marek,

I received your contact information from Irshad Ahmad. I am working on the SWM report for the Parker Lands and I would like to know if you could confirm the following:

1. Are the following storm events the only ones required for this type of report:
    a. 3 hour - 5 year
    b. 3 hour – 25 year
    c. May 2010 storm event (please provide me with a digital copy of the precipitation data)
2. The minor system I am analysing with the following flows:
    a. 70 L/s/ha for Single family residential and roads
    b. 110 L/s/ha for Multi-family sites
3. Are multifamily sites required to contain their runoff within the site? If yes, up to what return period?
4. Backwater effect analysed with pond at HWL (230.94 m) elevation

Your comments and suggestions are appreciated. Have a good day.

Thank you,

LGN Consulting Engineering Ltd.
Luis G. Narvaez, B.Sc., P.Eng.
Senior Stormwater Engineer
(403) 975-0598
Please consider the environment before printing this email.

Appendix B

1. **Wastewater Sewer Design Calculations**
2. **SFE Report**

Project: Parker Lands Updated Servcing Study
Table B.1 Sanitary System Design
Consultant: Morrison Hershfield Ltd.
Project No.: 3170097
Location: Winnipeg, Manitoba

Date: January 25, 2018

Design Criteria		
	Density	
Landuse	(Units/Hectare)	(People/Unit)
Single Family	12.29	3.05
Multi-Family	74.13	2.3
Manhole Drop @ Deflection < 45 deg (m)	0.03	
Manhole Drop @ deflection 45-90 deg (m)	0.06	
Groundwater Infiltration (L/ha/day)	2200	
Manhole Infiltration (L/min/manhole)	12	
Max. Manhole Spacing (m)	150	
Residential Manhole Density (MH/ha)	1.6	
Minimum Pipe Size (mm)	250	
Minimum Full Flow Velocity (m/s)	0.6	
Pipe Manning's n =	0.013	
Actual Per capita flow =	270	L/c/d

FROM MH	TO MH	AREA		RESIDENTIAL						AVERAGE FLOW	RESIDENTIAL HARMON'S PEAKING FACTOR	TOTAL PEAK FLOW	TOTAL SAG MHs	MH INFLOW	PIPE INFLOW /INFILT.	DESIGN FLOW	PIPE LENGTH	PIPE SIZE	SLOPE	[2] REQUIRED CAPACITY	DESIGN CAPACITY	PERCENT FULL (%)	FULL VELOCITY	U/S INVERT	D/S INVERT	TOTAL DROP	U/S RIM ELEV.	D/S RIM ELEV.	COVER TO U/S OBVERT	COVER TO D/S OBVERT	Notes
				Single Family UNITS		Multi-Family UNITS		POPULATION																						
		Initial	Cumulative	Initial	Cumulative	Initial	Cumulative	Initial	Cumulative																					
Label		(ha.)	(ha.)	(ea)	(ea)	(ea)	(ea)	(people)	(people)	(L/s)	1 + (14 / (4 + (P / 1000)$^{0.5}$))	(L/s)		(L/s)	(L/s)	(L/s)	(m)	(mm)	%	(L/s)	(L/s)		(m/s)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	
1	2	0.7	0.7	16	16	0	0	49	49	0.15	4.32	0.7	1	0.2	0.02	**0.9**	120.000	300	0.450	1.05	64.87	1%	0.92	231.485	230.945	0.030	235.82	235.10	4.03	3.85	
2	3	0.8	1.5	19	35	0	0	58	107	0.33	4.24	1.4	2	0.5	0.04	**1.9**	145.872	300	0.200	2.25	43.25	4%	0.61	230.915	230.623	0.060	235.10	234.56	3.88	3.64	
3	4	0.6	2.1	12	47	0	0	37	143	0.45	4.20	1.9	3	0.7	0.05	**2.6**	83.690	300	0.200	3.03	43.25	6%	0.61	230.563	230.396	0.030	234.56	234.29	3.70	3.59	
													0	0.0	0.00															
1	6	0.5	0.5	10	10	0	0	31	31	0.10	4.35	0.4	1	0.2	0.01	**0.6**	78.943	300	0.450	0.68	64.87	1%	0.92	231.485	231.130	0.060	235.82	235.41	4.03	3.98	
6	5	1.0	1.5	22	32	0	0	67	98	0.31	4.25	1.3	2	0.5	0.04	**1.8**	120.000	300	0.200	2.11	43.25	4%	0.61	231.070	230.830	0.030	235.41	235.01	4.04	3.88	
5	4	1.1	2.6	23	55	0	0	70	168	0.52	4.17	2.2	4	0.8	0.07	**3.1**	118.087	300	0.200	3.58	43.25	7%	0.61	230.800	230.564	0.060	235.01	234.29	3.91	3.43	
													0	0.0	0.00															
4	9	0.4	5.1	10	112	0	0	31	342	1.07	4.05	4.3	8	1.6	0.13	**6.1**	90.111	300	0.200	7.08	43.25	14%	0.61	230.366	230.186	0.030	234.29	233.87	3.62	3.38	
6	7	0.4	0.4	10	10	0	0	31	31	0.10	4.35	0.4	1	0.1	0.01	**0.5**	85.039	300	0.200	0.63	43.25	1%	0.61	231.070	230.900	0.060	235.41	234.97	4.04	3.77	
7	8	1.0	1.4	23	33	0	0	70	101	0.31	4.24	1.3	2	0.4	0.04	**1.8**	120.000	300	0.200	2.12	43.25	4%	0.61	230.840	230.600	0.030	234.97	234.54	3.83	3.64	
8	9	0.9	2.3	20	53	0	0	61	162	0.51	4.18	2.1	4	0.7	0.06	**2.9**	88.179	300	0.200	3.36	43.25	7%	0.61	230.570	230.393	0.060	234.54	233.87	3.67	3.18	
													0	0.0	0.00						0.00									
9	10	0.5	7.9	12	177	0	0	37	540	1.69	3.96	6.7	13	2.5	0.20	**9.4**	77.491	300	0.200	10.92	43.25	22%	0.61	230.156	230.001	0.075	233.87	233.53	3.41	3.23	
7	12	0.4	0.4	10	10	0	0	31	31	0.10	4.35	0.4	1	0.1	0.01	**0.5**	73.056	300	0.200	0.63	43.25	1%	0.61	230.840	230.694	0.060	234.97	234.49	3.83	3.50	
12	11	0.7	1.0	12	22	0	0	37	67	0.21	4.29	0.9	2	0.3	0.03	**1.3**	120.000	300	0.200	1.46	43.25	3%	0.61	230.634	230.394	0.030	234.49	234.20	3.56	3.51	
11	10	0.7	1.7	15	37	0	0	46	113	0.35	4.23	1.5	3	0.6	0.04	**2.1**	62.443	300	0.200	2.43	43.25	5%	0.61	230.364	230.239	0.075	234.20	233.53	3.54	2.99	
10	13	1.2	10.7	26	240	0	0	79	732	2.29	3.88	8.9	17	3.4	0.27	**12.6**	133.536	375	0.145	14.64	66.76	19%	0.60	229.926	229.732	0.030	233.53	233.53	3.23	3.42	
13	13A	0.0	10.7	0	240	0	0	0	732	2.29	3.88	8.9	17	3.4	0.27	**12.6**	10.988	375	0.145	14.64	66.76	19%	0.60	229.702	229.686	0.030	233.53	233.25	3.45	3.19	
13A	16	1.8	12.5	0	240	314	314	722	1454	4.54	3.69	16.8	20	4.0	0.32	**21.1**	140.822	375	0.145	24.52	66.76	32%	0.60	229.656	229.452	0.030	233.25	232.69	3.22	2.86	
16	17	1.0	13.5	0	240	188	502	432	1887	5.90	3.61	21.3	22	4.3	0.34	**25.9**	105.000	375	0.145	30.14	66.76	39%	0.60	229.422	229.270	0.030	232.69	232.33	2.89	2.69	
17	18	0.5	14.0	0	240	78	580	179	2066	6.46	3.57	23.1	22	4.5	0.36	**27.9**	70.000	375	0.145	32.46	66.76	42%	0.60	229.240	229.138	0.030	232.33	232.23	2.72	2.72	
18	19	0.6	14.6	0	240	168	748	386	2452	7.66	3.52	26.9	23	4.7	0.37	**32.0**	34.932	375	0.145	37.19	66.76	48%	0.60	229.108	229.058	0.030	232.23	232.67	2.75	3.24	
14	15	1.5	1.5	0	0	358	358	823	823	2.57	3.85	9.9	2	0.5	0.04	**10.4**	130.000	300	0.450	12.14	64.87	16%	0.92	230.093	229.508	0.030	233.58	232.98	3.19	3.17	
15	19	1.5	3.0	0	0	396	754	911	1734	5.42	3.63	19.7	5	1.0	0.08	**20.7**	150.000	300	0.250	24.09	48.35	43%	0.68	229.478	229.103	0.075	232.98	232.67	3.20	3.27	
19	20	0.0	17.6	0	240	0	1502	0	4187	13.08	3.32	43.4	28	5.6	0.45	**49.5**	53.804	375	0.145	57.50	66.76	74%	0.60	229.028	228.950	0.030	232.67	233.17	3.27	3.85	
20	21	0.0	17.6	0	240	0	1502	0	4187	13.08	3.32	43.4	28	5.6	0.45	**49.5**	140.000	375	0.145	57.50	66.76	74%	0.60	228.920	228.717	0.030	233.17	232.50	3.88	3.41	
21	22	0.0	17.6	44	284	0	1502	134	4321	13.50	3.30	44.6	28	5.6	0.45	**50.7**	62.450	375	0.145	58.92	66.76	76%	0.60	228.687	228.596	0.030	232.50	232.50	3.44	3.53	
22	23	0.0	17.6	4	288	0	1502	12	4333	13.54	3.30	44.7	28	5.6	0.45	**50.8**	61.166	375	0.145	59.05	66.76	76%	0.60	228.566	228.477	0.030	232.50	232.00	3.56	3.15	
22	23	0.0	17.6	0	288	202	1704	464	4797	14.99	3.26	48.9	28	5.6	0.45	**55.0**	150.000	375	0.145	63.91	66.76	82%	0.60	228.447	228.230	0.030	233.50	232.00	4.68	3.40	
23	25	0.0	17.6	0	288	0	1704	0	4797	14.99	3.26	48.9	28	5.6	0.45	**55.0**	150.000	375	0.145	63.91	66.76	82%	0.60	228.200	227.982	0.030	234.50	232.00	5.93	3.64	
25	26	0.0	17.6	0	288	0	1704	0	4797	14.99	3.26	48.9	28	5.6	0.45	**55.0**	150.000	375	0.145	63.91	66.76	82%	0.60	227.952	227.735	0.030	232.00	232.00	3.67	3.89	
26	27	0.0	17.6	0	288	0	1704	0	4797	14.99	3.26	48.9	28	5.6	0.45	**55.0**	150.000	375	0.145	63.91	66.76	82%	0.60	227.705	227.487	0.030	232.00	232.00	3.92	4.14	
27	28	0.0	17.6	0	288	0	1704	0	4797	14.99	3.26	48.9	28	5.6	0.45	**55.0**	43.782	375	0.145	63.91	66.76	82%	0.60	227.457	227.394	0.030	232.00	232.00	4.17	4.23	
28	29	0.0	17.6	0	288	0	1704	0	4797	14.99	3.26	48.9	28	5.6	0.45	**55.0**	20.509	375	0.145	63.91	66.76	82%	0.60	227.364	227.334	0.030	232.00	232.00	4.26	4.29	
29	Ex.MH	0.0	17.6	0	288	0	1704	0	4797	14.99	3.26	48.9	28	5.6	0.45	**55.0**	2.828	375	0.145	63.91	66.76	82%	0.60	227.304	**227.300**	0.030	232.00	232.07	4.32	4.39	
	CHECK	17.6		288		1704		4797																							

Notes:

1) Required Capacity=Q_{Design}/0.86

2) Pipe Costs include pipe, trenching, bedding, and backfill.

3) Population for the Parker lamds Subdivision is 4,187, Additional population is considered for the multifamily units south of BRT as per City of Winnipeg 2016 comments to make total popualation = 4,749

Final Report for

InfraCor Consulting Ltd.

Attn: Mr. Chris Follett, P. Eng.

Parker Avenue and Wynne Street, City of Winnipeg

Sanitary Sewer Flow Monitoring

May 2015 - July 2015

Prepared and submitted by:

SFE Global

10743 178th Street

Edmonton, Alberta T5S 1J6

Phone (780) 461-0171 Fax (780) 443-4613

Toll Free: 1-877-293-0173

August 14, 2015

Mr. Chris Follett, P. Eng.
InfraCor Consulting Ltd.
661 Century Street
Winnipeg, MB, R3H 0L9

FINAL REPORT: InfraCor - Parker and Wynne Street, Winnipeg
Sanitary Sewer Flow Monitoring
May 2015 - July 2015

Dear Mr. Follett,

Please find enclosed SFE's Final Report for the above mentioned project. If you have any questions, comments or concerns, please do not hesitate to contact us at your earliest convenience.

Thank you for having SFE conduct this work on your behalf. We are appreciative of the opportunity to work with you and your team on this project. We look forward to working together again in the near future.

Sincerely,
SFE Global

Nick Schellenberg
General Manager - Prairies
(780) 461-0171
nick.schellenberg@sfeglobal.com
www.sfeglobal.com

TABLE OF CONTENTS

1. INTRODUCTION **4**

2. FLOW MONITORING STATIONS **4**

3. QA/QC AND SAFETY STATEMENT **5**

4. DATA **5**

5. APPENDICES **5**

APPENDIX 1 ..... **6**

Area Velocity Flow Meters – Technical Information

APPENDIX 2 ..... **8**

Monitoring Station Site Book

APPENDIX 3 ..... **12**

Maintenance Sheet

1. Introduction

This report provides details of the sanitary sewer flow monitoring project conducted at Parker Avenue & Wynne Street, in the City of Winnipeg, Manitoba. SFE Global was retained by InfraCor Consulting Ltd., under the direction of Mr. Chris Follett, P. Eng. Mr. Nick Schellenberg represented SFE Global as Project Manager during this project.

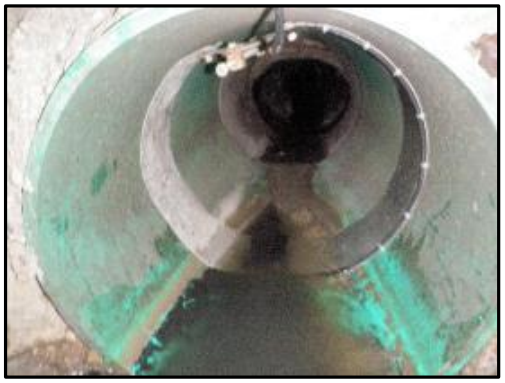
As requested, SFE installed one (1) sanitary sewer flow monitor to collect data for an anticipated two month duration. The station was installed May 8th 2015, and collected data until removal on July 10th 2015. The monitoring station is as follows:

Site #	Location	Meter Utilized
A14-184-01	Parker Avenue & Wynne Street	ISCO 2150 Area Velocity Flow Meter

2. Flow Monitoring Stations

Prior to installing flow monitoring stations, SFE performs detailed site assessments of each potential site to determine the acceptability of SFE's Custom Compound Weir. Factors such as pipe size, channel condition, site location, site access, and flow hydraulics were all considered and documented while performing site assessments. See Appendix #2 of this report for site assessment details.

SFE installed the flow monitoring station in accordance with the approved site assessment documentation. The meter was calibrated and set to log data at 5 minute intervals. SFE obtained and recorded corresponding meter and field readings during site installation, site maintenance visits, and site removal on the field maintenance sheet. These readings provided an indication of the accuracy and operation of the meter. See Appendix #3 of this report for the field report sheets detailing site inspection information, calibrations, and depth verifications.



Site A14-184-01 – Parker Avenue & Wynne Street

SFE installed an ISCO 2150 Area Velocity flow meter within the manhole to monitor flow from the 600mm diameter pipe. Flow was calculated using the continuity equation Q=VA by the flow meter's internal computer. Flow monitoring results were obtained for the complete monitoring duration. All equipment has been removed from the site.

3. QA/QC and Safety Statement

SFE confirms that all flow monitoring station were installed according to SFE's QA/QC methodology and protocol, and standard industry practice. All flow monitoring equipment and weir material has been removed from the site location.

SFE has a comprehensive Company Safety Manual and can be reviewed upon request.

Confined space entry procedures and general site/traffic safety was adhered to during site installation and site maintenance. SFE utilizes an approved rescue system, a 2800 CFM air induction device and four-gas air quality monitors. All of our staff members are thoroughly trained and certified in confined space entry procedures. Certificates are available upon request.

A thorough traffic control plan was established and used by SFE Global crews where required.

4. Data

Data collected during this project has previously been digitally reported via the GoData (www.godata.com) web-based monitoring system.

5. Appendices

Appendix #1	Includes technical information on Area Velocity Flow Meters
Appendix #2	Includes all site assessment sheets, site photos, and field set-up reports
Appendix #3	Includes site maintenance sheet and data

Report End
August 2015

SFE Global
Project A14-184

Appendix 1

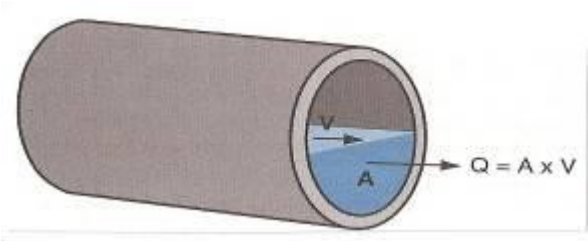
Area Velocity Flow Meters – Technical Information

Area Velocity Meter - Calibration & Verification of Monitor Sensors

Pipe Conduit Measurements

The measurement and condition of all sites were recorded during meter installation.

General Site Installation



Meter velocity was field calibrated according to the manufacturer's methodology and data was verified utilizing SFE Standard Protocol as outlined below.

Depth Verification

Depth verification was conducted at site and all data included on the field report. Five depth measurements from the meter and corresponding water depth are obtained simultaneously at sequential time intervals and recorded on the field worksheet. The lowest and highest measurements are discarded. The remaining three (3) measurements must be within 2.0 cm of each other. The averaged monitor reading must be within 5 % of the averaged field measurement to be acceptable.

Velocity Verification

Depth and velocity profiles were performed utilizing a Marsh McBirney Flow Mate point velocity meter. This instrument uses the Faraday principle to measure water velocity flowing over three electrodes. This allows an accurate velocity to be measured in a small area of the total flow.

SFE standard procedure is to use the 2-D method to determine average velocity. Numerous measurements are taken form the invert to water surface at the left, center and right thirds of the pipe. These measurements are averaged with the inclusion of readings taken from the upper left and right corner of flow.

SFE's alternate procedure when the pipe diameter is small or flow is sufficient is to use the .9-Vmax method. Point velocity readings are taken throughout the cross section of flow. The highest repeatable Velocity obtained is multiplied by 0.9 to determine average velocity. This average velocity is then correlated to the average velocity reading from the meter and must be within 10 %.

Appendix 2

Monitoring Station Site Book

Site Assessment Sheet

CLIENT FLOW MONITORING #:	1	SFE PROJECT #:	A14-184
NAME:	InfraCor - Park Ave & Wynne St - TFM	SFE SITE #:	A14-184-01

Project Specific Information

Client Name:	InfraCor Consulting Ltd.	
End User Name:	InfraCor Consulting Ltd.	
Project Name:	InfraCor - Park Ave & Wynne St - TFM	
Client Contact:	Chris Follett	204-918-0987
Field Contact:	Chris Follett	204-918-0987
SFE PM Contact:	Nick Schellenberg	204-999-3547
Site Maintenance	Monthly	

Site Equipment

Install / Removal Date:	8-May-15	10-Jul-15
Meter Make & Model:	ISCO 2151	
Meter I.D. - #1 and #2	208L00246	N/A
Wireless I.D # / Cell #:	N/A	N/A
Level / Velocity Type:	Submerged	AV Sensor
Sensor Mounting:	Scissor Band	
Primary Device:	Area Velocity	
Logging Rate / Call out:	5 minute	N/A

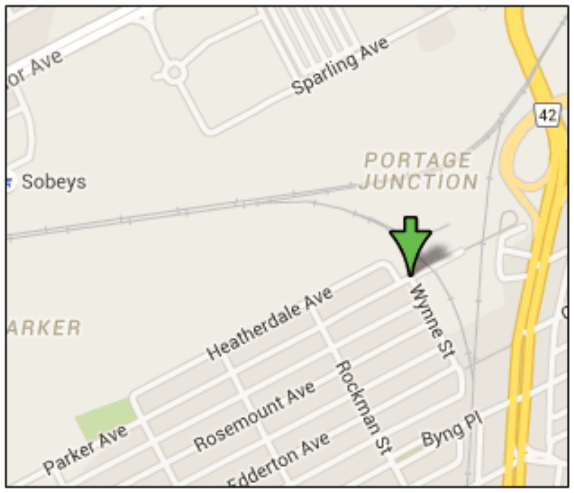
Site Location Information

Client Manhole #:	MH-18633	
Address (Location):	NE of Parker Ave. + Wynn St.	
City, Province:	Winnipeg, MB	
GPS (Lat - Long):	N49.8509854	W97.1554087
Landmarks:	Dead End of Road	
Traffic Control Req's:	Low	
Additional Information:	Near CN Rail Yard	

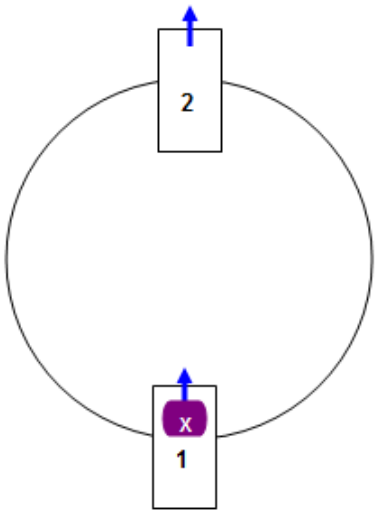
Site Profile

Manhole Depth (mm):	5500	Rungs?	Yes	
Overall Site Condition:	Fair			
Pipe Size (mm):	#1	600	#2	600
	#3	N/A	#4	N/A
Location of Sensor (which pipe?):	x =	1		
Overall Pipe Condition:	Good			
Additional Information:	VC-CS			

Map of Area



Manhole Layout



Site Pictures

CLIENT FLOW MONITORING #: 1
NAME: InfraCor - Park Ave & Wynne St - TFM
SFE PROJECT #: A14-184
SFE SITE #: A14-184-01

Site View

Site View

Downhole Install

Meter Closeup

Installation

Banding Setup

Area Velocity Install Sheet

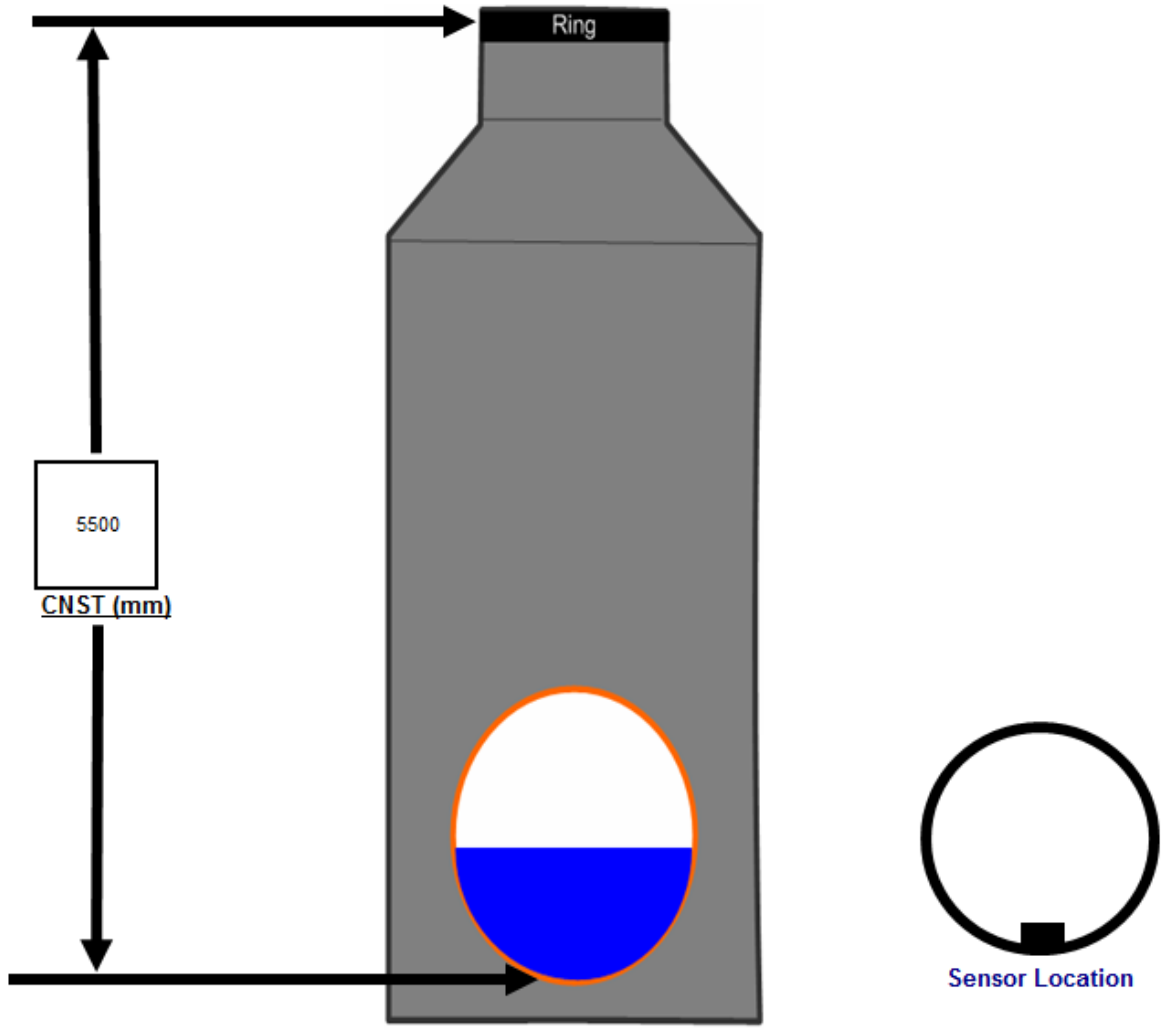
CLIENT FLOW MONITORING #: 1
NAME: InfraCor - Park Ave & Wynne St - TFM

SFE PROJECT #: A14-184
SFE SITE #: A14-184-01
Technician 1: Nick Schellenberg
Technician 2: Russell Hunter

Meter Depth vs.. Field Depth Calibration / Verification

Reading Number	Date (ddmmmyy)	Time (hh:mm)	Field Meas (mm)	Meter Depth (mm)	Comments (Zero Meter Level before Installation)
Initial	8-May-15	15:02	34	49	Calbrated
1	8-May-15	15:04	34	34	
2	8-May-15	15:06	34	33	
3	8-May-15	15:08	34	33	
Average			34	33	

** Three Continuous Measurements Within 20 mm.*
** Average Meter vs (WL1 and WL2) Within 5%*



Appendix 3

Maintenance Sheet

FIELD MAINTENANCE RECORD

PROJ. #:	A14-184
SFE SITE #:	A14-184-01
ADDRESS:	NE of Parker Ave + Wynn St
GPS:	N-49.851356, W-97.154199
SENSOR TYPE:	ISCO 2151
PRIMARY DEVICE:	AV

CONSTANTS		
D1 (mm):	N/A	D1-lip to x-bar
TOM (mm)	5500	Raw Weir L - lip to water
METER #	208L00246	DATE:
METER #		DATE:
METER #		DATE:

LEGEND	
DL - DOWNLOAD	**PC** - PROGRAM COMPLETE
CB - CHG BATTERY	**PM** - PROG. METER
V - VERIFY	**VIS** - VISUAL
LA - LEVEL ADJUST	**VP** - VELOCITY PROFILE
DO - DEPTH ONLY	**CD** - CHG DESICCANT

DATE	TIME	METER TIME	METER DEPTH	FIELD DEPTH	METER VEL	FIELD VEL-VIS	FLOW	BATT	SILT	Raw Weir L	Sensor Cleaned	MTC BY	COMMENTS
DDMMMYY	HH:MM	HH:MM	mm	mm	m/s	m/s	lps	V	mm	mm	(y/n)	(INIT.)	
8-May-15	15:08	15:08	33	34	0.46	0.4	3.2	12.1	0	N/A		NS	Install Site - DL/V/LA/CB/CD
11-May-15	9:17	9:17	29	28	0.45	0.4	2.05	11.8	0	NA		RSH	DL/V
25-May-15	11:04	11:04	31	31	0.576	0.4	3.02	11.44	0	N/A		RSH	DL/V/CB
9-Jun-15	12:30	12:30	29	29	0.413	0.4	2.34	11.09	0	N/A		RSH	DL/V
10-Jul-15	14:33	14:33	33	35	0.382	0.35	2.204	10.16	0	N/A		RSH	DL/V - Removed

DATE:	NOTES:

Appendix C

1. Water Distribution Model Results
2. Demands Simulation flow and Pressure Curves
3. Email Correspondence

Active Scenario: MDD+FF
Parkerlands Hydraulic Network Analysis - 3170097
Scenario Summary Report
Scenario: MDD+FF

Scenario Summary	
ID	72
Label	MDD+FF
Notes	
Active Topology	<I> Base Active Topology
Physical	Base Physical
Demand	MDD
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	200-100 L/s FF
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	Fire Flow Analysis
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary			
Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.001	Start Time	12:00:00 AM
Trials	40	Calculation Type	Fire Flow

Active Scenario: MDD+FF

Parkerlands Hydraulic Network Analysis - 3170097

Fire Flow Node FlexTable: Fire Flow Report

Label	Fire Flow Iterations	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated System Lower Limit) (kPa)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?
J-1	4	True	100.00	224.95	100.38	225.33	140	140	214	J-14	True
J-2	4	True	100.00	271.72	100.43	272.15	140	140	149	J-1	True
J-3	2	True	100.00	300.00	100.46	300.46	140	220	212	J-14	True
J-4	3	True	100.00	300.00	100.48	300.48	140	186	204	J-5	True
J-5	3	True	200.00	300.00	201.23	301.23	140	141	169	J-6	True
J-6	4	True	200.00	288.66	204.22	292.88	140	140	190	J-5	True
J-7	4	True	200.00	298.32	201.64	299.96	140	140	157	J-8	True
J-8	3	True	200.00	300.00	202.97	302.97	140	143	154	J-7	True
J-9	4	True	200.00	283.92	204.41	288.33	140	140	177	J-10	True
J-10	4	True	200.00	285.30	201.52	286.82	140	140	174	J-9	True
J-11	4	True	100.00	266.98	100.28	267.26	140	140	244	J-14	True
J-12	3	True	100.00	300.00	100.42	300.42	140	192	198	J-14	True
J-13	4	True	100.00	265.98	100.45	266.43	140	140	148	J-14	True
J-14	4	True	100.00	222.52	100.31	222.83	140	140	227	J-13	True
J-19	3	True	100.00	300.00	100.00	300.00	140	191	210	J-12	True

Active Scenario: MDD+FF

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Junction Table

ID	Label	Elevation (m)	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Maximum) (kPa)	Pressure (Minimum) (kPa)
29	J-1	235.40	<Collection: 1 items>	0.38	279.17	428	140	428	428
30	J-2	235.20	<Collection: 1 items>	0.43	279.17	430	140	430	430
31	J-3	235.20	<Collection: 1 items>	0.46	279.18	430	220	430	430
32	J-4	235.00	<Collection: 1 items>	0.48	279.17	432	186	432	432
33	J-5	234.20	<Collection: 1 items>	1.23	279.14	440	141	440	440
34	J-6	234.00	<Collection: 1 items>	4.22	279.12	442	140	442	442
35	J-7	233.00	<Collection: 1 items>	1.64	279.11	451	140	451	451
36	J-8	233.20	<Collection: 1 items>	2.97	279.11	449	143	449	449
37	J-9	234.00	<Collection: 1 items>	4.41	279.11	442	140	442	442
38	J-10	234.20	<Collection: 1 items>	1.52	279.12	440	140	440	440
39	J-11	235.60	<Collection: 1 items>	0.28	279.17	426	140	426	426
40	J-12	235.80	<Collection: 1 items>	0.42	279.17	424	192	424	424
41	J-13	236.20	<Collection: 1 items>	0.45	279.17	421	140	421	421
42	J-14	236.40	<Collection: 1 items>	0.31	279.17	419	140	419	419
99	J-19	234.93	<Collection: 0 items>	0.00	279.16	433	191	433	433

Active Scenario: MDD+FF

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pipe Table

ID	Label	Has User Defined Length?	Length (User Defined) (m)	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Headloss (m)
45	P-2	False	0	83	J-1	J-2	200.0	PVC	120.0	0.000	-1.47	0.05	0.022	0.00
46	P-3	False	0	90	J-2	J-3	200.0	PVC	120.0	0.000	-3.42	0.11	0.103	0.01
47	P-4	False	0	90	J-3	J-4	250.0	PVC	130.0	0.000	9.48	0.19	0.199	0.02
48	P-5	False	0	140	J-4	J-5	250.0	PVC	130.0	0.000	9.00	0.18	0.181	0.03
49	P-6	False	0	148	J-5	J-6	250.0	PVC	130.0	0.000	7.77	0.16	0.137	0.02
50	P-7	False	0	174	J-6	J-7	250.0	PVC	130.0	0.000	3.55	0.07	0.032	0.01
51	P-8	False	0	45	J-7	J-8	250.0	PVC	130.0	0.000	1.91	0.04	0.010	0.00
52	P-9	False	0	165	J-8	J-9	250.0	PVC	130.0	0.000	-1.06	0.02	0.003	0.00
53	P-10	False	0	143	J-9	J-10	250.0	PVC	130.0	0.000	-5.47	0.11	0.072	0.01
55	P-12	False	0	84	J-11	J-12	200.0	PVC	120.0	0.000	-0.28	0.01	0.001	0.00
56	P-13	False	0	86	J-12	J-13	200.0	PVC	120.0	0.000	-1.85	0.06	0.033	0.00
57	P-14	False	0	76	J-13	J-14	200.0	PVC	120.0	0.000	-0.78	0.02	0.007	0.00
58	P-15	False	0	274	J-14	J-1	200.0	PVC	120.0	0.000	-1.09	0.03	0.012	0.00
59	P-16	False	0	191	J-4	J-11	200.0	PVC	120.0	0.000	0.00	0.00	0.000	0.00
60	P-17	False	0	220	J-3	J-12	250.0	PVC	130.0	0.000	5.85	0.12	0.081	0.02
61	P-18	False	0	249	J-2	J-13	200.0	PVC	120.0	0.000	1.52	0.05	0.023	0.01
86	P-25	True	1	24	R-1	PMP-1	250.0	PVC	130.0	0.000	19.20	0.39	0.744	0.00
90	P-28	True	1	23	R-2	PMP-2	250.0	PVC	130.0	0.000	0.00	0.00	0.000	0.00
92	P-29	True	1	23	R-3	PMP-3	200.0	PVC	120.0	0.000	0.00	0.00	0.000	0.00
100	P-31	False	0	185	PMP-2	J-19	250.0	PVC	130.0	0.000	0.00	0.00	0.000	0.00
101	P-32	False	0	81	J-19	J-12	250.0	PVC	130.0	0.000	-6.99	0.14	0.113	0.01
102	P-33	False	0	280	J-19	J-10	250.0	PVC	130.0	0.000	6.99	0.14	0.113	0.03
117	P-35	False	0	209	PMP-1	J-3	250.0	PVC	130.0	0.000	19.20	0.39	0.735	0.15
119	P-36	False	0	365	PMP-3	J-8	200.0	PVC	120.0	0.000	0.00	0.00	0.000	0.00

Active Scenario: MDD+FF

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pump Table

ID	Label	Elevation (m)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (m)	Hydraulic Grade (Discharge) (m)	Flow (Total) (L/s)	Pump Head (m)
85	PMP-1	232.74	Taylor Cambridge MDD	On	232.84	279.34	19.20	46.50
88	PMP-2	232.94	Cooney Parker MDD	On	233.04	279.16	0.00	0.00
91	PMP-3	232.00	Daniel Parker MDD	On	232.10	279.11	0.00	0.00

Active Scenario: MDD+FF

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Reservoir Table

ID	Label	Elevation (m)	Flow (Out net) (L/s)	Hydraulic Grade (m)
68	R-1	232.84	19.20	232.84
69	R-2	233.04	0.00	233.04
70	R-3	232.10	0.00	232.10

Active Scenario: PHD
Parkerlands Hydraulic Network Analysis - 3170097
Scenario Summary Report
Scenario: PHD

Scenario Summary

ID	74
Label	PHD
Notes	
Active Topology	<I> Base Active Topology
Physical	Base Physical
Demand	PHD
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	<I> Base
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	<I> Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary

Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.001	Start Time	12:00:00 AM
Trials	40	Calculation Type	Hydraulics Only

Active Scenario: PHD

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Junction Table

ID	Label	Elevation (m)	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Maximum) (kPa)	Pressure (Minimum) (kPa)
29	J-1	235.40	<Collection: 1 items>	0.59	278.73	424	(N/A)	424	424
30	J-2	235.20	<Collection: 1 items>	0.68	278.74	426	(N/A)	426	426
31	J-3	235.20	<Collection: 1 items>	0.72	278.76	426	(N/A)	426	426
32	J-4	235.00	<Collection: 1 items>	0.74	278.72	428	(N/A)	428	428
33	J-5	234.20	<Collection: 1 items>	1.92	278.66	435	(N/A)	435	435
34	J-6	234.00	<Collection: 1 items>	6.59	278.61	437	(N/A)	437	437
35	J-7	233.00	<Collection: 1 items>	2.57	278.60	446	(N/A)	446	446
36	J-8	233.20	<Collection: 1 items>	4.64	278.60	444	(N/A)	444	444
37	J-9	234.00	<Collection: 1 items>	6.89	278.60	436	(N/A)	436	436
38	J-10	234.20	<Collection: 1 items>	2.37	278.62	435	(N/A)	435	435
39	J-11	235.60	<Collection: 1 items>	0.44	278.72	422	(N/A)	422	422
40	J-12	235.80	<Collection: 1 items>	0.66	278.72	420	(N/A)	420	420
41	J-13	236.20	<Collection: 1 items>	0.70	278.72	416	(N/A)	416	416
42	J-14	236.40	<Collection: 1 items>	0.48	278.73	414	(N/A)	414	414
99	J-19	234.93	<Collection: 0 items>	0.00	278.70	428	(N/A)	428	428

Active Scenario: PHD

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pipe Table

ID	Label	Has User Defined Length?	Length (User Defined) (m)	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Headloss (m)
45	P-2	False	0	83	J-1	J-2	200.0	PVC	120.0	0.000	-2.29	0.07	0.049	0.00
46	P-3	False	0	90	J-2	J-3	200.0	PVC	120.0	0.000	-5.34	0.17	0.236	0.02
47	P-4	False	0	90	J-3	J-4	250.0	PVC	130.0	0.000	14.80	0.30	0.454	0.04
48	P-5	False	0	140	J-4	J-5	250.0	PVC	130.0	0.000	14.06	0.29	0.412	0.06
49	P-6	False	0	148	J-5	J-6	250.0	PVC	130.0	0.000	12.14	0.25	0.314	0.05
50	P-7	False	0	174	J-6	J-7	250.0	PVC	130.0	0.000	5.55	0.11	0.074	0.01
51	P-8	False	0	45	J-7	J-8	250.0	PVC	130.0	0.000	2.98	0.06	0.023	0.00
52	P-9	False	0	165	J-8	J-9	250.0	PVC	130.0	0.000	-1.66	0.03	0.008	0.00
53	P-10	False	0	143	J-9	J-10	250.0	PVC	130.0	0.000	-8.55	0.17	0.164	0.02
55	P-12	False	0	84	J-11	J-12	200.0	PVC	120.0	0.000	-0.44	0.01	0.002	0.00
56	P-13	False	0	86	J-12	J-13	200.0	PVC	120.0	0.000	-2.89	0.09	0.076	0.01
57	P-14	False	0	76	J-13	J-14	200.0	PVC	120.0	0.000	-1.22	0.04	0.015	0.00
58	P-15	False	0	274	J-14	J-1	200.0	PVC	120.0	0.000	-1.70	0.05	0.028	0.01
59	P-16	False	0	191	J-4	J-11	200.0	PVC	120.0	0.000	0.00	0.00	0.000	0.00
60	P-17	False	0	220	J-3	J-12	250.0	PVC	130.0	0.000	9.13	0.19	0.186	0.04
61	P-18	False	0	249	J-2	J-13	200.0	PVC	120.0	0.000	2.37	0.08	0.052	0.01
86	P-25	True	1	24	R-1	PMP-1	250.0	PVC	130.0	0.000	29.99	0.61	1.674	0.00
90	P-28	True	1	23	R-2	PMP-2	250.0	PVC	130.0	0.000	0.00	0.00	0.000	0.00
92	P-29	True	1	23	R-3	PMP-3	200.0	PVC	120.0	0.000	0.00	0.00	0.000	0.00
100	P-31	False	0	185	PMP-2	J-19	250.0	PVC	130.0	0.000	0.00	0.00	0.000	0.00
101	P-32	False	0	81	J-19	J-12	250.0	PVC	130.0	0.000	-10.92	0.22	0.259	0.02
102	P-33	False	0	280	J-19	J-10	250.0	PVC	130.0	0.000	10.92	0.22	0.259	0.07
117	P-35	False	0	209	PMP-1	J-3	250.0	PVC	130.0	0.000	29.99	0.61	1.679	0.35
119	P-36	False	0	365	PMP-3	J-8	200.0	PVC	120.0	0.000	0.00	0.00	0.000	0.00

Active Scenario: PHD

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pump Table

ID	Label	Elevation (m)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (m)	Hydraulic Grade (Discharge) (m)	Flow (Total) (L/s)	Pump Head (m)
85	PMP-1	232.74	Taylor Cambridge MDD	On	232.84	279.11	29.99	46.27
88	PMP-2	232.94	Cooney Parker MDD	On	233.04	278.70	0.00	0.00
91	PMP-3	232.00	Daniel Parker MDD	On	232.10	278.60	0.00	0.00

Active Scenario: PHD

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Reservoir Table

ID	Label	Elevation (m)	Flow (Out net) (L/s)	Hydraulic Grade (m)
68	R-1	232.84	29.99	232.84
69	R-2	233.04	0.00	233.04
70	R-3	232.10	0.00	232.10

Active Scenario: MDD+200FF@J-5
Parkerlands Hydraulic Network Analysis - 3170097
Scenario Summary Report
Scenario: MDD+200FF@J-5

Scenario Summary

ID	108
Label	MDD+200FF@J-5
Notes	
Active Topology	<I> Base Active Topology
Physical	<I> Base Physical
Demand	MDD+200FF @J-5
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	Base
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary

Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.001	Start Time	12:00:00 AM
Trials	40	Calculation Type	Hydraulics Only

Active Scenario: MDD+200FF@J-5

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Junction Table

ID	Label	Elevation (m)	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Maximum) (kPa)	Pressure (Minimum) (kPa)
29	J-1	235.40	<Collection: 1 items>	0.38	268.76	327	(N/A)	327	327
30	J-2	235.20	<Collection: 1 items>	0.43	268.77	329	(N/A)	329	329
31	J-3	235.20	<Collection: 1 items>	0.46	268.82	329	(N/A)	329	329
32	J-4	235.00	<Collection: 1 items>	0.48	267.31	316	(N/A)	316	316
33	J-5	234.20	<Collection: 2 items>	201.23	263.71	289	(N/A)	289	289
34	J-6	234.00	<Collection: 1 items>	4.22	264.91	302	(N/A)	302	302
35	J-7	233.00	<Collection: 1 items>	1.64	266.47	328	(N/A)	328	328
36	J-8	233.20	<Collection: 1 items>	2.97	266.89	330	(N/A)	330	330
37	J-9	234.00	<Collection: 1 items>	4.41	267.32	326	(N/A)	326	326
38	J-10	234.20	<Collection: 1 items>	1.52	267.76	328	(N/A)	328	328
39	J-11	235.60	<Collection: 1 items>	0.28	268.27	320	(N/A)	320	320
40	J-12	235.80	<Collection: 1 items>	0.42	268.70	322	(N/A)	322	322
41	J-13	236.20	<Collection: 1 items>	0.45	268.73	318	(N/A)	318	318
42	J-14	236.40	<Collection: 1 items>	0.31	268.74	316	(N/A)	316	316
99	J-19	234.93	<Collection: 0 items>	0.00	268.70	331	(N/A)	331	331

Active Scenario: MDD+200FF@J-5

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pipe Table

ID	Label	Has User Defined Length?	Length (User Defined) (m)	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Headloss (m)
45	P-2	False	0	83	J-1	J-2	200.0	PVC	120.0	0.000	-3.64	0.12	0.116	0.01
46	P-3	False	0	90	J-2	J-3	200.0	PVC	120.0	0.000	-8.50	0.27	0.559	0.05
47	P-4	False	0	90	J-3	J-4	250.0	PVC	130.0	0.000	103.83	2.12	16.744	1.51
48	P-5	False	0	140	J-4	J-5	250.0	PVC	130.0	0.000	131.13	2.67	25.800	3.61
49	P-6	False	0	148	J-5	J-6	250.0	PVC	130.0	0.000	-70.10	1.43	8.090	1.20
50	P-7	False	0	174	J-6	J-7	250.0	PVC	130.0	0.000	-74.32	1.51	9.014	1.57
51	P-8	False	0	45	J-7	J-8	250.0	PVC	130.0	0.000	-75.96	1.55	9.386	0.42
52	P-9	False	0	165	J-8	J-9	250.0	PVC	130.0	0.000	-37.67	0.77	2.561	0.42
53	P-10	False	0	143	J-9	J-10	250.0	PVC	130.0	0.000	-42.08	0.86	3.143	0.45
55	P-12	False	0	84	J-11	J-12	200.0	PVC	120.0	0.000	-28.06	0.89	5.104	0.43
56	P-13	False	0	86	J-12	J-13	200.0	PVC	120.0	0.000	-6.93	0.22	0.383	0.03
57	P-14	False	0	76	J-13	J-14	200.0	PVC	120.0	0.000	-2.95	0.09	0.079	0.01
58	P-15	False	0	274	J-14	J-1	200.0	PVC	120.0	0.000	-3.26	0.10	0.095	0.03
59	P-16	False	0	191	J-4	J-11	200.0	PVC	120.0	0.000	-27.78	0.88	5.011	0.96
60	P-17	False	0	220	J-3	J-12	250.0	PVC	130.0	0.000	16.70	0.34	0.568	0.12
61	P-18	False	0	249	J-2	J-13	200.0	PVC	120.0	0.000	4.43	0.14	0.167	0.04
86	P-25	True	1	24	R-1	PMP-1	250.0	PVC	130.0	0.000	129.49	2.64	25.208	0.03
90	P-28	True	1	23	R-2	PMP-2	250.0	PVC	130.0	0.000	48.44	0.99	4.074	0.00
92	P-29	True	1	23	R-3	PMP-3	200.0	PVC	120.0	0.000	41.26	1.31	10.418	0.01
100	P-31	False	0	185	PMP-2	J-19	250.0	PVC	130.0	0.000	48.44	0.99	4.080	0.75
101	P-32	False	0	81	J-19	J-12	250.0	PVC	130.0	0.000	4.85	0.10	0.058	0.00
102	P-33	False	0	280	J-19	J-10	250.0	PVC	130.0	0.000	43.60	0.89	3.357	0.94
117	P-35	False	0	209	PMP-1	J-3	250.0	PVC	130.0	0.000	129.49	2.64	25.208	5.27
119	P-36	False	0	365	PMP-3	J-8	200.0	PVC	120.0	0.000	41.26	1.31	10.425	3.80

Active Scenario: MDD+200FF@J-5

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pump Table

ID	Label	Elevation (m)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (m)	Hydraulic Grade (Discharge) (m)	Flow (Total) (L/s)	Pump Head (m)
85	PMP-1	232.74	Taylor Cambridge MDD	On	232.81	274.09	129.49	41.28
88	PMP-2	232.94	Cooney Parker MDD	On	233.04	269.46	48.44	36.42
91	PMP-3	232.00	Daniel Parker MDD	On	232.09	270.69	41.26	38.60

Active Scenario: MDD+200FF@J-5

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Reservoir Table

ID	Label	Elevation (m)	Flow (Out net) (L/s)	Hydraulic Grade (m)
68	R-1	232.84	129.49	232.84
69	R-2	233.04	48.44	233.04
70	R-3	232.10	41.26	232.10

Active Scenario: MDD+200FF@J-7
Parkerlands Hydraulic Network Analysis - 3170097
Scenario Summary Report
Scenario: MDD+200FF@J-7

Scenario Summary	
ID	113
Label	MDD+200FF@J-7
Notes	
Active Topology	<I> Base Active Topology
Physical	<I> Base Physical
Demand	MDD+200FF @J-7
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	Base
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary			
Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.001	Start Time	12:00:00 AM
Trials	40	Calculation Type	Hydraulics Only

Active Scenario: MDD+200FF@J-7

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Junction Table

ID	Label	Elevation (m)	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Maximum) (kPa)	Pressure (Minimum) (kPa)
29	J-1	235.40	<Collection: 1 items>	0.38	269.42	333	(N/A)	333	333
30	J-2	235.20	<Collection: 1 items>	0.43	269.45	335	(N/A)	335	335
31	J-3	235.20	<Collection: 1 items>	0.46	269.60	337	(N/A)	337	337
32	J-4	235.00	<Collection: 1 items>	0.48	268.73	330	(N/A)	330	330
33	J-5	234.20	<Collection: 1 items>	1.23	266.86	320	(N/A)	320	320
34	J-6	234.00	<Collection: 1 items>	4.22	264.93	303	(N/A)	303	303
35	J-7	233.00	<Collection: 2 items>	201.64	262.85	292	(N/A)	292	292
36	J-8	233.20	<Collection: 1 items>	2.97	263.76	299	(N/A)	299	299
37	J-9	234.00	<Collection: 1 items>	4.41	265.11	304	(N/A)	304	304
38	J-10	234.20	<Collection: 1 items>	1.52	266.42	315	(N/A)	315	315
39	J-11	235.60	<Collection: 1 items>	0.28	269.05	327	(N/A)	327	327
40	J-12	235.80	<Collection: 1 items>	0.42	269.20	327	(N/A)	327	327
41	J-13	236.20	<Collection: 1 items>	0.45	269.32	324	(N/A)	324	324
42	J-14	236.40	<Collection: 1 items>	0.31	269.34	322	(N/A)	322	322
99	J-19	234.93	<Collection: 0 items>	0.00	269.07	334	(N/A)	334	334

Active Scenario: MDD+200FF@J-7

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pipe Table

ID	Label	Has User Defined Length?	Length (User Defined) (m)	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Headloss (m)
45	P-2	False	0	83	J-1	J-2	200.0	PVC	120.0	0.000	-6.55	0.21	0.345	0.03
46	P-3	False	0	90	J-2	J-3	200.0	PVC	120.0	0.000	-15.32	0.49	1.664	0.15
47	P-4	False	0	90	J-3	J-4	250.0	PVC	130.0	0.000	77.03	1.57	9.633	0.87
48	P-5	False	0	140	J-4	J-5	250.0	PVC	130.0	0.000	91.98	1.87	13.378	1.87
49	P-6	False	0	148	J-5	J-6	250.0	PVC	130.0	0.000	90.75	1.85	13.048	1.93
50	P-7	False	0	174	J-6	J-7	250.0	PVC	130.0	0.000	86.53	1.76	11.947	2.07
51	P-8	False	0	45	J-7	J-8	250.0	PVC	130.0	0.000	-115.11	2.35	20.269	0.91
52	P-9	False	0	165	J-8	J-9	250.0	PVC	130.0	0.000	-70.46	1.44	8.167	1.35
53	P-10	False	0	143	J-9	J-10	250.0	PVC	130.0	0.000	-74.87	1.53	9.139	1.30
55	P-12	False	0	84	J-11	J-12	200.0	PVC	120.0	0.000	-15.70	0.50	1.742	0.15
56	P-13	False	0	86	J-12	J-13	200.0	PVC	120.0	0.000	-13.75	0.44	1.362	0.12
57	P-14	False	0	76	J-13	J-14	200.0	PVC	120.0	0.000	-5.86	0.19	0.281	0.02
58	P-15	False	0	274	J-14	J-1	200.0	PVC	120.0	0.000	-6.17	0.20	0.309	0.08
59	P-16	False	0	191	J-4	J-11	200.0	PVC	120.0	0.000	-15.42	0.49	1.685	0.32
60	P-17	False	0	220	J-3	J-12	250.0	PVC	130.0	0.000	31.37	0.64	1.825	0.40
61	P-18	False	0	249	J-2	J-13	200.0	PVC	120.0	0.000	8.34	0.27	0.540	0.13
86	P-25	True	1	24	R-1	PMP-1	250.0	PVC	130.0	0.000	124.19	2.53	23.329	0.02
90	P-28	True	1	23	R-2	PMP-2	250.0	PVC	130.0	0.000	47.40	0.97	3.925	0.00
92	P-29	True	1	23	R-3	PMP-3	200.0	PVC	120.0	0.000	47.62	1.52	13.599	0.01
100	P-31	False	0	185	PMP-2	J-19	250.0	PVC	130.0	0.000	47.40	0.97	3.919	0.72
101	P-32	False	0	81	J-19	J-12	250.0	PVC	130.0	0.000	-29.00	0.59	1.577	0.13
102	P-33	False	0	280	J-19	J-10	250.0	PVC	130.0	0.000	76.39	1.56	9.486	2.66
117	P-35	False	0	209	PMP-1	J-3	250.0	PVC	130.0	0.000	124.19	2.53	23.327	4.87
119	P-36	False	0	365	PMP-3	J-8	200.0	PVC	120.0	0.000	47.62	1.52	13.593	4.96

Active Scenario: MDD+200FF@J-7

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pump Table

ID	Label	Elevation (m)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (m)	Hydraulic Grade (Discharge) (m)	Flow (Total) (L/s)	Pump Head (m)
85	PMP-1	232.74	Taylor Cambridge MDD	On	232.82	274.48	124.19	41.66
88	PMP-2	232.94	Cooney Parker MDD	On	233.04	269.80	47.40	36.76
91	PMP-3	232.00	Daniel Parker MDD	On	232.09	268.72	47.62	36.63

Active Scenario: MDD+200FF@J-7

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Reservoir Table

ID	Label	Elevation (m)	Flow (Out net) (L/s)	Hydraulic Grade (m)
68	R-1	232.84	124.19	232.84
69	R-2	233.04	47.40	233.04
70	R-3	232.10	47.62	232.10

Active Scenario: MDD+200FF@J-10
Parkerlands Hydraulic Network Analysis - 3170097
Scenario Summary Report
Scenario: MDD+200FF@J-10

Scenario Summary	
ID	115
Label	MDD+200FF@J-10
Notes	
Active Topology	<I> Base Active Topology
Physical	<I> Base Physical
Demand	MDD+200FF@J-10
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	Base
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary			
Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.001	Start Time	12:00:00 AM
Trials	40	Calculation Type	Hydraulics Only

Active Scenario: MDD+200FF@J-10

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Junction Table

ID	Label	Elevation (m)	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Maximum) (kPa)	Pressure (Minimum) (kPa)
29	J-1	235.40	<Collection: 1 items>	0.38	269.03	329	(N/A)	329	329
30	J-2	235.20	<Collection: 1 items>	0.43	269.07	332	(N/A)	332	332
31	J-3	235.20	<Collection: 1 items>	0.46	269.32	334	(N/A)	334	334
32	J-4	235.00	<Collection: 1 items>	0.48	268.71	330	(N/A)	330	330
33	J-5	234.20	<Collection: 1 items>	1.23	267.93	330	(N/A)	330	330
34	J-6	234.00	<Collection: 1 items>	4.22	267.14	324	(N/A)	324	324
35	J-7	233.00	<Collection: 1 items>	1.64	266.33	326	(N/A)	326	326
36	J-8	233.20	<Collection: 1 items>	2.97	266.14	322	(N/A)	322	322
37	J-9	234.00	<Collection: 1 items>	4.41	264.00	294	(N/A)	294	294
38	J-10	234.20	<Collection: 2 items>	201.52	262.33	275	(N/A)	275	275
39	J-11	235.60	<Collection: 1 items>	0.28	268.66	324	(N/A)	324	324
40	J-12	235.80	<Collection: 1 items>	0.42	268.64	321	(N/A)	321	321
41	J-13	236.20	<Collection: 1 items>	0.45	268.85	319	(N/A)	319	319
42	J-14	236.40	<Collection: 1 items>	0.31	268.88	318	(N/A)	318	318
99	J-19	234.93	<Collection: 0 items>	0.00	268.06	324	(N/A)	324	324

Active Scenario: MDD+200FF@J-10

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pipe Table

ID	Label	Has User Defined Length?	Length (User Defined) (m)	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Headloss (m)
45	P-2	False	0	83	J-1	J-2	200.0	PVC	120.0	0.000	-8.62	0.27	0.573	0.05
46	P-3	False	0	90	J-2	J-3	200.0	PVC	120.0	0.000	-20.18	0.64	2.771	0.25
47	P-4	False	0	90	J-3	J-4	250.0	PVC	130.0	0.000	63.63	1.30	6.762	0.61
48	P-5	False	0	140	J-4	J-5	250.0	PVC	130.0	0.000	57.40	1.17	5.586	0.78
49	P-6	False	0	148	J-5	J-6	250.0	PVC	130.0	0.000	56.17	1.14	5.366	0.80
50	P-7	False	0	174	J-6	J-7	250.0	PVC	130.0	0.000	51.95	1.06	4.644	0.81
51	P-8	False	0	45	J-7	J-8	250.0	PVC	130.0	0.000	50.31	1.02	4.375	0.20
52	P-9	False	0	165	J-8	J-9	250.0	PVC	130.0	0.000	90.20	1.84	12.903	2.13
53	P-10	False	0	143	J-9	J-10	250.0	PVC	130.0	0.000	85.79	1.75	11.760	1.68
55	P-12	False	0	84	J-11	J-12	200.0	PVC	120.0	0.000	5.48	0.17	0.248	0.02
56	P-13	False	0	86	J-12	J-13	200.0	PVC	120.0	0.000	-18.61	0.59	2.385	0.20
57	P-14	False	0	76	J-13	J-14	200.0	PVC	120.0	0.000	-7.93	0.25	0.491	0.04
58	P-15	False	0	274	J-14	J-1	200.0	PVC	120.0	0.000	-8.24	0.26	0.527	0.14
59	P-16	False	0	191	J-4	J-11	200.0	PVC	120.0	0.000	5.76	0.18	0.272	0.05
60	P-17	False	0	220	J-3	J-12	250.0	PVC	130.0	0.000	41.83	0.85	3.109	0.68
61	P-18	False	0	249	J-2	J-13	200.0	PVC	120.0	0.000	11.13	0.35	0.921	0.23
86	P-25	True	1	24	R-1	PMP-1	250.0	PVC	130.0	0.000	126.10	2.57	23.999	0.02
90	P-28	True	1	23	R-2	PMP-2	250.0	PVC	130.0	0.000	50.23	1.02	4.372	0.00
92	P-29	True	1	23	R-3	PMP-3	200.0	PVC	120.0	0.000	42.87	1.36	11.181	0.01
100	P-31	False	0	185	PMP-2	J-19	250.0	PVC	130.0	0.000	50.23	1.02	4.364	0.81
101	P-32	False	0	81	J-19	J-12	250.0	PVC	130.0	0.000	-65.49	1.33	7.132	0.58
102	P-33	False	0	280	J-19	J-10	250.0	PVC	130.0	0.000	115.73	2.36	20.471	5.73
117	P-35	False	0	209	PMP-1	J-3	250.0	PVC	130.0	0.000	126.10	2.57	23.998	5.02
119	P-36	False	0	365	PMP-3	J-8	200.0	PVC	120.0	0.000	42.87	1.36	11.188	4.08

Active Scenario: MDD+200FF@J-10

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pump Table

ID	Label	Elevation (m)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (m)	Hydraulic Grade (Discharge) (m)	Flow (Total) (L/s)	Pump Head (m)
85	PMP-1	232.74	Taylor Cambridge MDD	On	232.82	274.34	126.10	41.52
88	PMP-2	232.94	Cooney Parker MDD	On	233.04	268.87	50.23	35.83
91	PMP-3	232.00	Daniel Parker MDD	On	232.09	270.21	42.87	38.13

Active Scenario: MDD+200FF@J-10

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Reservoir Table

ID	Label	Elevation (m)	Flow (Out net) (L/s)	Hydraulic Grade (m)
68	R-1	232.84	126.10	232.84
69	R-2	233.04	50.23	233.04
70	R-3	232.10	42.87	232.10

Active Scenario: MDD+100FF @J-14
Parkerlands Hydraulic Network Analysis - 3170097
Scenario Summary Report
Scenario: MDD+100FF @J-14

Scenario Summary

ID	105
Label	MDD+100FF @J-14
Notes	
Active Topology	<I> Base Active Topology
Physical	<I> Base Physical
Demand	MDD+100FF @ J14
Initial Settings	<I> Base Initial Settings
Operational	<I> Base Operational
Age	<I> Base Age
Constituent	<I> Base Constituent
Trace	<I> Base Trace
Fire Flow	Base
Energy Cost	<I> Base Energy Cost
Transient	<I> Base Transient
Pressure Dependent Demand	<I> Base Pressure Dependent Demand
Failure History	<I> Base Failure History
SCADA	<I> Base SCADA
User Data Extensions	<I> Base User Data Extensions
Steady State/EPS Solver Calculation Options	Base Calculation Options
Transient Solver Calculation Options	<I> Base Calculation Options

Hydraulic Summary

Time Analysis Type	Steady State	Use simple controls during steady state?	True
Friction Method	Hazen-Williams	Is EPS Snapshot?	False
Accuracy	0.001	Start Time	12:00:00 AM
Trials	40	Calculation Type	Hydraulics Only

Active Scenario: MDD+100FF @J-14

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Junction Table

ID	Label	Elevation (m)	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Maximum) (kPa)	Pressure (Minimum) (kPa)
29	J-1	235.40	<Collection: 1 items>	0.38	273.56	373	(N/A)	373	373
30	J-2	235.20	<Collection: 1 items>	0.43	274.12	381	(N/A)	381	381
31	J-3	235.20	<Collection: 1 items>	0.46	275.35	393	(N/A)	393	393
32	J-4	235.00	<Collection: 1 items>	0.48	275.33	395	(N/A)	395	395
33	J-5	234.20	<Collection: 1 items>	1.23	275.33	403	(N/A)	403	403
34	J-6	234.00	<Collection: 1 items>	4.22	275.33	404	(N/A)	404	404
35	J-7	233.00	<Collection: 1 items>	1.64	275.34	414	(N/A)	414	414
36	J-8	233.20	<Collection: 1 items>	2.97	275.34	412	(N/A)	412	412
37	J-9	234.00	<Collection: 1 items>	4.41	275.32	404	(N/A)	404	404
38	J-10	234.20	<Collection: 1 items>	1.52	275.31	402	(N/A)	402	402
39	J-11	235.60	<Collection: 1 items>	0.28	275.23	388	(N/A)	388	388
40	J-12	235.80	<Collection: 1 items>	0.42	275.19	386	(N/A)	386	386
41	J-13	236.20	<Collection: 1 items>	0.45	273.73	367	(N/A)	367	367
42	J-14	236.40	<Collection: 2 items>	100.31	271.74	346	(N/A)	346	346
99	J-19	234.93	<Collection: 0 items>	0.00	275.31	395	(N/A)	395	395

Active Scenario: MDD+100FF @J-14

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pipe Table

ID	Label	Has User Defined Length?	Length (User Defined) (m)	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Material	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Headloss Gradient (m/km)	Headloss (m)
45	P-2	False	0	83	J-1	J-2	200.0	PVC	120.0	0.000	-32.68	1.04	6.769	0.56
46	P-3	False	0	90	J-2	J-3	200.0	PVC	120.0	0.000	-47.79	1.52	13.686	1.23
47	P-4	False	0	90	J-3	J-4	250.0	PVC	130.0	0.000	9.57	0.19	0.203	0.02
48	P-5	False	0	140	J-4	J-5	250.0	PVC	130.0	0.000	0.94	0.02	0.003	0.00
49	P-6	False	0	148	J-5	J-6	250.0	PVC	130.0	0.000	-0.29	0.01	0.000	0.00
50	P-7	False	0	174	J-6	J-7	250.0	PVC	130.0	0.000	-4.51	0.09	0.050	0.01
51	P-8	False	0	45	J-7	J-8	250.0	PVC	130.0	0.000	-6.15	0.13	0.089	0.00
52	P-9	False	0	165	J-8	J-9	250.0	PVC	130.0	0.000	8.40	0.17	0.159	0.03
53	P-10	False	0	143	J-9	J-10	250.0	PVC	130.0	0.000	3.99	0.08	0.040	0.01
55	P-12	False	0	84	J-11	J-12	200.0	PVC	120.0	0.000	7.87	0.25	0.485	0.04
56	P-13	False	0	86	J-12	J-13	200.0	PVC	120.0	0.000	53.78	1.71	17.026	1.46
57	P-14	False	0	76	J-13	J-14	200.0	PVC	120.0	0.000	68.01	2.16	26.303	1.99
58	P-15	False	0	274	J-14	J-1	200.0	PVC	120.0	0.000	-32.30	1.03	6.624	1.81
59	P-16	False	0	191	J-4	J-11	200.0	PVC	120.0	0.000	8.15	0.26	0.517	0.10
60	P-17	False	0	220	J-3	J-12	250.0	PVC	130.0	0.000	18.96	0.39	0.718	0.16
61	P-18	False	0	249	J-2	J-13	200.0	PVC	120.0	0.000	14.69	0.47	1.539	0.38
86	P-25	True	1	24	R-1	PMP-1	250.0	PVC	130.0	0.000	76.79	1.56	9.581	0.01
90	P-28	True	1	23	R-2	PMP-2	250.0	PVC	130.0	0.000	24.89	0.51	1.191	0.00
92	P-29	True	1	23	R-3	PMP-3	200.0	PVC	120.0	0.000	17.52	0.56	2.139	0.00
100	P-31	False	0	185	PMP-2	J-19	250.0	PVC	130.0	0.000	24.89	0.51	1.189	0.22
101	P-32	False	0	81	J-19	J-12	250.0	PVC	130.0	0.000	27.36	0.56	1.417	0.12
102	P-33	False	0	280	J-19	J-10	250.0	PVC	130.0	0.000	-2.47	0.05	0.016	0.00
117	P-35	False	0	209	PMP-1	J-3	250.0	PVC	130.0	0.000	76.79	1.56	9.577	2.00
119	P-36	False	0	365	PMP-3	J-8	200.0	PVC	120.0	0.000	17.52	0.56	2.134	0.78

Active Scenario: MDD+100FF @J-14

Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Pump Table

ID	Label	Elevation (m)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (m)	Hydraulic Grade (Discharge) (m)	Flow (Total) (L/s)	Pump Head (m)
85	PMP-1	232.74	Taylor Cambridge MDD	On	232.83	277.35	76.79	44.52
88	PMP-2	232.94	Cooney Parker MDD	On	233.04	275.53	24.89	42.49
91	PMP-3	232.00	Daniel Parker MDD	On	232.10	276.12	17.52	44.02

Active Scenario: MDD+100FF @J-14

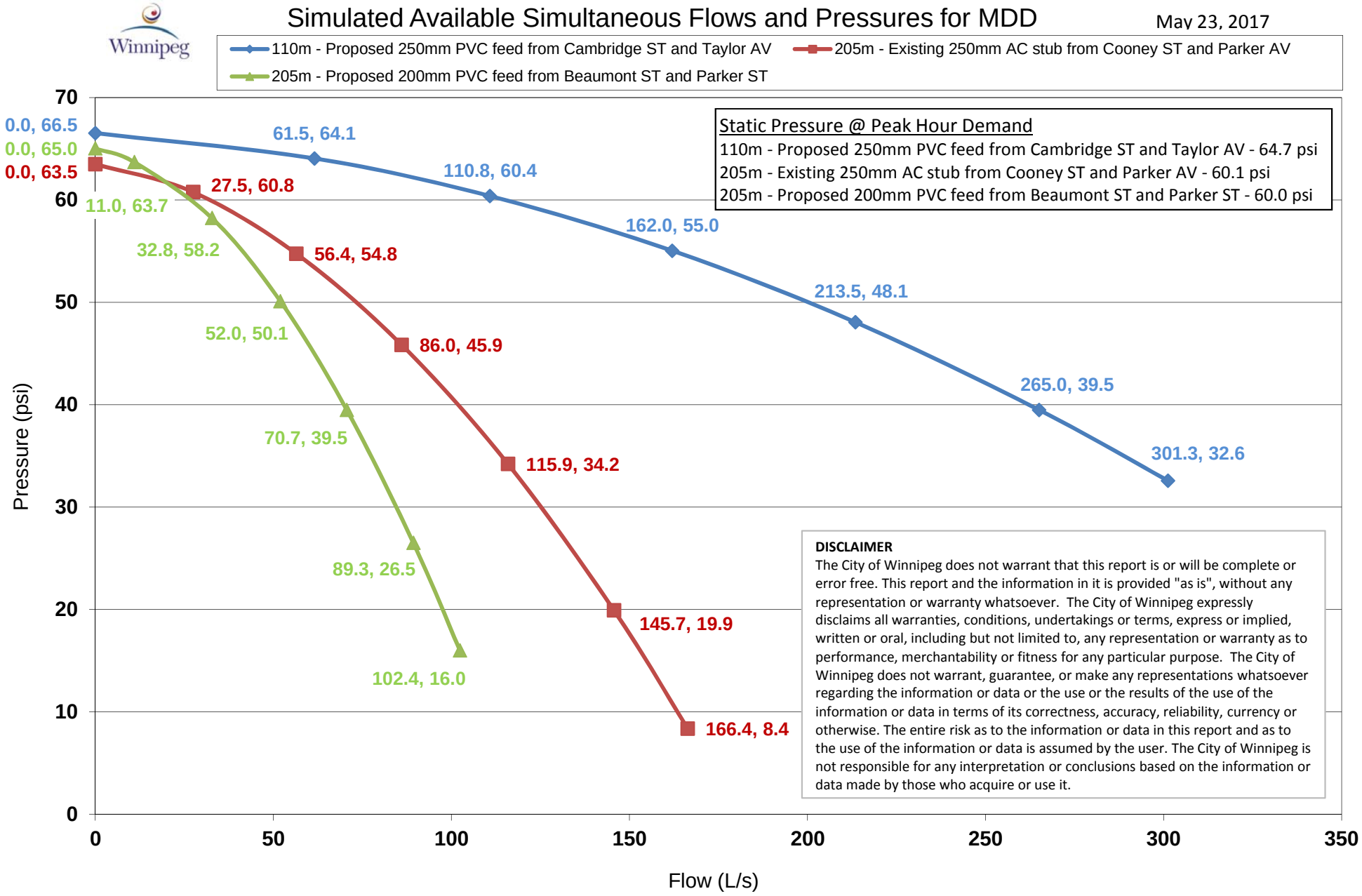
Parkerlands Hydraulic Network Analysis - 3170097

FlexTable: Reservoir Table

ID	Label	Elevation (m)	Flow (Out net) (L/s)	Hydraulic Grade (m)
68	R-1	232.84	76.79	232.84
69	R-2	233.04	24.89	233.04
70	R-3	232.10	17.52	232.10

Simulated Available Simultaneous Flows and Pressures for MDD

May 23, 2017



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Irshad Ahmad

From: Irshad Ahmad
Sent: Thursday, January 25, 2018 11:05 AM
To: 'Gajda, Marek'
Cc: Imy Kassam
Subject: RE: Sketches for Discussion
Attachments: PDF A.pdf; PDF B.pdf

Hi Marek,
Thanks a lot for talking to me this morning. As per our discussion I double checked that the road closure plan and found that Beaumont ST. ROW (Parcel "J") north of SWBRT is still active
As a residual land for future sale. Please see PDF "A" attached for your reference.
On attached PDF "B" I roughly draw that parcel "J". Please confirm the land between parcel "J" and south of Parker land property is owned by City of Winnipeg. See highlighted green on the attached plan "B"
This confirmation is for the reason as per our discussions that we need not to show any easement if the lands are owned by City of Winnipeg.

Along with this you will be getting back to me if the 6m and 9m wide public reserves will be enough to install one utility and two utilities respectively.

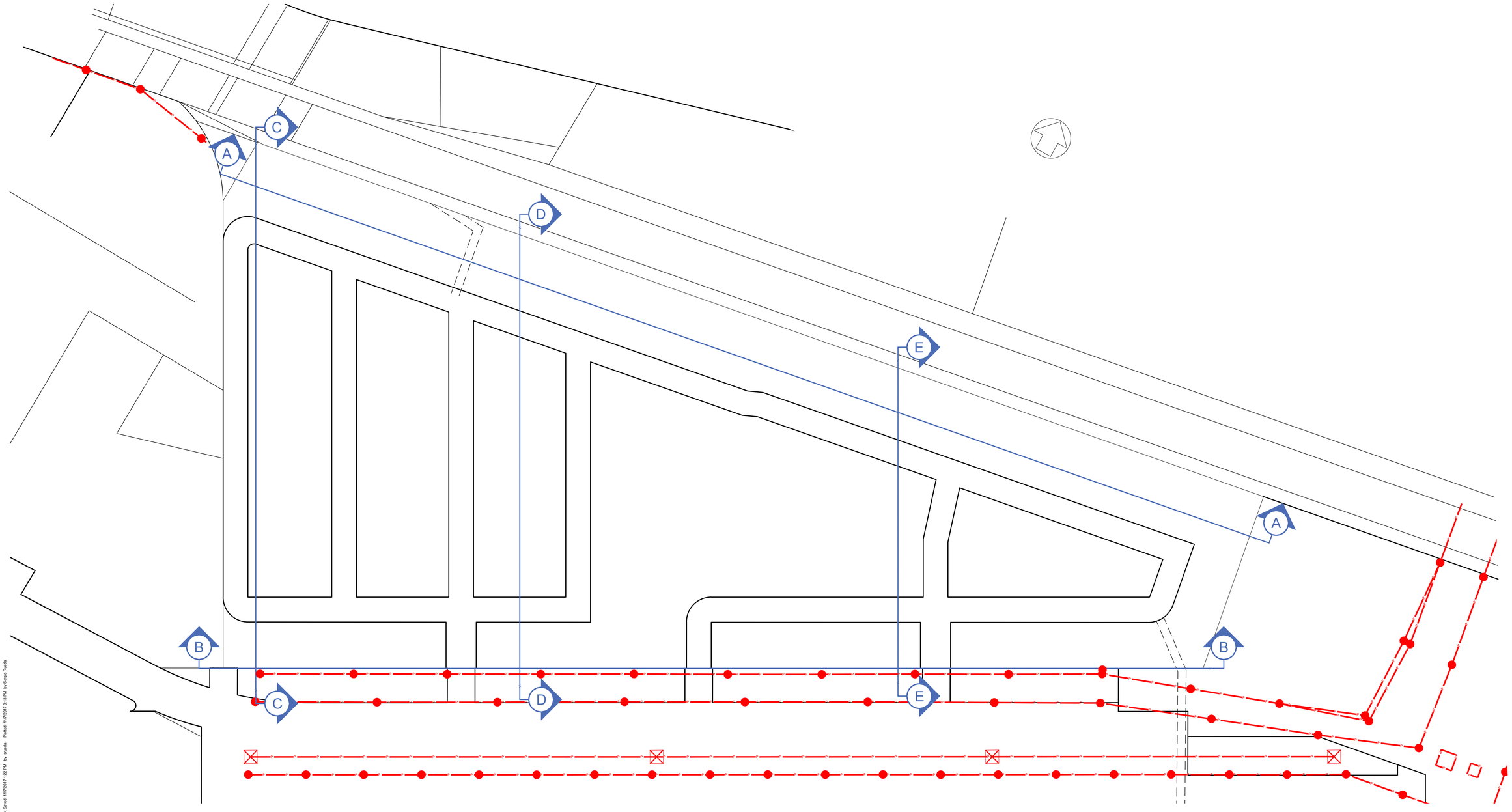
You also mentioned that as long as the total number of units remain the same minor changes in the layout is ok but we need to mention those changes in the servicing report.
Regards,

Irshad Ahmad

From: Irshad Ahmad
Sent: Thursday, January 25, 2018 8:40 AM
To: 'Gajda, Marek' <mgajda@winnipeg.ca>
Subject: Sketches for Discussion

Hi Marek,
Please see attached some sketches for discussion this morning. I will call you around 9am Calgary time (10 am Winnipeg time)
Regards,

Irshad



MORRISON HERSHFIELD

PARKER LAND - EARTHWORKS CROSS SECTIONS - KEY PLAN
THIS DRAWING IS FOR DISCUSSION PURPOSES ONLY

SCALE: 1000

Nov 07, 2017
VERSION ####

ry 375 PVC SDR 35
S=0.145%
COVER=2.955
C=??? l/s
l/s

S MH 20
Sanitary TYPE 5A MH – 1,220dia
RIM=232.373
NW (375): 228.950
SE (375): 228.920

EX GAS

Q=0.000 l/s
MIN COVER=2.590
C=??? l/s
S=0.145%
L=127.428
Proposed Sanitary 375 PVC SDR 35

S MH 21
Sanitary TYPE 5A MH – 1,220dia
RIM=232.975
NW (375): 228.735
SE (375): 228.705

Proposed Sanitary 375 PVC SDR 35
L=75.024
S=0.145%
MIN COVER=3.887
Q=0.000 l/s
C=??? l/s

S MH 23
Sanitary TYPE 5A MH – 1,220dia
RIM=232.879
SW (375): 228.477
NE (375): 228.447

S MH 24
Sanitary TYPE 5A MH – 1,220dia
RIM=232.979
SW (375): 228.230
NE (375): 228.200

S MH 22
Sanitary TYPE 5A MH – 1,220dia
RIM=232.993
NW (375): 228.596
NE (375): 228.566

Proposed Sanitary 375 PVC SDR 35
L=150.000 S=0.145%
MIN COVER=4.007
Q=0.000 l/s C=??? l/s

Proposed Sanitary 375 PVC SDR 35
L=61.166
S=0.145%
MIN COVER=4.019
Q=0.000 l/s
C=??? l/s

RIM=232.915
SW (375): 227.487
SE (375): 227.457
35
EX GAS
'roposed Sanitary 375 PVC SDR 35
L=43.782
S=0.145%
MIN COVER=5.074
Q=0.000 l/s
C=??? l/s
EX S MH
Sanitary TYPE 5A MH – 1,220dia
RIM=228.083
S (375): 227.300
GAS
EX GAS
EX GAS
S MH 28
Sanitary TYPE 5A MH – 1,220dia
RIM=228.262
NW (375): 227.394
NE (375): 227.364
Proposed Sanitary 375 PVC SDR 35
L=2.828
S=0.145%
MIN COVER=0.000
Q=0.000 l/s
C=??? l/s
Proposed Sanitary 375 PVC SDR 35

CNR Access Road

Tie to Existing

Property Line

Top of Berm
(Fenced)

20’–0”
[6.1m]

50’–1”
[15.5m]

20’–0”
[6.1m]

Duplex - Typical Lot Size:
120ft x 92ft

20’–0”
[6.1m]

Duplex - Typical Lot Size:
120ft x 92ft

I Got it Marek, Parcel 'J' is Still THERE As Residual Land

Parcels B, D & J:

- Planning, Property and Development, as residual land for a possible future sale.

Parcels F & H:

- Planning, Property and Development, as residual land for a possible future sale to Manitoba Hydro to offset acquisition costs of Hydro transmission corridor lands required for BRT.

Property south of Heatherdale Avenue adjoining Parcels A and B, (Blocks 44 and 47, Plan 276 WLTO) is owned by the City of Winnipeg. The balance of the land adjoining the closings is owned by Manitoba Hydro.

The subject streets and lanes north of the southern limit of the public lane north of Heatherdale Avenue were opened by Plan No. 1295 and registered in the Winnipeg Land Titles Office in October of 1907. The balance of the land is Old System.
All the closing areas are undeveloped land, consisting of scrub brush, open field and trees and appear to serve no public transportation purpose.

Misc. Plan No. 15045/2

Parcels A, E & L:

- Transit, for the dedicated transitway corridor.

Parcels C, G & J:

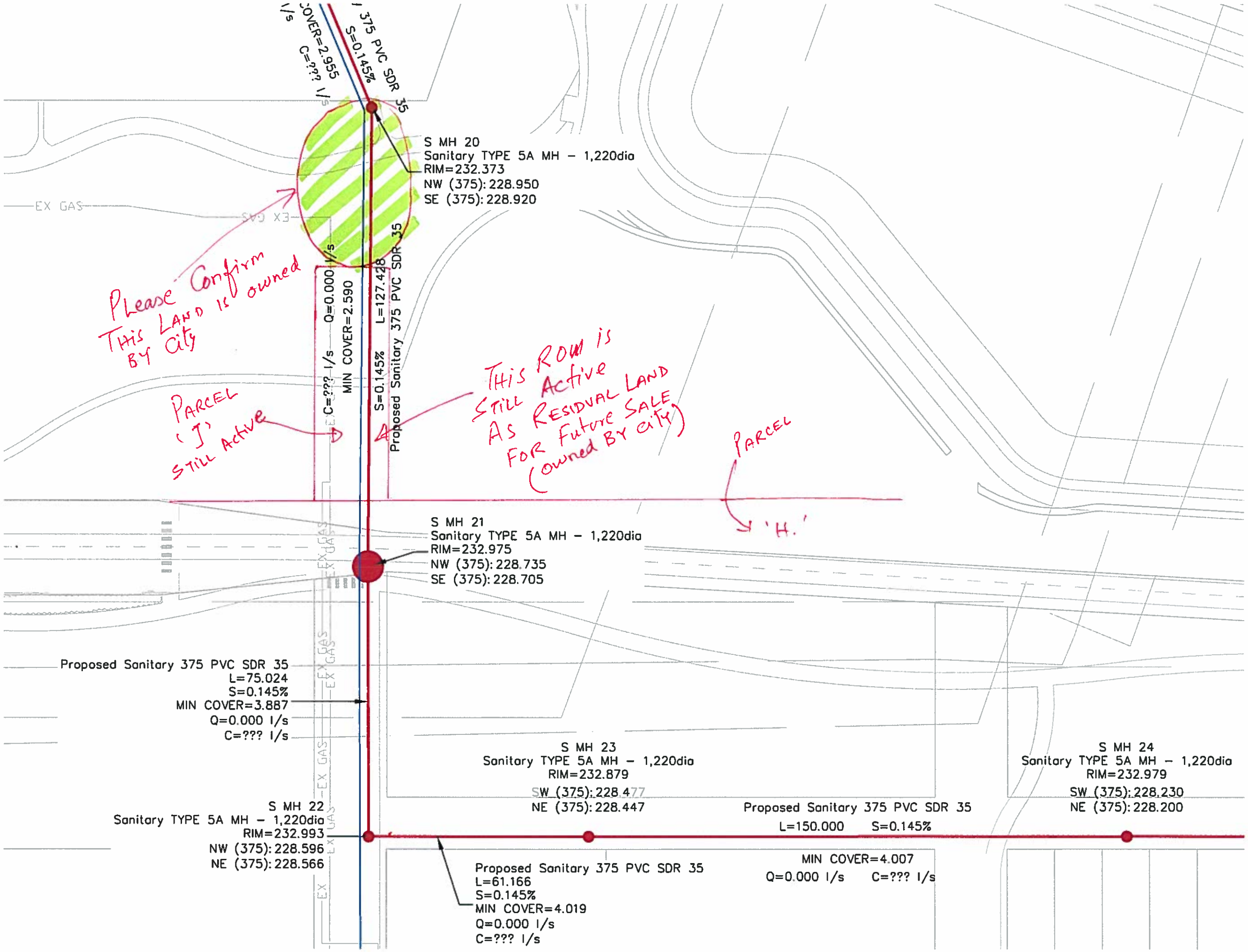
- Planning, Property and Development, as residual land for a possible future sale.

Parcels B, D, F, H, K, M, N, P & Q:

- Planning, Property and Development, as residual land for a possible future sale to Manitoba Hydro to offset acquisition costs of Hydro transmission corridor lands required for BRT.

- Note: Parcels D, K, M, N, P & Q are to form part of Brenda Leipsic Dog Park. The City will regularize the usage of this land for this specific purpose by way of a License Agreement with Manitoba Hydro.

At the request of the Public Works Department, the northerly 4.5m of Planet Street is being retained as legally opened public right of way for the future widening of Asquith Avenue.



COVER=2.955
C=??? l/s
375 PVC SDR 35
S=0.145%
S MH 20
Sanitary TYPE 5A MH – 1,220dia
RIM=232.373
NW (375): 228.950
SE (375): 228.920
EX GAS
Please Confirm
This Land is owned
By City
Q=0.000 l/s
C=??? l/s
MIN COVER=2.590
L=127.428
S=0.145%
Proposed Sanitary 375 PVC SDR 35
Parcel
'J'
Still Active
This ROW is
Still Active
As Residual Land
For Future Sale
(owned By city)
Parcel
'H.'
S MH 21
Sanitary TYPE 5A MH – 1,220dia
RIM=232.975
NW (375): 228.735
SE (375): 228.705
Proposed Sanitary 375 PVC SDR 35
L=75.024
S=0.145%
MIN COVER=3.887
Q=0.000 l/s
C=??? l/s
S MH 23
Sanitary TYPE 5A MH – 1,220dia
RIM=232.879
SW (375): 228.477
NE (375): 228.447
S MH 24
Sanitary TYPE 5A MH – 1,220dia
RIM=232.979
SW (375): 228.230
NE (375): 228.200
S MH 22
Sanitary TYPE 5A MH – 1,220dia
RIM=232.993
NW (375): 228.596
NE (375): 228.566
Proposed Sanitary 375 PVC SDR 35
L=150.000 S=0.145%
MIN COVER=4.007
Q=0.000 l/s C=??? l/s
Proposed Sanitary 375 PVC SDR 35
L=61.166
S=0.145%
MIN COVER=4.019
Q=0.000 l/s
C=??? l/s

Irshad Ahmad

From: Gajda, Marek <mgajda@winnipeg.ca>
Sent: Friday, November 24, 2017 2:44 PM
To: Irshad Ahmad
Subject: RE: Parker Lands MRS - Servicing Report Submission

Hi Irshad,

Please see my comments in red.

Regards,

Marek Gajda
Services Development Engineer
Water and Waste Department
204 986 7626

From: Irshad Ahmad [mailto:IAhmad@morrisonhershfield.com]
Sent: Friday, November 24, 2017 10:28 AM
To: Gajda, Marek
Subject: RE: Parker Lands MRS - Servicing Report Submission

Hi Marek,
Thanks a lot for you call yesterday.
Please elaborate on the overall PLMRS design

- What does PLMRS stands for?
  Please see the sentence below with yellow highlighting.
- What your expectations are from Gem equities on this plan?
  My understanding is Gem Equities is working to create this Secondary Plan. The servicing design also needs to be completed in this process. The City has previously provided information to InfraCor to include in MRS servicing design for land drainage design work conducted by others.
- What will be extents of this plan?
  The boundary of this Major Redevelopment Site.

As I understand the only change Parker lands Subdivision make south of BRT is the waste water service and that is shown on our design and one water connection along Beaumont Street connecting to existing also will be shown in our design.
LDS is being tied to the City Regional pond stays north of BRT. Water connection ties to the existing north of BRT along Cooney ST.

Your immediate response on this will be appreciated.
Regards,
Irshad Ahmad

From: Gajda, Marek [mailto:mgajda@winnipeg.ca]
Sent: Wednesday, November 01, 2017 10:25 AM
To: Andrew Marquess <andrew.marquess@gemequities.ca>; Irshad Ahmad <IAhmad@morrisonhershfield.com>
Cc: Imy Kassam <IKassam@morrisonhershfield.com>
Subject: Parker Lands MRS - Servicing Report Submission

Hello Andrew and Irshad,

Sorry for the delay in providing feedback to the GEM Equities lands servicing report.

As a general comment, the overall Parker Lands Major Redevelopment Site (PLMRS) servicing design will need to be determined through the Secondary Plan process.

Wastewater servicing comments:

- Please align the wastewater sewer (WWS) south along the former Beaumont Right-of-Way (ROW)
  - Beaumont apparently remains open from Asquith/Hurst to Parcel J of Misc Plan 15011/1, so no easement would be needed in that area
  - It appears there is City land part of the stormwater retention basin parcel, between GEM land and this open portion of Beaumont—no easement would be needed there either
  - I will send an updated request to PPD asking for Parcel J of Misc Plan 15011/1 to remain with the City
- Water and Waste (WWD) is looking for the WWS to be aligned within City land from the proposed new ROW to the south, e.g. in a public reserve with a pedestrian & cycling path, rather than in an easement
- This report indicated that the Heatherdale ROW is closed between the former Beaumont ROW and Daniel St, but this was not part of DAC 1/2016
- We recommend the contractor for this development coordinate with Plenary Roads or Winnipeg Transit's contractor for works affecting the new South West Rapid Transitway infrastructure

- 4.2 – The number for population we calculated:
  - 240 Units at 3.05 ppl/unit = 732 people
  - 1502 Units at 2.30 ppl/unit = 3,455 people
  - Total people 4,187 not the 4797 in the report
- 4.2 – The flows seem to be based on 4797 people
- We will be holding this area to the maximum number of units used in the design. A revision to the report will be required if there is an increase in number of units.
- Figure 4A and 4B – See the above comments regarding the sewer from the GEM lands to approximately Heatherdale Ave. The new connection at Wynne St will not work as drawing. There is a Ø400 gas main and a LDS where the proposed MHs are. There is no space in the Parker Row for a new sewer. This report needs to show that the area around the BRT can be serviced either off the existing Ø300 in Parker or off the new pipe in Heatherdale Ave.
- Appendix B, Design Table – The population total population and flows are different from section 4.2. The total area does not match section 1.0. These need to be in agreement.

Water Servicing comments:

Morrison Hershfield had noted that the water portion had already been approved. Our comments referred to the concept to facilitate providing flow-pressures curves for the initial layout. Typically there is further review at the servicing report stage.

The GEM Equities lands servicing will need to be consistent with the overall PLMRS design.

Replacement of the north-south 250mm water main (WM) is to be limited to north of the new Hurst right-of-way.

After receiving preliminary comments from Winnipeg Transit, alignment of the north-south off-site 200mm water main needs to be along the former Beaumont right-of-way (rather than along Georgina St).

WWD is looking for the re-aligned water main connecting to the existing 250mm WM at the north boundary to be aligned within City land e.g. in a public reserve strip, rather than in an easement

Land Drainage servicing comments:

Site servicing report

Section 3:

- Change the 1st statement in the 2nd paragraph. There are additional analyses with different rainfalls in the report (in Appendix A).

Appendix A – Land Drainage Service Report

Section 2:

- Area 18.31 ha of residential development – The main report describes a different land use plan (the area value is different as well).

- 2nd bullet- 100 year and the May 2010 event

Section 2.2:
- 1st bullet- no image in the report.

Section 3.4:
- Table 2 – Use 50% imperviousness (as minimum) for residential developments. Where the density increases (units/Acre), use a reasonable value (higher than 50%).
- Provide the correct land use type for the catchments in the table.

Section 4.1:
- Storing 100 year on the residential streets is not acceptable.
- Inlet Control Devices are not acceptable in the residential streets.

Section 4.2:
- Table 5 – The data provided in the table is unclear. The volumes under the spill conditions are less than the volumes under the 100 year results and the depths exceed 0.3m as well.
- Table 6 – Include the relevant rainfall event in the table.

Section 4.3:
- Update the 100 year analysis with the given rainfall data attached.

Section 4.4: - The statement is unclear. If this would be for the off-site drainage flows, re-write the statement to clarify it.

Section 5.0 – 3rd bullet – " preventing any offsite discharge" – Is this spill flow over the trap lows, explain clearly?

Rational Analysis: The initial time of concentration should be 10 min.

Please contact me with any questions—I will re-direct your technical enquiries as required.

Regards,

Marek Gajda
Services Development Engineer
Water and Waste Department
204 986 7626

From: Andrew Marquess [mailto:andrew.marquess@gemequities.ca]
Sent: Wednesday, October 04, 2017 10:10 AM
To: Gajda, Marek
Cc: Irshad Ahmad; Imy Kassam
Subject: RE: Parker Lands Fill Permit

Marek,

Have you had a chance to review the report and make any comments if necessary?

Andrew

From: Andrew Marquess
Sent: Monday, September 11, 2017 4:10 PM
To: Gajda, Marek <mgajda@winnipeg.ca>
Cc: Geoff Zywina <geoff.zywina@gemequities.ca>; 'dshaw@winnipeg.ca' <dshaw@winnipeg.ca>; 'rkowal@winnipeg.ca'

<rkowal@winnipeg.ca>; 'cmckay@winnipeg.ca' <cmckay@winnipeg.ca>; 'John Wintrup' <jwintrup@me.com>; 'Imy Kassam' <IKassam@morrisonhershfield.com>; Irshad Ahmad <IAhmad@morrisonhershfield.com>; James Platt (jplatt@winnipeg.ca) <jplatt@winnipeg.ca>; Kiernan, John <JKiernan@winnipeg.ca>
Subject: FW: Parker Lands Fill Permit

Hi Marek,

Thanks for the response.

I am attaching the final site servicing report for the site as prepared by Morrison Hershfield.

In speaking with Morrison Hershfield they are unaware of any engineering information that may be outstanding to process the permit application. I believe they will give you a call just to confirm this to be the case.

I am very interested in which City departments have concerns with the application. My understanding was that the main department to review the application was Water and Waste.

If other departments are reviewing the application, what information would be required by them to provide input into the permit application?

I or Chris Snelgrove have never been asked for any information other than the rough grading plan prepared by Morrison Hershfield.

Given that we are over 13 weeks into this permit application, I have received no other requests for information from other departments.

I look forward to hearing from you or if you are not the designated contact person for this application please put me in touch with the person responsible for this file.

Regards

Andrew

From: Gajda, Marek [mailto:mgajda@winnipeg.ca]
Sent: Monday, September 11, 2017 1:46 PM
To: John Wintrup <jwintrup@me.com>
Cc: Andrew Marquess <andrew.marquess@gemequities.ca>; Geoff Zywina <geoff.zywina@gemequities.ca>; Shaw, David <DShaw@winnipeg.ca>; Kowal, Richard <RKowal@winnipeg.ca>; McKay, Cynthia <CMckay@winnipeg.ca>
Subject: RE: Parker Lands Fill Permit

Hello John and Andrew,

Sorry for the delay in replying.

My understanding is multiple Departments have concerns with the proposed fill works. Water and Waste is conferring with Planning, Property and Development Department to ensure you receive a coordinated response. You will receive a follow up as soon as possible.

Regards,

Marek Gajda, P. Eng.
Services Development Engineer
Engineering Services Div., Water and Waste Department
City of Winnipeg

Phone: 204 986 7626
Email: mgajda@winnipeg.ca
Website: winnipeg.ca
Address: 110-1199 Pacific Avenue, Winnipeg, MB R3E 3S8

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From: John Wintrup [mailto:jwintrup@me.com]
Sent: Monday, September 11, 2017 8:34 AM
To: Gajda, Marek
Cc: Andrew Marquess; Geoff Zywina; Shaw, David; Kowal, Richard; McKay, Cynthia
Subject: Re: Parker Lands Fill Permit
Importance: High

Good Morning Marek,

We understand you have been on holidays. We are looking to get un update on the Development Permit for fill on the Parker Lands. My clients have been seeking this permit since June and now nearby infrastructure projects need a neighbouring land owner to accept fill in a matter of days. Please let us know what, if any, additional information is required for this matter to processed as my client wishes to move forward with accepting fill on his privately owned lands.

Thanks!

John S. Wintrup

J.Wintrup Consulting Ltd.

> On Sep 5, 2017, at 9:27 AM, John Wintrup <jwintrup@me.com> wrote:
>
> Hi Marek,
>
> We would like to get this permit going, please let us know the status of the review.
>
> John S. Wintrup

On Sep 5, 2017, at 9:09 AM, McKay, Cynthia <CMckay@winnipeg.ca> wrote:

Morning John,

I'll defer your question to Marek Gajda whom I've cc'd in this email.

<image001.jpg>

Cynthia McKay
Senior Technologist III
Engineering, Water and Waste
City of Winnipeg

Phone: 204-986-3484
Email: cmckay@winnipeg.ca
Website: winnipeg.ca
Address: 110-1199 Pacific Avenue, Winnipeg, MB R3E 3S8

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From: John Wintrup [mailto:jwintrup@me.com]
Sent: Monday, September 04, 2017 6:34 PM
To: McKay, Cynthia
Cc: Andrew Marquess; Geoff Zywina
Subject: Parker Lands Fill Permit

Hi Cynthia,

I am enquiring about the status of DP 17 137443 000 00 for the lands known colloquially as the 'Parker Lands' - see attached. It would appear the documents were submitted some 12 weeks ago, back on June 9, 2017.

My clients, the landowners, would like to understand what, if anything, remains outstanding for the City [Water & Waste] to review and issue this permit so work can lawfully begin on these privately owned lands.

Thanks!

John S. Wintrup

Irshad Ahmad

From: Tabing, Raymund <rtabing@winnipeg.ca>
Sent: Monday, May 29, 2017 9:46 AM
To: Irshad Ahmad
Cc: Lucky, Ryan; Nedal Barbar
Subject: RE: 2017 05 24 - SFS - Parker Lands - 3 of Connections

Hello Irshad,

At this point, the prelim design is acceptable provided the existing 250mm North/South WM alignment (Cooney ST) is included in the new network. The 250mm WM loop has improved fire flows substantially through the multifamily section of the development.

Please note we will review the design in more detail when we receive the revised Design Report.

Thank you,

Raymund Tabing
W&W Dept. | 1199 Pacific Ave | (204) 986-7645

From: Irshad Ahmad [mailto:IAhmad@morrisonhershfield.com]
Sent: Thursday, May 25, 2017 1:52 PM
To: Tabing, Raymund
Cc: Lucky, Ryan; Nedal Barbar
Subject: RE: 2017 05 24 - SFS - Parker Lands - 3 of Connections

Hi Raymund,
Please find attached revised layout for water network. Path of 250 water main is changed to meet the 3 m/s velocity.
Pipe dimeters are changed for some pipes.
Analysis is completed based on the simultaneous flow and pressure curves provided.
All other parameters like length, node elevation and water demands are same as before. A copy of the previous water plan showing pipe lengths and elevations is attached for your reference.
Table with water demands is also attached.
Regards,
Irshad Ahmad

From: Tabing, Raymund [mailto:rtabing@winnipeg.ca]
Sent: Wednesday, May 24, 2017 12:24 PM
To: Irshad Ahmad <IAhmad@morrisonhershfield.com>
Cc: Lucky, Ryan <ryanlucky@winnipeg.ca>; Nedal Barbar <NBarbar@morrisonhershfield.com>
Subject: 2017 05 24 - SFS - Parker Lands - 3 of Connections

Hello Irshad;

Please find the attach simultaneous flow and pressure curves for the requested locations. The 3 locations capture all flows entering the private system.

Boundary Conditions:

1. Simulation Based on City of Winnipeg Maximum Day Demand
    a. High Demand Conditions used to model existing distribution capacity for proposed system
    b. 2 Demand Nodes used to simulate high demand on the existing distribution system from proposed system
2. Internal WM network based on preliminary WM layout provided by Morrison Hershfield
    a. Development feed WM sizing based on existing system pipe/junction sizes
    b. Development internal network simulated with a 250mm WM loop
    c. Elevation for Internal WM network, based on Morrison Hershfield

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Discontinuance or interruption

485(1) The city is not liable for loss or damage as a result of

(a) the breakage, malfunction or failure of any pipe, wire, conduit, meter or other apparatus or equipment used for the delivery or supply of water or a commodity, service or thing unless it is established that the break, malfunction or failure was the result of the negligence of the city or its employees; or

(b) the discontinuance or interruption of the delivery or supply of water, or a commodity, service or thing provided by the city

(i) because of an accident or emergency,

(ii) if the discontinuance or interruption was imposed by the city for failing or refusing to pay the price, rate, fee, deposit or charge prescribed or fixed for the delivery or supply, or for failing or refusing to comply with any term or condition of the delivery or supply, or

(iii) because of the necessary repairs, replacement or extension of any pipe, wire, conduit, meter or other apparatus or equipment used for the delivery or supply.

We trust that this information is satisfactory for your purposes, and that your reasonable judgment will be exercised in this application.
This simulation does not denote approval of any service or sprinkler connection.

To request a simulated hydrant flow test please contact slowtheflow@winnipeg.ca. If you have any questions, please contact Ryan Lucky P.Eng at (204) 986-7455.

Regards,

Raymund Tabing C.E.T.
Technologist
Water Planning & Project Delivery Branch
Engineering Division
Water & Waste Department
Tel: 204-986-7645
winnipeg.ca

Scenario: MDD+FF

Scenario: MDD+FF

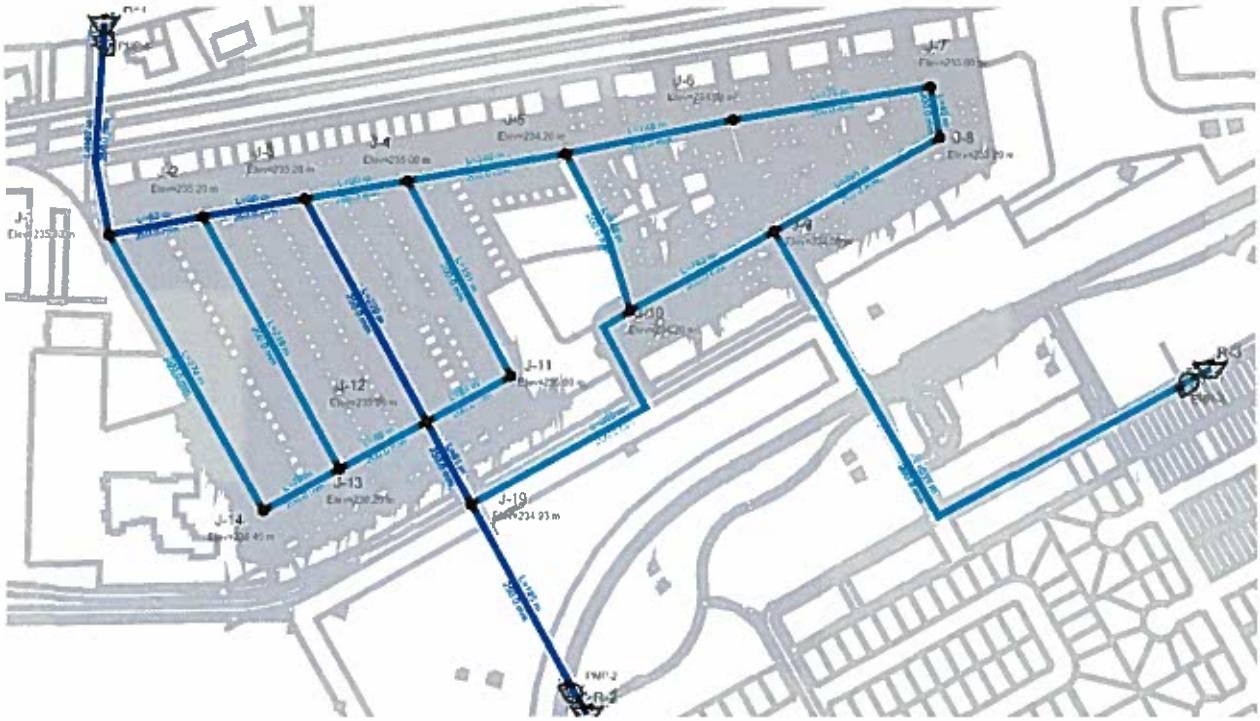

Table A.1 - Node and Demands Table

Water Junction Name	Zoning	Duplex	Triplex	Quadplex	Single Family	Total Single Family Units	Total Multi-Family Units	Total Units	Population	Average Daily Demand (ADD)	Total Avg Demand (+ 10%)	Maximim Daily Demand	Peak Hour Demand	Fireflow Required
		Lots								(L/s)	(L/s)	(L/s)	(L/s)	
J-1	Res		1	6		27		27	82	0.21	0.24	0.38	0.59	100
J-2	Res	2		1	23	31		31	95	0.25	0.27	0.43	0.68	100
J-3	Res	6			21	33		33	101	0.26	0.29	0.46	0.72	100
J-4	Res	5		2	16	34		34	104	0.27	0.30	0.48	0.74	100
J-5	Res		1	1	4	11	102	113	268	0.70	0.77	1.23	1.92	200
J-6	Res					0	400	400	920	2.40	2.64	4.22	6.59	200
J-7	Res					0	156	156	359	0.93	1.03	1.64	2.57	200
J-8	Res					0	282	282	649	1.69	1.86	2.97	4.64	200
J-9	Res					0	418	418	961	2.50	2.75	4.41	6.89	200
J-10	Res					0	144	144	331	0.86	0.95	1.52	2.37	200
J-11	Res	3			14	20		20	61	0.16	0.17	0.28	0.44	100
J-12	Res	4			22	30		30	92	0.24	0.26	0.42	0.66	100
J-13	Res	5			22	32		32	98	0.25	0.28	0.45	0.70	100
J-14	Res	3		4		22		22	67	0.17	0.19	0.31	0.48	100
	Total	**28**	**2**	**14**	**122**	**240**	**1502**	**1742**	**4187**	**10.90**	**11.99**	**19.19**	**29.98**	